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Productivity Commission

Murray-Darling Basin Plan: Five-year assessment

Productivity Commission
Inquiry Report

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The Productivity Commission

The Productivity Commission is the Australian Government's independent research and advisory body on a range of economic, social and environmental issues affecting the welfare of Australians. Its role, expressed most simply, is to help governments make better policies, in the long term interest of the Australian community.

The Commission's independence is underpinned by an Act of Parliament. Its processes and outputs are open to public scrutiny and are driven by concern for the wellbeing of the community as a whole.

Further information on the Productivity Commission can be obtained from the Commission's website (www.pc.gov.au).



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19 December 2018

The Hon Josh Frydenberg MP
Treasurer
Parliament House
CANBERRA ACT 2600

Dear Treasurer

In accordance with section 11 of the *Productivity Commission Act 1998*, we have pleasure in submitting to you the Commission's final report into *Murray-Darling Basin Plan: Five-year assessment*.

The Commission is to report on the matter of the effectiveness of the implementation of the Basin Plan and the water resource plans for the five-year period ending 31 December 2018, in accordance with Part 3 of the *Water Act 2007*.

We note that, on Friday 14 December 2018, the Murray-Darling Basin Ministerial Council made a number of decisions, including those relating to:

- allowing for delays in the accreditation of Water Resource Plans
- funding arrangements for stage one of supply measures projects
- progressing a work program for constraints easing projects
- funding for project feasibility assessments for the Northern Basin Toolkit
- developing efficiency measures projects, including criteria for a socioeconomic neutrality test that would apply to all projects
- addressing water deliverability challenges in the River Murray
- appointing a standing Aboriginal member of the Murray-Darling Basin Authority.

These decisions were taken after the Commission had finalised its report. They are related to many of the key issues for the next phase of the implementation of the Plan that are the subject of recommendations in the Commission's Final Report.

After consideration of the Ministerial Council's communique, the recommendations set out in this report remain pertinent to the successful implementation of the Basin Plan.

Yours sincerely

Dr Jane Doolan
Commissioner

John Madden
Associate Commissioner

Terms of reference

I, Scott Morrison, Treasurer, pursuant to Parts 2 and 3 of the *Productivity Commission Act 1998*, hereby request that the Productivity Commission (the Commission) undertake an Inquiry into the effectiveness of the implementation of the Basin Plan and water resource plans.

Background

The Basin Plan provides for the integrated management of water resources of the Murray-Darling Basin in ways that promote the objects of the *Water Act 2007 (Cth)* (Water Act), including the objective of optimising social, economic and environmental outcomes.

Under section 87 of the Water Act the Commission is required to undertake five-yearly assessments of the effectiveness of the implementation of the Basin Plan and water resource plans. This inquiry is the first such assessment.

Scope of the inquiry

In accordance with the provisions of Part 3 of the Water Act, the Commission is to report on the matter of the effectiveness of the implementation of the Basin Plan and the water resource plans for the five year period ending 31 December 2018.

In undertaking the Inquiry, the Commission should assess:

- progress towards implementing the actions required under the Plan within legislated timeframes, including:
 - the extent to which stated water recovery and other targets are on track to be delivered within statutory timeframes; and
 - the likelihood that activities and arrangements now in place will ensure that these targets and timeframes will be met.
- the extent to which the current framework for implementing the Basin Plan, including the framework for monitoring, compliance, reporting and evaluation, is likely to be sufficient:
 - to support delivery of the objectives and outcomes identified in Chapter 5 of the Basin Plan, acknowledging that the Basin Plan is not yet fully implemented and that many of the outcomes will only be observable over a longer timeframe;
 - to enable assessment of risks and risk mitigation requirements and provisions associated with Basin Plan implementation; and
 - to enable an assessment of progress in meeting the Plan's objectives and outcomes under the next scheduled review of the Basin Plan in 2026.

In assessing progress towards Basin Plan implementation, the Commission should report on progress towards milestones agreed in the Murray-Darling Basin Ministerial Council's report to

the Council of Australian Governments, *Implementing the Basin Plan*. Specifically, the Commission should focus on progress towards a pathway for three key priorities including:

- supply measures to offset the Basin Plan water recovery target of 2,750 GL by 2019, using the Sustainable Diversion Limit (SDL) adjustment mechanism;
- constraints measures to address impediments to delivering environmental water; and
- efficiency measures to recover an additional 450 GL by 2024, consistent with the Basin Plan legal requirement to achieve neutral or improved socio-economic outcomes.

In undertaking this assessment, the Commission should have regard to the *Intergovernmental Agreement on Implementing Water Reform in the Murray Darling Basin* (2013), and the *Basin Plan Implementation Agreement* between the Murray-Darling Basin Authority (MDBA), Basin states and the Commonwealth Environmental Water Holder (CEWH).

In undertaking this assessment, the Commission should also have regard to reviews and audits that have recently been completed or are ongoing, including those relating to compliance and Basin Plan implementation.

The Commission should also have regard to the differing responsibilities of the Basin states and the Australian Capital Territory, the Department of Agriculture and Water Resources (DAWR), the CEWH and the MDBA.

The Commission should assess progress towards full implementation in the context of the differing timeframes applicable to each key component of the Basin Plan. This includes an assessment of the extent to which Commonwealth and state-led water recovery efforts and state water resource plans are on track for when SDLs take effect from 1 July 2019.

The Commission should make findings on progress to date and recommendations on any actions required by the Commonwealth or Basin state or territory to ensure the timely implementation of Basin Plan requirements and the effective achievement of Basin Plan outcomes.

Process

In undertaking the inquiry, the Commission should consult widely including establishing a stakeholder working group in accordance with section 89 of the Water Act, inviting public submissions, holding public hearings, and releasing a draft report to the public. The Commission should consult with relevant Australian Government, Basin state and territory government agencies, key interest groups and affected parties. These consultations should include, but not be limited to, parties with interests in agriculture, industry and the environment, and Aboriginal groups. The Government has asked Basin jurisdictions to co-operate with this Inquiry, including by providing the Commission with the information it considers necessary in undertaking its Inquiry.

The final report is to be provided to the Government by 31 December 2018.

Scott Morrison
Treasurer

[Received 7 March 2018]

Disclosure of interests

The *Productivity Commission Act 1998* specifies that where Commissioners have or acquire interests, pecuniary or otherwise, that could conflict with the proper performance of their functions during an inquiry they must disclose the interests.

Dr Jane Doolan has advised the Commission that she is:

- Deputy Chair, Western Water
- Independent Chair, Yarra Consultative Committee.

Acknowledgments

The Commission has used a range of information sources in preparing this report. The Commission is grateful for the contributions made by stakeholders through their submissions and comments, and their participation in public forums, meetings and hearings. The Commission also thanks the Stakeholder Working Group (members are listed in appendix A) for their participation.

The Commission requested information from the Murray-Darling Basin Authority, the Australian Department of Agriculture and Water Resources, and the Basin States. The Commission thanks them for providing this information and for their broader participation in the inquiry.

The Commissioners express their appreciation to the staff who worked on the inquiry report and underlying analysis.

The Inquiry team was led by Dr John Salerian. The Inquiry team included Jack Knowles, Paul Loke, Lisa Leong, Mark Bryant, Matthew Hyde, Bronwyn Fisher, Sally Harvey, Lisa Tarzia, David Marshall, Timothy Hewett and Josh Lipp.

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Abbreviations

ACCC	Australian Competition and Consumer Commission
ANAO	Australian National Audit Office
ANZECC	Australian and New Zealand Guidelines for Fresh and Marine Water Quality
BDL	Baseline Diversion Limit
BOC	Basin Officials Committee
BPIA	Basin Plan Implementation Agreement
BWEWS	Basin-wide environmental watering strategy
CEWH	Commonwealth Environmental Water Holder
CEWO	Commonwealth Environmental Water Office
CHWN	Critical human water needs
COAG	Council of Australian Governments
COFFIE	Commonwealth On-Farm Further Irrigation Efficiency
DAWR	Department of Agriculture and Water Resources (Australian Government)
DEE	Department of the Environment and Energy (Australian Government)
FTE	full-time equivalent
GL	Gigalitre
GMID	Goulburn-Murray Irrigation District
IAC	Independent Assurance Committee
IGA	Intergovernmental Agreement
LTAAY	Long-term average annual yield
LTIM	Long-term intervention monitoring
LTWP	Long-term watering plan
MDB	Murray-Darling Basin
MDBA	Murray-Darling Basin Authority
ML	Megalitre
MLDRIN	Murray Lower Darling Rivers Indigenous Nations
NBAN	Northern Basin Aboriginal Nations

NBR	Northern Basin Review
NPA	National Partnership Agreement
NRAR	Natural Resources Access Regulator (New South Wales)
NRM	Natural resource management
NWI	National Water Initiative
OECD	Organisation of Economic Co-operation and Development
OEH	Office of Environment and Heritage (New South Wales)
PC	Productivity Commission
PPM	Pre-requisite policy measure
SARMS	South Australia River Murray Sustainability
SCBEWC	Southern Connected Basin Environmental Watering Committee
SDL	Sustainable Diversion Limit
TLM	The Living Murray
TDL	Transitional Diversion Limit
WESA	Water for the Environment Special Account
WQM plan	Water Quality Management Plan
WRP	Water Resource Plan

OVERVIEW

Key points

- The 2012 Basin Plan is a \$13 billion reform to reset the balance between environmental and consumptive use of water and to establish a new sustainable water management system.
- Significant progress has been made.
 - About 20 percent of the water that was available for consumptive users a decade ago is now dedicated to the environment. About \$6.7 billion has been spent to recover about 2000 gigalitres (GL). Water recovery is within five per cent of the July 2019 target.
 - The arrangements for managing environmental water are working well, with evidence of improved ecological outcomes at the local and system scale.
- There is still \$4.5 billion to be spent and the next phase is challenging.
- The package of supply measures to achieve equivalent environmental outcomes using 605 GL less water recovery is highly ambitious. Failure of key projects would delay environmental benefits and could cost taxpayers about half a billion dollars for further water recovery.
 - To manage the risks, Basin Governments need sound governance arrangements for integrated delivery. Before implementation, projects need to be independently reviewed to give confidence that they will deliver the predicted environmental outcomes and offer value for money. For some key projects, realistic implementation timeframes are likely to extend beyond 2024.
- The Australian Government's program to achieve enhanced environmental outcomes with an extra 450 GL of water recovery through efficiency measures needs to be adaptive to new information. These outcomes are at risk as key program assumptions have changed.
 - The Murray-Darling Basin Authority (MDBA) should update its modelling to reflect current information. The Australian Government should recover water in line with the ability to use it effectively. The 2021 legislated review of the budget appropriation for efficiency measures should be used to check the likely environmental benefits and the cost of achieving them.
- The development and accreditation of Water Resource Plans is behind schedule. Basin Governments should agree to extend the 2019 deadline for those plans where complex changes are required and there is a material risk to the quality of the plans.
- The MDBA should substantially revise the Basin Plan Evaluation Framework and Governments should develop a monitoring strategy. This will enable the impacts of the Plan to be effectively evaluated in 2020 and 2025, and provide information for the review of the Plan in 2026.
- The complex challenges ahead have been made more difficult because of the way Basin Governments have approached the implementation of the Plan.
 - The process has lacked transparency and candour with stakeholders.
 - It has been unclear who is responsible and accountable for leading implementation.
- In the Commission's view, the significant risks to implementation cannot be managed effectively under current institutional and governance arrangements. Reform is required.
- Basin Governments (not the MDBA) should take responsibility for leading implementation.
 - The Basin Officials Committee should be assigned responsibility for managing the significant risks to successful implementation, including the supply measures.
 - The MDBA has conflicting roles. It supports Basin Governments (as their agent) to implement the Plan and is also required to ensure compliance with the Plan. These conflicts will intensify in the next five years. The MDBA should be split into two separate institutions — the Murray-Darling Basin Agency and the Basin Plan Regulator.
- With negotiations largely settled, Basin Governments must make important changes now to ensure effective implementation. Failing to act will be costly for the environment and taxpayers, and undermine confidence that the Basin Plan has been worthwhile.

Overview

1 The Basin Plan and the Commission's approach to assessing implementation

The Basin Plan is a step change in the management of the Murray-Darling Basin (the Basin) (box 1). It is part of a comprehensive effort by the Australian and Basin State Governments¹ to reset the balance between environmental and consumptive use of water across the Basin and to establish a long-term sustainable water management system.

The development of the Basin Plan was a lengthy and contested process, involving negotiation and compromise before it was finalised and became law in November 2012. Making the Plan involved a series of substantial trade-offs between balancing the environmental benefits across the Basin and the socioeconomic impacts on industries and regional communities of a permanent reduction in water available for irrigation.

Basin Governments² are to have largely established the new management arrangements required by the Plan by 30 June 2019. The activities to reset the balance between the environment and consumptive uses are to be fully implemented by 30 June 2024.

The Productivity Commission has responsibility for assessing the effectiveness of the implementation of the Basin Plan and associated Water Resource Plans (WRPs) every five years. This function was included in the *Water Act 2007* (Cwlth) to ensure there was a regular independent review. This type of comprehensive review is critical to ensure public confidence in the implementation of the Basin Plan.

The Commission's approach to assessing implementation

The recurring nature of the Productivity Commission's role for assessing the implementation of the Basin Plan and associated WRPs means that this review is different from the typical Productivity Commission inquiry.

For this assessment, the Commission has looked at:

- how the actions of Governments to implement the Basin Plan are tracking against the set timeframes
- the extent to which management arrangements will deliver on the objectives of the Plan and enable its impacts and outcomes to be evaluated

¹ The Basin States are New South Wales, Victoria, Queensland, South Australia, and the Australian Capital Territory.

² Basin Governments are the Australian Government and the Governments of each Basin State.

-
- whether actions to implement the Plan have been effective and efficient
 - the institutional and governance arrangements for implementation.

Box 1 **The Murray-Darling Basin and the Basin Plan**

The Murray-Darling Basin

The Basin covers over 1 million square kilometres, including large areas of New South Wales and Victoria, the whole of the ACT, and parts of Queensland and South Australia. The Basin and its water resources support:

- the cultural, social, environmental, spiritual and economic needs of more than 40 Indigenous Nations whose traditional lands fall within the Basin
- over 30 000 wetlands, 100 of which are recognised as nationally important due to environmental, heritage or cultural significance
- about 41 per cent of the total gross value of Australia's agricultural production, including 46 per cent (\$7 billion) of the gross value of national irrigated agriculture
- the supply of drinking water for approximately 2.1 million people who reside within it, as well as a further 1.3 million people outside of the Basin.

The Basin Plan

The 2012 Basin Plan is the legal framework to reset the balance of water use in the Basin. It sets environmental and other objectives for the Basin and establishes new, lower sustainable extraction limits to achieve them. It also outlines the key actions, processes and timeframes that Governments are to adopt to implement the Plan. The Plan has several elements (section 2).

Funding

The Australian Government earmarked \$13 billion to implement the Plan, including:

- \$3.1 billion to purchase water entitlements for the environment. \$2.7 billion of this has been spent to recover 1227 gigalitres (GL).
- \$4.8 billion for investment in modernised water infrastructure, with \$3.9 billion spent. Of this, \$2.8 billion has been invested in projects that delivered 677 GL of water savings to the environment.
- \$1.3 billion for supply measures, of which \$34 million has been spent on developing projects.
- \$1.8 billion to recover an additional 450 GL to pursue enhanced environmental outcomes, of which \$14 million has been spent.
- \$2.0 billion for other programs and activities, with \$1.9 billion spent.

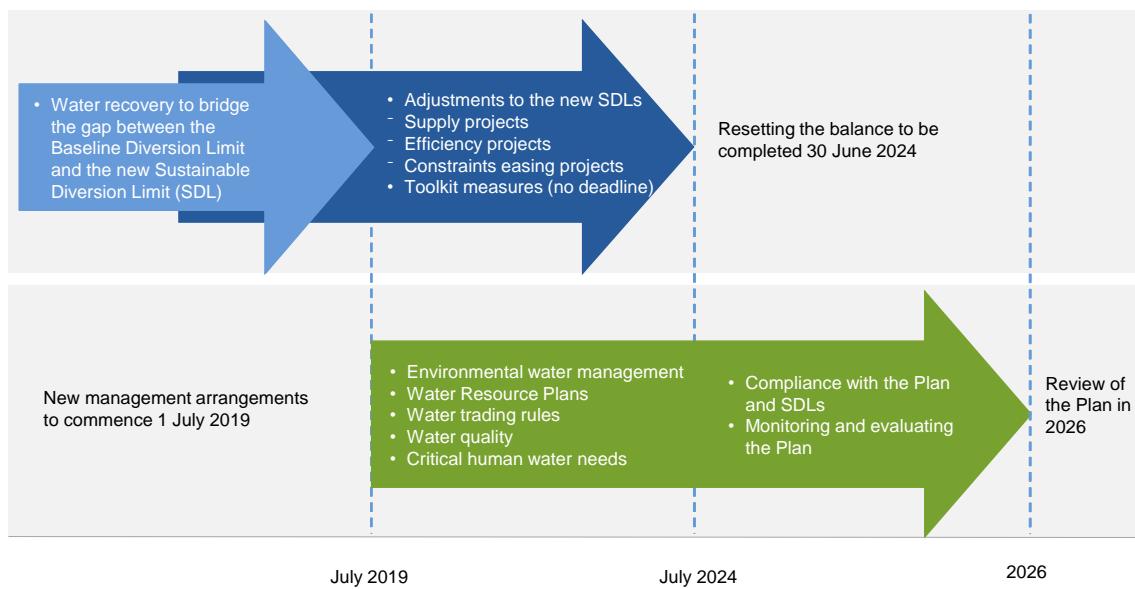
Almost \$8.5 billion has been spent, and \$4.5 billion is still to be spent by 2024.

The Commission's task in this review does not extend to examining the processes for setting the sustainable balance and associated targets in the Plan or measuring the impacts and outcomes of the Plan. However, it does examine the preparedness of Basin Governments and their institutions to effectively undertake these activities in the future.

2 Key elements to implementing the Basin Plan

The Basin Plan sets out a number of key elements that are required for implementation. Other elements, while not specified in the Plan (such as water recovery programs) are also necessary for successful implementation. The key elements of the Plan and their timing are outlined in figure 1.

Figure 1 Elements to implement the Basin Plan



Resetting the balance by 2024

Sustainable Diversion Limits (SDLs) are a core element of the Plan. They define how much water can be taken from rivers and groundwater for urban water supply, irrigation and other economic activities, and household use (consumptive uses). The remainder is dedicated to the environment to achieve the environmental outcomes outlined in the Plan. To bridge the gap between the historical extraction (baseline diversion limits) and the new SDLs, water is being recovered from consumptive use.

The initial SDLs in the Basin Plan required recovery of 2750 gigalitres (GL) from consumptive use by 30 June 2019. To achieve this, the Australian Government committed \$8 billion to purchasing water entitlements directly and to investing in irrigation infrastructure.

The Plan allows for SDLs (and water recovery targets) to be adjusted under certain circumstances, prior to them taking effect on 1 July 2019. In the northern Basin, these adjustments are to account for new information. In the southern Basin, SDLs can be changed by projects that achieve equivalent environmental outcomes with less water (supply and constraints easing measures) and through projects that aim to achieve enhanced

environmental outcomes through the recovery of additional water for the environment (efficiency and constraints easing measures) (box 2).

Box 2 **Adjustments to Sustainable Diversion Limits (SDLs)**

SDL adjustment mechanism

In the southern Basin, the Plan allows for adjustments to surface water SDLs through:

- **supply measures**, which allow for achievement of equivalent environmental outcomes with a lesser volume of water. Examples include using pumping stations, regulators and levees to deliver water to lakes and floodplains without creating overbank flooding
- **constraints easing**, to overcome some of the impediments to delivery of water down the system. They can include changes to physical features such as crossings and bridges, as well as negotiating easements where private land is flooded
- **efficiency measures**, to achieve enhanced environmental outcomes above those achievable with 2750 GL by recovering an additional 450 GL for the environment with neutral or improved socioeconomic outcomes. Examples of these projects include works to reduce on-farm water losses from irrigation, with a share of the water savings provided to the Australian Government as entitlements. The enhanced environmental outcomes are in the southern Basin, and are achieved by watering larger areas of floodplains, higher stream flows, and meeting specific objectives for the Coorong, Lower Lakes and Murray Mouth in South Australia. Delivering all these enhanced environmental outcomes is also dependent on easing water delivery constraints.

The Basin Plan limits the total amount by which SDLs can be adjusted. The Basin-wide long-term average SDL can be adjusted up or down by a maximum of five per cent of the 2012 SDL (approximately 543 GL). As the supply measures (605 GL) exceed this limit, further water recovery through efficiency measures is required (62 GL).

Northern Basin Review

When the Plan was developed, the Murray-Darling Basin Authority (MDBA) recognised that it required additional information to inform the setting of the SDLs in the northern Basin. As a result, Governments agreed that the MDBA would undertake a review into the northern Basin, which was completed in November 2016.

The key recommendation arising from this review was to reduce the water recovery target in the northern Basin from 390 GL to 320 GL on the provision that the Australian, Queensland and New South Wales Governments implement Toolkit measures to ensure effective management of environmental water in the north. These measures aim to target water recovery, protect environmental flows, improve the coordination and delivery of environmental water, ease constraints to environmental water delivery in the Gwydir River and construct works to improve fish passage.

The aim of supply measures was to test whether environmental outcomes could be achieved with less water, thereby reducing the socioeconomic impacts of water recovery on communities in the Basin. The inclusion of efficiency measures in the southern Basin reflects the opportunity to improve environmental outcomes (particularly in the Lower Murray) by recovering additional water for the environment.

A package of supply measures (including measures to ease constraints) equivalent to 605 GL in water recovery has been approved and Governments are required to implement these by 30 June 2024. If this is not achieved, Governments will most likely need to make up the shortfall with further water recovery.

Basin Governments are required to notify the Murray-Darling Basin Authority (MDBA) of the volume of water recovered through efficiency measures by the end of 2023. All recovered water is to be transferred to the Commonwealth Environmental Water Holder (CEWH) by 30 June 2024.

Following the Northern Basin Review, the MDBA recommended decreasing the water recovery target by 70 GL on the proviso that Basin Governments agree to implement Toolkit measures. However, unlike supply measures, Governments are not subject to the same checks and balances to incentivise them to implement the Toolkit.

In 2018, the Australian Government (with the agreement of the Australian Parliament) made two amendments to the Basin Plan that incorporated the adjustments to SDLs from the agreed supply measures and the Northern Basin Review. These adjustments reduced the surface water recovery target from 2750 GL to 2075 GL. The net adjustment to SDLs from supply and efficiency measures cannot be more than plus or minus 5 per cent. This means 62 GL must also be recovered through efficiency measures to give full effect to the supply measure adjustment (box 2).

New management arrangements are to be in place by 1 July 2019

Implementing the Basin Plan also involves establishing a new and ongoing management framework, which includes the following:

- **environmental water management** activities, whereby environmental water holders work together to deploy water to achieve the environmental objectives
- Basin States embedding the Plan (in particular SDLs) into their normal water planning and management processes through **WRPs**, which are assessed by the MDBA and accredited by the Australian Minister for Water. WRP s also include specific provisions relating to **water quality** and **critical human water needs**
- measures to establish consistent Basin-wide **water trading rules** for the trading and transfer of surface water and groundwater access rights, irrigation rights and water delivery rights, as well as consideration of third party impacts of trading and provision of information to improve the operation of the market

-
- a role for the MDBA to enforce **compliance** with the Basin Plan, noting that Basin States are to enforce compliance with their water take laws
 - a whole-of-Basin framework for **monitoring and evaluating** the impact and effectiveness of the Basin Plan, which includes public reporting requirements.

Institutional arrangements for implementing the Plan

The Basin Plan is an instrument of the Australian Parliament, and Basin Governments have committed to implement the Plan through intergovernmental agreements.

The Australian Government has responsibility for water recovery programs and the management of this water (by the CEWH) for environmental purposes.

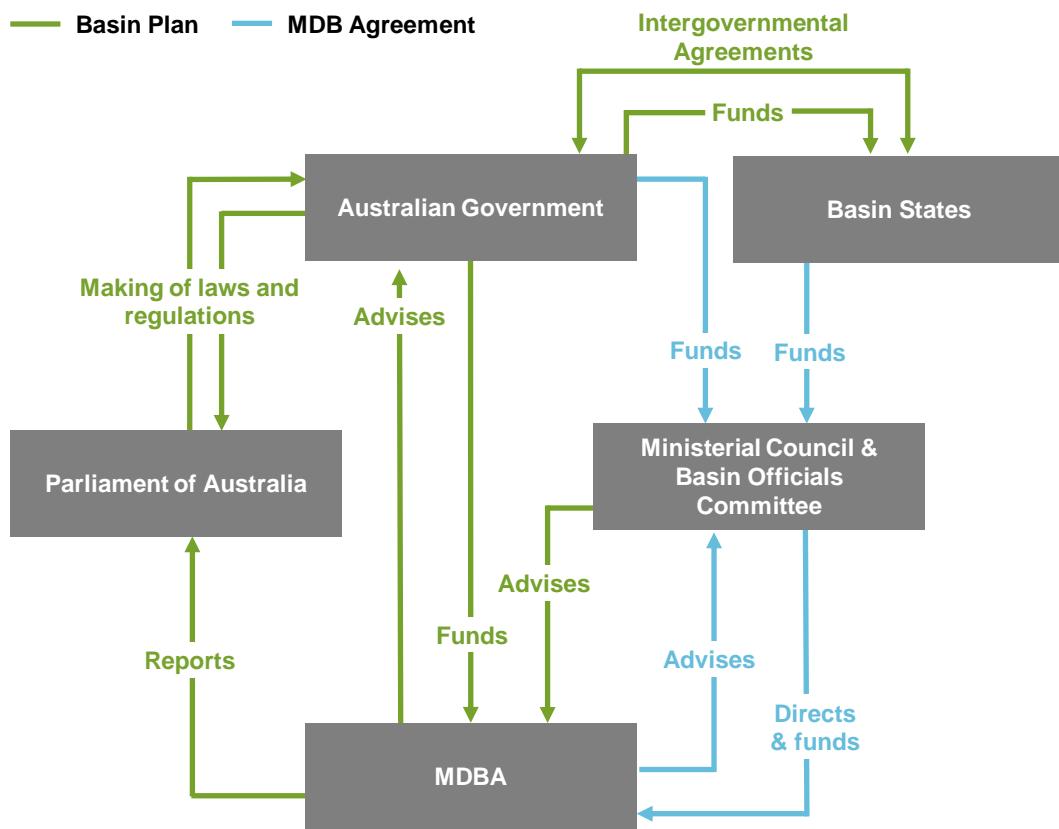
Constitutional responsibility for water resource management in the Basin resides with the Basin States. It is their role to ensure that their own State-based arrangements reflect and are consistent with the Basin Plan.

Basin Governments agreed that the MDBA (an independent Australian Government Corporate Commonwealth Entity) would be responsible for preparing and implementing the Plan, enforcing compliance with it, and monitoring and evaluating the outcomes.

The institutional arrangements agreed by Basin Governments for the Basin Plan were superimposed on long-standing settings, including those of the Murray-Darling Basin (MDB) Agreement (figure 2).

This means that the MDBA has roles in addition to those set out in the Basin Plan. In shared and highly connected systems (such as the River Murray) the MDBA is an agent of Basin Governments. It delivers State-based responsibilities on their behalf — such as those for resource management and river operations. For these functions, it is funded and directed by Basin Governments (through the Basin Officials Committee (BOC)).

Figure 2 Current institutional settings and relationships



Sources: Basin Plan 2012 (Cwlth); Water Act 2007 (Cwlth).

3 Is implementation on track?

Significant progress has been made

Basin Governments have made significant practical progress in implementing key elements of the Plan. Almost 20 per cent of the water that was available a decade ago for consumptive uses such as irrigated agriculture is now dedicated to the environment and arrangements for managing this water are in place.

Water recovery to meet the SDLs is largely complete

Basin Governments have delivered about 2000 GL of water to environmental water holders.

By 1 July 2019, the Australian Government needs to recover 2137 GL of surface water, comprising:

- 2075 GL, the adjusted Basin-wide surface water target³
- 62 GL through efficiency measures, to ensure adjustments to the SDLs comply with the 5 per cent limit.⁴

The Basin-wide water recovery target comprises local targets and shared targets (for connected water resources). Some local targets have not yet been met. The outstanding recovery tasks to meet the July 2019 target include:

- about 30 GL to finish recovery against local water recovery targets
- about 60 GL of water that still needs to be recovered through the efficiency measures program.⁵

For surface water, the 90 GL outstanding gap is less than five per cent of the July 2019 target of 2137 GL.

The Department of Agriculture and Water Resources (DAWR) expects that a further 120 GL will be *delivered by 30 June 2019. At the headline level, the 2019 water recovery task appears all but complete, even though more still needs to be done.*

When completed, it is possible that water recovery may exceed the targets established by SDLs, with over-recovery in some surface water areas. Although this cannot be determined until key technical work is finalised, there is not yet a process in place to calculate and address any over-recovery.

For groundwater, 40.4 GL needs to be recovered to meet the targets. While a further 37.7 GL needs to be delivered to finalise this task, arrangements are in place to meet this target by July 2019.

New management arrangements have been established for a number of elements

Basin Governments have put in place the key foundations of the Basin Plan's new management arrangements. Some are working well.

- For communities that rely on the River Murray, new rules for providing critical human water needs (including drinking water for cities and towns and stock water) have been established, with stakeholders expressing confidence that these rules will ensure these needs can be met in extremely dry times.

³ The original 2750 GL water recovery target to bridge the gap is now 2075 GL, after the target was revised down by 605 GL (following the notification of a supply measure offset) and by 70 GL (following the Northern Basin Review).

⁴ The Basin Plan limits the total change in the SDLs from the SDL adjustment mechanism to 5 per cent of the Basin-wide SDL (in 2012) of 10 873 GL (about 543 GL). As the 605 GL increase in the SDLs from supply measures exceeds that limit, 62 GL must also be recovered through efficiency measures to decrease the SDL and keep the net change within the 5 per cent limit when the SDLs enter into force on 1 July 2019.

⁵ About 1.9 GL of efficiency measures is currently under contract.

-
- Basin Plan salinity targets are integrated into the Basin salinity management framework and have been consistently met for most areas.
 - Basin States have improved their formal processes for engagement with Traditional Owners as part of WRP development; in particular, they are taking a nation-by-nation approach to consultation. Government efforts to support effective local-level consultation processes are likely to generate ongoing benefits where this consultation leads to long-term partnerships between Traditional Owners and local water managers.

New requirements to improve water market information and market confidence (such as protocols to manage market sensitive information) are in place. The Basin Plan trading rules also include a mechanism to validate or remove restrictions on trade. Although this mechanism has not yet been extensively applied, it has the potential to improve the efficiency of water markets.

The MDBA's role for ensuring **compliance with the Basin Plan** (including compliance with SDLs and WRPs) comes into full effect once WRPs are accredited. In 2017, major reviews of compliance were triggered by media reports of compliance and enforcement failures. Basin States have committed to strengthening water take compliance regimes. The MDBA has also reformed its regulatory approach, including establishing an Office of Compliance. This is a step forward in establishing its capability as a regulator.

There has been substantial progress to establish the arrangements to plan for and manage environmental water under the Environmental Management Framework set out in the Basin Plan. These arrangements have widespread support. Over 750 environmental watering events have occurred over the past five years, targeted at specific environmental outcomes linked to the long-term objectives of the Plan. There is already some evidence of improved ecological outcomes at the local and system scale. Key foundations for enabling this progress have been:

- Basin Government institutions that are focused, and have clear roles and responsibilities
- effective partnerships between Commonwealth and Basin State environmental water holders and environmental asset managers, based on shared objectives, with agreed principles for how governments will work together to achieve on-ground outcomes
- collaborative planning processes that result in clearly articulated targets and priorities, which provide strategic direction for implementation.

But for other elements there is still significant work to do

Resetting the balance through supply, efficiency and Toolkit measures

Resetting the balance between consumptive uses and the environment will only be finalised once **supply measures** are fully operational (these are scheduled to be completed in 2024) and the volume of water recovered through efficiency measures is known.

The supply package relies heavily on some projects that are still in the early stage of development. The 2024 timeframe for these projects is ambitious, and most likely

unrealistic. History has shown that these types of projects are complex, interdependent, require extensive consultation and take many years to implement. The timeframe for implementation has been compressed due to delays in developing and agreeing to the projects. At this stage, Basin Governments have not yet settled key governance arrangements for these projects, including the allocation of responsibilities, risk sharing and funding. Projects cannot commence until these issues are resolved, placing further pressure on the timeline. DAWR has provided little public information about how its funding approval processes will ensure that fully scoped projects will deliver the predicted environmental benefits and offer value for money.

There has been limited progress in implementing **efficiency measures**. Pilot water recovery programs have so far delivered less than 0.5 GL to the CEWH, and the current program risks recovering water in the northern Basin that is unlikely to be useful for achieving the enhanced environmental outcomes in the southern Basin. Key assumptions made in 2012 about the expected environmental improvements from recovering more water (and the costs of doing so) have changed. There is also ongoing debate about the requirement that these measures achieve neutral or improved socioeconomic outcomes, and this has further delayed progress.

The adjustment to SDLs arising from the MDBA's Northern Basin Review was on the provision that the Australian, Queensland and New South Wales Governments implement **Toolkit measures** to ensure effective management of environmental water in the north. Basin Governments are still to settle the details for implementation, including key milestones, funding arrangements and program governance.

Settling the remaining new management arrangements

The development and accreditation of **WRPs** is well behind schedule. Of the 33 WRPs that must undergo accreditation, 12 are in the early stages, 17 are in draft form, three are in the accreditation process and one has accreditation. Given the remaining workload, there is a significant risk that some WRPs will either not be accredited by 30 June 2019 or rushed through, compromising quality. This risk is greatest for WRPs in New South Wales.

The objectives of the Basin Plan are based on an assumption that Basin States will implement river operation and water accounting policies (known as **pre-requisite policy measures (PPMs)**) to enable the efficient use of environmental water in the southern Basin. The MDBA has accredited PPM implementation plans, and Basin States and the MDBA have conducted PPM pilot projects and trials. However, some of these arrangements are yet to be formalised and the pathway for doing so is not clear.

The MDBA is responsible for **evaluating** the outcomes of the Plan. More work needs to be done to improve the Basin-wide evaluation framework and provide clear direction for the collection of information required to monitor outcomes. While some work to revise the existing framework has commenced, the process for this (including how the views of stakeholders will be considered) is not yet clear. There is little evidence that any preparatory work for the 2026 Review of the Plan has commenced.

... and the community is concerned about the road ahead

Deficiencies in the way that Governments have approached implementation of the Plan have caused considerable concern in many Basin communities. This has left a legacy of community distrust, which the Commission considers is a risk to effectively implementing the next phase of the Plan.

In some WRP Areas, significant rule changes may be needed to meet Basin Plan requirements. Stakeholders are justifiably concerned that if WRPs are rushed to meet the accreditation deadline, changes could affect the reliability of their entitlements or not sufficiently protect environmental water. They are concerned that there is not enough time left to properly examine and test the proposed changes before they become law.

Many communities are increasingly sensitive to the socioeconomic impacts of the Plan. They are concerned about the impacts of water recovery observed to date and are increasingly apprehensive about the potential impacts of further water recovery, including the additional 450 GL to be acquired through efficiency measures.

There is considerable support for the agreed package of supply measures because it avoids the need for more water recovery. However, the community is increasingly divided about the approach to implementing these projects. Some stakeholders are concerned that implementation will impinge on their land or water property rights. And some are concerned that the equivalent environmental outcomes envisaged from these projects cannot be achieved, or that their local environmental values will be compromised to achieve broader Basin Plan objectives.

An overwhelming number of participants in the inquiry indicated that stakeholder confidence has been further diminished by concerns that some Basin States had substantial deficiencies in enforcement of their water take laws. An unwillingness to demonstrate that water acquired for the environment can be protected from extraction further downstream, and allegations of fraud in water recovery programs have compounded these concerns and left stakeholders sceptical of the motivations of Basin Governments.

There is a widely held view in the community that Governments have failed to provide clear and decisive direction-setting leadership. Communities are uncertain about who is responsible, and this has made it difficult for them to navigate the institutional landscape for implementing the Plan. Much of the community concern is driven by the way Basin Governments have sought to negotiate and navigate their way through issues. Consultation has been inconsistent and inadequate, and the community has often had little sense that decision makers have listened to their concerns. Governments' approach has regularly lacked transparency and candour.

Summary of progress

A summary of progress is in table 1.

Table 1 Summary of progress in implementing the Basin Plan

Element	On schedule	Risk to meeting its objectives	Nature of risks
Resetting the balance			
Water recovery	✗	Low	The 2019 target is unlikely to be met. However the consequences are minor as the gap is less than five per cent of the target.
Supply measures	✗	High	Compressed timelines for implementation, with a range of issues to resolve. 2024 deadline is highly ambitious, if not unrealistic for some projects. As individual projects are further developed there is no transparent process for assessing whether the project is worthwhile and provides value for money. Risk to budget is hundreds of millions of dollars.
Efficiency measures	✗	High	The design of the efficiency measures program is contested. Enhanced environmental outcomes from additional water recovery are unknown as key assumptions (including dependence on easing constraints) have changed. Material risk that costs are significantly larger than anticipated.
Northern Basin Toolkit	n/a	Medium	No firm deadlines for implementation. Not subject to the same checks and balances as supply measures (such as oversight by the MDBA).
New management arrangements			
Water Resource Plans (WRPs)	✗	Medium	Behind schedule. Complex issues in some WRPs yet to be resolved.
Critical human water needs	✗	Low	River Murray arrangements robust. WRP provisions for other areas behind schedule.
Water quality	✗	Low	Salinity targets largely being met. WRP provisions behind schedule.
Water trading rules	✓	Low	
Environmental water planning and management (including pre-requisite policy measures)	✓	Medium	Failure to implement pre-requisite policy measures is a low likelihood, but high consequence risk. Other risks associated with environmental water planning and management are low.
Reporting, monitoring, evaluation	✗	Medium	There is scope to improve the evaluation framework and there is no clear monitoring strategy to give effect to the evaluation framework for the Plan.
Compliance	ongoing	Low	

Note: A tick for ‘on schedule’ means the element is progressing in line with agreed timelines. The level of risk assigned reflects the risk to achieving the objectives of the element, after taking into account actions to manage the risk. For example, while water take compliance is fundamental to achieving the outcomes of the Plan, Basin Governments have agreed on substantial changes that, when implemented, will provide greater confidence and assurance of compliance with water take rules.

4 The way forward

Basin Governments are transitioning to a complex phase of implementation as they finalise the task of resetting the balance through supply and efficiency measures, integrate the Plan into their normal water resource management (including shared resources) through WRPs and substantially improve the arrangements for evaluating the impacts of the Plan.

The task ahead is challenging in its own right, and made more difficult by the degree of community concern about the next phase of implementation.

Of the \$13 billion earmarked for reform, \$4.5 billion remains. It is critical that it is spent effectively.

To rebuild confidence, Basin Governments need to focus on the fundamentals of good governance

The settings of the Plan are now largely settled. Key amendments to the Plan have been passed and Basin Governments have agreed to address compliance concerns. Now is the time for Basin Governments to shift their approach, openly acknowledge the issues for the next phase of implementation, and work together to implement the agreed Plan.

The best way for Basin Governments to successfully navigate the challenges ahead and to help rebuild confidence in the Plan, is to ensure the fundamentals of good governance and management are in place. This means:

- there is clarity about roles and responsibilities, with responsibility given to institutions that can best achieve the outcomes in the long term
- there are effective processes for collaboration on implementation, with all parties having a genuine commitment to shared goals and co-operative working arrangements
- there is transparency and clear accountability for decisions and actions, and the costs and benefits of decisions are clearly articulated
- there are community engagement processes that provide stakeholders with information, analysis and time to enable them to meaningfully contribute, and sufficient time to enable their issues and concerns to be understood and properly considered by decision makers
- there are adequate reporting, monitoring, evaluation and review processes in place for individual programs and the Plan as a whole, to provide the information and opportunity to review decisions in the light of experience.

These are the principles the Commission has used when making its recommendations.

Action is required for successful implementation

To finalise the task of achieving the adjusted SDLs, Governments need to take steps to:

- ensure that supply measures (including lifting constraints) deliver the expected equivalent environmental outcomes and offer the Australian taxpayer value for money
- recover water through efficiency measures in a way that delivers the enhanced environmental outcomes set out in Schedule 5 of the Plan
- implement the **Northern Basin Toolkit** to support effective management of environmental water in the northern Basin.

Given approaching deadlines, priority attention is required to finalise the establishment of new management arrangements. Basin Governments need to:

- finalise **WRPs**, which in some cases will take more time to resolve complex changes to State water resource planning instruments
- complete the implementation of **pre-requisite policy measures** to support the efficient use of environmental water in the southern Basin
- address shortcomings in the framework for evaluating the impacts of the Plan, to enable informed judgements to be made about the extent to which the Plan is meeting its objectives and to provide information for the review of the Plan in 2026.

Governance and leadership are important across all elements of Basin Plan implementation and the arrangements need reform for successful implementation. The Plan is a joint responsibility of Basin Governments and they need to work together to implement it. Collaboration is a key issue for delivery of the supply, efficiency and Toolkit measures. A priority for Basin Governments should be to establish clear roles and responsibilities and transparent processes for implementation. Clear roles and responsibilities support accountability for decision making. Accountability is further enhanced when a strong and independent regulator calls out Governments when they fall short.

Going forward, it is important that the adaptive management ethos in the Plan is translated into a genuine focus on continuous improvement across all elements. Effective arrangements for reporting, monitoring and evaluation are required to underpin this focus.

5 Implementation of adjustment measures needs to be improved

Supply measures require integrated management and a robust review process

The package of agreed supply measures is potentially more cost-effective than recovering 605 GL of water entitlements to achieve the environmental outcomes. Successful

implementation could save Basin Governments and taxpayers large sums of money by avoiding further water recovery, which is a concern for many communities. These measures could also provide additional benefits to improve the long-term health of the Basin, such as the ability to provide additional delivery capacity, greater flexibility for river operations and capacity to water new areas of floodplain.

Key projects are complex

Up to half of the 605 GL offset relies on six highly complex and interdependent projects that are still in the concept design stage of development (box 3). Past experience with similar projects shows that they will require detailed consultation and take many years to plan and implement. There is a degree of dissatisfaction and mistrust in parts of the community that are directly affected by these projects, including Traditional Owners. This sentiment is the result of a lack of transparency, consultation and candour in the process of developing these projects.

Stakeholders are aware of the magnitude of issues to be resolved to implement supply measures and are concerned about likely impacts on cultural assets, the reliability of water entitlements, and land use. The apparent reluctance of Basin Governments to recognise the reality of these issues and to plan to undertake the projects with full consultation and appropriate issue resolution is further eroding community confidence.

There are clear interdependencies between projects in the planning, construction and operation stages. Many projects will ultimately need to be integrated into the operation of shared water resources, including the River Murray. A number of them will require common approaches across State borders. The current approach to implementation does not enable these interdependencies to be managed effectively.

Basin Governments should develop an integrated plan for delivering supply measures

To address these issues, as soon as practicable Basin Governments should develop an integrated plan for delivering supply projects to enable:

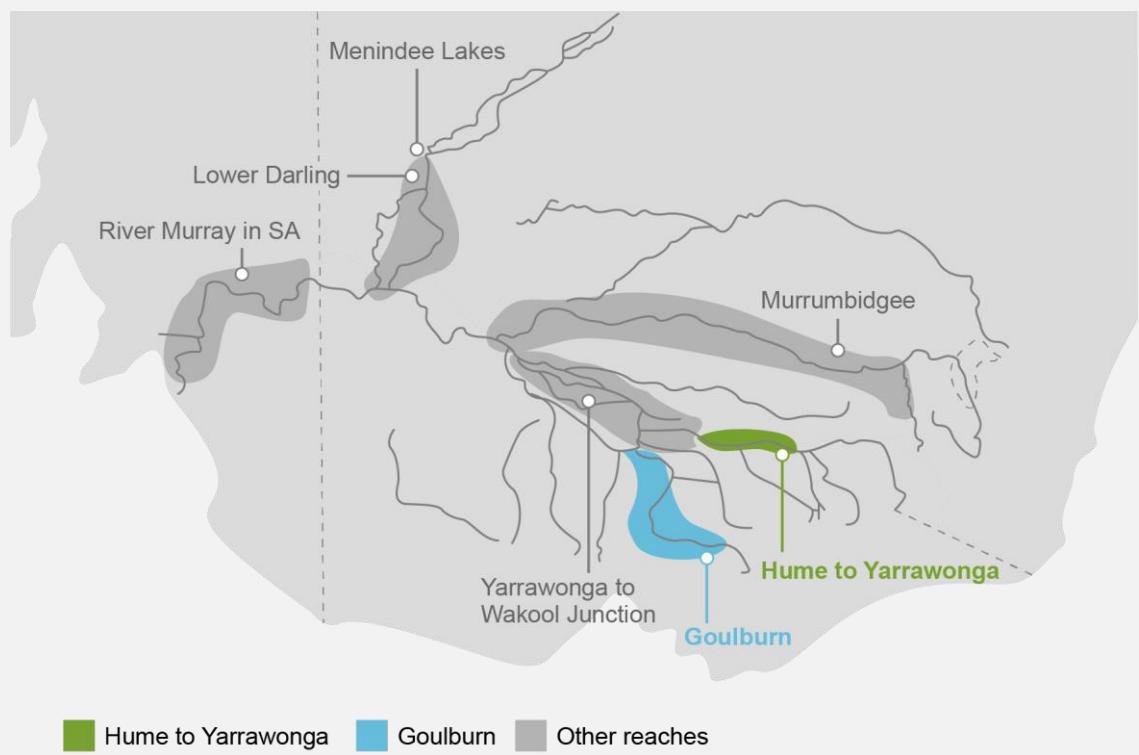
- management of interdependencies within the package of supply projects
- clear roles and responsibilities for implementation
- the development of common policy principles and consistent approaches where required
- logical sequencing of projects
- coordinated community and stakeholder engagement including with Traditional Owners
- integration into ongoing river operations and management.

Box 3 Challenging components of the supply package

Basin States are responsible for implementing the agreed supply package. The package relies heavily on six highly complex and interdependent projects, which could account for between one-third and half of the 605 GL expected water recovery offset. These projects are still in the concept design phase, and the preliminary cost estimate for them is in the order of \$583-765 million.

- **Menindee Lakes** — a project that aims to improve the operation of the Lakes to reduce evaporative losses. It involves changes to infrastructure and operational arrangements and easing constraints in the Lower Darling.
- **Constraints** — four projects that aim to increase the size of flows that can be delivered down the river system. This involves removing physical barriers (such as increasing the height of bridges), building levees to protect land from inundation and negotiating and signing agreements with landholders whose land is flooded by the higher flows.
- **Hydro-cues** — a project that aims to increase the ability of environmental water holders to coordinate environmental water delivery with increases in natural flows. It involves operational rules changes and system enhancements to achieve in-channel, floodplain and wetland environmental outcomes. It is dependent on easing constraints.

Easing constraints in the supply package will involve negotiations with over 3000 landholders across five reaches (shaded grey and green in the figure below). In the early 2000s, negotiations to secure easements for the right to release 25 000 ML/day from Hume Dam took almost eight years and involved negotiations with 103 landholders from Hume to Yarrawonga (green in map below). Easing constraints in the Goulburn (blue in map below) is not required for supply measures, but is for efficiency measures.



Adopting an integrated plan for implementing supply measures is an important step in establishing meaningful engagement with communities. It will provide a clear process for them to understand when and how decisions will be made. It will also support the provision of consistent and coordinated information, so that stakeholders can understand likely impacts on them and how these could be addressed.

There is an important role for the MDBA (as the agent of governments) to assist in the implementation of this integrated plan. Governments will rely on the MDBA's technical advice to understand the potential impacts of projects and to ensure they can be successfully incorporated into the operation of shared water resources.

Governments need to confront the reality that some projects may require more time

Failure to successfully implement these projects by 2024 would mean that either Basin States or the Australian Government will most likely need to make good any shortfall in the offset, which could include further water recovery. The 2024 deadline for a number of these projects (particularly the constraints projects) is highly ambitious, if not unrealistic.

The timeframe for implementation (which is already delayed) will continue to be compressed until Governments resolve significant policy issues including funding arrangements, responsibility for making good if projects fail and ongoing costs associated with assets. Agreement on these issues is urgent, as works cannot commence until they are resolved.

Strictly enforcing the 2024 deadline could lead to the abandonment of worthwhile projects.

To enable worthwhile projects to be implemented in realistic timeframes, Basin Governments should be open to the possibility of extending the 30 June 2024 deadline and make this clear to project proponents prior to detailed business cases being completed. This should not be interpreted as scope for a blanket extension for all projects or a reason for Basin States to procrastinate. Nor is it a reason to avoid making good if projects fall short. But being open to legitimate extensions of time avoids rejecting worthwhile projects or progressing projects with milestones that just cannot be met. Projects with unrealistic milestones will likely further erode community confidence that projects are achievable and worth doing.

Independent advice should inform whether specific supply projects have credible timelines and are worthwhile

Basin States are currently preparing detailed business cases for supply measures. Past experience in building environmental works projects has shown that the costs and benefits of projects can diverge substantially from original estimates. However, there is currently little public information about how DAWR plans to assess whether projects are still delivering environmental benefits and are value for money.

To ensure prudent use of public funds, it is vital that the process for funding supply projects is capable of removing projects if and when it becomes apparent that there has been a material decrease in the anticipated net benefits of that project. This includes instances where ongoing monitoring of a project reveals insufficient progress (particularly if extensions are granted). Because of the funding and community implications, there needs to be a high level of transparency about the process.

To this end, DAWR should appoint an **Independent Advisory Panel** on supply measures (independent panel) to provide it with expert advice to inform a gateway review process that determines whether supply measures proceed to implementation. The independent panel should consider any material decrease in the anticipated net benefits of projects since their initial business case (to ensure the projects represent a prudent and effective use of public money). It should also consider whether proposed milestones are credible and recommend where an extension to the 2024 deadline is warranted to allow worthwhile projects to be retained.

Based on the above assessment, the panel would make a recommendation on whether projects should proceed to implementation or be removed from the agreed package. DAWR should publicly respond to the advice of the independent panel, including justifying instances where it elects not to accept that advice.

Clear milestones for project implementation are required to keep Governments accountable for implementing projects. If the independent panel finds that a project owner has repeatedly failed to demonstrate credible progress against milestones, DAWR should cease project funding, and the project should be removed from the package.

Governments should not delay making good (through water recovery) until after the final reconciliation if it becomes apparent beforehand that the package of projects will fall short in achieving the estimated offset.

The cost of failure is considerable

The changes recommended by the Commission would maximise the likelihood of supply measures succeeding in meeting their objectives and could potentially reduce the cost to taxpayers of meeting SDLs by hundreds of millions of dollars. If Governments have to make good any shortfall through infrastructure modernisation (which is their current preferred approach), this will involve substantial expenditure. Failure to implement the constraints, Hydro-cues and Menindee Lakes projects could increase costs to Governments in the order of \$564 million.⁶ The additional costs to the taxpayer would be higher again if the

⁶ This estimate compares the average cost of implementing the key projects (based on their business cases) and the potential cost of recovering 250 GL through infrastructure works (the middle estimate of their water offset). Details of this estimate are in appendix B.2 of the main report.

Government had already invested money in a supply project, but then had to abandon the project and make good.⁷

There are also potential environmental losses from implementing poor projects. The changes recommended by the Commission would enable proper consideration of the risks to the environment arising from implementing the projects (including any trade-offs between local environmental assets and system-wide outcomes that may not emerge from environmental impact assessments), before a decision to proceed with implementation is made.

The efficiency measures program may not achieve all the enhanced environmental outcomes

The purpose of efficiency measures is to achieve enhanced environmental outcomes while maintaining or improving socioeconomic outcomes. The enhanced environmental outcomes (set out in Schedule 5 of the Plan) are located in the southern Basin. Delivering these enhanced environmental outcomes (particularly those for floodplains) is dependent on easing constraints to water delivery.

Since the efficiency program was initially negotiated in 2012, new information indicates that key assumptions underpinning the program (such as those relating to constraints easing proposals) have changed. Basin Governments and the MDBA need to do more work to provide greater confidence that the enhanced environmental outcomes can be achieved.

Key assumptions underpinning the efficiency measures program have changed

Anticipated environmental benefits

The 2012 Basin Plan modelling that underpinned the development of the Schedule 5 outcomes and the efficiency measures package made a number of assumptions that have since changed. In particular, the modelling suggested that without easing constraints to allow higher flow rates, additional environmental water would have few additional benefits. Since then, Basin States have developed proposals for constraints projects that will allow lower flow rates than those included in the 2012 modelling.

Environmental outcomes are likely to be improved by providing more base flows down the lower Murray towards sites in the Coorong, Lower Lakes and Murray Mouth, regardless of whether constraints are eased or removed. But it is not yet clear what environmental improvement can be expected, or how much water is required to realise those benefits.

⁷ The cost of making good through direct water purchases would be much less than infrastructure works and potentially comparable to the cost of the supply measures (though this ignores any additional operational benefits from supply measures). As such, direct purchase is an option Governments could consider in the event of a reconciliation to limit the cost to taxpayers.

The Australian Government also appears reluctant to countenance that at least some of the measures to ease or remove constraints may not be operational by 2024. If constraints projects are not implemented as expected, rushing to recover the full 450 GL by 2024 would risk the Australian Government spending hundreds of millions of dollars for an asset that (potentially) cannot be used for some time. Aligning water recovery with progress in lifting constraints could potentially save the Australian Government up to \$203 million.⁸

Program budgets are inadequate

There is a material risk that recovering an additional 450 GL through efficiency measures could be substantially more expensive than was anticipated in 2012 and will require further funding. Water entitlement prices in the southern Basin have increased by more than 150 per cent since the Basin Plan was made. To encourage participation, the program offers a premium of 75 per cent on market prices for entitlements recovered through efficiency projects. Based on current market prices, recovering 450 GL with this premium could exceed the funding available in the Water for the Environment Special Account (WESA) by \$660 million.⁹

Water recovery has commenced in the absence of a clear strategy

Enhanced environmental outcomes

Recovering water through efficiency measures has become increasingly divorced from the environmental outcomes it is meant to achieve. The current focus of the program is on meeting the legislated target of recovering an additional 450 GL by 2024. There is little evidence that it has been designed to recover water in the places needed to effectively achieve the enhanced environmental outcomes. For example, the Australian Government is soliciting proposals for water recovery projects in the northern Basin, and in systems that are considered disconnected from the southern Basin. Sizeable water recovery in the northern Basin would mean an effective portfolio of less than 450 GL would be available to pursue the Schedule 5 outcomes, which are in the southern Basin.

⁸ The estimate compares the net present cost of recovering water through efficiency measures by 2024 and increasing the time over which water is recovered to 2030. It does not consider other benefits and costs of recovering water, such as possible interim benefits before constraints are eased. Future costs are discounted at a rate of 5 per cent per year for this estimate (appendix B.4).

⁹ The estimate assumes that water is recovered by acquiring a portfolio of southern Basin entitlements in proportion to those on issue and held by non-environmental users, and excluding entitlements for which reliable price data were unavailable. A 75 per cent premium is applied to the volume-weighted average price for each entitlement for 12 months to June 2018 (appendix B.4).

Addressing adverse socioeconomic impacts

The recovery of 450 GL through efficiency measures is required to result in neutral or improved socioeconomic outcomes. The test for this, to date, has been voluntary participation of water users in infrastructure projects. However, this does not fully address stakeholder concerns about impacts of additional water recovery on regional communities. As a result, there is significant debate within the community and between Governments on additional criteria to assess socioeconomic neutrality, and whether such criteria should ensure no negative impacts at a local scale in any timeframe.

There is always the potential for an individual to be negatively affected by a project, for example, through a change in water prices or changing patterns of water trade — even if the net impacts of a project are overwhelmingly positive. Requiring a project to demonstrate no negative impacts would, in effect, block any additional water recovery. This debate has distracted Basin Governments from developing an effective and efficient strategy for addressing any substantial adverse socioeconomic impacts, and from developing community-supported projects that may recover environmental water cost-effectively and with relatively limited impact (at both a local and Basin-wide scale).

A structured pathway to deliver efficiency measures is required

With almost \$1.8 billion available in the WESA, the implementation of the efficiency measures program needs to be put on a sound footing prior to the Australian Government spending large sums of money.

A sequenced process would help the Australian Government address information gaps, review program parameters, and implement an effective and efficient program to recover water in line with the ability to deliver it to environmental sites to achieve Schedule 5 outcomes.

First, and as a matter of priority, the MDBA should update Basin modelling to establish the environmental benefits of additional water recovery within current operating conditions (including existing constraints), and the expected benefits arising from the agreed constraints proposals. This would identify those constraints projects that are most important for achieving the Schedule 5 outcomes and the entitlement types that should be prioritised in water recovery programs.

Second, DAWR should publish a water recovery strategy to define the environmental objectives of the program, to step out how those objectives will be pursued over time and to show how adverse socioeconomic impacts will be considered through program design.

To ensure that the recovery of the 450 GL is effective and efficient, this strategy should:

- prioritise recovering water that can usefully contribute towards achieving Schedule 5 outcomes
- plan for a range of scenarios for constraints easing

-
- phase water recovery to ensure that, as new information becomes available, it aligns with both revised constraint proposals and progress in easing constraints, and contributes towards specific Schedule 5 outcomes
 - consider all available options for recovering water in the development and assessment of projects, including community-designed initiatives
 - clearly outline how it will address adverse socioeconomic impacts through the design of its program
 - be transparent, and regularly publish information on successful projects, prices paid and overall progress against program objectives
 - outline clear processes to ensure engagement with local communities and industries for the duration of the program
 - include a regional-scale monitoring and evaluation program to determine what the impact of the program is on regional communities.

Within this strategy, addressing socioeconomic impacts should be undertaken through consideration of the likely benefits and impacts of individual project proposals coupled with an assessment of any potential cumulative effects to inform decisions on funding (recommendation 5.3).

Third, the 2021 independent review of the WESA should be a comprehensive review of the benefits, costs and impacts of additional water recovery given that, at this time, new and updated information will be available to inform decision making. This information will include final decisions on the level of constraint easing, updated modelling by the MDBA, adjusted cost estimates and any new information on watering requirements and environmental priorities for the environmental sites in Schedule 5.

This review needs to be supported by modelling provided by the MDBA and any additional information from Basin States.

Following this review, the Australian Government should determine whether there is a need to amend the Schedule 5 outcomes based on what is achievable, or adjust the water recovery strategy to pursue those agreed outcomes efficiently and effectively.

Governments should be held accountable for implementing the Northern Basin Toolkit

The MDBA's recommendation to increase SDLs in the northern Basin was on the provision that Toolkit measures were implemented. However, key milestones for implementation, funding arrangements and program governance are still to be settled by Basin Governments.

A lack of firm deadlines and checks and balances for implementing the Northern Basin Toolkit means accountability for outcomes is limited. Basin Governments should ensure that

the arrangements to implement the Toolkit measures are transparent, enable progress to be tracked and ultimately lead to understanding the effectiveness of the measures.

In the absence of such arrangements, there is a risk that the timeframes for implementing the Toolkit will blow out, or that some may never be put in place to the degree originally intended, which may have consequences for achieving environmental outcomes.

Ultimately, the extent to which the implementation of the Northern Basin Toolkit has achieved its objectives should be examined when SDLs for the northern Basin are again reviewed by the MDBA as part of the comprehensive review of the Plan in 2026.

6 Three other elements require urgent improvement

Pre-requisite policy measures need to be fully implemented

The outcomes of the Basin Plan are based on an assumption that Basin States will implement pre-requisite policy measures (PPMs) to enable the efficient use of environmental water by providing:

- credit for return flows from environmental watering events for environmental use downstream (rather than being used to supply the demands of other users)
- the ability for environmental water holders to order water from a specific storage to top up or ‘piggy-back’ on naturally occurring high flow events.

The PPMs were assumed in the original modelling used to set SDLs and were also incorporated into the environmental equivalence methodology that underpins supply measures and the associated adjustment to SDLs. Without PPMs, a water recovery target of more than 4000 GL would be required to achieve the outcomes of the Basin Plan. If Basin States do not implement PPMs by 1 July 2019, the MDBA may recalculate SDLs.

The MDBA has accredited PPM implementation plans, and Basin States and the MDBA have conducted PPM pilot projects and trials in the southern Basin. However, some of these arrangements are yet to be formalised, and a number of PPM implementation issues remain unresolved, primarily in New South Wales. There is a lack of transparency of the progress of Basin States to implement PPMs and the MDBA’s process for assessing the adequacy of State arrangements. There is some risk that PPMs will not be implemented by 30 June 2019.

Some WRPs need more time to address key issues

WRPs embed the Basin Plan in State-based water management arrangements and need to be accredited by 30 June 2019, at which time the MDBA’s role to ensure compliance with the Plan (including SDLs) takes full legal effect.

For a few WRP areas, significant changes to local water management arrangements (which are often defined in State legislative instruments) are needed to meet Basin Plan requirements and achieve the outcomes of the Plan. These include:

- changing rules that define permitted water take
- changing rules that protect environmental flows, including those to shepherd environmental water in connected water resources
- implementing PPMs (particularly in New South Wales)
- managing water quality and the supply of critical human water needs in extreme events.

It is critical that Basin Governments provide adequate time to conduct the detailed analysis and consultation required to understand local issues, identify and test feasible solutions and make the necessary amendments to rules and supporting documents. There is insufficient time left to do this well.

The risk is highest for New South Wales, given the number of outstanding WRPs and the magnitude of proposed changes in some plans, including rules to protect environmental water in the Barwon-Darling and provisions to meet critical human water needs and address water quality issues in the Lower Darling.

The Australian Minister for Water and Basin States should as a matter of priority negotiate extensions to the 30 June 2019 deadline for accrediting WRPs where there are substantive changes to State-based water management rules proposed that may have material impacts on entitlement holders and/or the environment. Given the progress made against water recovery targets and the results of the MDBA's trials of new SDL accounting methods, limited extensions for WRPs appear unlikely to undermine key Basin Plan objectives.

In the longer term, there is a need to clarify the purpose of and effective format for WRPs and associated compliance processes.

The framework for evaluating the impacts of the Plan needs development

Effective arrangements for monitoring and evaluation are critical to the successful implementation of the Basin Plan. Improvements in arrangements are required to provide a clear framework, to enable informed judgements to be made about the extent to which the Plan is meeting its objectives and to ensure the review of the Plan in 2026 is well informed.

Basin Governments should not squander the opportunity to learn the lessons from implementation of the Basin Plan. There is a risk that unless necessary planning and preparation is done soon, there will be inadequate information and knowledge to evaluate the Plan and inform the review.

The Basin Plan evaluation framework should be improved to define the specific questions that will be used to comprehensively evaluate the effectiveness of the Plan in achieving environmental, socioeconomic and cultural outcomes at both a region and Basin scale. This will enable Basin Governments to communicate the outcomes of the Plan in a clear, cogent and consistent manner.

A Basin Plan monitoring strategy should be developed to obtain the information needed to answer the questions set out in the evaluation framework. This includes what information will be collected and by who, the process to address information gaps, and the arrangements for sharing the costs of monitoring and evaluating the Plan among Basin Governments.

The MDBA (as Basin Plan Regulator) should urgently publish a revised Basin Plan evaluation framework. Basin Governments should develop and publish the monitoring strategy.

The Commission expects to see that the MDBA has made demonstrable progress in planning for the 2026 review when it next examines the implementation of the Plan in 2023.

7 Institutional and governance arrangements need reform

It is unclear who is responsible and accountable for leading the implementation of the Basin Plan — the MDBA or Basin Governments. The MDBA has played the central role in developing the Plan and recommending key amendments. However, since the Plan was agreed in 2012, there has been a shift and Basin Governments have taken a more central role in deciding how it would be implemented as the responsibility for the management of water resources ultimately resides with them.

This shift has occurred implicitly. The MDBA has positioned itself as leading the implementation, and stakeholders most often perceive it to be an Authority that is in charge (although of what is unclear). Basin Governments have not sought to challenge this position, or explicitly claim this role. There is consequently a lack of clarity about how Governments should respond to issues as they arise and an exposure to a lack of accountability. As a result, key risks to successful implementation have not been strategically managed with a default to last-minute negotiations as a crisis looms.

In the Commission’s view, the identified and significant risks to successful implementation cannot be managed effectively without improvements to the governance and institutional arrangements. Reform is required.

Basin Governments should set firm direction for the next phase

For the outcomes of the Basin Plan to be achieved and sustained, the Plan must be integrated into State water resource management frameworks and in joint arrangements for shared water resources.

The MDB Ministerial Council must set a much clearer tone of firm commitment to the Basin itself, with unmistakable collective direction for delivering on that commitment. BOC should take responsibility for leading the implementation of the Basin Plan, putting substance to Governments' Basin-wide direction-setting. This complements BOC's established role as the governance engine room of the MDB Agreement, directing the MDBA on the management of shared water resources and joint natural resource management programs.

To do both its roles well, BOC must change the way it operates. A shift in focus is required, from operational to strategic and from individual interests to 'Basin as a whole'. Rather than focusing on short-term crisis management, BOC should prioritise a long-term strategic approach that emphasises managing the implementation of the Basin Plan and sound water resource management. An independent Chair is required, to foster a culture of joint custodianship and a strategic approach to Basin-wide planning, resource management and service delivery.

Structural reform of the MDBA is required to manage its conflicting roles and better support Basin Governments

As the agent of Governments, the MDBA delivers the century-old role of custodian of the River Murray under the MDB Agreement and supports Basin Governments (through BOC) to manage shared water resources and joint natural resource management programs. And the MDBA will continue to be critical in driving collaboration between, and providing technical support to, Basin Governments to help them to implement the Basin Plan.

However, the MDBA is also the regulator of the Basin Plan. It is required to make final judgments on the success or otherwise of its own coordinated activity (for example, supply projects) and to manage breach or non-compliance of all aspects of the Plan. At times it may have to call out States (or indeed itself) when they are non-compliant.

Being the agent of, and funded by, those same Governments (a role that involves providing collaborative leadership, advice and technical capability) compromises the MDBA's ability to be an impartial regulator. This latter role is critical to restoring public confidence in the Plan. Conversely, having to regulate and stand in judgment of the States undermines the MDBA's ability to work closely and openly with them as a trusted adviser.

The MDBA has recognised and sought to manage these conflicts through its internal structure and processes. In the early phase of Basin Plan implementation, this was a pragmatic solution and the MDBA has done what it can to manage these conflicts. But

Governments have put it in an impossible position — it is an inherently conflicted entity and is perceived as such by stakeholders.

The conflict in the MDBA's roles will intensify over the next five years. Its agent of governments role will grow. Basin Governments will need to rely on the MDBA to help them to be proactive stewards of the shared water resources of the southern Basin, which has a market with more than \$13 billion of water entitlements. They will need its technical capability and river operations skills to implement supply projects and to maximise the benefits from an environmental water portfolio that is currently worth \$3.3 billion.

Its role as regulator of the Basin Plan comes into full effect when WRPs are accredited. As regulator of the Basin Plan, the MDBA will make judgements on whether Basin Governments and river operators manage water resources in a way that is consistent with WRPs. Given the MDBA's role as operator of the River Murray, it will be a judge of its own performance in this regard.

Structural conflicts are likely to be exacerbated by the very different operational culture and approach that will be required to perform each of these roles effectively. These conflicts cannot be successfully managed through internal controls. In its current form, the MDBA cannot be a trusted adviser to Basin Governments and a credible regulator.

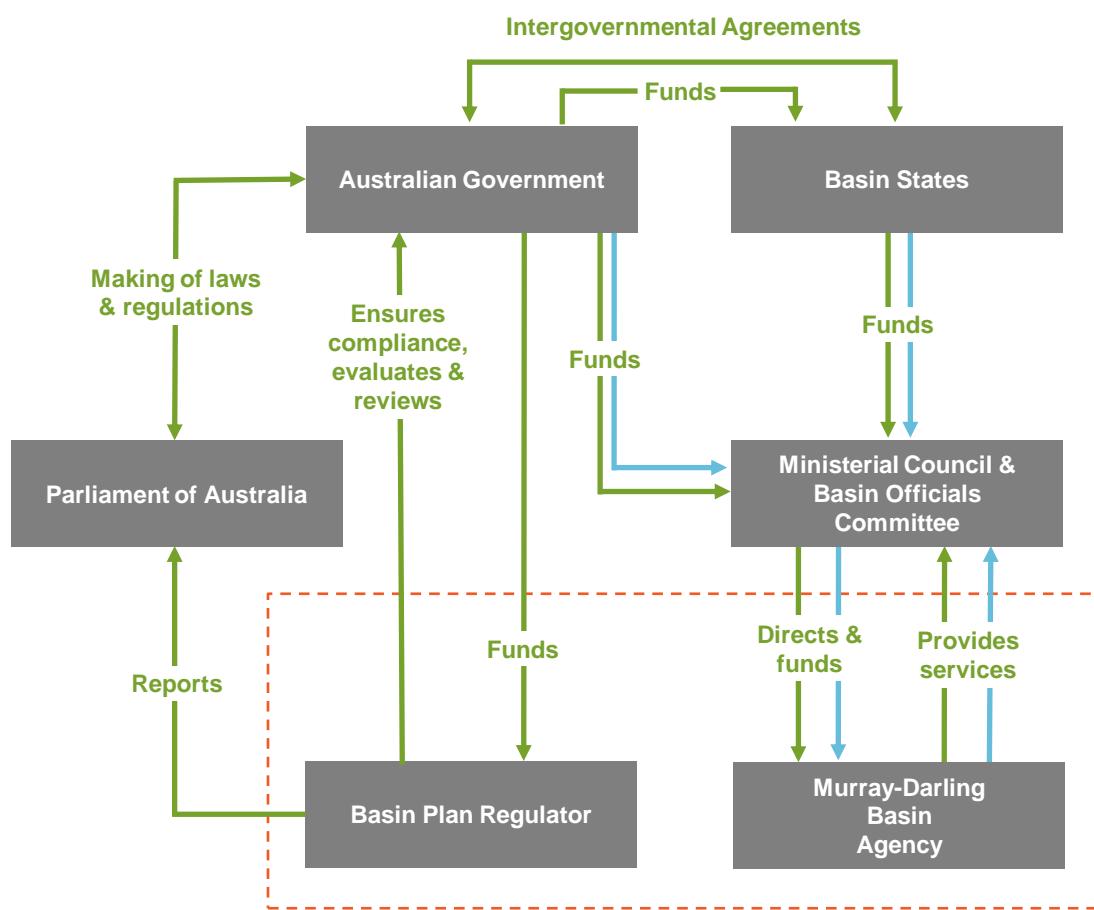
Structural reform is required to assign the MDBA's two key roles to separate institutions (figure 3). Failure to do so will compromise:

- the credibility of the MDBA and Basin Governments
- the effective implementation of the Plan
- community confidence that the substantial investment made in the Basin Plan has led to meaningful change in the way water resources in the Basin are managed.

The agent of Governments role of the MDBA should be assigned to a new Murray-Darling Basin Agency (the Agency). The Agency would be governed, directed and funded by Basin Governments. The core focus of the Agency would be to drive intergovernmental collaboration and strategic service delivery for the implementation of the Basin Plan and resource management for the shared River Murray. The Agency would provide Basin Governments with the capability and services (such as coordination) required to successfully implement supply and constraints easing projects. It would also provide strategic advice and guidance to policy makers as to how resource management needs to adapt and evolve to manage risks and enable the outcomes of the Basin Plan to be achieved.

Figure 3 Recommended institutional arrangements

— Basin Plan — MDB Agreement - - - Proposed changes



The compliance, evaluation and review functions of the MDBA should be assigned to a new independent Commonwealth statutory entity, the Basin Plan Regulator (the Regulator). The Regulator should be governed by a board consisting of members with skills that are aligned to its compliance and evaluation role. The Basin Plan Regulator would be a specialist regulator, established solely for the purpose of regulating compliance with the Plan. It would have the specific skills and expertise required to perform this role, and the ability to source additional expertise at times when it is required.

Where there is agreement, the process of institutional reform need not be protracted or excessively disruptive. In 2008, the current institutional arrangements were negotiated, agreed and implemented within a year. Further, the Commission estimates that the institutional changes proposed would affect less than 20 per cent of MDBA staff and about six per cent of total annual funding.

Although it would be ideal to have the Basin Plan regulatory functions commence in the context of a separate Basin Plan Regulator, the Commission acknowledges that institutional reform by July 2019 is not realistic.

As an interim measure, the MDBA should ensure its organisational structure aligns as far as possible with the recommended separation of functions. This would involve consolidating its compliance, evaluation and review functions into the Office of the Basin Plan Regulator. These changes would provide greater clarity of role and allow the different cultures required to do both roles well to be cultivated.

The recommended interim arrangement is achievable without legislative change and should be seen as a practical stepping stone to full structural separation. However, the interim arrangement does not solve the fundamental conflicts embedded in the current legislative settings, whereby the Chief Executive of the MDBA:

- is accountable to Basin Governments for the delivery of the agent of governments role
- has statutory obligations as a member of the Authority appointed to oversee the compliance and regulatory functions.

Only complete structural separation would create incentives for each institution to pursue its functions more effectively, as well as develop the internal cultures most appropriate for the delivery of these functions. Basin Governments should agree to and progress institutional reforms, so that they are in place by 2021.

8 The potential costs of inaction are massive

Much is riding on how Governments implement the Basin Plan from this point forward. There is still about \$4.5 billion in Australian Government funding left for implementing the Plan. Most of this is allocated to resetting the balance through supply and efficiency measures. If major shortcomings in current arrangements are not addressed, projects are likely to fail or be implemented poorly. Failure will mean:

- the future cost of resetting the balance could be in excess of \$564 million higher (the cost of having to make good by acquiring water entitlements plus any cost of wasted expenditure on failed projects)
- lower environmental outcomes as the anticipated benefits of projects are either delayed or do not eventuate
- community trust and confidence in the Plan and Basin Governments will be reduced further, particularly if there is a perception that money is being wasted as Governments are unaware of issues, or unwilling to confront them
- there will be shortcomings in key arrangements that will have potentially significant implications for how water is managed for the environment and to meet users' needs.

The Commission has made 38 recommendations that would significantly improve the arrangements for implementing the Plan. The recommendations are organised by timeline and responsible institution in figures 4 and 5.

Most of our recommendations involve incremental improvements to the current arrangements.

Other recommendations are to provide the strong foundations needed for the Plan to succeed — sound governance, good planning, and effective and adaptive management.

It has been a real achievement for Basin Governments to get this far, but without the recommended changes, the implementation of the Plan is at risk. Delivering on the objectives of the Plan is vital to a region that is of significant environmental, cultural, social and economic importance to Australia.

Figure 4 Short-term priorities (within 12 months)

Basin Governments
<ul style="list-style-type: none">• Take joint responsibility for implementing the Basin Plan (14.1).• Review collaborative processes, capability and resourcing required to jointly implement the Plan (14.4).• Resolve governance and funding and develop an integrated plan for delivering the package of supply measures (4.1).• Signal the possibility of extensions for the deadline for delivery of some supply measures to enable projects that offer value for money to be delivered in credible timeframes (4.2).• Develop a monitoring strategy to give effect to the evaluation framework (13.3).• Put in place transparent and accountable governance arrangements for implementing the Northern Basin Toolkit (4.5).• Agree on a policy and timeframe for addressing over-recovery (3.1).• Negotiate extensions to the timelines for WRP accreditation in areas where there is clearly insufficient time for adequate community engagement (6.1).• Publish a work plan that describes how delivery capacity issues associated with changes in water use and trade will be investigated and managed (10.2).• Establish transparent arrangements to coordinate connected environmental watering activities (11.4).• Ensure processes are in place for coordinating event-based watering decisions (11.5).• Consider the costs and benefits of metering policies, including the role of metering standards (12.2).
Basin States
<ul style="list-style-type: none">• The New South Wales Government to include, in the New South Wales Murray and Lower Darling WRP, how key operational plans interact and provide for critical human water needs (9.1).
The Australian Government
<ul style="list-style-type: none">• Ensure there are specific milestones and clear responsibilities in any future intergovernmental agreements, with independent assessment of progress (13.1).• Appoint an independent chair to the Basin Officials Committee (14.4).• The Department of Agriculture and Water Resources (DAWR) to establish a gateway review (with independent advice) to determine if supply projects offer value for money prior to funding (4.4).• DAWR to publish the advice it has received on environmental priorities for water recovery once transactions are complete (3.2).• DAWR to publish a new water recovery strategy that aims to achieve the Schedule 5 outcomes while minimising adverse socioeconomic impacts (5.2 and 5.3).
Murray-Darling Basin Authority
<ul style="list-style-type: none">• Change its organisational structure to create the Office of the Basin Plan Regulator to house all compliance and evaluation functions (14.3, 12.1).• Revise its compliance policy to convey its role in system-wide Basin Plan compliance and that water take enforcement is a Basin State responsibility (12.3).• Develop a revised Basin Plan evaluation framework (13.2).• Devise a strategy for undertaking SDL reconciliation to enable adaptive management and to assess reasonable progress (4.3).• Update its modelling to confirm the environmental benefits of additional water recovery (5.1).• Determine the extent of any over-recovery (3.1).• Clarify the annual reporting obligations of Basin States to enable them to demonstrate compliance with WRPs and the process for amending WRPs (6.2).• Finalise and publish a detailed terms of reference for the five-yearly evaluation of the effectiveness and efficiency of WRPs in consultation with Basin Governments (6.3).• Include in the 2019 Basin-wide environmental watering strategy clearer guidance on the relative priority of assets and types of watering activities (11.1).• Finalise and publish an assessment framework for evaluating trade restrictions (10.1).

Figure 5 Medium-term priorities (1–5 years)

Basin Governments
<ul style="list-style-type: none">• Agree and embark on the institutional reform to establish the Murray-Darling Basin Agency — an agent of Basin Governments, and the Basin Plan Regulator — an independent Commonwealth statutory authority (14.2).
Basin States
<ul style="list-style-type: none">• Ensure processes are in place for identifying social and cultural outcomes that could be achieved from environmental watering without compromising environmental outcomes (11.6).• Manage the risks to achieving environmental outcomes by delivering complementary management activities (11.7).
The Australian Government
<ul style="list-style-type: none">• Specify that the 2021 review of the Water for the Environment Special Account review the benefits, costs and impacts of pursuing the enhanced environmental outcomes, to inform how the Australian Government should proceed with water recovery (5.4).• Establish an effective Basin Plan Regulator by reviewing the skills mix of the statutory appointments, establishing a statement of expectations, and organising formal, transparent arrangements for the supply of any additional technical capabilities needed (14.5).• Target any further assistance to communities where substantial adverse impacts from water recovery have been identified (3.3).
Murray-Darling Basin Authority
<ul style="list-style-type: none">• Review the salt export objective (8.1).• Provide material to Basin States to guide the first revision of long-term watering plans (11.2).• Consider the usefulness of Basin Annual Environmental Watering Priorities as part of the 2020 review of the Environmental Watering Plan (11.3).• Publicly outline the approach to be taken for the 2026 review (13.4).

Findings and recommendations

Chapter 3 — Recovering water for the environment

The Australian Government (through the Department of Agriculture and Water Resources) is responsible for recovering water for the environment to give effect to the Sustainable Diversion Limits (SDLs) for surface water and groundwater on 1 July 2019. The surface water target was originally set at 2750 gigalitres (GL), but was reduced to 2075 GL in 2018 by the supply measures package (605 GL) and the *Northern Basin Review* (70 GL). The full offset of 605 GL is subject to 62 GL being recovered through efficiency measures to maintain the change in the SDL to less than 5 per cent, leading to an (effective) water recovery target of 2137 GL by 1 July 2019.

Recovered water contributes to a held water portfolio that is managed to achieve the environmental objectives of the Basin Plan. The Australian Government has spent \$6.7 billion on bridging the gap, which includes purchasing water and investing in water-saving infrastructure. In addition, \$189 million has been provided through structural adjustment programs to support communities in adjusting to reduced water availability.

FINDING 3.1

Basin Governments need to recover 2137 GL of surface water by 1 July 2019 and the outstanding gap is less than five per cent of this target. Achieving the 2019 target is contingent on:

- delivering 117.9 GL that is already under contract, but has not yet been delivered
- recovering a further 29.4 GL from the northern Basin
- delivering a further 61.5 GL through efficiency measures
- any change to planning assumptions that affects the contribution of water entitlements already recovered towards water recovery targets.

A total of 2000 GL has already been delivered to environmental water holders, but it is unlikely that the July 2019 target will be met. Any shortfall will be monitored through the Sustainable Diversion Limit reporting and compliance framework until the water recovery task is complete.

A further 37.7 GL must be delivered to finalise groundwater recovery. Arrangements are in place to meet this target.

RECOMMENDATION 3.1

Once Water Resource Plans are accredited, the Murray-Darling Basin Authority (as Basin Plan Regulator) should assess which (if any) resource units are over-recovered against the Sustainable Diversion Limit.

As soon as practicable, the Commonwealth Environmental Water Holder, in co-operation with Basin Governments, should develop a process and an appropriate timeframe to return any identified over-recovery to consumptive uses in accordance with Sustainable Diversion Limits.

RECOMMENDATION 3.2

The Department of Agriculture and Water Resources should ensure that water recovery aligns with environmental requirements and its processes for doing so are transparent.

To support accountability, it should commit to publishing all advice provided by the Commonwealth Environmental Water Holder and the Murray-Darling Basin Authority (including advice on strategic purchases) once transactions are complete in a Sustainable Diversion Limit resource unit.

FINDING 3.2

The Department of Agriculture and Water Resources has accounted for the impacts of improving irrigation efficiency on return flows in some major water recovery projects, but has not done so in all cases. The Department has committed to monitor impacts in future water recovery programs, but the framework for doing this is not yet clear.

The overall impact of improved irrigation efficiency on water resources is not precisely known, but recent independent work indicates it to be relatively small.

The Murray-Darling Basin Authority (as Basin Plan Regulator) is responsible for monitoring the risks to Sustainable Diversion Limits from changes in return flows.

FINDING 3.3

The size and speed of water purchases has had negative socioeconomic impacts on some regional communities.

Recovering water through infrastructure modernisation programs has partially offset pressure for structural adjustment in some communities, but at a significant cost to taxpayers.

Water recovery is only one factor of many driving change in regional communities. Higher water prices, water trade, and other pressures on the agriculture sector mean that some structural change is inevitable and ongoing.

FINDING 3.4

The Department of Agriculture and Water Resources has not always demonstrated that water recovery has been cost-effective in meeting its goal of mitigating adjustment pressures caused by sourcing water entitlements. It has:

- paid a substantial premium above market prices to recover water through infrastructure modernisation
- not systematically released information for strategic water purchases acquired by direct negotiation
- not undertaken a comprehensive assessment of benefits and costs of these approaches.

FINDING 3.5

There is little evidence to indicate that structural adjustment programs have been effective at supporting communities adjust to the Basin Plan.

- Assistance was not targeted to those areas considered most vulnerable to the Basin Plan.
- Some projects considered to provide community assistance have not done so.

RECOMMENDATION 3.3

If provided, the Australian Government should target any further assistance to communities where substantial adverse impacts arising from water recovery to date or any future recovery program have been identified. This should:

- have clear objectives and selection criteria
- be subject to monitoring and evaluation.

Any support for regional development should align with the Productivity Commission's strategies for transition and development, set out in its report on *Transitioning Regional Economies*.

Chapter 4 — Supply measures and Toolkit

The Australian Government made up to \$1.3 billion available for funding supply measures. A package of 36 supply measures was agreed by Basin States in May 2018. These projects provide equivalent environmental outcomes, enabling the water recovery target to be offset by 605 GL, and are required to be fully operational by 2024. Some of these projects are at the scoping or concept design stages of development. The Murray-Darling Basin Authority (MDBA) may undertake a reconciliation of the actual equivalent environmental outcomes of projects compared with their predicted outcomes in 2024. Failure to deliver projects by

the deadline may require Governments to make good the shortfall through further water recovery. Similar projects are proposed for the northern Basin (referred to as Toolkit measures), although there are no formal consequences if these projects fail.

FINDING 4.1

It is likely that some key projects in the approved supply package will not be fully operational in 2024.

- They are behind schedule and the timeframe for implementation has been compressed due to delays in developing the projects.
- They are still in an early stage of development.
- History has shown that these types of projects are complex, interdependent and require extensive consultation to implement.
- A range of issues still need to be resolved between Governments before these projects can proceed. These include project risk sharing, monitoring, governance and funding.

RECOMMENDATION 4.1

Basin Governments should, as soon as practicable:

- resolve governance and funding issues for supply measures, including risk sharing arrangements
- develop an integrated plan for delivering supply measures to improve understanding and management of interdependencies within the package of supply measures
- develop clear mechanisms for consultation on the package and individual projects with Traditional Owners and local communities.

RECOMMENDATION 4.2

Basin Governments should be open to the possibility of extending the 30 June 2024 deadline for specific supply measures to be operational where an extension would be necessary to allow worthwhile projects to be retained.

Basin Governments should make this position clear to project proponents early enough to inform the finalisation of detailed business cases for supply measures. It should be clear that extensions would need to be well founded, only apply in limited circumstances, and not alter the requirement to make good if a project ultimately fails.

RECOMMENDATION 4.3

The Murray-Darling Basin Authority (as Basin Plan Regulator) should, as soon as practicable, devise a strategy for undertaking the reconciliation of supply measures that accommodates projects to be delivered in realistic timeframes.

RECOMMENDATION 4.4

The Department of Agriculture and Water Resources should, as soon as practicable, establish a clear gateway process that determines whether proposed supply measures proceed to implementation.

The Department should appoint an independent panel to provide advice throughout the gateway review. The panel should consider:

- any material decrease in the anticipated net benefits of projects since their initial business case (to ensure projects represent a prudent and effective use of public money)
- whether project timeframes and milestones are credible.

Based on the above assessment, the panel would make a recommendation on whether projects should proceed to implementation. The Department should publicly respond to the advice of the independent panel, including justifying instances where it elects to not accept that advice.

Throughout implementation, the independent panel should also advise on whether projects are meeting their milestones, and projects that fail to make reasonable progress should be removed.

RECOMMENDATION 4.5

Northern Basin Governments should, as soon as practicable, put in place transparent and accountable governance arrangements for implementing the Northern Basin Toolkit. These arrangements should include:

- a mechanism to establish clear milestones to ensure the Toolkit measures are implemented within reasonable timeframes
- an independent assessment by the Murray-Darling Basin Authority (as Basin Plan Regulator) of progress and effectiveness in implementing the measures.

Chapter 5 — Efficiency measures

The Basin Plan allows for the recovery of an extra 450 GL of water to pursue environmental outcomes additional to those that can be achieved by recovering the equivalent of 2750 GL (outlined in Schedule 5 of the Plan). These enhanced environmental outcomes are also

dependent on easing or removing constraints (for example, flooding on private land). This extra water is to be recovered through efficiency measures — infrastructure investments to reduce water loss. Efficiency measures must meet the Basin Plan requirement for neutral or improved socioeconomic outcomes. \$1.575 billion is set aside in a special account for water recovery through efficiency measures.

FINDING 5.1

The Basin Plan requirement for neutral or improved socioeconomic outcomes, which is based on voluntary participation in infrastructure projects, does not fully address stakeholder concerns about the impacts of additional water recovery on regional communities.

However, requiring efficiency projects to have no adverse impacts is impractical. Any additional test that aims to ensure there are absolutely no negative impacts will, in effect, block additional water recovery, including projects that may recover environmental water cost-effectively and with relatively limited socioeconomic impact.

Potential adverse impacts of further water recovery would be better addressed through program design that aims to minimise the socioeconomic impacts of recovering the additional 450 GL.

FINDING 5.2

There is a high risk that the efficiency measures program will not achieve the enhanced environmental outcomes of the Basin Plan by 2024 or within the current budget.

- There has been no update to the 2012 modelling to estimate what environmental benefits can be realistically achieved under the revised constraints proposals.
- It is possible that the proposed projects to ease or remove constraints may not be fully operational by 2024.
- Despite not having re-modelled the objectives or targets, the Australian Government is rolling out a water recovery program Basin-wide, which risks recovering water in the northern Basin that may not contribute usefully to achieving the enhanced environmental outcomes in the southern Basin.
- Basin Governments have not yet agreed on an efficiency measures work plan to recover 450 GL by 2024. Proposed additional criteria to manage socioeconomic impacts remain contested and risk unduly delaying planning for the program.
- There is a material risk that recovering a further 450 GL could be significantly more expensive than anticipated. The benefits and costs of the program as a whole have not been assessed (and there is no requirement to do so).

RECOMMENDATION 5.1

As soon as practicable, the Murray-Darling Basin Authority (as the agent of governments) should comprehensively update and publish modelling to confirm the enhanced environmental outcomes that can be achieved with additional water recovery. This modelling should use up-to-date information on constraints proposals, the effects of supply measures, and the volume of held environmental water.

The Murray-Darling Basin Authority should also model the benefits of additional environmental water within existing delivery constraints, and use this information to establish which Sustainable Diversion Limit resource units should be the priority for additional environmental water recovery.

RECOMMENDATION 5.2

By early 2019, the Department of Agriculture and Water Resources should release a strategy for the efficiency measures program to achieve the Schedule 5 environmental outcomes while minimising adverse socioeconomic impacts. To ensure that the recovery of the 450 GL is effective and efficient, this strategy should:

- prioritise recovering water that can usefully contribute towards achieving Schedule 5 outcomes
- plan for a range of scenarios for constraint easing
- phase water recovery to ensure that, as new information becomes available, it aligns with both revised constraint proposals and progress in easing constraints, and contributes towards specific Schedule 5 outcomes
- consider all available options for recovering water in the development and assessment of projects, including community-designed initiatives
- clearly outline how it will address adverse socioeconomic impacts through the design of its program (recommendation 5.3)
- be transparent, and regularly publish information on successful projects, prices paid and overall progress against program objectives
- outline clear processes to ensure ongoing engagement with local communities and industries.

RECOMMENDATION 5.3

The Department of Agriculture and Water Resources' (DAWR's) water recovery strategy should explicitly outline how it will seek to address adverse socioeconomic impacts through program design. DAWR should require project proponents to provide information on:

- the likely benefits to, and adverse impacts on, the local district and any potential flow-on impacts
- the degree of engagement with community and/or industry
- alignment with irrigation network plans, including any planned rationalisation.

The purpose of collecting this information would be to identify possible cumulative socioeconomic impacts across different combinations of projects under consideration, as part of a broader decision about which projects to fund. This information should not be used as pass or fail criteria for individual projects.

DAWR should also implement a regional-level monitoring and evaluation program to identify (over time) which regions are subject to substantial socioeconomic impacts from additional water recovery.

RECOMMENDATION 5.4

The Australian Minister for Water should specify that the 2021 review of the Water for the Environment Special Account review the benefits, costs and impacts of pursuing the enhanced environmental outcomes in Schedule 5 on the basis of new and updated information. This should include:

- identifying which, if not all, of the Schedule 5 outcomes can be achieved, given progress in easing or removing constraints, and how much environmental water would be required to do so
- assessing the benefits and costs (and feasibility) of other approaches to achieving those environmental outcomes.

This review should be supported by modelling provided by the Murray-Darling Basin Authority (as the agent of governments) and any additional information from Basin States.

The Australian Government should use the outcome of this review to determine whether there is a need to amend the Schedule 5 outcomes, or adjust the water recovery strategy to pursue those outcomes efficiently and effectively.

Chapter 6 — Water resource planning

Water Resource Plans (WRPs) ensure that the Basin Plan (particularly the SDLs) is reflected in state-based water management arrangements. The Australian Minister for Water's accreditation of WRPs is due to be finalised by 30 June 2019. The Murray-Darling Basin Authority's role in ensuring compliance with the Plan takes full effect following accreditation.

FINDING 6.1

The development and accreditation of Water Resource Plans (WRPs) is well behind schedule and there are key issues still to be finalised in some WRP Areas.

Although a number of WRPs appear likely to meet the 30 June 2019 deadline, in some areas there is a risk that attempting to accredit the WRP by the 30 June 2019 deadline will compromise the quality of plans by:

- inadvertently impacting on the entitlements of water users or the environment
- reducing the effectiveness of WRPs in implementing key elements of the Plan including the protection of environmental water, providing water for critical human needs and water quality objectives
- not allowing sufficient time to consider and consult on those key issues with affected stakeholders.

This risk is highest for New South Wales, given the number of outstanding plans and the magnitude of proposed rule changes in some WRP Areas. There is currently limited public information on how the Murray-Darling Basin Authority will address the risk of some plans not having accreditation by 30 June 2019.

RECOMMENDATION 6.1

The Australian Minister for Water and Basin States should as soon as practicable negotiate extensions to the timelines for accrediting Water Resource Plans in areas where there is clearly insufficient time for adequate community engagement before 1 July 2019 (particularly in areas of New South Wales).

Extensions should only be given in limited circumstances, particularly where substantive changes to state-based water management rules are proposed that may have material impacts on entitlement holders and/or the environment.

FINDING 6.2

The process of developing Water Resource Plans has been onerous and unnecessarily costly because of inadequate guidance on the requirements of plans and little clarity on the Murray-Darling Basin Authority's expectations for accreditation.

Key details for the implementation of Water Resource Plans have not yet been agreed including the:

- requirements for annual compliance reporting, risking unnecessary compliance costs
- process for updating plans, risking an amendment process that inhibits adaptive management.

RECOMMENDATION 6.2

Before 1 July 2019, the Murray-Darling Basin Authority (as Basin Plan Regulator) should:

- clarify what Basin States are required to self-report annually to show compliance with Water Resource Plan (WRP) obligations
- articulate the compliance assessment regime relevant to WRP obligations
- consult with Basin States in developing guidance on how it proposes to assess future amendments to WRPs.

RECOMMENDATION 6.3

The Murray-Darling Basin Authority (as Basin Plan Regulator) in consultation with Basin Governments should finalise and publish a detailed terms of reference to assess the effectiveness and efficiency of Water Resource Plans in preparation for the five-yearly evaluation in 2020.

This evaluation should enable an assessment of the utility of Water Resource Plans for delivering on the objectives and outcomes of the Basin Plan.

Chapter 7 — Indigenous values and uses

The Basin Plan specifies how Indigenous values and uses are to be considered by Basin States in the preparation of Water Resource Plans and provides for Traditional Owners to be involved in the development of environmental watering priorities. Two organisations — the Murray Lower Darling Rivers Indigenous Nations (MLDRIN) and the Northern Basin Aboriginal Nations (NBAN) — represent Traditional Owners and work in partnership with the Murray-Darling Basin Authority to provide culturally authoritative advice.

FINDING 7.1

Basin States have improved their formal processes for engaging Traditional Owners as part of Water Resource Plan (WRP) development.

Given that so few WRPs have been submitted for accreditation to date, there is a risk that Basin States have left too little time before July 2019:

- to complete effective engagement with Traditional Owners
- to have regard to the views of Traditional Owners in preparing their WRPs
- for MLDRIN and NBAN to develop their advice about whether the WRP requirements for Indigenous values and uses have been met.

The risk of not meeting the deadline is greatest for New South Wales because of the number of WRPs they have to develop and their delayed start to nation-based consultation.

Beyond accreditation of WRPs, it is important that Basin States continue to consult on, and have regard to, Indigenous values and uses of water. Fostering long-term partnerships with Traditional Owners would contribute to the achievement of Indigenous outcomes from the Basin Plan and state water resource management more generally.

FINDING 7.2

Basin Governments have developed, in partnership with Indigenous Australians, a range of tools and processes to support the recognition of cultural values and uses in state water planning, and environmental management and planning.

The Australian Government has also committed \$40 million to administer a program to support Indigenous investment in cultural and economic water entitlements in the Basin. The objectives and principles guiding the implementation of this program have not yet been articulated. It is unclear why this funding is limited to Indigenous communities in the Basin, rather than being available to all Indigenous communities in Australia.

Chapter 8 — Water quality

The Basin Plan sets out specific objectives and targets for water quality that aim to ensure that water is suitable for a range of purposes. These include: an objective for salt export of two million tonnes per year from the Basin into the Southern Ocean, site-specific salinity targets for flow management in the River Murray and the Lower Darling, and end-of-valley salinity targets. The main Basin Plan mechanism by which water quality is to be managed is through Water Quality Management Plans, which form part of Water Resource Plans.

FINDING 8.1

Salinity targets for flow management have been met at four of the five reporting sites.

The salt export objective has not been met. In periods of low flows, there can be an inherent conflict between meeting site-specific salinity targets and meeting the salt export objective.

RECOMMENDATION 8.1

The Murray-Darling Basin Authority should review the Basin Plan salt export objective in its 2020 review of salinity and water quality targets. This review should consider:

- the relationship between the salt export objective and site-specific salinity targets that require a higher prioritisation to meet water quality objectives
- whether there are any additional environmental benefits associated with achieving the salt export objective that are not covered by achieving the environmental outcomes of the Basin Plan
- whether the objective should be respecified or abolished.

FINDING 8.2

Communities across the Basin are justifiably concerned about the management of water quality during periods of low flow in the Lower Darling. The development of the Water Quality Management Plan for the New South Wales Murray and Lower Darling Water Resource Plan is the process to resolve this concern.

Chapter 9 — Critical human water needs

The Basin Plan sets specific water volumes required to meet critical human water needs in communities that are dependent on the River Murray for water. For communities that rely on water from sources other than the River Murray, the Basin Plan requires that Water Resource Plans describe how critical water needs will be met during extreme events such as drought and water quality events.

FINDING 9.1

The Basin Plan provisions for supplying critical human water needs in the River Murray system in periods of low water availability are robust and no changes to the provisions are warranted.

FINDING 9.2

Communities across the Basin are justifiably concerned about the management of critical human water needs during periods of low flow in the Lower Darling. The development of the extreme event provisions in the New South Wales Murray and Lower Darling Water Resource Plan is the process to resolve this concern.

RECOMMENDATION 9.1

The New South Wales Murray and Lower Darling Water Resource Plan (WRP) should recognise the direct link between the management of Menindee Lakes, flows to the Lower Darling and the risks to the provision of water for critical human water needs.

The WRP should set out how key operational plans (including the Murray-Darling Basin Authority's River Murray System Annual Operating Plan and the WaterNSW Lower Darling Operations Plan) interact with each other to provide for critical human water needs.

Chapter 10 — Water trading rules

The Basin Plan water trading rules aim to contribute to more efficient water markets by introducing new requirements to improve market information and promote confidence in the market, and defining the types of trade restrictions that are permissible in the Basin.

FINDING 10.1

Some trade restrictions that were inconsistent with the Basin Plan trading rules have been removed.

The Murray-Darling Basin Authority (MDBA) has raised 17 instances of potential non-compliance with the trading rules with Basin States. Eleven of these matters remain unresolved and the MDBA has not been clear with Basin States about the steps to resolve these in a timely way.

RECOMMENDATION 10.1

The Murray-Darling Basin Authority (as Basin Plan Regulator) should:

- finalise and publish an assessment framework for evaluating the consistency of trade restrictions against the Basin Plan trading rules, which gives guidance about how to estimate the costs and benefits of removing trade restrictions
- specify the timeframes that it will endeavour to meet in resolving trading rule compliance matters
- notify Basin States about whether the 11 unresolved matters raised with them amount to non-compliance and what action is required by Basin States to resolve them
- publish the reasons given by Basin States for restrictions on surface water trade
- publish its compliance determinations and the assessments that support each determination.

FINDING 10.2

New information and reporting requirements specified under the Basin Plan trading rules are largely in place.

FINDING 10.3

Growth of trade has increased demands on delivery capacity and put pressure on delivery constraints in some parts of the Basin. A range of community members are increasingly concerned about the effects on third parties and the environment.

Basin States and the Murray-Darling Basin Authority are aware of this strategic policy issue, but the process for managing it is unclear to the market.

RECOMMENDATION 10.2

Basin Governments should set and publish a work plan within the next 12 months that describes how delivery capacity issues and third party effects associated with changes in water use and trade will be investigated and managed. The work plan should specify responsibilities, timeframes and how this information will be communicated to the water market.

Basin Governments should assign the Murray-Darling Basin Authority (as the agent of governments) responsibility for identifying and managing risks related to changes in water use and trade in shared resources and connected systems.

Chapter 11 — Environmental water planning and management

The outcomes of the Basin Plan are based on an assumption that Basin States would implement pre-requisite policy measures (PPMs) to enable the efficient use of environmental water. PPMs provide the capacity to credit environmental return flows for downstream environmental use and allow the call of held environmental water from storage to piggy-back on unregulated flows. The PPMs were included in the original modelling to determine the Sustainable Diversion Limits (SDLs) and have been incorporated in the environmental equivalence methodology that underpins supply measures and the associated adjustment to SDLs. By assuming PPMs would be implemented, a higher SDL could be determined. If PPMs are not implemented, SDLs may be recalculated.

The Basin Plan establishes an environmental management framework that outlines the principles and processes to coordinate the planning, prioritisation and use of environmental water. It includes a Basin-wide environmental watering strategy and catchment scale long-term environmental watering plans.

FINDING 11.1

Although the Murray-Darling Basin Authority (MDBA) (as Basin Plan Regulator) has approved the Pre-requisite Policy Measure (PPM) Implementation Plans for all relevant Basin States, there is a lack of transparency around the progress of Basin States and the MDBA's process for assessing the adequacy of PPMs following implementation. There is some risk that PPMs will not be implemented by 30 June 2019.

FINDING 11.2

The 2014 Basin-wide environmental watering strategy (BWEWS) has provided a strategic foundation for the environmental water planning of significant environmental water holders and has been used to inform their portfolio planning and watering decisions.

The 2014 BWEWS does not provide clear guidance on how to prioritise those assets or types of watering events that are most important for achieving the Basin Plan objectives and expected outcomes.

RECOMMENDATION 11.1

The Murray-Darling Basin Authority, when developing the next five-year Basin-wide environmental watering strategy in 2019, should strengthen its value as the key strategic plan governing environmental watering across the Basin by:

- including a clear objective to ‘maximise environmental outcomes through effective and efficient environmental water management’
- including a secondary objective that, where environmental outcomes are not compromised, environmental watering should seek to contribute to social or cultural outcomes
- providing clear guidance, under all water availability scenarios, on the relative priority of key Basin environmental assets (including instream assets) to achieving the overall environmental objectives of the Basin Plan and the expected outcomes set out in the strategy
- providing clear guidance, under all water availability scenarios, on the priority for achieving flow connectivity at the system scale relative to watering within an individual Water Resource Plan Area
- providing clear guidance on potentially harmful flow regimes, to support river operators and resource managers to act in a way that is consistent with the Basin Plan.

FINDING 11.3

Only seven out of 20 long-term watering plans (LTWPs) have been developed and published, with the remaining 13 due to be published by the ACT, New South Wales and Queensland Governments by 30 June 2019 or earlier.

LTWPs are likely to be an important component of the Environmental Management Framework because they are:

- undertaken at the catchment scale and facilitate top-down and bottom-up input
- a mechanism to facilitate local input into environmental water planning activities and the prioritisation of assets within a catchment.

Basin States have adopted different approaches to specifying priorities, objectives and targets in LTWPs.

RECOMMENDATION 11.2

Following the publication of the 2019 Basin-wide environmental watering strategy (BWEWS), the Murray-Darling Basin Authority (MDBA) (as Basin Plan Regulator) should provide clear guidance material to Basin States on the expected content of long-term watering plans (LTWPs) when they are reviewed and revised. This guidance material should include the need for LTWPs to articulate:

- realistic long-term objectives to be achieved from the available environmental water portfolio through watering activities within the operational constraints at that time
- environmental watering requirements in the catchment including the required magnitude, timing and frequency of watering for priority assets, ecosystem functions and system connectivity
- the relative priority of assets within the catchment for achieving the objectives of the Basin Plan and the expected outcomes of the BWEWS
- risks to the achievement of the long-term watering objectives, including the risk of undesirable outcomes arising from environmental watering or potentially harmful flow regimes as a result of river operations.

To improve the accessibility of information, the MDBA should maintain a register of LTWPs on its website, including relevant deadlines, progress towards completion, final documents when they are completed, and the status of each plan as they are reviewed and adapted over time.

FINDING 11.4

The Basin annual environmental watering priorities:

- are released too late to be considered by environmental water managers in their planning processes
- are becoming increasingly redundant as significant environmental water holders are moving to rolling multi-year plans.

RECOMMENDATION 11.3

As part of the 2020 review of the Environmental Watering Plan, the Murray-Darling Basin Authority (as Basin Plan Regulator) should consider the usefulness of Basin annual environmental watering priorities and whether the Basin Plan requirements for these annual priorities should be amended or removed.

RECOMMENDATION 11.4

By 2020, Basin Governments should:

- establish a Northern Connected Basin Environmental Watering Committee as a mechanism for intergovernmental coordination for planning and coordinating connected environmental watering events in the northern Basin
- increase the transparency of the Southern Connected Basin Environmental Watering Committee and its role by making governance arrangements including terms of reference, membership and reporting responsibilities publicly available.

RECOMMENDATION 11.5

Where not yet in place, Basin State Governments should establish processes for consultation and coordination between key stakeholders to enable event-based watering decisions — including water managers, asset managers and entitlement holders (including the Commonwealth Environmental Water Holder) — as soon as practicable.

These processes should be documented and publicly available.

Once in place, these arrangements should be reflected in the Commonwealth Environmental Water Holder's annual portfolio management plans.

RECOMMENDATION 11.6

While achieving environmental outcomes is the primary focus of environmental water holders under their respective legislation, opportunities to contribute to social or cultural outcomes (without compromising environmental outcomes) should be actively pursued. Before the first revision of long-term watering plans, Basin States and environmental asset managers should have processes to engage with local communities and Traditional Owners.

RECOMMENDATION 11.7

Basin States should manage the risks to achieving the environmental watering objectives set out in long-term watering plans by delivering complementary waterway and natural resource management measures (such as habitat restoration or weed and pest control).

Chapter 12 — Compliance

The Murray-Darling Basin Authority (as Basin Plan Regulator) is responsible for ensuring compliance with the Basin Plan. This role comes into full effect once Water Resource Plans are accredited by 1 July 2019. Basin States are responsible for ensuring compliance with their own water laws to prevent illegal water take and ensure entitlement holders fulfil their licence obligations. Basin Governments have instigated a number of reforms in response to recent reviews, including developing a Compliance Compact which outlines their commitments to reform.

FINDING 12.1

The Murray-Darling Basin Authority's reforms of its regulatory approach (including the establishment of an Office of Compliance) are a step forward in establishing its capability, but it is too early to gauge the likely effectiveness of the new arrangements. The Productivity Commission will examine these in its 2023 review of Basin Plan implementation.

RECOMMENDATION 12.1

As a transitional measure, the Murray-Darling Basin Authority should house its Sustainable Diversion Limit and Water Resource Plan compliance functions within the Office of Compliance, before its compliance role comes into full effect in July 2019.

FINDING 12.2

Compliance reforms by Basin State Governments, in aggregate, represent a strengthening of water take compliance regimes. Their efficiency and effectiveness will be reviewed in 2023 by the Productivity Commission.

RECOMMENDATION 12.2

Basin States should consider the role, costs and benefits of consistent metering policies including the role of metering standards.

Basin Governments should work with Standards Australia to formally revise standards to ensure quality and cost effectiveness in water measurement.

Before new Basin State metering regulation and implementation plans are put in place they should be subject to scrutiny through publicly available business cases.

RECOMMENDATION 12.3

The Murray-Darling Basin Authority (MDBA), as the regulator responsible for overseeing compliance at a Basin-wide level, should publicly report instances where Basin States are not effectively enforcing their water take laws.

The MDBA's 2026 Basin Plan review should reconsider the risk to meeting the objectives of the Basin Plan from non-compliance of water take, including the case for reducing Sustainable Diversion Limits if there is evidence of persistent illegal water take.

Chapter 13 — Reporting, monitoring and evaluation

The Basin Plan specifies annual and five-yearly reporting requirements that Basin Governments must meet. Reporting arrangements are also set out in the intergovernmental agreements that underpin the implementation of the Plan. The Plan sets out a program for evaluating its effectiveness. Completing these evaluations is the responsibility of the Murray-Darling Basin Authority (as Basin Plan Regulator), but the information required to conduct the evaluations comes from many different parties. Under the *Water Act (2007)* (Cwlth), the Plan is required to be reviewed in 2026.

FINDING 13.1

There are weaknesses in the design of the *National Partnership Agreement on Implementing Water Reform in the Murray-Darling Basin* (NPA) that reduce its usefulness as a means to hold Basin Governments to account for meeting their commitments in implementing the Plan.

These weaknesses include that:

- milestones are inadequately defined and have been able to be assessed as met when there is evidence to the contrary
- there is no option to recommend a partial payment to a Basin State. Payments must be made in full or not at all
- key information that informs assessments of progress against NPA milestones is not publicly released
- the release of assessments of progress against NPA milestones has not been timely in some years.

RECOMMENDATION 13.1

Reflecting lessons learned from deficiencies in past agreements, for any future funding agreements relating to the implementation of the Basin Plan, the Australian Government should ensure:

- the roles of the Australian Government and Basin States are clearly identified
- specific performance milestones are identified, and that clear responsibility is assigned for the delivery of each milestone
- where milestones are linked to payments, that these payments are disaggregated with a payment per milestone to provide a genuine incentive for implementation
- reporting on the progress of Basin Governments in meeting milestones is timely
- independent assessment of the progress of Basin Governments is undertaken
- advice provided by relevant agencies (such as the Murray-Darling Basin Authority or the Commonwealth Environmental Water Holder) is used to inform assessments of progress and is published in full.

FINDING 13.2

The 2014 Basin-wide evaluation framework is unclear and there is no clear strategy to coordinate the collection of the information needed to monitor the outcomes of the Plan. This means that:

- actions taken to monitor outcomes in the Basin are fragmented and inadequately integrated
- there is the potential for information gaps that may result in future evaluations being unable to accurately and comprehensively assess the impacts and outcomes of the Plan
- there is a risk of monitoring activity being duplicated
- the ability of Basin Governments to clearly communicate the outcomes of the Plan is impeded.

RECOMMENDATION 13.2

The Murray-Darling Basin Authority (as Basin Plan Regulator) should develop a revised Basin Plan evaluation framework. This framework should define the specific questions that are to be used to evaluate the outcomes and effectiveness of the Plan, and the scales and times at which these questions will be answered.

The process through which the framework will be developed should be made public as soon as possible.

The evaluation framework should be finalised by the end of 2019, and be made publicly available.

RECOMMENDATION 13.3

Basin Governments should develop a monitoring strategy to give effect to the evaluation framework for the Basin Plan. This should describe the process by which the information needed to answer the evaluation questions set out in the framework will be collected. This includes:

- outlining what information will be collected and by whom
- identifying any information gaps, who will be responsible for addressing them and the process by which they will be addressed
- establishing the arrangements for sharing the costs of monitoring and evaluating the Plan between Basin Governments.

This monitoring strategy should be developed by Basin Governments, supported by the Murray-Darling Basin Authority (as the agent of governments).

The monitoring strategy should be finalised by the end of 2019, and be made publicly available.

RECOMMENDATION 13.4

After the completion of the 2020 evaluation of the effectiveness of the Basin Plan, the Murray-Darling Basin Authority (as Basin Plan Regulator) should publicly outline the approach it will take for the 2026 review of the Plan. This should include establishing:

- the broad objectives and scope of the review
- how the process as set out in the Water Act will be undertaken, including establishing the timing of the review's discussion paper
- a clear process for identifying and addressing knowledge gaps that may hinder the review
- how the review will be resourced.

Chapter 14 — Institutions and governance

The Water Act, Murray-Darling Basin Agreement and the Basin Plan have resulted in a complex suite of institutional and governance arrangements for water management in the Basin. Responsibilities are shared by Basin Governments and key agencies (such as the MBDA) have been assigned multiple roles. There has been an implicit shift in responsibility for leading implementation from the MDBA to Basin Governments.

FINDING 14.1

There are major shortcomings in the current institutional and governance arrangements.

- Responsibility for leading the implementation of the Basin Plan is not clear and there has been a lack of strategic leadership. There is uncertainty about who should respond to issues as they arise.
- The Murray-Darling Basin Authority has conflicting roles. Its ability to effectively perform its collaborative service delivery functions (as the agent of governments) and be an independent and credible regulator that ensures compliance with the Plan is compromised by these conflicts.

These key deficiencies in institutional and governance arrangements have led to:

- a lack of transparency and accountability
- ineffective processes for intergovernmental collaboration
- stakeholders who are confused and frustrated by the efforts made to engage them due to a perceived lack of responsiveness
- key risks not being strategically managed and timelines slipping
- implementation being managed through last-minute negotiations as a crisis emerges or a deadline looms.

The shortcomings in institutional and governance arrangements pose a significant risk to the next phase of implementation of the Basin Plan.

RECOMMENDATION 14.1

Basin Governments should demonstrate strategic leadership, take joint responsibility and direct the implementation of the Basin Plan.

The Murray-Darling Basin (MDB) Ministerial Council should collaborate to provide the strategic leadership and policy direction required to implement the Plan, and be ultimately accountable for implementation.

In 2019, the MDB Ministerial Council should commence reforms to the institutional and governance arrangements for implementing the Basin Plan by:

- enhancing the role of and delegating accountability for implementation to the Basin Officials Committee (BOC). BOC should be responsible for managing the significant risks to successful implementation and ensuring effective intergovernmental collaboration
- ensuring that formal directions to BOC regarding implementation are publicly available
- ensuring that arrangements to assess progress, evaluate outcomes, and ensure compliance with the Plan are fully independent
- recognising that the Murray-Darling Basin Authority's agent of government role will continue to be key to driving collaboration between and providing technical support to Basin Governments as they implement the Plan
- ensuring that Basin Governments are individually and collectively resourced to perform their roles to implement the Plan.

RECOMMENDATION 14.2

Basin Governments should agree to the restructure of the Murray-Darling Basin Authority to separate its service delivery and regulatory functions into two institutions.

The Australian Government should then embark on the necessary institutional reforms to establish the:

- Murray-Darling Basin Agency — as the agent of Basin Governments
- Basin Plan Regulator — an independent Commonwealth Statutory Authority.

These institutional reforms should be in place by 2021.

RECOMMENDATION 14.3

As a transitional measure, and before the Murray-Darling Basin Authority's compliance role comes into full effect in July 2019, the Office of Compliance should be broadened to be the Office of the Basin Plan Regulator, and include compliance, evaluation and Plan review functions.

RECOMMENDATION 14.4

By 2020, to enable it to carry out its enhanced role (recommendation 14.1) the Basin Officials Committee should:

- have an independent Chair, appointed by the Australian Minister for Water in consultation with the Murray-Darling Basin Ministerial Council
- comprehensively review the capability and the resourcing it requires to jointly implement the Plan
- agree on the capability and services Basin Governments require of the Murray-Darling Basin Agency to support them to implement the Plan and for shared water resource management
- establish new arrangements and processes to support ongoing intergovernmental collaboration.

RECOMMENDATION 14.5

In establishing the Basin Plan Regulator by 2021, the Australian Government should ensure that it will be effective, including by reviewing the skills mix of the statutory appointments and establishing a statement of expectations.

When there is a need for additional technical skills not available within the Regulator's staff, the Regulator should organise formal, transparent arrangements for the supply of these capabilities from the Murray-Darling Basin Agency, Basin Governments, or other providers.

1 About this inquiry

1.1 About the Basin Plan and this inquiry

The Basin Plan is a step change in the management of the Murray-Darling Basin (the Basin) (box 1.1). It is part of a comprehensive effort by the Australian and Basin State Governments¹⁰ to reset the balance between environmental and consumptive use of water across the Basin and to establish a long-term sustainable water management system.

The Plan sets environmental and other objectives for the Basin and establishes new, lower sustainable extraction limits to achieve them. It outlines the key actions, processes and timeframes that Governments are to adopt to implement the Plan.

The development of the Basin Plan was a lengthy and contested process, involving negotiation and compromise before it was finalised and became law in November 2012. Making the Plan involved a series of substantial trade-offs between balancing the environmental benefits across the Basin and the socioeconomic impacts on industries and regional communities of a permanent reduction in water available for irrigation.

Basin Governments¹¹ are to have largely established the new management arrangements required by the Plan by 30 June 2019. The activities to reset the balance between the environment and consumptive uses are to be fully implemented by 30 June 2024.

The Productivity Commission has responsibility for assessing the effectiveness of implementation of the Basin Plan and associated Water Resource Plans (WRPs) every five years. This function was included in the *Water Act 2007* (Cwlth) to ensure there was a regular independent review. This type of comprehensive review is critical to ensure public confidence in the implementation of the Basin Plan. The recurring nature of the Productivity Commission's role means that this review is different from the typical Commission inquiry.

¹⁰ The Basin States are New South Wales, Victoria, Queensland, South Australia, and the Australian Capital Territory.

¹¹ Basin Governments are the Australian Government and the governments of each Basin State.

Box 1.1 The Murray-Darling Basin and the Basin Plan

The Murray-Darling Basin

The Basin covers over 1 million square kilometres, including large areas of New South Wales and Victoria, the whole of the ACT, and parts of Queensland and South Australia. The Basin and its water resources support:

- the cultural, social, environmental, spiritual and economic needs of more than 40 Indigenous Nations whose traditional lands fall within the Basin
- over 30 000 wetlands, 100 of which are recognised as nationally important due to environmental, heritage or cultural significance
- about 41 per cent of the total gross value of Australia's agricultural production, including 46 per cent (\$7 billion) of the gross value of national irrigated agriculture
- the supply of drinking water for approximately 2.1 million people that reside within it, as well as a further 1.3 million people outside of the Basin.

The Basin Plan

The 2012 Basin Plan is the legal framework to reset the balance of water use in the Basin. It sets environmental and other objectives for the Basin and establishes new, lower sustainable extraction limits to achieve them. It also outlines the key actions, processes and timeframes that Governments are to adopt to implement the Plan.

The Basin Plan is an instrument of the Australian Parliament, and Basin Governments have committed to implement the Plan through intergovernmental agreements.

The Australian Government has responsibility for water recovery programs and the management of this water (by the Commonwealth Environmental Water Holder) for environmental purposes. Constitutional responsibility for water resource management in the Basin resides with the Basin States. It is their role to ensure that their own State-based arrangements reflect and are consistent with the Basin Plan.

Basin Governments agreed that the Murray-Darling Basin Authority (an independent Australian Government Corporate Commonwealth Entity) would be responsible for preparing and implementing the Plan, enforcing compliance with it, and monitoring and evaluating the outcomes.

Funding

The Australian Government earmarked \$13 billion to implement the Plan, including:

- \$3.1 billion to purchase water entitlements for the environment. \$2.7 billion of this has been spent to recover 1227 GL
- \$4.8 billion for investment in modernised water infrastructure, with \$3.9 billion spent. Of this, \$2.8 billion has been invested in projects that delivered 677 GL of water savings to the environment
- \$1.3 billion for supply measures, of which \$34 million has been spent on developing projects
- \$1.8 billion to recover an additional 450 GL to pursue enhanced environmental outcomes, of which \$14 million has been spent
- \$2.0 billion for other programs and activities, with \$1.9 billion spent.

Almost \$8.5 billion has been spent, and \$4.5 billion is still to be spent by 2024.

Sources: ABS (*Gross Value of Irrigated Agricultural Production, 2016-17, Australia, July 2018*, Cat. no. 4610.0.55.008); DAWR (pers. comm., 22 June 2018; pers. comm., 5 November 2018); MDBA (2015b); Senate Select Committee on the Murray-Darling Basin Plan (2016).

1.2 Key elements to implementing the Basin Plan

The Basin Plan sets out a number of key elements that are required for implementation. Other elements, while not specified in the Plan (such as water recovery programs) are also necessary for successful implementation. The key elements of the Plan and their timing are outlined in figures 1.1 and 1.2.

The Australian Government has had a central role in resetting the balance by ‘bridging the gap’ to the Sustainable Diversion Limits (SDLs) and investing in SDL adjustment projects. The Plan also establishes ongoing roles for the Australian Government including setting Basin-wide environmental watering priorities, managing the Commonwealth Environmental Water Holdings and ensuring compliance with the Plan.

The Basin States have been responsible for developing WRPs, for working with environmental water holders to plan and manage environmental water, and for ensuring water take compliance. They are also responsible for delivering SDL adjustment projects.

Resetting the balance by 30 June 2019

SDLs define how much water can be taken from rivers and groundwater for urban water supply, irrigation and other economic activities, and household use (consumptive users). The remainder is dedicated to the environment to achieve the environmental outcomes outlined in the Plan. Given this function, SDLs are a core element of the Plan.

The initial SDLs in the Basin Plan required recovery of 2750 GL from consumptive use by 30 June 2019. To achieve this, the Australian Government committed \$8 billion to purchasing water entitlements directly and to investing in irrigation infrastructure.¹²

The Plan allows for SDLs (and water recovery targets) to be adjusted under certain circumstances, prior to them taking effect on 1 July 2019. In the northern Basin, these adjustments are to account for new information. In the southern Basin, SDLs can be changed by projects that achieve equivalent environmental outcomes with less water (supply and constraints easing measures) and through projects that aim to achieve enhanced environmental outcomes through the recovery of additional water for the environment (efficiency and constraints easing measures) (box 1.2).

A package of supply measures (including measures to ease constraints) equivalent to 605 GL in water recovery has been approved and Governments are required to implement these by 30 June 2024. If this is not achieved, Governments will most likely need to make up the shortfall with further water recovery.

¹² The Australian Government committed to bridge the gap between the Baseline Diversion Limits and the SDLs by recovering water in a way that ensured that water entitlements would not be eroded or compulsorily acquired.

Basin Governments are required to notify the Murray-Darling Basin Authority (MDBA) of the volume of water recovered through efficiency measures by the end of 2023. All recovered water is to be transferred to the Commonwealth Environmental Water Holder by 30 June 2024.

Following the Northern Basin Review, the MDBA recommended decreasing the water recovery target by 70 GL on the proviso that Basin Governments agree to implement Toolkit measures (box 1.2) aimed at ensuring effective management of environmental water in the north.

In 2018, the Australian Government (with the agreement of the Australian Parliament) made two amendments to the Basin Plan that incorporated the adjustments to SDLs from the agreed supply measures and the Northern Basin Review.

New management arrangements are to be in place by 1 July 2019

Implementing the Basin Plan also involves establishing a new and ongoing management framework, which includes the following:

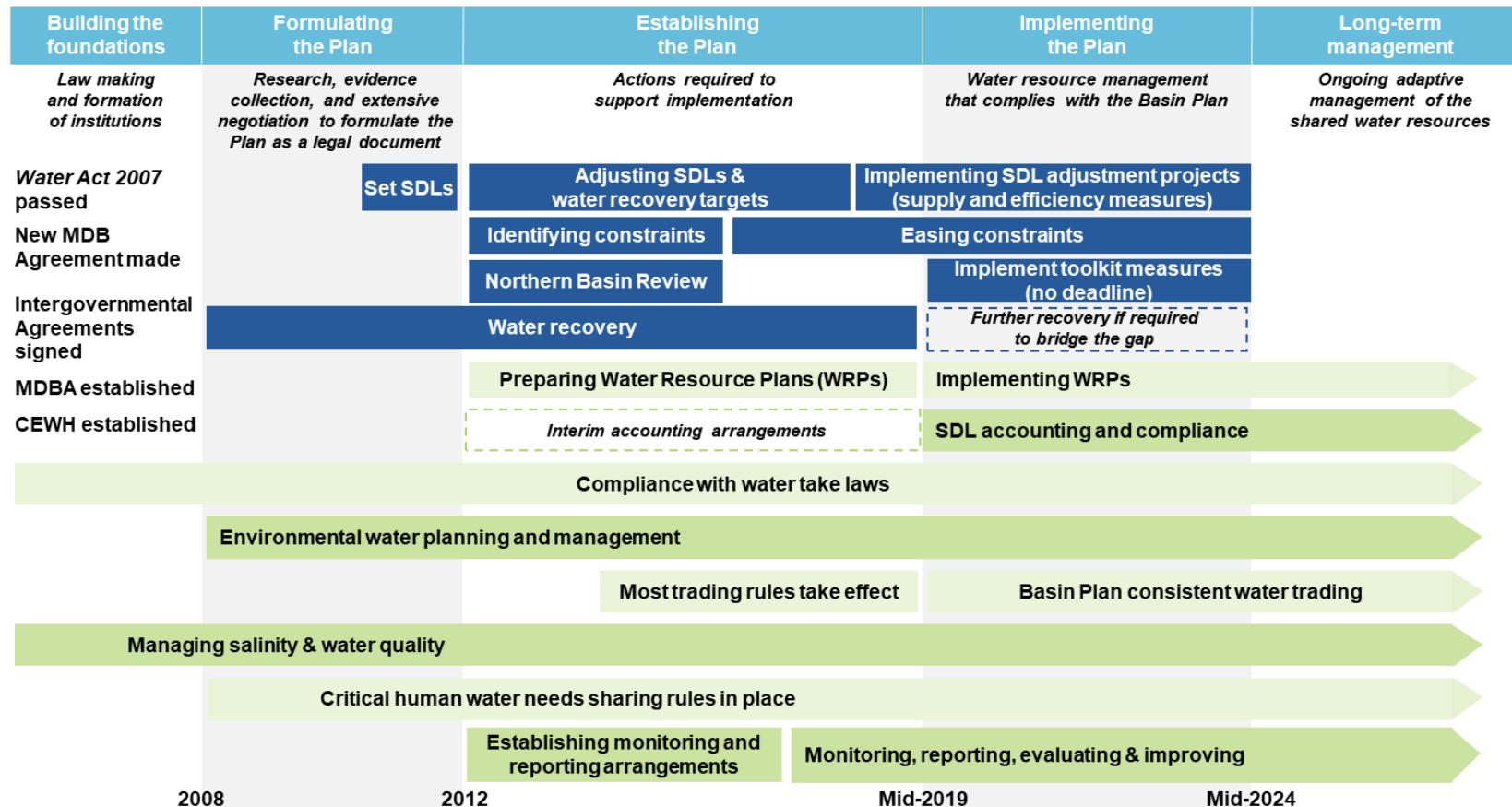
- environmental water management activities, whereby environmental water holders work together to deploy water to achieve the environmental objectives
- Basin States embedding the Plan (in particular SDLs) into their normal water planning and management processes through WRPs, which are assessed by the MDBA and accredited by the Australian Minister for Water. WRPs also include specific provisions relating to water quality and critical human water needs
- measures to establish consistent Basin-wide water trading rules for the trading and transfer of surface water and groundwater access rights, irrigation rights and water delivery rights, as well as consideration of third party impacts of trading and provision of information to improve the operation of the market
- a role for the MDBA to enforce compliance with the Basin Plan, noting that Basin States are to enforce compliance with their water take laws
- a whole-of-Basin framework for monitoring and evaluating the impact and effectiveness of the Basin Plan, which includes public reporting requirements.

Figure 1.1 Key elements of Basin Plan implementation^a

		Elements
Resetting the balance	Sustainable Diversion Limits (SDLs)	Recovering water for the environment <p>The Basin Plan sets SDLs, which is how much water can be used in the Basin, while leaving enough water for the environment.</p> <p>MDBA</p>
	Supply projects	Efficiency projects <p>The Basin Plan allows the SDL to increase by up to 650 GL where environmental infrastructure works and rule changes can be shown to achieve equivalent environmental outcomes with a lesser volume of environmental water.</p> <p>MDBA, Basin States</p>
	Toolkit measures	Constraints projects <p>Projects and changes to water management in the northern Basin to more effectively achieve environmental outcomes.</p> <p>Northern Basin States</p>
	Water Resource Plans (WRPs)	Compliance <p>The Basin Plan requires accredited WRPs, which are a mechanism for demonstrating compliance with Basin Plan requirements. WRPs are a vehicle for establishing SDLs, to be developed by States for catchments across the Basin.</p> <p>MDBA, Basin States</p>
	Environmental water management	Water quality <p>The Basin Plan introduces a new framework for managing water for the environment including how priorities are set.</p> <p>MDBA, Basin States, CEWH</p>
	Water trading rules	Critical human water needs <p>The Basin Plan sets out trading rules for water rights, including rules and reporting requirements for Basin States, the MDBA and irrigation infrastructure operators.</p> <p>MDBA, Basin States</p>
		Monitoring and evaluation <p>The Basin Plan outlines a program for reporting on and evaluating the Plan's implementation and effectiveness.</p> <p>MDBA, Basin States, CEWH, DAWR</p>

^a Dark blue boxes in each element denote the key institutions responsible.

Figure 1.2 Timelines for implementing the Basin Plan



a For communities that are dependent on the River Murray system, the Basin Plan sets specific water volumes required to meet critical human water needs. In other Basin communities (not dependent on the River Murray system), the Plan requires that Water Resource Plans describe how critical human water needs will be met during extreme events.

Box 1.2 **Adjustments to Sustainable Diversion Limits**

SDL adjustment mechanism

In the southern Basin, the Plan allows for adjustments to surface water SDLs through:

- **supply measures**, which allow for achievement of equivalent environmental outcomes with a lesser volume of water. Examples include using pumping stations, regulators and levees to deliver water to lakes and floodplains without creating overbank flooding
- **constraints easing**, to overcome some of the impediments to delivery of water down the system. They can include changes to physical features such as crossings and bridges, as well as negotiating easements where private land is flooded
- **efficiency measures**, to achieve enhanced environmental outcomes above those achievable with 2750 GL by recovering an additional 450 GL for the environment with neutral or improved socioeconomic outcomes. Examples of these projects include works to reduce on-farm water losses from irrigation, with a share of the water savings provided to the Australian Government as entitlements. The enhanced environmental outcomes are in the southern Basin, and are achieved by watering larger areas of floodplains, higher stream flows, and meeting specific objectives for the Coorong, Lower Lakes and Murray Mouth in South Australia. Delivering all of these enhanced environmental outcomes is also dependent on easing water delivery constraints.

The Basin Plan limits the total amount by which SDLs can be adjusted. The Basin-wide long-term average SDL can be adjusted up or down by a maximum of five per cent of the 2012 SDL (approximately 543 GL). As the supply measures (605 GL) exceed this limit, further water recovery through efficiency measures is required (62 GL).

Northern Basin Review

When the Plan was developed, the MDBA recognised that it required additional information to inform the setting of the SDLs in the northern Basin. As a result, Governments agreed that the MDBA would undertake a review into the northern Basin, which was completed in November 2016.

The key recommendation arising from this review was to reduce the water recovery target in the northern Basin from 390 GL to 320 GL on the provision that the Australian, Queensland and New South Wales Governments implement Toolkit measures to ensure effective management of environmental water in the north. These measures aim to target water recovery, protect environmental flows, improve the coordination and delivery of environmental water, ease constraints to environmental water delivery in the Gwydir River and construct works to improve fish passage.

1.3 What was the Commission required to do?

The terms of reference require the Commission to assess progress towards implementing actions required under the Basin Plan within legislated timeframes, including the:

- extent to which stated water recovery and other targets are on track to be delivered within statutory timeframes

-
- likelihood that activities and arrangements now in place will ensure that these targets and timeframes will be met.

The Commission has also been asked to examine the extent to which current arrangements for implementing the Basin Plan — including for monitoring, compliance, reporting and evaluation — are likely to be sufficient to:

- support delivery of the objectives and outcomes of the Basin Plan and associated reforms (as listed in Chapter 5 of the Plan)
- enable assessment of risks and risk mitigation requirements and provisions associated with Basin Plan implementation
- enable an assessment of progress in meeting the Plan’s objectives and outcomes when the MDBA reviews the Plan in 2026.

The Commission has been asked to make findings on progress towards implementing the actions required under the Basin Plan. In particular, the Commission is to make recommendations on any actions required by the Australian Government or Basin States to ensure timely implementation of the Basin Plan and the effective achievement of its intended outcomes.

The Commission’s task in this review does not extend to examining the processes for setting the sustainable balance and associated targets in the Plan or measuring the impacts and outcomes of the Plan. However, it does examine the preparedness of Basin Governments and their institutions to effectively undertake these activities in the future.

1.4 The Commission’s approach

The Commission has assessed the effectiveness of individual elements of the Basin Plan (such as WRPs and supply measures) as well as broader governance and institutional arrangements (incorporating monitoring, compliance, reporting and evaluation) (figure 1.1). For individual elements, the assessment broadly involved:

- defining the purpose of the element and how it operates
- assessing Governments’ progress in implementing agreed actions, taking into account whether Governments are on track to complete agreed actions within agreed timelines, whether those actions are likely to achieve their intended outcomes, and whether implementation has been cost-effective and followed good process
- identifying options for improving implementation, with the broader aim of maximising net benefits to the community.

The assessment of institutional and governance arrangements assesses the extent to which these align with well-established principles for good governance and are sufficient to manage the risks to future implementation.

The Commission placed greatest emphasis on assessing key implementation issues identified by inquiry participants and the Commission's own investigations. It has not sought to undertake a detailed audit of Plan implementation, such as reporting on each and every supply project or WRP requirement.

The Commission consulted widely

The Commission has consulted widely with stakeholders. Appendix A provides details of the individuals and organisations that have participated in this inquiry.

As part of its consultation, the Commission:

- released an Issues Paper in March 2018 that outlined a range of matters on which it was seeking information and views. In response to the Issues Paper, the Commission received 89 submissions and ten brief comments
- held public forums in 14 locations across the Basin during March and April 2018 to enable members of the community to provide informal input into the inquiry
- established a stakeholder working group (in accordance with the requirements of the Water Act) to provide a forum for the exchange of information and views on matters relevant to the inquiry
- released a draft report in August 2018 which included draft findings and recommendations. In response to the draft report, the Commission received an additional 54 submissions and four brief comments (meaning in total, the Commission received 143 submissions and 14 brief comments over the course of the inquiry)
- conducted public hearings in five locations in the Basin in October 2018.

Submissions and transcripts of the public hearings are available on the Commission's website. The Commission also met with numerous stakeholders over the course of the inquiry (details of which can be found in appendix A).

The Commission's assessment has been informed by a comprehensive review of relevant documents — including confidential documents — and detailed interviews with the agencies responsible for implementing the Plan, including:

- the Department of Agriculture and Water Resources
- the Murray-Darling Basin Authority
- Basin State water agencies
- Environmental water holders.

The Commission is grateful for the assistance it received from these agencies throughout the inquiry, which included providing data and helpful responses to questions about existing arrangements.

The Commission thanks all inquiry participants for meeting with Commissioners and staff, making submissions, attending public forums and hearings, and providing helpful information to inform the inquiry.

1.5 A guide to the rest of the report

The rest of this report is set out as follows:

Chapter 2 provides a summary of progress to date.

Chapters 3 to 5 explore elements that relate to resetting the balance:

- Chapter 3 Recovering water for the environment
- Chapter 4 Supply measures and Toolkit
- Chapter 5 Efficiency measures.

Chapters 6 to 11 explore elements that relate to establishing new management arrangements:

- Chapter 6 Water resource planning
- Chapter 7 Indigenous values and uses
- Chapter 8 Water quality
- Chapter 9 Critical human water needs
- Chapter 10 Water trading rules
- Chapter 11 Environmental water planning and management.

Chapters 12 to 14 explore cross cutting elements that support implementation:

- Chapter 12 Basin Plan compliance
- Chapter 13 Reporting, monitoring and evaluation
- Chapter 14 Institutions and governance.

2 Summary of progress

The Basin Plan resets the balance between environmental and consumptive uses of water across the Basin, and establishes new, more sustainable, water management arrangements. It requires the Australian and Basin State Governments to work together to complete a number of one-off tasks to establish the Plan, as well as ongoing tasks under the new business as usual.

This five-year assessment has considered the effectiveness of individual elements of the Basin Plan (such as Water Resource Plans (WRPs) and supply measures) as well as broader governance and institutional arrangements (including compliance, reporting, monitoring and evaluation). This chapter provides a summary of the Commission's findings on progress to date. Subsequent chapters provide detailed assessments and recommendations.

2.1 Significant progress has been made

Basin Governments¹³ have made progress in many elements of the Plan, particularly in recovery of water for the environment, and the establishment of planning and management arrangements for the use of this water.

Water recovery to meet the SDLs is largely complete

The Basin Governments have delivered about 2000 GL of water to environmental water holders. By 1 July 2019, the Australian Government needs to recover 2137 GL of surface water, comprising:

- 2075 GL, the adjusted Basin-wide surface water target¹⁴
- 62 GL through efficiency measures, to ensure adjustments to the Sustainable Diversion Limits (SDLs) comply with the 5 per cent limit.¹⁵

¹³ Basin Governments are the Australian Government and the governments of each Basin State — New South Wales, Victoria, Queensland, South Australia, and the Australian Capital Territory.

¹⁴ The original 2750 GL water recovery target to bridge the gap is now 2075 GL, after the target was revised down by 605 GL (following the notification of a supply measure offset) and by 70 GL (following the Northern Basin Review).

¹⁵ The Basin Plan limits the total change in the SDLs from the SDL adjustment mechanism to 5 per cent of the Basin-wide SDL (in 2012) of 10 873 GL (about 543 GL). As the 605 GL increase in the SDLs from supply measures exceeds that limit, 62 GL must also be recovered through efficiency measures to decrease the SDL and keep the net change within the 5 per cent limit when the SDLs enter into force on 1 July 2019.

The Basin-wide water recovery target comprises local targets and shared targets (for connected water resources). Some local targets have not yet been met. The outstanding recovery tasks to meet the July 2019 target of 2137 GL include:

- about 30 GL to finish recovery against local water recovery targets
- about 60 GL of water still needs to be recovered through the efficiency measures program.¹⁶

For surface water, the 90 GL outstanding gap is less than five per cent of the July 2019 target of 2137 GL.

The Department of Agriculture and Water Resources (DAWR) expects that a further 120 GL will be delivered by 30 June 2019. At the headline level, the 2019 water recovery task appears all but complete, even though more still needs to be done.

When completed, it is possible that water recovery may exceed the targets established by SDLs, with over-recovery in some surface water areas. Although this cannot be determined until key technical work is finalised, there is not yet a process in place to calculate and address any over-recovery.

For groundwater, 40.4 GL needs to be recovered to meet the targets. While a further 37.7 GL needs to be delivered to finalise this task, arrangements are in place to meet this target by July 2019.

New management arrangements have been established for a number of elements

Basin Governments have put in place the key foundations of the Basin Plan's new management arrangements. Some are working well.

- For communities that rely on the River Murray, new rules for providing critical human water needs (including drinking water for cities and towns and stock water) have been established, with stakeholders expressing confidence that these rules will ensure these needs can be met in extremely dry times.
- Basin Plan salinity targets are integrated into the Basin salinity management framework and have been consistently met for most areas.
- Basin States have improved their formal processes for engagement with Traditional Owners as part of WRP development; in particular, they are taking a nation-by-nation approach to consultation. Government efforts to support effective local-level consultation processes are likely to generate ongoing benefits where this consultation leads to long-term partnerships between Traditional Owners and local water managers.

¹⁶ About 1.9 GL of efficiency measures is currently under contract.

New requirements to improve water market information and market confidence (such as protocols to manage market sensitive information) are in place. The Basin Plan trading rules also include a mechanism to validate or remove restrictions on trade. Although this mechanism has not yet been extensively applied, it has the potential to improve the efficiency of water markets.

The Murray-Darling Basin Authority's (MDBA's) role for ensuring compliance with the Basin Plan (including compliance with SDLs and WRPs) comes into full effect once WRPs are accredited. In 2017, major reviews of compliance were triggered by media reports of compliance and enforcement failures. Basin States have committed to strengthening water take compliance regimes. The MDBA has also reformed its regulatory approach including establishing an Office of Compliance. This is a step forward in establishing its capability as a regulator.

There has been significant progress to establish the arrangements to plan for and manage environmental water under the Environmental Management Framework set out in the Basin Plan. These arrangements have widespread support. Over 750 environmental watering events have occurred over the past five years, targeted at specific environmental outcomes linked to the long-term objectives of the Plan. There is already some evidence of improved ecological outcomes at the local and system scale. Key foundations for enabling this progress have been:

- Basin Government institutions that are focused, and have clear roles and responsibilities
- effective partnerships between Commonwealth and Basin State environmental water holders and environmental asset managers, based on shared objectives, with agreed principles for how governments will work together to achieve on-ground outcomes
- collaborative planning processes that result in clearly articulated targets and priorities, which provide strategic direction for implementation.

2.2 But for other elements there is still significant work to do

Resetting the balance through supply, efficiency and Toolkit measures

Resetting the balance between consumptive uses and the environment will only be finalised once supply measures are fully operational (these are scheduled to be completed in 2024) and the volume of water recovered through efficiency measures is known.

The supply package relies heavily on a few projects that are still in the early stage of development. The 2024 timeframe for these projects is ambitious, and most likely unrealistic. History has shown that these types of projects are complex, interdependent, require extensive consultation and take many years to implement. The timeframe for implementation has been compressed due to delays in developing and agreeing to the

projects. At this stage, Basin Governments have not yet settled key governance arrangements for these projects, including the allocation of responsibilities, risk sharing and funding. Projects cannot commence until these issues are resolved, placing further pressure on the timeline. DAWR has provided little public information about how its funding approval processes will ensure that fully scoped projects will deliver the predicted environmental benefits and offer value for money.

There has been limited progress in implementing efficiency measures. Pilot water recovery programs have so far delivered less than 0.5 GL to the Commonwealth Environmental Water Holder, and the current program risks recovering water in the northern Basin that is unlikely to be useful for achieving the enhanced environmental outcomes in the southern Basin. Key assumptions made in 2012 about the expected environmental improvements from recovering more water (and the costs of doing so) have changed. There is also ongoing debate about the requirement that these measures achieve neutral or improved socioeconomic outcomes, and this has further delayed progress.

The adjustment to SDLs arising from the MDBA's Northern Basin Review was on the provision that the Australian, Queensland and New South Wales Governments implement Toolkit measures to ensure effective management of environmental water in the north. Basin Governments are still to settle the details for implementation, including key milestones, funding arrangements and program governance.

Settling the remaining new management arrangements

The development and accreditation of WRPs is behind schedule. Of the 33 WRPs that must undergo accreditation, 12 are in the early stages, 17 are in draft form, three are in the accreditation process and one has accreditation. Given the remaining workload, there is a significant risk that some WRPs will either not be accredited by 30 June 2019 or rushed through, compromising quality. This risk is greatest for WRPs in New South Wales.

The outcomes of the Basin Plan are based on an assumption that Basin States will implement river operation and water accounting policies (known as pre-requisite policy measures (PPMs)) to enable the efficient use of environmental water in the southern Basin. The MDBA has accredited PPM implementation plans, and Basin States and the MDBA have conducted PPM pilot projects and trials. However, some of these arrangements are yet to be formalised and the pathway for doing so is not clear.

The MDBA is responsible for evaluating the outcomes of the Plan. More work needs to be done to improve the Basin-wide evaluation framework and provide clear direction for the collection of information required to monitor outcomes. While some work to revise the existing framework has commenced, the process for this (including how the views of stakeholders will be considered) is not yet clear. There is little evidence that any preparatory work for the 2026 Review of the Plan has commenced.

... and the community is concerned about the road ahead

Deficiencies in the way that Governments have approached implementation of the Plan have caused considerable concern in many Basin communities. This has left a legacy of community distrust, which the Commission considers is a risk to effectively implementing the next phase of the Plan.

In some WRP areas, significant rule changes may be needed to meet Basin Plan requirements. Stakeholders are justifiably concerned that if WRPs are rushed to meet the accreditation deadline, changes could affect the reliability of their entitlements or not sufficiently protect environmental water. They are concerned that there is not enough time left to properly examine and test the proposed changes before they become law.

Many communities are increasingly sensitive to the socioeconomic impacts of the Plan. They are concerned about the impacts of water recovery observed to date and are increasingly apprehensive about the potential impacts of further water recovery, including the additional 450 GL to be acquired through efficiency measures.

There is considerable support for the agreed package of supply measures because it avoids the need for more water recovery. However, the community is increasingly divided about the approach to implementing these projects. Some stakeholders are concerned that implementation will impinge on their land or water property rights. And some are concerned that the equivalent environmental outcomes envisaged from these projects cannot be achieved, or that their local environmental values will be compromised to achieve broader Basin Plan objectives.

An overwhelming number of participants in the inquiry indicated that stakeholder confidence has been further diminished by concerns that some Basin States had substantial deficiencies in enforcement of their water take laws. An unwillingness to demonstrate that water acquired for the environment can be protected from extraction further downstream, and allegations of fraud in water recovery programs have compounded these concerns and left stakeholders sceptical of the motivations of Basin Governments.

There is a widely held view in the community that Governments have failed to provide clear and decisive direction-setting leadership. Communities are uncertain about who is responsible, and this has made it difficult for them to navigate the institutional landscape for implementing the Plan. Much of the community concern is driven by the way Basin Governments have sought to negotiate and navigate their way through issues. Consultation has been inconsistent and inadequate, and the community has often had little sense that decision makers have listened to their concerns. Governments' approach has regularly lacked transparency and candour.

Summary of progress

A summary of progress is in table 2.1.

Table 2.1 Progress towards implementing Basin Plan elements

Element	On schedule	Risk to meeting its objectives	Nature of risks
Resetting the balance			
Water recovery	✗	Low	The 2019 target is unlikely to be met. However the consequences of this are minor as the gap is less than five per cent of the target.
Supply measures	✗	High	Compressed timelines for implementation, with a range of issues to resolve. 2024 deadline is highly ambitious, if not unrealistic for some projects. As individual projects are further developed there is no transparent process for assessing whether the project is worthwhile and provides value for money. Risk to budget is hundreds of millions of dollars.
Efficiency measures	✗	High	The design of the efficiency measures program is contested. Enhanced environmental outcomes from additional water recovery are unknown as key assumptions (including dependence on easing constraints) have changed. Material risk that costs are significantly larger than anticipated.
Northern Basin Toolkit	n/a	Medium	No firm deadlines for implementation. Not subject to the same checks and balances as supply measures (such as oversight by the MDBA).
New management arrangements			
Water Resource Plans (WRPs)	✗	Medium	Behind schedule. Complex issues in some WRPs yet to be resolved.
Critical human water needs	✗	Low	River Murray arrangements robust. WRP provisions for other areas behind schedule.
Water quality	✗	Low	Salinity targets largely being met. WRP provisions behind schedule.
Water trading rules	✓	Low	
Environmental water planning and management (including pre-requisite policy measures)	✓	Medium	Failure to implement pre-requisite policy measures is a low likelihood, but high consequence risk. Other risks associated with environmental water planning and management are low.
Reporting, monitoring, evaluation	✗	Medium	There is scope to improve the evaluation framework and there is no clear monitoring strategy to give effect to the evaluation framework for the Plan.
Compliance	ongoing	Low	

Note: A tick for on schedule means the element is progressing in line with agreed timelines. The level of risk assigned reflects the risk to achieving the objectives of the element, after taking into account actions to manage the risk. For example, while water take compliance is fundamental to achieving the outcomes of the Plan, Basin Governments have agreed on substantial changes that, when implemented, will provide greater confidence and assurance of compliance with water take rules. .. Not applicable.

Table 2.2 presents Australian Government expenditure on implementing the Plan to date and shows there is still a substantial investment to be made over the coming years.

Table 2.2 Expenditure on implementing the Basin Plan^a
Expenditure as at 30 September 2018

Australian Government Program	Committed funding \$ million	Expenditure \$ million	Share of total expenditure per cent	Water recovered ^b GL (LTAAY)
Water recovery to bridge the gap	8 017	6 663	79	1 939.7
Direct purchase:	3 094	2 651	31	
- <i>purchase including program delivery</i>	2 914	2 651	31	1 226.9
- <i>Northern Basin Toolkit measures</i>	180	0	0	..
Infrastructure modernisation: ^c	4 803	3 909	46	
- <i>Gap-bridging water recovery projects</i>	3 100	2 790	33	676.8
- <i>MDB Water Infrastructure program (gap-bridging component)</i>	150	0	0	0
- <i>Other projects and activities</i>	1 553	1 119	13	..
SARMS (water recovery)	120	103	1	36.0
SDL adjustment mechanism	3 075	48	1	1.9
Supply measures ^d	1 300	34	0	..
Constraints easing ^e	200	5	0	..
Efficiency measures ^e	1 575	9	0	1.9
Structural adjustment assistance	189	189	2	..
MDB Regional Diversification ^f	100	100	1	..
Strengthening Basin communities	64	64	1	..
SARMS (regional development) ^f	25	25	0	..
Other programs and activities	1 721	1 574	19	..
MDBA for Basin Plan functions ^f	59	59	1	..
Implementation payments to States	136	87	1	..
Other programs and activities ^g	1 526	1 428	17	..
Total	13 002	8 474	100	

^a The table does not include ongoing funding secured for essential Australian Government water functions in the 2016 Mid-Year Economic Fiscal Outlook (MDBA, CEWH, BOM and MDB Joint Programs). ^b Water recovery under contract as of 31 October 2018 excluding state recoveries and water gifted to the Australian Government. ^c Infrastructure modernisation funding includes non-water recovery projects, including environmental works such as the South Australia Coorong, Lower Lakes and Murray Mouth project and other activities. ^d Based on a 605 GL offset, \$1.0 billion is available for funding supply measures, consistent with the *Intergovernmental Agreement on Implementing Water Reform in the Murray-Darling Basin*. ^e Funding from the Water for the Environment Special Account. ^f Funding was provided to other agencies to deliver these programs and is reported as per original funding and as fully expended when funds were transferred to the relevant agency. ^g Includes funding for South Australia Riverland Floodplains Integrated Infrastructure project (\$155 million), the industry assistance component of South Australia River Murray Sustainability (SARMS) program (\$120 million) and other Basin programs. .. Not applicable. LTAAY = Long-term average annual yield.

Source: DAWR (pers. comm., 5 November 2018).

2.3 Outcomes of the Plan

As noted in chapter 1, the Commission’s task in this review does not extend to measuring the impacts and outcomes of the Plan. The MDBA’s *Basin Plan Evaluation*, released in December 2017, considered the environmental, social, cultural and economic outcomes of the Basin Plan so far, drawing on a series of technical reports (MDBA 2017b). The MDBA has subsequently released Southern Basin community modelling by KPMG (February 2018) and an addendum to the Basin Plan evaluation (June 2018) which included additional analysis of irrigation-dependent communities in the southern Basin (MDBA 2018k).

The socioeconomic impacts of water recovery

Recovering water for the environment has been a highly contentious element of establishing the Basin Plan (chapter 3). This is because it results in a permanent reduction in the volume of water available for irrigated agriculture, with flow-on impacts for regional communities.

The Australian Government’s efforts to recover water for the environment in the Basin commenced in 2008, and expanded rapidly between 2008 and 2012 on the back of large open-market water purchase tenders. More than half of the gap-bridging water recovered to date was obtained prior to the Basin Plan commencing in 2012.

These concerns — and a change of government — led to a revised water recovery strategy in 2014, with the MDB Ministerial Council agreeing to slow the rate of water recovery to mitigate the risk of over recovery (MDBA 2016l). The Australian Government imposed a legislative cap of 1500 GL on surface water purchases, and its new strategy stated a preference for infrastructure projects to recover the remaining water (DOE 2014).

Government water purchases have generally had positive outcomes for participating irrigators, particularly for those who transitioned out of irrigated agriculture (Schirmer 2016; TC&A and Frontier Economics 2017; Wheeler and Cheesman 2013). Selling water compensates the irrigator, facilitating adjustment by providing them with financial resources to pay down debt, invest on-farm, or exit the industry.

The flow-on impacts of water purchases on the wider community are less clear-cut. Purchasing water leads to a permanent reduction in water availability and limits potential irrigated agricultural production. The cumulative effects of how irrigators adjust to these changes will affect irrigation networks, service providers, employment opportunities, and the viability of some regional communities. There can be significant distributional impacts as some areas benefit, while others do not.

Some water purchases have had adverse impacts at local scales — particularly where large irrigators sold substantial parcels of water entitlements, leading to rapid adjustment pressures on some small irrigation-dependent communities. In the northern Basin, the MDBA has identified towns that were adversely affected by early, relatively large water purchases (MDBA 2016d). For example, the largest employer in the Collarenebri area sold its entire

water holdings in 2009 and converted to dryland farming — this was found to have contributed to falling agricultural employment in that community (MDBA 2016g).

Box 2.1 outlines key findings on socioeconomic impacts of the Plan from the MDBA reports mentioned above.

Box 2.1 **Murray-Darling Basin Authority's evaluation of the socioeconomic impacts of Basin Plan water recovery**

The Murray-Darling Basin Authority's (MDBA's) 2017 *Basin Plan Evaluation* found that changes in the social and economic condition of the Basin were consistent with what was expected prior to the Basin Plan (MDBA 2017b). Overall, the population and economy of the Basin has continued to grow, even with the recovery of water for the environment.

The MDBA found that the Australian Government's approach to water recovery (prioritising recovering water through projects that modernise irrigation infrastructure and return a share of the saved water to the environment) has helped to lessen the effect of recovering water on industries and communities in the Basin. In the MDBA's view:

- on-farm infrastructure modernisation has allowed irrigators to retain a portion of the water saved through the Australian Government's programs, which has helped to improve farm productivity
- irrigators have benefited from the upgrading of irrigation delivery systems through off-farm programs
- the operation of the Sustainable Diversion Limit adjustment mechanism (and the associated 605 GL reduction in the water recovery target) will improve social and economic outcomes in the Basin.

The 2017 evaluation examined trends in irrigated agriculture, observing that the maximum gross value of irrigated agricultural production in the Basin has remained relatively constant in real terms over the period of water recovery. However, the MDBA also highlighted that Basin-wide statistics do not provide a clear picture of the effects of the Basin Plan, given other factors have also influenced the changes experienced at the community scale.

The MDBA provided additional analysis of irrigation-dependent communities in the southern Basin in the June 2018 *Basin Plan Evaluation addendum* (MDBA 2018k). The MDBA found that the effect of Basin Plan water recovery on employment varies from community to community.

- Across the 40 communities examined, 12 are likely to have experienced quite small adverse employment effects arising from Basin Plan water recovery.
- In the remaining 28 communities, the adverse effects of water recovery ranged from modest and identifiable (18 communities), through to quite large changes (10 communities).

The ten communities experiencing the largest changes are those where Basin Plan water recovery has led to effects on employment of greater than 6 per cent. However, the MDBA notes that those communities (Berri, Cobdogla-Barmera, Colignan, Lower Lakes, Loxton, Merbein, Red Cliffs, Rochester, Swan Reach and Wakool) have also been affected by factors other than the Basin Plan.

The environmental impacts of water recovery and new management arrangements

Recent evaluations and reports by the MDBA and the Commonwealth Environmental Water Holder point to some early evidence of improved environmental outcomes due to progress in implementing the Basin Plan to date. Box 2.2 summarises the findings of these reports.

Box 2.2 Reports on the environmental impacts of the Basin Plan

The Murray-Darling Basin Authority (MDBA) and the Commonwealth Environmental Water Holder (CEWH) have reported the following environmental outcomes associated with Basin Plan implementation.

- **Waterbirds** — Waterbird abundance in the Basin has been declining from the 1980s, but the rate of long-term decline in waterbird populations has slowed (MDBA 2017b). The CEWH's Long-Term Intervention Monitoring project has indicated that environmental water delivered in 2015-16 contributed to several bird breeding events, including colonial waterbird breeding in five monitored wetland sites in the Murrumbidgee (Wassens et al. 2016).
- **Native fish** — Environmental water flows have contributed to positive responses from native fish in Basin. Examples cited in the 2017 *Basin Plan Evaluation* include: the movement and dispersal of golden and silver perch, more successful recruitment (breeding) of Murray cod, freshwater catfish and silver perch, and maintaining critical habitats for the Murray hardyhead (MDBA 2017b).
- **Native vegetation** — Environmental watering has been found to have promoted the growth and establishment of numerous native plant species within six sites monitored by the CEWH's Long-Term Intervention Monitoring project (although variation was observed across these sites) (Capon and Campbell 2017). Additional environmental water has increased the diversity of vegetation communities at the landscape scale (Capon and Campbell 2017). The 2017 *Basin Plan Evaluation* also identified that the Basin Plan had helped maintain the condition of native vegetation, although noted that it is not yet possible to determine if the Plan is on track to meet some intermediate or longer-term targets (MDBA 2017n).
- **River flows** — The 2017 *Basin Plan Evaluation* reported over 750 environmental watering events between 2012-13 and 2016-17. It found mixed outcomes with respect to river flows and connectivity. It cited increased longitudinal connectivity in the southern Basin, but no material improvement for flows into and downstream of the Barwon-Darling in the northern Basin (MDBA 2017b). Counterfactual modelling (undertaken by the CEWH and MDBA) indicated that environmental flows have 'significantly enhanced barrage flows since 2012' (MDBA 2018ad, p. 36). For lateral connectivity, the MDBA found the Plan to have increased the number of freshes, but operational constraints have limited the ability of water managers to provide bankfull and overbank flows (MDBA 2017b).
- **Salinity** — Monitoring indicates that targets are being met at four of the five sites where salinity is measured in the Basin. The salt export objective of two million tonnes of salt reaching the sea per year has not been met because of relatively low inflows from 2012 (MDBA 2017b).

3 Recovering water for the environment

Key points

- Transitioning from historical water use to the new Sustainable Diversion Limits (SDLs) under the Basin Plan requires the recovery of water from consumptive users for the environment.
- State-led programs returned water to the environment prior to the Basin Plan. In 2008, the Australian Government started recovering more water to ‘bridge the gap’ to the SDLs.
- Basin Governments need to recover 2137 GL of surface water by July 2019 to meet all local and shared recovery targets and the 62 GL required under the efficiency measures program.
 - About 2000 GL of surface water is currently held by Basin Governments towards bridging the gap. Of this, about 60 per cent was obtained by purchasing water from willing sellers, and about a third recovered through projects that modernise water infrastructure and return a share of water savings to Basin Governments.
 - The efficiency measures program is part of the SDL adjustment mechanism. The Australian Government must recover 62 GL to keep the Basin-wide SDL adjustment below five per cent. Less than 0.5 GL in efficiency measures has been delivered so far.
- Almost 30 GL still needs to be recovered to meet local surface water targets, and about 120 GL currently under contract is yet to be delivered.
- The groundwater target is 40.4 GL, with 2.7 GL delivered and 37.7 GL yet to be delivered.
- If all contracted water is delivered, some parts of the Basin may be over-recovered against the SDL. There is currently no process in place to address this.
 - The Murray-Darling Basin Authority should identify any over-recovery and the Commonwealth Environmental Water Holder should develop a process and appropriate timeframe to return water to consumptive uses in accordance with SDLs.
- In addition to meeting SDLs, all water recovered should contribute to an environmental water portfolio that best enables environmental water holders to achieve Basin Plan objectives.
 - The Australian Government has not systematically demonstrated whether the entitlements recovered have environmental value. Subject to commercial sensitivity, the advice received on the environmental utility of different entitlement types should be published.
- Recovering water by modernising infrastructure, rather than through directly purchasing entitlements has increased the budgetary cost by about \$2 billion. Basin Governments have done so to try to address the socioeconomic impacts of water recovery.
 - Some positive outcomes have been reported from prioritising infrastructure modernisation, but many are private benefits accruing to irrigators. The program has not been comprehensively assessed to determine whether the benefits have exceeded the costs.
- Direct community assistance programs have been delivered to address the impacts of recovery. There is little evidence to indicate that these have been effective. New programs must clearly outline (and report against) program objectives, to enable the effectiveness of these initiatives to be properly assessed.

A key part of the Basin Plan reform is to reset the balance between environmental and consumptive uses of Basin water resources by establishing new, lower Sustainable Diversion Limits (SDLs) on consumptive take. To ‘bridge the gap’ from historic water use to the new SDLs, Basin Governments committed to recover water rights from consumptive users by purchasing them from willing sellers and investing in modernised water infrastructure. Environmental water holders can then use recovered water to protect and restore the Basin’s environmental values. Under the Basin Plan, governments were originally required to recover 2750 GL¹⁷ to transition to the new surface water SDLs by July 2019.

The Australian Government has also committed to recover an additional 450 GL through the efficiency measures program to pursue the enhanced environmental outcomes in Schedule 5 of the Basin Plan. Efficiency measures are part of the SDL adjustment mechanism and are to be recovered by July 2024. This program is discussed in more detail in chapter 5.

Recovering water for the environment has been a highly contentious element of establishing the Basin Plan, because it permanently reduces the volume of water available for irrigated agriculture, and it can have flow-on impacts for regional communities. Governments make decisions on how, where and when to recover water for the environment. These decisions have had wide-ranging (and, in some cases, acute) impacts on irrigators and communities — as well as significant budgetary costs to governments.

This chapter assesses how Basin Governments have recovered water to give effect to the SDLs set out in the Basin Plan.

- Section 3.1 outlines the background to water recovery in the Murray-Darling Basin (MDB).
- Section 3.2 considers whether water recovery is on track to meet targets within scheduled timeframes.
- Section 3.3 examines the extent to which processes to recover water have built a held water portfolio that allows environmental water holders to achieve the environmental objectives of the Basin Plan.
- Section 3.4 considers the cost-effectiveness of water recovery processes.
- Section 3.5 addresses structural adjustment assistance programs.

3.1 Background

Overallocation of the Basin’s water resources was recognised prior to the Basin Plan

Reforms to address overallocated water resources and to return water to the environment first began in parts of the Basin in the 1990s. Some Basin Governments provided water for

¹⁷ Unless otherwise specified, all water volumes in this chapter are presented in long-term average annual yield (LTAAY).

the environment by reducing water access rights for all users in a resource area to reduce water take (such as the commencement of some water sharing plans in New South Wales in 2004) (MDBA 2017o).

Basin States began recovering water from the mid-2000s. Direct purchases of entitlements from willing sellers began under the New South Wales RiverBank program in 2005 (OEH (NSW) 2017b), and Basin States began investing in more efficient irrigation systems to recover water, including through the joint Living Murray Initiative (TLM). TLM (488 GL) and Water for Rivers (70 GL for the River Murray), among other programs, were undertaken in partnership between Basin Governments prior to 2009 — and are therefore included in the Basin Plan’s Baseline Diversion Limit (BDL) (MDBA 2017o). As of 30 June 2017, state-based environmental water holders held about 1053 GL (37 per cent) of environmental water in the Basin, of which about 85 per cent was recovered before 2009 (MDBA 2018ak).¹⁸

The Australian Government intervened to reset the balance

A sharp decline in the condition of the Basin’s natural environment during the Millennium Drought made clear that efforts of previous reforms to provide water to the environment were inadequate to achieve environmental sustainability in the Basin. In 2007, the Australian Government intervened. A key part of this intervention was to recover more water from consumptive uses for the environment.

In early 2007, the Australian Government committed \$10 billion towards national water reform under the *National Plan for Water Security*, and the Parliament passed the *Water Act 2007* (Cwlth) later that year. The Australian Government committed to recover water entitlements through two primary instruments — purchases and projects to improve water use efficiency (Australian Government 2007) (box 3.1).

The Australian Government commenced recovering water in 2008 (Wong 2008). By late 2012, when the Basin Plan was made, 1547 GL of gap-bridging water had already been recovered.¹⁹ By the end of 2011-12, about 80 per cent of water recovered by the Australian Government was through direct entitlement purchase (DAWR 2017a).

The Australian Government assumed full financial responsibility for bridging the gap to the SDLs in 2013 (COAG 2013). It also agreed to manage the socioeconomic impacts of reduced water availability by prioritising on-farm and off-farm infrastructure modernisation (rather than water purchase) in future programs (DOE 2014). And jointly, Basin Governments agreed to use the SDL adjustment mechanism to offset up to 650 GL of water recovery (chapter 4).

¹⁸ Water recovered in the Basin prior to 2009 is not considered gap-bridging. A total of 163.5 GL (about 15 per cent of Basin State holdings) contributes to bridging the gap in the Basin (DAWR 2018n).

¹⁹ Note on original compilation of *Basin Plan 2012* (Cwlth), s. 6.04(2).

Box 3.1 **Approaches to recovering water for the environment**

Water can be recovered from consumptive uses through three primary tools.

1. **Administrative approaches** include resetting entitlements to a lower level, or changing rules over their use. These approaches can change the yield and reliability of entitlements, and affect the underlying property rights associated with them.
 - The Australian Government committed to bridge the gap in the Basin by securing water entitlements for environmental use to avoid risks to property rights.
2. **Direct purchase** of water entitlements from willing sellers. This includes:
 - open tenders available to all water users in an area (also known as buyback) delivered through programs such as *Restoring the Balance*
 - direct negotiation with water users ('strategic purchases' such as the 2017 purchase of Lower Darling entitlements from the Tandou property), which are subject to approval by the relevant Basin State
 - arrangements with Basin States under bilateral agreements.
3. **Investment in modernised water infrastructure.** These projects provide a share (of at least 50 per cent) of expected water savings to the Australian Government as an entitlement.
 - *On-farm* projects include converting flood irrigation systems to drip irrigation systems or deepening on-farm storages to reduce evaporative losses. Irrigators keep a share of those savings — and although they have a lower volume of entitlements, improved water use efficiency can allow irrigators to provide the same (or more) water to crops.
 - *Off-farm* projects include lining delivery channels to reduce seepage or decommissioning underutilised parts of an irrigation network. The irrigation infrastructure operator provides a share of the saved water to the Australian Government, and the entitlements of irrigators are unchanged.
 - *Non-irrigation* infrastructure modernisation projects include environmental works that return water to the environment (such as the South Australian Riverine Recovery Project).

Sources: DAWR (sub. 81 & (2018n); DOE (2014); PC (2010).

The Basin Plan established targets for water recovery ...

The Basin Plan established an environmentally sustainable level of take.²⁰ The Basin was divided into surface water and groundwater SDL Resource units, and a water recovery target was set to the difference between the historical level of allowable take (the BDL) and the new sustainable level of take (the SDL) for each SDL Resource unit.²¹

The Basin Plan originally set a headline surface water recovery target of 2750 GL to be recovered prior to the SDLs coming into force on 1 July 2019, requiring water recovery in

²⁰ Water Act 2007 (Cwlth), s. 3(c).

²¹ The BDL is not an estimate of actual diversions, but is instead an estimate of maximum *permitted* diversions in 2009, under the rules in place and level of resource development at that time. Surface water BDLs are calculated in Schedule 3 of the Basin Plan.

almost every surface water SDL Resource unit.²² The Basin Plan also set a water recovery target of 40.4 GL to meet SDLs in two Queensland groundwater SDL Resource units.

The Basin-wide surface water recovery target consists of:

- local targets for individual SDL Resource units, which are designed to achieve local environmental outcomes
- shared targets for zones that span multiple SDL Resource units, which are designed to contribute to downstream environmental outcomes for connected resources.

Water recovery must meet both local and shared targets. Local targets must be met by recovering water in that SDL Resource unit, while shared targets can be met by recovering water from any Resource unit within a connected zone. Two units — Wimmera-Mallee (Victoria) and Lachlan (New South Wales) — are considered disconnected and cannot contribute to shared targets.

... but the July 2019 target has only been recently finalised

The SDLs (and thus water recovery targets) have been adjusted twice since 2012.

The Basin Plan provided for reviews of surface water SDLs in the northern Basin and for three groundwater SDLs.

- The *Northern Basin Review* was completed by the Murray-Darling Basin Authority (MDBA) in 2016 (chapter 4), and proposed that the water recovery target could be reduced by 70 GL on the basis of northern Basin Governments agreeing to implement a number of ‘Toolkit measures’ designed to improve water management (MDBA 2016d).
- The groundwater reviews were completed in early 2014 and also increased SDLs in those resources, but this did not change recovery targets as the BDL for each area was already equal to or below the new SDL.²³

The amendment to the Basin Plan to give effect to both the *Northern Basin Review* and groundwater reviews was disallowed by the Australian Parliament in February 2018. The final northern Basin water recovery target was not confirmed until the Basin Plan was again amended on 3 July 2018, and the parliamentary disallowance period expired on 20 September 2018.

The Basin Plan includes the SDL adjustment mechanism, which contains both supply measures and efficiency measures (box 3.2). The change to the SDL arising from the adjustment mechanism was originally scheduled to be determined by 2016 (well prior to the

²² Original compilation of *Basin Plan 2012* (Cwlth), s. 6.04.

²³ These groundwater SDL resource units are: Eastern Porous Rock (New South Wales), Western Porous Rock (New South Wales) and Goulburn–Murray (Victoria).

finalisation of water recovery in 2019), but the water recovery offset of 605 GL was only confirmed in May 2018.

Collectively, the *Northern Basin Review* and the SDL adjustment mechanism reduced the gap-bridging target from 2750 GL to 2075 GL.

Box 3.2 **The Sustainable Diversion Limit adjustment mechanism**

The Plan allows for surface water Sustainable Diversion Limits (SDLs) to be adjusted up and down in the southern Basin.

- **Supply measures** allow for achievement of equivalent environmental outcomes with a lesser volume of water. This can increase SDLs and reduce water recovery targets. Examples include using pumping stations, regulators and levees to deliver water to lakes and floodplains without creating overbank flooding (chapter 4).
- **Efficiency measures** aim to achieve enhanced environmental outcomes by recovering a further 450 GL for the environment while maintaining or improving socioeconomic outcomes. These projects decrease SDLs; examples include works to reduce on-farm water losses from irrigation, with a share of the water savings provided to the Australian Government as entitlements (chapter 5).

The Basin Plan prevents the Basin-wide SDL from being adjusted by more than five per cent in net terms (about 543 GL). Achieving the full 605 GL offset from supply measures requires the Australian Government to register 62 GL under the efficiency measures program by 1 July 2019.

This means that the water recovery target for July 2019 is effectively 2137 GL (box 3.3). Meeting this target will reduce permitted water diversions across the Basin by almost 20 per cent compared with 2009 (MDBA 2018aa).

Box 3.3 What is the July 2019 water recovery target?

In 2012, the Basin Plan set a Basin-wide surface water recovery target of **2750 GL** to give effect to the Sustainable Diversion Limits (SDLs) when they come into effect on 1 July 2019. The gap-bridging water recovery target is defined as the difference between the overall 2009 Baseline Diversion Limit (originally estimated at **13 623 GL**) and the SDL (originally **10 873 GL**).^a

The SDL (and therefore the gap-bridging target) have since been adjusted.

- Following the *Northern Basin Review*, the Basin Plan was amended to increase SDLs in the northern Basin by **70 GL**. The gap-bridging target was adjusted down to **2680 GL**.
- Basin States submitted a package of supply measures under the SDL adjustment mechanism, which was assessed to offset **605 GL** of water recovery. This *increased* the Basin-wide SDL by the same amount, and revised the gap-bridging target to **2075 GL**.
- However, the SDL adjustment mechanism caps the net change in the SDL to five per cent of the SDL (as it stood at the commencement of the Basin Plan in 2012) (Basin Plan, s. 7.19). As the SDL was 10 873 GL at that time, the maximum permitted adjustment is **543 GL** (rounded down). Therefore, to keep the net adjustment within five per cent, the Australian Government must recover **62 GL** through efficiency measures to *decrease* the Basin-wide SDL by 1 July 2019, or the supply measure offset will be scaled back and may create a water recovery gap (Basin Plan schedule 6A).

To reflect both the gap-bridging target and the 62 GL needed to ensure the full 605 GL supply measure offset is achieved, the July 2019 water recovery target is **2137 GL**.

^a as in the original compilation of the Basin Plan 2012, note to s. 6.04(2).

Institutional arrangements for recovering water

The Department of Agriculture and Water Resources (DAWR) is responsible for implementing the Australian Government's commitment to bridge the gap by July 2019 (in accordance with the Australian Government's 2014 water recovery strategy — (DOE 2014)). DAWR is also responsible for implementing the efficiency measures program.

Basin States are responsible for facilitating the Australian Government's gap-bridging projects (COAG 2013). This includes approving strategic purchases and delivering certain water recovery projects (state priority projects) agreed to in 2008 (COAG 2008a).

Recovered water entitlements are transferred to the Commonwealth Environmental Water Holder (CEWH), who independently manages that water to maintain and improve environmental outcomes in the Basin (chapter 11).

The Commission's framework for assessing water recovery under the Basin Plan

The effectiveness of water recovery in supporting the objectives and outcomes of the Basin Plan has been assessed against two primary criteria.

- Water recovery targets should be met in accordance with scheduled timeframes (section 3.2).
- Water recovered should contribute to a secure water portfolio that allows environmental water holders to achieve the environmental objectives of the Basin Plan (section 3.3).

The Commission has also assessed the cost-effectiveness of water recovery programs (section 3.4). This considers whether water recovery programs have met targets cost-effectively, but also acknowledges that the Australian Government agreed to manage the socioeconomic impacts of the Basin Plan on communities and industries primarily through its approach to water recovery.

3.2 Progress to the July 2019 water recovery target

The first assessment criterion concerns progress towards meeting the water recovery targets set by the Basin Plan within scheduled timeframes. This has two aspects — a backwards-looking assessment of whether progress to date has been on-track, and an assessment of whether current settings are likely to enable the Australian Government to meet those targets by July 2019.

Significant progress has been made

Most of the water required is recovered or under contract

As of 31 October 2018, Basin Governments had registered²⁴ 2000.3 GL of gap-bridging environmental water and 0.5 GL of efficiency measures against the Basin-wide 2019 surface water target of 2137 GL (DAWR 2018n). The CEWH holds most of the gap-bridging water (1836.8 GL). State-based environmental water holders hold 163.5 GL (97.6 GL in Victoria, 59.5 GL in New South Wales and 6.4 GL in South Australia) (DAWR 2018n).

The Australian Government has contracted a further 117.9 GL of gap-bridging water, and 1.4 GL of efficiency measures, which has not yet been delivered to the CEWH. If all contracted entitlements are delivered in full, gap-bridging surface water recovery will stand at 2118.1 GL and the efficiency measures program at 1.9 GL, totalling 2120 GL. While this implies that less than 20 GL remains to meet the 2137 GL target, some local targets have not been met (representing 29.8 GL, table 3.1), and the full 62 GL of efficiency measures must be delivered to meet the five per cent limit on SDL adjustments (box 3.3).

²⁴ Registered water refers to entitlements delivered to environmental water holders. Some entitlements are contracted and not yet delivered, but are considered as ‘recovered’ by the Australian Government.

Table 3.1 Progress towards the July 2019 target^a

Contracted water recovery at 31 October 2018

SDL shared zone	Basin Plan target ^b		SDL Adjustment ^c	July 2019 target ^d	Recovery to date	Recovery remaining ^e	
	GL LTAAY	GL LTAAY				GL LTAAY	GL LTAAY
Bridging the gap – surface water							
Nth Basin (Qld)	Local	123.0	..	123.0	127.6	12.8	9
	Shared	17.0		17.0		0.0	0
Nth Basin (NSW)	Local	156.0	..	156.0	172.8	16.5	9
	Shared	24.0		24.0		0.0	0
Sth Basin (NSW)	Local	590.0	286.8	590.0	808.8	0.0	0
	Shared	458.0		171.2		0.0	0
Sth Basin (ACT)	Local	0.0	0.0	0.0	4.9	0.0	0
	Shared	4.9		4.9		0.0	0
Sth Basin (Vic)	Local	627.0	266.2	627.0	788.0	0.0	0
	Shared	425.3		159.1		0.0	0
Sth Basin (SA)	Local	101.0	52.0	101.0	143.9	0.0	0
	Shared	82.8		30.8		0.0	0
Disconnected (NSW)	Local	48.0	..	48.0	49.6	0.0	0
Disconnected (Vic)	Local	23.0	..	23.0	22.6	0.4	2
TOTAL (surface water)	Local	1 668.0	605.0	1 668.0	2 118.1	29.8	1
	Shared	1 012.0		407.0		0.0	0
Efficiency measures – surface water							
TOTAL (all zones)	450.0	..	62.0	1.9	60.1	97	
Bridging the gap – groundwater							
Upper Condamine Alluvium	Central Condamine Alluvium	35.4	..	35.4	4.9	30.5	86
	Tributaries	5.0		5.0		5.0	100
TOTAL (groundwater)	40.4	..	40.4	4.9	35.5	88	

^a All values are in long-term average annual yield (LTAAY) terms, calculated using the current long-term diversion limit equivalent factors (v2.05) agreed to by MDB Ministerial Council in November 2011, or those consistent with accredited Water Resource Plans. ^b As amended following the *Northern Basin Review*.

^c SDL adjustments are the apportioned supply measure offsets under the SDL adjustment mechanism.

^d Targets reflect SDL adjustments from the SDL adjustment mechanism and the *Northern Basin Review* amendments. The 62 GL of efficiency measures required to limit the change in the SDL to below five per cent by July 2019 can be recovered anywhere in the Basin. ^e As a proportion of the sum of local and shared targets, not including any potential over-recovery, not including offers accepted under the recent tender in the Condamine Alluvium groundwater resource. .. Not applicable.

Data source: DAWR (2018n).

The groundwater target is 40.4 GL. As of 31 October 2018, the Australian Government reported it has contracted 4.9 GL, of which 2.7 GL has been delivered to the CEWH (DAWR 2018n). This leaves 2.2 GL still to be delivered, with 35.5 GL yet to be contracted.²⁵

Although DAWR reports a recovery gap of 0.4 GL in the Wimmera-Mallee, the Commission has been advised that this gap is considered an error by the Victorian Government and is currently the subject of discussion between the Victorian Government and the MDBA (Victorian Government, sub. DR142). This gap is expected to be addressed in the relevant Water Resource Plan (WRP) (chapter 6).

How has the Australian Government recovered water so far?

About 60 per cent (1226.9 GL)²⁶ of gap-bridging water recovery under contract has been directly purchased by the Australian Government — either through open tender (1016.9 GL) or through ‘strategic purchases’ (negotiated directly between Governments and entitlement holders) (207.1 GL) (DAWR 2018n). Along with Basin State recoveries and 15.0 GL gifted to the CEWH by the Queensland Government, the remainder (712.8 GL) has been recovered through investment in modernised water infrastructure.

The only water recovered under the efficiency measures program so far has been through a pilot infrastructure program in South Australia (DAWR 2018n).

The Australian Government’s initial water recovery efforts were primarily through purchase, but, following a change in policy in 2013, the Australian Government imposed a legislative cap of 1500 GL on surface water purchases in 2014 (box 3.4). The Australian Government’s water recovery strategy now prioritises water recovery through investments in water infrastructure.

Remaining gaps are small and mostly in the northern Basin

The Australian Government has met all shared targets across the Basin (following the operation of the SDL adjustment mechanism and the passage of the *Northern Basin Review* amendments). Almost all local targets in the southern Basin have been achieved.

²⁵ This does not include offers accepted under the recently concluded tender in the two Condamine Alluvium groundwater resource units (totalling 31.9 GL). DAWR has indicated that these offers are being processed and are expected to be registered with the CEWH in early 2019 (pers. comm., 5 November 2018).

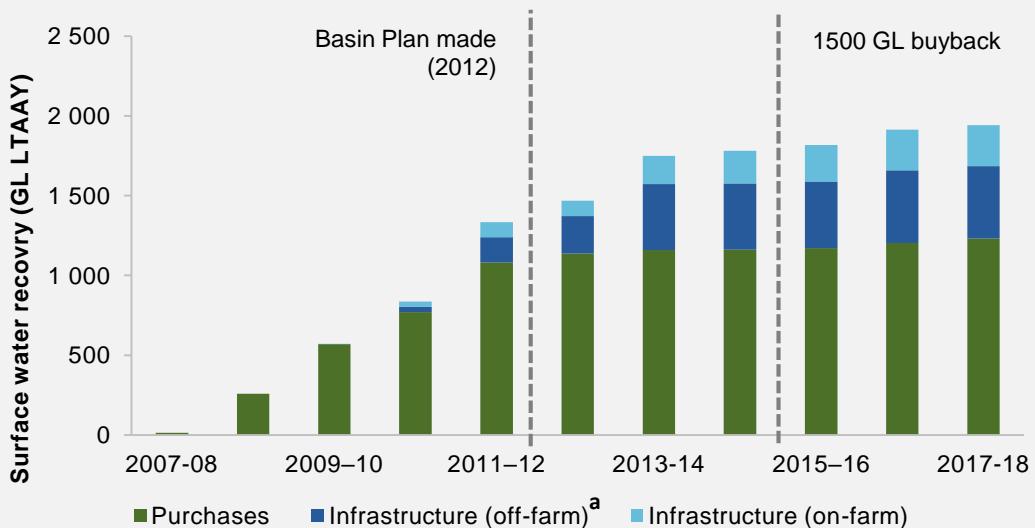
²⁶ Including 2.9 GL purchased from the South Australian Government that is not subject to the legislative cap on surface water purchases.

The remaining gaps are primarily local targets in the northern Basin, and are small relative to the overall water recovery task (figure 3.1).

Box 3.4 A decade of Australian Government water recovery

The Australian Government's efforts to recover water for the environment in the Basin commenced in 2008, and expanded rapidly between 2008 and 2012 on the back of large open-market water purchase tenders (figure below). More than half of the gap-bridging water recovered to date was obtained prior to the Basin Plan commencing in 2012.

Australian Government water recovery in the Murray-Darling Basin



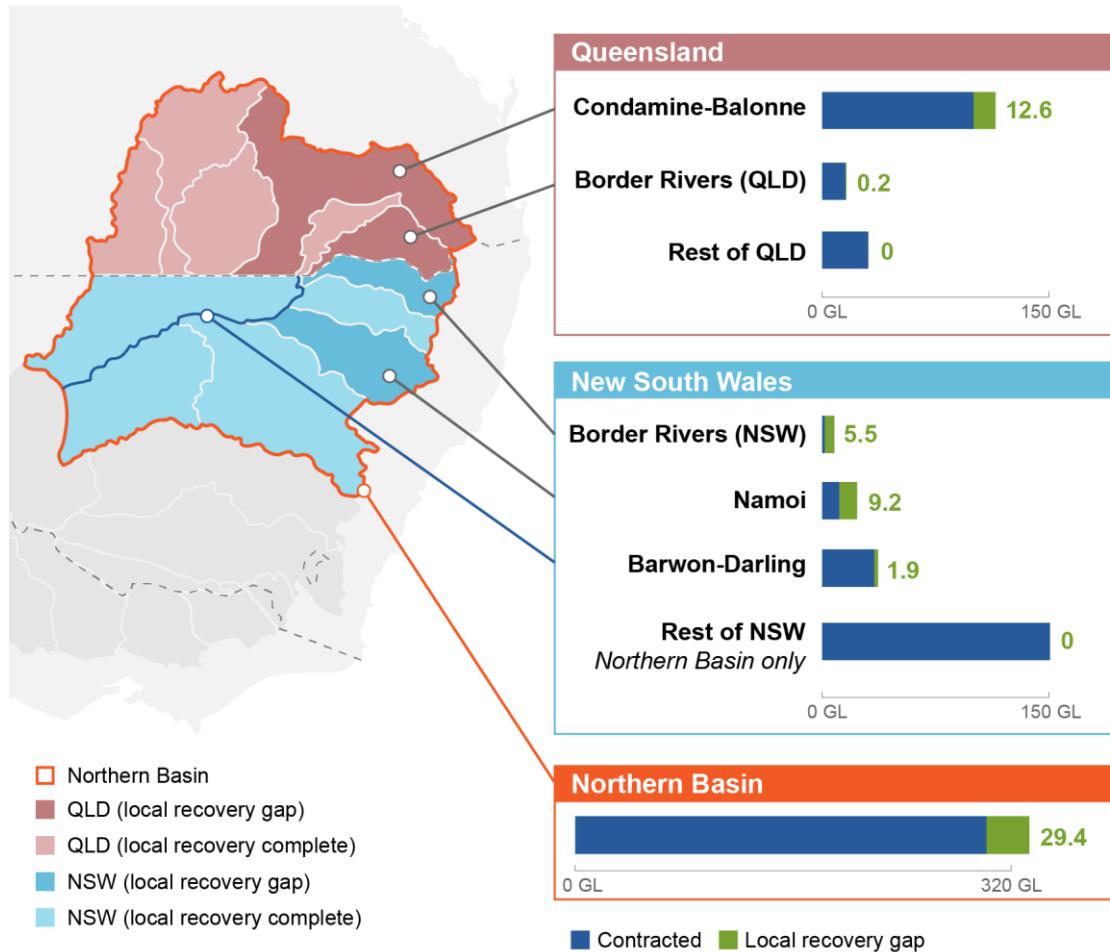
^a includes water recovered through the Nimmie-Caira project.

Source: DAWR, pers. comm., 5 November 2018.

Community opposition to the buyback soon emerged. The impacts of these purchases, coupled with ongoing drought conditions and the legacy of pre-Basin Plan water recovery, were seen to create considerable hardship in communities and undermine the viability of some irrigation districts (for example, Murray River Group of Councils (sub. 36), Lachlan Valley Water Inc. (sub. 49), Murray Darling Association (sub. 52), NSW Farmers' Association (sub. 60) and GMID Water Leadership (sub. 62)).

These concerns — and a change of government — led to a revised water recovery strategy in 2014, with the MDB Ministerial Council agreeing to slow the rate of water recovery to mitigate the risk of over-recovery (MDBA 2016l). The Australian Government imposed a legislative cap of 1500 GL on surface water purchases, and its new strategy stated a preference for infrastructure projects to recover the remaining water (DOE 2014).

Figure 3.1 Remaining surface water recovery in the northern Basin
 Local targets outstanding based on contracted recovery as of 31 October 2018



Source: DAWR (2018n).

Assuming delivery of contracted recoveries and the delivery of 62 GL of efficiency measures (which can be registered anywhere in the Basin), the specific water recovery gaps (at 31 October 2018) are:

- local surface water in Queensland: 12.6 GL in the Condamine-Balonne and 0.2 GL in the Queensland Border Rivers
- local surface water in New South Wales: 9.2 GL in the Namoi, 5.5 GL in the New South Wales Border Rivers and 1.9 GL in the Barwon-Darling
- groundwater in the Upper Condamine Alluvium resource: 35.5 GL.

What still needs to be finalised?

A few outstanding issues must be resolved to finalise water recovery by July 2019. These are:

- ensuring delivery of contracted gap-bridging water
- completing gap-bridging surface water recovery in the northern Basin and groundwater in the Condamine Alluvium
- delivering an additional 61.5 GL through efficiency measures
- managing the risk presented by revised planning assumptions in WRPs.

Ensuring delivery of contracted (but not yet delivered) water

The Australian Government contracts the delivery of infrastructure projects to delivery partners, which include Basin States and irrigation infrastructure operators.²⁷ These delivery partners are contracted to deliver all outstanding water prior to July 2019.

As of 31 October 2018, 117.9 GL under contract had not yet been delivered. These outstanding deliveries are primarily in Victoria (72.0 GL) and New South Wales (41.0 GL). Some contracts have been revised during 2018. Following agreement between Governments to revise the New South Wales Basin Pipes program, the Victorian Farm Modernisation Project and the Irrigation Farm Modernisation program, 35.4 GL of previously contracted water will no longer be delivered (DAWR, pers. comm., 5 November 2018).

There is a risk that contracts may be revised further, leading to a water recovery shortfall. The MDBA has reported that about 20 GL is at risk of not being delivered (MDBA 2018e). DAWR is managing the risk of any failures to deliver on contracted water through bilateral arrangements with the Basin States (DAWR, sub. 81). As a last resort, any failure to deliver contracted water will be addressed through the SDL reporting and compliance framework (DAWR, pers. comm., 5 November 2018; discussed below).

Meeting the gap-bridging targets

Of the remaining recovery gaps in the northern Basin, most material are:

- surface water targets in the Condamine-Balonne, the Namoi and the New South Wales Border Rivers (figure 3.1)
- the two targets for the Condamine Alluvium groundwater resources.

A further 29.4 GL of surface water is required in the northern Basin. While this gap is relatively small in the context of the overall recovery effort (table 3.1), existing programs

²⁷ Water is counted as recovered once the contract is signed, but water entitlements may not be transferred to the CEWH until works commence, or (for major off-farm projects) water may be transferred progressively in line with agreed milestones.

may not be enough to finalise water recovery because there are specific barriers to recovering water in the northern Basin. As highlighted by DAWR, many landholders have already participated in on-farm programs and are unlikely to do so again, citing administrative burden. There is also no industry group to facilitate engagement in parts of the region (Northern Basin Programs Taskforce 2017).

The Australian Government's Murray-Darling Basin Water Infrastructure Program is designed to both finalise gap-bridging surface water recovery and commence additional water recovery through efficiency measures (DAWR 2018h). The program is operating Basin-wide, with individual water users submitting proposals (to DAWR, or its delivery partners) for water saving projects.²⁸

DAWR considers the design of the Murray-Darling Basin Water Infrastructure Program to be more flexible than previous programs, and expects this to improve uptake. The program allows for: a wider range of eligible activities, opportunities for water users to lease back water allocations for short periods of time, and shorter waiting periods (DAWR, pers. comm., 5 November 2018).

In the event that proposals for infrastructure projects are not forthcoming, DAWR has indicated that strategic purchases will be considered where proposed by water entitlement holders (DAWR, pers. comm., 5 November 2018).

The other significant recovery gap is in the Condamine Alluvium groundwater resource, where 37.7 GL is yet to be delivered.²⁹ DAWR has operated a tender to recover this water and (as of 31 August 2018) had accepted offers providing a total of 31.9 GL (DAWR 2018o). Through the process of developing the Condamine-Balonne WRP, water entitlement holders have agreed that, if the Australian Government fails to recover the remaining water through purchase, the outstanding gap will be addressed through the WRP itself (Queensland Farmers' Federation, sub. 61). The approach to finalising groundwater recovery in the region appears credible and should ensure that gap-bridging water recovery is completed in those resources.

Recovering 62 GL through efficiency measures by July 2019

Under the efficiency measures program, water can only be recovered through irrigation infrastructure modernisation, or through urban, industrial or metering water efficiency projects.

²⁸ Consistent with the June 2018 MDB Ministerial Council meeting, this program allows for off-farm, industrial, urban and metering projects that save water, as well as on-farm projects in Queensland, South Australia and the ACT (but not New South Wales or Victoria) (MDB Ministerial Council 2018a).

²⁹ 2.2 GL of groundwater is under contract but not yet delivered.

As of 31 October 2018, 1.9 GL of the required 62 GL is under contract (DAWR 2018n). With 0.5 GL registered with the CEWH so far, there is 61.5 GL that still must be delivered by July 2019.

In June 2018, the MDB Ministerial Council announced a number of state-proposed projects that were expected to contribute towards the 62 GL (MDB Ministerial Council 2018a). Collectively, these projects account for less than half the required volume. The Victorian Government has since published additional information on projects that could provide up to 14 GL (although most would not be operational by 1 July 2019) (DELWP (Vic) 2018d). There is little information available about projects in other Basin States.

The pathway to the 62 GL is not apparent. If the 62 GL is not delivered in full by July 2019, the supply measure offset will be ‘scaled back’ across the Basin in accordance with the method in schedule 6A of the Basin Plan. This could create local water recovery shortfalls until either more water is recovered in that area, or enough Basin-wide efficiency measures are registered to make up the difference.

Some SDL Resource units in the southern Basin are nominally ‘over-recovered’ (contracted water recovery under the Basin Plan has exceeded the local and shared reductions). It is not clear if this water can contribute under the efficiency measures program.

Revisions to planning assumptions in Water Resource Plans

Basin States are in the process of finalising WRPs (chapter 6), which includes revising the planning assumptions underpinning those plans. Assumptions concerning the future use of entitlements inform the calculation of long-term diversion limit equivalent factors (also known as cap factors), which are estimated to convert different entitlement types into a long-term annual average volume. This helps estimate how much water has been recovered for the environment (MDBA 2018u).

Cap factors are applied to all entitlements in a system, including those held for environmental purposes, and therefore affect the contribution of the CEWH’s portfolio towards gap-bridging targets (which are expressed in long-term annual averages) (box 3.5). Changes to cap factors may affect the size of water recovery gaps.

The process of developing (by Basin States) and accrediting (by the MDBA) cap factors has not been transparent, and delays in finalising those assumptions have created additional uncertainty for both water recovery programs and water users.³⁰ Basin States are at different stages of the process of finalising cap factors.

- The New South Wales Government released draft cap factors, which decrease the contribution of the CEWH’s holdings overall, but contribute to possible over-recovery in some parts of the northern Basin (DOI (NSW) 2018f). The New South Wales

³⁰ National Irrigators’ Council (sub. 15), Coleambally Irrigation Co-Operative Limited (sub. 38), Namoi Water (sub. 82) and Gwydir Valley Irrigators Association Inc. (sub. 83).

Government is expected to publish revised factors by early 2019 (MDBA, pers. comm., 4 December 2018).

- The South Australian and Victorian Governments are yet to publish revised cap factors. These are likely to be released as part of consultation for WRPs in early 2019 (DAWR, pers. comm., 5 November 2018).
- The Queensland Government (sub. 87) anticipates only minor changes to cap factors in remaining WRPs. This is because Queensland's water accounting system assumes full utilisation; cap factors only change to reflect improved information.

Box 3.5 How do cap factors affect water recovery?

Cap factors convert the face value of water entitlements into a long-term average, with each type of entitlement having an associated cap factor. As the Commonwealth Environmental Water Holder's (CEWH's) portfolio is made up of different types of entitlements, any change in cap factors will affect the expected average annual yield of each entitlement accordingly.

As water recovery targets are defined as a long-term average, the overall contribution of the portfolio to meeting the water recovery targets will change if cap factors change. Changes to cap factors may create (or increase the size of) a water recovery gap, reduce the size of a gap, or lead to over-recovery (table below).

Effect of draft cap factors on the CEWH's holdings in the Gwydir

Entitlement type	Face value a,b	Cap factor (2011)	Long-term average (current)	Cap factor (2018 draft)	Long-term average (draft)	Difference
	ML	ML (LTAAY)			ML (LTAAY)	ML (LTAAY)
	A	B	A x B	C	A x C	(A x B) – (A x C)
High	4 508	1.000	4 508	0.886	3 994	- 514
General	89 525	0.360	32 229	0.380	34 020	+ 1 791
Supplementary	20 451	0.190	3 886	0.485	9 919	+ 6 033
Total^c	40 623	..	47 932	+ 7 309

^a CEWH holdings as of 30 April 2018. ^b These estimates do not align with those reported by the NSW Department of Industry (2018f) as they do not include entitlements held by the New South Wales Government. ^c Totals may not add due to rounding. .. Not applicable

Sources: CEWO (2018); MDBA (2017u); DOI (NSW) (2018f).

While the exact size (and direction) of changes to recovery progress from cap factors is not yet certain, the risk of a shortfall is likely to be manageable within the water already recovered. However, ongoing delays in finalising planning assumptions will affect how much time DAWR has to make additional recoveries (if needed) before 1 July 2019.

Basin Plan water recovery is unlikely to be completed by mid-2019

Bridging the gap in the Basin has been a major undertaking, and is now mostly complete. Although the remaining gaps are small relative to the overall task, the barriers to meeting the 2019 target are not insignificant.

In the Commission's view, given recent progress, it is unlikely that the final recoveries in the northern Basin and the full 62 GL of efficiency measures will be delivered on time. The ongoing delay in finalising planning assumptions creates a risk of a last-minute shortfall. The Commission understands that any failure to bridge the gap will be addressed through the *Sustainable Diversion Limit Reporting and Compliance Framework*, enforced by the MDBA (MDBA 2018ai) (box 3.6).

Box 3.6 What happens if the 2019 target is not met?

In November 2018, the Murray-Darling Basin Authority (MDBA) published the *Sustainable Diversion Limit Reporting and Compliance Framework*, which outlines the MDBA's approach to reporting and assessing compliance with the Basin Plan's Sustainable Diversion Limits (SDLs).

The MDBA monitors compliance with the SDLs over multiple years. A Basin State is assessed as being non-compliant with the SDL in a resource area if there is a cumulative excess of more than 20 per cent. Basin States must either argue for a reasonable excuse for the breach, or are obliged to 'make good' by reducing water take in that resource (potentially affecting all entitlement holders).

A valid reasonable excuse is that water recovery is incomplete because of circumstances outside of a Basin State's control, such as a failure by the Australian Government to bridge the gap (Basin Plan, s. 6.12(4)(b)). In this case, the MDBA will make an assessment of whether the failure to bridge the gap was partially or wholly beyond a Basin State's control.

- If the Basin State cannot argue reasonable excuse, they will need to 'make well' on that breach by reducing water take and bring the cumulative balance back below the SDL.
- If the MDBA determines the breach is outside of the Basin State's control, there is no requirement to make good.

Source: MDBA (2018ai).

The remaining gaps are less than five per cent of the 2019 water recovery target. As this is relatively small, failing to meet the target is unlikely to trigger an SDL compliance response unless local recovery gaps persist over multiple years. This means the consequences of not meeting the 2019 target to bridge the gap are minor. DAWR should focus on achieving the outcomes of water recovery (that is, acquiring useful environmental water) rather than just meeting a deadline.

FINDING 3.1

Basin Governments need to recover 2137 GL of surface water by 1 July 2019 and the outstanding gap is less than five per cent of this target. Achieving the 2019 target is contingent on:

- delivering 117.9 GL that is already under contract, but has not yet been delivered
- recovering a further 29.4 GL from the northern Basin
- delivering a further 61.5 GL through efficiency measures
- any change to planning assumptions that affects the contribution of water entitlements already recovered towards water recovery targets.

A total of 2000 GL has already been delivered to environmental water holders, but it is unlikely that the July 2019 target will be met. Any shortfall will be monitored through the Sustainable Diversion Limit reporting and compliance framework until the water recovery task is complete.

A further 37.7 GL must be delivered to finalise groundwater recovery. Arrangements are in place to meet this target.

There is not yet a clear process to address over-recovery

As a result of the uncertainty that the Australian Government has faced over the exact water recovery targets (discussed above), it is possible that parts of the Basin will be found to be over-recovered against local SDLs.

Some participants to this inquiry contend that water recovery in the Gwydir and Macquarie catchments in New South Wales has significantly exceeded the targets for those resources, attributing this to early ‘no regrets’ purchases undertaken by the Australian Government before the regional distribution of SDLs were set.³¹

However, other participants view it as too soon to declare any part of the Basin as over-recovered.³² Over-recovery, it is argued, should not be declared until after the contribution of the supply measure projects (chapter 4) is known and pre-requisite policy measures (chapter 11) are in place. Given this, participants argued that any decisions on over-recovery should not be made until the MDBA undertakes a reconciliation of SDLs in 2024, which will assess the actual offset provided by the supply projects (chapter 4).

Over-recovery may also interact with the efficiency measures program, although it is not yet clear how this would occur. The Commission cautions that any attempts to transfer

³¹ Lachlan Valley Water Inc., sub. 49 & DR119; Macquarie River Food and Fibre, sub. 56 & DR138; Gwydir Valley Irrigators Association Inc., sub. 83; National Farmers’ Federation, sub. DR129.

³² Healthy Rivers Dubbo, sub. DR104; Inland Rivers Network, sub. DR105; Commonwealth Environmental Water Holder, sub. DR110; Environment Victoria, sub. DR117; Goulburn Valley Environment Group, sub. DR125; Sarah Moles, sub. DR133.

over-recovered water to the efficiency measures program should not be countenanced in areas where water cannot meaningfully contribute to the environmental objectives of that program in the southern Basin (chapter 5).

In principle, holding excess environmental water represents an ‘opportunity cost’ in lost agricultural production. If environmental benefits are marginal or negligible for some held water (for example, because of delivery constraints that cannot be lifted, or limited connectivity to downstream environmental sites) it is reasonable to suggest that some water held by the CEWH (in excess of water recovery targets) may not represent an efficient allocation of resources. The CEWH has no incentive to take these alternative uses into account. The Water Act (s. 106) allows the CEWH to sell entitlements only where the proceeds of that sale would improve its capacity to achieve environmental objectives.

Participants have observed that Basin Governments have not clarified who is responsible for addressing any potential over-recovery (National Irrigators’ Council, sub. DR91; Macquarie River Food and Fibre, sub. DR138). The Commission has not made any judgment about whether over-recovery has occurred — but a clear process for declaring and dealing with over-recovery is needed, and one has not yet been published. This process requires two steps.

1. Assess the extent and location of over-recovery.
2. Determine a pathway for the CEWH to return water to the consumptive pool.³³

The MDBA (2018ai), through the *Sustainable Diversion Limit Reporting and Compliance Framework*, should be responsible for assessing whether an SDL Resource unit is over-recovered. This assessment should not be made hastily, and should not occur for an SDL Resource unit until (at a minimum):

- the WRP is accredited and cap factors are finalised (chapter 6)
- contracted water recovery is delivered and requests by Basin States to re-allocate shared reduction targets have been resolved
- agreed pre-requisite policy measures have been implemented (chapter 11).

While July 2019 may be too soon for the above conditions to hold, a wholesale delay until 2024 is not justified in all cases, because supply measures did not adjust water recovery targets in the northern Basin or in disconnected SDL Resource units. Basin Governments should make a judgment on whether it is sensible to return water to the consumptive pool in the southern connected Basin prior to reconciliation of the supply measure projects in 2024 (as reconciliation may necessitate further water recovery, chapter 4).

The CEWH, in co-operation with Basin Governments, should develop a clear approach (including the process and an appropriate timeline) for addressing identified over-recovery — subject to the CEWH’s obligation to ensure any proceeds are used to otherwise enhance environmental outcomes. All options (including temporary or permanent trade) should be

³³ The CEWH is not subject to the direction of the Department or the Minister in relation to the purchase, or disposal of Commonwealth water holdings (*Water Act 2007* (Cwlth), s. 107).

canvassed with Basin Governments and water users in the affected valley before any decision is made.

RECOMMENDATION 3.1

Once Water Resource Plans are accredited, the Murray-Darling Basin Authority (as Basin Plan Regulator) should assess which (if any) resource units are over-recovered against the Sustainable Diversion Limit.

As soon as practicable, the Commonwealth Environmental Water Holder, in co-operation with Basin Governments, should develop a process and an appropriate timeframe to return any identified over-recovery to consumptive uses in accordance with Sustainable Diversion Limits.

3.3 Environmental effectiveness of recovered water

Water recovery alone is not sufficient to reset the balance. Water should be recovered in a way that builds a portfolio of environmental water that is best able to contribute to environmental outcomes in the Basin.

The SDLs (and associated water recovery targets) are expressed as long-term averages, allowing entitlements of different reliabilities to be compared on a common basis and meaningfully added together.

The mix of different entitlement types held by the CEWH determines the allocations available for use each year, and thus affects the CEWH's ability to effectively provide environmental water under different seasonal conditions. As observed by the EDOs of Australia (2017, p. 6):

[w]hile it is often argued that 'cap protects the environment', such an approach fails to take into account the fact that species and ecosystems do not function on the basis of long-term annual averages.

The Australian Government could meet water recovery targets by focusing on a small number of entitlement types. However, recovering an 'unbalanced' portfolio may compromise the ability of the CEWH to meet the environmental watering objectives of the Basin Plan across a range of seasonal conditions.

Determining an ideal environmental water portfolio for the Basin is a highly technical question. As more information on the effective use of environmental water has become available, the CEWH's specialist knowledge makes it best-placed to assess the makeup of an ideal portfolio. It therefore should have a key role in identifying the priority entitlement types for water recovery programs.

Whether the portfolio recovered is likely to achieve the outcomes sought has been assessed by considering how DAWR:

- selects which water to recover to align to environmental outcomes
- ensures the integrity of water recovered (that is, entitlements have the expected characteristics).

DAWR's processes for assessing environmental benefits are opaque

Inquiry participants have raised concerns with the environmental utility of some entitlements recovered through recent purchases (Inland Rivers Network, sub. 23; Sarah Moles, sub. 67; Dr Anne Jensen, sub. DR95) and the roles and responsibilities of DAWR and the CEWH in identifying purchasing priorities (WWF-Australia, sub. 31; Sarah Moles, sub. 67).

Both the Commonwealth Environmental Water Holder and the Murray-Darling Basin Authority have input into purchasing decisions

Prior to the Basin Plan, water was recovered primarily through open tenders, with no official protocol between DAWR and the CEWH to ensure maximum benefit for the environment (ANAO 2011). Water recovered before the Basin Plan was made account for more than half of the gap bridging water recovered to date (box 3.4).

The water recovery strategy published in 2014 also did not include an explicit role for the CEWH to provide advice. DAWR (sub. 81, p. 7) has indicated that its current processes consider:

... the contribution towards the Basin SDL gap-bridging target, value for money and the environmental utility of the entitlement based on the CEWH's priorities. The Department, when undertaking strategic water purchases, will also consider additional factors such as the possible socio-economic impact of removing water from a catchment on local communities.

The CEWH provides advice to DAWR on the ‘entitlement characteristics that would provide a water portfolio with greatest utility for achieving the intended environmental outcomes’ (sub. DR110, p. 4). Its priorities include both general principles for water recovery and advice for specific catchments, particularly in the northern Basin.

The MDBA has also provided advice to DAWR. In the *Northern Basin Review*, the MDBA recommended targeted water recovery to improve environmental watering to the Narran Lakes, Lower Balonne and Culgoa floodplains, and the Barwon-Darling (MDBA 2016d). Similarly, the MDBA advised DAWR (when requested) on the benefits of specific entitlement types in the Warrego and Namoi catchments (MDBA, pers. comm., 6 November 2018).

While the CEWH and the MDBA have input into water recovery processes, there is a lack of transparency on how DAWR has considered that advice. The CEWH’s specific advice (outlining which entitlement types and locations are priorities in a particular catchment) is not

generally publicly available.³⁴ Some advice provided by the MDBA as part of the Northern Basin Review was published (MDBA 2016b), but its other advice is yet to be made public.

Improvements are needed to demonstrate environmental utility

Inquiry participants have raised concerns that a recent strategic purchase in the Warrego will not achieve environmental outcomes because DAWR purchased low reliability ('unsupplemented') water, which will not be available for the environment in drier years.

The Commission views the Warrego purchase as being consistent with the CEWH's published advice. The CEWH indicated a preference for lower-reliability water, stating:

... on the basis of the risk of extraction and lack of in-stream protection measures, supplemented (regulated) water allocations in the water supply scheme based at Cunnamulla weir ... are not recommended for recovery.³⁵

DAWR should address stakeholder concerns about the environmental value of particular purchases by being more transparent in how it takes advice from both the CEWH and MDBA into account. The complexity of determining which entitlements to recover clearly requires the CEWH's specialist input, and this role should be made clear to improve accountability.

DAWR does not publish the CEWH's technical advice systematically because it considers the advice as confidential, with potential to affect future water recovery negotiations (sub. DR103). Additionally, Basin States may still request the Basin Plan's shared targets to be reallocated between different resources until 31 December 2018, and water recovery may not be complete at a local level until those reallocations are finalised (this may not be completed until mid-2019) (DAWR, pers. comm., 5 November).

The Commission accepts that there may be commercial sensitivities in areas where water recovery is not yet complete, and further strategic purchases may be required. However, the default approach should be to publish this advice once it is no longer commercially sensitive. While DAWR has indicated it will consider releasing advice on a case-by-case basis (sub. DR103), it should (with agreement from the CEWH and the MDBA where appropriate) commit to systematically publishing advice. On release, any reasons for delaying publication of this advice should also be made public.

³⁴ In response to Senate orders to produce documents on particular strategic purchases (*Senate Motion No 579 for production of documents*), DAWR published the CEWH's specific advice in some catchments (Warrego) but withheld it in others (Condamine-Balonne). In October 2018, DAWR released additional information on the Condamine-Balonne and Murrumbidgee catchments.

³⁵ *Senate Motion No 579 for production of documents* (12 February 2018), p. 101 (p. 2 of CEWH advice for the Warrego catchment).

RECOMMENDATION 3.2

The Department of Agriculture and Water Resources should ensure that water recovery aligns with environmental requirements and its processes for doing so are transparent.

To support accountability, it should commit to publishing all advice provided by the Commonwealth Environmental Water Holder and the Murray-Darling Basin Authority (including advice on strategic purchases) once transactions are complete in a Sustainable Diversion Limit resource unit.

Processes to ensure the integrity of recovered entitlements

Purchases of overland flow entitlements require ongoing compliance

Part of the Australian Government’s approach to water recovery in the northern Basin has included the purchase of overland flow entitlements. The amount of water available under each of these entitlements is determined by the characteristics of the approved on-farm infrastructure that captures and stores these flows. For these entitlements to be available to the CEWH, that infrastructure must be decommissioned to allow surface flows to reach the river.

During regional consultations, inquiry participants raised concerns that works have not always been decommissioned as agreed, or are later reinstalled. The integrity of these entitlement types therefore depends on ongoing compliance by the relevant Basin State.

Return flows — are water savings real?

An ongoing debate in parts of the academic community considers that water recovered through investment in water use efficiency may not represent ‘real’ environmental water if projects do not account for changes to return flows (water lost from irrigation systems that flows back to the river). Contributions to this inquiry have raised similar arguments.³⁶

A return flow occurs where water applied by an irrigator is not used by crops and instead drains and returns to the river system or an environmental site through either surface flow or groundwater (van Dijk et al. 2006). These flows may be recorded as inflows in water accounting frameworks — although they are not directly measured in many cases (BOM 2010). Flows can also be counted as system losses if they flow to non-recoverable sources (such as saline aquifers). The proportion of return flows that become inflows (rather than losses) varies by location and over time.

³⁶ Matthew Colloff, John Williams and R. Quentin Grafton (sub. 12), Inland Rivers Network (sub. 23), Professors Sarah Wheeler, Jeff Connor, Quentin Grafton, Lin Crase and John Quiggin (sub. 40), Wentworth Group of Concerned Scientists (sub. 42), Sarah Moles (sub. 67; sub. DR133), Environment Victoria (sub. 73; sub. DR117), Murray Darling Association Region 6 (sub. 74), Healthy Rivers Dubbo (sub. DR104), EDOs of Australia (sub. DR126).

Improved water use efficiency can affect return flows and reduce the amount of water returning to the system (for example, lining channels can reduce seepage to an aquifer). However, improvements in water use efficiency are just one factor that affects return flows. Return flows are also affected by inter-regional water trade, the crop choice and land management decisions of individual landholders, and broader changes in land use (van Dijk et al. 2006). If not measured, changes in return flows may represent an unaccounted loss to system inflows.

Water accounting frameworks make assumptions to estimate the contribution of return flows, and these assumptions affect how water is allocated to entitlements. In regulated systems, ‘planned’ environmental water (or base flows) is supplied with higher priority than entitlements, and would still be provided for (Wang, Walker and Horne 2018). Thus, if actual return flows fall significantly below assumed levels, it may impact on allocations for all entitlement holders — including both irrigators and environmental water holders.

Changing patterns of return flows from irrigation therefore represent a risk to *all* entitlement holders — much like climate change, land use change (such as increased forestry) and bushfires (van Dijk et al. 2006).

Impacts of improved irrigation efficiency have not been systematically assessed

The Australian Government’s water recovery programs may accelerate changes in return flows by subsidising (and thus increasing) uptake of modernised irrigation infrastructure. These programs should account for the likely impacts on return flows.

Some major projects funded by the Australian Government have been subject to additional environmental approval processes that have considered the impacts of return flows.³⁷ For example, the two stages of the Northern Victoria Irrigation Renewal Project (NVIRP), which returned more than 200 GL to the CEWH, were required to have a robust water savings protocol to identify and provide ‘mitigation water’ to wetlands to compensate for losses in return flows (DSE (Vic) 2012). In this case, entitlements recovered do represent ‘genuine’ water savings net of beneficial return flows.

DAWR has not undertaken systematic assessments of return flows in recent infrastructure programs, but plans on collecting data and undertaking technical reviews as part of the monitoring and evaluation of projects funded under the MDB Water Infrastructure Program (DAWR, pers. comm., 5 November 2018). The framework for this is not yet clear.

How big is the risk to water recovery?

Because DAWR has not undertaken these assessments systematically, some participants have argued that the reduction in recoverable return flows may exceed the amount of water

³⁷ Under the *Environment Protection and Biodiversity Conservation Act 1999* (Cwlth).

saved — no ‘real’ water has been recovered for the environment through infrastructure programs.³⁸

This is an overestimate. A recent review commissioned by the MDBA assessed a number of Australian Government water recovery projects and estimated the potential loss of inflows from improved irrigation efficiency at between 90 GL and 150 GL a year (Wang, Walker and Horne 2018). This is between five and eight per cent of the water returned to the environment under gap-bridging water recovery programs to date. As any changes to inflows manifest over a long period of time, the issue of return flows is unlikely to substantially affect environmental flows. As outlined above, any impact is also mitigated in regulated systems by the entitlement and allocation framework.

The review recommended that the MDBA should investigate the potential impacts of its findings on the security of water supply for entitlement holders. The MDBA has indicated it will consider these recommendations in future work, but does not consider the long-run risk to entitlement reliability to be significant enough to undertake additional investigation at this time (pers. comm., 6 November 2018).

FINDING 3.2

The Department of Agriculture and Water Resources has accounted for the impacts of improving irrigation efficiency on return flows in some major water recovery projects, but has not done so in all cases. The Department has committed to monitor impacts in future water recovery programs, but the framework for doing this is not yet clear.

The overall impact of improved irrigation efficiency on water resources is not precisely known, but recent independent work indicates it to be relatively small.

The Murray-Darling Basin Authority (as Basin Plan Regulator) is responsible for monitoring the risks to Sustainable Diversion Limits from changes in return flows.

3.4 Cost-effectiveness of water recovery

The Commission’s assessment of Basin Plan implementation has also had regard for whether implementation has been cost effective and followed good process (chapter 1). The cost-effectiveness of water recovery is therefore an important consideration.³⁹

Under the National Water Initiative, all Australian Governments agreed to select measures to recover water for the environment primarily on the basis of cost-effectiveness, but with a

³⁸ For example: Matthew Colloff, John Williams and R. Quentin Grafton (sub. 12).

³⁹ Cost-effectiveness is defined as minimising the budgetary cost of achieving an objective (PC 2010). In this case, the objective is to meet water recovery targets and to recover a held water portfolio likely to be effective in pursuing environmental outcomes in the Basin.

view to managing the socioeconomic impacts of reduced water availability (paragraph 79(ii)(c)) (COAG 2004).

The approach to water recovery is the primary tool for mitigating the impact of the Basin Plan on industries and communities

The original Australian Government commitment to rebalance water use in the Basin accepted that structural adjustment would be necessary to ensure the viability of irrigation districts, and that the Australian Government would ‘work with communities in managing the necessary transition’ (Howard 2007, p. 4).

Basin Governments agreed to recover water through projects that modernise water infrastructure, in addition to the direct purchase of water from willing sellers (COAG 2008a). The Australian Government provided funding for the initial state-led projects on the basis of those projects:

1. securing long-term futures for irrigation communities in the context of climate change and reduced water availability
2. delivering substantial and lasting returns of water for the environment
3. representing value for money in the context of the first two principles.⁴⁰

In 2013, Basin Governments agreed that adjustment pressures on Basin communities would be primarily addressed through both the approach to water recovery and the operation of the SDL adjustment mechanism (COAG 2013).⁴¹

The cost of recovering water in the Basin has been substantial

Water recovery has been the most expensive element of Basin Plan implementation to date. As of 30 September 2018, the Australian Government has committed \$8 billion to programs to bridge the gap (table 3.2). Of this, \$6.3 billion is committed towards projects that recover water, with \$5.5 billion spent to date (DAWR, pers. comm., 5 November 2018).⁴²

⁴⁰ Paragraph 4.10 of the *2008 Agreement on Murray-Darling Basin Reform*.

⁴¹ Specific assistance programs have also been provided to help manage structural adjustment for communities. These are discussed in section 3.5.

⁴² This includes direct purchases, gap-bridging infrastructure modernisation projects, and the South Australia River Murray Sustainability (SARMS) program.

Table 3.2 Expenditure on implementing the Basin Plan
At 30 September 2018

Australian Government program	Committed funding	Expenditure	Share of total expenditure	Gap-bridging water recovered ^a
	\$ million	\$ million	%	GL (LTAAY) ^b
Bridging the gap programs	8 017	6 663	79	1 939.7
Direct purchase	2 914	2 651	31	1 226.9
Infrastructure modernisation: ^c	4 803	3 909	46	
- Gap Bridging Water recovery projects	3 100	2 790	33	676.8
- MDB Water Infrastructure program (gap bridging component)	150	0	0	Nil to date
- Other projects and activities	1 553	1 119	13	..
South Australia River Murray Sustainability program (water recovery)	120	103	1	36.0
Northern Basin Toolkit measures ^d	180	0	0	..
Other implementation programs^e	4 985	1 811	21	..
Total	13 002	8 474	100	..

^a Contracted recoveries as of 31 October 2018, excludes state recoveries, water gifted to the Australian Government, and the efficiency measures program. ^b Long-term average annual yield. ^c Infrastructure modernisation funding includes non-water recovery projects, including environmental works such as the South Australian Coorong, Lower Lakes and Murray Mouth project and other activities. ^d Funding for the Northern Basin Toolkit measures was repurposed from funding previously allocated to direct purchase. ^e Includes the SDL adjustment mechanism, structural adjustment assistance, WESA, implementation payments to Basin States and other programs. Does not include ongoing funding secured for Australian Government statutory authorities (MDBA, CEWH, BOM and MDB Joint Programs) for essential Australian Government water functions in the 2016 MYEFO. Includes funding provided to other agencies to deliver certain programs and reports as per original funding and as fully expended when funds were transferred to the relevant agency. Includes funding for South Australia Riverland Floodplains Integrated Infrastructure project (\$155 million), the industry assistance component of the SARMS program (\$120 million) and other Basin programs. .. Not applicable.

Source: DAWR, pers. comm., 5 November 2018.

Recovering water through infrastructure modernisation (rather than direct purchase) has substantially increased the budgetary cost of water recovery. On average, infrastructure modernisation has cost taxpayers about twice as much (per ML) as purchasing identical water. These premiums (market multiples) are explicit in the design of programs. The Australian Government's rationale for the higher cost is that infrastructure modernisation enables farms to improve water use efficiency and maintain agricultural production with less water, thus minimising impacts on communities (DAWR, sub. DR103).

This additional cost can be large. For example, round three of the New South Wales Private Irrigation Infrastructure Operators Program recovered 13.7 GL (LTAAY) from Murrumbidgee Irrigation Limited at a cost of \$122 million (DAWR 2018l). The average price paid was about \$8905/ML (LTAAY). As of September 2018, market prices for high reliability entitlements in the Murrumbidgee have increased substantially to more than

\$5400/ML LTAAY compared with about \$4200/ML LTAAY in January (Aither 2018a).⁴³ However, this is still considerably less than the price paid under the program.

Based on the premiums paid for previous infrastructure modernisation projects, the total premium paid (in excess of market prices) for recovering water in this way is about \$2 billion (appendix B).

There is some evidence that this approach has lessened socioeconomic impacts

Purchases have facilitated adjustment, but have had flow-on impacts

Government water purchases have generally had positive outcomes for participating irrigators, particularly for those who transitioned out of irrigated agriculture (Schirmer 2016; TC&A and Frontier Economics 2017; Wheeler and Cheesman 2013). Selling water compensates the irrigator, facilitating adjustment by providing them with financial resources to pay down debt, invest on-farm, or exit the industry.

The flow-on impacts of water purchases on the wider community are less clear-cut. Purchasing water leads to a permanent reduction in water availability and limits potential irrigated agricultural production. The cumulative effects of how irrigators adjust to these changes affects irrigation networks, service providers, employment opportunities, and the viability of some regional communities. There can be significant distributional impacts as some areas benefit, while others do not.

Some water purchases have had adverse impacts at local scales — particularly where large irrigators sold substantial parcels of water entitlements, leading to rapid adjustment pressures on some small irrigation-dependent communities. In the northern Basin, the MDBA has identified towns that were adversely affected by early, relatively large water purchases (MDBA 2016d). For example, the largest employer in the Collarenebri area sold its entire water holdings in 2009 and converted to dryland farming — this was found to have contributed to falling agricultural employment in that community (MDBA 2016g).

Infrastructure modernisation projects can help maintain irrigated agricultural production

Recovering water through infrastructure modernisation is intended to mitigate the impact of water recovery by helping maintain irrigated agricultural production and injecting capital into the regions (DAWR, sub. DR103). While water availability is similarly reduced, this approach effectively attempts to mitigate structural change and minimise adjustment pressure on communities.

⁴³ Prices are volume-weighted average prices, converted to LTAAY using a long-term diversion limit equivalent factor of 0.95.

DAWR's evaluations, along with other reports into the impacts of water recovery, have highlighted a number of outcomes from recovering water through infrastructure modernisation. Research commissioned by DAWR has found that irrigators who participated in on-farm infrastructure modernisation programs reported benefits from those projects, including: improved water use efficiency, improved water delivery timing, reduced on-farm workload, higher farm productivity, and improved profitability (DAWR 2018p).

However, some irrigators reported higher farm costs (particularly from increased energy requirements from modernised irrigation systems) and others reported that they were more exposed to higher water allocation prices and delivery costs (DAWR 2018p; TC&A and Frontier Economics 2017).

For the wider community, investment in on- and off-farm infrastructure is likely to have increased long-term employment and regional economic activity in the Murrumbidgee Irrigation Area, compared with a relatively minor benefit from water purchases (MJA 2017). The construction of improved infrastructure also provided a short-term stimulus to local economic activity.

At the Basin scale, the MDBA concluded that the productivity benefits of infrastructure modernisation programs, along with water trade, have offset some of the impacts of water recovery on regional employment across the southern Basin (MDBA 2018k).

But infrastructure modernisation does not stop structural change

Recovering water for the environment is one of many factors affecting Basin communities. Structural change in regional Australia is ongoing; while the Basin's economy is growing at an aggregate level, populations are declining in some regional communities (MDBA 2018k). Water recovery is one of a number of factors driving this, along with higher water prices, trends in water trade, changing agricultural labour requirements and commodity price movements (MDBA 2016f, 2018j).

In particular, freer water trade (in some cases as part of Basin Plan reforms, chapter 10) and higher water prices are causing changes in a number of Basin communities.

One of the drivers of higher water entitlement prices is infrastructure modernisation. After participating in water recovery programs, some irrigators purchase water entitlements on the market to replace water provided to the Australian Government, and this contributes to higher market prices and spreads the impact of water recovery well beyond that irrigator's region (Aither 2017a).

Higher prices affect how water is used; generally moving water from lower-value uses (per unit of water, such as pasture production) to higher-value uses (such as horticulture). High market prices also spur innovation by water users, who have a strong incentive to reduce their water consumption and improve water-use efficiency.

Higher prices are likely to accelerate the rate of change in Basin communities. A recent trend in the southern Basin has been net trade in water entitlements from the upper Goulburn districts to the lower Murray (TC&A and Frontier Economics 2017). This has created concerns of trade out of some districts, higher costs for remaining irrigators and flow-on socioeconomic impacts for those communities (Murray River Group of Councils, sub. 36; GMID Water Leadership, sub. 62).

Reduced delivery volume may require irrigation infrastructure operators to spread a fixed cost over a smaller number of remaining irrigators, increasing charges for those users. While irrigation infrastructure operators can charge termination fees to irrigators that disconnect from the network as compensation, some operators have waived these fees to reduce costs for exiting landholders.⁴⁴

FINDING 3.3

The size and speed of water purchases has had negative socioeconomic impacts on some regional communities.

Recovering water through infrastructure modernisation programs has partially offset pressure for structural adjustment in some communities, but at a significant cost to taxpayers.

Water recovery is only one factor of many driving change in regional communities. Higher water prices, water trade, and other pressures on the agriculture sector mean that some structural change is inevitable and ongoing.

Water recovery processes have not always demonstrated value for money

In addition to recovering water for the environment, governments have also attempted to improve socioeconomic outcomes for Basin communities through water recovery programs. This has increased the cost of meeting water recovery targets. In light of this decision, governments should demonstrate that water recovery programs remain a cost-effective way of achieving those multiple objectives.

⁴⁴ For example, Goulburn-Murray Water waived more than 70 per cent of termination fees between 2012-13 and 2014-15 (although it charged a fee in all cases during 2015-16) (ACCC 2017a, p. 141).

Purchasing water through direct negotiation requires transparency

Since 2015, DAWR has only purchased surface water through direct negotiation with entitlement holders (referred to as strategic purchasing).⁴⁵ There have been six such purchases since 2016 (table 3.3).

Participants have raised concerns that some of these purchases have not represented value for money (WWF-Australia, sub. 31; MLDRIN, sub. 72; Robert and Katharine McBride, sub. 78) and lack transparency (Inland Rivers Network, sub. 23; Wentworth Shire Council, sub. 48; Environment Victoria, sub. 73).

Table 3.3 Water purchased through direct negotiation
From January 2016

Date	SDL resource unit	Entitlement type	Cost \$m	Volume ML LTAAY ^a	Average unit cost \$/ML LTAAY ^a
May 2016	Border Rivers (QLD)		0.4	256	1 500
June 2016	Murray (SA) ^b	High reliability	8.0	2 880	2 778
January 2017	Murrumbidgee (NSW)	Supplementary	4.5	4 071	1 098
June 2017	Warrego (Qld)	Unsupplemented	16.9	10 130	1 668
June 2017	Lower Darling (NSW)	High security General security	78.0 ^c	2 129 15 682	3 881 1 896
August 2017	Condamine-Balonne (Qld)	Overland flow	78.9	26 443	2 989

^a Long-term average annual yield ^b Purchased from the South Australian Government, not subject to the 1500 GL water purchase cap. ^c Includes \$40 million to decommission irrigation infrastructure. This is not included in the calculation of average unit cost.

Sources: Commission estimates, DAWR (2018a; sub. 81), *Senate Motion No. 420 for production of documents* (6 October 2017), *Senate Motion No. 579 for production of documents* (12 February 2018).

DAWR considers value for money as one of the criteria in assessing purchases, along with the contribution to water recovery targets, environmental utility of the entitlement, and possible socioeconomic impacts (DAWR, sub. 81). As these purchases involve direct negotiation with potential sellers, transparency becomes essential (ANAO 2011). DAWR must balance the need for transparency against the commercial sensitivity of some information. Therefore, the integrity of DAWR's purchasing processes is essential for both ensuring and communicating that purchases represent value for money to the taxpayer — particularly after transactions are completed and information is no longer commercially sensitive.

Transparency in purchasing processes has not been systematic. The 2017 purchase of water in the Lower Darling is an example of this. The Australian Government paid \$38 million for

⁴⁵ These purchases differ from 'strategic purchases' agreed to through bilateral arrangements with Basin States (such as Goulburn-Murray Water Connections in Victoria or the Nimmie-Caira project in New South Wales), although purchases through direct negotiation must still be approved by the relevant Basin State.

water entitlements, as well as an additional payment of \$40 million to decommission irrigation infrastructure. Assuming the planned Menindee Lakes Water Savings project supply measure proceeds (chapter 4), this additional payment may be justified to avoid the cost of connecting the property to the reconfigured lakes. But DAWR did not justify this until well after the purchase, and only at the behest of the Australian Parliament.⁴⁶

The Australian National Audit Office's work program for 2018-19 has flagged a potential performance audit to consider 'value for money and the application of the Commonwealth Procurement Rules' in DAWR's recent purchases (ANAO 2018a). This is an appropriate process to provide independent assurance over whether DAWR has achieved value for money in its previous strategic purchases, and so the Commission has not made its own detailed assessment.

DAWR has indicated that it now publishes information about contracts awarded through limited tender on its website (sub. 81). In October 2018, DAWR released further information on the strategic purchase in the Condamine-Balonne as it had re-assessed the commercial sensitivity of some information that was not released under a previous senate motion. However, it remains important that this information is published systematically to provide transparency for future direct purchases.

Some premiums for infrastructure projects are high, and the basis for this is not clear

A premium is explicit in the design of infrastructure programs, but the reasons why different premiums are paid is not always apparent. Premiums (in volume-weighted terms) have varied from 1.8 to 7.1 times the prevailing market price (DAWR, pers. comm., 5 November 2018). High premiums provide opportunities for arbitrage, and may not represent a good use of public money unless they are justified through additional public benefits.

Submissions have provided specific examples of high premiums for some infrastructure modernisation projects, with Namoi Water (sub. 82) noting that water recovered through on-farm projects in the Peel Valley cost the Australian Government almost four times the prevailing market price at the time.

DAWR noted that all infrastructure projects must represent value for money, with some individual projects differing in their assessment criteria to reflect different objectives. DAWR considers that higher premiums deliver substantial long-term benefits for Basin communities and industries (sub. DR103). But it has not substantiated what additional public benefits have been achieved by paying those higher market multiples for some projects compared with others.

For future programs, DAWR should ensure the basis of different premiums is clear — noting that funding under the current MDB Water Infrastructure Program allows for a maximum market multiple of 1.75 (well below that of previous programs) (DAWR 2018h).

⁴⁶ *Senate Motion No 420 for production of documents* (6 October 2017).

The net benefits of infrastructure projects have not been comprehensively assessed

The Australian Government's choice to invest in infrastructure modernisation to recover water has substantially increased the cost of meeting water recovery targets. This was a deliberate decision by Basin Governments, in part to reduce major pressures for structural change on communities, and the socioeconomic impacts these changes can bring.

However, this investment should still be considered against principles for public funding of water infrastructure — the public benefits of the investment must exceed the costs to taxpayers (PC 2017b).

What benefits are genuinely additional?

Available evidence indicates a number of private benefits for irrigators, but does not substantiate that infrastructure projects have delivered public benefits that have helped sustain regional communities. There is evidence that infrastructure works can provide a stimulus effect, depending on the share of expenditure that is spent locally (MJA 2017).

If the benefits of infrastructure modernisation are primarily private (and those benefits exceed the costs of works), it raises the question of why those investments were funded by Governments rather than by irrigators or irrigation infrastructure operators (PC 2010).

The analysis commissioned by DAWR (MJA 2017) does not estimate how much investment is likely to have occurred in the absence of Australian Government programs — particularly, if water were purchased, and some proportion of the proceeds were used by irrigators to invest on-farm to realise those same private benefits. This is critical to understanding what benefits are additional and caused by Australian Government investment, rather than those that would have (in time) been realised anyway without government expenditure.

Have infrastructure projects mitigated structural adjustment?

The MJA (2017, p. iii) analysis of infrastructure modernisation in the Murrumbidgee Irrigation Area states it is not a benefit-cost assessment, and does not consider economy-wide impacts or alternative uses of taxpayer funds. A number of benefits and costs have therefore not been considered in the analysis released so far.

- Private net benefits from on-farm infrastructure modernisation require improved productivity to increase irrigated production and offset lower future production (because some water has been transferred to the Government) (EY 2018).
- Improved water use efficiency may not provide economic benefits where modernised irrigation infrastructure has higher operating costs.

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- Expenditure on ‘gold-plating’ farms or shared water infrastructure that later becomes underutilised represents an economic cost in inefficient use of resources (and government expenditure).

The additional cost has not been clearly justified

The available evidence indicates that infrastructure modernisation is likely to have provided some benefits for irrigators, and had some positive flow-on effects for regional communities through economic stimulus. But the size of these benefits are not apparent, and no comprehensive benefit-cost analysis has been undertaken to confirm that the public benefits of these measures have exceeded the costs to taxpayers. Public evaluation is needed to improve confidence in the implementation of the Plan and to demonstrate the program is achieving its intended outcomes (chapter 13).

The MDBA, DAWR and the Australian Bureau of Agricultural and Resource Economics and Sciences are developing a coordinated framework to monitor and evaluate the socioeconomic impacts of water recovery (DAWR, pers. comm., 5 November 2018). This framework should fully account for the economic costs and benefits (public and private) of recovering water for the environment through different approaches.

FINDING 3.4

The Department of Agriculture and Water Resources has not always demonstrated that water recovery has been cost-effective in meeting its goal of mitigating adjustment pressures caused by sourcing water entitlements. It has:

- paid a substantial premium above market prices to recover water through infrastructure modernisation
- not systematically released information for strategic water purchases acquired by direct negotiation
- not undertaken a comprehensive assessment of benefits and costs of these approaches.

3.5 Structural adjustment assistance

While most of the socioeconomic impacts of the Basin Plan were to be managed through the approach to water recovery, governments have also delivered specific assistance programs to help communities transition to a future with less water. These programs were generally grants programs, with payments made to local governments to undertake projects considered to support those communities adjust to lower water availability.

Spending on specific assistance programs as part of the Basin Plan reforms has totalled \$189 million, including:

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- the Strengthening Basin Communities program between 2009 and 2011 (\$200 million committed, with \$64 million spent)
 - the Murray-Darling Basin Regional Economic Diversification Fund, commencing in 2013 and concluding in June 2019 (\$100 million)⁴⁷ — this program is being administered by the Australian Department of Infrastructure, Regional Development and Cities to fund projects selected by Basin States
 - the economic development component of the South Australia River Murray Sustainability (SARMS) program, which has since concluded (\$25 million).

There is little evidence to indicate that specific assistance has been effective

The effects of specific assistance programs are difficult to disentangle from the other factors affecting communities, industries and individuals in the Basin (discussed above). Specific evaluation of the individual programs is therefore essential to be able to assess the effectiveness of the funding provided. However, as specific structural adjustment assistance is not part of the Basin Plan, there is no direct requirement to evaluate these programs.

As such, there is little information available on the implementation or outcomes of assistance programs.

- The Strengthening Basin Communities program provided grants to local governments for urban water saving initiatives and to help communities plan for reduced water availability.
 - DAWR has published which local governments received grants under the programs, and what types of projects were funded (DAWR 2016b). While projects worth \$80 million were committed to, only \$64 million of funding was spent (DAWR, pers. comm., 10 August 2018).
- The MDB Regional Economic Diversification fund provided competitive grants to assist Basin communities diversify their economies and adjust to a water constrained environment.
 - This program was implemented by Basin States. There is some information on what projects were funded in some Basin States, but the criteria used to assess these grants is not apparent (DOI (NSW) 2016; DSD (Qld) 2017; RDV 2017).
 - RAMROC (sub. 27) highlighted \$32.6 million was spent in New South Wales on a number of projects, but could not provide evidence those projects had contributed to the outcomes of the Basin Plan.

⁴⁷ Refers to funding transferred to the Australian Department of Infrastructure, Regional Development and Cities; however, only \$73 million has been committed through the program (DAWR, pers. comm., 10 August 2018).

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- A further \$25 million was provided for regional development under the SARMS program (PIRSA 2017).

Prior to the Basin Plan, a number of analyses assessed which Basin communities were likely to be most vulnerable to the impacts of the plan (MDBA 2012c). But it is not clear if structural adjustment programs targeted these vulnerable communities. Multiple submissions have criticised where grants under the MDB Regional Economic Diversification program were provided.⁴⁸

There is little evidence to indicate that these grants were well-targeted. Although some projects were funded in communities identified as being most vulnerable prior to the Basin Plan (such as Warren), a number of grants were provided to areas that, while located in the Basin, did not rely on irrigated agriculture — for example, regional centres Armidale, Orange and Wagga Wagga (DOI (NSW) 2016).

DAWR (sub. 81) considers a number of other projects have helped communities adjust to the Basin Plan.⁴⁹ Some of these projects were implemented well prior to the Basin Plan, do not align to where impacts were expected at the time, or do not relate to helping communities adjust to the Basin Plan. The SARMS program also included \$7.5 million to redevelop the Loxton Research Centre (PIRSA 2017). There is no clear basis as to why this and other initiatives are considered by DAWR to have assisted communities adjust to the Basin Plan.

FINDING 3.5

There is little evidence to indicate that structural adjustment programs have been effective at supporting communities adjust to the Basin Plan.

- Assistance was not targeted to those areas considered most vulnerable to the Basin Plan.
- Some projects considered to provide community assistance have not done so.

Recent commitments must avoid similar mistakes

In May 2018, the Australian Government agreed to provide \$20 million for economic development grants to Indigenous, remote, rural and regional communities most affected by the Basin Plan (DAWR 2018f). Some northern Basin communities (St George, Dirranbandi, Collarenebri and Warren) have been identified as having highest priority in this program.

⁴⁸ Southern Riverina Irrigators (sub. 29), Coleambally Irrigation Co-operative Limited (sub. 38), Cotton Australia (sub. 47), Lachlan Valley Water Inc. (sub. 49), Lower Edward River Pumpers & Landholders (sub. 63) and Gwydir Valley Irrigators Association Inc. (sub. 83).

⁴⁹ These include the Integrated Pipelines project in South Australia (\$117 million), the Wimmera-Mallee Pipeline (\$98 million) and the Orange City Pipeline (\$20 million).

Details on how this program will be implemented are not yet available, and its objectives are not apparent. While a relatively small program, it risks being ineffective if not directed towards where it can address the most significant impacts.

The Australian Government should target funding to areas where there is clear evidence of Basin Plan impacts — reflecting communities with the least capacity to adjust, not necessarily where water was recovered. This is especially pertinent for any calls for further assistance associated with additional water recovery through the efficiency measures program. As discussed in chapter 5, a program-level approach should be taken to monitoring impacts as they emerge over time.

The Commission has previously provided principles for effective regional economic development programs in its *Transitioning Regional Economies* study, and for addressing structural adjustment issues linked to water reform (PC 2017c). In line with these principles, DAWR should ensure that any future assistance:

- funds projects that align with state-based regional planning processes, and avoids industry assistance or subsidies
- applies rigorous and transparent processes for choosing, implementing, and evaluating individual projects
- monitors and reports on whether the program achieved its outcomes.

RECOMMENDATION 3.3

If provided, the Australian Government should target any further assistance to communities where substantial adverse impacts arising from water recovery to date or any future recovery program have been identified. This should:

- have clear objectives and selection criteria
- be subject to monitoring and evaluation.

Any support for regional development should align with the Productivity Commission's strategies for transition and development, set out in its report on *Transitioning Regional Economies*.

4 Supply measures and Toolkit

Key points

- Supply measures are a Sustainable Diversion Limit (SDL) adjustment mechanism that enable water recovery to be reduced where equivalent environmental outcomes could be achieved through use of works and alternate measures. These include environmental infrastructure works, rule changes and constraint easing. They were included in the Basin Plan with the aim of reducing the socioeconomic impacts on Basin communities while still achieving its environmental objectives.
 - Basin States are responsible for developing and implementing approved supply projects by 2024; failure to implement projects by this date may mean further water recovery.
 - The Australian Government made up to \$1.3 billion available for funding supply measures.
- A supply measures package to offset 605 GL has been approved but Basin States face significant challenges implementing all supply measures by 2024.
 - There have been delays in the development and approval of the package and community dissatisfaction with the level of transparency and consultation to date.
 - There are still substantial policy and funding issues to be resolved before implementation can commence, with little information currently available about how the Australian Government will assess supply measures before approving final funding.
 - The supply package relies heavily on six highly complex and interdependent projects. Past experience with similar projects suggests the 2024 deadline is highly ambitious, if not unrealistic.
- The Commission recommends that:
 - Basin Governments develop an integrated plan for delivering supply projects to enable consistency of approach, manage interdependencies within the package of projects and ensure their efficient operation.
 - Basin Governments be open to the possibility of extending the deadline for *some* supply measures where an extension is necessary to allow worthwhile projects to be retained.
 - The Australian Government refine its processes for funding supply measures, by developing a process that draws on independent advice, to ensure each supply measure represents a prudent use of public funds and provide credible assessment of any deadline extensions.
- These proposed changes would allow supply measures to succeed in meeting their objectives and potentially reduce the cost to taxpayers of meeting SDLs by hundreds of millions of dollars.
- Following the review of SDLs in the northern Basin, Governments have agreed to reduce the water recovery target by 70 GL and implement Toolkit measures.
 - Toolkit measures have many similarities to supply measures but not the same program-level checks and balances.
 - Northern Basin Governments should now develop transparent and accountable governance arrangements for implementing the Toolkit measures within reasonable timeframes.

This chapter discusses supply measures in the southern Murray-Darling Basin (MDB). Section 4.1 provides some background on the purpose and operation of supply measures. Section 4.2 then presents the Commission’s assessment of implementation of supply measures and section 4.3 presents options for improving implementation in the future. It concludes with discussion of the northern Basin Toolkit (section 4.4).

4.1 Background

Supply measures are a way to achieve environmental outcomes with less water recovery

Sustainable Diversion Limits (SDLs) are the limits on the average amount of water that can be taken from the Basin’s rivers, while providing enough water to meet agreed environmental outcomes. To ensure extractions are within SDLs, the Australian Government agreed in 2012 to recover 2750 GL of surface water for the environment (chapter 3).

The Basin Plan provides the opportunity to adjust SDLs and the consequential water recovery targets prior to SDLs commencing on 1 July 2019. In the southern Basin, adjustments to surface water SDLs may occur through the SDL adjustment mechanism. Under the SDL adjustment mechanism, the surface water SDL can be *increased* where works and measures can be shown to achieve equivalent environmental outcomes with a lower volume of environmental water.⁵⁰ These are known as supply measures and can include environmental infrastructure works, rule changes and constraint easing. The maximum increase in the SDL from supply measures anticipated under the Basin Plan was 650 GL.

Under the SDL adjustment mechanism, surface water SDLs can also be *reduced* to enable a suite of enhanced environmental outcomes (box 4.1). This reduction can occur where an additional 450 GL of water⁵¹ can be recovered for the environment while maintaining or improving socioeconomic outcomes. These are known as efficiency measures and can include projects that increase the technical efficiency of water use.

Supply and efficiency measures are linked in several ways.

- The overall net change in SDLs from these adjustment measures must be within 5 per cent of the original surface water SDL.
- They are also both reliant (to different extents) on easing or removing constraints to the delivery of environmental water in river systems.
- In May 2018, the Australian Government agreed to link payments for supply measures with full co-operation with the delivery of efficiency measures under the National Partnership Agreement (NPA).

⁵⁰ Basin Plan s. 7.09(b).

⁵¹ Beyond the original (2012) Basin Plan’s water recovery target of 2750 GL to meet benchmark environmental outcomes.

Nevertheless, the purposes and intended outcomes of supply and efficiency measures are quite distinct (box 4.1).

The inclusion of both supply and efficiency measures in the SDL adjustment mechanism reflects a compromise that was struck between the Australian and Basin State Governments in finalising the Basin Plan (MDBA, sub. 86). On the one hand, a primary motivation for including supply measures was to test whether environmental outcomes could be achieved with less water, thereby reducing the socioeconomic impacts on communities in the Basin. On the other, the inclusion of efficiency measures in the southern Basin reflects the opportunity to improve environmental outcomes (particularly in the Lower Murray) by recovering additional water for the environment. The requirement that additional water is recovered with neutral or improved socioeconomic outcomes was to address concerns about detrimental socioeconomic impacts of additional water recovery (chapter 5).

Approved supply projects must be implemented by 2024

The *Intergovernmental Agreement on Implementing Water Reform in the Murray-Darling Basin* (IGA) set out the requirements for the development, approval and implementation of the supply measures package (COAG 2013). Under the IGA, Basin States were responsible for identifying and preparing business cases for potential supply and efficiency measures (figure 4.1). The Basin Officials Committee (BOC)⁵² then assessed the notified measures and recommended a package of adjustment measures for consideration by the Murray-Darling Basin Authority (MDBA).

The MDBA was responsible for assessing the package of adjustment proposals and providing a recommendation to the Australian Minister for Water on how much to adjust the SDL for surface water. The scope of the assessment was to determine the environmental equivalence from the final package of State projects and recommend an adjustment volume for the SDLs (box 4.2).

When the Minister approved the final adjustment to the SDLs, they tabled an amendment to the Basin Plan in the Parliament (as a disallowable instrument). Basin States have until 2024 to implement approved SDL adjustment projects. The Basin Plan requires Basin States to withdraw a measure from the package if it will not be operational by 30 June 2024 (however, it is unclear how strictly this will be applied in practice).⁵³

If the MDBA judges that there has been material changes to the package of supply measures during implementation, it must conduct a reconciliation by 30 June 2024. This would involve re-estimating the size of the SDL adjustment using the same method as the initial determination (MDBA, sub. 86; box 4.2). A downward revision in the adjustment may mean

⁵² BOC comprises representatives from the Australian, New South Wales, Victoria, South Australia, Queensland and the ACT Governments. It is chaired by the Australian Government representative. The MDBA's Chair and Chief Executive are non-voting members.

⁵³ Basin Plan s. 7.12(6).

Governments are required to undertake further water recovery to meet the SDLs. Governments are yet to finalise arrangements about whether the Australian Government or Basin States would be responsible for recovering water should this be required. ‘Make good’ arrangements are expected to be outlined in the funding agreements for supply measures.

Box 4.1 **Adjustments to Sustainable Diversion Limits**

In the southern Basin, the Plan allows for adjustments to surface water SDLs.

- **Supply measures** increase SDLs (and the water recovery target to decrease) by allowing for projects that achieve equivalent environmental outcomes with less environmental water. The Basin Plan anticipates a maximum water recovery offset of 650 GL from supply measures (figure below). (If supply measures achieve less than 650 GL of water offset, then water recovery to bridge the gap must be more than 2100 GL.)
- **Constraints easing** aims to overcome some of the impediments to delivery of water down the system. They can include changes to physical features such as crossings and bridges, as well as negotiating easements where private land is flooded. Constraint measures were originally included in the Basin Plan because they facilitate the delivery of enhanced environmental outcomes (outlined in Schedule 5 of the Plan) by enabling the delivery of water, particularly to larger areas of floodplains. However, they also assist in delivering equivalent environmental outcomes and are largely being progressed as a subset of supply measures.
- **Efficiency measures** aim to achieve enhanced environmental outcomes above those achievable with (the equivalent of) 2750 GL by recovering an additional 450 GL for the environment. Additional water is to be recovered through projects that increase the technical efficiency of water use, while securing neutral or improved socioeconomic outcomes. The enhanced environmental outcomes are in the southern Basin and are achieved by watering larger areas of floodplains, higher stream flows, and meeting specific objectives for the Coorong, Lower Lakes and Murray Mouth in South Australia. Delivering these enhanced environmental outcomes is also dependent on easing constraints.

The Basin Plan limits the total amount by which SDLs can be adjusted. The Basin-wide long-term average SDL can be adjusted up or down by a maximum of 5 per cent of the 2012 SDL (approximately 543 GL).

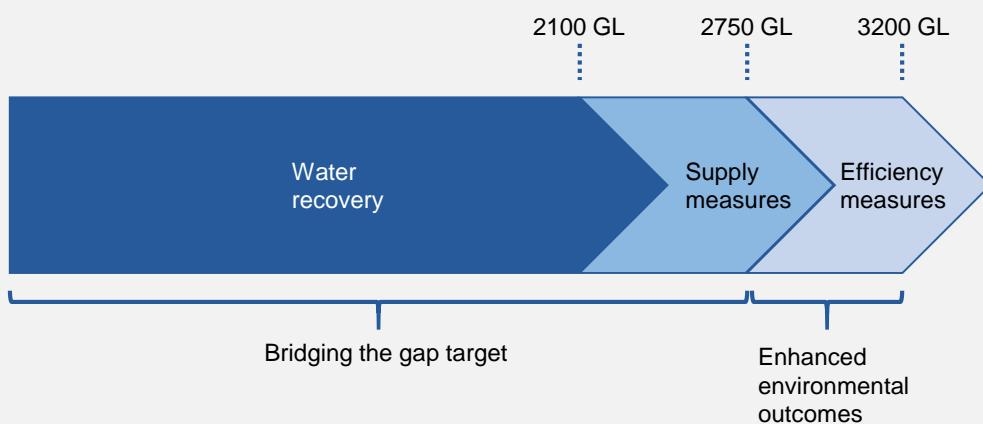
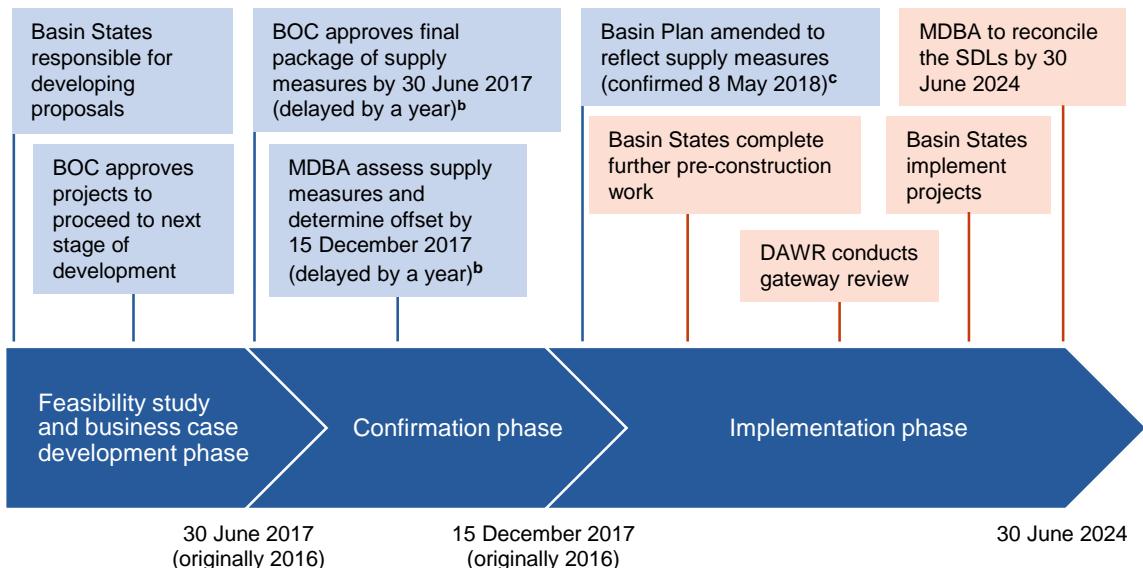


Figure 4.1 Timeline for developing, assessing and implementing supply measures^a



^a Light blue boxes indicate actions that have occurred, orange boxes indicate actions to occur. ^b An amendment to the Basin Plan (s. 7.10(1)) in 2016 allowed Basin States an extra 12 months to nominate supply measures. The initial dates for approving and assessing supply measures were for 2016. The extra time allowed for the Enhanced Environmental Water Delivery (Hydro-cues) project to be added. ^c The Basin Plan was amended in December 2017, but was subject to a disallowance that was resolved in May 2018.

Sources: MDB Ministerial Council (2017b); MDBA (2017r).

The IGA limits the total amount of funding for supply measures to the cost of recovering the same amount of water through purchase. The Australian Government originally earmarked up to \$1.3 billion for supply measures. Based on the determined 605 GL supply measure offset and the reference price for water⁵⁴, \$1.0 billion is available for supply projects (DAWR, pers. comm., 10 August 2018).

Constraint measures nominated as supply measures can also be funded from the \$200 million available from the Water for the Environment Special Account. Further, Governments (primarily the Australian Government) have committed or spent about \$800 million⁵⁵ through other initiatives on projects that have been notified as supply measures.

The Department of Agriculture and Water Resources (DAWR) recently established a two-stage approach for funding implementation of the supply measures (DAWR,

⁵⁴ The reference price of water of \$1660/ML was determined by the average price of water entitlements between 2009-10 and 2014-15, as per Schedule 2 of the IGA (COAG 2013).

⁵⁵ Six The Living Murray Initiative works and measures cost approximately \$320 million (MDBA 2012d). Three South Australian State Priority Projects are costed over \$310 million (DEWNR (SA) nda, ndb, ndc) and the NSW Nimmie-Caira supply project is receiving funding of \$14 million (DAWR, pers. comm., 3 December 2018). \$156 million has been reserved for the Menindee Lakes project under the Sustainable Rural Water Use Infrastructure Program (DPI (NSW) 2017b).

sub. DR103). It involves providing funding to Basin States to complete further pre-construction work — including conducting stakeholder consultation, progressing statutory approvals and preparing detailed business cases. DAWR has indicated that at the end of the pre-construction phase, projects will be subject to a gateway review that will assess whether the level of funding sought for an individual project is appropriate and whether the project should proceed to implementation (DAWR, sub. DR103). DAWR will provide funding for construction of the supply projects through a new NPA (DAWR 2018f). The specific details of the two-stage process have not yet been announced.

Box 4.2 Determining equivalent environmental outcomes

To calculate the supply contribution (water recovery offset) for supply measures that achieves equivalent environmental outcomes, the MDBA followed the method set out in Schedule 6 of the Basin Plan. The method involved the MDBA using hydrologic models to compare the environmental outcomes under the benchmark scenario (with 2750 GL water recovery) and a scenario which includes the supply measures and a reduced amount of water recovery (MDBA 2017r). It assumed that Basin States would implement ‘pre-requisite policy measures’ by 30 June 2019 (chapter 11). The MDBA compared environmental outcomes using a scoring method of ecological elements, that was developed by the CSIRO and agreed by Basin States, to determine that the supply measures achieve equivalent environmental outcomes across key environmental sites in the Basin (Overton et al. 2015). In applying the method, the MDBA had to ensure that there was no reduction in the benchmark environmental outcome scores for each region, but there was scope for some limited reductions in the score or outcome of individual elements if they are offset by increases in other elements (limits of change).

The MDBA’s modelling approach was subject to independent review in 2017 which found the approach was consistent with the requirements of the Basin Plan (Bewsher Consulting Pty Ltd 2017). The SDL adjustment mechanism process was more broadly reviewed in 2018 and found to be consistent with the IGA and Basin Plan obligations (Tucker, Davies and Turner 2018).

4.2 Assessment of implementation risks

To assess the effectiveness of the implementation of supply measures, the Commission considered whether Basin States are on track to implement supply measures by 2024, and hence, achieve their goal of equivalent environmental outcomes with less water recovery. It also considered broader issues such as whether the process for implementing supply measures ensures value for money. To inform this analysis, the Commission examined several lines of evidence including experiences with similar projects in the past (such as The Living Murray Initiative (TLM)) and the extent that decisions have been underpinned by good processes that include transparency, management of key risks and governance arrangements that promote accountability and clarity of roles.

A supply package has been approved, but there is a range of issues to be resolved during the implementation phase

In May 2018, the Australian Minister for Water confirmed plans to proceed with an approved package of 36 supply measures with an estimated water recovery offset of 605 GL (Littleproud 2018a). The Minister approved the package in December 2017 on the advice of the MDBA; however, there were delays in finalising required amendments to the Basin Plan owing to the need to debate a disallowance motion. The uncertainty associated with the disallowance meant there was limited progress on implementation for nearly six months. This delay was on top of the one year extension to the original deadline for Basin States to notify the MDBA of the supply measures and for the MDBA to assess the package (figure 4.1). As a consequence, there is effectively 18 months less to implement the supply projects than parties originally envisioned.

The package includes a variety of projects such as rule changes, environmental infrastructure works and constraint easing (MDBA 2018ah). For example:

- New South Wales and Victoria have a joint project that involves changing operating rules to allow the river operator to release flows from the Hume Dam at a higher rate and reduce operational losses and unseasonal flooding in the Barmah-Millewa Forest
- the TLM environmental works⁵⁶ project at Hattah Lakes uses a pumping station, regulators and levees to deliver water to the lakes and floodplain more frequently and with less water in the River Murray.

Effectively, the supply package has the potential to provide additional benefits to improve the long-term health of the Basin, such as the ability to provide additional delivery capacity, greater flexibility for river operations and capacity to water new areas of the floodplain. It will provide a new suite of tools and operating rules that will need to be integrated into river management in the future — this will require community support.

Projects are at varying stages of implementation (table 4.1). For example, six works projects commissioned under TLM in 2004 are operational, while most supply projects are still in the concept design phase. Those projects yet to be implemented and have a number of issues that Governments will need to resolve during project refinement for successful implementation. These include significant consultation with local communities, establishing environmental targets, addressing potential water quality issues and monitoring third party impacts.

⁵⁶ TLM environmental works have been included as supply measures as they were not operational in 2009 and were not included in the benchmark model.

Table 4.1 Supply projects at December 2018

<i>Project</i>	<i>Proponent(s)</i>	<i>Status</i>
Operational rule changes and system enhancements^a		
2011 Snowy Water Licence Schedule 4 Amendments (RMIF)	NSW, Vic	Draft rules
Operating rule change to the use of the Barmah-Millewa Forest Environmental Water Allocation	NSW, Vic	Being trialled
Computer Aided River Management system for the Murrumbidgee River	NSW	Being trialled
Enhanced Environmental Water Delivery (Hydro-cues)	NSW, Vic, SA	Scoping
Flexible rates of fall in river levels downstream of Hume Dam	NSW, Vic	In operation
Operating rule change to Hume Dam airspace management and pre-releases	NSW, Vic	In operation
Menindee Lakes Water Savings project (including the Lower Darling constraints key focus area)	NSW	Scoping
SDL Offsets in the Lower Murray, New South Wales (Locks 8 and 9 Weir Pool Manipulation)	NSW	Scoping
Improved Regulation of the River Murray	NSW, Vic	na ^b
Environmental works^c		
Belsar-Yungera floodplain management project	Vic	Concept design
Burra Creek floodplain management project	Vic	Concept design
Gunbower National Park environmental works project	Vic	Concept design
Guttrum and Benwell Forests environmental works project	Vic	Concept design
Hattah Lakes North floodplain management project	Vic	Concept design
Lindsay Island (stage 2) floodplain management project	Vic	Concept design
Nyah floodplain management project	Vic	Concept design
Vinifera floodplain management project	Vic	Concept design
Wallpolla Island floodplain management project	Vic	Concept design
Riverine Recovery Project	SA	In operation
South East Flows Restoration Project	SA	Under construction
TLM Environmental Works and Measures: Koondrook-Perricoota Forest Flood Enhancement Works	NSW, Vic, SA	In operation
TLM Environmental Works and Measures: Mulcra Works	NSW, Vic, SA	In operation
TLM Environmental Works and Measures: Lindsay Island (Stage 1) Works	NSW, Vic, SA	In operation
TLM Environmental Works and Measures: Hattah Lakes Works	NSW, Vic, SA	In operation
TLM Environmental Works and Measures: Gunbower Forest Works	NSW, Vic, SA	In operation
TLM Environmental Works and Measures: Chowilla Floodplain Works	NSW, Vic, SA	In operation
Improved flow management works at the Murrumbidgee River – Yanco Creek offtake	NSW	Concept design

(continued next page)

Table 4.1 (continued)

<i>Project</i>	<i>Proponent(s)</i>	<i>Status</i>
Nimmie-Caira Infrastructure Modification Proposal	NSW	Under construction
Eastern Mount Lofty Ranges Flows for the Future Project	SA	Detailed design
Murray and Murrumbidgee National Parks	NSW	Concept design
Modernising supply systems for effluent creeks – Murrumbidgee River	NSW	Concept design
South Australian Riverland Floodplains Integrated Infrastructure Program (SARFIIP): Pike and Katarapko Floodplain project elements	SA	Under construction
Constraints^d		
Yarrawonga to Wakool junction reach constraints measure	NSW	Concept design
Murrumbidgee constraints measure	NSW	Concept design
Hume to Yarrawonga constraints measure	NSW, Vic	Concept design
River Murray in South Australia constraints measure	SA	Concept design

^a Status categories for rule changes: Scoping, Draft rules, Being trialled, In operation. ^b Project not modelled as part of SDL adjustment determination. ^c Status categories for environmental works: Concept design, Detailed Design, Under Construction, In operation. ^d Status categories for constraints: Concept design, Community consultation, Being trialled, In operation.

Source: MDBA (2018ah).

Key details about governance and funding of the supply measures package are also yet to be finalised.

- Basin Governments have not yet agreed the roles and responsibilities for ongoing operation of new works, or the responsibility for ‘making good’ where supply projects do not meet their intended outcomes (DAWR, pers. comm., 3 December 2018).
- Basin Governments have not yet outlined a plan for strategic delivery of the package, including undertaking further consultation and accounting for project interdependencies.
- DAWR has not yet finalised the details about the gateway review process, or the process for providing funding for implementing projects.
- The MDBA has not yet finalised and published how it will assess projects as part of reconciliation in 2024, which will in turn have implications for project risks and the investment decisions of Basin States.

That Governments have not substantially addressed these fundamental issues by this stage appears to be symptomatic of both a broader lack of trust and effective coordination across parties in implementing the Plan (chapter 14). Until these issues are resolved, the timeframe for implementing supply projects will be further compressed.

There is community dissatisfaction with the level of transparency and consultation to date

There is considerable support for the agreed package of supply measures because it avoids the need for more water recovery. However, the community is increasingly divided about the approach to implementing these projects. Some stakeholders are concerned that implementation of some projects (such as Menindee Lakes, constraints and Yanco Creek projects) will impinge on their land or water property rights. And some are concerned that the equivalent environmental outcomes envisaged from these projects cannot be achieved, or that their local environmental values will be compromised to achieve broader Basin Plan objectives. Community angst has been compounded by a lack of detailed information on the benefits, costs and impacts of some individual projects (including not publishing the business cases) and tokenistic community consultation.⁵⁷ For example, Murray Valley Private Diverters Inc. (sub. 69, p. 14) said ‘the lack of consultation and deliberate exclusion of NSW Murray stakeholders gaining access to SDL project Business Cases, has heightened tensions’. This lack of trust has increased community divisions over a number of projects and reduced broader community confidence and support for the Basin Plan in general. It has also reduced the willingness of a number of individuals to participate in the implementation of projects (such as constraints).⁵⁸

Traditional Owners have voiced strong concern that implementation of the supply package carries significant risks to cultural values, and that ‘there has been no adequate process of free, prior and informed consent in the development and implementation of [supply measures]’ (MLDRIN, sub. DR139, attachment 1, p. 13). There is also concern that the supply measures sacrifice some environments at the expense of others:

MLDRIN is concerned that the SDLAM [SDL adjustment mechanism] fails to account for impacts on First Nations values and uses, due to the uneven distribution of ‘benefits’ and ‘dis-benefits’ arising from the use of supply measures as an offset for real water recovery. (MLDRIN, sub. 72, p. 3)

As the MDBA and Basin States further develop supply projects, addressing this trust deficit will be a major challenge.

Basin Governments and the MDBA plan to take steps to address these concerns. DAWR (sub. DR103) has indicated that it will provide funding to Basin States to conduct further community consultation during the pre-construction phase. The MDBA has committed to regularly reporting on progress in implementing the supply projects, whether projects will achieve their intended outcomes and any potential adjustment to the SDLs where projects are not on track to achieve their intended outcomes (MDBA 2017r).

⁵⁷ For example: Arnold (sub. DR112), Australian Food and Agricultural Company Ltd (sub. DR92), Beer and Pattison (sub. DR96), EDO’s of Australia (sub. 14), Inland Rivers Network (sub. 23), Leeton Shire Council (sub. 17), Lower Edward River Pumpers & Landholders (sub. 63), MLDRIN (sub. 72), Murray Darling Association Inc. (sub. 52), Murray Valley Private Diverters Inc. (sub. 69), South West Water Users (sub. DR107) and WWF-Australia (sub. 31).

⁵⁸ Beer and Pattison (sub. DR96), Lower Edward River Pumpers & Landholders (sub. 63).

The package relies heavily on six highly complex projects

Although all the projects to be implemented have a number of outstanding issues to be resolved for successful implementation, there are six key projects (Menindee Lakes, Hydro-cues and four constraints projects) that are particularly noteworthy. These projects could account for between one-third and half of the expected water recovery offset of the approved supply package (box 4.3). They are highly complex and are in relatively early stages of development. As discussed below, past experience suggests the 2024 deadline for all these projects to be fully operational is highly ambitious, if not unrealistic.

Box 4.3 Importance of constraints, Hydro-cues and Menindee Lakes to the supply measures offset

In assessing the supply measures offset, the MDBA worked out the proposed adjustment to the SDLs based on the full package of supply projects. It did not calculate adjustment values for each project individually due to ‘the interlinked and interdependent nature of river management’ (MDBA 2017r, p. 29). For example, the environmental benefits of the Hydro-cues project is heavily dependent on easing constraints.

While governments have said that it is not possible to precisely define the marginal contribution that individual projects make to the overall 605 GL offset, past estimates provide some insight into the contribution of the constraints, Hydro-cues and Menindee Lakes projects.

- A 2015 stocktake of supply measures estimated a package without the constraints, Hydro-cues and Menindee Lakes projects could offset over 400 GL (Martin and Turner 2015).
- The 19-project package of supply measures which did not include the Hydro-cues project — but did include an earlier version of the Menindee Lakes project — was able to offset up to 400 GL (Blackmore et al. 2017).
- MDBA modelling showed that adding Hydro-cues to the 19-project package could achieve a better environmental outcome score with an offset of 200 GL (MDBA 2017j).
- MDBA modelling of the Menindee Lakes project estimated it offset 106 GL (DPI (NSW) 2017b).

There are varying views on the size of the offset from the key projects because of the reported challenges in ascribing the marginal contribution. Various estimates place the offset contribution of these projects between 200 and 300 GL — or between one-third and half of the total offset. Despite the high level of uncertainty, it is clear that these projects are integral to the package of supply measures achieving the 605 GL offset.

If these projects fail, the Australian Government or Basin States may then have to ‘make good’, by recovering extra water, which could be more costly than supply measures. If governments make good residual water recovery through infrastructure modernisation (which is their current preferred approach), failure to implement the constraints, Hydro-cues and Menindee Lakes projects could increase costs to governments in the order of \$564 million (appendix B.2).⁵⁹ If governments make good through direct purchases then the cost would be substantially less.

Constraints

Constraint measures aim to overcome the barriers that constrain the delivery of water down the system to water additional areas of the floodplain. This involves removing physical barriers (such as increasing the height of bridges), building levees to protect priority areas of land from inundation and, negotiating and signing agreements with landholders whose land is flooded by the higher flows.

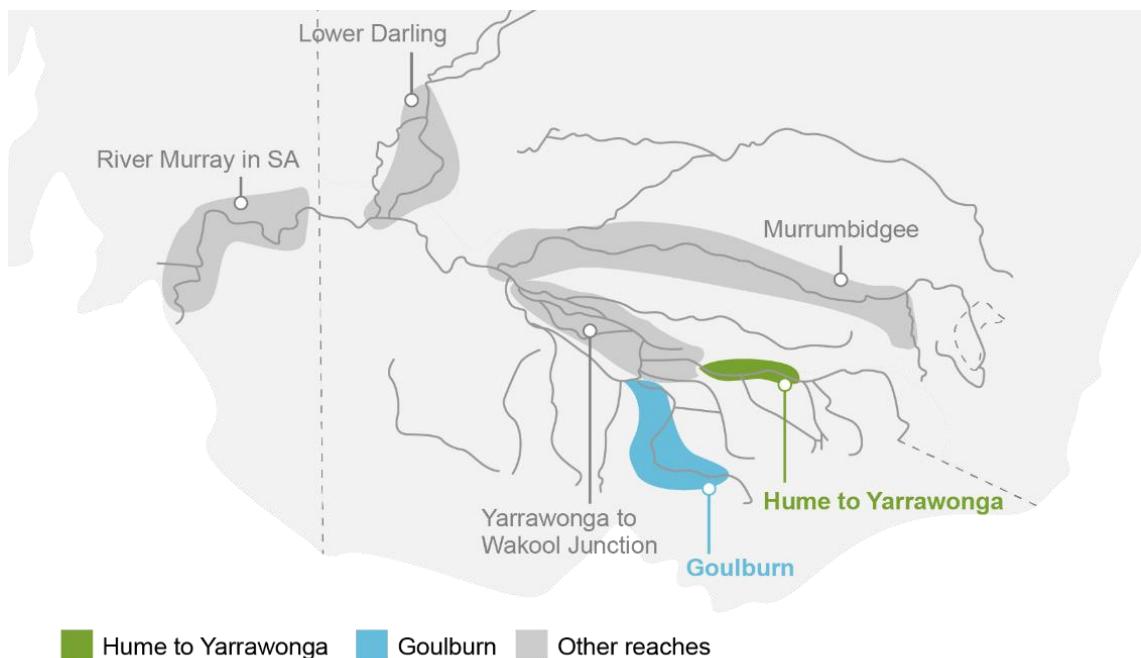
The approved supply package includes five constraint measures along key river reaches in the southern Basin (Hume to Yarrawonga, Yarrawonga to Wakool Junction, Murrumbidgee, SA Murray and Lower Darling (as part of the Menindee Lakes project)) (figure 4.2). These projects are still concept proposals and there are a number of issues that will need to be resolved during the project implementation phase to better understand the benefits, costs and third party impacts of the projects (MDBA 2018ah).

Implementation of constraint measures will be highly complex. It will involve Governments assessing the impacts of higher flows for every affected landholder. Governments and landholders will likely need to agree on mitigation measures and compensation to landholders through event-based payments, infrastructure or legal easements recognised on the property title (DPI (NSW) 2016c; MDBA 2018ah). On the River Murray where these negotiations will involve landholders in both New South Wales and Victoria, Governments will need to work together to develop and deliver an equitable and consistent approach to undertaking these negotiations and share risk. Governments have established the Constraint Measures Working Group to improve coordination and integration of constraints projects, but have not yet published a work plan (DAWR 2018b); sub. 81). As a result, it is not clear how governments will ease constraints and deal with areas where landowners refuse to participate in negotiations.⁶⁰

⁵⁹ This estimate compares the average cost of implementing the six projects (based on their business cases) and the potential cost of recovering 250 GL (the middle estimate of their water offset) through infrastructure modernisation. The range for this estimate (based on an offset range of 200-300 GL and uncertainty in the costs of supply projects) is an additional cost of between \$229 million and \$898 million. Details of this estimate are in appendix B.2.

⁶⁰ The Victorian Government ruled out compulsory acquisition of land or easements. The Constraints Management Strategy also includes principles to recognise and respect the property rights of landholders and water entitlements holders (MDBA 2013a).

Figure 4.2 Constraints in the southern Basin^a



^a Previous constraint easing has occurred in the Hume to Yarrawonga reach (in green). Constraint easing in all reaches must be completed by 2024. The Goulburn constraint measure (in blue) is not nominated as a supply measure but nominated as a constraint measure as part of the SDL adjustment mechanism to achieve enhanced environmental outcomes (chapter 5).

Based on past experience with similar projects, the 2024 deadline for all constraints to be fully operational appears highly ambitious, if not unrealistic. For example, negotiations in the 2000s to secure the right to release 25 000 ML/day from Hume Dam involved negotiating legal easements with 103 landholders from Hume to Yarrawonga (MDBA 2015c) and took almost eight years to complete (MDBA, pers. comm. 9 August 2019; 2009). In comparison, easing constraints for the five supply measures will require negotiations with over 3000 landholders and must take place over six years to 2024, assuming Basin States start immediately (figure 4.2, table 4.2). These negotiations will also be hampered, at least initially, by the legacy of community mistrust and concern resulting from poor consultation to date. Murray Irrigation (sub. 26, p. 3) noted that government agencies have acknowledged in addressing constraints that ‘the scale and complexity of stakeholder engagement has been significantly underestimated’. Upper Goulburn River Catchment Association (Shepparton trans., p. 193) stated that ‘constraints strategies do not have the ongoing approval and acceptance by local communities; therefore they have no social licence whatsoever’.

Table 4.2 Characteristics of the constraint-as-supply measures

<i>Constraint measure</i>	<i>Estimated cost (\$ million)</i>	<i>Estimated agricultural area affected (ha)</i>	<i>Estimated number of affected properties</i>
Hume to Yarrawonga	26-34	1 201	207
Murrumbidgee	113-164	53 103	1 056
South Australian Murray	38-55 ^a	9 374	ne
Yarrawonga to Wakool Junction	262-306	22 879	1 513
Lower Darling (part of Menindee Lakes Water Savings Project)	np	ne	260 ^b
Total	439-559	86 557	3 036

^a Cost estimate released as part of *Senate Motion No. 685 for production of documents* (22 March 2018). ^b Number of licence holders in Lower Darling. **ne** not estimated in business case. **np** not published.

Sources: DELWP (Vic) (2016); DEWNR (SA) (2016); DPI NSW (2016a, 2016b, 2017); MDBA (ndb).

Further, the estimated costs of the constraints proposals have increased over time. At the pre-feasibility stage in 2014, the MDBA estimated the total cost of the four nominated constraints-as-supply projects at \$192 million (MDBA 2014c). The more recent cost estimates in the business cases put the total of these projects at over \$430 million (table 4.2).

Hydro-cues

Hydro-cues is a supply project that involves operational rules changes. It aims to achieve environmental outcomes (namely, in-channel, floodplain and wetland condition) by increasing the ability of environmental water holders to coordinate environmental water delivery with increases in natural flows caused by rainfall (MDBA 2017j).

Hydro-cues is early in the scoping and development phase and while small trials have been coordinated in the southern Basin by river operators, the MDBA and other stakeholders since 2010-11, considerable further work is required to understand the benefits, costs and impacts of the program (MDBA 2017j).

It is also a complex project, requiring coordination across three States and input from a range of stakeholders including environmental water holders, environmental water managers, catchment management organisations and water authorities.

There are a number of issues to be resolved during implementation. This includes developing a detailed implementation plan that will give river operators confidence and capacity to actually deliver higher flows with no adverse consequences and align objectives with Water Resource Plans (MDBA 2017j, 2018ah). Realising the full benefits of Hydro-cues is ‘critically dependent’ on implementing constraint measures (MDBA 2017j, p. 17) which are highly unlikely to be completed by 2024, as outlined above. The project must also develop a strategy to engage stakeholders and communities and a detailed monitoring and evaluation plan. Given the issues to be resolved, the likelihood of Hydro-cues being operational and achieving its predicted environmental outcomes by 2024 appears to be low.

Menindee Lakes Water Savings Project

The Menindee Lakes project aims to change the operation of the Lakes to reduce evaporative losses. It involves modifying infrastructure and operational arrangements to store less water in the lakes and return more water to the system for environmental use.

There is currently a considerable list of issues to resolve prior to implementing the Menindee Lakes project (MDBA 2018ah). These include:

- the need for greater consultation and engagement with communities on project development and refinement
- the need for a detailed Environmental Impact Statement to assess potential impacts to the ecology of the Menindee Lakes and the Lower Darling and an Aboriginal Heritage Impact permit to assess and mitigate potential impacts to Aboriginal cultural values
- the need to develop a detailed new proposed operating regime to provide for the needs of the Lower Darling and assess and mitigate impacts on the wider River Murray System operation, acknowledging that implementation of the project needs to maintain reliability of water entitlements
- a mechanism for recognition and treatment of additional protected environmental inflows from the northern Basin
- a mechanism for recognition and treatment of water savings as a result of the project
- the need for more detailed design of infrastructure, refurbishment and enhanced flood protection works.

Inquiry participants have voiced a number of concerns about the Menindee Lakes project, with several arguing that governments have not adequately acknowledged the potential adverse impacts on communities and the environment.⁶¹ These concerns relate to the reliability of Lower Darling water entitlements, environmental and cultural degradation of Menindee Lakes and the Lower Darling and increased costs for Broken Hill water users. For example, the Lower Darling Horticulture Group (Mildura trans., p. 27) stated that ‘the proposed Menindee Lakes project will further reduce the security of water supply to the Lower Darling that will make our irrigation businesses unviable’ and that ‘the environmental needs of the Lower Darling should not be sacrificed for environmental outcomes further downstream’. An effective consultation strategy will be essential to addressing these concerns during project development.

The timelines for project delivery by 2024 appear to have little margin for contingencies and rely on a number of highly optimistic assumptions for the project to be operational. For example, the business case assumed dry conditions during the brief (18 month) period allocated to construction, with no contingency plan if this is not the case (DPI

⁶¹ For example: Arnold (sub. DR112), Jensen (sub. 28), Lower Edward River Pumpers & Landholders (sub. 63), MacKenzie (sub. 35), McBride (sub. 78, sub. DR113), Mills (sub. 84), MLDRIN (sub. 72), Moles (sub. 67) and South West Water Users (sub. DR107).

(NSW) 2017b). Further, the business case relies on changes to the project because of the Environmental Impact Statement and Aboriginal Heritage Impact Permit being easily addressed. These issues mean there is a significant risk that the project will not be operational in 2024 as required by the Basin Plan.

FINDING 4.1

It is likely that some key projects in the approved supply package will not be fully operational in 2024.

- They are behind schedule and the timeframe for implementation has been compressed due to delays in developing the projects.
- They are still in an early stage of development.
- History has shown that these types of projects are complex, interdependent and require extensive consultation to implement.
- A range of issues still need to be resolved between Governments before these projects can proceed. These include project risk sharing, monitoring, governance and funding.

There is little information about how the Australian Government will assess supply measures before providing final funding

Basin States are currently preparing detailed business cases for supply measures. Past experience in building environmental works projects through TLM has shown that the costs and benefits of projects can diverge substantially from original estimates. For example, the final cost of the Koondrook-Perricoota Forest works project (\$80 million) was several times higher than the initial budget (\$11 million) (box 4.4). To ensure prudent use of public funds, it is vital that the process for funding supply projects is capable of removing projects if and when it becomes apparent that:

- there has been a material decrease in the anticipated net benefits of that project
- the project carries unacceptable risks (such as financial risks or risks to local environmental and cultural assets).

There is currently little public information about how DAWR's gateway review process will assess whether projects proceed to implementation. In particular, DAWR has not yet released information on how it will deal with a situation where the anticipated net benefits of individual projects materially change following the concept design phase. For example, it has not yet outlined benchmarks or criteria it might use to make the call that a project no longer offers a good use of public funds, in the face of rising project costs (such as the estimated costs per megalitre of the offset compared to water recovery). Without such criteria, there is a risk that governments exhaust the funding for supply measures but do not achieve equivalent environmental outcomes. Resolving these issues and releasing such information is important to ensuring stakeholder confidence in government decision making.

Box 4.4 Koondrook-Perricoota Forest works

The Koondrook-Perricoota Forest works project was undertaken by the New South Wales Government as part of the Living Murray Initiative and involved constructing a series of channels and flow management structures designed to flood the forest in order to improve the condition of wetlands, river red gum forests and fish and bird outcomes. The projects initially had an expected completion date of 2011 and an expected budget of \$11 million (MDBC 2004).

The project was eventually completed in 2013 at a final cost of \$80 million. The increase in timeframes and budget were due to flooding in the forest during construction, and unforeseen changes to the project to avoid Indigenous cultural heritage sites and to address community concerns about flooding (MDBA 2012d).

In addition to higher than expected cost and timeframes for completion, the project has not been able to operate at capacity because landholder consent for flooding private land has not been secured.

4.3 Improving implementation

The package of agreed supply measures is potentially more cost effective than recovering 605 GL of water entitlements to achieve the environmental outcomes. Successful implementation could save Basin Governments and taxpayers in the order of half a billion dollars by avoiding further water recovery, which is a concern for many communities. These measures could also provide additional benefits to improve the long-term health of the Basin, such as the ability to provide additional delivery capacity, greater flexibility for river operations and capacity to water new areas of floodplain.

Governments urgently need to change the current approach to implementing supply measures to realise the benefits of supply measures. To date, Governments have focused on how to design a package of supply measures that achieves the maximum water recovery offset, while achieving equivalent environmental outcomes. Having decided to progress with a package of supply measures, Governments must now commit to delivering them lest persistent delay, deferral of community agreement and subsequent potential for abandonment undermine the credibility of the Plan itself. Successful implementation of the supply measures package will require:

- recognition that the supply measures are an integrated package of projects with clear interdependencies between projects in the planning, building and operation stages and which will ultimately need to be integrated into operation of the River Murray and shared resources
- clear roles and responsibilities for project implementation and oversight
- realistic timeframes that enable consultation, approvals processes, planning and implementation to be undertaken properly
- commitment to meaningful engagement where communities are consulted, local knowledge is incorporated and local issues are recognised and resolved. Stakeholders

-
- should be provided with information to understand the possible impacts on them and how these will be mitigated
 - commitment to engagement with Traditional Owners not only at the local scale (as required by current legislation) but also at the program scale on the design, sequencing and operation of the package.

Stakeholders are fully aware of the magnitude of issues to be resolved to implement supply measures and achieve the full offset. They are concerned that governments are not properly considering the likely impacts on cultural assets, land use and the reliability of water entitlements. The apparent reluctance of Governments to recognise the reality of these issues and maintain a mantra of delivering the Plan ‘in-full and on-time’ without appropriate issue resolution is further eroding community confidence. Basin Governments must change course and properly implement supply measures to avoid unnecessary further water recovery costs.

The Basin Officials Committee should develop an integrated plan for delivering the package of supply measures

BOC should develop and publish an integrated plan for delivering the package of supply measures to maximise the chances of successfully implementing projects. The integrated plan should outline how Basin Governments will conduct stakeholder consultation when refining supply measures at a project and package level. Governments should outline consultation plans that give voice to the concerns of local communities and Traditional Owners (box 4.5). These plans should inform communities on the overall process to address issues, such as whether projects compromise local environmental assets or communities.

The integrated plan should also outline how Governments will implement projects while managing the interdependencies and linkages within the package of supply measures. Examples of issues the plan should address include:

- the management of interdependencies within the package of supply measures
- clear roles and responsibilities for implementation
- the development of common policy principles and consistent approaches where required
- the logical sequencing of individual projects, given known risks and interdependencies (such as Hydro-cues and constraints)
- integration into ongoing river operations and management, including linkages to other key areas of work (for example Menindee Lakes and Water Resource Plans for the Barwon-Darling, Murray and Lower Darling).

The MDBA (as the agent of governments) has an important role in the implementation of this integrated plan. Governments will rely on the MDBA’s technical advice to understand the potential impacts of projects and to ensure they can be successfully incorporated into the operation of shared water resources. However, the MDBA is also a regulator and assessor of the Plan. It will track the progress of Basin Governments in implementing projects and will

be responsible for reconciling the supply measures' outcomes in 2024. It is important that the MDBA's dual roles are managed well (chapter 14).

Delivery of the package of supply measures also relies on Basin Governments resolving outstanding policy and governance arrangements for implementing supply measures. They must agree on the conditions which funding will be provided to Basin States, including responsibility for making good if supply measures do not achieve their intended outcomes and responsibility for ongoing costs and maintenance of assets created from the supply measures. Governments should resolve these arrangements promptly to minimise the delays to implementation.

Box 4.5 Areas for improving community consultation on supply measures

During consultation for this inquiry, some common themes and principles emerged regarding requirements for governments to have effective consultation on supply measures with Traditional Owners and local communities. These include that governments:

- clearly communicate the roles and responsibilities of the agencies responsible for implementation
- have a clear process for consultation that outlines how consultation will inform decision making over the duration of the program
- provide ongoing opportunities for engagement based on a two way working relationship
- engage with Traditional Owners giving consideration to the Akwé: Kon guidelines
- ensure local communities and Traditional Owners:
 - know where to go to obtain information on the implementation of supply measures in their local communities
 - have the opportunity to identify local issues and possible solutions
 - have enough time to consider information and analysis provided for consultation to allow for meaningful contribution
- communicate decisions to stakeholders and communities in an open, transparent and accessible way.

RECOMMENDATION 4.1

Basin Governments should, as soon as practicable:

- resolve governance and funding issues for supply measures, including risk sharing arrangements
- develop an integrated plan for delivering supply measures to improve understanding and management of interdependencies within the package of supply measures
- develop clear mechanisms for consultation on the package and individual projects with Traditional Owners and local communities.

Governments should confront the reality that some projects may require more time

As noted in section 4.2, the Commission considers that for some of the more complex supply measures, the 2024 deadline appears highly ambitious, if not unrealistic. Strictly enforcing this deadline could lead to potentially worthwhile projects being abandoned during implementation or not being attempted at all. This would essentially mean that any funding provided to these projects to date would have been wasted and taxpayers would face higher costs of potentially hundreds of millions of dollars by making good through further water recovery.

To enable worthwhile projects to be implemented in realistic timeframes, Basin Governments should be open to the possibility of extending the 30 June 2024 deadline with appropriate checks and balances. Governments should make this position clear to project proponents prior to detailed business cases being complete. This should not be interpreted as scope for a blanket extension for all projects or a reason for Basin States to procrastinate. Nor is it a reason to avoid making good if projects fall short. But being open to legitimate extensions of time avoids rejecting worthwhile projects or progressing projects with milestones that just cannot be met. Setting realistic timeframes would improve community confidence that projects are achievable and worth doing.

RECOMMENDATION 4.2

Basin Governments should be open to the possibility of extending the 30 June 2024 deadline for specific supply measures to be operational where an extension would be necessary to allow worthwhile projects to be retained.

Basin Governments should make this position clear to project proponents early enough to inform the finalisation of detailed business cases for supply measures. It should be clear that extensions would need to be well founded, only apply in limited circumstances, and not alter the requirement to make good if a project ultimately fails.

Allowing some extensions to the 30 June 2024 deadline would likely necessitate changes to the MDBA's reconciliation process. The MDBA (as Basin Plan Regulator) has yet to outline its principles for reconciliation, including what Basin States will need to do to demonstrate that a project is operational. Clearly defining how projects will be assessed is fundamental to the credibility of the deadline. It also has implications for the risks that governments will take on when progressing with a project and may affect the investment decisions of governments.

RECOMMENDATION 4.3

The Murray-Darling Basin Authority (as Basin Plan Regulator) should, as soon as practicable, devise a strategy for undertaking the reconciliation of supply measures that accommodates projects to be delivered in realistic timeframes.

Independent advice should inform whether specific supply projects have credible timeframes and are worthwhile

The process for funding and implementing supply projects needs to ensure supply measures represent a prudent use of public funds and fosters public confidence. The Commission is therefore proposing that the Australian Government refine its gateway process (section 4.2) and put in place checks to ensure that project proponents have a strong incentive to meet milestones, especially where the Government deem an extension to the 2024 deadline is required to retain worthwhile projects. The Commission consider that DAWR should appoint an independent panel to provide advice on the gateway and monitoring process.

The proposed gateway review process, including independent advice, should be applied to all supply measures yet to be implemented, including those funded through other sources (such as the Menindee Lakes project).

The gateway review process

To ensure prudent use of public funds, it is vital that the process for funding supply projects is capable of removing projects if and when it becomes apparent that there has been a material decrease in the anticipated net benefits of that project. Because of the funding and community implications, there needs to be a high level of transparency about the process.

To this end, DAWR should appoint an **Independent Advisory Panel** on supply measures (independent panel) to conduct an assessment of the detailed business case for each supply measure and provide a recommendation to the Australian Minister for Water whether supply measures proceed to implementation (figure 4.3). The independent panel should consider any material decrease in the anticipated net benefits of projects since their initial business case (to ensure the projects represent a prudent and effective use of public money). In undertaking this task, the panel should use a set of transparent and consistent benchmarks or assessment criteria to inform this judgement. If the detailed business case fails the assessment criteria, governments should not persist in re-scoping the project.⁶²

As part of its gateway assessment, the independent panel should consider whether proposed milestones are credible and recommend where an extension to the 2024 deadline is warranted to allow worthwhile projects to be retained. The assessment should ensure the deadline does not allow project proponents to procrastinate in implementing projects. The panel could also advise on whether the projects seeking an extension well beyond 2024 still represent a good use of public funds (given potential environmental trade-offs from further delays), irrespective of whether the timeframes are realistic.

⁶² The Commission notes that some stakeholders have rejected benchmarks such as comparing the implied cost per megalitre of the supply offset against the market price of water, citing the problems of calculating a cost per megalitre of the supply offset. However, such a benchmark might simply be informative rather than deterministic in the decision of whether to proceed with a project. Further, these stakeholders are yet to propose alternatives (calling into question how transparent and consistent the process will be).

Ongoing project monitoring

Clear milestones for project implementation will be required to keep Governments accountable for implementing projects. It will also help manage the risk that projects change significantly throughout implementation. The independent panel should monitor the progress of projects against their agreed milestones and provide advice to DAWR about how the project is tracking. If the independent panel finds that a project proponent has repeatedly failed to demonstrate credible progress against milestones or the project poses unacceptable risks, DAWR should cease project funding, and the project should be removed from the package (figure 4.3).

Where this occurs, Governments should not delay making good (through water recovery) until after the final reconciliation if it becomes manifestly apparent beforehand — based on the MDBA’s monitoring and assessment of supply measures — that the package of projects will fall short in achieving the estimated offset. Starting make good prior to reconciliation will allow the Australian Government to meet its SDL obligations sooner and achieve the associated environmental benefits.

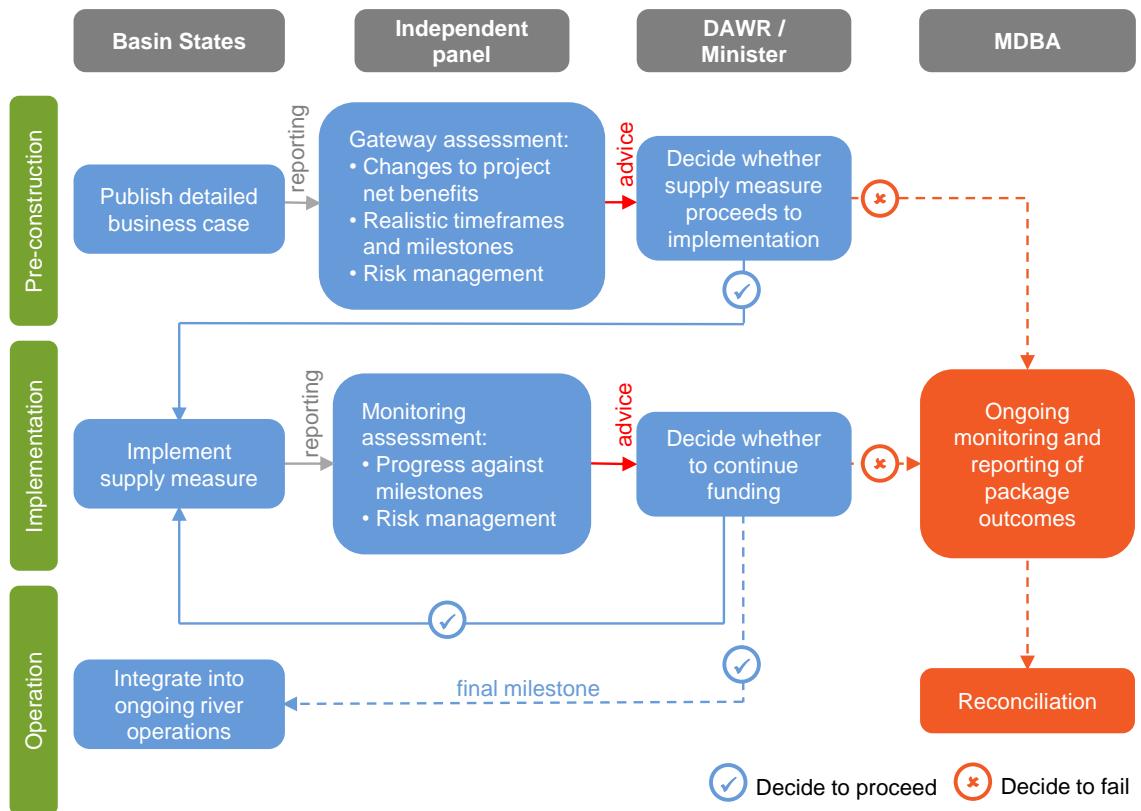
Independent advice will ensure integrity and accountability

The purpose of the independent panel is to provide clear and transparent assurance to the community that the funding process and progress monitoring are being run in an impartial and consistent manner. It will build stakeholder confidence in the process and provide credibility to any decision to allow an extension of time to allow successful project implementation.

To be effective in its task, the appointment of panel members should be based primarily on relevant skills and expertise (rather than simply industry or government representation) and account for any real or perceived conflicts.

To ensure transparency and accountability to the gateway process and the provisional funding of projects, the default position of the Australian Minister for Water and DAWR should be to publish the advice and recommendations of the independent panel. DAWR should publicly respond to the advice of the independent panel, including justifying instances where it elects not to accept that advice.

Figure 4.3 The proposed model for reviewing supply measures



RECOMMENDATION 4.4

The Department of Agriculture and Water Resources should, as soon as practicable, establish a clear gateway process that determines whether proposed supply measures proceed to implementation.

The Department should appoint an independent panel to provide advice throughout the gateway review. The panel should consider:

- any material decrease in the anticipated net benefits of projects since their initial business case (to ensure projects represent a prudent and effective use of public money)
- whether project timeframes and milestones are credible.

Based on the above assessment, the panel would make a recommendation on whether projects should proceed to implementation. The Department should publicly respond to the advice of the independent panel, including justifying instances where it elects to not accept that advice.

Throughout implementation, the independent panel should also advise on whether projects are meeting their milestones, and projects that fail to make reasonable progress should be removed.

4.4 Northern Basin Toolkit

During the development of the Basin Plan it was recognised that additional knowledge of certain systems would be beneficial for ensuring the SDLs met their goal of providing a sustainable level of take while balancing social and economic outcomes. As a result, Governments agreed that the MDBA would undertake a review of SDLs in the northern Basin.

The Northern Basin Review has been completed

The MDBA completed the Northern Basin Review (NBR) in 2016. The NBR involved research into the economic and social impacts of the Basin Plan on local communities, the workings of the river systems and their flora and fauna, and the importance of water to Indigenous communities. The MDBA also took advice from community and industry groups. Two stakeholder groups — the Northern Basin Advisory Committee and the Northern Basin Aboriginal Nations (NBAN) — were given a central role in informing the Review.

The key recommendation arising from the review was to reduce the water recovery target in the northern Basin from 390 GL to 320 GL on the provision that the Australian, Queensland and New South Wales Governments (northern Basin Governments) implement a Toolkit of measures that enhance the use of environmental water (MDBA 2016d). These Toolkit measures are similar to supply measures in that they aim to change how rivers in the region are managed to more effectively achieve Basin Plan environmental outcomes. The six projects in the MDBA's recommended package of Toolkit measures are listed in table 4.3.

Table 4.3 The Toolkit measures

Toolkit measure	Nature of benefits
Protection of environmental flows	Enhancement of low flows and fresh flows, particularly in the unregulated river systems of the Condamine-Balonne and Barwon-Darling.
Better targeting of water recovery	Improved environmental watering into Narran Lakes, Lower Balonne and Culgoa floodplains and the Barwon-Darling River.
Event-based mechanisms including: one-off temporary trade by event, options over pumping (enduring agreements) and store and release	Benefits in the Narran Lakes, some areas of the Lower Balonne, the Border Rivers and Namoi regions, and limited benefits in the Barwon-Darling.
Improved coordination and delivery of environmental water	Improved outcomes from environmental water moving from upper catchments to downstream rivers — such as the Barwon-Darling and the Lower Balonne Rivers, improved habitats for many aquatic organisms during dry times.
Removal of constraints in the Gwydir	Higher river flows associated with significant environmental benefits in the Gwydir.
Constructing fishways and control of cold water pollution	Improved fish passage, mitigated effects of cold water pollution on fish.

Source: MDBA (2016d).

In June 2017, the MDB Ministerial Council provided an in-principle commitment to implementing the Toolkit subject to funding being available (MDB Ministerial Council 2017a). Some of the measures naturally fit into existing programs or instruments (for example, better targeting of water recovery translates to making shifts in the Commonwealth's bridging the gap programs), so unlike with supply measures, the Toolkit's implementation will not be administered through a single, distinct package.

Stakeholders have raised a range of concerns over the NBR since its release. Inquiry participants have criticised the MDBA's environmental modelling, both in terms of its assumptions and data inputs, and how the MDBA interpreted the outputs to produce its final recommendation.⁶³ Some have also questioned whether all of the Toolkit measures would ultimately be put in place,⁶⁴ as while the lowering of the water recovery target would be locked into the Basin Plan through an amendment, the northern Basin States had only agreed in principle to implement the Toolkit at the time of its tabling. NBAN was dismayed by the review's outcomes, and felt that its views were not given enough weight when decisions were made (MDBA 2017b).

Reflecting these and other concerns with implementation of the Basin Plan, the Australian Greens Party introduced a disallowance motion for the amendment to the Basin Plan to enable changes from the NBR in November 2017, which Parliament initially upheld in February 2018.

The Australian Government and Opposition subsequently reached an agreement in May 2018 whereby they would pass amendments to enable changes from the NBR subject to a range of conditions. These conditions include that measures and funding would be put in place to improve outcomes for Indigenous Australians, the Australian Government publicly release the MDBA's NBR modelling, and a 'Northern Basin Commissioner' — responsible for monitoring, auditing and reporting on a number of Basin Plan related activities and outcomes in the region — would be established.

Details for implementing the Toolkit are still emerging

A Northern Basin Project Group, made up of representatives from the northern Basin Governments as well as the MDBA and Commonwealth Environmental Water Office, is currently working on arrangements for implementing the Toolkit measures that do not already fit within other programs (including improved coordination and delivery of environmental water, Gwydir constraint removal, and the fishways and cold water pollution measure). Northern Basin Governments are also drafting an NPA to formalise the Toolkit's funding (MDBA, sub. 136). DAWR has advised that the Australian Government will provide up to \$180 million out of money saved by reducing the water recovery target

⁶³ For example, Bycroft (sub. 4), Goulburn Valley Environment Group Inc. (sub. 13), Inland Rivers Network (sub. 23), Jensen (sub. 28), Brown (sub. 66), Murray Darling Association Region 6 (sub. 74).

⁶⁴ For example, Inland Rivers Network (sub. 23), Murray Darling Association Region 6 (sub. 74), National Parks Association of NSW (sub. 76).

(DAWR, pers. comm., 10 August 2018). A key difference between these arrangements and those for the supply measures in the southern Basin is that unlike the reconciliation process associated with the latter, there is no vehicle for reviewing the northern Basin SDLs in the event that the Toolkit measures are not implemented as originally intended.

Transparent and accountable governance arrangements for implementing the Toolkit measures are necessary to ensure that they achieve their intended purpose. These should feature a mechanism for keeping the implementation in line with specified timelines, as well as independent reporting on their implementation and resultant effectiveness.

The MDBA, in its role as Basin Plan Regulator, is well placed to formally play this oversight role for the Toolkit, given it is undertaking an equivalent role for the supply measures in the southern Basin. That is, it will have relevant experience, resources and skills for the task. In contrast, the non-statutory and short-term nature of the Northern Basin Commissioner – whose terms of reference include providing a degree of oversight for the Toolkit – means it would not have the same level of status as the MDBA (particularly under the proposed institutional arrangements outlined in chapter 14). Moreover, the Commissioner’s other function of advising the MDB Ministerial Council on scientific and other contextual information relevant to the northern Basin (such as planning assumptions, floodplain harvesting and water trade) may conflict with its regulatory role, and the breadth of its reporting duties suggest it would not be capable of examining the Toolkit in sufficient detail. Given that the Toolkit measures lack the cross-border issues associated with the supply measures, there is less of a need for the MDBA to additionally operate as the agent of governments in this setting.

Reporting on the measures should culminate in an assessment of the extent to which the Toolkit has achieved its objectives after its implementation. This assessment should be part of the MDBA’s review of the Plan in 2026 and in particular the review of SDLs for the northern Basin.

In line with the above point about the need for reporting on the Toolkit’s effectiveness, the MDBA has indicated that it will seek to include a reconciliation process in relation to the measures’ environmental outcomes (MDBA, pers. comm, 6 November 2018). DAWR has also suggested that the MDBA, rather than the Northern Basin Commissioner, will play the lead role in any such assessment (DAWR, pers. comm, 6 November 2018). An NPA for the Toolkit would add some accountability to its implementation. To fulfil this accountability function effectively, it should clearly articulate milestones for the NSW and Queensland Governments to deliver against, and incentivise Governments by linking payments to these milestones (chapter 13).

In the absence of these kinds of governance arrangements, there is a risk that the timeframes for implementing the measures will blow out, or that some may never be put in place to the degree originally intended. The premise of the recommendation package was that the northern Basin would suffer only a slight overall decrease in environmental health as a consequence, but if the Toolkit is mismanaged and not subject to review, this may not be the outcome.

RECOMMENDATION 4.5

Northern Basin Governments should, as soon as practicable, put in place transparent and accountable governance arrangements for implementing the Northern Basin Toolkit. These arrangements should include:

- a mechanism to establish clear milestones to ensure the Toolkit measures are implemented within reasonable timeframes
- an independent assessment by the Murray-Darling Basin Authority (as Basin Plan Regulator) of progress and effectiveness in implementing the measures.

5 Efficiency measures

Key points

- Additional water recovery through efficiency measures (water-saving projects) is part of the Basin Plan Sustainable Diversion Limit adjustment mechanism. These measures aim to improve environmental outcomes while maintaining or improving socioeconomic outcomes. The Australian Government has committed to recover 450 GL through an efficiency measures program to pursue the enhanced environmental outcomes in Schedule 5 of the Plan.
 - The Schedule 5 outcomes go beyond the benchmark environmental outcomes in the Plan. These outcomes are focused on sites in the southern Basin, including higher level floodplains and the Coorong, Lower Lakes and Murray Mouth.
- Achieving the Schedule 5 outcomes requires Basin States to ease or remove constraints to water delivery in the southern Basin, to allow river operators to meet increased demands from environmental water holders. Basin Plan modelling suggested that, if this does not occur, the extra water would have few additional environmental benefits.
- There has been limited progress so far, and key assumptions underpinning the program have changed. There is a high risk that the Schedule 5 outcomes will not be achieved by 2024, or within the current budget.
 - There has been no revised modelling to estimate what environmental benefits can be achieved under the revised constraints projects. It is possible that projects to ease or remove constraints may not be fully operational by 2024.
 - The Australian Government is rolling out a water recovery program Basin-wide, which risks recovering water in the northern Basin that is of limited use to achieving the enhanced environmental outcomes in the southern Basin.
 - Basin Governments have not yet agreed on an efficiency measures work plan to recover 450 GL by 2024. Additional program criteria to address socioeconomic impacts remain contested and risk unduly constraining the program.
 - There is a material risk that recovering an additional 450 GL through efficiency measures could be significantly more expensive than anticipated.
- The Australian Government has so far committed almost \$1.8 billion to pursue the Schedule 5 outcomes. This program must be placed on a sound footing to maximise the chance of achieving these outcomes.
 - As soon as practicable, the Murray-Darling Basin Authority should update its modelling to establish the benefits of additional water recovery within both current operational constraints and within the current suite of constraint easing proposals.
 - In early 2019, the Australian Government should release a water recovery strategy that outlines how it will recover water in line with the ability to use it effectively, and how it will address socioeconomic impacts through program design.
 - The Australian Minister for Water should specify that the independent statutory review of the program funding in 2021 assesses the benefits, costs and impacts of pursuing the Schedule 5 outcomes. The Australian Government should then determine whether to amend the Schedule 5 outcomes or adjust the water recovery strategy to effectively and efficiently pursue these outcomes.

This chapter discusses efficiency measures, which, along with supply and constraint measures, are part of the Sustainable Diversion Limit (SDL) adjustment mechanism in the Basin Plan. Efficiency measures aim to further enhance environmental outcomes in the Murray-Darling Basin (MDB) by recovering more water, in conjunction with easing or removing capacity constraints⁶⁵ on delivering water, in ways that maintain or improve social and economic outcomes in the Basin.

This chapter assesses the implementation of the Australian Government's efficiency measures program.

- Section 5.1 describes the purpose of efficiency measures and the operation of the Australian Government's program.
- Section 5.2 presents the Commission's assessment of progress and the effectiveness of implementation.
- Section 5.3 outlines how implementation should be improved in the future.

5.1 Background

Efficiency measures seek to achieve enhanced environmental outcomes

Efficiency measures are projects that increase the technical efficiency of using water, with an agreed share of the amount of water saved transferred as entitlements to Governments for environmental use (chapter 4, box 4.1). Under the Basin Plan, additional water can be recovered through efficiency measures under the SDL adjustment mechanism, which reduces the SDL in each area where additional water is acquired.⁶⁶

The Australian Government commitment to recover an additional 450 GL for the environment by 2024 through an efficiency measures program is in addition to its existing commitment to 'bridge the gap' to the SDLs by July 2019 (chapter 3).

The aim of the Australian Government program is to pursue the enhanced environmental outcomes outlined in Schedule 5 of the Basin Plan. These outcomes reflect the results of hydrological modelling undertaken by the Murray-Darling Basin Authority (MDBA) in 2012 (box 5.1). The outcomes were based on a modelling scenario with 3200 GL of water recovery and relaxed delivery constraints, and go beyond the benchmark environmental outcomes from recovering (the equivalent of) 2750 GL.

⁶⁵ Constraints are barriers that restrict the delivery of water down the system. They limit the amount of water that river operators can release from storages (such as dams) and deliver downstream. They are represented as maximum allowed flow rates (usually in ML/day).

⁶⁶ This adjustment is made each year following the method described in Schedule 6A of the Basin Plan. Adjustments must be notified by the end of 2023, and water entitlements transferred to the Australian Government by 30 June 2024 (Basin Plan, s. 7.12).

Box 5.1 Modelling that informed the Basin Plan

The Murray-Darling Basin Authority's (MDBA's) modelling that informed the development of the Basin Plan examined three water recovery scenarios (2400, 2800 and 3200 GL by varying recovery in the southern Basin), assuming no changes to infrastructure, river rules or river operations (benchmark conditions). The MDBA's judgment based on the modelling was that:

- water recovery of 2400 GL would be insufficient to achieve key environmental objectives
- 2800 GL would achieve sufficient environmental objectives for in-stream processes and low-level wetlands and floodplains
 - as a result of sensitivity testing of alternative water recovery strategies in the Condamine-Balonne (Queensland) the benchmark water recovery target (to meet the SDLs) was reduced from 2800 GL to 2750 GL
- 3200 GL showed marginal improvements in some outcomes in the Coorong, Lower Lakes and Murray Mouth, but improvement for higher level floodplains was limited by river operating constraints.

At the request of the Murray-Darling Basin Ministerial Council, the MDBA completed further modelling which examined water recovery of 2800 GL and 3200 GL with eased constraints in the river system. The results showed that easing constraints would improve the ability to deliver high-flow events to inundate floodplains in the Lower Murray. Relative to the 2800 GL water recovery with benchmark constraints scenario:

- easing constraints with recovery of 2800 GL allowed for more high-flow events, but did not achieve more flow targets (table below)
- easing constraints with recovery of 3200 GL achieved significantly more environmental targets.
 - In particular, this scenario met high flow targets along the River Murray, including the target at the Riverland-Chowilla floodplain of achieving 80 000 ML/day for 30 days (discussed in box 5.3).
 - The enhanced environmental outcomes in Schedule 5 reflect the results of this modelling scenario.

Thus, achieving significant environmental benefits above the benchmark scenario was considered to require both the recovery of the additional water **and** the easing of constraints.

Number of flow indicators achieved under the tested scenarios

	<i>Baseline</i>	<i>2800 GL</i>	<i>2800 GL relaxed constraints</i>	<i>3200 GL</i>	<i>3200 GL relaxed constraints</i>
Flow indicators achieved – River Murray	0 / 18	11 / 18		11 / 18	13 / 18

Sources: MDBA (2012a, 2012b).

Schedule 5 refers to sites in the southern Basin, and includes environmental outcomes for larger areas of floodplains in South Australia, New South Wales and Victoria; in-stream flow targets; and improved connections with low and middle level floodplains in the southern Basin (box 5.2). It also includes specific targets for salinity and water levels in the Coorong, Lower Lakes and Murray Mouth at the end of the system in South Australia.

Box 5.2 Enhanced environmental outcomes in Schedule 5 of the Basin Plan

Schedule 5 of the Plan outlines the enhanced environmental outcomes pursued through efficiency measures and easing or removing constraints. The outcomes are:

- further reducing salinity in the Coorong and Lower Lakes
- keeping water levels in the Lower Lakes high enough to maintain flows into the Coorong, prevent acidification, acid drainage and riverbank collapse below Lock 1 at all times
- ensuring the mouth of the River Murray is open without the need for dredging in at least 95 per cent of years
- exporting two million tonnes of salt from the Basin annually as a long-term average
- increasing flows through the barrages to the Coorong and supporting more years where critical fish migrations can occur
- in conjunction with easing constraints, providing opportunities for watering an additional 35 000 hectares of floodplain in South Australia, New South Wales and Victoria
- achieving enhanced in-stream outcomes and improved connections with low to middle level floodplains and habitats adjacent to rivers in the southern Basin.

The inclusion of both supply and efficiency measures in the SDL adjustment mechanism reflects a compromise between Basin Governments when finalising the Basin Plan in 2012 (chapter 4). Efficiency measures recover more water for the environment. To address community concern over the socioeconomic impacts of further water recovery, Basin Governments agreed that additional recovery would aim to maintain or improve socioeconomic outcomes.⁶⁷

The Plan states that neutral or improved socioeconomic outcomes from additional water recovery are evidenced by the participation of consumptive water users in on- or off-farm water use efficiency projects.⁶⁸ Water can also be recovered under ‘alternative arrangements proposed by a Basin State, assessed by that State as achieving water recovery with neutral or improved socio-economic outcomes’.⁶⁹

In 2013, the Australian Parliament amended the *Water Act 2007* (Cwlth) to give effect to that compromise. This amendment provided funding through the Water for the Environment Special Account (WESA) for an Australian Government program to both recover an additional 450 GL and to ease or remove delivery constraints in pursuit of enhanced environmental outcomes.⁷⁰ The WESA allocates \$1.775 billion in total — nominally split into \$1.575 billion for additional water recovery and \$200 million to ease or remove constraints. The Water Act requires the Australian Minister for Water to commission two independent reviews of the WESA (to report in 2019 and 2021) to ensure funding in the

⁶⁷ Basin Plan, s 7.09(a).

⁶⁸ Basin Plan, ss. 7.17(2)(b)(i)-(ia).

⁶⁹ Basin Plan, s. 7.17(2)(b)(ii).

⁷⁰ *Water Act 2007* (Cwlth), Part 2AA.

special account is sufficient to recover 450 GL and ease or remove constraints by 30 June 2024.⁷¹

Basin States will need to ease constraints in the river system to achieve the Schedule 5 outcomes

Delivery constraints in parts of the southern Basin limit the ability of river operators to deliver environmental water at the higher flow rates required to achieve the Schedule 5 outcomes. These constraints need to be eased to achieve those environmental outcomes.

Easing constraints can require both changes to physical features (such as raising bridges) as well as negotiating easements where private land may be flooded (chapter 4, box 4.1). Drawing on its 2012 modelling, the MDBA (2013a) prepared a Constraints Management Strategy that identified six areas in the southern Basin where Basin States should investigate easing constraints. The MDBA's modelling showed that without easing those constraints, recovering 3200 GL had 'few additional benefits' compared with the benchmark (MDBA 2012b, p. viii).

Easing constraints is particularly important for achieving the Schedule 5 outcome of watering larger areas of floodplains in the southern Basin.⁷² Modelling suggests that this requires a flow rate of 80 000 ML/day in the River Murray at the South Australian border (box 5.1).

Basin States have nominated six constraints projects as part of the SDL adjustment mechanism (chapter 4). The location of these projects aligns with the key focus areas in the *Constraints Management Strategy*. With the exception of the Goulburn constraint project, all southern Basin constraints projects are in the approved supply measures package and are eligible for funding as supply measures in addition to the funding available from the WESA (DAWR, pers. comm., 10 August 2018).⁷³

The Australian Government must meet both 2019 and 2024 water recovery targets

The Department of Agriculture and Water Resources (DAWR) is responsible for implementing the efficiency measures program and administering funding from the WESA. The Commonwealth Environmental Water Holder (CEWH) is responsible for managing the additional environmental water recovered by DAWR in pursuit of the Schedule 5 outcomes.

⁷¹ Water Act 2007 (Cwlth), s. 86AJ.

⁷² Basin Plan, Schedule 5 s. (2)(f).

⁷³ This includes four constraints projects (Hume to Yarrawonga, Yarrawonga to Wakool Junction, Murrumbidgee and South Australian Murray) and the Menindee Lakes Water Savings project, which includes easing constraints in the Lower Darling.

In July 2018, DAWR commenced the MDB Water Infrastructure Program to recover the additional 450 GL through efficiency measures, in addition to the outstanding recovery required to meet the July 2019 water recovery target (DAWR 2018h). \$1.4 billion of WESA funding has been committed to tenders under this program (DAWR, pers. comm., 5 November 2018).

As discussed in chapter 3, the Australian Government's July 2019 water recovery target includes both finalising gap-bridging water recovery and recovering the first 62 GL of efficiency measures, before the SDLs come into effect on 1 July 2019.⁷⁴ The efficiency measures program differs from gap-bridging water recovery because of the Basin Plan requirement for neutral or improved socioeconomic outcomes. This places limits on the options available for additional water recovery. Furthermore, the Australian Government committed it would not conduct open tender water purchases using WESA funds.⁷⁵

Although the efficiency measures program is funded by the Australian Government, it agreed to consult closely with Basin States on the design of the program, including the regional distribution of water recovery targets, in order to secure farm-level participation and to achieve neutral or improved socioeconomic outcomes.⁷⁶

In response to community concern, Basin Governments commissioned independent analysis on how to design, target and resource efficiency measure projects in ways that will ensure neutral or improved socioeconomic outcomes. This analysis was undertaken by EY (2018). Basin Governments agreed that, by the end of 2018, they would develop additional program criteria to ensure neutral or improved socioeconomic outcomes from on-farm infrastructure projects. They also agreed to define a pathway for recovering the extra 450 GL by 2024 through development of a work plan (MDB Ministerial Council 2018a).

5.2 Assessment of implementation effectiveness

To assess the effectiveness of implementation, the Commission considered whether the Basin Governments are on track to recover 450 GL through efficiency measures and to ease or remove constraints by 30 June 2024, as well as whether the program is likely to achieve the enhanced environmental outcomes set out in Schedule 5 of the Basin Plan.⁷⁷ The assessment also considered the potential budgetary cost of the efficiency measures program.

⁷⁴ The Basin Plan (s. 7.19) limits the total change in the SDLs from the SDL adjustment mechanism to five per cent of the Basin wide SDL (in 2012) of 10 873 GL (about 543 GL). As the 605 GL increase in the SDLs from supply measures exceeds that limit, 62 GL must also be recovered through efficiency measures to decrease the SDL and keep the net change within that limit when the SDLs enter into force on 1 July 2019.

⁷⁵ Water Act 2007 (Cwlth), part 86AD.

⁷⁶ Paragraph 4.7 of the *Intergovernmental Agreement on Implementing Water Reform in the Murray Darling Basin 2013*.

⁷⁷ Progress towards the 2019 efficiency measures target is discussed in chapter 3.

Specifically, the Commission has considered whether:

- additional water recovery and constraints projects will be capable of achieving the Schedule 5 outcomes by 2024
- the water recovery program is well-designed; in particular, whether it is likely to achieve its objective of improving environmental outcomes while maintaining or improving social and economic outcomes
- the water recovery program is on-track to recover the additional 450 GL within budget.

Modelling has not been updated to confirm the environmental benefits of additional water recovery

Floodplain outcomes

Some of the proposed constraints projects under the SDL adjustment mechanism will provide lower flow rates than those modelled by the MDBA in 2012 (table 5.1). There are concerns that the current proposals will not facilitate water delivery to achieve the Schedule 5 outcomes for higher floodplains (Beer, sub. 9; Wentworth Group of Concerned Scientists, sub. 42; box 5.3). For example, the lower flow rates in the Goulburn, Lower Darling and Murrumbidgee key focus areas may affect the ability of environmental water holders to call sufficient water to deliver high flows in the absence of an unregulated flow event.

In submitting constraint measures as supply measures, Basin States were not required to demonstrate that constraint proposals were capable of achieving the Schedule 5 outcomes. States only had to demonstrate that the projects achieved equivalent environmental outcomes to the 2750 GL benchmark. The MDBA chose not to complete further hydrological modelling to assess whether those flow rates could achieve the Schedule 5 outcomes (MDBA, pers. comm., 3 August 2018). The MDBA (sub. 86) indicated that States chose not to develop constraint proposals that achieved the flow rates assumed in the modelling, because of community concerns about flooding.

Table 5.1 Flow rates in the MDBA's eased constraints modelling scenario (2012) and proposed constraints projects

Key focus area	Location	Benchmark constraint (ML/day)	Eased constraint in modelling scenario (ML/day)	Target flow rate in proposed constraint project (ML/day)
Hume to Yarrawonga	Doctor's Point	25 000	40 000	40 000
Yarrawonga to Wakool	Yarrawonga Weir	22 000 ^a	40 000	30 000^b
Lower Darling	Weir 32	9 300	18 000	14 000
Murrumbidgee	Gundagai	30 000	50 000	38 000
	Balranald	9 000	13 000	12 000
Goulburn	Seymour	12 000	15 000	na
	McCoy's Bridge	20 000	40 000	20 000
River Murray in SA	SA border	80 000	80 000	80 000

^a Constraint was eased to 40 000 ML/day in 2012 Basin Plan modelling, but it is effectively limited by the Hume to Yarrawonga constraint. ^b With a buffer for 50 000 ML/day under certain circumstances.

Sources: MDBA (2012a, 2018ah).

In addition to uncertainty about whether the proposed flow rates are sufficient, environmental water holders and river operators will face challenges in delivering high flow events. Building high flow events — such as an event to deliver 80 000 ML/day at the South Australian border — is a significant change from historical river management. It requires the coordinated release of environmental water in multiple tributaries to ‘piggyback’ off unregulated flow events in other river reaches (box 5.3). River operators will likely be cautious, as they are legally liable for any flooding or third party impacts from the release of environmental water (James 2017). Improving the understanding of river reach hydrology, the timing of environmental water releases, and building experience in multi-site environmental watering is important to ensure that environmental events can be delivered within new operational constraints (MDBA 2013d).

Proposed constraints projects may not be fully operational by 2024

There are a number of complex issues to work through to implement constraints projects (chapter 4). As such, the 2024 deadline for these projects to be operational appears highly ambitious, if not unrealistic. The Commission is proposing that Basin Governments be open to the possibility of extending the 30 June 2024 deadline in limited circumstances for key supply measures (including constraints measures) where they are worthwhile, but cannot be feasibly implemented by 2024 (section 4.3).

If constraints are not eased or removed by 2024, river operators will be unable to deliver the flows required for the Schedule 5 outcomes by this date.

Box 5.3 Achieving enhanced floodplain outcomes

Achieving the Schedule 5 outcomes for floodplains is reliant on easing constraints. The Murray-Darling Basin Authority's (MDBA's) modelling scenario with 3200 GL of water recovery and eased constraints showed that improved outcomes to floodplains could be achieved by meeting high flow targets at the key indicator sites along the River Murray (Basin Plan, s. 7.09(e), box 5.1). It was the only scenario where the environmental flow target of 80 000 ML/day for 30 days at the Riverland-Chowilla floodplain (on the South Australian border) was met (table below). The MDBA's modelling indicated that this flow will water an additional 35 000 ha of floodplains in the southern Basin.

Building a flow event that achieves 80 000 ML/day for 30 days at the South Australian border requires sizeable upstream flows from the four major river reaches in the southern Basin (Upper Murray, Goulburn, Murrumbidgee and Darling). Previous floods indicate that the sum of these four flows (measured at Yarrawonga, McCoy's Bridge, Balranald and Weir 32 respectively) must add to about 150 000 ML/day to produce a flow of up to 80 000 ML/day at the border (MDBA 2014g). A regulated flow under the proposed constraints projects at those four points could only add up to 96 000 ML/day. Meeting the target, even under the assumption of eased constraints, is reliant on sizeable, unregulated flooding in at least one river reach, with water released in other reaches to 'piggyback' on that flow (MDBA 2014g). This represents a significant challenge for river operators.

The lower flow rates in some constraint proposals may mean fewer opportunities to achieve a flow of 80 000 ML/day at the South Australian border, as flexibility in how flows from different tributaries could be combined is reduced (MDBA, pers. comm., 3 August 2018). The 80 000 ML/day flow may still be achieved under unregulated high flow and flood conditions.

Percentage of years where the 80 000 ML/day for 30 days target is estimated to be achieved under various modelling scenarios

Target: (high to low uncertainty)	Without development	Baseline (2009 conditions)	2800 GL	2800 GL, eased constraints	3200 GL	3200 GL, eased constraints
17 – 25 %	34%	10%	14%	13%	14%	18%

Source: MDBA (2012a).

End of system outcomes

As mentioned above, the MDBA's 2012 modelling found that without easing constraints, the additional water recovery would have 'few additional benefits' (MDBA 2012b, p. viii). However, the South Australian Government has suggested that the modelling assumptions — which do not account for a reduced volume of held environmental water — are not reflective of the current settings of the Basin Plan (Government of South Australia, sub. DR140; Speirs 2018). The Government of South Australia (sub. 85, p. 14) stated that:

Even without relaxing constraints, the additional 450 GL is expected to deliver significant additional benefits including flows during dry years and additional flows for sites that are primarily volume dependent, such as the Coorong, Lower Lakes and Murray Mouth.

However, without completing further modelling, any benefits at the end of the system from additional water recovery are based on inferences on how changes to modelling assumptions might affect modelled outcomes.

Shortcomings in the design of water recovery programs may put outcomes at risk

Additional water recovery is underway, but little progress has been made

The Australian Government has commenced recovering additional water through efficiency measures, with the short-term priority being to recover the first 62 GL by 30 June 2019 (chapter 3). As of 31 October 2018, 1.9 GL is under contract and 0.5 GL of this has been delivered to the CEWH and formally registered as an efficiency measure. These efficiency measures were contracted under a three-year pilot program in South Australia — the Commonwealth On-Farm Further Irrigation Efficiency program (COFFIE) (DAWR 2018n).

The Australian Government has since commenced the MDB Water Infrastructure Program, which will:

- operate Basin-wide (that is, projects in any surface water SDL resource unit in the Basin will be eligible to apply)
- recover permanent water rights (entitlements) through tender
- include off-farm, urban, industrial and metering projects Basin-wide, as well as on-farm projects in Queensland, South Australia and the ACT⁷⁸
- fund projects to a maximum of 1.75 times the market price of recovered entitlements.

The program includes a monitoring and evaluation component, and requires project proposals to outline the likely socioeconomic impacts of the project (DAWR 2018d). DAWR is also tendering for delivery partners to coordinate, develop and deliver smaller projects.

Four tender rounds have been undertaken under the MDB Water Infrastructure Program, and as of 31 October 2018, no water has been delivered (DAWR 2018h).

The Australian Government has not yet published a water recovery strategy to complement the commencement of the MDB Water Infrastructure Program. DAWR has indicated the draft work plan (under development by Basin Governments to reflect actions agreed to by the MDB Ministerial Council) will address the need for a water recovery strategy, although this work plan has not yet been finalised (sub. DR103).

⁷⁸ Reflecting the outcomes of the June 2018 meeting of the MDB Ministerial Council, on-farm projects will not be offered in New South Wales or Victoria until additional socioeconomic criteria are agreed to.

It is not clear how projects will contribute to Schedule 5 outcomes

For water recovery to bridge the gap to the SDLs, the MDBA set local and shared water recovery targets in each SDL resource unit (chapter 3). This guidance was to ensure the location of water recovery aligned with environmental requirements.

In contrast to past water recovery programs, regional targets have not been publicly released for the efficiency measures program, despite an agreement in 2013 to develop them in consultation with Basin States (COAG 2013). There is also no detail on how DAWR will assess if and when additional water recovered through proposed efficiency projects will be able to be delivered to key sites, given the dependency of some outcomes on constraints projects.

Although DAWR has stated it will take into account the contribution that recovered water would make to the Schedule 5 outcomes, it is rolling out the program Basin-wide, including in the northern Basin and in the Lachlan (DAWR 2018h). Recovering water in the northern Basin (particularly Queensland) or in disconnected systems does not align with the MDBA's 2012 modelling, which assumed all additional water would be recovered in the southern connected Basin (box 5.1).

In the absence of any process for prioritising the types of water entitlements to be acquired under the program, there is a risk that DAWR will source water that does not usefully contribute to the enhanced environmental outcomes in Schedule 5.

Lack of agreement on socioeconomic neutrality has stymied planning

Recovering an additional 450 GL for the environment is highly contentious, largely because of concerns about the potential social and economic impacts of additional water recovery on Basin communities.

Inquiry participants have voiced strong views that the cumulative impact of additional water recovery (on top of previous water recovery) is likely to have negative impacts on regional communities, through reduced agricultural production and lower employment.⁷⁹ Of particular concern is that water trade will concentrate the impacts of further water recovery in some regions, such as the Goulburn Valley, with the Murray River Group of Councils (sub. 36, p. 2) noting:

... the connected nature of the Southern Basin means that wherever in the Southern Basin that water is recovered from, it is inevitable that further Victorian ... entitlements will be lost from the Goulburn Murray Irrigation District (GMID) with further economic and social impact.

Concerns over the impacts of additional water recovery have been acknowledged by Basin Governments. In 2017, the MDB Ministerial Council (2017b, p. 35) recognised that:

⁷⁹ Speak Up Campaign Inc., sub. 18, sub. DR114; GMID Water Leadership, sub. 62; Greater Shepparton City Council, sub. 71; sub. DR102

Critical to the success of this initiative is finding a way to provide Basin governments and communities with the necessary confidence that enhanced environmental outcomes nominated in the Basin Plan can be achieved in ways that have a neutral or positive socio-economic impact on Basin communities.

The voluntary participation test in the Basin Plan (that neutral or improved outcomes are ‘evidenced’ by individual participation in a water-use efficiency program) is currently the default requirement for an efficiency project to be considered to result in neutral or improved socioeconomic outcomes (as it has been under the COFFIE pilot). By the end of 2018, the MDB Ministerial Council will consider additional program criteria to ensure socioeconomic neutrality for on-farm programs, and to account for regional and cumulative impacts (MDB Ministerial Council 2018a). The Australian Government will not recover water through on-farm projects in New South Wales and Victoria until additional program criteria are in place (DAWR 2018e).

The voluntary participation test (alone) will not address stakeholder concerns about impacts on regional communities

The lack of an agreed approach reflects a major disconnect between (and within) Governments and Basin communities over how to achieve the objective of maintaining or improving social and economic outcomes from further water recovery.

- The Government of South Australia (sub. 85) argued the legal requirement of voluntary participation in efficiency measures should be retained, as it does not inhibit projects being delivered on time and in budget to deliver the 450 GL.
- The Victorian Government (sub. 89, p. 4) described the voluntary participation test as ‘inadequate’ and unable to ‘reflect the real impact that water already taken from the system has had’.
- The Murray River Group of Councils (sub. 36, p. 2) is concerned that adherence to the current test could lead to water recovery with ‘significant social and economic impact on northern Victorian communities while still meeting the definition of “neutral”’.

The voluntary participation test in the Basin Plan will not guarantee that there are no negative impacts from additional water recovery. Experience from previous infrastructure modernisation projects indicates that recovering water through on-farm projects can impact on non-participants — particularly through second-round effects on the water market (chapter 3). Transferring water to the Australian Government influences the future decisions of participating irrigators, which, in turn, may impact on communities. Participants may enter the water market to replace the water provided to the Australian Government after a project is complete, raising prices generally (Aither 2017a). Or, if multiple participants purchase water from areas with joint infrastructure, this may increase adjustment pressures within that network.

Through the MDB Water Infrastructure Program, the Australian Government has sought to address community concerns over the participation test by requiring project applications to

outline the expected regional socioeconomic impacts of the project, and expected changes in on-farm employment (DAWR 2018d). Although this information is to be collected for monitoring and evaluation purposes, DAWR has not yet published how this information will be used in future decision making regarding this program.

But a strict ‘no impacts’ test is unworkable

Many community groups, local governments and irrigator representatives (particularly in upstream States) consider the commitment by Governments that additional water recovery will maintain or improve socioeconomic outcomes implies a firm assurance that there will be no adverse impacts (for any individual or the wider community) from efficiency measures.⁸⁰

Any definition of socioeconomic neutrality that requires Governments to demonstrate that an on-farm efficiency measure would have *no* negative impacts is simply an impossible ideal. Even if the impacts of an efficiency measure are positive in net terms, higher water prices may reduce economic activity in some regions and lead to a negative local impact.

A strict interpretation of socioeconomic neutrality could lead to a situation whereby any potential adverse impacts would prevent a project from being implemented. This could block projects that would have acquired water for the environment in a cost-effective fashion, and with little impact.

A number of additional criteria for on-farm projects have been proposed in recent public discourse (box 5.4). In effect, some of these proposed criteria will stop any further water being recovered. For example, GMID Water Leadership (2018) has proposed that projects leading to *any* increase in water prices should not occur. It is not clear how a proposed project would be able to demonstrate that it meets each of the criteria. Other criteria proposed by Basin Governments, such as requiring a letter of ‘no objection’ from the relevant local government or infrastructure operator (DAWR 2018c), would effectively provide veto power to those organisations, regardless of the merits of projects.

⁸⁰ For example: National Irrigators’ Council (sub. 15), Leeton Shire Council (sub. 17), Speak Up Campaign Inc. (sub. 18), Coleambally Irrigation Co-operative Limited (sub. 38), NSW Farmers’ Association (sub. 60), GMID Water Leadership (sub. 62) and Greater Shepparton City Council (sub. 71).

Box 5.4 Proposed socioeconomic criteria for efficiency projects

In June 2018, the Murray-Darling Basin Ministerial Council directed Basin Governments to develop additional criteria to ensure neutral or improved socioeconomic outcomes from on-farm efficiency measures. Some Basin Governments and community groups have since issued proposals for socioeconomic criteria.

Victorian and New South Wales Governments

On 15 October 2018, the Victorian and New South Wales Governments released a set of eight criteria for efficiency projects which are designed to ensure that **any** projects have neutral or positive socioeconomic outcomes for Basin communities. These criteria specify that all project applications must be made public, and requires that every project:

- Identifies potential impacts on the district and explains any benefits
- Does not directly increase the price of water
- Contributes to the current and future financial viability of irrigation districts
- Supports regional economies by not impacting on irrigation jobs now and in the future
- Does not have negative third-party impacts on the irrigation system, water market or communities
- Is supported by the community
- Identifies and improves social and environmental outcomes and does not negatively impact them
- Identifies, protects and improves Aboriginal values.

Australian Government and southern Basin Governments

On 18 October 2018, the Australian Government published proposed program criteria for on-farm projects to operate in addition to existing criteria in the Murray-Darling Basin Water Infrastructure Program. The proposal, agreed to by the Australian Government and southern Basin Governments, is that projects:

- must provide evidence that the proposal is consistent with the operator's business or infrastructure/network plans
- must provide evidence that the project is aligned with local government or regional development plans or strategies.

The criteria also suggest additional actions could be considered, such as co-designed projects.

GMID Water Leadership

GMID Water Leadership, which represents irrigators and community members in the Goulburn Valley, conducted a workshop to develop additional criteria to reflect the local community's concerns. In October they proposed four questions that, if met, would rule a project out of consideration. The four questions are:

- Will this recover more water from the consumptive pool?
- Will this increase water prices, or create other distortions in water markets?
- Will individual projects collectively result in adverse third-party impacts on other water users, enterprises and the broader community?
- Will individual projects collectively result in adverse third-party impacts by transferring costs to the irrigated production supply chain? (p. 1)

Sources: DAWR (2018c), GMID Water Leadership (2018), Victorian Government (2018b).

A new approach is needed

The focus of policy discussions to date has been on project-level criteria. But because the impacts of any further efficiency measures may not materialise in the areas where water is recovered, socioeconomic impacts cannot be effectively addressed at the project level. The current focus has delayed progress towards a more comprehensive program design that is responsive to impacts when they materialise.

Basin Governments should instead focus on developing a strategy that pursues achievable environmental objectives while minimising socioeconomic impacts across the Basin.

FINDING 5.1

The Basin Plan requirement for neutral or improved socioeconomic outcomes, which is based on voluntary participation in infrastructure projects, does not fully address stakeholder concerns about the impacts of additional water recovery on regional communities.

However, requiring efficiency projects to have no adverse impacts is impractical. Any additional test that aims to ensure there are absolutely no negative impacts will, in effect, block additional water recovery, including projects that may recover environmental water cost-effectively and with relatively limited socioeconomic impact.

Potential adverse impacts of further water recovery would be better addressed through program design that aims to minimise the socioeconomic impacts of recovering the additional 450 GL.

Additional water recovery may cost more than the current budget

The Australian Government's program aims to recover 450 GL within the current water recovery budget in the WESA (\$1.575 billion). To achieve this, projects must (on average) deliver water entitlements to the Australian Government at a cost of \$3500/ML (LTAAY).⁸¹ This benchmark:

- is at the upper bound of some recent on-farm infrastructure modernisation programs — for example, the average unit cost for water recovered through the On-Farm Irrigation Efficiency Program (over five rounds, with the latest in March 2015) varied between \$2697 and \$3612/ML LTAAY (EY 2018, p. 188).
- is well below the cost of recent off-farm programs, including round 3 of the Private Irrigation Infrastructure Operators Program in New South Wales.⁸²

⁸¹ Long-term average annual yield.

⁸² Projects in round three have contracted 39 834 ML (LTAAY) at a cost of \$249.6 million (DAWR, pers. comm. 14 November 2018). This implies an average cost of \$6266/ML (LTAAY).

The MDB Water Infrastructure Program requires project proponents to submit tenders to design and construct water use efficiency projects, the proposed volume of savings to be transferred to the Australian Government, and the required funding (DAWR 2018h). The Australian Government intends to fund projects up to a maximum 75 per cent premium over the market price of the water entitlement for the proposed share of the water savings.⁸³

There are inherent risks with this somewhat arbitrary approach. First, there will be incentives for proponents to inflate estimated costs to extract the full premium. Under the COFFIE pilot, for example, the average premium paid so far has been close to the maximum (1.75), with average funding exceeding \$5000/ML (LTAAY) (DAWR, pers. comm., 5 November 2018). Uptake of this program has been relatively low, with less than 2 GL under contract from the program, which began in 2016.

If the program pays close to the maximum premium for water, current market prices suggest a highly probable risk that the current budget will be insufficient to acquire 450 GL. Between July 2012 and October 2018, the nominal prices for water entitlements in the southern Basin have increased by more than 150 per cent (figure 5.1). As of September 2018, prices for most southern Basin high reliability water entitlements are above \$3500/ML LTAAY, with some as high as \$5400/ML LTAAY⁸⁴ (Aither 2018a).

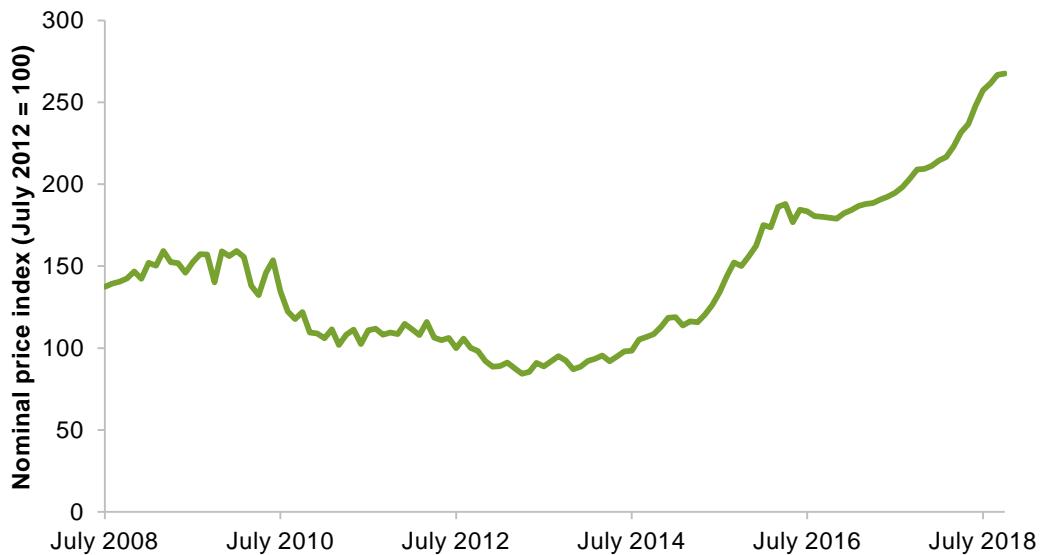
The Commission's estimates suggest that (assuming current entitlement prices hold) recovering 450 GL at a market multiple of 1.75 would cost about \$2.2 billion — exceeding the funding available in the WESA for water recovery by about \$660 million (appendix B.3).

This estimate assumes that the current maximum market multiple provides enough incentive to encourage participation to acquire the 450 GL, and that efficiency measure projects are delivered primarily on-farm. It is possible that other program streams (such as urban or industrial measures) may provide more cost-effective projects which could bring down the average cost — but these are only expected to provide a small share of the 450 GL compared with on-farm measures (EY 2018). However, EY observed that off-farm projects are likely to be more expensive than on-farm works and some may not be achievable within the current market multiple (EY 2018, p. 30).

⁸³ This premium is known as the market multiple, and refers to the cost of water recovered through an infrastructure project compared with the prevailing market price for the same entitlement at the time of the project approval (DOE 2014). DAWR has indicated that the MDB Water Infrastructure Program is to recover water with a maximum market multiple of 1.75 (DAWR 2018q).

⁸⁴ The nominal price (volume-weighted average) for Murrumbidgee high security entitlements was \$5146/ML in September. This was converted to LTAAY with a factor of 0.95.

Figure 5.1 Southern Basin entitlement prices
Nominal price index, July 2008 to October 2018^a



^a The index measures changes in the weighted capital value for a group of major water entitlement types in the southern Murray-Darling Basin. The index is based on nominal historical entitlement prices (not adjusted for inflation).

Sources: Aither (2017b, pers. comm., 16 November 2018).

The estimated costs of constraints projects have also risen

The estimated costs of constraint easing projects have risen substantially since the Basin Plan was made. In 2013, the Australian Government allocated \$200 million (through the WESA) to ease or remove constraints. In 2014, the MDBA (2014b) suggested that this funding would be inadequate and estimated that the cost of easing constraints in the six key focus areas in the southern Basin would be closer to \$220 million. Based on publicly available cost estimates from the business cases prepared by Basin States for supply measures (chapter 4), the total cost estimate is now in the range of \$509-\$629 million⁸⁵ — even with lower flow rates than those assumed in the MDBA's preliminary cost estimates.

⁸⁵ This cost estimate excludes the Lower Darling constraint (which is part of the Menindee Lakes water savings supply measure and is not publicly available). It does include an estimated cost for the New Goulburn Constraints measure of \$70 million. The cost of an older version of this constraint project was estimated at \$140 million (DELWP (Vic) 2016a). Victoria is still waiting for feedback from New South Wales before completing the revised business case (which now focusses on in-channel constraints) and making it public. Given the scope is considerably less, the costs of implementation are likely to be in the order of half. However final costs would depend on addressing comments from other States (DELWP, pers. comm., 9 August 2018).

To fund the full suite of constraints projects, Basin States have sought Australian Government funding for constraints as supply measures, as well as through the WESA (DAWR, pers. comm., 10 August 2018).⁸⁶ As a result, constraints projects need to meet the criteria for supply measures if they are to receive supply measure funding (chapter 4).

Funding some constraints projects as part of the supply measures package is necessary to avoid exceeding the \$200 million budgeted for constraints in the WESA. If some constraint measures fail the supply measure criteria, more money from WESA may be required to facilitate the enhanced environmental outcomes. This will affect the funding available for additional efficiency measures and increase the risk of failing to recover the full 450 GL within the current statutory budget.

There are opportunities to increase funding — but there is no requirement to assess benefits and costs when doing so

When the Australian Parliament amended the Water Act in 2013 to include the WESA, the Australian Government acknowledged the risk that the cost of recovering water could be higher than expected. The Act provides for two independent reviews of the WESA (in 2019 and 2021) to assess whether the money available in the WESA is sufficient to recover the additional 450 GL and ease or remove constraints. The reviews must also consider progress towards the water recovery target and whether the design of water recovery projects is likely to be effective in recovering the full volume.

These reviews were intended to enable parliamentary scrutiny of the account and provide an opportunity for the Australian Parliament to increase funding for the WESA. These reviews are not required to assess the benefits and costs when doing so.⁸⁷

Given potential increases in the costs of both additional water recovery and for constraints projects, the costs of achieving the Schedule 5 outcomes could be significantly higher than the current funding available in the WESA. Any shortfall in funding leaves three options for the Australian Government, which are to:

1. increase the budget through the statutory reviews and continuing to pursue 450 GL
2. change the scope of the program to allow for more cost-effective water recovery projects
3. adjust the environmental outcomes being pursued, so that achieving them is feasible within available funding and the agreed constraints projects.

⁸⁶ Other than the Goulburn constraints measure, all southern Basin constraints projects are also supply measures.

⁸⁷ The benefits and costs of the SDL adjustment mechanism were not considered in the Basin Plan's *Regulation Impact Statement* (MDBA 2012c).

FINDING 5.2

There is a high risk that the efficiency measures program will not achieve the enhanced environmental outcomes of the Basin Plan by 2024 or within the current budget.

- There has been no update to the 2012 modelling to estimate what environmental benefits can be realistically achieved under the revised constraints proposals.
- It is possible that the proposed projects to ease or remove constraints may not be fully operational by 2024.
- Despite not having re-modelled the objectives or targets, the Australian Government is rolling out a water recovery program Basin-wide, which risks recovering water in the northern Basin that may not contribute usefully to achieving the enhanced environmental outcomes in the southern Basin.
- Basin Governments have not yet agreed on an efficiency measures work plan to recover 450 GL by 2024. Proposed additional criteria to manage socioeconomic impacts remain contested and risk unduly delaying planning for the program.
- There is a material risk that recovering a further 450 GL could be significantly more expensive than anticipated. The benefits and costs of the program as a whole have not been assessed (and there is no requirement to do so).

5.3 Improving implementation

Implementation of additional efficiency measures has become increasingly divorced from the environmental objectives they are meant to achieve.

The current focus of the Australian Government's program appears to be on meeting the legislated target of recovering an additional 450 GL for the environment by 2024. But since the efficiency measures program was agreed to in 2012, new information has emerged, which indicates that key assumptions underpinning the program have changed. It is uncertain if water will be recovered in the places and volumes needed, or whether water can be delivered to effectively achieve the Schedule 5 outcomes.

The Australian Government also appears reluctant to countenance the risk that at least some of the measures to ease or remove constraints may not be fully operational by 2024, or provide the flow rates needed to deliver the outcomes.

The Commission views it as a high risk that water recovery and constraint easing will not be completed by 2024 and within the current budget. With almost \$1.8 billion available in the WESA, the implementation of the efficiency measures program must be put on a sound footing prior to the Australian Government spending large sums of money. This will maximise the opportunity for efficiency measures to improve environmental outcomes in the Basin.

Basin Governments and the MDBA should do more to provide confidence that the enhanced environmental outcomes can be achieved. A sequenced process towards 2024 would help

Basin Governments address information gaps and review program parameters. Such a process would assist the Australian Government to implement an effective and efficient program to recover water in line with the ability to deliver it to environmental sites to achieve the Schedule 5 outcomes. This should include the following steps.

1. First and as a matter of priority, the MDBA should **update Basin modelling** to establish the environmental benefits of additional water recovery within current operating conditions (including existing constraints), and the expected benefits arising from the agreed constraints proposals. This would identify those constraints projects that are most important for achieving the Schedule 5 outcomes and which entitlement types should be prioritised in water recovery programs.
2. The Australian Government should **publish a water recovery strategy** to define the environmental objectives of the program and to step out how those objectives will be pursued over time in an effective and efficient manner. The strategy should:
 - (a) clearly specify how water will be recovered in line with the ability to use it effectively, including through prioritising different entitlement types
 - (b) outline how adverse socioeconomic impacts will be addressed through program design — rather than by applying stringent criteria to individual projects.
3. The Australian Minister for Water should **broaden the 2021 independent review of the WESA** to comprehensively assess the benefits, costs and impacts of pursuing the Schedule 5 outcomes.
 - (a) The review should examine updated modelling results on the benefits of additional environmental water, progress towards and realistic timelines for constraint easing, the likely costs and impacts of further water recovery, and any new information on environmental priorities for the environmental sites in Schedule 5.
 - (b) Following this review, the Australian Government should determine whether there is a need to amend the Schedule 5 outcomes to what is achievable, or adjust the water recovery strategy to pursue the agreed outcomes efficiently and effectively.

The Commission's proposed approach will help pursue the enhanced environmental outcomes at considerably lower cost. It will also provide Basin Governments greater scope to manage risks to the program, by providing opportunities to refine implementation in response to new information. This pathway is outlined in further detail below.

1. Update Basin modelling to establish the benefits

Basin Governments should develop a better understanding of what enhanced environmental outcomes can be realistically achieved from additional environmental water. Some of the key assumptions from the 2012 modelling may no longer hold — flow rates for the proposed constraints projects have been revised, some supply measures are already in operation (chapter 4), there is some risk that pre-requisite policy measures will not be implemented on time (chapter 11), and the CEWH holds a lower than anticipated volume of held

environmental water. The 2012 modelling is therefore not adequate evidence that recovering 450 GL will achieve the full suite of Schedule 5 outcomes.

The MDBA (as the agent of governments) should immediately re-model with updated assumptions, to confirm the environmental benefits of additional water recovery. The objective of this modelling is to confirm how frequently river operators could deliver the required flow of 80 000 ML/day (for 30 days) at the South Australian border (box 5.3) and which of the flow and salinity targets for the Coorong, Lower Lakes and Murray Mouth outlined in Schedule 5 can be met.

The MDBA should also undertake modelling to estimate the environmental outcomes that could be achieved from additional water recovery within current operational constraints, to ensure that water recovered in the short term can be used effectively to pursue environmental outcomes. Based on this modelling, the MDBA should consider the portfolio of water entitlements required to achieve the Schedule 5 outcomes — particularly, which SDL resource units should be the priority for additional water recovery to maximise environmental benefits within current operational constraints.

The MDBA should formally advise DAWR on these recovery priorities, and consider utilising the provisions of the Basin Plan to publish recommendations for additional water recovery.⁸⁸

RECOMMENDATION 5.1

As soon as practicable, the Murray-Darling Basin Authority (as the agent of governments) should comprehensively update and publish modelling to confirm the enhanced environmental outcomes that can be achieved with additional water recovery. This modelling should use up-to-date information on constraints proposals, the effects of supply measures, and the volume of held environmental water.

The Murray-Darling Basin Authority should also model the benefits of additional environmental water within existing delivery constraints, and use this information to establish which Sustainable Diversion Limit resource units should be the priority for additional environmental water recovery.

2. Publish an overarching water recovery strategy for the 450 GL

The current water recovery program appears solely focused on recovering a set volume of water. The program does not account for the interdependencies of water recovery and constraints projects. It is currently soliciting proposals for efficiency projects anywhere in

⁸⁸ Basin Plan, ss. 8.45-8.47 (Chapter 8, Part 4, Division 7) set out the MDBA's role in planning for the recovery of additional environmental water. The MDBA may publish water recovery recommendations, and if Governments do not follow those recommendations, they must provide the MDBA with a statement of reasons for why they did not do so.

the Basin — regardless of whether the water recovered will be effective in contributing to Schedule 5 outcomes.

As discussed above, there are likely to be some environmental benefits from recovering additional water, regardless of constraints. But, until the MDBA updates its modelling, it is not clear how much water is required to realise these benefits, compared to those that are dependent on easing constraints. If constraints projects are not implemented as anticipated, rushing to recover the full 450 GL by 2024 would risk the Australian Government spending hundreds of millions of dollars on an asset that (potentially) cannot be used for some time. Aligning water recovery to progress in easing constraints could potentially save the Australian Government up to \$203 million.⁸⁹

For this reason, the Commission considers a clearly structured water recovery strategy is required, with the 2021 review of the WESA allowing for a comprehensive review point (discussed below).

The Australian Government should publish an overarching strategy for its efficiency measures program. This strategy should specify the environmental objectives of its program, and establish timeframes and key decision points. This would provide certainty to the wider community on the expected benefits of the program, and transparently identify and manage risks to implementation, including socioeconomic impacts.

Water recovery is fundamentally an environmental program. Environmental objectives must be paramount in any strategy, with the target and choice of water recovery instruments simply a means to an end. In particular, the Australian Government’s strategy must set out how it will recover water in line with the ability to use it effectively to meet environmental objectives.

Additional water recovery must be effective and efficient

Under the new strategy for the efficiency measures program, it is important that water recovery is effective and efficient in achieving the environmental objectives, while minimising adverse socioeconomic impacts. The Commission suggests a number of core principles should underpin this strategy (box 5.5).

⁸⁹ The estimate compares the net present cost of recovering water through efficiency measures by 2024 and increasing the time over which water is recovered to 2030. Future costs are discounted at a rate of 5 per cent a year for this estimate (appendix B.4).

Box 5.5 Principles for the additional water recovery strategy

- **Targeted:** align implementation to the program objective.
 - The volume and entitlement types of water recovered should be prioritised on the basis of how effectively that water can contribute to the enhanced environmental outcomes. Progress in constraint easing and transparent advice from the Commonwealth Environmental Water Holder and the Murray-Darling Basin Authority should be considered.
- **Flexible:** consider all available options for achieving the objective.
 - There should be clear avenues for co-designed and industry- or community-submitted proposals. Timeframes should be established up-front to ensure projects can be developed and considered over the life of the program. Alternative or innovative water products (such as options contracts) should be considered where capable of securely contributing to enhanced environmental outcomes at a lower cost.
- **Responsive:** be adaptive in response to new information.
 - The program should adapt to changes in the operating environment (such as large shifts in water prices), information on environmental condition, or evidence of cumulative or regional socioeconomic impacts that emerge over time. Explicit program implementation review points should be set out in advance, along with mechanisms for adapting the program in response to these reviews.
- **Transparent:** ensure information on objectives, processes, progress, timeframes and realised outcomes is publicly accessible.
 - The locations, types and prices paid for successful projects should be published to provide certainty for potential participants and the wider community. The strategy itself should be current and regularly updated.
- **Accountable:** define clear roles and responsibilities, timeframes and decision points.
 - Close two-way engagement with affected communities and industries (such as irrigation infrastructure operators) should be documented to ensure individuals and groups can efficiently develop project proposals.

Some of these principles are already reflected in DAWR’s program. For example, DAWR has a valuation strategy to apply a consistent and reliable methodology in determining the value of offered entitlements as part of a transparent water recovery process (DAWR 2018r). Other principles, such as the need to be targeted in selecting which water to recover, do not appear to be reflected in the ongoing program.

A targeted and responsive program is essential to achieving the environmental objectives

In pursuit of well-defined and feasible environmental objectives, DAWR should align additional water recovery in different parts of the Basin with the timeframes for easing relevant delivery constraints. It should consider the contribution of water in different parts of the Basin towards the enhanced environmental outcomes (based on the MDBA’s advice, recommendation 5.1).

The exact timeframes and prospects for easing or removing constraints are not yet known, and will not be known with any certainty until they pass DAWR's funding gateway (chapter 4). Hence, DAWR should plan for a range of scenarios for constraints easing, including the possibility that some proposals may not proceed to implementation.

DAWR should phase water recovery over time to align with constraints projects. In the first instance, any water recovered prior to the confirmation of constraints projects (including the 62 GL required by July 2019) must be capable of being delivered to the sites outlined in Schedule 5. Where constraints projects proceed, the priorities for the location and type of water recovered should continue to align with progress in their implementation. Water recovery priorities should be updated as new information becomes available.

DAWR should actively consider all available options for recovering water — in how it assesses projects and in how it develops projects in partnership with industries and communities. All options should be considered and assessed on their merits towards program objectives, including value for money.

As flagged previously, any adverse socioeconomic impacts of additional water recovery should be managed through a program design approach, rather than through consideration of project criteria alone (this is discussed in more detail below).

An ongoing commitment to transparency is required to communicate benefits and demonstrate progress towards the environmental objectives. DAWR should address identified shortcomings from previous water recovery programs (chapter 3), which requires:

- greater transparency of the advice on water recovery priorities provided by the CEWH and the MDBA
- publication of prices paid and the justification for different price premiums
- monitoring the potential impacts on return flows from infrastructure modernisation.

To support ongoing engagement with industries and communities, clear processes and published timeframes will help establish wider support and improve accountability.

The first scheduled review of the WESA is in 2019. The Australian Minister for Water could specify that the 2019 review evaluates whether the Australian Government's additional water recovery strategy establishes an effective and efficient basis for implementation. A credible review in 2019 should help improve public confidence that additional water recovery is achievable and worthwhile, and that the approach to program design will identify and address likely adverse socioeconomic impacts.

RECOMMENDATION 5.2

By early 2019, the Department of Agriculture and Water Resources should release a strategy for the efficiency measures program to achieve the Schedule 5 environmental outcomes while minimising adverse socioeconomic impacts. To ensure that the recovery of the 450 GL is effective and efficient, this strategy should:

- prioritise recovering water that can usefully contribute towards achieving Schedule 5 outcomes
- plan for a range of scenarios for constraint easing
- phase water recovery to ensure that, as new information becomes available, it aligns with both revised constraint proposals and progress in easing constraints, and contributes towards specific Schedule 5 outcomes
- consider all available options for recovering water in the development and assessment of projects, including community-designed initiatives
- clearly outline how it will address adverse socioeconomic impacts through the design of its program (recommendation 5.3)
- be transparent, and regularly publish information on successful projects, prices paid and overall progress against program objectives
- outline clear processes to ensure ongoing engagement with local communities and industries.

Addressing socioeconomic concerns should focus on minimising adverse impacts through program design

Basin Governments have agreed to implement additional program criteria to address the social and economic impacts of additional water recovery. As discussed above, any test that aims to ensure there are **no** negative impacts will, in effect, limit additional water recovery. It will also substantially increase the costs of implementing the program (costs that are borne by the taxpayer) and, in turn, put the Schedule 5 outcomes at risk.

Applying stringent additional criteria at the *project level* is likely to be an ineffective way of addressing socioeconomic impacts. Instead, DAWR should put in place clear and credible *program-level* arrangements to assess and manage the impacts of additional water recovery. This should include monitoring impacts over time, using information gathered from individual project proposals.

DAWR should assess the impacts of multiple projects over time. This assessment should be informed by information on individual projects including:

- the likely benefits to, and adverse impacts on, the local district and any potential flow-on impacts
- the degree of engagement with community and/or industry
- alignment with irrigation network plans, including any planned rationalisation.

This information should not be used as overly-restrictive ‘pass or fail’ criteria for an individual project. Instead, this information should allow DAWR to identify potential cumulative impacts of different groups of projects, including the effects on flow-on industries and irrigation networks.

Although the market multiple indicates that the net impacts from efficiency projects will be positive for Basin communities, some adverse impacts cannot be avoided. Additional water recovery may accelerate some changes, but socioeconomic impacts emerge over time and they do not always align to where water was recovered (MDBA 2016d, 2017b).

DAWR should implement a monitoring and evaluation program to identify (over time) which regions are subject to substantial adverse socioeconomic impacts from additional water recovery. If warranted, a whole-of-government response could then be adopted to support adjustment in those regions. The relevant Governments should ensure the design of any strategies are transparent and adaptive to new information from the monitoring and evaluation program (and ensure the strategies themselves are monitored and evaluated — chapter 3).

RECOMMENDATION 5.3

The Department of Agriculture and Water Resources’ (DAWR’s) water recovery strategy should explicitly outline how it will seek to address adverse socioeconomic impacts through program design. DAWR should require project proponents to provide information on:

- the likely benefits to, and adverse impacts on, the local district and any potential flow-on impacts
- the degree of engagement with community and/or industry
- alignment with irrigation network plans, including any planned rationalisation.

The purpose of collecting this information would be to identify possible cumulative socioeconomic impacts across different combinations of projects under consideration, as part of a broader decision about which projects to fund. This information should not be used as pass or fail criteria for individual projects.

DAWR should also implement a regional-level monitoring and evaluation program to identify (over time) which regions are subject to substantial socioeconomic impacts from additional water recovery.

3. Broaden the 2021 review of the Water for the Environment Special Account

The Commission has highlighted a material risk that the cost of recovering 450 GL through efficiency measures may be higher than anticipated — potentially exceeding the current budget by \$660 million. To recover the full 450 GL, it is likely that funding in the WESA will need to be increased.

The likely cost overrun raises difficult questions. If current funding is only sufficient to achieve some (but not all) of the Schedule 5 outcomes, how much more is the Australian Government willing to spend to meet the remainder — given that funding could be directed towards achieving other environmental outcomes in the Basin? And, are there other approaches (such as further constraint easing or complementary measures) that are more cost-effective in meeting environmental outcomes than additional water recovery?

The Australian Minister for Water should specify an expanded terms of reference for the 2021 review of the Water for the Environment Special Account

The second review of the WESA (due in September 2021) presents an opportunity to address these questions. By then, the timeframes, feasibility and benefits of easing or removing constraints should be established as projects pass the Australian Government’s funding process (chapter 4), and the benefits of water recovery under updated assumptions will be better substantiated.⁹⁰

The Commission considers that the terms of reference for the 2021 review of the WESA should be substantially expanded to enable a comprehensive review of the feasibility, benefits, costs and impacts of pursuing the enhanced environmental outcomes in Schedule 5, within expected delivery constraints. The Australian Minister for Water should give effect to this expanded scope by specifying the review considers these additional matters.⁹¹

The review provides an opportunity for the Australian Government to ensure the program represents value for money moving forward, as well as improving accountability to help secure broader consensus for further water recovery.

While 2021 is some time away, the Australian Government will need to commence collecting information and consulting on the exact scope of the review with Basin Governments, and the MDBA will need to undertake additional modelling. The 2021 review should consider:

- updated modelling results on the benefits of additional environmental water
- progress towards, and realistic timelines for, constraint easing

⁹⁰ While the WESA will also be reviewed in 2019, the Commission considers this too soon to assess the benefits, costs and impacts. This is because constraints projects are unlikely to be finalised by that time.

⁹¹ *Water Act 2007* (Cwlth), s. 86AJ(3)(c) requires the review to consider ‘any other matter specified in writing by the Minister that is relevant to achieving the object of this Part’.

-
- the likely costs and impacts of further water recovery
 - any new information on environmental priorities for the environmental sites in Schedule 5.

On the basis of the review, the Australian Government (in consultation with Basin States) should decide whether there is a need to amend the Schedule 5 outcomes, or adjust the water recovery strategy to pursue those outcomes efficiently and effectively.

RECOMMENDATION 5.4

The Australian Minister for Water should specify that the 2021 review of the Water for the Environment Special Account review the benefits, costs and impacts of pursuing the enhanced environmental outcomes in Schedule 5 on the basis of new and updated information. This should include:

- identifying which, if not all, of the Schedule 5 outcomes can be achieved, given progress in easing or removing constraints, and how much environmental water would be required to do so
- assessing the benefits and costs (and feasibility) of other approaches to achieving those environmental outcomes.

This review should be supported by modelling provided by the Murray-Darling Basin Authority (as the agent of governments) and any additional information from Basin States.

The Australian Government should use the outcome of this review to determine whether there is a need to amend the Schedule 5 outcomes, or adjust the water recovery strategy to pursue those outcomes efficiently and effectively.

6 Water resource planning

Key points

- Basin State water planning arrangements continue to be the primary instruments for water management at the local level while Water Resource Plans (WRPs) are the mechanism for demonstrating compliance with Basin Plan requirements.
- WRPs are a key instrument in implementing the Sustainable Diversion Limit (SDL) in WRP Areas and ensuring Basin States consistently address key elements of the Basin Plan, such as critical human water needs, environmental water planning and management, and water quality.
 - Basin States are required to develop WRPs to be accredited by the Australian Minister for Water by 30 June 2019.
 - From 1 July 2019, the Murray-Darling Basin Authority (MDBA) will be responsible for enforcing compliance with WRPs. It will use separate mechanisms to enforce compliance with SDLs (Register of Take) from other provisions of WRPs (annual self-reporting).
- The development and accreditation of WRPs is well behind schedule.
 - In December 2018, of the 33 WRPs that must undergo accreditation, 12 were in the early stages, 17 were in draft form, three were in the accreditation process and one has accreditation.
- Given the remaining workload, there is a risk that attempting to accredit all WRPs by 30 June 2019 will compromise the quality of some WRPs by not allowing sufficient time to consider and consult on key issues and proposed changes with affected stakeholders. This may reduce the effectiveness of WRPs in implementing key elements of the Basin Plan.
- There are concerns that the implementation of WRPs has been poorly executed by all parties over the past five years, with the accreditation process resulting in unnecessary costs in developing plans and potentially making adaptive management more difficult.
- In response to these issues the Commission recommends that:
 - the Minister and Basin States as soon as practicable negotiate extensions to the timeline for accrediting WRPs in areas where there is clearly insufficient time for adequate community engagement. Extensions should only be given in limited circumstances, particularly where substantive changes to state-based water management rules are proposed. These limited extensions would be unlikely to undermine SDLs
 - before 1 July 2019, the MDBA as Basin Plan Regulator: clarify what Basin States are required to self-report annually to show compliance with WRP obligations; articulate the compliance assessment regime relevant to WRP obligations; and consult with Basin States in developing guidance on how it proposes to assess future amendments to WRPs
 - the MDBA and Basin Governments finalise and publish terms of reference to assess the utility of WRPs in preparation for the five-yearly evaluation of WRPs in 2020.

This chapter discusses Water Resource Plans (WRPs). It first provides background on the purpose and operation of WRPs (section 6.1). It then presents the Commission’s assessment of WRP implementation to date (section 6.2) and options for improving implementation in the future (section 6.3).

6.1 Background

Water Resource Plans are a key instrument in implementing the Basin Plan and Sustainable Diversion Limits

WRPs are a key instrument in implementing the Sustainable Diversion Limit (SDL) in WRP Areas (box 6.1) and ensuring Basin States consistently address key elements of the Basin Plan. The *Water Act 2007* (Cwlth) sets out 12 parts that a WRP must address which the Murray-Darling Basin Authority (MDBA) translated into 54 requirements under the Basin Plan.⁹² The following key elements of WRPs are dealt with in greater detail in subsequent chapters of this report: Indigenous water values and uses (chapter 7); water quality (chapter 8); critical human water needs (chapter 9); water trading rules (chapter 10); environmental water planning and management (chapter 11); compliance (chapter 12) and reporting, monitoring and evaluation (chapter 13).

Basin State water planning arrangements continue to be the primary instruments for water management at the local level while WRPs are the mechanism for demonstrating compliance with Basin Plan requirements. WRPs are designed to ‘bring together existing state rules and instruments, along with other supplementary material, to provide a plan for managing water resources in a way that is consistent with the Basin Plan’ (MDBA 2017f, p. 2). To the extent a Basin State’s entitlement and planning arrangements do not address specific matters set out for WRPs, they would need to amend their arrangements or supplement them with new ones to be compliant with the Basin Plan. For example, Basin States will need to develop accounting methods that demonstrate how they incorporate and apply SDLs for their WRP Area.

The actual form of WRPs can vary depending on Basin States’ existing water planning arrangements and how they choose to demonstrate compliance with the WRP requirements. They can be a single document which references various states instruments, or made up of a number of documents (MDBA 2017w). For example, the main document submitted for accreditation for the Queensland Warrego-Paroo-Nebine WRP used an index giving line-by-line detail of how each requirement was met, referring to instruments and supporting text that constituted the WRP (DNRN (Qld) 2016). In contrast, the Victorian draft Wimmera-Mallee WRP is provided in the form of a report which ‘largely explain [Victoria’s] current water legislation and management tools … acknowledging work done in implementing the Basin Plan’ (DELWP (Vic) 2017, p. 15).

⁹² The Water Act, s.22(3) and Basin Plan chapter 10.

Box 6.1 **Implementing Sustainable Diversion Limits through Water Resource Plans**

The Basin Plan introduces a new water accounting and compliance framework based on Sustainable Diversion Limits (SDLs) that is due to replace the Murray–Darling Basin Cap on Surface Water Diversions (the Cap) on 1 July 2019.

How will WRPs implement SDLs?

Water Resource Plans (WRPs) are the mechanism that bring SDLs into effect. They require Basin States to set out how they will calculate the maximum quantity of water that the Basin Plan permits to be taken for consumptive use (permitted take) in a water accounting period and any associated rules for take in each WRP Area. The determination of permitted take, and subsequently how the actual water take in a WRP Area meets its SDL over the long term, is underpinned by a number of ‘planning assumptions’ such as historical climate conditions, expected utilisation of entitlement classes, trading patterns and the impact of water sharing rules for a particular WRP Area (for example, carryover, trading, floodplain harvesting and water access rules).

How will SDLs differ from the Cap?

The Cap was introduced in 1995 by the MDB Ministerial Council to ‘protect and enhance the riverine environment and protect the rights of water users’ by introducing long-term limits on the volume of water consumptive users could take from rivers in 24 designated river valleys (MDBA 2017u, p. 7). Under the Cap, Basin States had to provide data to the Murray–Darling Basin Authority and its predecessor the Murray-Darling Basin Commission, about how much water consumptive users actually took each year compared with the annual Cap targets.

The SDL framework expands on the Cap by explicitly including water take from groundwater, run-off dams, floodplain harvesting, commercial plantations (net take) and basic water rights. The framework applies to 29 surface water and 81 groundwater SDL resource units (that sit within WRP Areas). Between the introduction of the Basin Plan in 2012 and when SDLs become enforceable in 2019, Basin States have been required to report on Transitional Diversion Limits, which are SDLs adjusted for water recovery progress in WRP Areas (MDBA 2017u). The Basin Plan also places limits on growth of take under basic rights, by runoff dams and net take of commercial plantations. Take can increase above the limit set out provided another form of take with limits in the same SDL resource unit decreases at the same time so there is no net change in the long term average annual quantity of water taken (MDBA 2018aj).

How will SDLs be monitored and enforced?

The Murray–Darling Basin Authority will collate the volumes of permitted and actual take in an annual Register of Take against which it will assess compliance. Annual permitted take and actual take, the difference between them (either a debit or a credit) and the cumulative balance of take are recorded in the Register of Take. Like the Cap, non-compliance occurs when the cumulative balance exceeds 20 per cent of the long term annual diversion limit for the SDL and Basin States do not provide a reasonable excuse (MDBA 2018aj).

Compliance with SDLs sits outside of and is separate to compliance with WRPs (MDBA 2018n). The SDL reporting and compliance framework was finalised in November 2018 after consultation with Basin States and key stakeholders (MDBA 2018aj). The most recent SDL compliance report found that all SDL resource units were compliant (MDBA 2018ak).

Sources: MDBA (2017u, 2018aj, 2018n, 2018ak)

All Water Resource Plans must be accredited by 30 June 2019

Basin States are responsible for developing WRPs for 33 WRP Areas.⁹³ All WRPs are required to be accredited by 30 June 2019 to enable the implementation of key elements of the Basin Plan that commence on 1 July 2019. There are 54 requirements that WRPs must address to gain accreditation.⁹⁴ Some of them relate to the inclusion of specific content (for example, requirements to incorporate and apply SDLs, including rules necessary for sustainable use and management, and to set out circumstances under which trade is permitted) while others are about process (for example, the form the WRP must take, a description of consultation undertaken, and how best available information was used).

Once Basin States have developed their WRPs they submit them to the MDBA. The MDBA is responsible for assessing the WRPs and making a recommendation to the Australian Minister for Water (the Minister) on whether each should be accredited. There must be an accredited WRP for each WRP Area.⁹⁵ Once accredited, WRPs become operational and take on the status of Commonwealth legislative instruments. The accreditation period lasts for as long as the WRP is in effect.⁹⁶

In limited circumstances, the Minister can request that the MDBA prepare part or all of a WRP, through the ‘step-in power’, in place of a Basin State (for example, when a WRP is not submitted for accreditation in time or the submitted WRP is not accredited by the Minister).⁹⁷ However, before the Minister can decide to exercise the step-in power, they must follow certain procedures (box 6.2).⁹⁸ These broadly involve the Minister and the affected Basin State negotiating in good faith to address the circumstances that have triggered the use of step-in power, followed by escalating notices and responses where negotiation and mediation break down. Once these processes have been followed, the Minister may decide to exercise the step-in power if they consider this to be the most effective means of dealing with the circumstances and there is no other feasible or effective alternative way of dealing with them.

⁹³ New South Wales has 20 to complete, Victoria has five, Queensland and South Australia have three each and the ACT has two.

⁹⁴ There are 55 requirements in Chapter 10 but requirement 10.01 is a simplified outline.

⁹⁵ The Water Act, s.54.

⁹⁶ The Water Act, s.64 sets out the provisions about the duration of accreditation, with the WRP in effect usually for the duration of the state instruments that underpin it. For example New South Wales water sharing plans have a duration of ten years.

⁹⁷ The Water Act, ss.68–69.

⁹⁸ The Water Act, s.73.

Box 6.2 **Summary of the procedure to be followed before exercising step-in power**

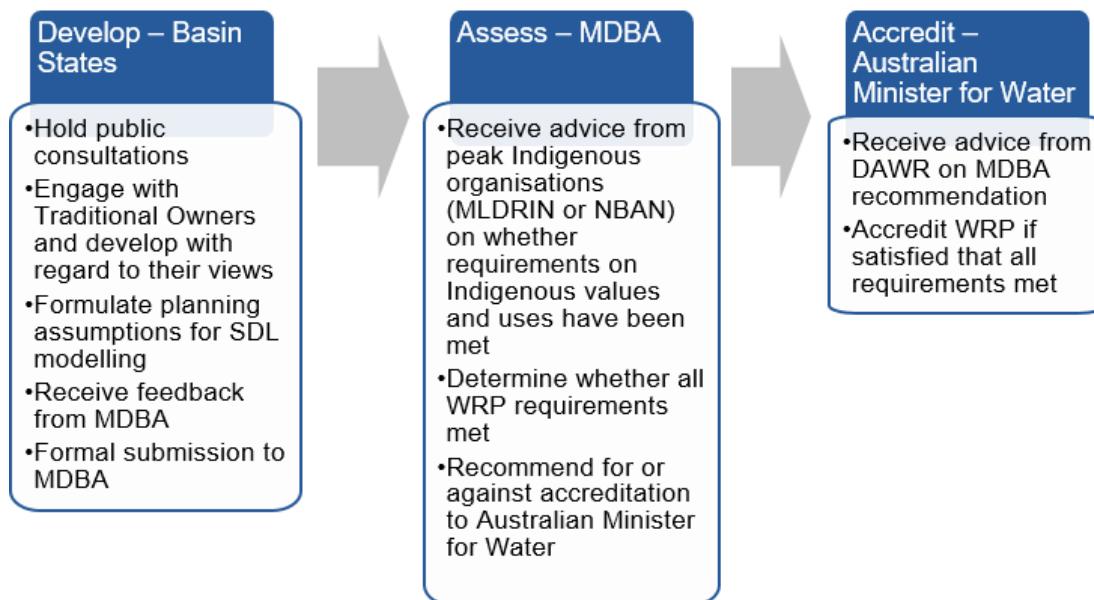
Section 73 of the Water Act sets out the procedure to be followed before the Minister can exercise the step-in power to request the Murray-Darling Basin Authority prepare a Water Resource Plan.

1. Good faith negotiation — between the Minister and the affected Basin State, and any relevant agency to deal effectively with the circumstances that might trigger the step-in power as set out under s.68 ss (2)–(5).
2. Preliminary notice — where the Minister gives a preliminary notice to the relevant State Minister for the affected Basin State of the specific circumstances and the reason they believe they give rise to use the step-in power; that they are considering using the step-in power; and that they are willing to engage in mediation and are seeking a response from the Basin State about their willingness to engage in mediation in relation to the circumstances.
3. Mediation — where the Basin State is willing to engage in mediation in relation to the circumstances set out in the preliminary notice, a mediator and the mediation process will be determined by agreement between the Minister and the Basin State or a mediator will be nominated by the President of the Law Council of Australia and they will determine the process.
4. Formal notice — where the affected Basin State has indicated that it is not willing to engage in mediation to address the circumstances specified in the preliminary notice or does not do so within specified timeframes, the Minister gives a notice of the specific circumstances and the reason they believe they give rise to use the step-in power, specifies actions that would deal with the circumstances without the use of the step-in power and a timeframe for these actions to be taken before the step-in power will be considered.
5. Affected Basin State response to formal notice — where the Basin State may raise any issues with respect to the formal notice and any matters in relation to the circumstances specified in it, particularly mitigating factors, and propose alternative actions.
6. Notice of an intention to proceed to a decision — when the Basin State does not respond to the formal notice or the Minister considers their response and decides to proceed to consider whether to exercise the step-in power, the Minister must give the affected Basin State notice they intend to proceed to consider the step-in power and the reasons for intending to do so.
7. Decision to exercise the step-in power — the Minister exercises the step-in power only after processes set out under s.73 (or as agreed with the affected Basin State) have been followed in the allowed timeframes and the circumstances, if not dealt with, will materially and adversely impact on the implementation of the Basin Plan and the step-in power would be the most effective means of dealing with the circumstances and there is no other feasible or effective alternative way of dealing with them.

Source: Water Act 2007 (Cwlth) s.7.

Figure 6.1 illustrates the development, assessment and accreditation process. Table 6.1 sets out the roles of Basin States, the MDBA and the Minister in the development, assessment and accreditation phases for WRPs. The MDBA, as set out in the Basin Plan, also consults with relevant peak Indigenous organisations to confirm that the requirements relating to Indigenous values and uses have been met as part of the assessment process (chapter 7).

Figure 6.1 Process for accrediting Water Resource Plans by 30 June 2019



Once WRPs are in place, Basin States are able to review and amend their accredited WRPs at any time; however, any changes will need to be assessed by the MDBA and reaccredited by the Minister.⁹⁹ The MDBA are in the early stages of developing guidance for future amendments to WRPs based on the process set out in section 65 of the Water Act 2007 (MDBA, pers. comm., 21 November 2018). The process to make a regulation relating to minor WRP amendments is the responsibility of the Department of Agriculture and Water Resources (DAWR). DAWR have not commenced this process (DAWR, pers. comm., 24 October 2018).

The MDBA is responsible for ensuring compliance with accredited Water Resource Plans once they are operational

Both Basin States and the MDBA have responsibilities relating to monitoring, reporting and reviewing the implementation of accredited WRPs. In particular, Basin States must self-report annually on compliance with any ongoing obligations in their WRPs to the MDBA.¹⁰⁰ The MDBA has identified 22 possible types of obligations from WRP requirements that may affect State agencies, operating authorities, infrastructure operators or holders of water access rights (MDBA 2017h). Whether these obligations are imposed will ‘depend on the nature of the particular water resource plan area, the content of the particular Basin Plan requirement and how that requirement is satisfied in the water resource plan’ (MDBA 2017f, p. 4).

⁹⁹ The Water Act, ss.65–66 and the Basin Plan ss.10.47–10.48.

¹⁰⁰ The Basin Plan, Schedule 12, Matter 19.

Table 6.1 Roles across Water Resource Plan development and implementation phases

Role	Responsible party
Development phase – before 1 July 2019	
Develop WRPs	Basin States
Issue assessment guidelines and provide feedback on draft WRPs	MDBA
Consult with stakeholders on WRP content	Basin States
Engage with Traditional Owners and have regard to their objectives and desired outcomes throughout WRP development	Basin States
Peak Indigenous organisations (Murray and Lower-Darling River Indigenous Nations and Northern Basin Aboriginal Nations) provide advice to the MDBA on whether requirements on Indigenous values and uses have been met	MDBA and peak Indigenous organisations
Recommend for or against accreditation to the Minister	MDBA
Advise Minister on the MDBA recommendation	DAWR
Decision on accreditation	Minister
<i>If WRP accredited then it becomes a legislative instrument</i>	MDBA
<i>If WRP not accredited the Minister can invoke step-in power^a</i>	Minister, Basin States and MDBA if step-in power exercised
Implementation phase – from 1 July 2019	
Manage water resources consistent with policies set out in WRPs	Basin States
Carry out compliance activities where WRP policies place obligations on individuals	Basin States
Enforce compliance with WRPs by States or individuals if States fail to do so	MDBA
Maintain register of take for SDLs	MDBA
Carry out compliance actions if SDLs breached	MDBA
Annual reporting on compliance with WRPs	Basin States
Five-yearly reporting on the efficiency and effectiveness of WRPs	Basin States and MDBA
Propose amendments to WRP and provide reasoning	Basin States
Recommend for or against accreditation of amendments to the Minister	MDBA
Decision to accredit amendments	Minister

^a Step-in power where the Minister requests the MDBA to prepare part or all of a WRP.

Examining these obligations, the Commission suggests that they can be categorised by the type of function they impose. These include:

- **restrictive obligations**, such as water entitlement holders complying with associated conditions or restrictions on activities, States ensuring that the actual quantity of water taken is kept below the permitted take quantity each year, and States seeing that there is no net reduction in planned environmental water
- **operational obligations**, such as States maintaining a register of held environmental water, ensuring consistency with long term environmental watering plans, and implementing water quality management plans
- **triggered management obligations**, such as measures to preserve critical human water needs in the case of extreme events, actions that must be taken if interception activities

such as floodplain harvesting are found to be impacting on the area's water resources, and if a State wishes to amend a WRP.

The MDBA plans to adopt a risk-based approach to WRP compliance, where although all obligations in WRPs must be complied with, there will be a focus on those obligations that:

... have the greatest implications for outcomes ... [including] compliance with sustainable diversion limits, protection of planned environmental water and compliance with Basin Plan water trading rules. (MDBA 2017f, p. 3)

The MDBA is developing a WRP compliance framework, which will include annual reporting requirements under Schedule 12 Matter 19 of the Basin Plan. Consultation with Basin States on the proposed approach is planned for 2019 (MDBA, pers. comm., 21 November 2018). As Basin States have responsibility for compliance with their existing water management arrangements, the MDBA 'expects the Basin state to take appropriate compliance action' if there is non-compliance with obligations that exist under a State's law (MDBA 2017f, p. 3) (chapter 12).

Basin States are required to set out monitoring in their WRPs that will be undertaken to fulfil all reporting obligations set out under Schedule 12 of the Basin Plan and reporting agreements on all reporting obligations were to be in place by 2015 (chapter 13).¹⁰¹

Basin States and the MDBA must both report on the 'efficiency and effectiveness' of the operation of WRPs every five years.¹⁰² The first of these five-yearly reports under Schedule 12 of the Basin Plan are due in 2020.

Sustainable Diversion Limit monitoring and compliance has its own framework

As part of the WRP accreditation process, Basin States are required to show how they will meet SDLs by defining how permitted water take will be measured (box 6.1). However, once WRPs are accredited, SDL monitoring and compliance will occur via a Register of Take which the MDBA administers separately to WRP monitoring and compliance (MDBA 2018n). The MDBA finalised the SDL reporting and compliance framework in November 2018 after undertaking consultation in August with key stakeholders.¹⁰³ The compliance framework outlines that SDL accounting results will be published in the annual Water Take Report in March each year and will include (MDBA 2018aj, p. 29):

- the Register of Take
- a clear statement of the compliance status for each SDL resource unit
- all reasonable excuse claims made

¹⁰¹ The Basin Plan, s.10.46 and s.13.15.

¹⁰² The five-yearly evaluation is required under the Basin Plan, Schedule 12 Matter 18 and must also include an assessment on whether they provide a robust framework for a changing climate.

¹⁰³ Action 1.1 for the MDBA in the Murray-Darling Basin Compliance Compact (MDB Ministerial Council 2018b)

-
- whether the claim has been granted
 - any associated ‘make good’ steps and the timeframes over which progress is expected to be made.

Any SDL non-compliance result will be investigated over a two to four year period, depending upon the level of investigation required, before a final decision is made to either review the permitted take method and reaccredit the WRP or a growth in use notification is issued (MDBA 2018aj). If a growth in use notification is issued the Basin State will be obliged to make good by reducing water allocations in the same or another form of take within that WRP Area (MDBA 2018aj).

In the MDBA’s (2018ak) *Transition Period Water Take Report 2016-17*, all cap valleys were compliant and take in all surface and groundwater SDL resource units was compliant with the Transitional Diversion Limits (TDL), that is none recorded a cumulative balance greater than 20 per cent of the relevant TDL.¹⁰⁴ In the past five years of TDL compliance reporting, only one SDL resource unit recorded a cumulative balance greater than the 20 per cent trigger of the TDL. In 2014-15 and 2015-16 the Lower Gwydir Alluvium SDL resource unit was non-compliant but returned below the cumulative balance trigger in 2016-17 (MDBA 2017u, 2018ak). Had this breach occurred in 2019-20, New South Wales would have to provide a reasonable excuse to explain the breach or be found non-compliant and trigger a discover phase to determine appropriate compliance actions.

Within the *Transition Period Water Take Report 2016-17* (MDBA 2018ak) the MDBA reaffirmed the recommendations to improve methods for estimating volumes of take (permitted and actual), increasing the proportion of actual take that is measured to an agreed standard and using automated reporting where possible. It also acknowledged the work being undertaken by New South Wales and Queensland in the area of measuring flows in unregulated systems and their commitment to policy reform and further consultation (DOI (NSW) 2018c; Queensland Government 2018a, 2018b).¹⁰⁵ For example, New South Wales will begin to monitor floodplain harvesting extractions from 2019, and is adjusting its modelling to better estimate historical extraction levels (box 6.3).

104 During the transitional SDL accounting period there will be no actual consequences of non-compliance. The transitional accounting period finishes with the 2018-19 water accounting year when water recovery is expected to be complete and SDLs are in place, and as such non-compliance in 2019-20 will result in enforcement actions being undertaken.

105 The Basin Plan, s.10.45 states that (to be accredited) a WRP must specify measures for maintaining and, if practicable, improving: the proportion of take measured and the standard to which take is measured and a timeframe for doing so. In its Compliance and enforcement policy 2018-21, the MDBA (2018n, p. 15) states it will ‘work to develop and implement methods to improve accuracy of water measurement and increase transparency of water take’.

Box 6.3 Licensing of floodplain extractions in New South Wales

The New South Wales (NSW) Floodplain Harvesting Policy was introduced by the NSW Government in 2013 to bring existing floodplain harvesting extractions into the water entitlement system. Previously landholders with approved works had legally been able to extract water in this way without restriction. Under the policy, landholders' extraction volumes will instead be tied to entitlements granted by the NSW Government, as is the case for other forms of consumptive water take. The policy is initially being implemented in the Gwydir, Namoi, Border Rivers, Macquarie and Barwon-Darling valleys before being expanded across the state. These five valleys will have entitlements in place by 2019.

The move to include floodplain harvesting within the water entitlement framework is aimed at improving the NSW Government's accounting for that form of use, which will help to limit the possibility of extractions growing over time. Growth in extractions would risk negative impacts to the environment and potentially to holders of other entitlements who might face reduced allocations.

The new licensing regime will be supported by better estimates of historical floodplain harvesting extraction levels and by ongoing monitoring of these extractions going forward. Historical floodplain harvesting extraction estimates were included in the Basin Plan's Baseline Diversion Limit in 2012, but were thought to be inaccurate. Improvements to these will come from enhanced modelling by the NSW Department of Industry and monitoring of extraction volumes.

Floodplain harvesting entitlements will be allocated so that the new long term average level of extractions is equal to the lower value of the new modelling estimates for the extraction levels in the 1993-94 and 1999-00 water years. If the estimated current level of extractions is higher than this, the entitlements of all landholders who had approved works in place as of July 2008 will be allocated so that they face an equal reduction in extraction volumes. Works which were not approved by this time will not be eligible for floodplain harvesting entitlements. The new policy will not change the amount of water that must be recovered to meet the Sustainable Diversion Limits in each Water Resource Plans (WRP) Area.

The new floodplain harvesting entitlements will need to be identified within WRPs, and will be subject to the requirements around determining permitted and actual annual water take. These Sustainable Diversion Limit accounting type requirements are stricter than the ones that would have applied to floodplain harvesting had it remained unlicensed and been listed separately in WRPs as an interception activity. Draft rules around floodplain harvesting entitlements for the Gwydir, Namoi, Border Rivers, Macquarie and Barwon-Darling Valleys will go on public exhibition within water sharing plans before WRPs are finalised, with a draft determination of entitlements is expected to be made by May 2019, in time to be included in WRPs for their review and accreditation.

The NSW Department of Industry has run a series of workshops in October 2018 to consult with stakeholders over the policy. An independent review of the Department's modelling and the policy's implementation is currently underway, with its outcomes to be presented in another round of workshops in April and May 2019.

Sources: Beecham (2018); DOI (NSW) (2018j, 2018g, 2018i, 2018h); DOI (NSW) (pers. comm., 23 November 2018); MDBA (2013c).

6.2 Assessment of implementation

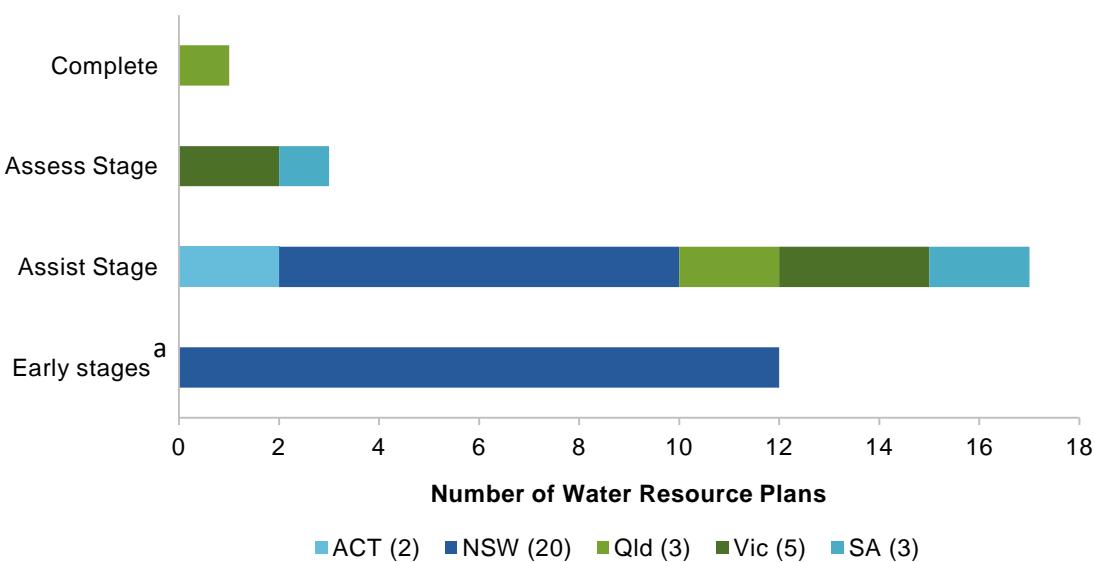
The Commission assessed the effectiveness of WRP implementation by considering whether WRPs are likely to be accredited by the 30 June 2019 deadline so that SDLs can take effect

on 1 July 2019; as well as whether they are likely to effectively implement SDLs and other key elements of the Basin Plan.¹⁰⁶ As the vast majority of WRPs are under development at the time of writing, the Commission based its assessment on whether WRPs are likely to effectively implement SDLs and other key elements of the Basin Plan on principles of good water planning such as transparency, stakeholder engagement and flexibility (adaptive management). The Commission also had regard to whether WRPs impose only the lowest necessary compliance costs (such as adopting a risk-based approach to compliance).

Water Resource Plan development is behind schedule

The development and accreditation of WRPs is well behind schedule. The MDBA initially projected that 14 plans would be accredited by 2017 and 26 by 2018 (MDBA 2017b); however, as at 12 December 2018 only Queensland's Warrego-Paroo-Nebine WRP has accreditation (complete), 12 of the remaining WRPs were in the early stages, 17 were in draft form (assist stage) and three had been submitted to the MDBA for final assessment (assess stage) (MDBA 2018an) (figure 6.2).

Figure 6.2 Progress of Water Resource Plans



^a Early stages category represented here includes the rest of the WRPs not accounted for in the assist, assess and complete categories listed on the MDBA website as of 12 December 2018.

Data source: MDBA (2018an).

¹⁰⁶ There is no explicit objective for WRPs set out in the Basin Plan.

Slow progress in developing and accrediting WRPs has been attributed to a number of factors, including ineffective interactions between the Basin States and the MDBA. The MDBA (sub. 86, p. 34) suggested progress had been slower than expected because:

- Development and communication of policy positions and accreditation requirements took time ... [and] was a learning process for both Basin states and the MDBA on what was adequate.
- Too few resources were allocated to the task in both the Basin states and the MDBA.
- Some states have had significant and ongoing internal changes through restructuring and staff turnover, resulting in a loss of corporate knowledge and delays in undertaking work.
- There has been a reluctance by some states to engage fully in the WRP process and its requirements.
- New knowledge and skills have been required to address some aspects of the requirements ... This has generally needed a specific engagement and longer timeframes.

The MDBA (sub. 86, p. 15) also described that ‘work on SDL Adjustment Mechanism and Northern Basin Review became almost all-consuming, absorbing the time and energy of government processes’.

Some Basin States attributed delays to the MDBAs approach to accreditation. Queensland (sub. 87, p. 6) observed the MDBA’s ‘interpretation of what is required to meet the Basin Plan requirements is often too legalistic and not fit-for-purpose’. Victoria (sub. 89, p. 3) noted the ‘timeliness and consistency of feedback from the MDBA remains an issue that is impacting on WRP timelines’ (these issues are discussed further below).

The MDBA has sought to address concerns, but time is running out

The MDBA (sub. 86, p. 34) acknowledged some of these concerns noting it ‘should have provided earlier and clearer guidance about how to address Plan requirements’. It has also made efforts to speed up the accreditation process by developing an assessment template to help streamline the development of WRPs and publishing position statements on how they interpret requirements and what they expect from Basin States to meet them. The Queensland (sub. 87) and South Australian (sub. 85) Governments both acknowledged these changes had improved the timeliness of the accreditation process.

In the past 12 months the MDBA has taken a number of actions to improve engagement with Basin States to assist with WRP development (MDBA, pers. comm., 3 August 2018). Examples include fortnightly teleconferences and regular face-to-face meetings between MDBA and Basin State staff and establishing a WRP project management office with a focus on improving responsiveness given tight timeframes and working closely with Basin States to resolve issues.¹⁰⁷

¹⁰⁷ The terms of reference for this inquiry also requires the Commission to report on progress towards milestones agreed in the MDB Ministerial Council Implementing the Basin Plan (MDB Ministerial Council 2017b) including whether the MDBA has appropriately engaged with the States on their plan development.

However, concerns remain this will not be enough to get all WRPs accredited for the 30 June 2019 deadline. In the 2018 September quarterly report on WRP progress, the MDBA identified seven WRPs in New South Wales as having a confidence level of less than 25 per cent as progressing to schedule and that ‘contingency discussions’ had commenced given ‘the heightened risk of New South Wales not meeting agreed timeline’s’ (MDBA 2018am, p. 6). It is worth noting that the quarterly reports on WRP progress only provide part of the picture and are not an analysis of the WRPs content at that point in time.

Basin Governments are yet to complete planning assumptions

One of the key ways WRPs give effect to SDLs is through the requirements with regards to defining annual permitted take (box 6.1). The determination of annual permitted take considers a range of matters, some of which are underpinned by planning assumptions, such as expected utilisation of water allocations.¹⁰⁸ Some Basin States are yet finalise the planning assumptions (table 6.2).¹⁰⁹ New South Wales is also currently finalising floodplain harvesting extraction licences which will have implications for how SDL accounting will be implemented (box 6.3).¹¹⁰

Table 6.2 Status of Basin States planning assumptions

<i>Basin State</i>	<i>Status</i>	<i>Update</i>
New South Wales	Incomplete	Consultation on draft planning assumptions closed 17 July 2018. Publication of revised factors expected by early 2019. This work will be finalised, in consultation with the MDBA, as part of WRPs.
Victoria	Incomplete	Discussing draft material with MDBA and will be finalised as part of WRPs.
Queensland	Incomplete	Expected to be finalised in early 2019.
South Australia	Incomplete	Submitted some work to the MDBA in 2017. Some details still to be finalised as part of the SA River Murray WRP.
ACT	Not applicable	Not a relevant matter for ACT water recovery as the ACT shared reduction amount will be recovered from within New South Wales.

Note: The MDBA plans to commission independent reviews of methodologies used by Basin States in developing their planning assumptions and publish these reviews.

Source: MDBA (pers. comm., 4 December 2018).

Finalisation of planning assumptions is required to clarify the remaining water recovery task and to provide certainty to entitlement holders. Planning assumptions determine the ‘cap factors’ for

108 Basin Plan s.10.12(1).

109 Planning assumptions were to be submitted to the MDBA by the end of 2016 for assessment (MDBA 2017b).

110 Queensland has committed to revising floodplain harvesting limits once the full measurement and licensing of the Border Rivers Floodplain has been completed in 2022 (MDBA 2018v).

each different entitlement class in a given WRP Area. These cap factors convert entitlements into long-term annual average volumes and thus affect the contribution of the Commonwealth Environmental Water Holder's portfolio towards water recovery targets (box 3.5). Delays in finalising planning assumptions would pose some risk of uncertainty and disruption for entitlement holders, about whether more water or less water is needed to complete water recovery as well as potential risks to the value of entitlements.¹¹¹ As noted in chapter 3, it is unlikely that the July 2019 water recovery target will be met. However, the remaining task is less than five per cent of the July 2019 water recovery target, and any outstanding gaps will be monitored through the SDL reporting and compliance framework. Ongoing delays in finalising planning assumptions will affect how much time DAWR has to make additional recoveries (if needed) before 1 July 2019. In areas where stakeholder engagement has been completed, Basin States should prioritise finalising planning assumptions to inform water recovery and ensure timely development of WRPs for accreditation.

In the event that water recovery is not complete by July 2019, the Basin Plan provides for the MDBA to 'adjust the register of take to remove any volume attributable to incomplete water recovery in the SDL resource unit in the subsequent water year' if a Basin State exceeds the SDL as a result of incomplete water recovery outside of Basin States' control (MDBA 2018aj, p. 27).¹¹²

Attempting to accredit all Water Resource Plans by 30 June 2019 risks compromising quality

Given the remaining workload, there is a risk that the quality of some WRPs will be compromised to meet the 30 June 2019 accreditation deadline, and subsequently the ability of those WRPs to effectively meet the objectives of the Basin Plan in the longer term.

Effective stakeholder and community engagement is a critical component of good quality water planning. It facilitates transparency about positions being put forward and evidence supporting them, allows for local knowledge to be incorporated and facilitates understanding of complex issues which may have serious consequences, such as changes to property rights of water entitlements and cultural values of Traditional Owners. Confidence in WRPs to facilitate Basin Plan outcomes would be enhanced by ensuring consultation aligns with the expectations of local communities and Traditional Owners, including sufficient time to consider information for discussion and at appropriate forums (box 4.5).¹¹³

A number of participants to this inquiry raised concerns that the 30 June 2019 deadline for accrediting WRPs does not allow sufficient time to transparently consider and consult on

¹¹¹ NIC (sub. 15).

¹¹² Basin Plan s.6.11(5), s.6.12(4)(b) and s.6.12C(2)(a) and (4)(b).

¹¹³ Consultation that meets Basin Plan requirements may not necessarily meet community expectations.

key issues (particularly in New South Wales, which has the largest number of WRPs to accredit). Specific concerns raised by participants included:

- failure to properly consider and consult with entitlement holders and third parties on significant rule changes to protect environmental flows (chapters 11), water quality (chapter 8) and critical human water needs (chapter 9)¹¹⁴
- lack of consultation on measurement of water take in New South Wales — particular areas of concern were the level of consultation with the Stakeholder Advisory Panels on the modelling assumptions underlying SDLs and the limited timeframes to carefully consider and provide input on issues¹¹⁵
- work is still ongoing in defining floodplain harvesting access licences (box 6.3), individual daily extraction limits and active management provisions in a number of New South Wales water sharing plans and is unlikely to be completed in time to be included in WRPs submitted for accreditation by 30 June 2019¹¹⁶
- inadequate consultation timeframes by some States with Indigenous groups in the Basin — the Murray Lower Darling River Indigenous Nations (sub. 72, p. 7) noted ‘the stalled progress of WRP development has created compressed timelines that impose unreasonable and culturally inappropriate pressures on First Nations’ (chapter 7).¹¹⁷

Inadequate consultation may result in poorer water management outcomes than if key stakeholders had been engaged in a timely manner to work through issues of contention and help develop solutions. This is particularly important where rule changes potentially impact on the reliability and use of water entitlements or planned environmental water. Failure to adequately consider and address the above concerns (and be seen to do so) risks undermining community trust in the both the usefulness and legitimacy of WRPs and acceptance of the rules they impose. This may in turn reduce the likelihood of meeting the broader objectives and outcomes of the Basin Plan.

An example of where significant rule changes are under consideration and consultation remains to be undertaken with the community and stakeholders is in the Barwon-Darling WRP Area (box 6.4). Rule changes being considered for the water sharing plan include ‘active management’ which specifically identifies when and how much of the flow is available for extraction to protect low and environmental flows (DOI (NSW) 2018a). The consultation process on changes to the Barwon-Darling water sharing plan rules is being done at the same time as WRP consultation through the Stakeholder Advisory Panel process (DOI (NSW) 2018l). The timelines for implementing the Barwon-Darling WRP assumes that consultation with the stakeholder advisory panel and public exhibition will occur over the second half of 2018 (DOI (NSW) 2018c). As of 12 December 2018 the draft

¹¹⁴ Cotton Australia (sub. 47); Robert and Katherine McBride (sub. DR113); NSW Irrigation Council (sub. DR128); Macquarie River Food and Fibre (sub. DR138).

¹¹⁵ Lower Edward River Pumpers and Landholders (sub. 63); Ricegrowers Association of Australia (sub. 70); NSW Irrigation Council (Sub 80); GVIA (sub. 83).

¹¹⁶ Inland Rivers Network (sub. DR105); Healthy Rivers Dubbo (sub. DR104).

¹¹⁷ Environment Victoria (sub. DR117).

Barwon-Darling WRP had yet to go on public exhibition. The MDBA has this WRP scheduled for assessment in February 2019 (MDBA 2018am), implying a maximum period of three months for consultation before the WRP is assessed for accreditation.

It is unlikely that three months will be sufficient for public consultation on significant rule changes (such as active management to share flows and detailed options on amendments to access rules) that are yet to be finalised. For perspective, consultation (involving targeting key stakeholders and public exhibition) on the 2012 Barwon-Darling water sharing plan took place over a period of more than 12 months and the subsequent changes put through then still remain a concern for some stakeholders (DPI (NSW) 2012, pp. 70–73). In *Delivering Water Resource Plans for New South Wales* (DPI (NSW) 2016a), at least six months was factored in for targeted consultation of strategy and rule development for WRPs and another six months of public and targeted consultation on the draft WRP before submitting to the MDBA for accreditation.

Similarly, the Lower Darling is an area where community engagement and stakeholder consultation needs to be improved. Increasing periods of low to no flows in the Lower Darling has seen persistent high levels of salinity and blue-green algae resulting in inadequate water quality (chapter 8) with consequences for both critical human water needs (chapter 9) and Indigenous values and use (chapter 7). Given the range of complex issues in the Lower Darling region, the risks of inadequate consultation are particularly high and the Commission has heard from inquiry participants further engagement is needed. There are concerns about how community engagement and stakeholder consultation will be undertaken in the time remaining before the 30 June 2019 WRP accreditation deadline, particularly when contributing components such as rule changes to upstream water sharing plans and details of the Menindee Lakes supply project (chapter 4) are yet to be finalised.

While a number of WRPs are likely to be accredited by the 30 June 2019 deadline, outstanding issues remain. Given the timeframe remaining and the issues that still need to be resolved in some WRP Areas, it is unlikely there will be time for adequate consultation in those WRP Areas if the 30 June 2019 accreditation deadline is to be met. There is a choice here to either:

- attempt to accredit all WRPs by 30 June 2019 and risk compromising the quality of those plans by rolling over existing inadequate rules or rushing in new rules which are likely to be ill-specified and lacking wider stakeholder understanding and commitment, resulting in WRPs being ineffective, or
- provide an extension to those WRP Areas with issues still to be resolved to enable adequate consultation, particularly where rule changes to state water management plans are required to be consistent with the Basin Plan.

Box 6.4 Barwon-Darling Water Resource Plan

The *Murray-Darling Basin Water Compliance Review* (MDBA 2017t, p. 15) found the Barwon-Darling water sharing plan failed to ‘provide adequate protection for environmental water, particularly during low flows’ potentially inhibiting achievement of the environmental and social outcomes of the Basin Plan. A range of submissions to this inquiry and participants attending public forums have raised concerns about the Barwon-Darling water sharing plan (2012), which commenced just before the Basin Plan was finalised, including:

1. Rules that permit the take of water during low flows, which are important to pass through to downstream systems
2. Rules that permit the take of water when flows reach certain thresholds without accounting for contributions from environmental flows upstream — allowing consumptive users to extract water intended for environmental flows within the rules of the water sharing plan
3. Illegal take of water (including when there is a section 324 embargo to protect water flows)
4. The current water sharing plans are unlikely to meet the requirements of the Basin Plan during extreme events.

Submissions to this inquiry expressed concern that unless these issues were addressed in the Water Resource Plan then the Basin Plan would ‘lock in’ the existing Barwon-Darling water sharing plan at the expense of communities and the environment:

The Basin Plan locks in the Barwon Darling water sharing plan made in 2012, which changed the access to low flows. Low flows are legally extracted by a small number of very large scale irrigation businesses. This has been at the expense of the Brewarrina Community (Brewarrina Shire Council, sub. 2, p. 1).

... [NPA has been] dismayed by some of the goal shifting changes that have occurred in the unregulated Barwon-Darling that severely compromise downstream river and wetland health, to the detriment of communities and environment. At this stage, with the requirement to accredit WRPs by mid-2019, NPA emphasises the importance of not locking in inappropriate commitments within existing NSW WSPs (National Parks Association of NSW, sub. 76, p. 4).

The New South Wales Government has committed to undertaking substantial actions to address identified issues in the Barwon-Darling system in the past 12 months through its Water Reform Action Plan, including developing enduring solutions for the better protection and management of environmental water to be implemented through amendments to water sharing plans. These actions have been incorporated into the *Murray-Darling Basin Compliance Compact* (MDB Ministerial Council 2018b).

In June 2018, the New South Wales Parliament passed amendments to the *Water Management Act (2000)* (NSW) to address issues raised with respect to the Barwon-Darling water sharing plan. Among other things, these legislative changes will enable:

- changes to the Barwon-Darling water sharing plan, including allowing the establishment of Individual Daily Extraction Limits and Total Daily Extraction Limits to better protect environmental water
- temporary water restrictions (section 324 notices) to protect environmental water and a framework for the application of these restrictions to be developed.

The Department of Industry note these amendment provisions aim to ‘allow sufficient time to develop the rules and tools for active management’ using Individual Daily Extraction Limits with further work and consultation with relevant stakeholders in the Barwon-Darling required to implement these changes (DOI (NSW) 2018a).

Sources: DOI (NSW) (2018a), (2018b); DPI (NSW) (2017a); MDB Ministerial Council (2018b); MDBA (2017t).

The MDBA, while strongly supporting accreditation within the agreed timeframe (option one above), acknowledged there may be some ‘slippage’ in the development of quality WRPs such that additional time may be needed to meet the ‘high standards required by chapter 10 of the Basin Plan’ (option two above) (MDBA, sub. DR136, p. 11). They indicated this could be accommodated through activating the step-in process set out in section 73 of the Water Act (box 6.2) under which the Minister and Basin States may negotiate in good faith (MDBA, sub. DR136; DAWR, sub. DR103).

It is currently unclear what contingency strategies might be considered as part of negotiations in good faith (for example, neither the MDBA, or DAWR have publicly laid out whether options include extension of timeframes to deliver WRPs or to partially accredit a WRP by 1 July 2019).¹¹⁸ However, the MDBA has suggested critical elements that any agreement needs to include would be accounting for SDLs; pre-requisite policy measures (PPMs); and protection measures for environmental flows in the northern Basin to be in place by 1 July 2019 (MDBA, pers. comm., 21 November 2018). Like SDL accounting, a number of unresolved implementation issues still remain for PPMs which are discussed further in chapter 11.

FINDING 6.1

The development and accreditation of Water Resource Plans (WRPs) is well behind schedule and there are key issues still to be finalised in some WRP Areas.

Although a number of WRPs appear likely to meet the 30 June 2019 deadline, in some areas there is a risk that attempting to accredit the WRP by the 30 June 2019 deadline will compromise the quality of plans by:

- inadvertently impacting on the entitlements of water users or the environment
- reducing the effectiveness of WRPs in implementing key elements of the Plan including the protection of environmental water, providing water for critical human needs and water quality objectives
- not allowing sufficient time to consider and consult on those key issues with affected stakeholders.

This risk is highest for New South Wales, given the number of outstanding plans and the magnitude of proposed rule changes in some WRP Areas. There is currently limited public information on how the Murray-Darling Basin Authority will address the risk of some plans not having accreditation by 30 June 2019.

¹¹⁸ Water Act s.68 ss(2)-(5).

There are concerns that Water Resource Plan implementation has been poorly executed

While acknowledging the accreditation process has provided some consistency in approaches (for example the incorporation of Indigenous values and uses and accounting for more types of water take), participants to this inquiry have raised concerns that the implementation of WRPs has been poorly executed.

There are concerns the Water Resource Plan accreditation process has been overly burdensome

Participants to this inquiry argued that the WRP accreditation process has been overly burdensome and had resulted in unnecessary administrative costs and delays. They attributed this to both the nature and number of accreditation requirements as well as the MDBA's interpretation of what is needed to meet those requirements. For example, the Queensland Government noted that the MDBA's interpretation of requirements was not focused on outcomes:

This results in a significant amount of time spent preparing and explaining details that are of no material benefit to the management of the basin's water resources and are low risk to achieving the Basin Plan objectives. (Queensland Government, sub. 87, p. 6)

These concerns have been exacerbated by the absence of a clear process for how WRP development would be managed from the beginning, covering how conflict would be resolved and response timeframes between the MDBA and Basin States. This lack of clarity on WRP development is an example of the ineffective processes for intergovernmental collaboration discussed further in chapter 14. The MDBA's (2017w) *Water resource plan assessment framework* addressed some of the ambiguity of the assessment process, but still lacked detail on resolving areas of difference between the MDBA and Basin States in a timely manner.¹¹⁹

Concerns remain about ongoing reporting

Another concern about WRPs is that the ongoing reporting obligations of Basin States may lack a clear purpose and focus. This will reduce their effectiveness as an accountability tool for ensuring Basin States continue to abide by requirements set out in WRPs and add an unnecessary burden on Basin States. There is currently limited information about what Basin States will need to self-report on annually to demonstrate WRP compliance. The MDBA is currently developing annual reporting requirements as part of the WRP compliance framework (MDBA, pers. comm., 21 November 2018).

The lack of a comprehensive WRP reporting and compliance assessment regime, such as that developed for SDLs, has compounded uncertainty around how WRPs will be

¹¹⁹ The MDBA began publishing a quarterly report on the progress of each WRP based on Basin State work programs in 2018.

implemented alongside state water management arrangements once accredited. Guiding principles are provided in the *Approach to monitoring and compliance: water resource plans* (MDBA 2017f) and the *Compliance and enforcement policy 2018–21* (MDBA 2018n) provides an overview of the role of the MDBA, compliance tools available to the MDBA, and enforcement actions it can take in WRP compliance. However, these documents lack detailed information on how the reporting and compliance regime will actually operate once WRPs are accredited, such as triggers for specific compliance tools or timeframes for responding to compliance notices.

The MDBA expects to consult Basin States early in 2019 on a proposed WRP compliance framework it is currently developing, including a proposed compliance work program such as periodic compliance reviews of WRPs and risk based assurance activities (MDBA, pers. comm., 21 November 2018). The absence of this information to date has meant Basin States have had to develop WRPs without a detailed understanding of how WRPs will be enforced. Until more information on a WRP reporting and compliance assessment regime becomes available, the Commission is unable to assess whether this will be an effective and efficient approach.

Uncertainty about amendment processes risks inhibiting adaptive management

In addition to the upfront costs of the initial WRP accreditation process, some participants suggested WRPs could inhibit adaptive management by adding another layer of administration (and costs) to those associated with changing state instruments. In particular, changes to any of the water management instruments defined by WRP requirements may trigger the need for reaccreditation of the WRP by the Minister. Having to change water management tools at both a state level and in the WRP adds to the complexity of water management, legal confusion and could stymie the capacity of Basin States to respond in a timely manner to new information.

The Queensland Government highlighted a need to streamline this process to maximise efficiency where state instruments are part of the accredited WRP:

As the WRPs comprise many instruments and texts, there is a need to streamline the process to maintain accreditation of the WRPs when, in the future, non-material changes are made to any of the WRP components ... Re-accreditation requirements need to be configured to maximise efficiency of process and minimise effort taken from managing the WRPs, given the number of jurisdictions and instruments from each that comprise Commonwealth WRPs. (Queensland Government, sub. 87, p. 6)

There is a lack of clarity on what the MDBA's process will be for assessing amendments, such as what exactly Basin States would need to submit for reaccreditation or how long the approval process might take. Regulations for minor amendments to WRPs, if developed, are unlikely to go beyond those that exist for the Basin Plan such that any changes to water management arrangements of an accredited WRP would require reaccreditation.¹²⁰ The MDBA has indicated

¹²⁰ The Water Act, s.65 enables these regulations to be developed for WRPs. Section 2.03 of the Water Regulations 2008 (Cwlth) outline minor amendments that the MDBA can make to the Basin Plan.

that it is in the early stages of developing guidance for amendments to WRPs. The process is being included in discussions with Basin States around MDBA-Basin State compliance protocols for consistency with Commonwealth and Basin State water management arrangements (MDBA, pers. comm., 21 November 2018). Until more detail is provided on the amendment process there is a risk that WRPs may inhibit adaptive water resource management and particularly how it will seek to avoid unnecessary administrative costs.

FINDING 6.2

The process of developing Water Resource Plans has been onerous and unnecessarily costly because of inadequate guidance on the requirements of plans and little clarity on the Murray-Darling Basin Authority's expectations for accreditation.

Key details for the implementation of Water Resource Plans have not yet been agreed including the:

- requirements for annual compliance reporting, risking unnecessary compliance costs
 - process for updating plans, risking an amendment process that inhibits adaptive management.
-

6.3 Improving implementation

There should be a pathway for granting extensions to the 30 June 2019 accreditation deadline

Rushing through key elements of WRP development without effective stakeholder engagement to meet the 30 June 2019 deadline for accreditation may result in poor implementation, lack of community acceptance and failure to meet Basin Plan objectives. As noted above, some key issues remain unresolved in some WRP Areas, particularly in areas of New South Wales where consultation is still being undertaken. There is a concern that the time available in some WRP Areas is insufficient for adequate consultation and that as a result, either existing inadequate rules will be rolled over or new rules will be passed into law with little or no commitment from stakeholders.

Having States simply direct more resources into plan development is unlikely to be an easy fix as genuine consultation requires time. Furthermore, the MDBA has already moved to simplify the drafting task for the States by streamlining its assessment criteria, so there may be limited room for further moves of this nature without risking a lowering of standards.

The Commission believes having the MDBA prepare a WRP (the last resort in exercising 'step-in' powers) (box 6.2) would be a poor outcome for many reasons including: the conflict that it would create with Basin States in compliance; State agencies are best placed to draft local level policy and have established relationships with stakeholders; and not least, that stepping in would not guarantee that WRPs would meet the accreditation deadline.

Proper consideration and consultation over significant rule changes takes time to allow for appropriate community engagement and understanding, and an extension would allow for this in cases where the process began too late and provide certainty for stakeholders. While an extension would generate some costs, applying it carefully only to those WRPs where there are changes proposed to state-based water management rules with material impacts for entitlement holders or third parties that require comprehensive community engagement, could keep these in check.

There are several reasons to suggest targeted and limited extensions for WRP accreditation would be unlikely to undermine key Basin Plan objectives.

- The MDBA advises that:
 - it will be possible to put in place provisions for key elements such as SDL accounting, PPMs and protection for environmental flows outside of accredited WRPs through agreements made under the negotiate in good faith provisions (MDBA, pers. comm., 21 November 2018).
 - sufficient progress has been made to implement SDL accounting by 1 July 2019 (MDBA, sub. DR136; DAWR, sub. DR103).
- If actual take did increase in a SDL resource unit during this time, it would be picked up by the SDL reporting and compliance framework (MDBA 2018aj). For example, once a WRP is accredited any take that exceeded the permitted take between 1 July 2019 and when the WRP is accredited could be accounted for in the cumulative balance of the next water take reporting period. In the past five years of TDL compliance reporting, all but one SDL resource units were compliant (MDBA 2017u, 2018ak).
- Water recovery is mostly complete with a few outstanding local water recovery gaps that are relatively small in the context of the overall targets (chapter 3).

Extending the WRP accreditation deadline in limited circumstances would require a shift from the current commitment to implement the Basin Plan ‘on time and in full’. However, the Commission considers that the potential long-term benefits of the type of limited extensions described are likely to be worth any potential short-term costs which do not seem material. While the present situation could have been avoided, what matters now is the quality of the outcome.

RECOMMENDATION 6.1

The Australian Minister for Water and Basin States should as soon as practicable negotiate extensions to the timelines for accrediting Water Resource Plans in areas where there is clearly insufficient time for adequate community engagement before 1 July 2019 (particularly in areas of New South Wales).

Extensions should only be given in limited circumstances, particularly where substantive changes to state-based water management rules are proposed that may have material impacts on entitlement holders and/or the environment.

The MDBA should finalise outstanding work critical to the effective implementation of Water Resource Plans from July 2019

A number of key components of WRP implementation from 1 July 2019 such as annual WRP reporting requirements, and how WRP compliance and amendment processes will be implemented remain incomplete and should be finalised as a priority. The MDBA is currently developing a WRP compliance framework and are in the early stages of developing guidance for future amendments to WRPs. Consultation with Basin States as part of that process is planned for early 2019.

In undertaking to finalise these key components, the MDBA should:

- explicitly consider how they will impact on compliance costs and adaptive management
- seek to minimise any unnecessary costs and administrative burdens and
- maximise the potential for positive water management outcomes.

Before 1 July 2019, the MDBA should provide detailed guidance that clarifies what Basin States will be required to self-report annually to show compliance with WRP obligations. This guidance should describe how the MDBA will ensure annual WRP compliance reporting does not duplicate other reporting required under the Basin Plan and focuses on WRP compliance issues that are most material to achieving Basin Plan outcomes, such as through reporting by exception.

In developing guidance for amendments to WRPs, the MDBA should state how it will assess whether changes made by Basin States to water management instruments covered in WRPs require reaccreditation, and the process for reaccreditation. The guidance should set out ‘the why, who and how’ of the amendment process including response timeframes and clearly articulate what type of changes would require reaccreditation (currently all changes to accredited WRPs and the state water management instruments that constitute the WRP require reaccreditation).

The MDBA should consult with Basin States in developing such guidance to minimise the potential legal complexity and administrative and regulatory burden, while maximising Basin States’ ability to responsively manage water resources.

Waiting to complete this work until after all WRPs are accredited creates uncertainty about consequences for non-compliance and how restrictive they may be for responsive water management during development.

RECOMMENDATION 6.2

Before 1 July 2019, the Murray-Darling Basin Authority (as Basin Plan Regulator) should:

- clarify what Basin States are required to self-report annually to show compliance with Water Resource Plan (WRP) obligations
- articulate the compliance assessment regime relevant to WRP obligations
- consult with Basin States in developing guidance on how it proposes to assess future amendments to WRPs.

The five-yearly evaluation of Water Resource Plans provides an opportunity to examine their utility

The five-yearly evaluation of the efficiency and effectiveness of WRPs provides an opportunity for the Basin States and the MDBA to assess the utility of WRPs in implementing the Basin Plan.¹²¹ While there is no terms of reference for these five-yearly evaluations, the MDBA is currently developing a new evaluation framework to guide evaluation activities and the collection of monitoring data out to 2025 (MDBA, pers. comm., 21 November 2018).¹²² The terms of reference should consider opportunities to improve the utility of WRPs in a robust and impartial way including: scope to reduce compliance costs by examining whether content currently included in them are better addressed in other Basin Plan instruments or could be streamlined; ensuring WRP obligations align with Basin Plan objectives; and that adaptive management is not constrained.

The Commission recognises that the 2020 evaluation would provide limited time to fully gauge how WRPs are operating in practice, and that a more comprehensive evaluation and consideration of some matters might have to wait until 2025 to gather further information. That said, this should not preclude common sense changes occurring following the 2020 evaluation. Addressing areas above in 2020 and 2025 would reduce the risk that WRPs will be rolled over as is and used as a catch all for changing elements of the Basin Plan in 2026 when they may not be the best instrument to do this.

The terms of reference for the five-yearly evaluation of WRPs should be finalised and published as a priority in preparation for the evaluation in 2020. This would enable Basin Governments and the MDBA to collect the information required to facilitate the assessment, provide scope for consultation as well allow time to identify gaps and make improvements before it is undertaken.

¹²¹ The Basin Plan, Schedule 12 Matter 18.

¹²² Consultation with Basin States is being done through the Monitoring and Evaluation Working Group that reports to the Basin Plan Implementation Committee (MDBA, pers. comm., 21 November 2018).

RECOMMENDATION 6.3

The Murray-Darling Basin Authority (as Basin Plan Regulator) in consultation with Basin Governments should finalise and publish a detailed terms of reference to assess the effectiveness and efficiency of Water Resource Plans in preparation for the five-yearly evaluation in 2020.

This evaluation should enable an assessment of the utility of Water Resource Plans for delivering on the objectives and outcomes of the Basin Plan.

7 Indigenous values and uses

Key points

- Indigenous Australians value water for cultural, social, spiritual, customary, economic and environmental purposes.
- The Basin Plan states that there should be sufficient and reliable water supplies that are fit for a range of purposes including cultural use.
- Basin States have introduced policies to meet 2004 National Water Initiative commitments regarding Indigenous values and uses, and these are contributing to their Basin Plan obligations.
- The Basin Plan requires Basin States to consult on and identify cultural water values and uses, and to have regard to these and other matters (such as native title and cultural heritage) in Water Resource Plans (WRPs).
 - Basin States have improved their formal processes for engaging with Traditional Owners, particularly by taking a nation-by-nation approach to consultation.
 - There is a risk that New South Wales will not meet its WRP requirements related to Indigenous values and uses by the 30 June 2019 deadline.
- The Basin Plan contains provisions for Traditional Owners to be involved in the planning and management of environmental water. Basin Governments have been pursuing opportunities to support cultural values through environmental watering.
 - This approach benefits from long-term partnerships between Traditional Owners and environmental managers at the local level, combined with investments in knowledge about cultural values and uses.
- The Murray-Darling Basin Authority has developed tools, in partnership with Traditional Owners, to improve knowledge of cultural values and uses, and to evaluate outcomes. It is important that evaluation can enable continuous improvement and review of programs and policies.
- In May 2018, the Australian Government committed \$40 million for direct investment in cultural and economic water entitlements in the Basin. It is unclear why this funding is limited to Indigenous communities in the Basin, rather than being available to all Indigenous communities in Australia.

7.1 Background

Indigenous values and uses of water

There are more than 40 Indigenous Nations across the Basin that value and use water for cultural, social, spiritual and customary purposes (collectively referred to as cultural values and uses in this report). Through consultation, the Queensland Government found that water is an important part ‘of many aspects of Aboriginal life, such as fishing, hunting, swimming,

storytelling, family gatherings, ceremonies and other sacred activities' (DNRME (Qld) 2018, p. 6). Cultural values and uses are often supported by a healthy environment so there will often be occasions where environmental and cultural objectives align (PC 2017b).

Indigenous Australians also value water for economic uses, such as employment for Indigenous Australians in water management, and income gained through the selling of fish, other animals and plants (DNRME (Qld) 2018). The boundaries between water uses for cultural and economic purposes can sometimes be blurred. Despite this, the Commission concluded in its National Water Reform inquiry in 2017 that it is useful for water planners to consider water for economic purposes as a distinct issue (PC 2017b).

The National Water Initiative and state water policies

Under section 52 of the National Water Initiative (NWI), COAG agreed in 2004 to incorporate Indigenous objectives and the strategies to achieve them into water plans, wherever they can be developed. Basin States have implemented state policies to meet these NWI commitments as part of their water resource planning responsibilities (table 7.1). The Basin Plan is consistent with national policy.

The Commission assessed progress of all States and Territories in meeting the NWI commitments in 2017, including those related to Indigenous values and uses. It found that some good progress against the NWI requirements had been made. However, there was considerable scope for jurisdictions to better recognise and accommodate Indigenous Australians' water needs by:

- identifying and providing for cultural objectives in water plans
- using existing water entitlement frameworks and market mechanisms to provide water for economic purposes (along with supporting arrangements), where governments seek to do so
- providing for cultural values as part of environmental water management, where this can be done without compromising environmental outcomes
- monitoring and reporting on strategies that provide water for Indigenous Australians (PC 2017b).

Basin States have started to address the deficiencies in how their policies protect cultural values and uses on a statewide basis. Momentum on state policies has increased — in some cases, as a result of the Basin Plan requirements. In other cases, state policies are contributing to the implementation of the Basin Plan. In addition, the Australian Government has partnered with Basin States and Traditional Owners to support cultural objectives in the Basin, such as through the National Cultural Flows Research Project (section 7.4).

Table 7.1 Examples of state-based Indigenous water policies and programs

<i>Basin State</i>	<i>State policies and programs that contribute to Indigenous objectives in relation to water</i>
New South Wales	Following the cessation of its Aboriginal Water Initiative in 2016, New South Wales has employed four new identified staff, who are regionally spread, to work on Aboriginal cultural water policy, planning and native title projects (DOI (NSW), pers. comm., 23 November 2018). The Government has made cultural access licences (capped at 10 ML per year per application and unable to be traded) available to support Indigenous cultural requirements (PC 2017b).
Victoria	Victoria launched its Aboriginal water policy in 2016 as part of its state policy Water for Victoria. The Government is investing \$4.7 million over four years to improve understanding of Aboriginal water values, uses, aims and requirements. The policy also seeks to: build capacity and increase Aboriginal participation in water planning and management; provide shared benefits from environmental watering to both the environment and Indigenous communities; and is investing \$5 million to provide water for economic development (DELWP (Vic) 2017).
Queensland	In 2018, the Queensland Government amended the <i>Water Act 2000</i> (Qld) to require the Minister to consider the interests of Indigenous Australians in making a draft water plan and to require water plans to state desired cultural outcomes.
South Australia	In South Australia, the Aboriginal Partnerships Program has worked with Indigenous Australians to increase participation in managing natural resources, including water since 2013 (DEW (SA) 2018a). The program aims to improve awareness and understanding of Aboriginal culture, and protect Aboriginal heritage. The Ngarrindjeri Partnerships Project seeks to protect and manage the cultural values of sites with regard to the revegetation, native animal, water flow and infrastructure activities taking place in the Coorong, Lower Lakes and Murray Mouth (DEWNR (SA) 2015).
ACT	The ACT has statutory requirements to consult all stakeholders, including Indigenous groups, in the development of water plans (PC 2017b). The ACT Government has undertaken 22 assessments using the Aboriginal Waterways Assessment framework across 16 sites to identify objectives and outcomes that recognise Indigenous values and uses (PC 2017b).

The Basin Plan provisions specific to Indigenous Australians

One of the stated Basin Plan objectives is ‘to optimise social, economic and environmental outcomes arising from the use of Basin water resources in the national interest’ (s. 5.02(1)(c)). Cultural water uses are specifically included within the outcomes and objectives of the Plan (ss. 5.02(2)(a) and 5.04(1)).

The Basin Plan also contains provisions for Indigenous Australians to be involved in and to advise on water resource management in relation to water planning, environmental management, knowledge building and evaluation.

Part 14 of chapter 10 of the Basin Plan specifies that Basin States must identify the objectives and outcomes of Indigenous Australians in relation to water resource management for each Water Resource Plan (WRP) Area. Basin States must have regard to the views of Indigenous Australians across matters such as cultural values and uses, native title rights and claims, Indigenous Land Use Agreements, Aboriginal heritage, risks, and cultural flows.

The Environmental Management Framework in chapter 8 of the Plan includes several provisions that aim to incorporate Indigenous values and uses into environmental water planning and management. The Murray-Darling Basin Authority (MDBA) is to have regard to Indigenous values and uses when preparing the Basin-wide environmental watering strategy and the Basin annual environmental watering priorities (ss. 8.15 and 8.29). The Basin Plan also contains principles to be applied by environmental water managers, one of which is to have regard to Indigenous values as a way to maximise the benefits of environmental watering (s. 8.35).

The MDBA is required to evaluate the extent that the objectives and outcomes of the Basin Plan have been achieved (ss. 13.05–13.06) and must have regard to strategies to improve knowledge of water requirements relating to cultural values and uses (s. 4.03).

The Murray Lower Darling Rivers Indigenous Nations (sub. 72, p. 2) argued that ‘actions and targets included within the Plan do not go far enough to support the outcome of Aboriginal communities with “sufficient and reliable water supplies” [as per s. 5.02] fit for cultural purposes’ and that the Basin Plan’s objectives and outcomes give ‘only passing mention’ of Traditional Owners’ rights, interests and cultural obligations. In this inquiry, the Commission has primarily assessed the effectiveness of implementation to date for the current provisions in the Basin Plan (chapter 1).

The rest of this chapter describes the Commission’s assessment of the effectiveness of implementation of the provisions of the Basin Plan related to Indigenous values and uses, and how implementation can be improved. Section 7.2 looks at the quality of the consultation undertaken for the development of WRPs. Section 7.3 describes how cultural values are increasingly being considered in environmental water planning and management. Section 7.4 discusses efforts to improve knowledge about cultural values and uses, and how good monitoring and evaluation can improve strategies that provide for cultural values now and in the next phase of Basin Plan implementation.

7.2 Progress in considering Indigenous values in Water Resource Plans

The MDBA’s guidelines for Water Resource Plans

The MDBA works in partnership with two peak Indigenous organisations to provide culturally authoritative advice on the management of the Basin. The organisations are the Murray Lower Darling Rivers Indigenous Nations (MLDRIN) in the southern Basin and the

Northern Basin Aboriginal Nations (NBAN) in the northern Basin. MLDRIN and NBAN are independent and represent Traditional Owners in the Basin on natural resource management.

The MDBA has published guidelines to assist Basin States in meeting the WRP requirements in relation to Indigenous Australians' objectives and outcomes for water (MDBA 2017x). The guidelines for part 14 of chapter 10 of the Plan were developed in consultation with MLDRIN, NBAN and the Basin States, and were informed by the Akwé: Kon Guidelines (box 7.1).

In the MDBA's view, the consideration of Indigenous values and uses in WRPs can only be generated through a sound consultation process with Traditional Owners and Nations relevant to the plan area (MDBA, pers. comm., 21 November 2018). The guidelines describe how the MDBA expects engagement in the development of WRPs to occur with Traditional Owners at the local level and to involve:

- a planned approach, such as adequate time and resources
- identification and involvement of appropriate Traditional Owners
- proper notification of the opportunity to be involved
- the provision of clear information about water planning processes
- the use of appropriate tools for recording objectives and outcomes (MDBA 2017x).

The guidelines also include options and considerations for better practice, over and above WRP requirements.

Box 7.1 **Akwé: Kon Guidelines**

The Akwé: Kon Guidelines are voluntary and designed to facilitate the full involvement of indigenous and local communities in the assessment of the cultural, environmental and social impact of proposed developments on sacred sites and on lands and waters they have traditionally occupied.

The guidelines were developed by the Secretariat of the Convention on Biological Diversity in co-operation with indigenous and local communities, as part of the work program agreed by the Parties to the Convention on Biological Diversity, which Australia signed on as a party to in 1992. The guidelines, which represent best practice, were endorsed by the Parties to the Convention in 2004.

The guidelines aim to:

- support effective participation of indigenous communities in screening, scoping and development planning exercises
- properly take into account the concerns and interests of indigenous communities
- have regard to the protection and ownership of traditional knowledge, innovations and practices.

Source: Secretariat of the Convention on Biological Diversity (2004).

Once each WRP is submitted for accreditation, the MDBA seeks advice from MLDRIN or NBAN in relation to whether the requirements in part 14 have been met. MLDRIN and NBAN seek advice from Traditional Owners on the consultation undertaken by Basin States in relation to Indigenous values and uses of water for each WRP. Both organisations then use the elements of good engagement with Traditional Owners described in the MDBA's guidelines as part of their framework for assessing WRPs (MLDRIN, sub. DR139; NBAN, pers. comm., 2 August 2018). The MDBA takes this advice into account when assessing whether the legal requirements for accreditation of the WRP have been met (MDBA, pers. comm., 21 November 2018). The MDBA fund MLDRIN and NBAN to undertake this advisory role.

Efforts to support effective local-level consultation processes are likely to generate ongoing benefits where this consultation leads to long-term partnerships between Traditional Owners and local water managers.

Improving consultation on supply measures

MLDRIN (sub. 72) raised concerns about the impact of the supply measures on cultural values and cultural heritage. MLDRIN (sub. DR139) stated that Basin States should use the Akwé: Kon Guidelines as a benchmark in developing engagement processes regarding the implementation of supply measures.

The Commission is recommending (recommendation 4.1) that Basin Governments develop clear mechanisms for consultation on the supply measure package and individual projects with Traditional Owners and local communities. The Akwé: Kon Guidelines could be embedded in the mechanism.

In December 2017, the Murray-Darling Basin Ministerial Council requested the MDBA to lead work on Aboriginal engagement in Basin water matters (MDBA, pers. comm., 21 November 2018). The Basin Officials Committee noted on 1 August 2018 that the MDBA would establish a cross-jurisdictional task group to find an agreed way forward to align Aboriginal engagement activities across Basin Governments. The MDBA noted that this 'work is still at a pre-developmental stage and will look to engage with Basin Traditional Owners and Nations as the work progresses' (MDBA, pers. comm., 21 November 2018).

If delivered in a timely manner, any agreed engagement arrangement may also be useful for consultation on supply measures.

Basin States have improved consultation arrangements ...

As of 12 December 2018, only Queensland's Warrego Paroo Nebine WRP has accreditation. NBAN's (2016, p. 1) view on the development of this WRP was that the first two rounds of consultation were not effective but that the third round was 'much more targeted at Traditional Owners which lead to a much better outcome'. As a result of advice from NBAN,

Queensland changed from town-based meetings to nation-based meetings for the consultation processes for its other WRPs.

Following consultation, the Queensland Government committed to new water planning measures to provide for Indigenous outcomes. For example, a report on the flow requirements to support cultural values and uses, informed by engagement with Indigenous Australians, is to be published within five years of the Condamine-Balonne and Moonie and Border Rivers water plans commencing (DNRME (Qld) 2018).

As there is only one WRP accredited, it is too early to tell how well the WRP provisions related to Indigenous values and uses are being met by all Basin States and how well the process for accreditation is working. It is promising that the New South Wales, Victorian, and South Australian Governments are also taking a nation-by-nation approach to consultation (DOI (NSW), pers. comm., 19 June 2018; South Australian Government 2017; DELWP (Vic), pers. comm., 2 July 2018).

The WRP requirements have raised the standard for identifying the water-related objectives, outcomes, values and uses of Indigenous Australians in the Basin. The South Australian Government (sub. 85, p. 20) stated that the Basin Plan requirements have provided ‘an important catalyst to enhance engagement’ on water management and that this has provided a foundation for improved engagement across the State. The Victorian Government stated that engagement with Traditional Owners is a major focus of the development of their WRPs as the identification of Traditional Owner water objectives and outcomes is a significant gap in Victoria’s water management arrangements (DELWP (Vic), pers. comm., 2 July 2018).

... but delays in New South Wales are concerning

Basin States have had since 2012 to consult with Traditional Owners on the WRP requirements. As of 2017, the MDBA (2017b) reported that engagement with Indigenous Australians about their values and uses of water had commenced in all Basin States other than New South Wales. All WRPs are required to be accredited by 30 June 2019 (chapter 6). (In the case of the South Australian Murray Region WRP, consultation took place over several years (DEW (SA) 2018b).)

Specific engagement processes with Traditional Owners in New South Wales are now in place. New South Wales completed consultation with the Gomeroi Nation in April 2018 and a final report has been completed that will inform a number of WRPs, including the Gwydir Surface Water WRP (DOI (NSW), pers. comm., 19 June 2018). The Government has hired consultants to undertake consultations with other Indigenous Nations in the next three to six months (DOI (NSW), pers. comm., 19 June 2018).

However, concerns have been raised about the effectiveness of consultation in New South Wales to date. The New South Wales Aboriginal Land Council (NSWALC, sub. DR135, p. 3) stated that Aboriginal Land Councils have not been properly involved in engagement processes for WRPs and that where they had been involved, that engagement generally

occurred ‘at very short notice and not on the basis of free, prior and informed consent’. The NSWALC (sub. DR135) also expressed concern that planning processes for WRPs and Water Sharing Plans (the water planning instruments used by the New South Wales Government) were not adequately coordinated, and that Indigenous engagement should align for both planning processes.

MLDRIN (sub. DR139, p. 3) noted that although deficiencies in consultation processes were most stark in New South Wales, other States have many issues to negotiate:

Commitments to improve consultation during and beyond the development of the WRPs need to be properly defined and tangible, funded and implemented through formal policy or legislation.

Following consultation, New South Wales is required to have regard to the views of Indigenous Australians in preparing its WRPs, including those related to native title. In 2015, native title rights were recognised for the Barkandji people over a large section of the Darling River and some adjacent land (Hartwig and Jackson 2017). In 2017, the New South Wales Government signalled its intention to account for the Barkandji determination in the relevant state water plan when it is updated as part of the development of the Murray and Lower Darling WRP (PC 2017b). The status of this commitment is unclear because the draft WRP is not publicly available.

MLDRIN (sub. 72, p. 9) noted that developing advice on whether the WRP obligations have been met requires ‘considerable engagement, research and technical review of Plans’ and that this should not be streamlined to meet the deadline. The MDBA has provided additional resources to NBAN and MLDRIN for WRP development (DAWR, sub. DR103). The MDBA (pers. comm., 21 November 2018) confirmed that streamlining of the WRP assessment process has not affected advice to Basin States about how to meet the part 14 requirements.

Despite its recent commitments to accelerate progress, there may not be enough time for New South Wales to meet the part 14 obligations and for MLDRIN, NBAN and the MDBA to complete their assessment of all 20 New South Wales WRPs before July 2019. Remaining timeframes to complete implementation are short and the MDBA (2018am) has reported that New South Wales is behind schedule with WRP delivery.

A number of participants raised concerns about poor outcomes from water resource management for Indigenous Australians in New South Wales, particularly along the Darling River (NSWALC, sub. DR135; McBride, Murray Bridge trans., p. 49; McKay, Shepparton trans., p. 51).

Non-Indigenous laws and rules governing use of water in the Barwon-Darling River system are contributing to devastating impacts on Barkandji people, from the level of personal health and well-being to the survival of cultural knowledge, traditions and practices. The increasing frequency of cease to flow events, poor water quality, blue-green algae blooms, impacts on native fish populations and the ability to engage in recreational activities impact on Aboriginal people and militate against Barkandji people’s cultural obligations. (MLDRIN, sub. DR139, attach. 1, pp. 17–18)

The Commission is recommending (recommendation 6.1) that the Australian Minister for Water and Basin States should negotiate extensions to the timelines for accrediting WRPs in some areas. Extensions should only be given in limited circumstances, where there is clearly insufficient time for adequate community engagement on substantive proposed changes to state-based water management rules. Consultation on proposed changes to water rules should include Traditional Owners where they are one of the stakeholder groups affected.

FINDING 7.1

Basin States have improved their formal processes for engaging Traditional Owners as part of Water Resource Plan (WRP) development.

Given that so few WRPs have been submitted for accreditation to date, there is a risk that Basin States have left too little time before July 2019:

- to complete effective engagement with Traditional Owners
- to have regard to the views of Traditional Owners in preparing their WRPs
- for MLDRIN and NBAN to develop their advice about whether the WRP requirements for Indigenous values and uses have been met.

The risk of not meeting the deadline is greatest for New South Wales because of the number of WRPs they have to develop and their delayed start to nation-based consultation.

Beyond accreditation of WRPs, it is important that Basin States continue to consult on, and have regard to, Indigenous values and uses of water. Fostering long-term partnerships with Traditional Owners would contribute to the achievement of Indigenous outcomes from the Basin Plan and state water resource management more generally.

7.3 Progress in implementing environmental water management provisions

The MDBA

There is scope for the MDBA to improve how it has regard to cultural values and uses when undertaking environmental water planning. At a Stakeholder Working Group meeting (chapter 1), NBAN and MLDRIN described limitations in the MDBA's consultation processes for its Environmental Management Framework, in particular that consultation with Indigenous organisations can be last minute.

The Commission is recommending (recommendation 11.1) that the MDBA strengthen the next iteration of the Basin-wide environmental watering strategy (BWEWS) in 2019 by including a secondary objective that, where environmental outcomes are not compromised, environmental watering should also seek to contribute to social or cultural outcomes.

The MDBA (2018i) has committed to partnering with NBAN and MLDRIN to develop guidance on the outcomes Indigenous Nations would like environmental watering to achieve. It intends to incorporate this information into the Basin environmental watering priorities from 2019-20. This work should also feed into the 2019 BWEWS.

Monitoring the effect of environmental watering on cultural values

The MDBA has reported some information about how environmental watering has contributed to cultural outcomes. In the 2017-18 Basin environmental watering priorities, the MDBA referred to two case studies by MLDRIN and NBAN that demonstrate how past environmental watering has contributed to outcomes for Indigenous Australians. The case study by MLDRIN (2017) described how a watering event in 2014 in the Barapa Barapa portion of the Gunbower Forest improved the condition of understorey vegetation, which supported cultural values. The case study by NBAN (2017) described how environmental watering in the Macquarie Marshes has supported cultural outcomes for the Wayilwan Nation since they became involved in environmental water management in 2007.

This reporting role is likely to grow. In June 2018, the Australian Minister for Water (Littleproud 2018b) gave a Direction under the *Water Act 2007* (Cwlth) that the MDBA must report annually on how environmental water holders have considered Indigenous values and uses and involved Indigenous Australians, when planning for environmental watering.

The CEWH and The Living Murray Initiative

The Commonwealth Environmental Water Holder (CEWH) works with NBAN, MLDRIN and other Indigenous groups to improve collective understanding about cultural values and investigate ways to deliver shared benefits from environmental water (CEWH 2017b, 2017a). The CEWH is also involved in the local engagement processes of Basin States that enable a range of stakeholders, including Traditional Owners, to share views on environmental watering (CEWH 2017a).

In May 2018, the Australian Government announced that it will require the CEWH to enhance engagement with Indigenous communities on decisions underpinning the use of environmental water to meet Indigenous values (DAWR 2018f). The CEWH should not necessarily undertake all consultation processes themselves but should ensure that environmental watering priorities and proposals are based on meaningful consultation between local water managers and Traditional Owners or Indigenous organisations.

In 2016-17, environmental watering (using jointly held water) under The Living Murray Initiative was informed by proposals developed with the support of a range of stakeholders including Traditional Owners (MDBA 2017a). The Living Murray Initiative also includes an Indigenous Partnerships Program (IPP). In 2016-17, activities under the IPP included consultation on site-based environmental water planning, cultural heritage management, pest

management and ecological monitoring; and building the capacity of Indigenous communities to identify and share cultural knowledge and values (MDBA 2017a).

The Southern Connected Basin Environmental Watering Committee (SCBEWC) makes decisions about the allocation of the water held under The Living Murray Initiative and the coordination of environmental watering in the southern Basin. SCBEWC should consult with MLDRIN when developing its annual priorities for the southern Basin (chapter 11).

Basin States

Basin States have taken steps to consider and provide for cultural values as part of environmental watering. The New South Wales Government includes Indigenous representation on its Environmental Watering Advisory Groups (EWAGs) (MDBA 2017k). The Victorian Environmental Water Holder's (VEWH's) seasonal watering plan is informed by proposals by Catchment Management Authorities (CMAs) who undertake consultation with Traditional Owners (DAWR 2018j; VEWH 2018). In South Australia, the *2016-17 Annual Environmental Watering Plan for the South Australian River Murray* was informed by Indigenous engagement initiated by the State's environmental managers when developing their watering proposals, including with the Ngarrindjeri Regional Authority and the First People of the River Murray and Mallee Region (DEWNR (SA) 2016a).

Victoria has taken additional measures to integrate cultural values and uses into its regulatory framework governing environmental water management. It appointed an Aboriginal Commissioner to the VEWH in 2017 and has introduced legislation that will require the VEWH to consider opportunities to provide for Indigenous water-related environmental outcomes (PC 2017b).

MLDRIN (sub. DR139) noted that the state-based mechanisms for including Traditional Owner perspectives in environmental water planning could be better resourced and improved. Specifically, they advised that EWAGs may not be a culturally appropriate forum for Traditional Owners (at least not without greater support and capacity building) and that opportunities for Traditional Owner input into watering proposals are not consistent across CMA regions.

Long-term watering plans (LTWPs) can be a valuable resource for managers of environmental water (chapter 11). MLDRIN (sub. DR139, p. 6) is concerned that LTWPs are 'not being prepared in a way that demonstrates proper, genuine and realistic consideration of Indigenous values' and claimed that some States have not incorporated Indigenous values and uses into their LTWPs.

The ability to provide for cultural values as part of environmental management is supported by quality, long-term partnerships and meaningful engagement at the local level. Basin States and environmental water managers should put processes in place so that knowledge that is shared and learnt at the asset level can be systematically captured and feed into environmental water planning and management (including LTWPs). Given that the amount

of knowledge about cultural values and how to provide for them continues to grow, planning processes should be responsive to new information.

The Commission is recommending (recommendation 11.6) that Basin States and environmental asset managers should have processes to engage with Traditional Owners, and that opportunities to contribute to cultural outcomes without compromising environmental outcomes should be actively pursued. Basin States should design consultation processes that reflect the preferences of Traditional Owners. Basin States should put these arrangements in place before the first revision of long-term watering plans.

7.4 Improving knowledge and evaluating outcomes

The MDBA's work program

The MDBA Aboriginal Partnerships team undertakes a range of projects to support improved Indigenous outcomes. The MDBA, in partnership with Indigenous Australians, has developed processes and research tools to assist Traditional Owners with engaging in water research, planning and management, and to build the skills and knowledge of all people involved in water planning (MDBA 2017c). Projects include Use-and-Occupancy Mapping, the Aboriginal Waterways Assessment tool, developing the sociocultural research methodology used in the Northern Basin Review, the Strengthening Connections Plan, the Aboriginal Weather Watchers Project and the Aboriginal Submissions Database (MDBA 2017c).

The Aboriginal Waterways Assessment methodology was developed by the MDBA, MLDRIN and NBAN to enable Traditional Owners to measure and prioritise the spiritual, cultural and environmental value of chosen wetland and river sites and measure the health of these sites (MDBA 2015a). All Basin States have funded or committed to fund Traditional Owners to carry out waterways assessments on their traditional lands, with findings to be incorporated into water planning and environmental management (DNRN (Qld) 2017; DNRME (Qld) 2018; MDBA 2017e; Riverine Herald 2018).

Australian Government funded programs and projects

On 29 June 2018, the Australian Government and MLDRIN announced the release of the findings from the National Cultural Flows Research Project (box 7.2). This project aimed to support Indigenous Australians and water planners to provide for cultural flows, through both the development of a cultural flows assessment methodology and a review of relevant legal and policy mechanisms.

MLDRIN (sub. DR139) suggested that the outputs of this research should be built into processes related to the implementation of the Basin Plan, including the environmental water planning, development of WRPs, evaluation, reporting and risk assessment. The National

Farmers Federation (sub. DR129, p. 16) acknowledged the results of the National Cultural Flows Research Project ‘as a pathway to recognise and develop a framework for the inclusion of cultural flows in the Plan’.

Tools like the Aboriginal Waterways Assessment methodology and the cultural flows assessment framework are likely to provide future benefits as they are applied across various elements of water resource management. Most Basin States have not yet articulated how they plan to use the findings from the National Cultural Flows Research Project. The South Australian Government stated that it recognised the outcomes of the Project and will work with South Australian representatives from MLDRIN to implement those findings within the South Australian context (DEW (SA) 2018b).

The Commission sees merit in Basin States considering the National Cultural Flows Research Project’s framework and findings as part of state water policies, environmental management and planning, and the preparation of the next iteration of state water plans.

Box 7.2 **The National Cultural Flows Research Project**

The National Cultural Flows Research Committee released several reports in June 2018 as part of the concluding stage of the National Cultural Flows Research Project (the Project). The committee formed in 2011 and was originally made up of representatives from MLDRIN, NBAN and the North Australian Indigenous Land and Sea Management Alliance. The MDBA provided support throughout the project. The committee was expanded in 2015 to include Australian and state government representatives. The Project was funded by several Australian government agencies.

The aim of the Project was to “secure a future where First Nations’ water allocations are embedded within Australia’s water planning and management regimes, to deliver cultural, spiritual and social benefits as well as environmental and economic benefits” (p. 4). The Project centred on two case studies in New South Wales. The first was within a regulated system at the Toogimbie Wetlands on Nari Nari Country on the Murrumbidgee River near Hay. The second in an unregulated system near the Queensland border, at the Gooraman Swamp on Murrawarri Country.

The Project had three broad phases:

1. a literature review of known Indigenous values and uses of water in Australia
2. two field studies used to develop and test methodologies for quantifying cultural flows and monitoring and evaluating their effects. The results were generalised into a new cultural flows framework, with guidelines and technical reports developed for the community and water managers
3. a review of the policy and legal options available to Indigenous Nations and governments to give effect to cultural flows.

Source: Cultural Flows Planning and Research Committee (2018).

In May 2018, the Australian Government announced a range of measures to improve outcomes for Indigenous Australians in the Basin. Several of the commitments are likely to support the provision of cultural flows,¹²³ such as:

- funding of two full time staff positions and \$1.5 million to support NBAN and MLDRIN to work with Indigenous Nations and government agencies to translate the findings of the National Cultural Flows Research Project into practical and effective ways forward, and to continue the development of Aboriginal Waterway Assessments
- committing \$40 million to administer a program to support Indigenous investment in cultural and economic water entitlements
- presenting bills to Parliament in 2018 to increase the flexibility of the Indigenous Land Corporation to use its funds to access water entitlements
- working with New South Wales and Queensland to identify water entitlements in the northern Basin that could be allocated to Indigenous communities to support both cultural and economic activity (DAWR 2018f).

In the Commission's inquiry into National Water Reform, it recommended that the National Water Initiative should be revised to include provisions about how to provide access to water for Indigenous communities for economic development. It recommended that State and Territory Governments should source water within existing water entitlement frameworks, ensure adequate supporting arrangements, involve Indigenous communities in program design, specify governance arrangements, and regularly monitor and report on the program and its outcomes (PC 2017b).

The NSWALC (sub. DR135) and National Irrigators Council (sub. DR91) welcomed and supported the \$40 million program for investment in water entitlements for cultural and economic purposes. Some participants also supported the use of water entitlements to provide for cultural flows because they questioned a reliance on the use of environmental water for achieving cultural outcomes (Environment Victoria, sub. DR117; MLDRIN, sub. DR139).

There is still work to be done to implement the water entitlement investment program. For example, the Victorian Government (sub. DR142) commented that it is important that the program is developed and led by Traditional Owners and that program design should give consideration to how to deliver and apply water for Traditional Owners and Aboriginal groups who do not own land.

The \$40 million is for Indigenous communities in the Basin. It is not known if the Australian Government intends to announce similar programs for Indigenous communities outside of the Basin.

¹²³ Other measures include: a commitment of \$20 million over four years to provide grants for economic development projects for Indigenous, remote, rural and regional communities most affected by the Basin Plan; giving priority to Indigenous and local suppliers in the delivery of environmental works under the Northern Basin Toolkit measures; and supporting works for cultural gatherings and low impact water recreation, such as options to refurbish weirs at Wilcannia and Cunnamulla (DAWR 2018f).

FINDING 7.2

Basin Governments have developed, in partnership with Indigenous Australians, a range of tools and processes to support the recognition of cultural values and uses in state water planning, and environmental management and planning.

The Australian Government has also committed \$40 million to administer a program to support Indigenous investment in cultural and economic water entitlements in the Basin. The objectives and principles guiding the implementation of this program have not yet been articulated. It is unclear why this funding is limited to Indigenous communities in the Basin, rather than being available to all Indigenous communities in Australia.

Progress in monitoring and evaluating outcomes

The MDBA developed and trialled a participatory and cross-cultural evaluation methodology to track how the implementation of the Basin Plan was taking Aboriginal interests into account (MDBA 2017b). The evaluation strategy was trialled in the Barkandji Nation's Country along the Darling River (the Baarka) (MDBA 2017b). The trial included surveys, which explored the relationship between water management and determinants of Aboriginal health and wellbeing.

This evaluation approach was based on that used for the socioeconomic analysis for the Northern Basin Review. For the Northern Basin Review, the MDBA sought information about Aboriginal values and priorities through NBAN and conducted a sociocultural survey that looked at the importance of environmental water to Traditional Owners in three towns (MDBA 2017b).

The MDBA will be assessing Indigenous outcomes in its 2020 evaluation of the Basin Plan. However, the trialled evaluation methodology will not be used because:

... the approach proved to be prohibitive in terms of scalability and budget. Feedback on the results also indicated that the subject matter explored and results of the trial were out of scope for Basin Plan evaluation requirements. (MDBA, pers. comm., 21 November 2018)

MLDRIN (sub. DR139) advocated for the critical role that proper monitoring and evaluation of Indigenous outcomes can play in enabling ongoing policy development and possible improvements to the Plan.

The MDBA (pers. comm., 21 November 2018) stated that it is continuing to work with MLDRIN and NBAN to develop an appropriate methodology for the 2020 evaluation. This work should be considered in relation to the Commission's recommendations regarding monitoring and evaluation of the Plan (chapter 13), including with regard to:

- the specific questions to be used to evaluate the outcomes and effectiveness of the Plan defined in the revised Basin Plan evaluation framework (recommendation 13.2)
- the monitoring strategy, which should outline what information will be collected to answer the evaluation questions (recommendation 13.3).

The Commission is also recommending that the MDBA publicly commit to the approach it will take for the review of the Plan scheduled for 2026 (recommendation 13.4). With the benefit of greater knowledge about cultural values and how to effectively provide for them, the 2026 review may provide an opportunity to re-examine the provisions set in the Basin Plan related to Indigenous values and uses. Evidence on outcomes may also inform the development of strategies that provide for Indigenous values and uses in the future.

8 Water quality

Key points

- The Basin Plan builds on decades of collaborative work by governments to manage water quality, particularly salinity.
- The Plan sets out non-mandatory objectives and targets for water quality to be suitable for drinking, agricultural, recreational, cultural and environmental purposes and includes:
 - specific river targets that relate to salinity levels (at five reporting sites), dissolved oxygen (blackwater events) and blue-green algae
 - an aspirational objective for salt export of two million tonnes per year from the Basin into the Southern Ocean
 - a framework for developing water quality targets for each water resource area (based on the Australian and New Zealand Guidelines for Fresh and Marine Water Quality) which are required to be detailed in new Water Quality Management (WQM) Plans to be developed as part of Water Resource Plans (WRPs)
 - end-of-valley targets for the purposes of long-term salinity planning and management.
- In addition, the Basin Plan places obligations on Basin States, river operators, environmental water holders and the managers of planned environmental water to have regard to water quality targets when making flow decisions.
- Site-specific salinity targets indicate when salinity concentrations are likely to affect water users. They have been met at four of the five reporting sites.
 - The specific salinity target at Burtundy is not being met during periods of low flow. It should be reviewed in 2020, in the context of the drivers of low flows in the Lower Darling and any potential changes to the future operation of Menindee Lakes.
- The salt export objective is not being met. In periods of low flows, there can be an inherent conflict between meeting the site-specific salinity targets and meeting the salt export objective. The Murray-Darling Basin Authority (MDBA) 2020 review of salinity and water quality targets should consider whether the objective should be respecified or abolished.
- The main Basin Plan mechanism by which water quality will be managed in tributaries and catchments are WQM Plans which are part of WRPs. All WRPs are to be accredited by 30 June 2019. After this date, the MDBA's compliance responsibility will commence (with the exception of any plans that may require extension (chapter 6)).
 - It is important that WQM Plans adequately assess water quality risks, set out appropriate mechanisms to address water quality events when they occur and follow principles of effective water management planning.
 - It is equally important that the MDBA, through the WRP accreditation process, is clear and transparent in how it will assess adequacy of water quality.
- Communities are justifiably concerned about salinity and blue-green algae problems occurring in the Lower Darling.
 - The development of the WQM Plan for the New South Wales Murray and Lower Darling WRP is the process to resolve these concerns.

Maintaining the water quality of the Basin is crucial for a healthy environment, farming, industries, human consumption, recreation and cultural needs.

This chapter discusses how the Basin Plan incorporates the existing collaborative working arrangements that managed water quality across the Basin (section 8.1) and provides an outline of key water quality provisions under the Plan. The chapter then investigates whether targets and objectives under the Basin Plan are being met (section 8.2) and reports on the development of Water Quality Management (WQM) Plans (section 8.3).

8.1 The Basin Plan is an evolution in water quality management

Water quality issues in the Basin have been a focus of public concern, government policy and water managers since increasing irrigation development led to the rise of severe salinity issues in the 1980s. Water quality concerns intensified in the 1990s with increasing nutrient problems and toxic algal blooms in addition to salinity issues. Poor water quality can put stress on a range of aquatic organisms, impact on Aboriginal cultural and spiritual uses of water, increase the cost of drinking water treatment, contribute to public health risks and decrease the suitability of water for irrigation (DPI (NSW) 2017c).

Impacts of poor water quality can be local and can also intensify as water flows down through the system.

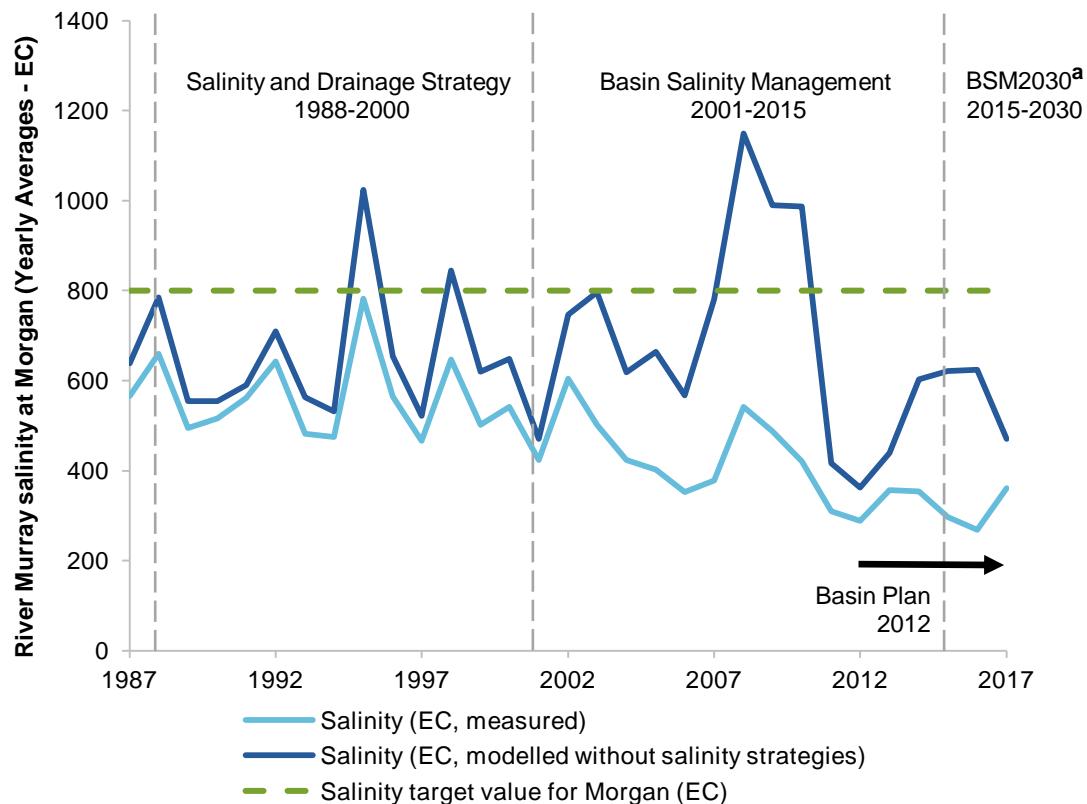
The Basin Plan builds on decades of collaborative work by Basin Governments to manage water quality, particularly salinity. The inter-jurisdictional approach began with the Salinity and Drainage Strategy (1988–2000), followed by the Basin Salinity Management Strategy (2001–2015), which managed salinity by placing limits on salt entering the river, investing in salt interception schemes and improving land and water management (MDB Ministerial Council 2015).

The Basin Salinity Management 2015–2030 (BSM2030), agreed by the Murray-Darling Basin (MDB) Ministerial Council in 2015 is the current joint management strategy for salinity mitigation. These strategies have led to a 30 year trend of decreasing salinity levels in the River Murray (figure 8.1).

Australian, State and Territory Governments have also worked together to develop the National Water Quality Management Strategy (NWQMS) which aims to deliver a nationally consistent approach to water quality management.

While the NWQMS is non-mandatory, it is utilised by all state and territory governments in establishing their own guidelines, regulations, policies, processes and/or standards for managing the quality and supply of water that is fit for purpose. (Australian Government 2018, p. 5)

Figure 8.1 Decreasing salinity in the River Murray



^a Basin Salinity Management 2030.

Data source: MDBA (pers. comm., 20 July 2018).

The NWQMS includes the development of the Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZECC guidelines).

The Basin Plan provides a water quality management framework built around existing measures

The Basin Plan sets out non-mandatory objectives and targets for water quality to be suitable for drinking, agricultural, recreational, cultural and environmental purposes. It includes:

- specific targets that relate to salinity levels (at five reporting sites), dissolved oxygen (blackwater events) and blue-green algae
- an aspirational objective for salt export of two million tonnes per year from the Basin into the Southern Ocean

- water quality targets (and a framework for refining these) for each water resource area based on the ANZECC guidelines¹²⁴ which are required to be detailed in new WQM Plans to be developed as part of Water Resource Plans (WRPs)
- end-of-valley targets for the purposes of long-term salinity planning and management based on targets set out in the MDB Agreement (box 8.1).

Box 8.1 **Water quality commitments under the Basin Plan**

The Basin Plan sets out a range of objectives and targets for water quality.

- Chapter 5 sets out a general objective to maintain appropriate water quality for environmental, social, cultural and economic activity in the Basin, and the related outcome that Basin water resources remain fit for purpose.
- Chapter 9 sets out a series of water quality targets to help ensure the Basin's water is suitable for drinking, agricultural, recreational and environmental purposes. These include:
 - specific river targets for managing water flows – salinity (at five salinity reporting sites), dissolved oxygen, and blue-green algae.
 - Water Resource Plan (WRP) targets for fresh water-dependent ecosystems, irrigation water and recreational water (based on the ANZECC guidelines).
 - surface water salinity targets for the purposes of long-term salinity planning and management by establishing a link to end-of-valley targets set out in the Murray-Darling Basin Agreement.
- Chapter 9 puts obligations on Basin States, river operators, environmental water holders and the managers of planned environmental water to have regard to water quality targets when making flow decisions.
- An objective for salt export for the River Murray system is included in Chapter 9. This is more aspirational than a target and aims for the discharge of an average of two million tonnes of salt from the River Murray System into the Southern Ocean each water accounting period (July to June).
- Chapter 10 (Part 7) states the need for WRPs to include a Water Quality Management (WQM) Plan. The provisions link the development of WQM Plans to the objectives and targets in Chapter 9 of the Basin Plan.

Source: MDBA (2017v).

The Basin Plan does not guide joint government action in the day-to-day management of water quality in the shared water resources of the Basin. Rather, BSM2030 integrates the requirements of the Basin Plan into the joint arrangements for salinity management and river operations. It is the mechanism by which governments collaborate on salinity management to implement individual, collective and coordinated actions in the shared water resources and, where necessary, in their catchments.

¹²⁴ The guidelines form the central technical reference of the National Water Quality Management Strategy, which all Australian, State and Territory Governments have adopted for managing water quality.

BSM2030 and the Basin Plan are consistent and inter-linked. They link State catchment-based arrangements for salinity management with Basin Plan WRP obligations, their obligations to have regard to the Basin Plan salinity targets for managing water flows and their mutual commitment to salinity management (MDB Ministerial Council 2015).

The role of flow management

Management of the quality of water in the landscape requires the management of pollutant inputs, catchment land-use and run-off and groundwater recharge which generally occurs under state environment protection laws and other relevant legislation and policies. However, river operations and flow management can also have a significant effect on water quality within rivers and streams.

The Basin Plan has a direct and positive effect on water quality, particularly on salinity in the River Murray by resetting the balance of consumptive and environmental water use. As water extracted for irrigation is reduced and irrigation efficiency is improved (in part because of Government investments in modernised water infrastructure) the risk of salt entering the river system is reduced. The provision of additional water for the environment also provides water quality benefits — from additional dilution flows to reduce salinity (MDB Ministerial Council 2015).

However, environmental watering can also, in some circumstances, have adverse effects on water quality such as increases in salinity. This means that proactive resource management is required to minimise water quality impacts (MDB Ministerial Council 2015).

Recognising the potential role of flow management in the management of water quality in rivers and streams, the Basin Plan places obligations on Basin States, river operators, environmental water holders and the managers of planned environmental water to have regard to targets (in Chapter 9 of the Basin Plan) when making flow decisions.

The concept of decision-makers having ‘regard to’ has been defined by the Murray Darling Basin Authority (MDBA) in relation to Basin Plan matters.

When a decision-maker is required to ‘have regard to’ particular matters, it is expected that the decision-maker will give those matters proper, genuine and realistic consideration, even if not ultimately bound to act in accordance with those matters. (MDBA 2013c, p. 109)

The MDBA provides assurance that Basin States and the Commonwealth Environmental Water Holder (CEWH) are having regard to the water quality and salinity targets when managing flows and using environmental water.¹²⁵ Failure to achieve targets is not a breach of the Basin Plan, but rather, sends a signal that management settings may require modification (MDBA 2018n). Reporting indicates that the MDBA, Basin States and the

¹²⁵ Under Schedule 12 of the Basin Plan, the MDBA, Basin States and CEWH must report annually on the extent to which regard is had, to the targets in Chapter 9 of the Basin Plan, when making flow management decisions.

CEWH are having regard to Chapter 9 Basin Plan targets when making flow management decisions (MDBA 2018l) (chapter 13).

8.2 Monitoring and evaluation of water quality targets and objectives

Ongoing monitoring and evaluation of salinity targets and the salt export objective tracks the implementation of salinity provisions and outcomes systematically and forms the basis of adaptive salinity management.

Salinity targets and the salt export objective

Salinity management across the Basin is an ongoing challenge. If not managed well, salinity poses an ongoing risk to the Basin’s land and water resources. Salt occurs naturally in the Basin’s landscape, but activities such as irrigation development and land clearing can increase the accumulation of salt in particular locations. Water flowing through the River Murray system and out to the Southern Ocean through the Murray Mouth is the only natural means by which salt can leave the Basin (MDBA 2017g).

Together, salinity targets and the salt export objective are intended to provide indicators of salinity management outcomes in the Basin.

- The salt export objective is based on an adequate flushing of salt from the river system but is aspirational in nature.
- The site-specific river salinity targets for flow management provide an indication of the salinity concentrations at key points in the River Murray system, and whether water quality is fit for purpose.
- The end-of-valley targets under BSM2030 ‘provide a valley scale context to the identification and management of salinity risks to the shared water resources’ (MDB Ministerial Council 2015). These are incorporated into WQM Plans.

The salinity target at Burtundy is not being met

The Basin Plan requires daily monitoring of salinity levels at five reporting sites, namely Lock 6, Morgan, Murray Bridge, Milang and Burtundy. The targets are deemed to have been met if salinity has been below the Basin Plan targets for 95 per cent of the time.

Between July 2012 and June 2017, salinity targets for flow management (under Chapter 9 of the Basin Plan) were met at four of the five reporting sites (table 8.1).

The unmet target was at Burtundy in the Lower Darling where salinity exceeded the target value for 36 per cent of days between July 2012 and June 2017. The MDBA reported:

Over the reporting period, the salinity at Burtundy was above the target value for 36 per cent of days. A dry period, between mid-2014 and mid-2016, in the Darling River system led to low flows in the lower Darling, downstream of Menindee Lakes, resulting in over 1500 EC salinity at Burtundy from early March to mid-August in 2016. The lack of water available from Menindee Lakes made it difficult to take actions to effectively manage salinity in the lower Darling River. (MDBA 2017g, p. 4)

High levels of salinity have been a persistent problem during periods of low flows in the Lower Darling. Key drivers of flows in the Lower Darling include:

- total inflows (both up and downstream of Menindee)
- how much water is extracted by upstream users (upstream of Menindee) in low flows
- how Menindee Lakes is and will be managed (downstream of Menindee) (MDBA 2018y).

A recent MDBA (2018ao) report on the hydrological history of the Barwon-Darling found that since 2000, there have been much longer periods of no to very low flows. This is discussed further in section 8.3 and chapter 9.

**Table 8.1 Salinity levels compared to target values in the Basin Plan
Five-year reporting period (July 2012 to June 2017)**

Reporting site	Target value (EC in $\mu\text{S}/\text{cm}$)	Non-exceedance salinity ($\mu\text{S}/\text{cm}$)	Percentage of days above the target value
River Murray at Murray Bridge	830	563	0
River Murray at Morgan	800	520	0
River Murray at Lock 6	580	363	0
Darling River downstream of Menindee Lakes at Burtundy	830	1 620	36
Lower Lakes at Milang	1 000	877	0

Source: MDBA (2017g).

Given that the salinity target at Burtundy cannot be consistently met during periods of low flow in the Lower Darling, it is legitimate to question why this is the case. For example, has the target (as specified) been effectively set as a real-time management tool? Or is there an issue with the effectiveness of management arrangements and responses to manage water quality?

The MDBA's assessment of the salinity targets provides data to ascertain whether targets have been met but it fails to address the key issue — whether changes should be made (for example, to river operations) given the poor flow and salinity outcomes in the Lower Darling.

Salinity targets will be reviewed by the MDBA in its 2020 review of salinity and water quality targets. The salinity target at Burtundy, in particular, requires critical examination

with a view as to whether the target should be abolished or respecified given that it is persistently not being met during periods of low flows in the Lower Darling. Key considerations include:

- the role, value and utility of the Burtundy target
- whether operational changes should be made at Menindee Lakes to increase the likelihood that the target can be met
- whether the Burtundy target should be respecified during very dry periods
- whether the Burtundy target is redundant (and should be abolished) because the salinity target at Morgan is the best measure of outcomes from shared Basin salinity responsibilities.

The value of the salt export objective is questionable

The MDBA assesses whether the two million tonnes per year salt export objective is being met by estimating of the number of tonnes of salt exported per year into the Southern Ocean from the River Murray system (averaged over the preceding three years).

The salt export objective is not being met

During the most recent three year assessment period (July 2014 to June 2017) the estimated annualised rate of salt export over the barrages was 870 000 tonnes (table 8.2). This was significantly less than the Basin Plan's objective.

Table 8.2 Salt export and salt interception schemes (SISs)

Reporting year	2014-15 (tonnes/year)	2015-16 (tonnes/year)	2016-17 (tonnes/year)
Estimated salt export over the lower lake barrages — annual average over three preceding years	900 000	560 000	870 000
Salt diverted away from the river and adjacent landscapes through SISs	432 000	525 000	395 000

Source: MDBA (2017g).

A number of factors influence whether the salt export objective can be met

The salt export objective is influenced by a number of factors including the operation of salt interception schemes (SISs), river regulation, changed land management practices, complex groundwater systems and the highly variable hydrological conditions in the Basin.

In particular, SISs play an important role in salinity management, diverting salt from the river during periods of low flows. For example:

- in the relatively dry 2015-16 reporting year, SISs diverted over 500 000 tonnes of salt away from the River Murray system and an average of 560 000 tonnes of salt was exported through the river mouth
- in comparison, in the relatively wet 2016-17 reporting year, SISs played a less significant role in salinity management. In that year, 395 000 tonnes of salt was diverted under SISs and an estimated average of 870 000 tonnes of salt was exported to the Southern Ocean (table 8.2).

There can be conflict between the salt export objective and salinity targets

In periods of low flows, there is an inherent conflict between meeting salinity targets and meeting the salt export objective. Maintaining water quality that is fit for purpose by meeting salinity targets should be prioritised over meeting the salt export objective. The MDBA stated that:

It may not be possible to flush 2 million tonnes of salt consistently while maintaining salt concentration or the salinity levels in the river at acceptable levels. During periods of low flows, preventing salt entering the river is more important than exporting salt to the ocean. (MDBA 2017g, p. 4)

Given this conflict, the value of the salt export objective is questionable. As such, the inquiry draft report recommended that the salt export objective should be reviewed in the MDBA's 2020 review of salinity and water quality targets with consideration as to whether the objective should be respecified or abolished.

While the majority of inquiry participants (that commented on the salt export objective in post-draft inquiry submissions, comments and hearings) supported a review of the salt export objective, some argued that it should not be abolished, citing environmental concern.¹²⁶

The MDBA's 2020 review of salinity and water quality targets should consider the benefits of the salt export objective. And, in particular, whether there are any specific environmental benefits associated with achieving the salt export objective that are not already covered in achieving the environmental outcomes of the Basin Plan. If no additional benefits are identified, the salt export objective should be abolished.

126 For example: Dr Anne Jensen (sub. DR95), Inland Rivers Network (sub. DR105), Environment Victoria (sub. DR117), Conservation Council of South Australia (sub. DR118), River Lakes and Coorong Action Group Inc. (sub. DR124), and Sarah Moles (sub. DR133).

FINDING 8.1

Salinity targets for flow management have been met at four of the five reporting sites.

The salt export objective has not been met. In periods of low flows, there can be an inherent conflict between meeting site-specific salinity targets and meeting the salt export objective.

RECOMMENDATION 8.1

The Murray-Darling Basin Authority should review the Basin Plan salt export objective in its 2020 review of salinity and water quality targets. This review should consider:

- the relationship between the salt export objective and site-specific salinity targets that require a higher prioritisation to meet water quality objectives
- whether there are any additional environmental benefits associated with achieving the salt export objective that are not covered by achieving the environmental outcomes of the Basin Plan
- whether the objective should be respecified or abolished.

8.3 Water quality management plans

The main Basin Plan mechanism by which water quality will be managed at the local scale is through WQM Plans, which are a component of WRPs.

WQM Plans are being developed to take into account any potential and emerging risks to water quality for each WRP Area and to establish rules to meet water quality objectives. WQM Plans will identify key causes of water quality degradation and risks to water quality, incorporate water quality and salinity targets, and seek to provide the same or better levels of protection as those set out in the Basin Plan (MDBA 2013c).

The MDBA is responsible for assessing WRPs and advising the Minister on whether to accredit a WRP and any amendments to a WRP. Currently, only Queensland's Warrego-Paroo-Nebine WRP had been accredited (chapter 6).

Generally, State water quality legislation and policies already provide for water quality management in a manner that would fulfil many of the requirements under WQM Plans. Relevant material can form part of the WRP in accordance with s. 10.04 of the Basin Plan. The WRP accredited to date (Warrego-Paroo-Nebine) draws principally on the Healthy Water Management Plan prepared under the Queensland Environmental Protection (Water) Policy (DNRM (Qld) 2016). Publicly exhibited plans (while yet to be accredited) indicate that a similar approach is likely to be adopted in other Basin States.

In the development of WQM Plans, and through the WRP accreditation process, the MDBA and Basin States must ensure that WQM Plans are consistent with national water quality guidelines. The relevant guidelines are the:

- ANZECC guidelines
- Guidelines for Managing Risks in Recreational Water
- Australian Drinking Water Guidelines (MDBA, sub. 86 p. 42).

The Basin Plan sets high level water quality targets but enables Basin States (through WQM Plans) to develop alternative water quality target values (equivalent to water quality guidelines/objectives) — in accordance with the ANZECC guidelines. States must also state why an alternative target will be more effective in achieving the objective or why the target in the Basin Plan is inappropriate for that WRP Area (MDBA, sub. 86, p. 41).

The Warrego–Paroo–Nebine WRP includes a number of alternative, more locally relevant water quality target values than the default values included in the Basin Plan (DNRM (Qld) 2016).

The Basin Plan requires that all 33 WRPs be accredited by 30 June 2019. After this date, the MDBA's compliance responsibility for WRPs will commence (including the Warrego–Paroo–Nebine WRP). However, as discussed in chapter 6, WRP development is behind schedule (particularly in New South Wales) and there may be a need for some extensions to avoid the risk of compromising on quality. For WRPs that require extension, the MDBAs compliance role in these WRP Areas may commence beyond 1 July 2019.

Section 59 of the *Water Act 2007* (Cwlth) requires that an agency of a Basin State, an operating authority, an infrastructure operator or a holder of a water access right must not act inconsistently with a WRP or fail to act as required by a WRP. The MDBA's compliance role will be to monitor and enforce compliance of all regulated entities with accredited WRPs and ensure that State water management processes do not diverge from the accredited arrangements (chapter 12).

It is too early to gauge the likely effectiveness of the new arrangements at ensuring that water quality is fit for purpose, as only one WRP is currently accredited and the MDBA's WRP compliance role is yet to commence. However, there is considerable Basin-wide concern about water quality in the Lower Darling.

Arrangements for the New South Wales Murray and Lower Darling Water Resource Plan Area

The Commission has repeatedly heard concern (from inquiry participants in the Lower Darling and more widely, across the Basin) for water quality in one WRP Area — the New South Wales Murray and Lower Darling — where current arrangements do not appear to be delivering adequate water quality for much of the time. The ‘Lower Darling’ is the portion

of the Darling River regulated by releases from Menindee Lakes. Inflows to Menindee Lakes are sourced from the Barwon-Darling River and its tributaries.

Many inquiry participants expressed significant concern about persistent blue-green algae and salinity problems in the Lower Darling. A number of inquiry participants suggested that these problems were exacerbated by current management arrangements and advised that without change these problems are unlikely to be addressed under WRP processes (box 8.2).

Concerns about whether these water quality issues are impacting on the ability to provide water for meeting critical human water needs in the Lower Darling are discussed in chapter 9.

Box 8.2 Water quality in the Lower Darling: participants' views

Murray Valley Private Diverters Inc. (sub. 69, p. 37):

Water Quality issues in the Lower Darling are of major public and local concern – they are not being resolved under the Basin Plan. This question should be posed to the MDBA.

Wentworth Shire Council (sub. 48, p. 1):

The supply for communities reliant on the Menindee Lakes and Lower Darling River System, including the townships of Menindee, Pooncarie, Ellerslie, and Pomona is subject to ongoing water quality issues due to a decrease in flows in the Barwon-Darling System which has led to higher salinity levels being experienced and longer lasting blue-green algae blooms. The expected outcome looks bleak and our farmers are reporting an inability to plan long term, or even get information or be consulted about their particular issues.

Murray Lower Darling Rivers Indigenous Nations (sub. 72, pp. 10–11):

In many cases, water quality across the Basin is not adequate to support cultural activities. In particular, the condition of water resources in the Baarka or Darling River, have been identified as a threat to the ability of Aboriginal communities to sustain cultural practices, share knowledge and use the river.

Robert and Katharine McBride (sub. 78, pp. 11–13):

Since 2015, there have been clear issues with the quality of water in the Lower Darling. This has had a significant impact on communities and the environment ... there has been a clear failure of water managers to achieve appropriate water quality, and a failure to recognise and address these issues going forward, as we have seen a repeat of the same issues, and a failure of water managers to acknowledge and accept responsibility for the poor water quality ... several users extract water for stock and domestic use directly from the river, and that there are limited filtration systems available. This makes high quality safe water in the river an important matter.

Water quality and low flows

Water quality events (including salinity build up and blue-green algae blooms) in the Lower Darling are associated with periods of low flow. The drivers of flows in the Lower Darling include:

- total inflows (both up and downstream of Menindee)
- how much water is extracted by users (upstream of Menindee) in low flows

-
- how Menindee Lakes is and will be managed (downstream of Menindee) (MDBA 2018y).

In recent years, with the exception of 2016-17, there have been extremely low volumes of inflow into Menindee Lakes (MDBA 2016h, 2017p, 2018ae). The MDBA has acknowledged that small flows are important for maintaining water quality through regular flushing of refuge pools to mitigate against issues such as algal blooms and salinity spikes (MDBA 2018t). However, since 2000, there have been much longer periods of no to very low flows (MDBA 2018ao).

This recent inflow history has heightened community concern in the Lower Darling that the frequency of low flow events and water quality problems are increasing. Water quality issues are interlinked with the ability to provide for critical human water needs (CHWN) in the Lower Darling (chapter 9).

The MDBA reported that the observed flow reduction in recent years along the Barwon-Darling River is most likely the result of river regulation and water resource development, as well as different climate sequences (MDBA 2018w).¹²⁷ The role of the management of Menindee Lakes in exacerbating low flows is still contentious.

As outlined in chapter 9, while recent reports (MDBA 2018w, 2018ao) provide much needed data, on flows in the Barwon-Darling and the likely causes of the change in flows, they fail to address the key issue of what should be done to improve outcomes for the Lower Darling community.

The development of Water Quality Management Plans

The development of the WQM Plan for the New South Wales Murray and Lower Darling WRP is the process to resolve concerns regarding water quality in the Lower Darling.

Participants to the inquiry (through post-draft inquiry report submissions and in public hearings) have expressed a lack of confidence in the ability of the New South Wales Murray and Lower Darling WQM plan to ensure water quality in the Lower Darling. For example, Robert and Katharine McBride commented:

We have significant concerns about the development of the New South Wales Murray and Lower Darling Water Resource Plan, particularly given the lack of community engagement or consultation ... We have received no indication that the issue of connectivity will be resolved through the Water Resource Plans ... The response by the New South Wales Government in regard to addressing urgent water quality issues, particularly for stock and domestic users, has been both slow and minimal (sub. DR113, p. 3).

¹²⁷ The MDBA states that this conclusion should be taken as indicative only as it is based on comparing data from one small catchment upstream of Keepit Dam and the catchment upstream of Bourke, and other potential contributing factors, such as land use changes were not examined (MDBA 2018w, p. 18).

There is also heightening concern that WRPs will be unable to ensure that water quality, in the Darling River is fit for cultural use. Murray Lower Darling Rivers Indigenous Nations (MLDRIN) said:

Barkandji people on the Baarka, Darling River are facing the impacts of declining flows, poor water quality and associated social/cultural dislocation. Unless water resource allocation and management under the Plan can address these kinds of impacts, MLDRIN believes implementation is inequitable and the Plan is not achieving its intended purposes. (sub. DR139, p. 2)

Indigenous values and water use is discussed in more detail in chapter 7.

WQM Plans must adequately assess water quality risks, set out appropriate mechanisms to address water quality events when they occur and follow principles of effective water management planning. Key principles include evidence based analysis drawing on different response options, sound documentation, transparency, and ongoing and meaningful community engagement. The MDBA advised:

If there are community concerns about water quality issues in the Murray and Lower Darling WRP, these issues should be raised through the appropriate New South Wales community consultation processes, including public exhibitions on the WQMP elements of the WRP. (MDBA pers. comm., 6 November 2018)

It is important that the New South Wales Murray and Lower Darling WQM Plan address the risks to water quality from current operating rules at Menindee Lakes and from longer periods of no to very low flows.

Chapter 9 examines recent operating plans (MDBA River Murray System Annual Operating plans and WaterNSW Lower Darling Operations plans). It finds that operating plans should interact effectively to ensure that any roles they have in managing risks to the supply of CHWN in the Lower Darling are integrated. And, that this interrelationship should be reflected in the New South Wales Murray and Lower Darling WRP. This should also assist in addressing water quality concern in the region.

It is equally important that the MDBA, through the WRP accreditation process, is clear and transparent in how it will assess the adequacy of water quality management plans (in the New South Wales Murray and Lower Darling WRP, in particular). The MDBA said:

[The] MDBA uses a set of published criteria and guidelines that were prepared for assessing Water Resource Plans (WRPs) prepared by New South Wales and other states, including for Chapter 10 part 7 of the Basin Plan for those aspects relating to Water Quality Management Plans (WQMPs) ... Through the WRP accreditation process the MDBA applies the criteria and guidelines to ensure that the requirements of the provisions in Chapter 10 part 7 of the Basin Plan have been adequately addressed. This process has been made clear to the states, including New South Wales, who is required to identify the cost-effective measures in the Murray and Lower Darling water quality management plan. (MDBA pers. comm., 6 November 2018)

Once WRPs, enter into force, compliance, monitoring and adaptive management will be critical to the effectiveness of WQM Plans to achieve good outcomes in water quality management. Chapter 6 examines WRP processes including assessment, accreditation and compliance. In particular, chapter 6 discusses core WRP accreditation requirements and recommends that in limited circumstances (such as the New South Wales Murray and Lower Darling WRP) extensions to WRP timeframes are necessary to allow for adequate community consultation and negotiation regarding water quality provisions.

FINDING 8.2

Communities across the Basin are justifiably concerned about the management of water quality during periods of low flow in the Lower Darling. The development of the Water Quality Management Plan for the New South Wales Murray and Lower Darling Water Resource Plan is the process to resolve this concern.

9 Critical human water needs

Key points

- Critical human water needs (CHWN) are the minimum volumes of water that can reasonably be provided from Basin resources to meet core human consumption requirements that, if not met, would cause prohibitively high social, economic or national security costs.
- In communities that are dependent on the River Murray system, the Basin Plan and the Murray-Darling Basin Agreement set water volumes for CHWN based on experience during the Millennium Drought, and establish a three-tiered approach to water sharing.
- Since the Basin Plan entered into force, the Murray-Darling Basin Authority (MDBA) has not declared either Tier 2 or Tier 3 water sharing arrangements — the effectiveness of CHWN provisions for River Murray communities has not been tested under a significant dry period.
- Participants to this inquiry reported confidence in the provisions for meeting CHWN in extreme dry conditions in River Murray communities.
 - The MDBA is undertaking a proactive approach to preparing to meet CHWN in periods of extreme dry through continual risk assessment, scenario testing and education.
 - The Basin Plan provisions for supplying CHWN in the River Murray system in periods of low water availability are robust — no changes to the provisions are warranted.
- For Basin communities outside the River Murray system, the Basin Plan requires that Water Resource Plans (WRPs) describe how CHWN will be met during extreme events.
 - In WRP Areas where Basin States are developing provisions for CHWN during extreme events there is an immediate need for transparency and good process.
 - It is equally important that the MDBA, through the WRP accreditation process, is clear and transparent in how it will assess the adequacy of provisions for meeting CHWN during extreme events.
- Communities across the Basin are justifiably concerned about the management of CHWN during periods of low flow in the Lower Darling.
 - The MDBA River Murray System Annual Operating Plan and the WaterNSW Lower Darling Operations Plan should evaluate any failures to meet predicted outcomes in the Lower Darling, and consider whether there are fundamental issues that should be addressed, through these plans or wider water-sharing arrangements.
 - The MDBA and WaterNSW operating plans should also interact effectively to manage the risks to the supply of CHWN in the Lower Darling.
 - The development of the extreme event provisions in the New South Wales Murray and Lower Darling WRP is the process to resolve CHWN concern in the Lower Darling.
 - Extreme event provisions in the New South Wales Murray and Lower Darling WRP should describe how the MDBA, River Murray System Annual Operating Plan and the WaterNSW, Lower Darling Operations Plan interact with each other and with provisions to meet CHWN.

The Basin provides water to over three million people for critical human water needs (CHWN) such as drinking, food preparation and sanitation. CHWN is defined under the *Water Act 2007* (Cwlth) as the minimum amount of water that can reasonably be provided from Basin resources to meet:

- core human consumption requirements in urban and rural areas that are dependent on Basin water resources
- non-human consumption requirements that, if not met, would cause prohibitively high social, economic or national security costs (s. 86A(2)).

Under the Basin Plan, CHWN is managed through two planning mechanisms.

- In communities that are dependent on the River Murray system, the Basin Plan (Chapter 11 of the Plan) and the Murray-Darling Basin Agreement set specific water volumes required to meet CHWN, and establish a tiered approach to water sharing. These provisions were forged during the Millennium Drought. They reflect the lessons of that extreme dry period, the worst ever recorded (MDBA, sub. 86).
- In other Basin communities (those that are not dependent on water from the River Murray System), the Basin Plan (Chapter 10, Part 13) requires that Water Resource Plans (WRPs) describe how CHWN will be met (for each WRP Area) during extreme events.

This chapter discusses these two mechanisms for planning to meet CHWN during periods of extreme dry. Section 9.1 discusses the tiered approach to water sharing in the River Murray System and the MDBA's approach to dry scenario preparedness. Section 9.2 examines planning for CHWN through extreme event provisions in WRPs.

9.1 Critical human water needs in the River Murray system

During the Millennium Drought, when inflows were at a record low, Basin States faced the prospect of being unable to meet water for CHWN in the River Murray system (MDBA 2016i).

In response, jurisdictions agreed that in the River Murray system, CHWN should be prioritised above all and developed specific water sharing rules for periods of extreme water scarcity. In 2008, the concept of CHWN for the River Murray system was added to the Water Act. At this time, additional CHWN provisions were included in the Murray-Darling Basin Agreement and these were then reflected in the Basin Plan in 2012 (box 9.1).

Box 9.1 CHWN provisions in the River Murray system

Critical human water needs are met in accordance with the arrangements in the Water Act, the Basin Plan, and the Murray-Darling Basin Agreement.

The Water Act (Part 2A)

The Water Act establishes CHWN as the highest priority water use for communities that are dependent on the Basin's water resources. To give effect to this in the River Murray system, the Water Act provides conveyance water (required to deliver CHWN) as the first priority of available water. The Water Act sets out a range of requirements (such as volumes for CHWN) for the Basin Plan to address CHWN. The Water Act also requires an emergency response by the Murray Darling Basin Authority and the Basin Officials Committee if a water quality trigger is reached.

The Basin Plan reflects the requirement of this Act

Chapter 11 of the Basin Plan sets out a three-tiered system for water sharing, including :

- volumes of water for CHWN
- conveyance water and the conveyance reserve
- salinity and water quality triggers at which water becomes unsuitable for meeting CHWN
- processes to assess and manage risks associated with inflow prediction
- triggers for changing water sharing tiers.

The Murray-Darling Basin Agreement

The Murray–Darling Basin Agreement was again amended in 2011 to allow for CHWN provisions in the Water Act, and the provisions required by the Water Act to be included in the Basin Plan. The Agreement gives effect to these provisions by changing water sharing arrangements — for example, giving priority to conveyance water. Changes to the Agreement included Schedule G (accounting for the South Australian storage right) and Schedule H (water sharing during Tiers 2 and 3 events).

Source: MDBA (2016i).

Water volumes to meet critical human water needs

The highest priority water in the River Murray system is conveyance water for the river system, which is the volume of water required to ensure that the CHWN volume can be delivered to where it is needed, taking into account evaporation and seepage.

Chapter 11 of the Basin Plan sets out the agreed volumes for CHWN for New South Wales, Victoria and South Australia, and the conveyance water needed to deliver those CHWN volumes (MDBA nda). States set aside these volumes at the start of each water year.

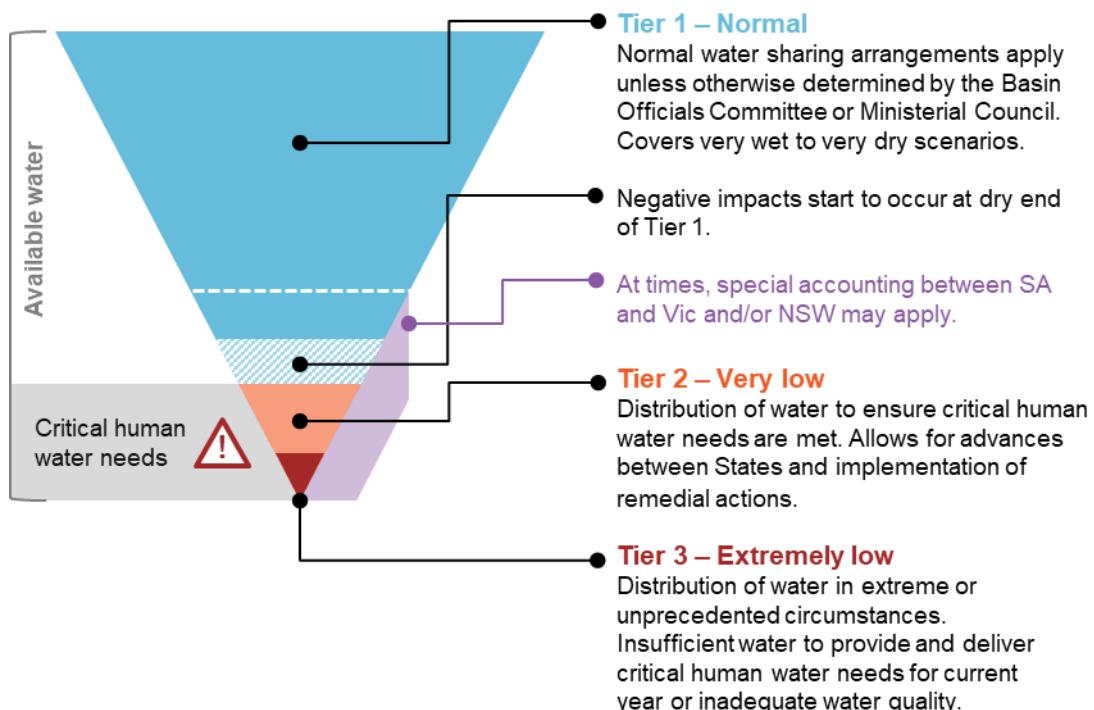
The Plan focuses on critical human water needs for communities dependent on the River Murray system, setting out a process to identify risks, while providing the flexibility to respond to circumstances. The MDBA and states have fully incorporated these Plan requirements into their water management practices. For example, processes are in place to ensure states set aside the required critical human water needs volumes and report these to the MDBA, by the start of the water year. (MDBA, sub. 86, p. 49)

The MDBA (sub. 86) and Department of Agriculture and Water Resources (sub. DR103) noted that the volume of water required to meet CHWN in New South Wales does not take into account the pipeline for supplying Broken Hill with water from the Murray River to improve long term water security. This is likely to have only a small impact on CHWN volumes. Any risks should be assessed as part of the MDBA's operational planning (discussed later in box 9.3).

Water sharing to meet critical human water needs

Water sharing is based on a three-tiered approach whereby Tier one represents normal water availability, Tier two is very low water availability and Tier three is extremely low water availability (figure 9.1).

Figure 9.1 Tiered water sharing in the River Murray system



Source: MDBA (nda).

Tier 2 and 3 water sharing arrangements occur in extreme conditions, similar to, or worse than the Millennium Drought.

The Basin Plan sets triggers for moving between tiers. Triggers are based on the amount of water available, or the quality of water, in the system. Water availability triggers are based on forecasts of the water available to meet conveyance water, conveyance reserve or CHWN requirements. Water quality triggers are activated if water cannot be treated for human

consumption, or if salinity is greater than 1400 EC ($\mu\text{S}/\text{cm}$) upstream of Wellington. Activating the water quality trigger establishes Tier 3 water sharing arrangements (MDBA nda).

The MDBA is responsible for declaring Tier 2 or Tier 3 water sharing arrangements, and the MDBA, the Basin States and the Department of Agriculture and Water Resources are jointly responsible for reporting on the implementation of the emergency response process for meeting CHWN (when necessary). If the MDBA has declared Tier 3 water sharing arrangements the Ministerial Council must meet at least once every four months to consider recommendations or reports by the Basin Officials Committee and take appropriate action (box 9.2).

Effectiveness of the River Murray system CHWN provisions

The MDBA reports annually on whether CHWN have been met. The system is currently under Tier 1 arrangements. The MDBA reported:

Tier 1 water sharing arrangements are expected to continue for 2018-19. If inflows over 2018-19 are extremely low, and do not recover in 2019-20, there may not be sufficient water to sustain Tier 1 next year and delivery of critical human water needs may be a challenge. The probability of this occurring is low but nonetheless a possibility. The MDBA will liaise with partner governments to closely monitor risks and adjust plans accordingly in the knowledge that drought security is reliant on forward planning and the management of reserves. (MDBA 2018ae, p. 12)

Since the Basin Plan entered into force, the MDBA has not declared either Tier 2 or Tier 3 water sharing arrangements. As such, the effectiveness of CHWN provisions for River Murray communities has not been tested under a significant dry period. However, inquiry participants reported confidence and satisfaction with current provisions for meeting CHWN in River Murray communities as the provisions were developed during the Millennium Drought and therefore have a sound foundation. For example, the South Australian Government (sub. 85, p. 4) commented that ‘no changes to the provisions for critical human water needs are needed at this time’. Similarly, the Department of Agriculture and Water Resources stated:

The Department considers the current triggers and measures within the Basin Plan adequate to meet any risks to CHWN which may arise. (sub. 81, p. 23)

And, Murray Valley Private Diverters Inc. said:

Critical human water needs provisions are already well protected in NSW Murray water sharing and resource planning, Victorian Planning — all provisions for both states and South Australian needs are well protected and there is no need for change. (sub. 69, p. 40)

Box 9.2 Roles in providing for CHWN in the River Murray

The role of the MDBA

The MDBA is responsible for declaring Tier 2 or 3 water sharing arrangements. In particular, it may declare (on its website) which tier is to cease and which is to enter into effect, under what conditions the declaration has been made and the date the change is to take place.

- Tier 1 water sharing arrangements occur when there is sufficient water available to meet conveyance, CHWN (New South Wales 61 GL, Victoria 77GL and South Australia 204 GL) and support starting seasonal allocations.
- Tier 2 will be declared if:
 - from 1 June to 31 August there is insufficient water to provide conveyance water in the current water accounting period and/or
 - from 1 September to 31 May there is insufficient water to set aside a conveyance reserve for the next water accounting period.
- Tier 3 will be declared if:
 - there is insufficient water to provide all of the CHWN in the current year or
 - there is insufficient water to provide the conveyance water in the current water year
 - the specified water quality or salinity trigger is reached.

The MDBA is required to advise the Basin Officials Committee (BOC) if there is unlikely to be sufficient water available to a State in the current water year to: meet any required contribution to the conveyance reserve; meet its contribution to current conveyance; or allocate at least the volume set aside by it for CHWN in the previous water year. If insufficient water is available, the MDBA is required to advise BOC whether an advance of water from another State could prevent a shortfall, including which State should make the advance and the volume required.

The role of the Basin States

It is the responsibility of the Governments of New South Wales, Victoria and South Australia to set aside the water volumes to meet CHWN, prescribed under Chapter 11 of the Basin Plan.

The Basin Plan also requires a State, via its BOC member, to advise the MDBA if a water quality trigger point has been reached, and of the need to enact Tier 3 water sharing arrangements.

The role of the Basin Officials Committee (BOC)

- If the MDBA has declared Tier 2 water sharing arrangements, BOC is required to determine if any remedial action is required — in the form of advances or otherwise.
- If the MDBA notifies BOC that there is insufficient water to meet the current conveyance requirements BOC must consider the MDBA's view. If BOC, agrees that there is insufficient water it must make a declaration to that effect and take remedial action. If BOC disagrees, the MDBA may decide to review its declaration of Tier 2 water sharing arrangements.
- If the MDBA has declared Tier 3 water sharing arrangements, BOC must meet at least once every two months to consider and recommend actions.

The role of the Ministerial Council

If the MDBA has declared Tier 3 water sharing arrangements, the Ministerial Council must meet at least once every four months to consider recommendations or reports by BOC and take appropriate action.

Source: MDBA (2013b).

Periods of extreme dry are inevitable in the River Murray system. The CHWN provisions under the Basin Plan establish a solid framework for managing CHWN under dry climate scenarios.

Effective planning to meet CHWN also relates to preparedness — for example, through continual risk assessment, scenario testing and education. The MDBA have demonstrated a proactive approach in this area (box 9.3).

Box 9.3 **Preparedness to meet CHWN in the River Murray system**

The Murray-Darling Basin Authority employs a range of strategies to prepare for meeting critical human water needs in periods of extreme dry in the River Murray system.

Scenario planning

Ongoing scenario testing is important in water resource management because there are many dynamic variables (such as rainfall, soil moisture and water user demands) that influence water availability and these are difficult to forecast.

The MDBA reports on water availability scenarios in the *River Murray System Annual Operating Plan*. The scenarios are prepared by the MDBA with input from the Australian Government and the States of New South Wales, Victoria and South Australia through the MDBA's Water Liaison Working Group.

River Murray system scenarios for 2018-19 include six scenarios ranging from extreme dry to wet scenarios (MDBA 2018ae).

Education

In 2015-16, in response to increasingly dry conditions the MDBA conducted a drought preparedness project. Its aim was to educate and prepare River Murray water resource managers and CHWN decision makers for the implementation of CHWN provisions in the Plan.

The project also included a comprehensive review of the actions taken to respond to the Millennium Drought (MDBA 2016a). The 2016 report *Since the Millennium Drought* concluded that the changes made to managing extreme dry conditions in the River Murray System in response to the Millennium Drought provide a 'robust but flexible framework' to plan for and manage extreme dry conditions (MDBA 2016i, p. 7).

Monitoring and evaluation

The MDBA undertakes ongoing risk assessment for CHWN and has stressed the importance of future evaluation. The MDBA commented:

Looking to the future, the MDBA will continue to closely monitor risks to critical human water needs and the management of extreme droughts, and will factor any relevant new information into future reviews of the Plan. After any triggering of Tier 2 or 3 water sharing arrangements, the MDBA would review the effectiveness of its response, including the requirements of the Plan and the Murray–Darling Basin Agreement and would seek amendments if required. (sub. 86, p. 50)

FINDING 9.1

The Basin Plan provisions for supplying critical human water needs in the River Murray system in periods of low water availability are robust and no changes to the provisions are warranted.

9.2 Managing CHWN through Water Resource Plans

A common misconception amongst Basin communities is that CHWN provisions under Chapter 11 of the Basin Plan apply to all Murray-Darling Basin communities. This is not the case. In Basin communities not supplied from the River Murray system, the provision of water for CHWN is managed through extreme event provisions in WRPs. This also applies to the management of CHWN in the Edward-Wakool system (box 9.4).

Box 9.4 CHWN in the Edward-Wakool system

There is some confusion as to why critical human water needs (CHWN) in parts of the Edward-Wakool system are managed through Water Resource Plans rather than Chapter 11 provisions in the Basin Plan given the Edward-Wakool is managed as part of the River Murray system.

Murray Valley Private Diverters Inc. commented:

In times of extreme drought critical human water needs are not protected in the Edward-Wakool System. The Basin Plan 86B highlights communities dependent on the waters of the Edward-Wakool systems downstream of Stevens Weir are excluded from the mandatory content of the Basin Plan (arrangements for critical human needs). This is a major oversight of the Basin Plan. (sub. 69, p. 40)

The Water Act and Basin Plan explicitly exclude, from CHWN provisions, communities dependent on the waters of the Edward-Wakool System downstream of Stevens Weir. This decision was made on the advice of representatives of the New South Wales Government, based on lessons from the Millennium Drought. In extreme circumstances, the CHWN of communities downstream of Stevens Weir can potentially be delivered more efficiently by overland transport rather than through running the river system (MDBA pers. comm., 20 July 2018).

This should be set out in the New South Wales Murray and Lower Darling Water Resource Plan.

Provisions for CHWN in Water Resource Plans

The Basin Plan (Chapter 10, Part 13) requires that WRPs describe how water resources are to be managed during an extreme event, including the provision of water for CHWN. Extreme events include extreme dry periods (such as a dry period that is outside the range of experience contained in the 114-year historical climate baseline), water quality events and infrastructure failure that could put at risk the supply of water for CHWN (box 9.5).

Box 9.5 Providing for CHWN in extreme events through WRPs

Similar to critical human water needs (CHWN) provisions in the River Murray system, it is expected that Water Resource Plans (WRPs) demonstrate that arrangements are in place to provide for CHWN during extreme events. The Murray-Darling Basin Authority *Handbook for Practitioners* (2013c) provides guidelines for Basin State governments in developing extreme event provisions.

The guidelines state that information that could be used to satisfy CHWN, extreme event provisions includes:

- roles and responsibilities relating to the management of water resources during the identified extreme events (for example, the powers of the Minister to declare an extreme event)
- the water management actions that will be implemented to respond to extreme events (for example restrictions on water take, the policies for determining the level and timing of those restrictions, and how water will be provided to the point of use)
- a demonstration of how the WRP will perform under extreme circumstances
- alternative water management rules to manage water resources during extreme events (for example, changes in the way that water allocation rules are applied)
- estimates of the volume of water required to meet CHWN
- the indicators that will be used to assess whether an event (such as a dry period or water quality event) is classified as extreme and determine the type or level of action to be taken (for example, specifying the duration or severity of an extreme event)
- circumstances in which a WRP can be suspended and the extent of temporary rules that could be put in place (MDBA 2013c).

The intention is for flexibility in arrangements. The MDBA reported:

In some cases, new scientific information will emerge that will change our understanding of the nature of extreme events — for instance, events that were once considered extreme and unusual are recognised as occurring more regularly. The WRP needs to contain structures that allow these changes in information to be taken into account, including considering the need to manage water resources differently. This may then lead to a review of the existing WRP and amendments to manage water differently, which would need to be accredited according to the requirements in the Act to have standing under the Basin Plan. (MDBA 2013c, p. 103)

The MDBA is responsible for assessing WRPs and advising the Minister on whether to accredit a WRP and any amendments to a WRP. Currently, only Queensland's Warrego-Paroo-Nebine WRP has been accredited. In this WRP Area, water for CHWN is not sourced from the Basin (DNRM (Qld) 2016).

The Basin Plan requires that all 33 WRPs be accredited by 30 June 2019. In Basin communities not supplied from the River Murray system, extreme event provisions for CHWN are expected to be accredited on the basis of guidelines in box 9.5. After 30 June 2019 the MDBA's compliance responsibility for WRP's will commence (including the Warrego-Paroo-Nebine WRP). However, as discussed in chapter 6, WRP development is well behind schedule (particularly in New South Wales) and there may be a need for extensions, in some WRP Areas, to avoid the risk of compromising on quality. For WRPs

that require extension, the MDBA's compliance role in these WRP Areas may move beyond 1 July 2019.

The Water Act requires that an agency of a Basin State, an operating authority, an infrastructure operator or a holder of a water access right must not act inconsistently with a WRP or fail to act as required by a WRP. The MDBA's compliance role will be to monitor and enforce compliance of all regulated entities with accredited WRPs and ensure that State water management processes do not diverge from the accredited arrangements (chapter 12).

It is too early to gauge the likely effectiveness of the new arrangements at delivering water to meet CHWN, during extreme events, as only one WRP is currently accredited (and it does not rely on Basin resources to supply water for CHWN) and the MDBA's WRP compliance role is yet to commence. However, there is considerable Basin-wide concern about whether CHWN can be consistently met in the Lower Darling.

Arrangements for the New South Wales Murray and Lower Darling Water Resource Plan Area

The Commission has repeatedly heard concern (from inquiry participants in the Lower Darling and more widely, across the Basin) for CHWN in one WRP Area — the New South Wales Murray and Lower Darling. The 'Lower Darling' is the portion of the Darling River regulated by releases from Menindee Lakes. Inflows to the Menindee Lakes are sourced from the Barwon-Darling River and its tributaries.

The provision of CHWN becomes a concern during periods of low flow. The risk to meeting CHWN in the Lower Darling is interlinked with water quality issues (chapter 8). Water quality events — including salinity build up and blue green algae blooms — are associated with periods of low flow and compound the problem of whether CHWN can be met.

The key community concern is that, since 2000, there has been an increase in the frequency and duration of no to very low flows.

A number of inquiry participants suggested that issues in meeting CHWN are exacerbated by current management arrangements for Menindee Lakes and advised that without change these problems are unlikely to be addressed under WRP processes. Robert and Katharine McBride commented:

There are significant concerns in meeting CHWN on the Lower Darling, which have increased since the introduction of the Plan and the 2012 Barwon-Darling WSP ... It is critical that CHWN of downstream users are prioritised in WRPs going forward ... Failure to prioritise connectivity (particularly in the Lower Darling) over efficiency of delivery of water by the MDBA (their primary priority as stated to us on many occasions) has led to serious risk to CHWN. The Menindee Lakes SDL adjustment mechanism project will significantly increase risk to CHWN on the Lower Darling. (sub. 78, p. 13)

Increased periods of low flows

The drivers of flows in the Lower Darling include:

- total inflows (both up and downstream of Menindee)
- how much water is extracted by users (upstream of Menindee) in low flows
- how Menindee Lakes is and will be managed (downstream of Menindee) (MDBA 2018y).

In recent years, with the exception of 2016-17, there have been extremely low volumes of inflow into Menindee Lakes (MDBA 2016h, 2017p, 2018ae). The MDBA has acknowledged the importance of small flows for the environment and for providing reliable and good quality water for CHWN in the Lower Darling (MDBA 2018t). However, since 2000, there have been much longer periods of no to very low flows (MDBA 2018ao).

Flow changes in the Lower Darling are influenced by multiple factors including climate, Menindee Lakes operation and water extraction (up-stream of Menindee Lakes). The MDBA report on the hydrological history of the Barwon-Darling found that while there are natural drivers of flow change (including groundwater seepage, pool recharge and evaporation) water extraction is also a significant factor (MDBA 2018ao). And, an MDBA assessment of flow changes in the northern Basin and water entering in the Menindee Lakes found that flow reduction in recent years along the Barwon-Darling River is most likely the result of river regulation and water resource development, as well as different climate sequences (MDBA 2018w).¹²⁸

While the MDBA's recent reports (MDBA 2018w, 2018ao) provide much needed data on flows in the Barwon-Darling and the likely causes of the change in flows, they fail to address the key issue of what should be done to improve outcomes for the Lower Darling community.

Management of Menindee Lakes

Stakeholders are particularly concerned that the current operation of Menindee Lakes is contributing to the observed increase in the frequency and duration of low flows in the Lower Darling. The Lakes are currently managed as the first preference to supply water to South Australia. Robert and Katharine McBride commented:

The Menindee Lakes were at full capacity in December 2016. The community again called for the NSW Government and MDBA to improve management of the Menindee Lakes storage to prevent the lakes and Lower Darling going dry. We argued that draining the Menindee Lakes as first preference of supply is not sustainable, and that the justification on the basis of high evaporation rates was not valid over having a connected river system and water in the Lower Darling. (sub. 78, p. 4)

128 the MDBA states that this conclusion should be taken as indicative only as it is based on comparing data from one small catchment upstream of Keepit Dam and the catchment upstream of Bourke, and other potential contributing factors, such as land use changes were not examined (MDBA 2018w, p. 18).

The Menindee Lakes storage is operated by the New South Wales Government, in accordance with the arrangements under the Murray-Darling Basin Agreement. Under the Agreement, when the volume of water at Menindee Lakes rises above 640 GL, and until it falls below 480 GL the water is shared between New South Wales, Victoria and South Australia (to meet downstream demands in the River Murray). The rules that frame how and when this water is to be released are outlined in the Agreement and further detailed in the *Objectives and Outcomes* for River Operations in the River Murray System (MDBA pers. comm., 13 November 2018). The MDBA's *River Murray System Annual Operating Plan* describes how Menindee Lakes will be operated to meet River Murray demands under a number of inflow scenarios in each incoming year.

There has been speculation from inquiry participants, as to whether the MDBA has changed its approach to operating Menindee Lakes. The MDBA has informed the Commission that this is not the case.

There has been no change to the rules that provide access rights to the MDBA in the last 5 years. The MDBA has continued to undertake operations in accordance with the rules. (MDBA pers. comm., 13 November 2018)

Management of extreme events (in the Lower Darling), including providing for CHWN, becomes an issue when Menindee Lakes are low. Under the Murray–Darling Basin Agreement, water is reserved for New South Wales when the Lakes drop to 480 GL at which time WaterNSW is then responsible for operating decisions.

The WaterNSW Lower Darling Operations Plan outlines how the New South Wales Government sets out to maximise the use of water to meet customer demands (within the Lower Darling) and to meet New South Wales and Victoria's contribution to the Murray while ensuring that CHWN can be met (under the scenario of the worst drought on record) (WaterNSW 2018).

In WRP Areas (such as the New South Wales Murray and Lower Darling) where there is a high risk of low flows that compromise the provision of water for CHWN, resource managers must be proactive. This includes ongoing risk assessment, effective evaluation of outcomes and responses, and adaptive management. An examination of the MDBA and WaterNSW operating plans reveals no evidence of effective evaluation.

In 2017-18, the MDBA's operating plan provided a forecast to water licence holders that water demand would be met.

Higher than average stream flows over 2016-17 resulted in relatively high storage volumes for the start of the 2017-18 water year ... The Menindee Lakes is holding around 45% capacity, which is sufficient to assure full allocation for all lower Darling licence categories (MDBA 2017p, p. 16).

Similarly, the December 2017 WaterNSW Lower Darling Operations operating plan forecast that water demand would be met in the 2017-18 water year.

Demands for town water supply, stock and domestic, high security and general security are expected to be met by ensuring the Lower Darling River remains connected to the Murray. (WaterNSW 2017, p. 10)

But, as detailed in the November 2018 WaterNSW plan, connection was not achieved in the Barwon-Darling system in the later part of 2017-18 and drought mitigation measures needed to be established in the Lower Darling.

The Barwon-Darling River system was mostly disconnected during the second half of 2017-18 water year. Wilcannia was at cease to flow condition for 97 days starting from 27 January 2018. Flow arrived at Wilcannia during 1st week of May from rainfall events of Moonie and Culgoa in Queensland then continued with Northern Connectivity Event. Barwon Darling River is not currently flowing, and flow ceased at the end of Northern Connectivity Event. The Menindee Lakes system has received around 1.5 GL of inflow over the winter months. Currently, with the total storage is below the trigger volume of 480 GL, several drought mitigation measures are in place. (WaterNSW 2018, p. 17)

Neither the MDBA operating plan or the WaterNSW operating plan provide an evaluation of why the predicted outcome (of a connected river system) was not achieved and whether Menindee Lakes operational measures require change to improve outcomes for the Lower Darling community.

While some uncertainty in water supply forecasts is unavoidable (as risks such as seasonal conditions and changes to the nature of inflows can be unpredictable), the absence of commentary on, or evaluations of, river operations and outcomes does not reflect an adaptive approach to water resource management. Where predicted outcomes are not achieved in the Lower Darling, consideration must be given as to the likely cause and whether there is a fundamental issue that should be addressed through operational plans, or wider water-sharing arrangements.

A related consideration is the interrelationship between the MDBA and WaterNSW operational plans. Community stakeholders have expressed significant concern that water volumes at Menindee Lakes are drawn down quickly (under the MDBA's call) with responsibility then handed to the New South Wales Government to manage the supply of water to meet CHWN in the Lower Darling.

This, seemingly blunt, handover of responsibility for water resource management (from the MDBA to the New South Wales Government), is potentially an issue that may result in public confusion, an absence of evaluation and a lack of accountability both now and under a WRP for the area (after 30 June 2019). The MDBA and WaterNSW operational plans should interact effectively to ensure that any roles they have in managing risks to the supply of CHWN in the Lower Darling are integrated.

The development of extreme event provisions

The development of the extreme event provisions in the New South Wales Murray and Lower Darling WRP is the process whereby the concerns regarding CHWN in the Lower Darling must be resolved.

Participants to the inquiry (through post-draft inquiry report submissions and in public hearings) expressed a lack of confidence in the process of developing the New South Wales Murray and Lower Darling WRP to ensure the provision of CHWN in the Lower Darling¹²⁹. For example, South West Water Users Group commented:

The issues around water quality, and I'd suggest also the extreme event policy, get very brief verbal mentions [during Stakeholder Advisory Panel meetings]. But realistically, if you're going to achieve anything on those you actually have to have the rules and the operating system structured in to what will become the Water Resource Plan, which is supposed to cover the whole river, and to do that you need those concepts incorporated into what are initially water sharing plans. Now, the unfortunate reality is that in New South Wales there is a categorical refusal to do that. (trans., p. 19)

It is important that the New South Wales Murray and Lower Darling WRP clearly documents how the MDBA River Murray System annual operating plan and WaterNSW Lower Darling Operations Plan, together, will assist in the management of CHWN.

In WRP Areas where Basin States are developing provisions for CHWN during extreme events there is also an immediate need for transparency and good process. In planning for extreme events (through WRPs) it is important that risks are assessed, appropriate mechanisms are in place to provide for CHWN when extreme events occur and that principles of effective water management planning are followed. Key principles include evidence based analysis drawing on different response options, sound documentation, transparency, and ongoing and meaningful community engagement.

It is equally important that the MDBA through the WRP accreditation process is clear and transparent in how it will assess the adequacy of provisions for meeting CHWN during extreme events (in the New South Wales Murray and Lower Darling WRP, in particular). The MDBA will have to clearly articulate its compliance role in overseeing the effective implementation of WRPs by Basin States and river operators (including the MDBA, as operator of the River Murray and WaterNSW).

Chapter 6 examines WRP processes including assessment, accreditation and compliance. In particular, chapter 6 discusses core WRP accreditation requirements and recommends that in limited circumstances (such as the New South Wales Murray and Lower Darling WRP) extensions to WRP timeframes are necessary to allow for adequate community consultation and negotiation regarding provisions such as arrangements for meeting CHWN during extreme events.

¹²⁹ For example: Healthy Rivers Dubbo (sub. DR104), South West Water Users (sub. DR107), Robert and Katharine McBride (sub. DR113) and Goulburn Valley Environment Group Inc. (sub. DR125).

FINDING 9.2

Communities across the Basin are justifiably concerned about the management of critical human water needs during periods of low flow in the Lower Darling. The development of the extreme event provisions in the New South Wales Murray and Lower Darling Water Resource Plan is the process to resolve this concern.

RECOMMENDATION 9.1

The New South Wales Murray and Lower Darling Water Resource Plan (WRP) should recognise the direct link between the management of Menindee Lakes, flows to the Lower Darling and the risks to the provision of water for critical human water needs.

The WRP should set out how key operational plans (including the Murray-Darling Basin Authority's River Murray System Annual Operating Plan and the WaterNSW Lower Darling Operations Plan) interact with each other to provide for critical human water needs.

10 Water trading rules

Key points

- Trade in the Basin has increased significantly in the past 30 years, supported by reforms that have reduced barriers to trade and improved market information.
- The Basin Plan trading rules aim to promote efficient water markets by introducing new requirements to improve market information and support confidence in the market, and by providing a mechanism to validate or remove restrictions on trade.
 - However, more should have been done since 2014 by the Murray-Darling Basin Authority (MDBA) and Basin States to review restrictions on trade and resolve compliance matters raised to date.
- The establishment of the Office of Compliance in late 2017 and release of a compliance policy by the MDBA in June 2018 may help speed up progress in assessing trade rules but there are additional improvements to compliance processes that could be made.
 - In particular, the MDBA should develop an assessment framework for reviewing trade restrictions and be more transparent about its compliance role, processes and the outcomes of its work.
- Basin Governments should be proactive in their market stewardship role. A priority should be examining the effects of changes in trade and water use patterns on the environment and other third parties.
 - It is important that Basin Governments are timely and transparent about how these issues are managed and have protocols in place for effectively communicating any policy changes to the market.
- Separating the agent of governments role and regulatory role of the MDBA would improve incentives to pursue both functions more effectively (chapter 14).
 - The Murray-Darling Basin Agency, as the agent of governments, could assist Basin States in their assessments of the need for new and existing restrictions on trade.
 - The Basin Plan Regulator would determine if restrictions on trade are compliant with the Basin Plan trading rules.

10.1 Background

History of trading in the Basin

Trade of water allocations and entitlements in the Basin has increased significantly since each of the southern Basin State Governments first allowed trade in the 1980s (Hughes, Gupta and Rathakumar 2016; NWC 2011). The development of the water market in the

Basin was further enabled by the major water reforms through the 1990s and 2000s. These included the Murray-Darling Basin Agreement (MDB Agreement) in 1992 and COAG commitments in 1994 and 2004, which introduced measures to reduce barriers to trade (including interstate trade) and to support trade through improved market information (NWC 2011).

Trade reforms have provided water users with greater flexibility to respond to changes in commodity prices and water availability. This facilitates water moving to higher value uses. Between 2008-09 and 2016-17, the volume of surface water allocations traded in the Basin increased by 139 per cent to over 4000 GL (ABARES 2018).¹³⁰ The value of entitlements held for consumptive use in the southern Basin was estimated to be about \$13.6 billion in 2017-18 (Aither 2018b, p. 24).

Trading under the Basin Plan

The Basin Plan contains objectives for water trading such as facilitating the operation of efficient water markets, protecting the needs of the environment, providing appropriate protection to third parties and minimising transaction costs on water trades through good information flows (s. 5.07(1)).

The Basin Plan also includes a chapter on water trading rules (chapter 12), which augment previous water trade-related reforms. The inclusion of the trading rules in the Basin Plan provides a common framework for the trading of water rights¹³¹ in the Basin.

The trading rules can be split into two main categories.

First, the trading rules define the types of trade restrictions that are permissible in the Basin. These rules largely apply to Basin States, which are responsible for the setting of trading rules and restrictions as part of their water resource management arrangements. An example of this type of rule is that a person may trade a water access right free of any restriction on the trade that relates to the person being a member of a particular class of persons (such as environmental water holders or irrigators) or the purpose for which the water will be used (ss. 12.07–12.08).

The second category includes provisions aimed at improving market information and market confidence. There are about 16 different notification, disclosure and reporting requirements that apply to Basin States, the Murray-Darling Basin Authority (MDBA), irrigation infrastructure operators and water traders. Examples of this type of rule are that persons aware of a market announcement must not enter into trades informed by that information until it is generally available (s. 12.51) and that Basin States must give the MDBA

¹³⁰ Transfers of environmental allocations have been excluded from this calculation.

¹³¹ Water rights applicable include water access entitlements, water allocations, irrigation rights and some water delivery rights.

information about the characteristics of different types of water entitlements in their jurisdiction (s. 12.43).

Most of the Basin Plan trading rules became effective in July 2014. However, under the Basin Plan Implementation Agreement, Basin States were given until Water Resource Plans (WRPs) are accredited (by July 2019) to ‘review and exercise their best endeavours’ to ensure that their trade restrictions are consistent with the Plan (MDBA et al. 2013, p. 24). Only trade restrictions related to the Basin Plan trading rules on groundwater (ss. 12.24–12.26) need to be included and accredited as part of WRPs¹³² — restrictions on surface water trade do not need to be accredited through WRPs.

The main consequence of insufficient progress in implementing the Basin Plan trading rules would be a slower rate of improvement to the efficiency of the water market. This can impose costs on those who would like to trade water, third parties and the environment, and prevent productivity gains that benefit the broader community. It is important that there is ongoing momentum to improve the efficiency of the water market over time.

Roles and responsibilities of the MDBA with respect to water trade

The MDBA has various roles and responsibilities with respect to water trade.

- The MDBA provides advice to Basin Governments on the implementation of Schedule D of the MDB Agreement, which sets principles and administrative arrangements for trade between valleys and States in the southern connected system. The MDBA’s functions under the MDB Agreement are funded by Basin Governments under a joint program.
- The MDBA also has a regulatory role under the Basin Plan, which includes enforcing compliance with the Basin Plan trading rules by Basin States and other parties obligated by the rules. As part of this role, the MDBA published guidelines to assist Basin States in understanding the requirements of the trading rules (MDBA 2014d).

The MDBA’s Water Trade Team is part of the Office of Compliance division but is also involved in joint activities for Basin Governments under the MDB Agreement. The MDBA is a member of two trade-related working groups, one for the implementation of the Basin Plan trading rules and the other for the MDB Agreement.

The MDBA’s regulatory role broadly entails two kinds of compliance.

1. It has a typical compliance role, which involves identifying, investigating and responding to breaches of the trading rules. For example, if a person selling a water access right does not notify the approval authority of the price agreed for the trade as per section 12.48, this would be a relatively straightforward breach of the water trading rules.

¹³² If a trade restriction is used as supporting information in a WRP, then changes to that trade restriction may require an amendment of the WRP. The MDBA’s process for considering minor amendments of WRPs is discussed in chapter 6 of this report.

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2. In contrast, compliance matters related to trade restrictions may not be so black and white. The clearest example of this are sections 12.16 to 12.18 of the Basin Plan, which state that surface water trade should be free of any restriction¹³³ except where it is necessary: due to the existence of a physical constraint, to address hydrologic connections and water supply considerations, to protect the environment or due to the level of groundwater hydraulic connectivity. Determining whether a trade restriction is consistent with this trading rule can involve detailed analysis and judgement.

The MDBA is taking a risk-based approach to enforcing compliance with the trading rules. In 2016, the MDBA set priorities for compliance based on an assessment of the relative importance that each requirement set under the trading rules has on the achievement of water trading objectives (MDBA 2016j). This document identified trade restrictions and the disclosure and management of water announcements as high priority areas for the MDBA's compliance work program (MDBA 2016j).

The MDBA has raised about 17 potential compliance issues with Basin States since the commencement of the trading rules in 2014 (MDBA, pers. comm., 21 November 2018). Some of these issues were identified during the extensive consultation processes undertaken by the MDBA and the Australian Competition and Consumer Commission (ACCC) during the development of the Basin Plan trading rules (MDBA, pers. comm., 3 May 2018). There have also been eight issues reported to the MDBA by members of the public as of July 2018, and the MDBA has recorded these complaints on its register of non-compliance allegations (MDBA 2017d, 2018r, 2018s).

The rest of this chapter discusses the effectiveness of the implementation of the trading rules and recommends ways to improve outcomes for the water market and trading. The Commission's assessment of the effectiveness of implementation has included consideration of:

- progress made in implementing the Basin Plan trading rule requirements
- whether arrangements and processes in place for implementation and compliance are sufficiently transparent, evidence-based, consultative and cost-effective
- risks to achieving the objectives for water trading.

The outcomes of this analysis are discussed under three different themes. Section 10.2 is about implementation and compliance with the trading rules related to trade restrictions. Section 10.3 describes new arrangements put in place by Basin Governments as a result of the trading rules to improve market information and market confidence.

Section 10.4 recognises that Basin Governments also need to be forward-looking in their market stewardship role. They need to be able to identify and manage potential issues associated with growth in trade and the constraints that might affect the delivery of trades.

¹³³ This rule applies to trades within a regulated system, between regulated systems, or within an unregulated system.

10.2 Restrictions on water trading

Some progress has been made in removing inconsistent trade restrictions ...

Section 12.19 of the Basin Plan requires Basin States to notify the MDBA of all restrictions on the trade of surface water and the allowable reasons for the restrictions. Basin States sent initial lists of restrictions to the MDBA in 2014 (MDBA 2017b). The total number of restrictions exceeded 1500 (MDBA, sub. 86, p. 45).

Many of these restrictions are valid. Reasons to restrict the trade of water rights include managing constraints on the physical delivery of water and third party effects from trade, including effects on the environment such as increased channel erosion or unseasonal flows. Trade can increase evaporation or seepage which causes conveyance losses that can affect the reliability of other water users' entitlements.

After consultation with the MDBA, Basin States reviewed and changed some of their trade rules as a result of the Basin Plan trading rules. For example, Victoria removed its four per cent annual limit on trade out of irrigation districts in 2014 and South Australia has allowed water traded from interstate to be carried over since 2016 (MDBA, sub. 86). Queensland's draft water plans for the Condamine–Balonne and Border Rivers–Moonie amend previous rules so that they support non-discriminatory trade (Queensland Government, sub. 87).

... but there is scope to do more

The changes to trade restrictions and efforts to consult on and identify compliance issues signalled early progress but it appears that there has been little progress since. Of the 17 potential compliance matters that the MDBA has raised with Basin States, 11 issues remain unresolved (MDBA, pers. comm., 21 November 2018). Most of these issues are about potential inconsistencies with the trading rules specified in part 2 of chapter 12, which relates to restrictions on trade.

Some of the issues that the MDBA has raised as potential areas of non-compliance have been reported publicly, including those related to:

- some inter-valley trade limits in the southern Basin (DAWR 2016a, 2018j)
- interstate trade between the ACT and New South Wales. Although these Basin States reached an in-principle agreement to establish interstate trade in 2017, the New South Wales Government has since stated that it is not required to establish interstate trade because it considers the ACT Murrumbidgee to be an unregulated surface water system (DAWR 2018j)
- interstate trade between New South Wales and Queensland on the intersecting streams. Both States have expressed the view that there is little if any demand for interstate trade on the intersecting streams (DAWR 2016a). The Queensland Government has agreed to

-
- monitor demand and has outlined a process to establish an interstate market if and when there is net benefit in doing so (DNRM (Qld) 2017)
- a possible breach of section 12.23 (a rule about how restrictions apply to delivery of water under a tagged entitlement) in Victoria (MDBA 2017d). The MDBA has been in discussions with Victoria about the management of tagged entitlements in that State (DAWR 2018j).

Participants to the inquiry have raised a small number of concerns about trade rule issues in addition to the 17 matters that the MDBA has investigated to date. These issues mostly relate to the northern Basin.

The current unregulated trade rules prevent trade in the northern unregulated systems, it is not fit for purpose and it is at risk due to the tight timeframes for the Water Resource Plan development. (Namoi Water, sub. 82, p. 19)

In its advice on the development of Basin Plan trading rules, the ACCC noted that trade rules ‘within unregulated systems are generally not as clearly stipulated as rules for regulated systems, or in some cases are not in place at all’ (ACCC 2010, p. 180). As of 2017, the ACCC (2017b) stated that only limited progress in implementing its recommendations to develop opportunities for trade in unregulated systems had been made since 2010.

Deficiencies in the MDBA’s compliance function have contributed to slow progress in implementing the trading rules and a log of unresolved compliance issues. The MDBA (sub. 86, p. 46) itself stated that:

Work is progressing too slowly under the current approach of assessing existing state trade rules against the Trading Rules.

The MDBA can investigate trade restrictions as it becomes aware of potential inconsistencies with the trading rules, such as through its audit program or complaints raised by others. (This assumes that Basin States have not already requested that the MDBA declare that a surface water trade restriction is consistent with the Basin Plan, as is allowed by section 12.20 of the Plan.)

The MDBA’s compliance tools for the trading rules include audits of high-risk water trading rules and using its power to request compellable information for its investigations (MDBA 2018n). If Basin States (or other parties obligated by the rules) are not cooperative in changing inconsistent rules or there is a dispute, the MDBA’s enforcement options include enforceable undertakings to make good on an area of non-compliance and applying to a court for an injunction to prevent non-compliant behaviour (MDBA 2018n).

Despite having a range of compliance options, the MDBA has mainly addressed trade issues to date by communicating bilaterally with Basin States through both informal discussions and formal letters. Letters have been used to communicate the MDBA’s preliminary view of an issue following an initial investigation, and Basin States have been asked to provide further information.

This approach has not been particularly effective. Negotiation is a suitable and low-cost option to initiate a compliance action but if no resolution is reached, then there is a need to escalate matters through a formal process. In discussions with some Basin States, the Commission has heard that the MDBA has been reluctant to provide them with a formal resolution on some matters and that there is a tendency for the MDBA to continue to seek further information rather than make a determination on compliance.

However, the MDBA has increased its resources and focus on compliance, which may support more decisive compliance action in the future (MDBA, sub. 86). In late 2017, the MDBA established the Office of Compliance, and moved the Water Trade Team to this division. Although the MDBA received complaints from the public about compliance with the trading rules from 2015, it only published a register of these complaints in 2017 as part of the Murray-Darling Basin Water Compliance Review (MDBA 2017t). In June 2018, the MDBA (2018n) published its compliance and enforcement policy for 2018–21, which outlined many of its compliance and enforcement options for the Basin Plan trading rules publicly for the first time.

The Commission has identified scope for further improvements to the compliance process for the Basin Plan trading rules.

FINDING 10.1

Some trade restrictions that were inconsistent with the Basin Plan trading rules have been removed.

The Murray-Darling Basin Authority (MDBA) has raised 17 instances of potential non-compliance with the trading rules with Basin States. Eleven of these matters remain unresolved and the MDBA has not been clear with Basin States about the steps to resolve these in a timely way.

Improving compliance processes

Develop an assessment framework for trade restrictions

Assessing and validating the need for a trade restriction (such as a volumetric limit on inter-valley trade) is often not cut and dried — it can require an understanding of matters such as policy objectives, delivery capacity, demand at different times of the year and the extent of third party effects that are considered acceptable. Existing trading rules may have been appropriate for historic patterns of water use but may need to be re-examined as trade and use patterns change and information about third party effects improves.

The MDBA's guideline on managing surface water trade restrictions provided limited advice on what constitutes an allowable restriction to manage third party effects. It stated that both costs and benefits should be considered and they will vary on a case-by-case basis (MDBA 2014e). This vagueness is a flaw in the MDBA's compliance strategy.

The MDBA should develop an assessment framework for evaluating the consistency of trade restrictions against the Basin Plan trading rules. Specifically, the framework should provide additional information about how to assess and compare the benefits and costs of removing restrictions and how to determine a threshold above which a restriction is justified.

The MDBA (sub. 86, p. 47) flagged this as an option for strengthening arrangements:

The Plan presents high level principles about allowable restrictions. It would help the process if these principles were developed in more detail, so that they provide an assessment framework.

The Victorian Government (sub. DR142) also voiced support for the development of a framework to assess the consistency of trade restrictions against the Basin Plan trading rules.

The framework should be developed by the MDBA with advice from Basin States. If the MDBA and Basin States are not working within a consistent framework, this could lead to avoidable disputes. The assessment framework should be comprehensive enough to assess compliance of existing restrictions and be useful to Basin States in evaluating the potential need for new trade restrictions (section 10.4). The framework should require all costs and benefits of removing restrictions to be considered.

A documented assessment framework would make the compliance process more transparent, improve community understanding and better identify uncertainties and data limitations. To the extent that the framework assists with resolving compliance matters and changing trade restrictions, this would improve the efficiency of the market.

The MDBA (sub. DR136, p. 7) has commenced and committed to changes in line with recommendation 10.1, including:

... developing an assessment framework to evaluate the consistency of state trade restrictions under Basin Plan requirements, which will be published when completed. Once it is in place, the Authority will assess state trade restrictions under the framework and publish any determinations made and the reasoning for them.

The Commission considers this a positive step. It is important that the assessment framework is completed in a timely manner.

Clarify roles and responsibilities for assessing restrictions

Currently, the MDBA appears to be taking a lead role in conducting the analysis required to assess the compliance of state trade rules.

Given that Basin States implement trade restrictions in their jurisdictions based on local knowledge and consultation with interested parties, the MDBA should ask Basin States to undertake the analysis required to substantiate the need for the trade restrictions that it is investigating. The MDBA would then review the assessment, ask for further information if necessary and determine whether the restriction is compliant with the Basin Plan.

However, there is the potential for the MDBA to be marking its own homework under this approach. The MDBA, in its role as the agent of governments, could be asked to assist Basin States with their analysis of trade restrictions. This would compromise the MDBA's ability to be an impartial regulator. Chapter 14 of this report sets out how these conflicting roles can be effectively addressed.

Set timeframes for resolving matters

The MDBA has published a protocol for handling allegations of non-compliance generally (MDBA 2017s). Credible allegations will be referred to the relevant regulatory agency, which in the case of the Basin Plan trading rules is the MDBA itself. The protocol sets timeframes for a state agency to address matters that the MDBA has referred to it and an escalation pathway if the Basin State does not resolve matters in a timely manner. However, the protocol does not include timeframes for cases when the MDBA itself is the regulator.

The MDBA should establish realistic timeframes that it will endeavour to meet for investigating and addressing trading rules compliance matters. Greater discipline on timeframes could be set for steps in the process, such as after the receipt of information from a Basin State and after the MDBA has made a determination on a compliance matter.

The MDBA (sub. DR136) stated that its compliance framework will include processes and procedures for how it will investigate and resolve potential breaches of the water trading rules in a thorough and timely manner. A draft Case Management Protocol and draft Investigations Protocol have been developed to this end (MDBA, pers. comm., 6 November 2018).

Transparency and reporting by the regulator

Although there is some public information about the compliance status of Basin States, there is less information about the compliance status of other parties obligated by the trading rules. The MDBA has not published information about the compliance status of irrigation infrastructure operators, despite these rules taking effect four years ago.

The National Farmers' Federation (sub. 77, p. 9) called for more transparent processes when considering changes to trading rules:

Full examination about the potential impacts of any rule changes must be transparently conducted, in consultation with stakeholders. In many instances, there are fundamentally sound reasons for trade rules, such as to ensure deliverability, to protect the environment or to ensure that the entitlements of others are not eroded. These reasons should not be arbitrarily discarded in the pursuit of unfettered trade.

Transparent processes go some way towards minimising the risk that third-party or environmental effects are given either too little or too much weight when changes to trade restrictions are considered.

Consultation with interested parties may be required to obtain information about the costs and benefits of keeping or removing a trade restriction. When Basin States and the MDBA do consult, they should take care to make information about potential rule changes generally available.

Better public reporting and transparency by the MDBA would make it more accountable for its compliance work program and the time it takes to resolve compliance matters. The MDBA should report publicly on its compliance work, such as the numbers of audits and investigations initiated and closed annually, the outcome of all determinations, and the trading rules to which the investigations applied.

The MDBA could provide greater opportunity for public scrutiny by publishing the Basin States' reasoning for each surface water restriction that is in place, sent to the MDBA under section 12.19. Further, publishing the assessments of the consistency of trade restrictions against the trading rules may assist others with understanding how to apply the assessment framework.

The MDBA should do more to communicate to members of the public about the processes for getting potential trading rule issues investigated. A first step in this effort would be to provide a link to the MDBA's *Report a breach of the Basin Plan* webpage from the main Basin Plan trading rules webpage.¹³⁴

It is unlikely that all restrictions on trade will be consistent with the Basin Plan trading rules by July 2019. However, the Commission is less concerned with States meeting this commitment set in the Basin Plan Implementation Agreement and more concerned about an ongoing commitment by Basin States and the MDBA to improve compliance with the trading rules over time.

The Commission expects that the new compliance policy and the additional improvements that it has recommended will lead to a more proactive approach and greater discipline by the MDBA in closing unresolved matters with Basin States. The Department of Agriculture and Water Resources (DAWR, sub. DR103, p. 13) supported the proposed changes, stating that 'the actions recommended will promote progress by facilitating a consistent, transparent approach to assessment of trade restrictions'. These changes should also enable any remaining compliance issues to be uncovered over time and resolved.

¹³⁴ <https://www.mdba.gov.au/managing-water/water-markets-trade/basin-plan-water-trading-rules>

RECOMMENDATION 10.1

The Murray-Darling Basin Authority (as Basin Plan Regulator) should:

- finalise and publish an assessment framework for evaluating the consistency of trade restrictions against the Basin Plan trading rules, which gives guidance about how to estimate the costs and benefits of removing trade restrictions
- specify the timeframes that it will endeavour to meet in resolving trading rule compliance matters
- notify Basin States about whether the 11 unresolved matters raised with them amount to non-compliance and what action is required by Basin States to resolve them
- publish the reasons given by Basin States for restrictions on surface water trade
- publish its compliance determinations and the assessments that support each determination.

10.3 Market information and transaction costs

Market information and market confidence have improved as a result of the Plan

Basin States and the MDBA have made good progress in implementing the Basin Plan requirements aimed at improving market information and market confidence.

To improve market confidence, the Commonwealth Environmental Water Holder, South Australia and Victoria have put protocols in place to ensure that staff who are aware of an upcoming water announcement do not trade until the information is public, as per section 12.51 of the Plan (MDBA, sub. 86). The MDBA has a protocol in place, as per section 12.52 of the Plan, to manage access to sensitive market information within the organisation (MDBA 2017a). In 2017, New South Wales committed to meet these Basin Plan requirements, as well as disclosure obligations under section 12.38:

NSW does not currently provide information on the disclosure of relevant interests where the approval authority is a party to the trade. ... It is anticipated that this issue will be addressed through a negotiated workplan with the MDBA. In addition, a Market Sensitive Information Policy is being finalised along with guidelines on the ‘Communication of Market Sensitive Information’ and ‘Breach Management’. (DOI (NSW) 2017, p. 13)

To improve market information, the MDBA has published the characteristics of the 70 most traded types of entitlements for regulated surface water systems in the Basin, using a consistent template (MDBA, sub. 86).

The Basin Plan trading rules oblige those selling water to report prices (s. 12.48). The MDBA (2016j) stated that the consequences of any individual seller misreporting prices are

generally minimal, except in thin markets or for large sales. Although 48 per cent of allocation trades in the Basin were reported as having a price of zero in 2016-17, many of these transactions were between related parties or were a result of environmental water management (ABARES 2018). Nevertheless, price reporting could be improved and the National Irrigators' Council (sub. DR91) noted that regulators should consider ways to reduce zero price reporting.

Government commitments to improve price reporting are encouraging. The *Queensland Water Act 2000* was amended in 2018 to require price reporting for allocation trades (known as seasonal water assignments in Queensland), South Australia now requires trade applicants to supply price information on transfer forms and New South Wales will provide summarised trading price information (DOI (NSW) 2017; South Australian Government, sub. 85). The MDBA (2018o) announced that the accurate reporting of water trade prices will be one of its compliance priorities in 2018-19. Options to improve the accuracy of price reporting should be assessed in terms of their costs (including administrative costs) and benefits (the extent that the change improves market information) to demonstrate whether they are warranted.

There is still room to reduce transaction costs

Implementation of the Basin Plan requirements related to improving market information and market confidence contribute to the Basin Plan objective to minimise transaction costs on water trades (s. 5.07(1)(b)).

Participants have identified a range of ways to improve market information and reduce transaction costs. For example, the National Irrigators' Council (sub. 15) reported that the market is often not easy to use or access and that any work to explain complex trade rules or make processes more transparent would be worthwhile.

Coleambally Irrigation Co-operative Limited (sub. 38) commented on the variability of the accessibility and usability between different state water registers and the need to improve them. Lower Edward River Pumpers & Landholders (sub. 63), Ricegrowers' Association of Australia (sub. 70, DR141) and Cotton Australia (sub. 47) would like real-time processing of water trades.

Many of these concerns echo those raised with the Commission as part of its inquiry into National Water Reform in 2017. In that inquiry, the Commission found that market information provided by governments and the private sector had improved but that there was room for States and Territories to improve the quality and accessibility of trade data in their water registers (PC 2017b). The Commission also recommended that the Australian Government commission an independent review of the effectiveness and efficiency of service standards for trade approvals, which should consider whether the standards should require shorter approval times. The Commission will review progress on this issue and opportunities for further reform in its 2020 review of National Water Reform.

FINDING 10.2

New information and reporting requirements specified under the Basin Plan trading rules are largely in place.

10.4 Responding to emerging risks from greater trade

Risks emerging from increased trade

Although the Basin Plan requirements are about *removing* inconsistent trade restrictions, participants to the inquiry have raised concerns about a separate but related matter — the potential need for *new* trade restrictions to manage emerging risks. The consideration and implementation of new trade restrictions is the responsibility of Basin States.

Trading can put pressure on delivery constraints and affect environmental values

The ACCC (2018, p. xi) noted that ‘some regions are experiencing significant changes in land use and crop types, which influence water use, trade and delivery patterns’. For example, the expansion of the almond industry in the Victorian lower Murray has resulted in large volumes of water being traded into this region from other parts of the southern Basin (ABARES 2018). These changes have been made possible because of a reform program that has enabled water trade in connected parts of the Basin.

Trade and the growth in water use downstream in the Murray has increased pressure on delivery capacity at peak periods of demand. Participants noted that these changes could result in channel capacity sharing issues that could compromise the rights of other irrigators to extract water.¹³⁵ If delivery capacity within the system is insufficient, reduced flow rates at peak times may occur, resulting in increased management costs or farm yield losses.

River operators have several strategies to manage delivery shortfall risks, and temporary water restrictions have not been used to manage a shortfall in the River Murray system since March 2002 (MDBA 2018al).

However, the risk of delivery shortfall is changing over time. The Victorian Government (DELWP (Vic) 2018c) described changes in water use patterns that could affect shortfall risks in the Lower Murray, including due to the growth of permanent plantings further away from major dams, climate change and the recovery of water for the environment. The Australian Bureau of Agricultural and Resource Economics stated that water requirements for the lower Murray area are likely to increase over time as new almond plantings reach maturity (ABARES 2018).

¹³⁵ Lower Edward River Pumpers & Landholders, sub. 63; Murray Valley Private Diverters, sub. 69; National Irrigators’ Council, sub. DR91, Southern Riverina Irrigators, sub. 29.

In addition to concerns about risks to delivery, water users are concerned about how water trade may be increasing third party effects. Some participants stated that trade is increasing conveyance losses, which affects the reliability of supply for existing users.¹³⁶

Participants to the inquiry have also raised concerns about inadequate protection of environment values from trade. In particular, the Commission heard about erosion and other negative effects to the Goulburn River, Macquarie River and to the River Murray at the Barham Choke due to unseasonal or extended high flows to meet water demand downstream.¹³⁷

From an environmental point of view, we're spending a lot of money, using a lot of environmental water to develop instream vegetation. ... Unfortunately, the summer flows just drown out a lot of that vegetation. Now this is flowing way above what it ever would've been in summer flows under natural conditions, it's way above what's been flowing over the last 20 years through here. (Goulburn Valley Environment Group, Shepparton trans., pp. 7–8)

Participants to the inquiry have also been vocal about the socioeconomic effects of increased trade.¹³⁸ Some asserted that new horticulture developments are being watered with a higher share of water allocations compared with water entitlements than traditional business models, and that this is putting significant upward pressure on water allocation prices.¹³⁹ Others have questioned whether there should be greater planning restrictions on new developments or whether trade restrictions should be used to prevent water from leaving irrigation districts.¹⁴⁰

The Commission considers that trade restrictions and restrictions on new developments are not an appropriate way to address the socioeconomic effects of structural change in the agricultural sector. Trends in the water market are a response to a range of factors (such as commodity prices), and restricting trade is unlikely to improve outcomes in Basin communities (chapter 3). The effects of structural change can in part be managed by irrigation infrastructure operators through the use of termination fees. Consistent with the Basin Plan trading rules, trade restrictions should only be used to manage delivery constraints and appropriate third party effects, including adverse effects on entitlement reliability and the environment.

¹³⁶ Beer and Pattison, sub. DR96; Murray Irrigation, sub. DR143; NIC, sub. DR91.

¹³⁷ Beer and Pattison, sub. DR96; Campbell, sub. DR116; Environment Victoria, sub. DR117; Healthy Rivers Dubbo, sub. DR104; Murray Valley Private Diverters Inc., sub. 69.

¹³⁸ MRCC, sub. DR111; Riverina and Murray Joint Organisation, sub. DR101; Speak Up Campaign Inc., sub. DR114; Victorian Farmers Federation and United Dairyfarmers of Victoria – West Goulburn Branch, Shepparton trans., p. 47.

¹³⁹ Riedl, Shepparton trans., p. 77; Temba Orchards, Shepparton trans., p. 14.

¹⁴⁰ Campbell, sub. DR116; MDA, sub. 52; Murray Irrigation sub. DR143; Riedl, Shepparton trans., p. 76; SRI, sub. DR132; Temba Orchards, Shepparton trans., p. 14.

A strategic and collaborative approach to managing emerging risks

Basin Governments should strategically monitor and analyse potential delivery capacity issues and third party effects of trade across the Basin.¹⁴¹

The MDBA and Victorian Governments released separate fact sheets in August 2018 on understanding delivery shortfall risks in the River Murray (DELWP (Vic) 2018c; MDBA 2018al). The MDBA stated that the risk of delivery shortfall is not new and that water holders ‘along the River Murray, especially downstream of the Barmah Choke, need to understand the risk of water delivery shortfall and take it into account in their business planning and investment decisions’ (MDBA 2018al, p. 1).

Although both fact sheets provided context about the risk of delivery shortfall, Basin Governments could do more to provide information to help the market assess changing risks and to provide a coordinated policy response where required.

Where there are concerns about deliverability and third party effects in shared resources and connected systems, Basin Governments should collaborate closely to determine the best response. Consistent with joint government decision making under the MDB Agreement, this is a responsibility of the Basin Officials Committee (BOC). Under the MDB Agreement, BOC may direct the MDBA (as the agent of governments) to provide advice or technical expertise on these issues.

This arrangement is already in place for the southern Basin, where the MDBA (sub. DR136, p. 13) ‘has been working with partner governments for a number of years on the matter of River Murray system capacity risks’. This work is being undertaken as part of MDB Agreement joint activities and is overseen by BOC (MDBA, pers. comm., 3 August 2018). DAWR (sub. DR103, p. 13) noted that the work includes an investigation of ‘current and long-term risks to meeting state water orders’ and ‘how best to manage and mitigate these risks’.

However, it is unclear exactly what work is being done because little information has been made public. Given the growing public concern about delivery capacity issues and third party effects, Basin Governments should be more transparent about their work plan for assessing and addressing these issues. DAWR (sub. DR103, p. 13) agreed that it was appropriate that messaging to the public about this issue is ‘consistent and transparent, to maintain confidence in the water market’.

It is the responsibility of Basin Governments as water resource managers to communicate policy changes effectively to the water market. There are a range of policy changes that can affect water markets. Changes to deliverability, trade restrictions, river operations and water sharing rules as well as growth-in-use response strategies to make good on SDL

¹⁴¹ The Victorian Government (2018a) has completed a review of delivery shares. The design of and trade of delivery shares can manage deliverability and congestion risks within irrigation districts but does not assist with deliverability risks within and between rivers.

non-compliance are some factors that could affect the security of entitlements, regional trade and water prices.

There are shortcomings in communications to the market on these issues. For example, on 14 September 2018, Murray Irrigation Limited (2018) announced that it had made an agreement with WaterNSW to allow the use of its Mulwala Canal to bypass the Barmah Choke for some water deliveries down the River Murray. The Australian and New South Wales Ministers for Water also released a joint media release about the agreement on the same day (Littleproud and Blair 2018). Neither of the announcements made available detailed information about the agreement, including specific implications for deliverability in the southern connected system. This type of information may affect water market participants' behaviour and expectations.

It is important that Basin Governments provide full information about policy changes so that the market is informed. Having a consistent protocol for major water market policy announcements, such as by using a consistent location and format for announcements, would improve market information disclosure for water users. In shared and connected water systems, Basin Governments should also consider who is best placed to make announcements on their behalf so that water users have ready access to the information.

Neither the MDBA or BOC appear to have appropriate protocols in place sufficient for this purpose. This is a deficiency they should seek to address.

More generally, Basin States should take care that their responsibility for market stewardship does not fall by the wayside. The National Farmers' Federation (sub. DR129, p. 17) noted that the 'ongoing integrity of the water market is a critical component of the Basin Plan.' Proactive market managers identify and track emerging market risks, not just respond to them after they have materialised. The MDBA (sub. 86), DAWR (sub. 81) and ACCC (2017b) have suggested that there is a need for more integrated and agile responses to improve the management of the water market.

As water markets evolve, new opportunities might emerge to improve their efficiency. For example, the MDBA (in its advisory role under the MDB Agreement) and Basin States have been working on the Trade Adjustments Project. The project is exploring how to improve the processes that adjust state water shares when water is traded between States, which could lead to improvements in the transparency and efficiency of some trade restrictions in the southern Basin (MDBA 2017q).

Trade restrictions may not be the best policy response

The lowest cost and most effective solution to water delivery pressures may not be new trade restrictions. The Commission's inquiry into National Water Reform mentioned the potential for tradeable rights to the capacity of a congestion point on a river to replace some trade restrictions (PC 2017b). Alternatively, engineering or infrastructure solutions could be used to ease some constraints (this sort of policy response is somewhat analogous to the projects aimed at easing constraints that restrict the delivery of environmental water (chapter 4)).

New trade restrictions may ultimately be an appropriate response to delivery constraint issues. However, in the first instance river operators should clarify delivery capacity at different times of the year and under different climatic scenarios, and consider whether river operations can be modified to meet changes in water demand. In this way, river operators can play a valuable role in assisting policymakers with understanding the magnitude of the risk and alerting them to changes over time.

FINDING 10.3

Growth of trade has increased demands on delivery capacity and put pressure on delivery constraints in some parts of the Basin. A range of community members are increasingly concerned about the effects on third parties and the environment.

Basin States and the Murray-Darling Basin Authority are aware of this strategic policy issue, but the process for managing it is unclear to the market.

RECOMMENDATION 10.2

Basin Governments should set and publish a work plan within the next 12 months that describes how delivery capacity issues and third party effects associated with changes in water use and trade will be investigated and managed. The work plan should specify responsibilities, timeframes and how this information will be communicated to the water market.

Basin Governments should assign the Murray-Darling Basin Authority (as the agent of governments) responsibility for identifying and managing risks related to changes in water use and trade in shared resources and connected systems.

Potential conflicts in the MDBA's role

If Basin States introduced new trade restrictions to manage deliverability risks and third party effects, they would need to notify the MDBA, as regulator of the Basin Plan trading rules. The new restrictions may then be subject to investigation by the MDBA as part of compliance processes.

This highlights how the MDBA's multiple responsibilities in relation to water trading could be a contributing factor to slow progress on compliance with the trading rules.

The Commission is proposing (recommendation 14.2) that the MDBA be split into two institutions to separate its agent of governments and regulatory roles. The Basin Plan Regulator would have an oversight role that includes ensuring compliance with the trading rules. The Murray-Darling Basin Agency could assist Basin Governments with market stewardship and, where requested, assessing the costs and benefits of trade restrictions. Structural separation would create incentives for each institution to pursue its functions more effectively, as well as develop the internal culture most appropriate for the delivery of these functions.

11 Environmental water planning and management

Key points

- The Basin Plan builds on previous State and joint Basin Government reforms. It defines an increased share of water for the environment and sets out a new range of requirements to promote the effective planning and management of environmental water.
 - The Australian Government is recovering water entitlements to bridge the gap from historical levels of extraction to the new Sustainable Diversion Limits. About 20 per cent of water available for consumptive users a decade ago is now dedicated to the environment.
- Achieving the environmental outcomes of the Basin Plan is predicated on Basin States implementing an agreed set of pre-requisite policies to support the efficient use of environmental water. There is some risk that these pre-requisite policy measures will not be fully implemented by all Basin States by 30 June 2019.
- The Basin Plan Environmental Management Framework sets out the guiding principles and processes to coordinate the planning, prioritisation and use of environmental water. The Framework facilitates co-operation between Commonwealth and State environmental water holders and local environmental asset managers. Overall, this has operated well.
 - Over 750 environmental watering events have occurred over the past five years, targeted at specific environmental outcomes linked to the long-term objectives of the Plan.
 - The environment is responding positively to environmental watering activities with early evidence of improved ecological outcomes at the local and system scale.
- Key long-term plans, including the Basin-wide environmental watering strategy and some regional long-term watering plans, are in place. When revising these plans, the Murray-Darling Basin Authority and Basin States should provide clearer guidance on the relative priority of watering for key environmental assets and system connectivity.
 - This will assist in ensuring that environmental water is best utilised and enhance the transparency and accountability of environmental water managers as they make trade-off decisions between different ecosystem components and environmental targets.
- Intergovernmental arrangements for coordinated environmental watering have been established for the southern Basin. Basin States should review these arrangements to ensure they reflect current practice and are transparent. Similar arrangements should be established in the northern Basin by 2020.
- Unregulated flow events require real-time decision making by environmental water holders. Basin State Governments should establish processes for consultation and coordination between key stakeholders to support event-based environmental watering decisions.
- While achieving environmental outcomes is the primary focus of environmental water holders under their respective legislation, opportunities to contribute to social or cultural outcomes without compromising environmental outcomes should be actively pursued.
- Achieving the environmental objectives of the Basin Plan will require more than just environmental watering. Basin States should plan for and deliver complementary waterway and natural resource management measures.

Under the COAG water reform agenda, all States and Territories committed to providing a legally recognised share of water for the environment and addressing over-allocation of water resources (chapter 3). These commitments were implemented by:

- providing planned environmental water¹⁴² (through water sharing arrangements)
- supplementing this with held environmental water¹⁴³ in a number of systems.

Since the late 1990s, Basin Governments have worked to address over-allocation through their own water planning and water entitlement recovery programs. In addition to these State programs, a joint Basin Government initiative — The Living Murray Initiative (TLM) — was agreed to in the River Murray in 2004. Under TLM, about 500 GL of water was recovered from the consumptive pool, and investments were made in environmental works to assist with the effective use of this water.

During the Millennium Drought, Basin Governments agreed that, despite these efforts, Basin water resources were still over-allocated and further reform was needed to achieve environmental sustainability. They agreed to develop the Basin Plan to reset the balance between environmental and consumptive uses of water. The Plan represented a step change in the management of the Basin and established an increased share of water for the environment by reducing diversions to new Sustainable Diversion Limits (SDLs) and ensuring the protection of planned environmental water.

Water recovery programs were implemented to ‘bridge the gap’ between historic levels of use and the new SDLs (chapter 3), with most recovered water managed by the Commonwealth Environmental Water Holder (CEWH) — a new, independent statutory body established under the *Water Act 2007* (Cwlth).

The Plan also sets high-level outcomes and more specific environmental objectives that, if met, will improve the health of Basin ecosystems. Achieving these outcomes requires sustaining or improving the environmental condition of rivers, floodplains and wetlands across the Basin at the local asset, catchment, connected system and Basin-wide scale. To do this, the Commonwealth and State environmental water holders, local environmental asset managers and water resource managers need to work together to use environmental water effectively. The Plan provides a framework for the planning and management of environmental water to facilitate co-operation between Basin Governments and assist in coordinating their planning and annual decision making. A key change arising from the Plan has been a more prominent and ongoing role for the Australian Government.

¹⁴² Planned environmental water involves imposing rules or obligations on water resource managers and/or consumptive water users to leave a residual flow in the river and associated wetlands.

¹⁴³ Held environmental water involves acquiring water entitlements (with the same conditions and legal properties as those held by consumptive users) that can be actively managed to achieve environmental outcomes.

This chapter assesses the effectiveness of the implementation of the Basin Plan's requirements for environmental water planning and management, and considers:

- requirements to provide and protect the agreed share of water for the environment and ensure its effective use
- the long-term planning frameworks for achieving environmental objectives through environmental watering
- the annual planning and management of environmental water
- the coordination and consultation undertaken by environmental water holders.

Providing water for the environment is essential but not sufficient to achieve environmental outcomes. This chapter also identifies measures that sit outside the Basin Plan that will be necessary to maximise the benefits of environmental water and achieve the Plan's environmental outcomes.

11.1 Background

The Basin Plan outlines a number of specific targets, outcomes and objectives that are relevant to environmental water planning and management. Monitoring and evaluation of environmental outcomes is covered in detail in chapter 13 of this report.

Chapter 5 of the Basin Plan outlines the management objectives and outcomes to be achieved in relation to the environment of the Basin. Objectives include to:

- protect and restore water-dependent ecosystems and ecosystem functions
- ensure water-dependent ecosystems are resilient to climate change
- ensure environmental watering is well coordinated between relevant parties.

Chapter 8 of the Basin Plan also outlines a number of specific environmental objectives for water-dependent ecosystems, while Schedule 7 sets out intermediate targets (to be met up to 30 June 2019) and longer term targets for maintaining flows, river condition, hydrological connectivity and water-dependent species such as vegetation, birds and fish.

To achieve these outcomes the Basin Plan requires:

- water recovery to bridge the gap and enable the SDLs to commence on 1 July 2019 (chapter 3)
- Basin States to implement pre-requisite policy measures (PPMs) by 30 June 2019 to enable more efficient use of environmental water

- Basin States to develop Water Resource Plans (WRPs) by 30 June 2019, which include provisions to enable environmental watering between connected water resources and to ensure that there is no net reduction in the protection of planned environmental water
- the implementation of the Basin Plan ‘Environmental Management Framework’¹⁴⁴.

The inclusion of the Environmental Management Framework in the Basin Plan recognises that there are multiple parties involved in environmental water management, each with their own statutory responsibilities (box 11.1). The Environmental Management Framework aims to facilitate consultation, coordination and co-operative arrangements amongst all of these key players to ensure effective and efficient planning and management of all environmental water (both planned and held) to achieve the objectives of the Basin Plan.

Box 11.1 Major parties involved in environmental water management

There are a range of parties involved in environmental water management and delivery.

- **The Commonwealth Environmental Water Holder** holds and manages environmental water on behalf of the Australian Government, guided by the Basin Plan and the Basin-wide environmental watering strategy.
- **Basin State environmental water holders**, such as the Victorian Environmental Water Holder and the New South Wales Office of Environment and Heritage, manage their own State water portfolios and allocate their water to achieve State priority objectives.
- **River operators and waterway managers** store, manage and deliver water (including environmental water) within particular areas of the Basin.
- **Local environmental asset managers** manage the delivery of water to environmental assets to achieve on-ground outcomes at the local scale.

The Environmental Management Framework builds on the policies and arrangements that were in place prior to the Basin Plan. These include those within each State and those underpinning the collaborative arrangements for environmental watering for TLM. The Framework combines a top-down and bottom-up approach and operates over three time scales:

1. Long-term (5–10 year) environmental water planning to specify and prioritise environmental outcomes.
2. Annual and multi-year environmental water planning to inform decisions on environmental water use.
3. Real-time delivery and management of environmental watering events.

¹⁴⁴ Contained within Chapter 8, Part 4 of the Basin Plan.

11.2 How the Commission has assessed effectiveness

The effectiveness of environmental water planning and management has been assessed by gauging the extent to which the:

- measures outlined in the Basin Plan for providing, protecting and efficiently using the agreed share of water for the environment (such as WRPs and PPMs) are, or will be, in place
- required planning documents are, or will be, delivered within the agreed timeframes set out in the Basin Plan
- content of those planning documents influences decision making and contributes to achieving the environmental outcomes and objectives of the Basin Plan
- actual planning and management of environmental water, including coordination between environmental water holders has, and will likely continue to have, facilitated meeting the environmental outcomes and objectives of the Basin Plan.

In assessing current arrangements, the Commission recognises that environmental water management at the Basin scale is relatively new and increasingly complex. Environmental water management will continue to evolve as a number of processes relevant to the Basin Plan are completed over the next five years and beyond, including:

- finalisation of the held water portfolio from gap-bridging water recovery (chapter 3)
- the implementation of supply and constraints easing measures (chapter 4)
- additional water recovery, which is aimed at achieving the enhanced environmental outcomes outlined in Schedule 5 of the Plan (chapter 5).

The recommendations outlined in this chapter seek to improve current environmental watering planning frameworks and remove barriers to effective management. A key consideration has been to increase the accountability of environmental water managers to deliver the environmental outcomes of the Plan through more effective planning. The Commission has also aimed to preserve flexibility for water managers to maintain their capacity to learn through experience and adaptively improve management. The Commission will further examine the arrangements for environmental watering in its 2023 review of Basin Plan implementation.

11.3 Providing and protecting the agreed share of water for the environment

State-based water sharing arrangements establish rules that allow for a share of water for environmental purposes and water for a range of extractive purposes (the consumptive pool). In many regulated systems, planned environmental water is supplemented by held environmental water (water entitlements with the same conditions and legal properties as those held by consumptive users), which is actively managed to achieve environmental outcomes. This section discusses the requirements for providing and protecting the agreed

share of water for the environment and ensuring its effective use. These requirements include:

- protecting planned environmental water and supporting connectivity (including by enabling shepherding), through WRPs
- recovering water for the held portfolio, to meet SDLs
- implementing pre-requisite policy measures (PPMs).

Water Resource Plans will provide planned environmental water and support connectivity, but some are behind schedule

The Basin Plan requires planned environmental water to be identified through WRPs and for ‘no net reduction’ in the protection of planned environmental water relative to past arrangements (chapter 6). WRPs must also ensure that environmental watering events can be coordinated between connected WRP Areas — enabling environmental water to be shepherded through the system. Shepherding is vital to facilitate the efficient and effective delivery of environmental flows and achieve the Plan’s environmental objectives, particularly in unregulated systems in the northern Basin (MDBA 2016d).

The development and accreditation of WRPs is well behind schedule (chapter 6). WRPs are to be developed by Basin States for accreditation by the Australian Minister for Water by 30 June 2019. However, there are concerns in some WRP Areas (such as in the Barwon-Darling) that there is insufficient time remaining to properly consult with stakeholders on the significant rule changes that are proposed to protect planned environmental water and to enable shepherding — such as individual and total daily extraction limits (chapter 6).

In chapter 6, the Commission has recommended extending the timeframe for WRP development and accreditation in limited circumstances to allow for adequate community engagement and negotiation of substantive changes to State-based water management rules.

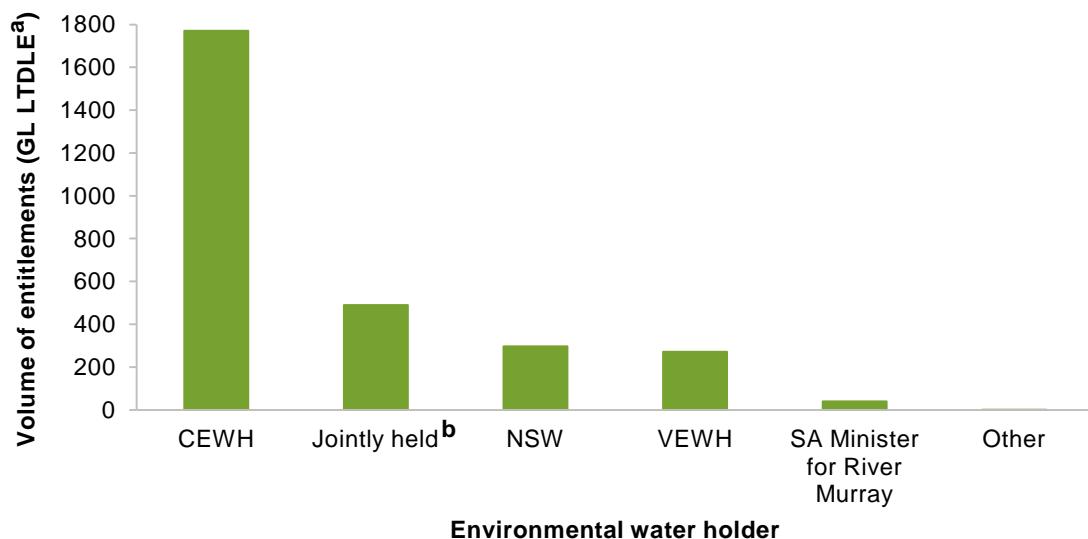
A significant volume of water is now held and actively managed by environmental water holders

Water recovery is the means by which the SDLs are achieved. Water entitlements are transferred from consumptive use to the held water portfolio of environmental water holders to be actively managed to achieve the environmental objectives of the Basin Plan. Significant progress has been made toward recovering water for the environment to meet the July 2019 target (chapter 3). About 2000 GL (LTAAY) has been delivered to environmental water holders against the 2019 surface water target of 2137 GL (DAWR 2018n).

The vast majority of water recovered to bridge the gap to SDLs is held by the CEWH (figure 11.1). As at 30 September 2018, the CEWH managed about 2710 GL of entitlements

with a long-term average annual yield of approximately 1860 GL¹⁴⁵ (DEE 2018). The CEWH's environmental water portfolio has a current value of about \$3.3 billion (CEWH, sub. DR110, p. 1). Environmental water recovered by State programs such as NSW RiverBank and TLM under earlier reforms, and a small amount of gap-bridging water, is also held by Basin States. Overall, approximately 20 per cent of all water entitlements in the Basin available for consumptive uses such as irrigated agriculture a decade ago are now managed for the environment (MDBA 2018aa).

Figure 11.1 Held environmental water entitlements in the Basin by owner
As at 30 June 2017



^a Long-term diversion limit equivalence factors estimate the actual long-term use associated with water entitlements, allowing them to be compared on 'equal terms' (DOI (NSW) 2018f). ^b Entitlements held by multiple governments, such as those acquired through TLM.

Source: MDBA (2018h).

The size and characteristics of the CEWH's environmental water portfolio varies between catchments, due to different water recovery targets in each catchment (and the types of entitlements that have been recovered to meet these targets). For example, in the Lower Darling, the CEWH owns 40 per cent of all high security entitlements and 28 per cent of general security entitlements, while in the Murrumbidgee, the CEWH holds only 3 per cent of all high security entitlements and 15 per cent of general security entitlements (DEE 2018; MDBA 2016k). More than 80 per cent of the CEWH's gap-bridging water entitlements are held in the southern Basin (DAWR 2018n).

¹⁴⁵ The volume of the CEWH's holdings is lower than the volume of gap bridging water recovery because some gap bridging water is managed by Basin State environmental water holders, and some contracted water recoveries are yet to be delivered to the CEWH.

As discussed in chapter 3, water recovery is mostly on track, but some issues remain. The Department of Agriculture and Water Resources (DAWR) does not have a systematic and transparent process for ensuring that all water recovered will be useful for the CEWH (chapter 3). Given this, the CEWH may need to rebalance some of its portfolio in time, to maximise its usefulness for achieving the environmental outcomes and objectives of the Plan.

There is some risk that pre-requisite policy measures will not be implemented on time

The outcomes of the Basin Plan are based on an assumption that Basin States will implement PPMs. PPMs, referred to as ‘unimplemented policy measures’ in the Basin Plan¹⁴⁶, are operating rules which enable more efficient use of held environmental water in the southern Basin. PPMs provide:

- credit for return flows from environmental watering events for environmental use downstream (rather than being used to supply the demands of other users)
- the ability for environmental water holders to order water from a specific storage to top up or ‘piggy-back’ on naturally occurring high flow events.

PPMs were assumed in the original modelling to establish the SDLs as well as in the model used to determine the environmental equivalence of supply measures. If PPMs are not implemented, overall water recovery would need to rise considerably when reconciliation of the total water recovery target is completed in 2024 (chapter 4).

Basin States are required to implement PPMs by 30 June 2019. Failure to fully implement the PPMs by the target date will influence the Murray-Darling Basin Authority’s (MDBA’s) assessment of potential adjustments to SDLs proposed as part of the supply measures under the SDL adjustment mechanism (chapter 4). According to the MDBA (2017m, p. 2):

... if the PPMs are not addressed, it is estimated that the Basin Plan outcomes could only be achieved with a SDL reduction of more than 4000 GL ... unless PPMs are addressed, it will not be possible to achieve any significant offsets from the SDL adjustment mechanism.

New South Wales, South Australia and Victoria have submitted their plans for implementing PPMs and these have all been approved by the MDBA, although these are not all publicly available. These States have all conducted PPM pilot projects and trials in the southern Basin, and have reported on progress towards PPM implementation to the Basin Officials Committee (MDBA, pers. comm., 30 November 2018). However, the details of this progress are not publicly available. Some arrangements for implementing PPMs are yet to be formalised, and some PPM implementation issues remain unresolved, primarily in New South Wales.

In New South Wales, there is a lack of publicly available information regarding the timeframe and process for implementing PPMs. The New South Wales Government

146 Chapter 7, Part 2, Division 4.

indicated that PPMs would be implemented through provisions in state water sharing plans and procedure manuals (DPI (NSW) 2017d). New South Wales developed a draft work plan, and provided the MDBA with two draft procedure manuals, and there has been some consultation with stakeholders through the WRP development process (MDBA, pers. comm., 30 November 2018).

Victoria and South Australia appear to be largely on track to have in place the policy mechanisms required to implement PPMs by the target date. Both States have already implemented return flow provisions.

The joint-government arrangements for resource management have considered the implementation of PPMs in the River Murray. The MDBA intends to implement PPMs by amending the *Objectives and outcomes for river operations in the River Murray System* (MDBA 2018z), which guide its river operation guidelines and procedures. These amendments are scheduled to be approved by the Basin Officials Committee in early 2019 (MDBA, pers. comm., 30 November 2018).

The MDBA has conducted informal reviews of ‘PPM drafts’ in 2018, with the formal PPM assessment scheduled to begin in January 2019 (pers. comm., 30 November 2018). The MDBA stated that they will assess PPM implementation against Basin State implementation plans and a set of criteria — including that PPMs are secure and enduring, fully operable and transparent. However, details of this assessment process are not publicly available.

There remains a lack of transparency around the processes and progress of Basin States and the MDBA towards implementing the PPMs, and the MDBA’s process for assessing the adequacy of their implementation. There is some risk that PPMs will not be effectively implemented before the Basin Plan deadline. When implementing arrangements to facilitate PPMs, Basin States should ensure they are fully in place by 30 June 2019, and that these arrangements are sufficiently flexible to allow for refinement over time.

FINDING 11.1

Although the Murray-Darling Basin Authority (MDBA) (as Basin Plan Regulator) has approved the Pre-requisite Policy Measure (PPM) Implementation Plans for all relevant Basin States, there is a lack of transparency around the progress of Basin States and the MDBA’s process for assessing the adequacy of PPMs following implementation. There is some risk that PPMs will not be implemented by 30 June 2019.

11.4 Long-term planning for environmental water

The Environmental Management Framework sets out requirements to guide the long-term planning of environmental water (figure 11.2). This comprises the Basin-wide environmental watering strategy and long-term watering plans for each WRP Area.

Under the Basin Plan¹⁴⁷, the MDBA must prepare a Basin-wide environmental watering strategy (BWEWS). The BWEWS:

- outlines the expected detailed long-term outcomes from environmental watering for priority rivers, wetlands and key ecosystem components and functions
- explains the context within which annual environmental watering priorities will be developed
- helps to coordinate the management of environmental water at the Basin scale by setting policies and principles for prioritising the use of environmental water under different climate scenarios.

Basin States must prepare a long-term watering plan (LTWP) for each surface water WRP Area. LTWPs must be consistent with the BWEWS and:

- set out the long-term objectives for the use of environmental water
- identify local priority environmental assets and ecosystem functions
- provide details of the watering requirements needed to meet the corresponding ecological targets outlined in the Plan.

LTWPs can be informed by long-term asset plans for individual assets. These asset plans are developed by managers of individual environmental assets, often as a requirement of State legislation or policy.

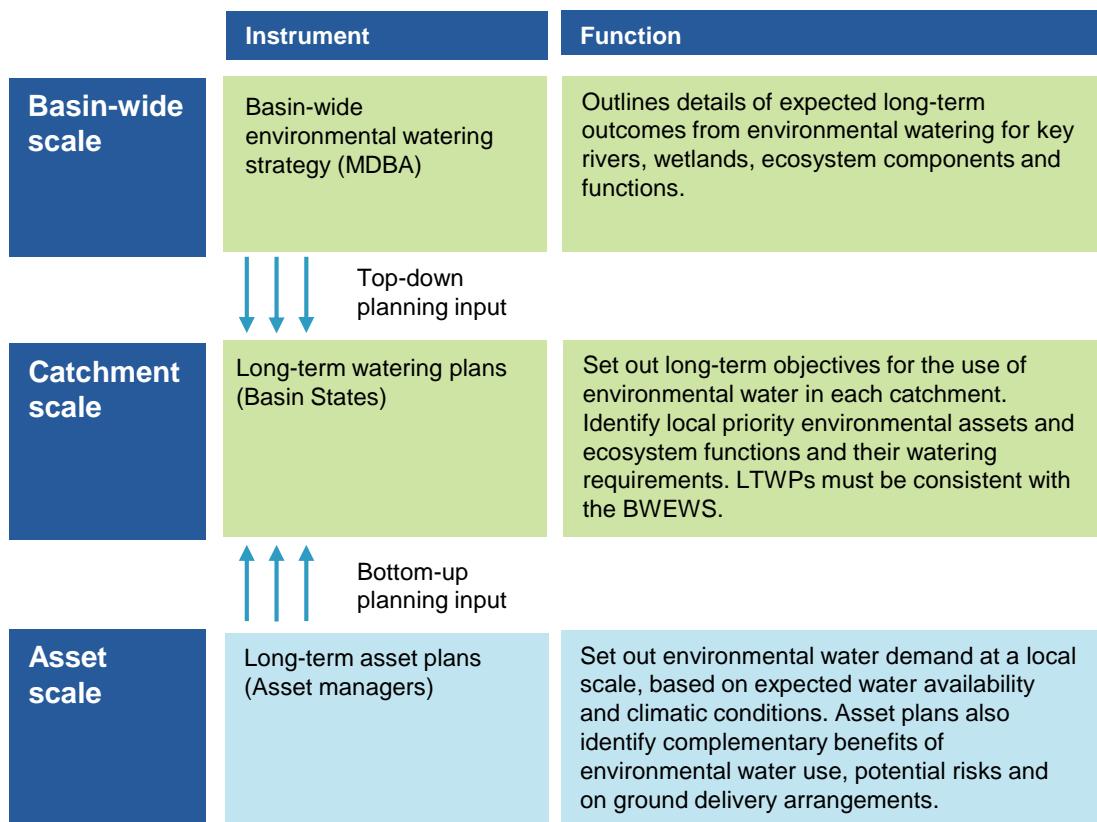
The Basin Plan¹⁴⁸ also sets out the program for evaluating the effectiveness of the Basin Plan (chapter 13), including the effectiveness of environmental water planning and management. The Basin Plan requires the MDBA to conduct a review of the Environmental Watering Plan¹⁴⁹ every five years.

¹⁴⁷ Chapter 8, Part 4, Division 2.

¹⁴⁸ Chapter 13, Part 3, Division 2.

¹⁴⁹ Chapter 13, Part 3, Division 2.

Figure 11.2 Long-term environmental water planning architecture^a



^a Documents highlighted in green are formally required by the Basin Plan. Documents highlighted in blue are not formally required by the Basin Plan.

The Basin-wide environmental watering strategy is useful but must evolve

The first BWEWS was published in 2014, consistent with the legislated timeframe within the Basin Plan. This BWEWS outlines the expected outcomes for river flows and connectivity, native vegetation, waterbirds, and native fish over the next decade, given the new SDLs and current operating rules and procedures (MDBA 2014b). The 2014 BWEWS was informed by long-term asset plans (where these were in place) and MDBA modelling. The BWEWS must be reviewed every five years, with the next BWEWS due for publication in 2019.

The BWEWS is being successfully utilised by managers of environmental water. The CEWH has used the BWEWS as a key input to inform its portfolio management planning approach (CEWO 2016). In its annual reporting to the MDBA, the CEWH has provided Statements of Assurance that it has performed its functions and exercised its powers in a way that is consistent with the BWEWS. Basin States have used the objectives outlined in the BWEWS as the basis for catchment-level objectives outlined in LTWPs (for example, in DELWP (Vic) 2015) and to inform the development of State annual environmental watering priorities.

The Commission considers the BWEWS to be a useful part of the Basin Plan's environmental planning framework. It provides strategic direction on the expected outcomes of environmental watering and the policies and principles for making environmental watering decisions across the Basin. The formal articulation of specific Plan environmental objectives and expected outcomes through the BWEWS will become an increasingly useful yardstick against which the effectiveness of environmental water management can be measured.

However, the field of environmental water management is evolving rapidly. Environmental water managers are learning from experience, adapting to new knowledge, working more closely with river operators, experimenting with more complex multi-site and connected system watering events, and planning for several years in advance. They are also learning more about the water requirements of ecosystems under different climatic conditions.

The 2014 BWEWS was developed on the basis of government policy and the best available scientific knowledge at the time. For the BWEWS to remain the overarching strategy guiding environmental watering in the Basin, it will need to evolve. Given the progress made in the Basin since the conception of the BWEWS, the 2014 BWEWS has limitations. These include a lack of clear guidance on:

- the priority for achieving flow connectivity at the system scale relative to watering within an individual WRP Area
- priorities for connected watering events in the northern Basin
- the relative importance of the criteria for determining priorities for environmental water use, particularly under different climatic scenarios
- the relative importance of listed priority environmental assets and functions for maintaining the ecological health of the Basin as a whole
- the relative priority of different regions in the Basin for key ecosystem components and functions
- elements of flow regimes that are environmentally harmful and should be avoided
- how secondary, non-environmental outcomes should be considered.

The Commission has identified a number of solutions to address these limitations. The 2019 BWEWS should include explicit objectives to maximise environmental outcomes and to contribute to additional cultural and social outcomes where these do not compromise environmental outcomes. The 2019 BWEWS should also articulate the relative importance of the priorities for achieving Basin-wide outcomes, provide clearer guidance on priorities for system connectivity and more guidance to support river operators and water resource managers to act in a way that is consistent with the Basin Plan.

To build on the learnings of the past five years, when developing the next iteration of the BWEWS in 2019 the MDBA should:

- consider the LTWPs and contemporary local asset plans that have been developed by Basin States

-
- incorporate learnings from the past five years of watering practice, particularly in relation to advances in event-based management, multi-site watering and multi-year planning
 - incorporate new knowledge, including that generated from the Northern Basin Review, the 2017 Basin Plan evaluation, relevant research, and improved understanding of environmentally harmful river operation practices
 - consider recent changes to government policy, including the Australian Government's recent commitments to improve outcomes for Indigenous Australians (chapter 7)
 - consult widely and harness the experiences of environmental water holders, river managers, local asset managers and their local communities.

Increasing the specification of the BWEWS will provide greater direction to, and accountability for, the CEWH. The CEWH is obligated under the Water Act to manage its portfolio in a manner that is consistent with the Basin Plan's Environmental Watering Plan. It must also report annually against the achievement of objectives under the Plan when deploying its water portfolio. By better articulating the relative priorities of assets in connected systems, the BWEWS will encourage the CEWH (the largest environmental water holder in the Basin) to shift its focus from smaller-scale environmental watering activities to undertaking larger-scale coordinated events.

FINDING 11.2

The 2014 Basin-wide environmental watering strategy (BWEWS) has provided a strategic foundation for the environmental water planning of significant environmental water holders and has been used to inform their portfolio planning and watering decisions.

The 2014 BWEWS does not provide clear guidance on how to prioritise those assets or types of watering events that are most important for achieving the Basin Plan objectives and expected outcomes.

RECOMMENDATION 11.1

The Murray-Darling Basin Authority, when developing the next five-year Basin-wide environmental watering strategy in 2019, should strengthen its value as the key strategic plan governing environmental watering across the Basin by:

- including a clear objective to ‘maximise environmental outcomes through effective and efficient environmental water management’
- including a secondary objective that, where environmental outcomes are not compromised, environmental watering should seek to contribute to social or cultural outcomes
- providing clear guidance, under all water availability scenarios, on the relative priority of key Basin environmental assets (including instream assets) to achieving the overall environmental objectives of the Basin Plan and the expected outcomes set out in the strategy
- providing clear guidance, under all water availability scenarios, on the priority for achieving flow connectivity at the system scale relative to watering within an individual Water Resource Plan Area
- providing clear guidance on potentially harmful flow regimes, to support river operators and resource managers to act in a way that is consistent with the Basin Plan.

Long-term watering plans are likely to be useful, but there is room for improvement

The majority of LTWPs (13 out of 20) are yet to be published. Of these, nine are yet to be published in New South Wales, three in Queensland and one in the ACT (MDBA, pers. comm., 6 November 2018). Some Basin States have negotiated with the MDBA for an extension to the initial Basin Plan deadline for completing LTWPs (within 12 months of the first publication of the BWEWS) until 30 June 2019 (MDBA 2017k).

Where they have been prepared, Basin States have taken different approaches to developing LTWPs. While some LTWPs contain predictions of expected environmental water demands for environmental assets in each catchment, others contain more aspirational targets.

LTWPs provide detail on the magnitude, nature and location of the demand for environmental water at the regional scale, and are a valuable resource for managers of environmental water. The CEWH (sub. 75) stated that LTWPs are highly useful in informing their decision making. However, participants¹⁵⁰ raised a number of concerns regarding the implementation of LTWPs. These included that LTWPs:

- may become codified, and Basin States should balance the need to provide certainty with the need to allow flexibility. The CEWH (sub. 75) advocated for flexible and adaptable

¹⁵⁰ Including Namoi Water (sub. 82), New South Wales Irrigators' Council (sub. 80) and the Wentworth Group of Concerned Scientists (sub. 42).

management of environmental water and suggested that LTWPs should be ‘living documents’ — able to be updated as operational practices improve and as new information becomes available

- may be too aspirational, and are seen as a ‘shopping list’ of environmental actions that give no consideration to matching demands to the likely supply or the capacity to deliver environmental water. The content of LTWPs varies significantly between Basin States, with some setting targets that are highly ambitious and only achievable under highly favourable circumstances, such as with the removal of all constraints and under favourable natural conditions. The Commission heard concerns regarding the feasibility of some targets within South Australia’s LTWPs, and in particular flow-rate targets for the Murray Mouth. Unrealistic targets are not useful for environmental water managers and may prevent effective environmental watering and monitoring at the catchment level
- are not independently accredited. This creates a risk that targets specified in some LTWPs may not align with the BWEWS or be fully consistent with the objectives and outcomes sought by the Basin Plan as a whole. The Wentworth Group of Concerned Scientists (2017) suggested that LTWPs should be aligned with Basin Plan targets, the BWEWS and WRPs as part of an accreditation process.

While LTWPs are still in the establishment phase, the Commission has identified some areas for improvement to be considered as lessons are learned from implementation and LTWPs are progressively reviewed. There may be scope for LTWPs to be made more consistent across jurisdictions, and in the longer term, LTWPs should articulate realistic long-term objectives for the use of environmental water within the constraints operating at that time. More consistent LTWPs will also facilitate improved coordination of environmental watering between Basin States by outlining the environmental watering requirements in different locations in a consistent manner.

Participants¹⁵¹ raised concerns around the damage to rivers resulting from ‘unseasonal high flows’. LTWPs should identify the nature of any risks to the achievement of the Basin Plan’s long-term environmental watering objectives and describe the potential environmental consequences if they are not addressed. For instance, LTWPs should recognise potentially harmful outcomes arising from environmental watering activities or river operations or the need for complementary measures within the catchment.

LTWPs must be reviewed at least every five years. To drive greater consistency and ensure improvements in the BWEWS are incorporated into LTWPs, the MDBA (as Basin Plan Regulator) should provide clear guidance material to Basin States on the expected content of LTWPs following the publication of the 2019 BWEWS. This guidance material should be utilised by Basin States when reviewing and revising LTWPs, and will help to improve consistency across LTWPs and accountability of Basin States in implementing them. The MDBA should consult widely when developing guidance material for LTWPs. Strategic input should be sought from those who utilise LTWPs, including asset managers and

¹⁵¹ Including Goulburn Valley Environment Group Inc. (sub. 13 and trans., 17 October 2018).

environmental water holders and managers, to ensure that their utility for decision making can be improved over time.

The Commission does not see a need for a formal LTWP accreditation process. The Basin Plan requires LTWPs to be consistent with the BWEWS and the principles to be applied in environmental water management¹⁵². These requirements, taken with the statutory responsibilities of environmental water managers and additional guidance material provided by the MDBA, should ensure that LTWPs are developed consistently with Basin Plan environmental outcomes and objectives, while maintaining flexibility and adaptability.

LTWPs should also consider and incorporate relevant new modelling as it becomes available. For example, the CEWO (in collaboration with the MDBA, Basin States and scientists) have developed a ‘Black Box Management Framework’ — for managing black box eucalypts based on the vulnerability of key ecosystem components (CEWH, sub. DR110). Such research could enable clearer guidance on the prioritisation of environmental assets at the regional level.

The Basin Plan does not outline any requirements regarding the publication of LTWPs. While the MDBA does maintain a register of ‘measures to protect environmental water’ on its website with links to key environmental planning documents (MDBA 2018c), there is room for improvement. Transparency around the development of LTWPs would be improved if this register were updated to include relevant deadlines, progress towards completion and final documents when they are completed. Since LTWPs are reviewed at least every five years, this function would also be useful to publicly communicate the current status of LTWPs following their initial completion by 30 June 2019.

As most LTWPs are still in the establishment phase, with some in the implementation phase, the Commission will revisit the issues of alignment and accountability in its 2023 review of Basin Plan implementation.

FINDING 11.3

Only seven out of 20 long-term watering plans (LTWPs) have been developed and published, with the remaining 13 due to be published by the ACT, New South Wales and Queensland Governments by 30 June 2019 or earlier.

LTWPs are likely to be an important component of the Environmental Management Framework because they are:

- undertaken at the catchment scale and facilitate top-down and bottom-up input
- a mechanism to facilitate local input into environmental water planning activities and the prioritisation of assets within a catchment.

Basin States have adopted different approaches to specifying priorities, objectives and targets in LTWPs.

¹⁵² Chapter 8, Part 4, Division 3.

RECOMMENDATION 11.2

Following the publication of the 2019 Basin-wide environmental watering strategy (BWEWS), the Murray-Darling Basin Authority (MDBA) (as Basin Plan Regulator) should provide clear guidance material to Basin States on the expected content of long-term watering plans (LTWPs) when they are reviewed and revised. This guidance material should include the need for LTWPs to articulate:

- realistic long-term objectives to be achieved from the available environmental water portfolio through watering activities within the operational constraints at that time
- environmental watering requirements in the catchment including the required magnitude, timing and frequency of watering for priority assets, ecosystem functions and system connectivity
- the relative priority of assets within the catchment for achieving the objectives of the Basin Plan and the expected outcomes of the BWEWS
- risks to the achievement of the long-term watering objectives, including the risk of undesirable outcomes arising from environmental watering or potentially harmful flow regimes as a result of river operations.

To improve the accessibility of information, the MDBA should maintain a register of LTWPs on its website, including relevant deadlines, progress towards completion, final documents when they are completed, and the status of each plan as they are reviewed and adapted over time.

11.5 Annual planning of environmental water

The Environmental Management Framework sets out the requirements to guide annual planning of environmental watering. These plans guide the water use decisions of environmental water holders (figure 11.3). The Basin Plan requires:

- the MDBA to identify Basin annual environmental watering priorities (Basin AEWPs) to guide the management of environmental water at the Basin-scale for a given water year. These may identify priority environmental assets and ecosystem functions that have Basin-scale significance or require complex arrangements and any potential synergies in environmental watering activities. Basin AEWPs must be consistent with the BWEWS and may be informed by State priorities. They must be published by 30 June each year
- Basin States to identify annual environmental watering priorities (State AEWPs) in each WRP Area that contains surface water, guiding the annual planning, prioritisation, and use of environmental water at the catchment scale¹⁵³. State AEWPs must have regard to the BWEWS and relevant LTWPs and outline priorities for the watering of priority environmental assets and ecosystem functions within each catchment. They must be handed to the MDBA by 31 May each year (unless otherwise agreed).

¹⁵³ Chapter 8, Part 4, Division 4.

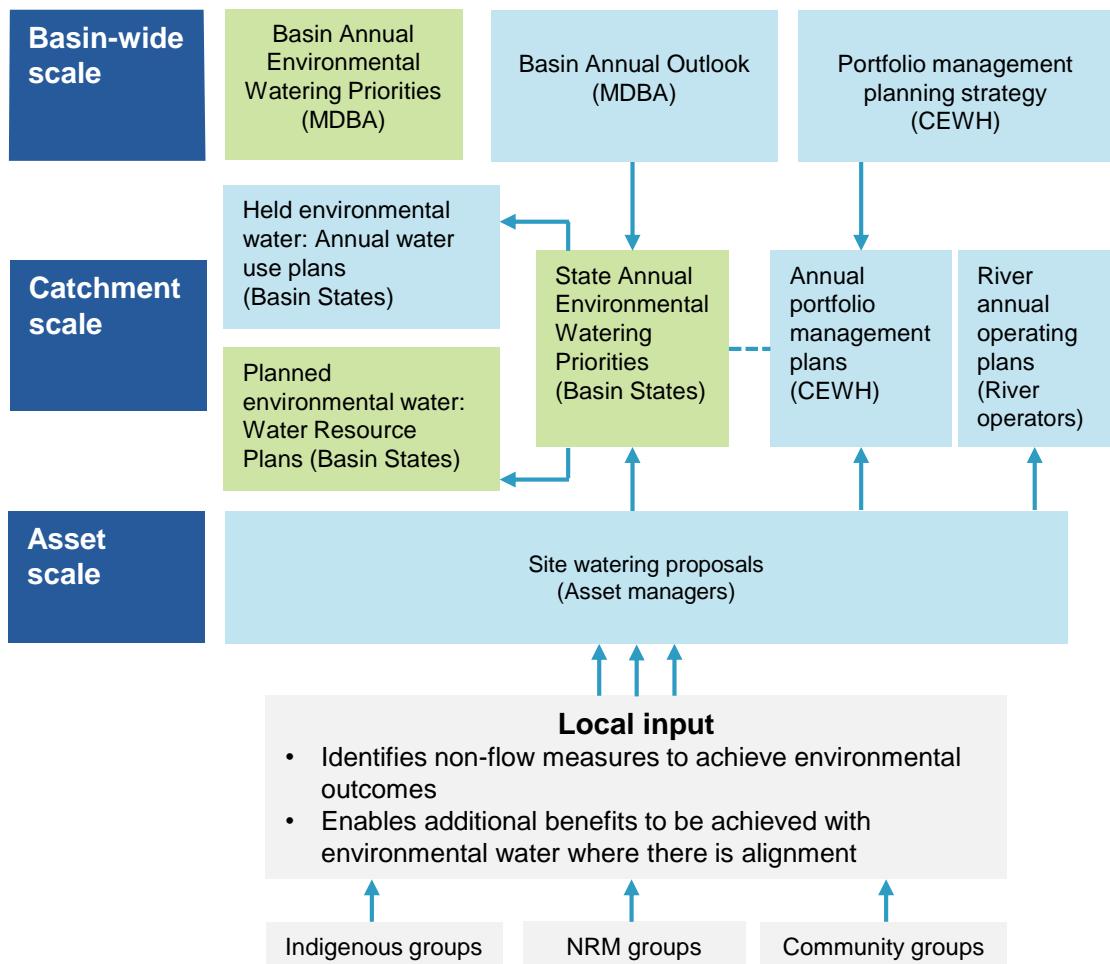
State annual environmental watering priorities are critical for identifying local watering needs

The Basin Plan requires State AEWPs to be consistent with Basin AEWPs. However, recognising that State AEWPs are published prior to Basin AEWPs, the MDBA also publishes a Basin-wide annual environmental watering outlook in April each year. The outlook is not required by the Basin Plan, but provides a preliminary list of Basin-wide priorities to facilitate State planning (MDBA 2017k).

When developing State AEWPs, Basin States consider planned environmental water arrangements (as outlined in WRPs) and their own planning instruments for held environmental water that are not required under the Basin Plan. For example:

- State AEWPs are informed in a ‘bottom-up’ manner by **local asset plans** (developed by the owners or managers of particular environmental assets)
- in many areas where they possess held water, Basin States develop **annual plans for water use** in collaboration with the CEWH and river operators (MDBA 2016c) such as Victoria’s Seasonal Watering Plan, New South Wales’ annual watering plans and the Annual Environmental Watering Plan for the South Australian River Murray
- the CEWH develops **annual portfolio management plans** for all catchments where it holds water, informed by local asset plans and Basin States’ annual plans for water use.

Figure 11.3 Annual environmental water planning architecture^a



^a Documents highlighted in green are formally required by the Basin Plan. Documents highlighted in blue are not formally required by the Basin Plan.

These planning documents, while not formally required by the Basin Plan, are a crucial part of the Basin's 'bottom-up' environmental water planning architecture. They are useful tools for Basin States when developing State AEWPs and are therefore important for achieving the environmental outcomes of the Plan.

State AEWPs have been completed within required timeframes each year. The Commission heard that State AEWPs have been fundamental for articulating what is needed at the local level on an annual timeframe. State AEWPs are used as a basis for priority-setting and coordination in the southern Basin, and also assist in informing the CEWH's environmental water portfolio plans (CEWH, sub. 75). Based on the evidence presented to this inquiry, the Commission considers that no changes to these arrangements are needed at this time.

Basin annual environmental watering priorities may not be useful in their current form

Basin AEWPs have been completed within required timeframes each year, however participants¹⁵⁴ raised questions about the usefulness of Basin AEWPs for managers of environmental water. For example, participants argued that:

- Basin AEWPs are released too late in the year to be useful for planning. The MDBA's earlier seasonal forecast — the Basin environmental watering outlook — fulfils the role of a 'draft' set of Basin AEWPs and is seen as a more useful, high level document that helps to inform local priorities
- Basin AEWPs have been viewed merely as a check-list, rather than actually directing environmental watering decisions
- annual priority setting at the catchment scale has shifted towards 2–3 year planning in some areas.

Other participants¹⁵⁵ argued that Basin AEWPs, while not ideal in their current form, fill a strategic gap between State AEWPs and the BWEWS. The MDBA (sub. DR136) argued that consultation during the development of the Basin AEWPs influences the decisions of environmental water managers and that the priorities are useful for guiding annual decision making to meet the outcomes of the BWEWS and promoting the management of the Basin as a connected system.

The value of Basin AEWPs is likely to be reduced if the Commission's recommendation for improving the BWEWS (recommendation 11.1) is implemented. The clearer articulation of relative priorities will be useful to inform rolling annual catchment scale planning.

The MDBA (as Basin Plan Regulator) should consider this issue when it reviews the Basin Plan Environmental Management Framework in 2020¹⁵⁶. The review should determine whether Basin AEWPs effectively facilitate the achievement of Basin Plan environmental outcomes in their current form and, if not, how they should be amended to do so. If, after implementing the 2019 BWEWS, the MDBA finds no strategic gap in the Environmental Management Framework to be filled by Basin AEWPs, the requirement to produce them should be removed in order to streamline the environmental water planning process.

¹⁵⁴ Including Cotton Australia (sub. 47) and Gwydir Valley Irrigators Association Inc. (sub. 83).

¹⁵⁵ Including Inland Rivers Network (sub. DR105), Moles (sub. DR133) and the Victorian Government (sub. DR142).

¹⁵⁶ As required by the Basin Plan (Chapter 13, Part 3, Division 2).

FINDING 11.4

The Basin annual environmental watering priorities:

- are released too late to be considered by environmental water managers in their planning processes
 - are becoming increasingly redundant as significant environmental water holders are moving to rolling multi-year plans.
-

RECOMMENDATION 11.3

As part of the 2020 review of the Environmental Watering Plan, the Murray-Darling Basin Authority (as Basin Plan Regulator) should consider the usefulness of Basin annual environmental watering priorities and whether the Basin Plan requirements for these annual priorities should be amended or removed.

11.6 Coordination and consultation by environmental water holders

The Basin Plan outlines a number of principles¹⁵⁷ to be applied in planning for and delivering environmental water. For example, environmental watering must be coordinated and information on environmental watering must be transparently shared between the MDBA, the Commonwealth, Basin States and environmental water managers to ensure environmental water is used efficiently and effectively. Environmental watering must also be undertaken in a way that utilises local knowledge and experience, and considers wider impacts. This section considers the current arrangements for coordinated planning and delivery of environmental water use and decision making in real-time during environmental watering events in the Basin.

Environmental water holders are coordinating with each other, but more transparent arrangements are needed

Environmental water holders have worked co-operatively with the MDBA and Basin States towards achieving the environmental objectives of the Plan (MDBA, sub. 86). The CEWH has incorporated input from local communities through various forums (Natural Capital Economics 2017). Environmental water holders have determined annual priorities in consultation with each other and their local communities, and have developed individual portfolio management plans outlining their intended environmental watering actions. Using these processes throughout the previous five years, over 750 environmental watering events

¹⁵⁷ Chapter 8, Part 4, Division 6.

have occurred within the Basin, targeted at specific environmental outcomes linked to the long-term objectives of the Plan (MDBA, sub. 86). There is early evidence that the environment is responding positively to environmental watering activities, including a reduced decline in waterbird abundance, positive responses from native fish, and improved growth and diversity of native vegetation (chapter 2).

To facilitate coordination for the delivery of environmental watering events, the MDB Ministerial Council established the Southern Connected Basin Environmental Watering Committee (SCBEWC) in 2014. SCBEWC is a collaborative forum that brings together environmental water holders, asset managers and river operators to prioritise effort and resources to meet environmental needs in the southern connected Basin, and is valued by its members¹⁵⁸. SCBEWC's terms of reference defines its role as coordinating the delivery of all environmental water in the southern Basin, in particular the River Murray System, consistent with the Basin Plan and its objectives. It also makes decisions under the MDB Agreement including the allocation of the water held by Governments acquired under TLM, and arrangements for the River Murray Unregulated Flows¹⁵⁹ and the River Murray Increased Flows¹⁶⁰.

SCBEWC has been highly successful in increasing the coordination of environmental watering in the southern Basin. From 2014-15 to 2015-16, the share of environmental watering events that were coordinated across multiple water holders in the southern Basin increased from 18 per cent to 33 per cent (MDBA 2017k). The yearly number of environmental watering events occurring throughout the southern Basin has fallen, while the total volume of environmental water delivered has risen (figure 11.4).

Notwithstanding the success of established forums for coordination of environmental watering to date, there is scope for improvement. Over time, SCBEWC's focus has grown from its TLM responsibilities to broader coordination of environmental water in the southern Basin to achieve the outcomes of the Basin Plan. Basin Governments should regularly ensure that its terms of reference are contemporary and that they are made publicly available to aid transparency.

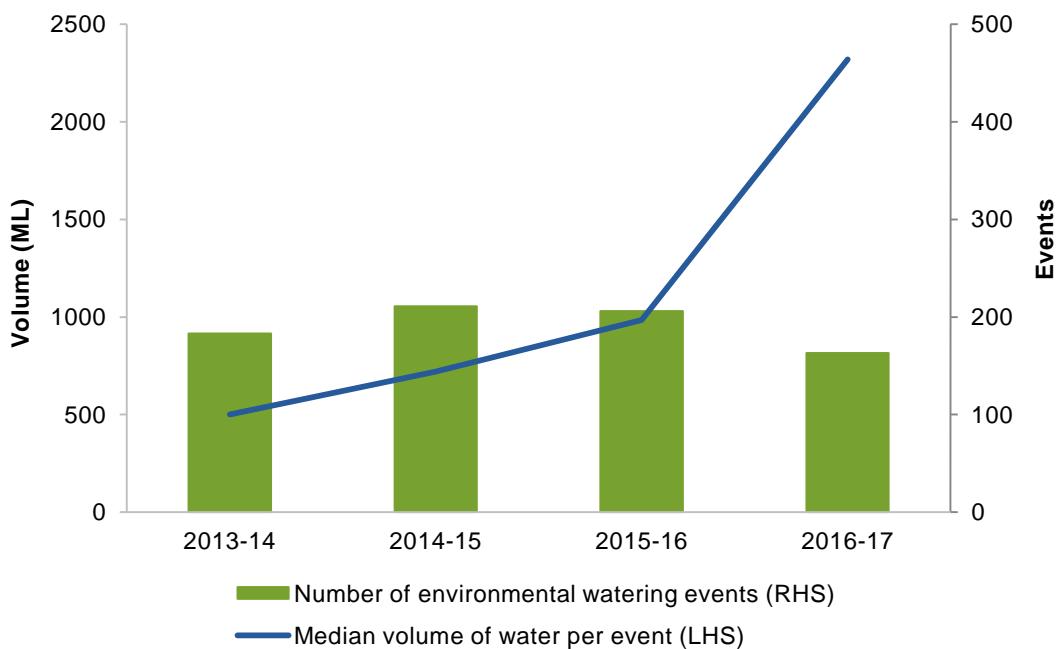
There is also scope to improve consultation with stakeholders, including Traditional Owners and Indigenous groups, at the connected system scale. SCBEWC should consult with Murray Lower Darling Rivers Indigenous Nations (MLDRIN) when developing its annual priorities.

¹⁵⁸ Including the CEWH (sub. 75) and the MDBA (2017k).

¹⁵⁹ River Murray Unregulated Flows is the water remaining in the River Murray after New South Wales and Victoria exercise their rights to access unregulated flows for consumptive use (MDBA 2014a).

¹⁶⁰ River Murray Increased Flows is a share of the water savings from the Snowy Initiative that can be called from Snowy storages for environmental use in the River Murray (MDBA 2014a).

Figure 11.4 Coordination of environmental watering



Source: MDBA (2017b).

However, there is no forum to coordinate the use of environmental water in the northern Basin. The need for such a body was demonstrated in April 2018 when, for the first time, a significant environmental watering event was undertaken to restore connectivity in the Barwon-Darling system (MDBA 2018ab). This was a coordinated release from the CEWH (24 GL) and the New South Wales Office of Environment and Heritage (OEH) (7 GL), and was accompanied by a New South Wales Government Ministerial Order imposing a temporary embargo on extraction by consumptive users. An MDBA review (2018d) found that this embargo successfully facilitated flows through the Barwon-Darling and demonstrated the benefits of improved coordination in the northern Basin. This event was facilitated through an ad-hoc arrangement.

While the CEWH and New South Wales OEH currently undertake co-operative environmental water planning through a partnership agreement, participants¹⁶¹ identified the lack of a coordinated environmental watering forum in the northern Basin as a significant issue. The CEWH (sub. DR110) suggested that a formalised northern Basin forum consisting of environmental water holders, river operators, storage managers, monitoring organisations and compliance agencies would enable cross-valley collaboration in environmental water planning and delivery, and allow communities in areas not covered by Environmental Water Advisory Groups (EWAGs) to have a say. Such a forum could also provide an enduring focus for the implementation of key Northern Basin Toolkit measures related to improved

¹⁶¹ Including McBride (sub. 78), MDBA (sub. 86) and the New South Wales Irrigators' Council (sub. 80).

protection and coordination of environmental flows, and actively identify future opportunities for connected environmental watering events.

The Commission considers that formal arrangements for coordination are required for the northern Basin. Given the success of SCBEWC, and the forthcoming implementation of Northern Basin Toolkit measures which relate to environmental flows, a similar committee in the northern Basin should be established.

RECOMMENDATION 11.4

By 2020, Basin Governments should:

- establish a Northern Connected Basin Environmental Watering Committee as a mechanism for intergovernmental coordination for planning and coordinating connected environmental watering events in the northern Basin
- increase the transparency of the Southern Connected Basin Environmental Watering Committee and its role by making its governance arrangements including terms of reference, membership and reporting responsibilities publicly available.

Event-based management requires transparent processes for consultation

Annual planning undertaken by environmental water holders transparently establishes the priorities for water use in that year under a range of water availability scenarios. However, the actual deployment of environmental water during the year depends on the weather and consequent streamflow conditions. In some systems, particularly in the northern Basin, unregulated flow events require environmental water holders to make real-time decisions about the use of their portfolios. The need to make these event-based decisions, and the principles and requirements for environmental water delivery imposed by the Basin Plan, mean that processes to effectively consult and coordinate with key stakeholders in real time are critical.

Such processes have been established throughout parts of the Basin. For example, EWAGs throughout New South Wales and equivalent groups in some Victorian catchments plan and review deliveries at the catchment scale, while Operational Advisory Groups (OAGs) provide specialist real-time advice on environmental watering at the asset scale throughout the southern Basin (MDBA 2017k). OAGs comprise of State agencies, water authorities, river operators, site managers, environmental water managers and scientists, and meet on a weekly basis both before and during environmental watering events to discuss a range of operational matters including ecological responses, engineering issues and risk management (MDBA 2017k). Both EWAGs and OAGs were viewed by participants¹⁶² as highly successful in facilitating coordinated environmental water management.

¹⁶² Gwydir Valley Irrigators Association Inc. (sub. 83), Healthy Rivers Dubbo (sub. DR104), Inland Rivers Network (sub. DR105), Macquarie Marshes Environmental Landholders Association (sub. 68), MDBA (2017k) and Moles (sub. DR133).

EWAGs and OAGs have been established in some catchments, however, some gaps remain. Where these gaps exist, Basin States should establish processes for event-based decision making, in consultation with water managers, asset managers and environmental water holders. These processes should be transparent so that stakeholders are aware of how environmental water managers make real-time decisions. Where possible, these processes should also build on existing arrangements for environmental watering or event management.

RECOMMENDATION 11.5

Where not yet in place, Basin State Governments should establish processes for consultation and coordination between key stakeholders to enable event-based watering decisions — including water managers, asset managers and entitlement holders (including the Commonwealth Environmental Water Holder) — as soon as practicable.

These processes should be documented and publicly available.

Once in place, these arrangements should be reflected in the Commonwealth Environmental Water Holder's annual portfolio management plans.

11.7 Maximising the benefits of environmental water

Environmental watering can often provide additional benefits

While its primary purpose is to maintain and improve environmental outcomes, environmental water can often provide a number of secondary benefits. For example, water released for environmental purposes can, in some instances, provide for Indigenous water values (chapter 7) or improve amenity.

When managing held environmental water, environmental water holders are obligated under their respective legislation to have a primary focus on environmental outcomes. However, additional benefits can often be achieved without compromising the primary environmental benefits sought from the use of environmental water, and can align with the overall objectives of the Basin Plan¹⁶³.

Understanding of these additional benefits is required to enable opportunities for alignment with environmental water use to be identified. The identification of these opportunities must occur at the local scale, and community engagement is therefore critical. Engagement with Traditional Owners and Indigenous groups is also crucial to developing this understanding by allowing for the identification of cultural uses of environmental water, and increasing the efficiency of environmental water use by harnessing traditional ecological knowledge. In

¹⁶³ For example, Chapter 5 of the Plan outlines the objective to ‘optimise social, economic and environmental outcomes arising from the use of Basin water resources in the national interest’ and the outcome of a healthy and working Basin that includes communities with sufficient and reliable water ‘fit for a range of intended purposes, including domestic, recreational and cultural use’.

May 2018, the Australian Government announced a range of measures to improve outcomes for Indigenous Australians in the Basin — including that the CEWH will enhance engagement with Indigenous communities on decisions underpinning the beneficial use of environmental water to meet Indigenous values (chapter 7).

Processes for identifying additional values from environmental water use are already in place in some areas. For example, Basin States are required to identify Indigenous water objectives and outcomes through the development of WRPs (chapter 7). However, further effort is required to enable this to inform asset and catchment scale planning across the entire Basin.

All Basin States and environmental asset managers should have formal processes for engagement with local communities and Traditional Owners, in order to identify opportunities to achieve social or cultural outcomes with environmental water while ensuring environmental outcomes are not compromised. Basin States should design these processes in consultation with Traditional Owners and Indigenous organisations and communities to enable meaningful engagement (chapter 7). These should be in place in time for the first revision of LTWPs.

RECOMMENDATION 11.6

While achieving environmental outcomes is the primary focus of environmental water holders under their respective legislation, opportunities to contribute to social or cultural outcomes (without compromising environmental outcomes) should be actively pursued. Before the first revision of long-term watering plans, Basin States and environmental asset managers should have processes to engage with local communities and Traditional Owners.

Achieving environmental outcomes requires more than just water

The provision of environmental flows, while necessary, is not always sufficient to achieve environmental outcomes. A range of non-flow related measures and activities need to be managed, mostly at the local scale, to maximise the benefits of environmental water use and ensure the achievement of the environmental outcomes outlined in the Plan. Examples of non-flow measures and activities important for facilitating the efficient use of environmental water and achieving the environmental objectives of the Basin Plan include:

- complementary waterway management activities, or '**complementary works**'. These refer to activities that protect or enhance rivers, wetlands and estuaries, and include the management of pest plants and animals, habitat restoration, water quality improvement and management of riparian corridors and catchment land (PC 2017b).
- the management of '**environmental works**'. These take the form of water management infrastructure such as regulators and levees, designed to facilitate the efficient delivery of environmental water to particular sites. For example, a suite of environmental works

were built as part of TLM, and continue to be developed under the Basin Plan’s SDL adjustment mechanism.

Despite their importance for achieving the Basin Plan’s objectives, these non-flow factors operate outside of the formal requirements of the Plan and are the responsibility of Basin State Governments. A number of participants¹⁶⁴ raised the lack of explicit requirements for complementary works in the Plan as an issue.

The approach taken to implement these non-flow measures varies across the Basin. Environmental water and complementary works tend to be managed by separate bodies, which can lack the authority or incentives to coordinate the development of their priorities (PC 2017b). The Commission’s inquiry into National Water Reform (2017b) found that, of the Basin States, New South Wales and Queensland have the least integrated arrangements, while more robust arrangements for integrating water and waterway management exist in Victoria, South Australia and the ACT. In the latter cases, legislation provides a clear direction to align water and natural resource management (NRM) planning and this is implemented through institutions and policy frameworks that draw on the expertise of local managers.

As outlined in section 11.4, the risks to achieving the environmental outcomes of the Basin Plan should be identified in LTWPs. This should include identifying when environmental water delivery and complementary works are required to achieve Plan outcomes. For example, providing environmental water to a particular wetland may only increase native fish populations if waterway managers also maintain wetland vegetation, reduce weeds and install screens to exclude carp (PC 2017b). This should also include identifying threats to achieving environmental outcomes from broader landscape issues such as sea level rise.

Identifying the need for complementary works in LTWPs provides some assurance that Basin States, environmental water holders, and NRM managers are aware of the issues and seek to align their management practices where appropriate. It also helps to ensure that environmental watering is being undertaken in the broader context of State NRM priorities and planning. The Commission’s inquiry into National Water Reform (2017b) recommended State and Territory Governments ensure the management of environmental water is aligned and coordinated with complementary works at the local level by applying consistent management objectives and, where possible, a single planning process.

Looking forward, effective monitoring and evaluation will be required to determine the impact of complementary measures on achieving Plan objectives. To effectively conduct the 2026 review of the Basin Plan, the MDBA requires this evidence to determine the potential need for more complementary measures and/or further water recovery. Planning for the 2026 review is covered in chapter 13.

¹⁶⁴ Including Cotton Australia (sub. 47), Lachlan Valley Water Inc. (sub. 49), New South Wales Irrigators’ Council (sub. 80) and Speak Up Campaign Inc. (sub. 18).

RECOMMENDATION 11.7

Basin States should manage the risks to achieving the environmental watering objectives set out in long-term watering plans by delivering complementary waterway and natural resource management measures (such as habitat restoration or weed and pest control).

Using held environmental water for drought relief is contrary to the National Water Initiative

In response to drought conditions experienced throughout various parts of the Basin, some stakeholders have called for environmental water to be released, leased or sold to farmers for consumptive use. In October 2018, New South Wales OEH (2018b) sold 15 GL of environmental water allocations in response to dry conditions. New South Wales OEH routinely trades water to assist with the payment of water charges and to balance water availability and environmental demand. However, it is unclear whether the 15 GL sold recently was surplus to meeting environmental needs, as the sale was described as ‘assisting [farmers] during the drought’, with all proceeds earmarked for drought-related projects (OEH 2018a).

Similar calls to release environmental water for drought relief were directed at the CEWH. However, the Water Act¹⁶⁵ prevents the CEWH from disposing of water entitlements unless they are surplus to meeting environmental needs, and stipulates that the CEWH is not subject to the direction of DAWR or the Australian Minister for Water when undertaking water trading. A similar legislative restriction applies to the Victorian Environmental Water Holder.

The sale or reallocation of environmental water purely for the purpose of drought relief is inconsistent with the National Water Initiative (NWI) (COAG 2004). Paragraph 35 of the NWI explicitly states that environmental water should only be traded when not required to meet environmental and other public benefit outcomes. The NWI provisions are important for the integrity of the entitlements system.

Moreover, directions that result in environmental entitlements not being used for their intended purpose may undermine the Basin Plan and erode community confidence in the importance of recovering water for the environment — a key premise of the Basin Plan.

The Commission has previously identified risks around the political sensitivity of competing uses of water during dry times. In the inquiry into National Water Reform, the Commission recommended institutional separation between environmental water holders and government, so that decisions regarding environmental water could be made without being subject to political interference. This allows environmental water holders to operate at arms-length from government, promoting objectivity in decision making and strengthening community ‘buy in’ to environmental water programs.

¹⁶⁵ Part 6, Division 1.

12 Basin Plan compliance

Key points

- The *Water Act 2007* (Cwlth) assigns responsibility for ensuring compliance with the Basin Plan to the Murray-Darling Basin Authority (MDBA). However, Basin States remain responsible for water take compliance under state water laws.
- A Four Corners (July 2017) report into water management in the Basin, particularly in the northern Basin, caused serious concern and reduced confidence in state compliance regimes. A number of reviews were instigated. The message was that Basin States must be more active, consistent and transparent in enforcing water take laws and the MDBA must develop a clear statement of its compliance role.
- Basin Governments have instigated changes. The New South Wales Government has established the Natural Resources Access Regulator, the Queensland Government has released a rural water management program and Basin Governments have released a Compliance Compact.
- A key focus of the Compliance Compact is on improving metering and measurement as a basis for more transparent monitoring of water take.
 - Basin States should consider the role, costs and benefits of consistent metering policies and implementation plans should be supported by publicly available business cases.
 - Basin Governments should work with Standards Australia to revise metering standards to ensure quality and cost effectiveness in water measurement.
- There are six areas of the Basin Plan where the MDBA has compliance and enforcement responsibility (under the Water Act), namely: Sustainable Diversion Limits; Water Resource Plans (WRPs); water trading rules; planning and protection of environmental water; illegal water take; and water quality. The MDBA also has an underpinning role in improving the metering and measurement of water take.
 - The MDBA's full compliance role comes into effect after WRPs are accredited (1 July 2019, with the exception of any WRPs that require extension (chapter 6)).
 - For the most part, assessing compliance in these areas involves assessing the actions of Basin States.
- Until late 2017, the MDBA had a limited focus on preparing for its upcoming compliance role. It is now implementing a range of actions including establishing an Office of Compliance and an Independent Assurance Committee.
- The MDBA has roles in both implementing and ensuring compliance with the Basin Plan. To internally separate these conflicting functions, the MDBA should immediately house all its compliance functions within the Office of Compliance.
- There is confusion about the MDBA's compliance and enforcement role in illegal water take.
 - Enforcement of illegal water take is the responsibility of Basin States.
 - The MDBA's main role is to provide assurance of Basin State compliance and enforcement systems through conducting audits and investigating state practices and processes.
 - The MDBA should publicly report instances where Basin States are not effectively enforcing their illegal water take laws.
- The Productivity Commission will review the efficiency and effectiveness of the new compliance arrangements in 2023.

Compliance is a key element of Basin Plan implementation. There are various compliance activities and responsibilities across different aspects of the Plan. The Murray-Darling Basin Authority (MDBA) is responsible for taking actions to enforce compliance with the Basin Plan and Water Resource Plans (WRPs) (including Sustainable Diversion Limit (SDL) compliance). Basin States remain responsible for ensuring compliance with their own water laws, such as rules governing water take. Compliance regimes need to be effective and efficient (keeping cost to a reasonable level) while ensuring community confidence in water management regimes.

The first section of this chapter examines compliance with the Basin Plan, focusing on the MDBA's role, its response to compliance reviews and the inherent conflicts in the MDBA managing multiple roles and responsibilities. The second section discusses water take compliance including participants concerns, recent policy responses to compliance reviews and the roles of the Basin States and the MDBA in water take compliance.

12.1 Compliance with the Basin Plan

The *Water Act 2007* (Cwlth) is a Commonwealth legislative instrument and as such the Australian Government is accountable for assuring compliance under the Act. Under section 137 of the Water Act, the MDBA is assigned as the ‘appropriate enforcement agency’ for contraventions relating to Part 2 of the Water Act (Management of Basin Water Resources, including the Basin Plan) and the information gathering provisions of Part 10 of the Act.

The MDBA’s role for ensuring compliance with the Basin Plan (including compliance with SDLs and WRPs) comes into full effect when WRPs are accredited (currently, 1 July 2019). However, if Basin States are granted an extension, for some WRPs, the MDBA’s full compliance role, in these areas, may commence beyond 1 July 2019 (chapter 6).

The MDBA’s role in ensuring compliance with the Basin Plan trading rules came into effect when the rules commenced in 2014.

The MDBA’s compliance role

The MDBA (2018n) compliance and enforcement policy lists six areas of the Basin Plan where the MDBA has compliance and enforcement responsibilities (under the Water Act). These are summarised below, including a reference to where each area is discussed in more detail in this report. For the most part, assessing compliance in each of these areas involves assessing the actions of Basin States.

Sustainable Diversion Limits (SDLs, chapter 6)

The MDBA ensures compliance with the SDLs, which are limits on the amount of water that can be sustainably taken from the Basin and used for consumptive purposes. The MDBA is

required to maintain and publish a register of water take annually, including the cumulative balance of permitted and actual take for each WRP Area (MDBA 2018n). Where jurisdictions do not comply with the SDL they are required to make good by reducing the cumulative balance of the register to zero.

Water Resource Plans (WRPs, chapter 6)

Developed by the Basin States, assessed by the MDBA and accredited by the Minister, WRPs are the key instrument through which Basin States implement SDLs and other requirements of the Basin Plan (such as critical human water needs and water quality) and through which the MDBA regulates state-level activities. The Water Act requires that an agency of a Basin State, an operating authority, an irrigation infrastructure operator or a holder of a water access right must not act inconsistently with a WRP or fail to act as required by a WRP. The MDBA's compliance role is to monitor and enforce compliance of all regulated entities with accredited WRPs. Once the WRPs are accredited, the MDBA and Basin States will need to ensure that state water laws and policies remain consistent with WRP requirements (MDBA 2018n).

Trading rules (chapter 10)

The Basin Plan trading rules are aimed at removing restrictions on trade and improving information in the market. The MDBA's compliance role includes ensuring that: restrictions on trade are compliant; water announcements are disclosed appropriately; irrigation infrastructure operators and Basin States meet information and reporting requirements; reporting of water trade prices is accurate; and use of exchange rates is compliant (MDBA 2018n).

Planning and protection of environmental water (chapter 11)

The MDBA will report on compliance with environmental requirements under the Basin Plan, providing assurance that environmental water is protected in the Basin. It assesses WRP provisions relating to the identification and protection of planned and held environmental water and also assesses the effectiveness of the implementation of pre-requisite policy measures by Basin States (due to be implemented by 30 June 2019). Commonwealth and State environmental water holders provide the MDBA with annual Statements of Assurance that they have performed their functions and exercised their powers in a way that is consistent with the Basin-wide environmental watering strategy (MDBA 2018n).

Illegal take (this chapter)

The MDBA provides assurance of the compliance and enforcement frameworks of each Basin State. For example, to improve confidence in the management of the Basin's water resources, it will conduct audits of Basin State compliance and enforcement processes. The

MDBA's policy also states that the MDBA may directly regulate the compliance of individual water users with the Basin Plan, and it intends to do so in the absence of adequate action by a Basin State (MDBA 2018n).

Water quality and salinity (chapter 8)

The Basin Plan sets out objectives and targets for water quality that aim to ensure that water quality is suitable for drinking, agricultural, recreational and environmental purposes. Basin States, river operators, the Basin Officials Committee and environmental water holders must have regard for water quality targets when making relevant water management decisions. The MDBA reports on whether objectives and targets are being met and provides assurance that Basin States and the Commonwealth Environmental Water Holder are having regard to water quality and salinity when managing flows and using environmental water. The MDBA must also monitor, assess and report on salinity levels in the River Murray (MDBA 2018n).

Enforcement options vary by area of compliance

The enforcement options available to the MDBA (under the Water Act) vary by area of compliance (figure 12.1).

In the compliance areas of SDLs, WRPs, planning and protection of environmental water, trading rules and illegal take, the MDBA can use declarations, enforceable undertakings, enforcement notices and investigations and audits using its power to request information to enable compliance action to be taken, if needed. In contrast, in the area of water quality, the MDBA's enforcement options are limited to non-judicial mechanisms such as investigations and audits, public reporting and data release.

Improving water metering and measurement of water take

The MDBA has no specific enforcement options for improving water metering and measurement. But, the MDBA has an underpinning strategic role to develop and implement best practice methods to improve the accuracy of water measurement and increase the transparency of water take across the Basin. This includes the use of remote sensing and emerging technologies to support Basin Plan compliance and water compliance monitoring activities (MDBA 2018n).

Figure 12.1 MDBA compliance escalation pathways



(continued next page)

Figure 12.1 (continued)



Source: MDBA (2018n).

The MDBA is instigating change

Until late 2017, the MDBA had a limited focus on preparing for its role to ensure compliance with the Basin Plan. However, following evidence of non-compliance in the northern Basin, which triggered a range of review processes (box 12.1), the MDBA acknowledged that it had given insufficient attention to the need for a clear statement of its compliance role and had not dealt adequately with allegations of compliance breaches.

The MDBA has also stated that it is committed to fixing compliance issues by implementing the recommendations of the *Murray–Darling Basin Water Compliance Review*, published in November 2017 (MDBA, sub. 86). To this end, the MDBA is implementing a range of reform actions. Key amongst these are establishing an Office of Compliance and an Independent Assurance Committee (IAC).

Box 12.1 **Compliance reviews in response to issues raised by Four Corners**

The broadcast of an ABC Four Corners program ('Pumped') in July 2017 raised issues about water management (including compliance) in the Barwon-Darling river system in New South Wales and generated considerable public interest. The program described cases of alleged non-compliance with water laws and regulations in New South Wales, and raised broader questions about the effectiveness of compliance and enforcement regimes. The episode resonated with Basin communities, raising issues that many had been concerned about for years.

Basin Governments, concerned with eroding community confidence and its impact on the implementation of the Basin Plan, initiated a number of investigations into compliance at both the Basin-wide and state level (table below).

The Murray-Darling Basin Authority (MDBA) and an Independent Panel conducted the *Murray-Darling Basin Water Compliance Review* at the request of the Australian Government. It assessed the legislative, policy and practical implementation of water management compliance across the Basin. In particular, concerns were raised about a lack of comprehensive reporting on compliance, deficiencies in the compliance efforts of some water regulators (including the commitment to accurate metering and measurement of water take) and relatively low levels of compliance resourcing in some Basin States. On release of the review the MDBA said:

All Australians must be able to have trust and confidence in the MDBA's handling of compliance matters — so we will be more transparent and consistent in how we handle allegations of non-compliance. We will be revising our compliance and enforcement strategy and framework, providing a clear escalation pathway, and reporting publicly and regularly on handling and progress of compliance matters. (MDBA 2017i)

The MDBA and Basin States are in the process of implementing recommendations from the review.

Key compliance reviews

Date	Author	Title
September 2017	Mr Ken Matthews AO	<i>Independent investigation into NSW water management and compliance, interim report</i>
November 2017	Mr Ken Matthews AO	<i>Independent investigation into NSW water management and compliance, final report</i>
November 2017	Ombudsman NSW	<i>Investigation into water compliance and enforcement 2007–17, progress report</i>
November 2017	MDBA and the Independent Review Panel	<i>The Murray-Darling Basin water compliance review</i>
November 2017	The Australian National Audit Office	<i>A limited assurance review of the Department of Agriculture and Water Resources' assessment of New South Wales' protection and use of environmental water under the National Partnership Agreement on Implementing Water Reform in the Murray-Darling Basin</i>
March 2018	Ombudsman NSW	<i>Investigation into water compliance and enforcement 2007–17, final report</i>
March 2018	Independent Expert Panel	<i>Independent audit of the Queensland Government's regulatory frameworks for water measurement and compliance</i>

The MDBA has established the Office of Compliance to address compliance concerns, provide accountability and ultimately increase the public's confidence and trust in the compliance regimes that support the Basin Plan. Its responsibilities include:

- setting compliance and enforcement policies and processes
- maintaining an audit program
- conducting investigations into allegations of non-compliance
- implementing compliance with the water trading rules
- developing best practice guidelines for different aspects of compliance
- benchmarking Basin State performance against best practice
- reporting publicly on compliance performance (MDBA 2018n).

The MDBA has appointed an Independent Assurance Committee (IAC) to provide advice on the design, implementation and adequacy of the MDBA's compliance program. The IAC comprises up to four experts in compliance, enforcement and regulation and was established under section 203 of the Water Act (with section 204 providing for the termination of member appointments by the MDBA at any time). The IAC provides the MDBA with advice on its approach to compliance, and external assurance over how well this work is being implemented. It includes how the MDBA is managing conflicts of interest involving its Basin Plan responsibilities and the operation of the River Murray. The IAC's advice is to be made public (MDBA 2018n).

Other MDBA compliance reforms and commitments include: an online register to report on the handling and progress of compliance matters reported to the MDBA; protocols for handling allegations of breaches under the Basin Plan; and a Memorandum of Understanding with the New South Wales Natural Resources Access Regulator (NRAR), to underpin a strong and co-operative approach to compliance (MDBA 2018f).

In line with these reforms, the MDBA sets compliance priorities for each water year based on a risk assessment for each of its compliance areas. The MDBA's 2018-19 priorities on high-level threats to Basin Plan compliance include:

- adequacy of compliance and enforcement of unauthorised take in the northern Basin (particularly the Barwon-Darling)
- protection of environmental water
- WRP assessment and development
- accurate reporting of water trade prices
- accurate measurement of water take and use (MDBA 2018o).

FINDING 12.1

The Murray-Darling Basin Authority's reforms of its regulatory approach (including the establishment of an Office of Compliance) are a step forward in establishing its capability, but it is too early to gauge the likely effectiveness of the new arrangements. The Productivity Commission will examine these in its 2023 review of Basin Plan implementation.

There are inherent conflicting functions within the MDBA

The MDBA is managing multiple roles and responsibilities. On the one hand, the MDBA has a key role in the implementation of the Basin Plan, including providing technical advice to the Basin States and acting as their agent in a number of project areas. On the other hand, the MDBA is responsible for assessing how well it is undertaking these multiple roles and providing assurance that it is complying with provisions in the Water Act and the Basin Plan. The MDBA explained:

Where the MDBA has a specific role in complying with provisions in the Water Act and the Basin Plan, it will publish details of its performance in its annual report, including details of any independent auditing of its own activities to provide assurance that it is acting in accordance with the Basin Plan. If at any time the MDBA is found to be non-compliant with the Water Act or Basin Plan, it will move immediately to remedy the situation, with full public disclosure on the non-compliance and steps taken to address it. (MDBA 2018n, p. 4)

In effect, the MDBA is regulating itself. Areas where conflicts may occur between the MDBA's implementation and compliance responsibilities include:

- environmental planning — the MDBA coordinates environmental flow planning and management, and is also responsible for ensuring alignment of environmental watering with the requirements of the Basin Plan
- water trading rules — the MDBA informs and implements inter-valley and interstate trading rules, assesses deliverability, and is also responsible for ensuring compliance with water trading rules
- River Murray operations — the MDBA is responsible for conducting river operations in accordance with WRPs for the River Murray system, and is also responsible for assessing compliance, including taking enforcement action when river operators and others act in a way that is inconsistent with a WRP (chapter 6).

Chapter 14 discusses the principles of good governance. Key among these is that conflicting functions should be managed through the separation of regulatory, service delivery and policy making roles. The establishment of the MDBA's Office of Compliance provides an avenue to internally separate the MDBA's compliance role from its Basin Plan implementation functions. Conflicting functions have the potential to undermine

accountability, bias judgment and decision making, erode trust in compliance regimes and tarnish the MDBA's public image.

Under the MDBA's operational structure, only a partial separation has been achieved. In particular, two key areas of compliance (SDLs and WRPs) remain housed within other divisions of the MDBA, outside the MDBA's Office of Compliance. A more logical and effective structure would be to house all MDBA compliance responsibilities within the Office of Compliance.

But, even if compliance functions are fully contained in the Office of Compliance, they remain under the remit of the MDBA, and the potential for conflicts will persist. The MDBA has recognised this lack of independence through the establishment of the IAC.

The IAC is a good first step but is not truly independent. IAC member appointments can be terminated by the MDBA at any time (under section 204 of the Water Act) and the MDBA also has the ability to provide procedural direction to the IAC as to the way it carries out its functions and holds meetings (section 205).

The success of the Basin Plan is dependent on confidence in the integrity of compliance arrangements. Independent and transparent compliance arrangements are critical to ensure that decisions are made on an objective, impartial and consistent basis.

The inherent risk from the MDBA's conflicting responsibilities must be resolved. The MDBA should internally separate its Basin Plan implementation role from its compliance role by housing all compliance functions in the Office of Compliance. However, this will not fully address the inherent conflict between the MDBA's policy implementation and compliance roles. Chapter 14 examines governance solutions over the longer term.

RECOMMENDATION 12.1

As a transitional measure, the Murray-Darling Basin Authority should house its Sustainable Diversion Limit and Water Resource Plan compliance functions within the Office of Compliance, before its compliance role comes into full effect in July 2019.

12.2 Water take compliance

Illegal take is the take or use of water without authorisation from the relevant state regulatory authority. Illegal take occurs when:

- an individual takes water for which they do not have a water access right
- a water user takes water in contravention of:
 - conditions attached to a water access right (such as conditions as to total volume, rate or timing of take)

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- a works approval (such as location, pump size or use of a compliant meter)
 - illegally built works interfere with the flow of water for the purpose of taking it (such as bores or levees) (MDBA 2017t).

Illegal take is a crime that affects neighbours, downstream water users, and the environment.

Basin States are responsible for water take compliance

State water management laws govern the take of water by establishing when water may be taken, and under what conditions. Generally, a limited amount of water for non-commercial domestic or stock use (which is a very small proportion of total water take) may be taken without a licence. However, individuals can only take water for other purposes with a water licence issued by the relevant state authority.

In the Murray-Darling Basin, the Basin States are responsible for ‘on the ground’ water take compliance such as monitoring water take through meter checks and other information gathering, and enforcing their own laws with respect to water access.

State agencies have access to a range of penalties and sanctions for enforcing illegal water take under state laws. These include verbal and written warnings, fines, licence suspension and imprisonment.

There is overwhelming concern about water take compliance

Significant concerns have been raised (by Four Corners and in reviews) about compliance and enforcement of water take laws (box 12.1). In particular, the review undertaken by the MDBA and an Independent Panel found that ‘all Basin State regulators need [to] be more active, consistent and transparent in enforcing compliance’ and that ‘compliance systems and activities in some jurisdictions are more effective than in others’ (MDBA 2018m). The MDBA reported:

There are significant variations between the Basin States in the degree to which there is a culture of compliance, the level of resourcing, the extent of transparency, the comprehensiveness and clarity of the policy framework and the kinds of challenges posed by compliance. (MDBA 2017t, p. 12)

By Basin State, the review found that:

- New South Wales faces the challenges of having the greatest number of licences, greatest volume of take and the largest geographic area. It also has a significant volume of unregulated water and floodplain harvesting, which is difficult to measure and assess whether there has been a compliance breach. Tackling compliance has been a low priority in the 20 water agencies that have been responsible for compliance in New South Wales in the past 20 years. The absence of a culture of compliance, organisational instability

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- and limited resourcing have meant that compliance has relied heavily on custom and practice, resulting in a lack of effectiveness, consistency and transparency
- Queensland has had the least experience with developing a compliance culture. Overland flow harvesting is more significant in Queensland than it is in New South Wales (where it is referred to as floodplain harvesting). Like New South Wales, Queensland's limited compliance resources face the challenges of distance and an industry with some very large entitlement holders
 - in Victoria, the review examined compliance within Goulburn Murray Water, the largest water authority in the Basin in Victoria. It reported that the Goulburn Murray is a networked, largely regulated system, served by modern remote sensor meters. As a networked system, the interdependence of irrigators yields a culture of compliance. A specific issue to be addressed in Victoria is the lack of a full suite of penalties and sanctions
 - South Australia has had a long commitment to a compliance culture. Its compliance framework is the most extensively codified by way of guidelines for staff, and transparent and decision-making responsibilities are clear. However, it faces an ageing meter fleet
 - in the ACT, water take compliance is the most manageable of the Basin States. All licensed water extraction must be metered. With a small area to cover, staff are able to audit meters regularly and monitor compliance effectively (MDBA 2017t).

Concerns with water take compliance were raised in all 14 public forums held by the Commission, and by an overwhelming number of inquiry participants in pre-draft report submissions. On the one hand, inquiry participants spoke of the importance of compliance and an intolerance for cheating. For example, the Murray Darling Association Region 6 said:

The allegations of non-compliance in New South Wales are of serious concern to our community ... Proper compliance of water rules is crucial for ensuring community confidence in Basin Plan outcomes along the entire length of the river. In times of severe drought, communities at the end of the system need confidence that upstream States and water users are doing the right thing and that Basin Plan environmental watering will operate as expected. (sub. 74, p. 7)

And the National Irrigators' Council stated that it:

has zero tolerance for water theft. Water is a valuable and expensive asset and irrigators are disadvantaged if someone else is able to undercut them in their production costs. (sub. 15, p. 3)

On the other hand, a number of inquiry participants suggested that non-compliance was not wide spread, and that water take concerns are isolated to a small number of areas. Cotton Australia commented:

Cotton Australia supports a very robust and transparent compliance regime, and it is clear from recent revelations and inquiries that the current regime is lacking. However, Cotton Australia does not believe that the current 'compliance environment' is as broken as many portray and is confident that the vast majority of the Basin's ... licence holders have done and will continue to do the right thing. (sub. 47, p. 11)

This view was also supported in reviews. For example, Ken Matthews reported:

There continues to be strong and broad-based stakeholder support for firm and speedy action to fix the compliance and enforcement system. ... irrigators have expressed concern to me that the Four Corners program and my report have left an impression that non-compliance by irrigators is rife across the state. I want to make clear that that is not my view. The overwhelming honest majority of NSW irrigators take compliance seriously themselves and are firmly in favour of action against the small minority who may not be playing by the rules. They too, want the system fixed. (Matthews 2017, p. 1)

Change has been instigated

In response to reviews, change has been instigated.

The New South Wales Government has responded to concerns raised in the Matthews report on New South Wales water management and compliance, with the publication of a Water Reform Action Plan. Key amongst these actions is the establishment of the NRAR, which has investigation powers and will determine when to commence prosecutions or use other enforcement tools in cases of non-compliance (MDB Ministerial Council 2018b).

The NRAR reported that in its first 100 days of operation it undertook 109 compliance actions, with four progressing to prosecution (DOI (NSW) 2018k). The newly established NRAR was also responsible for compliance arrangements associated with the Northern Connectivity Event.

In response to reviews, the Queensland Government has initiated the Rural Water Management Program to deliver actions across four themes — appropriate regulatory frameworks, strengthened metering, transparent water information and robust compliance that builds community confidence (including an education and awareness program, regulatory actions focused on priority areas, and up-to-date formal compliance processes) (Queensland Government 2018b).

Together, the Australian Government and Basin States have agreed on and released a Compliance Compact. It is a collaborative approach that aims:

... to restore public confidence in water resource management in the Basin by providing transparency and accountability of surface and groundwater management and regulation, and a consistent approach to compliance and enforcement practices by governments across the Basin. (MDB Ministerial Council 2018b, p. 1)

The compact establishes priorities for reform, work plans that will be regularly reported and a response to recent compliance reviews. It focuses on five key compliance and enforcement themes including metering and measurement, transparency and accountability, compliance and enforcement frameworks, finalising WRPs, and protecting and managing environmental water (MDB Ministerial Council 2018b).

The MDBA recently reported progress on Compliance Compact commitments.

- The IAC assurance report on MDBA progress recommended further attention be paid to a Basin-wide system to provide real-time advice on environmental watering, guidelines for reviewing metering thresholds, ensuring a comprehensive range of approved meters are available and guidance on measuring floodplain harvesting.
- The MDBA’s assurance report on progress by the Basin States to meet Basin Compliance Compact commitments found that although there has been reasonable progress to date, the Basin States could increase their efforts to maintain momentum and quality of reform in some areas (MDBA 2018b).

It is too early to gauge the likely effectiveness of new arrangements in improving compliance and confidence in the Basin Plan. Going forward, a commitment to SDL compliance, transparency, ongoing reporting of the progress of implementing reforms and (in time) evaluating the effectiveness of the changes along with adaptive management of compliance regimes will be instrumental in fostering long-term confidence in water take compliance in the Murray-Darling Basin.

FINDING 12.2

Compliance reforms by Basin State Governments, in aggregate, represent a strengthening of water take compliance regimes. Their efficiency and effectiveness will be reviewed in 2023 by the Productivity Commission.

Metering is a key focus area for reform

The MDBA compliance review reported that in 2015-16, 64 per cent of Basin surface water take was metered but there were wide disparities between Basin States. For example, 96 per cent of surface water take was metered in South Australia in 2015-16, compared with 29 per cent in the northern Basin. Similar disparities were also reported in groundwater metering — in 2015-16, 91 per cent of groundwater take was metered in Victoria, compared with 28 per cent in Queensland (MDBA 2017t).

Understanding water availability and water take is instrumental to managing the Basin’s resources. Metering is a key means of collecting information on the water take of entitlement holders in the Basin. Although it is possible to meter all significant take from the Basin’s watercourses, it is not possible to meter all forms of take — in these instances, water take is measured rather than metered. The MDBA reported:

Floodplain harvesting, or overland flows, in the northern Basin are the most prominent example [of non-metered water take], with recent estimates at 210 GL annual take (noting the high uncertainty of this estimate). In this regard, storage level recorders calibrated by volumetric survey data of individual storages are an important source of data. Farm dams and forestry plantations are also instances of non-metered take. For these forms of take, the hydrometric network and hydrological modelling are the way in which estimates are derived. (MDBA 2017t, p. 19)

Many participants to this inquiry emphasised that accurate metering and measurement are essential for water management, compliance and community confidence.

All water take must be measured with the majority of take metered through highly accurate devices. All measurement must be auditable, verifiable and within accuracy requirements, but that accuracy and measurement methodology may vary depending on the establishment of state-wide thresholds and or the category of water take. (Gwydir Valley Irrigators Association Inc., sub. 83, p. 17)

Many also expressed concern about a lack of measurement in the northern Basin.

There continues to be concern amongst the community about the inequity in metering requirements amongst valleys within the Basin. The issue of a lack of metering in the Northern Basin (particularly in the northern NSW section) must be considered as a matter of urgency. (Wentworth Shire Council, sub. 48, p. 2)

The implementation of the New South Wales Floodplain Harvesting Policy will provide a more accurate basis for compliance of this form of take (chapter 6).

A commitment to improved metering through the Compliance Compact

A key focus of the Compliance Compact is on improving metering as a basis for more transparent monitoring of water take.

While the Matthews review and the MDBA compliance review recommended universal or close to universal metering of water extractions and real-time reporting, jurisdictions did not agree on these measures (Craik 2018). However, Basin States have agreed to publish (by 31 December 2018) a metering policy and implementation plan addressing: meter accuracy; meter coverage; transmission of data; high-risk take (including large users in the Barwon-Darling) to be accurately metered by December 2019; and a timetable for the installation of new meters and telemetry, and auditing and maintenance of the metering fleet (MDB Ministerial Council 2018b).

There was also agreement that implementation plans include the provision that, by no later than June 2025, all new and replacement meters must comply with the National Metering Standard (AS4747) — including pattern approval and verification.

- all new and replacement meters must comply with AS4747 where available (with any exemption made by the Basin State to be supported by a justification published on the relevant agency website)
- where an AS4747 compliant meter is not available, the use of an interim meter that has been verified with a manufacturer's certificate of accuracy to within +/- 5 per cent is acceptable (MDB Ministerial Council 2018b).

Other agreements on metering and measurement in the Compliance Compact include:

- when an existing meter no longer meets +/- 5 per cent accuracy in the field, it must be repaired and validated so that it is accurate to within +/- 5 per cent in the field, or replaced

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- all meters are to be periodically validated consistent with the requirements of AS4747 (with any exemption made by the state to be supported by a justification published on the relevant agency website)
 - annual reporting by each Basin State on progress with the implementation plan, and the relative proportion of take via AS4747 meters, interim verified meters, unverified meters, and unmetered take (commencing 30 September 2019)
 - the Australian Government and Basin States are to work with testing laboratories, meter manufacturers and industry to set a timetable for delivering a comprehensive range of pattern approved meters (31 December 2018)
 - New South Wales and Queensland are to publish their programs for improved measurement of floodplain harvesting and overland flow harvesting, respectively (30 June 2019) (MDB Ministerial Council 2018b).

In June 2018, a *Draft NSW Metering Framework* was released for discussion with stakeholders and new regulation giving effect to this framework commenced in December 2018 (box 12.2).

It is important that all new metering regulations and frameworks introduced by the Basin States are subject to scrutiny through standard regulatory and economic review processes. The New South Wales Government reported that the New South Wales non-urban water metering policy was informed by economic analysis, technical expertise and two rounds of community consultation — meeting the requirements for a regulatory impact statement under the *Subordinate Legislation Act 1989* (NSW) (pers. comm., 23 November 2018).

The commitments in the Compliance Compact guiding the implementation of new Basin State metering frameworks should follow the principle of being risk-based (weighing the benefits of new metering measures with the costs). To this end, the new metering implementation plans being developed by Basin States should be supported by publicly available business cases.

Box 12.2 NSW metering provisions have been released

A new metering framework for non-urban water take in New South Wales commenced on 1 December 2018. It aims to improve the standard and coverage of water meters across New South Wales by ensuring that licensed water users have accurate, tamper-proof meters.

The new metering requirements are prescribed in the *Water Management Act 2000* (NSW) and the *Water Management (General) Regulation 2018* (NSW), and are set out in the *NSW Non-Urban Water Metering Policy*.

The new metering requirements will be implemented in stages over five years.

- The policy and the majority of the new metering-related provisions of the Act and regulation commence on 1 December 2018.
- The requirements for new and replacement meters, and faulty meters commence on 1 April 2019.
- The remainder of the framework will be implemented in a staged manner (1 December 2019 for large surface water pumps and a regional roll-out for all remaining works from 1 December 2020 until 1 December 2023).

The policy applies to licensed water take where the water taken can be measured by a meter. The threshold proposed for when water supply works will be required to have a meter is:

- surface water: all authorised works (including open channels and closed pipe), except pumps less than 100 mm.
- groundwater: all authorised works (which includes spear points), except water bores less than 200 mm.

Users with multiple pumps or bores will be required to have meters if the capacity to take water is equivalent to the thresholds. And users with existing meters below the threshold will be required to keep and maintain their meters, and replace their meters if and when they fail.

Other elements of the metering framework include:

- new and replacement meters must be pattern approved
- existing meters must be independently verified for accuracy (+/- 5 per cent)
- all meters will be required to have tamper-evident seals and data loggers.

Source: DOI (NSW) (2018d).

Can the Australian metering standard be met?

Although stakeholders are generally supportive of improvements in the accuracy of metering and metering coverage, there are concerns surrounding the Australian Standard (AS4747). The National Irrigators' Council said:

In principle, we agree that accurate measurement is critical and the NSW objectives are sound. We would caution though, that there needs to be transition processes in particular for requirements like compliance with AS4747. So far that standard has proved difficult for manufacturers to comply with - some might say impractical. ... The Commission needs to understand that even very modern meters being funded under modernisation programs are not compliant. This is a very significant problem and it results in the industry being given an impossible task. They can't comply because, through no fault of their own, there is no appropriate compliant meter available. (sub. 15, p. 25)

As discussed earlier, the Compliance Compact has set in place a transition process whereby all new and replacement meters must comply with AS4747 by June 2025. The key issues are whether the requirement for meters to meet AS4747 is practical, cost effective and deliverable by 2025.

In particular, there are concerns regarding the process that was undertaken for developing the National Metering Standard. The National Irrigators' Council stated that it 'was a process that developed an aspirational but impractical standard with no real consultation with irrigators and meter manufacturers' (sub. 15, p. 25). Similarly, in a submission to the Productivity Commission's inquiry into National Water Reform, Coleambally Irrigation Co-operative Limited (CICL) commented:

CICL cites the National Metering Standard as a very concrete example of a national water initiative that was very aspirational. To the best of CICL's knowledge, there are still only two meters that have met the standard. Quite simply, there were too few practitioners at the table when the standard was developed; the standards were set too high; and there was a lack of regard to the fact that there was insufficient capacity in Australia to undertake the testing required for pattern (meter) approvals. (CICL 2017, p. 3)

Further consideration is required as to the role, costs and benefits of consistent metering policies and the AS4747.

RECOMMENDATION 12.2

Basin States should consider the role, costs and benefits of consistent metering policies including the role of metering standards.

Basin Governments should work with Standards Australia to formally revise standards to ensure quality and cost effectiveness in water measurement.

Before new Basin State metering regulation and implementation plans are put in place they should be subject to scrutiny through publicly available business cases.

Confusion surrounding the MDBA's role in water take compliance

Water take compliance is primarily the responsibility of state water agencies. The MDBA, as the agency responsible for overseeing compliance at a Basin-wide level, has a role in providing assurance of the compliance and enforcement frameworks within each Basin State. The MDBA may conduct audits and investigate state practices and processes (MDBA 2018n). This may also include supporting Basin States by, for example providing information and guidance materials (such as metering standards and the establishment of a network of water compliance practitioners) to promote best practice in water take compliance and enforcement.

A recent area of focus has been on developing and building capability for the application of satellite imagery for Basin Plan compliance monitoring (MDBA 2018a). Remote sensing

using satellite imagery can be used as a tool for analysing landscape change across large spatial scales such as the Murray-Darling Basin. Satellite imagery can provide repeated observations (snapshots) of water moving through landscapes, water present in dams and storages, and crop presence at regular intervals. Its associated data can provide Basin water agencies with information, which may be useful for compliance monitoring and investigations (box 12.3).

Box 12.3 **Satellite imagery: tracking the Northern Connectivity Event**

As part of the package of commitments announced under the agreement between the Australian Government and the Federal Opposition on 7 May 2018, the Australian Government committed \$20 million to support improved hydrometric networks in the northern Basin and the development of remote sensing and other technologies to enhance monitoring, measurement and compliance in all Basin jurisdictions (DAWR, sub. DR103, p. 15). Remote sensing using satellite imagery was successfully trialled by the MDBA to track an environmental flow through the Barwon–Darling Rivers.

Between April and June 2018 a large environmental watering event, known as the Northern Connectivity Event, was coordinated by the Commonwealth Environmental Water Holder and NSW Office of Environment and Heritage (OEH). Protected by a temporary embargo on consumptive water extraction in the Barwon–Darling (for all circumstances other than the taking of water under a local water utility access licence, domestic and stock access or town water supply access), the flow travelled a 2000 kilometre network of rivers in the northern Basin reaching Menindee Lakes.

The Northern Connectivity Event provided an opportunity to test the use of satellite imagery to track the flow of an environmental release. During the course of the event over 100 satellite images were provided to the Murray-Darling Basin Authority (MDBA) by Geoscience Australia from April to the end of July 2018, covering more than a third of the Basin.

The imagery was used in conjunction with gauge data, to determine whether there were any changes to storages or flow that would signal a water take compliance concern. The images and gauge data found no significant changes in farm dam and storage water areas or any unusual properties of the flow itself — suggesting a low probability that any significant water take compliance issues occurred during the course of the Northern Connectivity Event.

In summing up the remote sensing trial, the MDBA reported:

This work represents the first large-scale use of satellite imagery for tracking the progress of an environmental flow event covering a large fraction of the Basin along with associated hydrological changes ... It provides a first step in a longer-term work program to use satellite imagery and gauge data for compliance studies across the Basin on a regular basis. (MDBA 2018a, p. 45)

Sources: MDBA (2018a, 2018ac).

Confidence in the Basin Plan requires an unambiguous system of compliance. Although this Basin-scale oversight role is well-accepted, there is confusion as to whether the MDBA has (or should have) an enforcement role with respect to breaches of state water take rules or licence conditions by individual water users.

The Independent Panel to the Compliance Review reported that under the Water Act, the MDBA has an enforcement role in respect of illegal take if:

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- water is taken by the holder of a water access right inconsistent with a Water Resource Plan that applies to the water
 - water is taken in a way that is inconsistent with the Basin Plan
 - illegal take (including take by a person who does not have a water access right at all) prejudices, or has an adverse effect on, the effectiveness or implementation of the Basin Plan or a WRP (MDBA 2017t).

The Basin Plan requires that all 33 WRPs be accredited by 30 June 2019. After this date, the MDBA's compliance responsibility for WRPs will commence (with the exception of any WRPs that require extension (chapter 6)).

Given the potential for duplication in enforcement roles between the MDBA and Basin States, it was agreed (under the *Basin Plan Implementation Agreement*) that the MDBA would only seek to exercise its powers under the Water Act as a 'last resort'.

The MDBA will focus its efforts on promoting and monitoring compliance in areas where it has a reasonable belief that the underlying issue may impact materially on the achievement of Plan outcomes. If compliance issues arise, the MDBA would seek to resolve them in good faith, in a way that is proportional to the issue being addressed, considers the actions taken toward achieving compliance, and with a view to dealing effectively with the circumstance. The MDBA would only seek to exercise its powers under the Water Act 2007 (the Act) as a last resort. (MDBA et al. 2013, p. 4)

The MDBA has been working under the premise that enforcement of water take is a matter for the Basin States. However, in light of recent allegations of illegal water take, many stakeholders argued that that the MDBA should clarify its position as to whether it will pursue enforcement against illegal water take, in the absence of action by a Basin State.

In developing the Basin Plan, the MDBA has worked on the basis of compliance and enforcement against individuals being a matter for states. However, in the course of the Review, it has been made very clear that the community does not accept this arrangement. Numerous stakeholders have expressed considerable frustration that the MDBA did not respond adequately to allegations of serious breaches. They are looking to the MDBA to take more responsibility for compliance and enforcement. (MDBA 2017t, p. 14)

The MDBA has stated that it will take a more proactive approach to water take compliance.

The MDBA accepts that it has not adequately escalated allegations of water theft when the relevant state authorities have not dealt adequately with them. A more assertive and transparent approach to compliance by the MDBA is needed, including a proactive escalation strategy ... an audit and assurance program, better public reporting, and a willingness to employ its enforcement powers where necessary. (MDBA 2017t, p. 23)

The MDBA's 2018–21 compliance and enforcement policy (2018n) signals the MDBA's intention to pursue an enforcement role with respect to breaches of water take licence conditions by individual water users. The policy states:

The MDBA may also directly regulate the compliance of individual water users with the Basin Plan, and intends to do so in the absence of adequate action by a Basin State, for example in response to allegations of illegal take. (MDBA 2018n, p. 5)

The benefits of an MDBA role in this space are difficult to anticipate because it is unclear what is likely to be considered as evidence of ‘the absence of adequate action by a Basin State’. Nevertheless, benefits may include increased levels of compliance, and improvements in the confidence in compliance systems supporting the Basin Plan.

The Commission considers that an MDBA enforcement role against individual water users may lead to perverse incentives. For example, Basin States may hold themselves less accountable to enforce breaches of water take laws or licence conditions by individual water users, under the expectation that the MDBA will ultimately respond to concerns of non-compliance. This will result in costly duplication of compliance processes and an unclear division in compliance responsibilities between the Basin States and the MDBA. It may also shift enforcement costs to the Australian Government — the annual cost of compliance in New South Wales alone is over \$4 million (MDBA 2017i, p. 90).

Further, Basin States (as opposed to the MDBA) are accountable for land and water management and must enforce compliance of their own water take laws, drive reform and tailor management responses to local variation. And as discussed in the previous section, Basin States have acknowledged the need for improvements in water take compliance and are in the process of implementing change.

The benefits of increased levels of compliance, and improvements in the confidence in compliance systems, may also be achieved through a comprehensive audit and assurance process and a spotlight mechanism whereby the MDBA publicly announces instances where Basin States are not effectively responding to concerns of illegal take. This mechanism may be capable of assisting Basin States to act on concerns of illegal take.

Over the longer term, ongoing assessment of the risks of water take non-compliance is important. The MDBA 2026 Basin Plan review should review this risk. Considerations include: the likelihood of current occurrence; emerging risks; consequences of non-compliance (such as impacts on the environment and stakeholders); whether current compliance and enforcement mechanisms are effective; and the case for reducing SDLs if there is evidence of persistent illegal water take.

RECOMMENDATION 12.3

The Murray-Darling Basin Authority (MDBA), as the regulator responsible for overseeing compliance at a Basin-wide level, should publicly report instances where Basin States are not effectively enforcing their water take laws.

The MDBA’s 2026 Basin Plan review should reconsider the risk to meeting the objectives of the Basin Plan from non-compliance of water take, including the case for reducing Sustainable Diversion Limits if there is evidence of persistent illegal water take.

13 Reporting, monitoring and evaluation

Key points

- Effective reporting, monitoring and evaluation is critical to the successful implementation of the Basin Plan.
 - Monitoring and reporting holds Basin Governments to account by measuring their progress against their commitments under the Plan.
 - Monitoring and evaluation allows the outcomes of the Plan to be measured. This is required for informed judgements about whether the Plan is effectively and efficiently meeting its objectives. It also allows for judgements about whether the significant investment has been worthwhile and whether more needs to be done.
- The evaluation framework for the Plan is unclear and there is no clear strategy to coordinate information collection from the various monitoring programs that are relevant to the Plan.
 - This creates risks going forward, including that information gaps will hinder evaluations of the Plan; monitoring resources will be used inefficiently; and stakeholders will find it difficult to discern a clear, cogent message on the outcomes of the Plan.
- A revised Basin Plan evaluation framework and a monitoring strategy to give effect to this framework are needed.
 - The Basin Plan evaluation framework should define the specific questions (across a range of time periods and scales) that will be used to evaluate the outcomes and the effectiveness of the Plan. The Murray-Darling Basin Authority (MDBA), as Basin Plan Regulator, should release a revised evaluation framework by the end of 2019.
 - The monitoring strategy should describe the process by which the information needed to answer these evaluation questions will be obtained. It should include what information will be collected and by who, the process to address knowledge gaps and the arrangements for sharing the costs of monitoring and evaluating the Plan between Basin Governments. This strategy should be developed by Basin Governments, with the support of the MDBA (as the agent of governments).
- The Plan is scheduled to be reviewed in 2026. This review will need to be forward looking and consider emerging risks (such as climate change). Planning for the 2026 review needs to commence soon and the Commission expects to see demonstrable evidence of this planning when it next examines the implementation of the Plan in 2023. This includes establishing a process to identify and address any knowledge gaps that may hinder the 2026 review.
- There are weaknesses in the design of the National Partnership Agreement on Implementing Water Reform in the Murray-Darling Basin. These weaknesses include inadequately defined milestones and the inability to recommend that a Basin State receive partial payment in instances where it has only partially met milestones.
 - The Australian Government should ensure these weaknesses are not repeated in any future funding agreements relating to the Basin Plan.

The Basin Plan represents a step change in the management of the Basin. While Basin Governments have monitored, reported and evaluated water resource management outcomes in the Basin for their own purposes and accountabilities well before the commencement of the Plan, it cannot be assumed that past arrangements will be sufficient to satisfy the need for reporting and evaluation for the Plan as a whole.

The Basin Plan outlines new reporting and evaluation arrangements. Ensuring that these new arrangements are effective is important for both the short term and the long term.

In the short term, significant aspects of the Plan are about to commence or are in the early stages of implementation (such as the implementation of the supply measures). Reporting on implementation is important to keep governments accountable.

In the longer term, as implementation progresses, governments and the community will expect that the effectiveness of the Plan is assessed against its objectives. This will enable judgements on whether the significant investment in the Plan has been worthwhile and whether more needs to be done.

This chapter examines the implementation of the reporting, monitoring and evaluation arrangements for the Plan.

- Section 13.1 provides background on the reporting and evaluation arrangements for the Plan.
- Section 13.2 outlines the Commission's approach to assessing the effectiveness of these arrangements.
- Section 13.3 assesses the extent to which current arrangements are effective in holding governments accountable for meeting their commitments under the Plan.
- Section 13.4 assesses the extent to which current arrangements are effective for evaluating the outcomes and effectiveness of the Plan as a whole.
- Section 13.5 looks ahead to the review of the Plan scheduled in 2026.

13.1 Background

The Basin Plan specifies a range of reporting requirements that Basin Governments must meet. Reporting arrangements are also set out in the intergovernmental agreements that underpin the implementation of the Plan. A program to evaluate the Plan is set out in the *Water Act 2007* (Cwlth) and within the Plan itself. The Plan does not specify monitoring activities to be undertaken (beyond specifying some broad principles to be applied when monitoring the Plan's effectiveness).

Reporting requirements in the Plan

Schedule 12 of the Basin Plan outlines a range of matters that the Murray-Darling Basin Authority (MDBA), the Commonwealth Environmental Water Holder (CEWH), the Department of Agriculture and Water Resources (DAWR) and Basin States are required to report against (table 13.1). The reporting framework is structured across two time scales. Some matters are reported annually, others on a five-yearly basis.

Table 13.1 **Matters to be reported (Schedule 12 of the Plan)**

Matter	Responsible party or parties
Matters to be reported on an annual basis	
The effectiveness of the management of risks to Basin water resources	Basin States, MDBA
The transition to long-term average Sustainable Diversion Limits	Department
The extent to which local knowledge and solutions inform the implementation of the Basin Plan	Basin States, MDBA, CEWH
The identification of environmental water and the monitoring of its use	Basin States, MDBA, CEWH
The implementation of the environmental management framework	Basin States, MDBA, CEWH
The implementation, where necessary, of the emergency response processes for critical human water needs	Basin States, MDBA, Department
The implementation of the water quality and salinity management plan	Basin States, MDBA, CEWH
The implementation of water trading rules	Basin States, MDBA
Compliance with Water Resource Plans	Basin States
The prioritisation of critical human water needs	Basin States
The accountability and transparency of arrangements for water sharing	Basin States
Matters to be reported on a five-yearly basis	
The transparency and effectiveness of the management of the Basin water resources	MDBA
The protection and restoration of water-dependent ecosystems and ecosystem functions in the Murray-Darling Basin, including for the purposes of strengthening their resilience in a changing climate	MDBA
The extent to which the Basin Plan has affected social, economic and environmental outcomes in the Murray-Darling Basin	MDBA, Department
The achievement of environmental outcomes at a Basin scale	MDBA, CEWH
The achievement of environmental outcomes at an asset scale	Basin States
The fitness for purpose of Basin water resources	MDBA
Progress towards the water quality targets	Basin States, MDBA
The facilitation, by efficient and effective water markets, of tradeable water rights reaching their most productive use	MDBA
The certainty of access to Basin water resources	MDBA
The efficiency and effectiveness of the operation of Water Resource Plans, including in providing a robust framework under a changing climate	Basin States, MDBA

Annual reporting requirements predominantly relate to the implementation of, and compliance with, different elements of the Plan. Five-yearly reporting has a greater focus on the outcomes of the Plan.

Annual reporting began in 2013-14, and the first tranche of five-yearly reporting is scheduled to occur in 2020. The information from this reporting should provide a valuable source of evidence for the MDBA's evaluation of the effectiveness of the Plan that is also scheduled to be completed in the same year (MDBA 2017b).

Reporting requirements set out by intergovernmental agreements

The implementation of the Plan is underpinned by a number of intergovernmental and interagency agreements. Key agreements include the:

- *Intergovernmental Agreement on Implementing Water Reform in the Murray Darling Basin* (IGA) (COAG 2013). In this agreement, Basin Governments expressed their joint commitment to implementing the Basin Plan
- *National Partnership Agreement on Implementing Water Reform in the Murray-Darling Basin* (NPA) (COAG 2014). The NPA sets out the outputs, outcomes and milestones that Basin States are required to achieve to meet their commitments. It also specifies Commonwealth payments to be made to the States in return for meeting these requirements. The NPA specifies that up to \$174 million could be afforded to Basin States over the course of the agreement (which runs to 30 June 2020)
- *Murray-Darling Basin Plan Implementation Agreement* (BPIA) (MDBA et al. 2013). The BPIA documents the implementation obligations of the Basin States, the MDBA and the CEWH and interdependencies between these obligations. The BPIA is in operation until 22 November 2022 (ten years from when the Plan was adopted).

The BPIA and the NPA place additional reporting requirements on Basin Governments.

Under the BPIA, parties are required to 'prepare annual statements of assurance of their compliance with Plan obligations that will be made public' (MDBA et al. 2013, p. 6).

Under the NPA, Basin States have a responsibility to report on 'milestone progress' (COAG 2014, p. 4). These milestones relate to actions taken by Basin States to:

- support the Australian Government to 'bridge the gap' (relating to the commitment to recover water to meet the Sustainable Diversion Limits set by the Plan)
- ease constraints
- co-operate with arrangements for environmental watering.

This reporting feeds into an annual assessment of progress against NPA milestones (undertaken by DAWR), and decisions (made by the Australian Minister for Water) about whether milestone payments should be afforded to Basin States.

Evaluation requirements set out in the Plan

The Plan prescribes a program for evaluating its effectiveness¹⁶⁶ that reflects requirements in the Water Act. This program involves:

- reporting annually on the effectiveness of the Basin Plan
- advising on the impacts of the Basin Plan (to occur before the end of 2020)
- undertaking five-yearly reviews that focus on assessing the effectiveness of some elements of the Plan, including the water quality and salinity management plan targets and the environmental watering plan. The first reviews for both these plans are scheduled to occur in 2020 (MDBA 2017b).

The MDBA is responsible for undertaking these evaluations. The MDBA has commenced annual reporting on the Basin Plan, and undertook an ‘interim’ evaluation of the Plan in 2017 (which was not statutorily required). Consistent with requirements set out in Schedule 12 of the Plan, the MDBA is scheduled to undertake the next evaluations on the effectiveness of the Plan in 2020 and 2025 (MDBA 2017b).

There is also a requirement for the MDBA to review the Plan every 10 years.¹⁶⁷ The first 10-yearly review is scheduled to occur in 2026. Information from evaluations will be an important source of evidence for these 10-yearly reviews.

The Plan empowers the MDBA to undertake audits to assess the extent of compliance with the Plan¹⁶⁸, and to undertake periodic assessments of trends in the condition and availability of Basin water resources and the social, cultural and economic contexts in which these resources are used.¹⁶⁹

Although not explicit in the Plan, the Water Act requires the Productivity Commission to undertake five-yearly public inquiries into the effectiveness of the implementation of the Basin Plan and Water Resource Plans.¹⁷⁰ This Commission inquiry is the first of these.

¹⁶⁶ Chapter 13, Part 3.

¹⁶⁷ Chapter 13, s. 13.05(1)(c).

¹⁶⁸ Chapter 13, s. 13.10.

¹⁶⁹ Chapter 13, s. 13.11.

¹⁷⁰ The Water Act, s. 87.

13.2 How the Commission has assessed effectiveness

The Commission has assessed the extent to which current arrangements facilitate three critical functions.

First, the Commission has assessed the extent to which arrangements allow for progress on implementation to be measured and are effective in ensuring governments are accountable for meeting their commitments. As identified in other chapters, the implementation obligations of Basin Governments are significant. Meeting these obligations will require substantial resources and effort and there are likely to be significant consequences if these obligations are not implemented well. Reporting tracks the progress of governments in implementing these obligations and allows for emerging issues to be identified and addressed as they arise.

Second, the Commission has assessed the extent to which current arrangements provide the information needed to evaluate the outcomes and effectiveness of the Plan. The Basin Plan is designed to achieve a range of environmental, social, economic and cultural objectives and Basin Governments have made significant investments to recover water for the environment and implement new management arrangements to meet these objectives. Monitoring and evaluation provides the evidence needed to determine whether these objectives are being realised and to enable informed judgements to be made on whether the Plan has been worthwhile and/or if more needs to be done.

Third, the Commission has considered the extent to which current arrangements will provide the information needed to underpin a comprehensive review of the Plan, as is required to occur in 2026.

The Commission's assessment also considered the extent to which current arrangements uphold principles of good design (box 13.1).

It is important to note that reporting, monitoring and evaluation is also required to facilitate the adaptive management of a number of specific elements that contribute to the implementation of the Plan. For example, monitoring and evaluation provides information that is essential for the adaptive management of water quality, salinity and environmental watering.

The Commission recognises the importance of undertaking reporting, monitoring and evaluation to improve management of specific elements of the Plan, and the information generated through these activities will provide useful input for evaluations of the Plan. However, the Commission has not examined the effectiveness of individual programs that monitor specific parts of the Plan, but rather reporting, monitoring and evaluation for the Plan as a whole.

Box 13.1 Some features of good reporting, monitoring and evaluation arrangements

Good reporting, monitoring and evaluation arrangements:

- are **clear**, which is achieved by:
 - establishing the purpose, scope and objectives of the reporting, monitoring and evaluation program
 - identifying the timelines and scales on which these objectives will be met
 - identifying the processes that will be used to meet these objectives
 - identifying the roles of different parties responsible for reporting, monitoring and evaluation
- are **comprehensive**. This means that all the information needed to meet the objectives of the reporting, monitoring and evaluation program is collected, and any information gaps are actively managed
- draw upon the **best available knowledge** where practicable. This includes scientific knowledge, economic knowledge and cultural knowledge both on a local and a Basin-wide scale
- are **transparent** and **promote impartiality**. This includes that the information collected, used and reported is evidence-based, accurate and made publicly available
- are **built with input from the stakeholders** who will use the information. In the context of the Plan, this includes river managers, environmental groups, industry groups, Indigenous communities and local governments, among others
- are **designed and agreed to by the parties who will be responsible** for undertaking reporting, monitoring and evaluation. In the context of the Plan, this includes the Murray-Darling Basin Authority, the Department of Agriculture and Water Resources, Basin States and the Commonwealth Environmental Water Holder. Processes for collaboration between partners should also be developed
- are **timely**. Information provided through reporting, monitoring and evaluation should be sufficiently timely to hold those responsible for implementing the Plan to account, or to feed into decisions about the management of the Basin
- are **sufficiently resourced** both in terms of funding, and in terms of the capabilities of those responsible for reporting, monitoring and evaluation.

Sources: Adapted from Kusek and Risk (2004); NSW Department of Education and Communities (2014); OECD (2013); Queensland Government (2014); The World Bank (2013).

13.3 Reporting on progress of implementation

How effective are current arrangements?

In 2013, the MDBA developed guidelines to assist Basin Governments to meet their reporting responsibilities (including those under the Plan and associated intergovernmental agreements). These have since been ‘codified’ into a standard information collection template, drawing on reporting obligations from Schedule 12 of the Plan, the BPIA and the NPA (MDBA 2017b, 2018l). Each year, Basin Governments populate this template with the

information needed to meet their reporting requirements and submit these to the MDBA, which subsequently publishes them on its website.

In short, the process by which Basin Governments report implementation progress is clear and governments have been meeting their reporting requirements. However, deficiencies in the design of the NPA detract from the effectiveness of current reporting arrangements in holding governments to account for meeting their commitments under the Plan.

As an instrument for holding governments accountable, the NPA needs to serve two critical functions. First, it should clearly articulate the milestones against which Basin Governments are to deliver. Second, it should incentivise Basin Governments to deliver these milestones by linking them to payments. There is evidence that the NPA has not fulfilled either of these functions effectively.

Under the NPA, each Basin State must submit an annual Statement of Assurance (as part of the reporting template) to the Australian Government, describing its progress against NPA milestones (DAWR, pers. comm., 3 December 2018). An assessor (currently DAWR and previously the National Water Commission) prepares an annual milestone report using these statements and any supporting documentation provided by Basin States. In this report, DAWR assesses the extent to which each State has met the performance milestones and, if it has not met a milestone, whether it has taken steps to do so (COAG 2014). The assessment is provided to the Australian Minister for Water, who then decides whether payments to a Basin State should be made under the NPA.

There are shortcomings in the design of the NPA that detract from its value as an accountability measure. These include:

- a lack of specific, measurable deliverables for the milestones that are sought through the NPA
- that there is no option to recommend a partial payment to a Basin State. Payments must be made in full or not at all. So, even when a State has only partially met the required deliverables, it can only receive the full payment amount or no payment.

There have also been weaknesses with the assessment of the progress of Basin States in meeting NPA milestones. These include that:

- there appear to be disparities in the way the assessment findings of ‘met’ and ‘partially met’ have been used. In some instances, Basin States that have met some (but not all) sub-milestones are assessed as having met the overall milestone, whereas in other cases, the overall finding is ‘partially met’
- key advice provided to the Australian Government by the MDBA and CEWH to inform assessments of progress has not been published in full
- reporting has not been timely in some years. For example, the most recent assessment of milestone progress (for the 2016-17 year) was not published until July 2018, despite it being due to the Minister by 31 October 2017 (COAG 2014; DAWR 2018j).

In the past, the Australian National Audit Office (ANAO) also found shortcomings with DAWR's assessment. It found that there was a lack of evidence and explanation in DAWR's 2015-16 assessment to substantiate a positive assessment of New South Wales' performance against a particular milestone (that related to co-operating with environmental watering arrangements) (ANAO 2017).

However, DAWR did not agree with this finding in its response to the ANAO report (DAWR 2017b, sub. DR103). It is notable that DAWR's most recent assessment found that New South Wales 'did not make satisfactory progress to implement the Basin Plan in 2016-17' (DAWR 2018j, p. 6). Subsequently, New South Wales did not receive payment under the NPA for the year 2017-18 (DAWR 2018i).

Shortcomings — both in the design of the NPA and in the assessment of progress against it — provide useful lessons to help guide any future funding agreements relating to the implementation of the Plan.

FINDING 13.1

There are weaknesses in the design of the *National Partnership Agreement on Implementing Water Reform in the Murray-Darling Basin* (NPA) that reduce its usefulness as a means to hold Basin Governments to account for meeting their commitments in implementing the Plan.

These weaknesses include that:

- milestones are inadequately defined and have been able to be assessed as met when there is evidence to the contrary
- there is no option to recommend a partial payment to a Basin State. Payments must be made in full or not at all
- key information that informs assessments of progress against NPA milestones is not publicly released
- the release of assessments of progress against NPA milestones has not been timely in some years.

How can arrangements be improved?

Basin Governments have a number of key obligations during the next phase of Plan implementation, including:

- supply measures (including easing constraints)
- efficiency measures
- the Northern Basin Toolkit.

These are substantial obligations and there are significant consequences if they are not implemented well. Implementation of these commitments will require significant resources (and significant effort) from Basin Governments. Given this, future funding agreements relating to the Plan need to include robust reporting requirements that allow progress to be tracked properly and governments to be held accountable.

DAWR has indicated that new NPAs (which are currently under development) will specify obligations and milestones for Basin Governments for implementing the supply and Toolkit measures going forward (sub. DR103, DAWR, pers. comm., 3 December 2018). The development of these NPAs — or any other future funding agreements relating to the Plan’s implementation — represents an opportunity to learn from the limitations of the previous NPA to enhance their usefulness as accountability measures.

RECOMMENDATION 13.1

Reflecting lessons learned from deficiencies in past agreements, for any future funding agreements relating to the implementation of the Basin Plan, the Australian Government should ensure:

- the roles of the Australian Government and Basin States are clearly identified
- specific performance milestones are identified, and that clear responsibility is assigned for the delivery of each milestone
- where milestones are linked to payments, that these payments are disaggregated with a payment per milestone to provide a genuine incentive for implementation
- reporting on the progress of Basin Governments in meeting milestones is timely
- independent assessment of the progress of Basin Governments is undertaken
- advice provided by relevant agencies (such as the Murray-Darling Basin Authority or the Commonwealth Environmental Water Holder) is used to inform assessments of progress and is published in full.

13.4 Evaluation to assess the outcomes and effectiveness of the Plan

How effective are current arrangements?

For evaluations of the Plan to be effective, information on the environmental, social, cultural and economic impacts of the Plan is required. This information can come from many different parties, such as the MDBA, the CEWH, DAWR and various agencies of Basin State Governments.

In relation to the Plan:

- the MDBA is responsible for monitoring and evaluating the Plan as a whole, including looking at outcomes on a Basin-wide scale
- the CEWH is responsible for monitoring and evaluating the use and impacts of Commonwealth-held environmental water and the contribution this water makes to meeting the environmental objectives of the Plan
- DAWR is responsible for monitoring and evaluating the programs that recover water for the environment, consistent with the commitment made by the Australian Government to bridge the gap
- Basin States are responsible for monitoring and evaluating their own state-level actions (MDBA 2016c).

Each of these organisations implement monitoring programs designed to provide information to meet their own statutory and policy accountabilities (including those that lay outside the Plan). This may include information that is needed to undertake adaptive management, program evaluation or for the sound management of Basin resources more broadly.

Monitoring programs across the Basin

Across the Basin, there is currently a mix of monitoring programs, many of which pre-date the Plan. Overviews of the key programs that contribute to monitoring the impacts of the Plan are provided in table 13.2 and box 13.2. Monitoring of cultural outcomes is discussed in chapter 7.

Monitoring is undertaken across a range of scales including at the local asset scale (for example, monitoring of the impacts of environmental watering on a particular wetland) and at larger scales such as across catchments, connected systems or the Basin as a whole (such as monitoring of environmental condition, water quality and salinity).

All of these monitoring programs can be drawn upon by Basin Governments to provide information to assist with evaluating the Plan, but together, they may not provide a sufficient evidence base to evaluate the Plan as a whole. Given this, a robust evaluation framework is required to provide clarity about how the outcomes and effectiveness of the Plan will be evaluated. A clear monitoring strategy is also needed to determine which of the available information will be used to evaluate the Plan, where additional monitoring will be required, and who is responsible for collecting this information.

Table 13.2 Major programs monitoring outcomes in the Basin

Program	Scale	Responsible agency or agencies	Overview of program
Environmental programs			
Monitoring under The Living Murray (TLM) Initiative	Asset	The MDBA as the agent of governments, funded by the Australian, New South Wales, Victorian, South Australian and the ACT Governments	Monitors ecological outcomes in the six 'icon' sites of TLM. These sites are: the Barmah-Millewa Forest; the Gunbower-Koondrook-Perricoota Forests, Hattah Lakes, Chowilla Floodplains and Lindsay-Wallpolla-Mulcra Islands, the Lower Lakes, Coorong and Murray Mouth, and the River Murray Channel.
The Long-term Intervention Monitoring (LTIM) program	Asset and Basin-wide	The CEWH	<p>Monitors the ecological impacts of Commonwealth environmental water across multiple water years at seven specified areas across the Basin: the Gwydir river system; the Lower Lachlan river system; the Murrumbidgee river system; the Edward-Wakool river system; the Goulburn River; the Lower Murray River; and the junction of the Warrego and Darling rivers.</p> <p>In addition, under the LTIM program, the Murray-Darling Freshwater Research Centre has produced a Basin-scale report (most recently in 2015-16) that seeks to determine 'outcomes from the portfolio of Commonwealth environmental water across the Basin'.</p>
Short-term intervention monitoring	Asset	The CEWH	At some sites, the CEWH undertakes short-term intervention monitoring, looking at the extent selected watering actions have met their intended objectives.
State government environmental monitoring programs	Asset and catchment	Basin States	Basin State Governments undertake a wide variety of monitoring programs. An overview of some of the key programs of Basin States is provided in box 13.2.
Water quality and quantity monitoring	Selected points across the Basin	The MDBA as the agent of governments	Monitoring of water quality and quantity (for both surface and groundwater) is undertaken at a number of sites across the Basin.
Socioeconomic programs			
MDBA socioeconomic monitoring	Community and Basin-wide	The MDBA	Monitoring and analysis of the outcomes of the Plan in Basin communities. Work undertaken to date has, among other things, examined the extent that the Plan has impacted on irrigated hectares and employment in Basin communities.
DAWR socioeconomic monitoring	Community and Basin-wide	DAWR	Monitoring and analysis of the impacts of DAWR's water recovery programs on Basin communities.

Sources: DAWR (2017a, 2018p); DEE (2015, nd); Gawne et al. (2017); Marsden Jacob Associates (2017); MDBA (2015d, 2016e, 2017b, 2018x, 2018af, ndc).

Box 13.2 Some Basin State monitoring programs

Basin State Governments undertake and fund a variety of monitoring programs. Some examples include:

- the *Eastern Australian Waterbird Survey*, which is a multi-jurisdictional program (funded by both the Australian Government and the Basin States). Aerial surveys are conducted across major wetland sites in the Basin to identify the species and numbers of waterbirds present. The survey has been undertaken since 1983
- the *Victorian Environmental Flows Monitoring and Assessment Program*, which is funded by the Victorian Government. The program has existed in a number of stages, but currently primarily focuses on intervention-based monitoring that examines the effects of environmental flows on fish and vegetation
- *WetMAP*, which is funded by the Victorian Government. The program is designed to assess the ecological responses of vegetation, fish, frogs and waterbirds to environmental water deliveries in a subset of Victoria's priority wetlands
- the New South Wales Office of Environment and Heritage has a program of monitoring for all its major valleys that includes inundation mapping, wetland vegetation condition and extent mapping, and surveys that assess the response of selected animals to watering events
- Natural Resources SA Murray-Darling Basin's wetland monitoring, which monitors the impacts of different wetting cycles in a range of wetlands and lagoons across a number of parameters, including water quality, vegetation and fauna
- the *Environmental Flows Assessment Program*, which monitors ecological responses to planned environmental water in Queensland
- hydrological monitoring networks which monitor water quality and quantity in rivers and streams across the Basin. Monitoring of the quality and quantity of groundwater resources is also undertaken.

Sources: DELWP (Vic) (2018a, 2018b); Department for Environment and Water (SA) (2015); DES (Qld) (2013); OEH (NSW) (2017a); PC (2017b); UNSW (2018).

The MDBA is revising its framework ...

To inform evaluations of the Plan, the MDBA released a Basin-wide evaluation framework in 2014. This framework (*the Murray-Darling Basin Water Reforms: Framework for Evaluating Progress*) outlines:

- ... how the Murray-Darling Basin Authority will work with partner governments and the community to evaluate:
- the implementation of the Plan — how well it has been put in place by all those with obligations outlined in the legislation, and how it is working administratively
 - the effectiveness of this significant water reform package — whether the intended environmental, social and economic objectives and outcomes are being achieved. (MDBA 2014f, p. 2)

The framework provides an overview of the approaches the MDBA could take when undertaking evaluations of the Plan. The framework identifies 14 sample evaluation

questions, provides a broad overview of the types of methods that could be used when evaluating the Plan, and identifies 38 indicators (most of which are at a very high level) that could be used to assist with answering the sample evaluation questions. The framework also briefly acknowledges data sources that could be drawn upon when undertaking evaluations of the Plan.

The MDBA has acknowledged that ‘more work is needed’ on the Basin Plan evaluation framework and that it:

... has begun to develop a revised framework, in consultation with Basin governments. The revised framework will more clearly identify the evaluation purpose, themes, questions and approach, and define a process for aligning questions and information requirements. (sub. DR136, pp. 6–7)

The fact that work is underway to revise the framework is a positive development. But the process that will be followed to finalise this framework, including how input from the community and interested stakeholders will be considered, remains unclear.

... and this is an opportunity to address the shortcomings of existing arrangements

In developing a revised evaluation framework, the MDBA has an opportunity to address deficiencies with the 2014 framework.

The 2014 framework is largely an exploratory document, outlining methodologies, indicators and data sources that could be used to evaluate the Plan, yet does not explicitly identify how the effectiveness of the Plan will be evaluated. DAWR has described the framework as ‘high-level’ and ‘aspirational’ (sub. 81, p. 26).

Further, the framework does not detail how progress towards meeting the enhanced environmental outcomes pursued through additional efficiency measures (as set out in Schedule 5 of the Plan) will be monitored (chapter 5).

The influence of the framework on the first substantive evaluation of the Plan (undertaken by the MDBA in 2017) is also not clear, with that evaluation taking a more thematic approach to assessing the outcomes of the Plan to date, rather than directly answering the evaluation questions specified in the framework.

The MDBA (2017b, p. 5) has described its 2017 evaluation as ‘interim’ and a ‘health check on Basin Plan progress’, and its scope is different from that required for future evaluations of the Plan. Much of the evaluation centred on the progress of governments in implementing elements of the Plan. While early outcomes were examined, given data limitations and the fact that some outcomes require more time to observe, the analysis was often broad and centred on whether the Plan is ‘on track’ to deliver expected outcomes.

Although the 2017 evaluation provides a useful stocktake of progress, future evaluations will need to more directly examine the specific outcomes attributable to the Plan (with reference

to a counterfactual where practicable), and based on this, judge the extent to which the Plan has been effective in meeting its objectives. Notwithstanding the fact that some inquiry participants found the 2017 evaluation to provide useful information, there remains apprehension from some participants about how the Plan will be evaluated in the future.

There is also a lack of a clear and publicly released strategy (agreed to by all Basin Governments) to coordinate monitoring in the Basin. As a result, it is not clear who has responsibility for collecting what monitoring information (and therefore, who has responsibility for closing information gaps), how this information will be integrated to evaluate the Plan and how collecting this information will be resourced.

While Basin Governments have established mechanisms to coordinate monitoring activity, such as the Monitoring and Evaluation Working Group (under the Basin Plan Implementation Committee), there is little evidence to suggest that these forums have been effective in fostering a coordinated and integrated monitoring program.

If the inadequacies of the current evaluation framework — and the lack of a clear monitoring strategy — are not addressed, there are significant risks that may impede the effective evaluation of the Plan in the future. These risks include:

- a lack of alignment across monitoring programs, leading to information gaps that could hinder the evaluations of the Plan scheduled to occur in 2020 and 2025 and the wider review of the Plan to occur in 2026
- resources being spent inefficiently by duplicating work already being undertaken, or by undertaking work that is not useful for evaluating the outcomes and/or effectiveness of the Plan
- a confused message on the outcomes and effectiveness of the Plan because there is no unifying framework to present individual or localised findings in the context of the Plan as a whole.

Some of these risks are materialising now. For example, the MDBA has commented on a lack of alignment across programs that monitor the outcomes of environmental watering in the Basin:

Although there are a patchwork of useful programs and components that help report on the outcomes from the use of environmental water, they are currently not well linked or aligned. Work is needed to ensure that monitoring programs across Commonwealth and State agencies are aligned to the Basin Plan objectives and outcomes. (MDBA 2018ag, p. 14)

Ambiguity about how monitoring and evaluation at an asset scale will effectively align with monitoring and evaluation at a Basin-wide scale has also been identified by some Basin States (for example, Government of South Australia, sub. 85, Queensland Government, sub. 87).

The fact that both the MDBA, and Basin States (as parties responsible for monitoring the outcomes of the Plan) are expressing concern about a lack of alignment across different scales in the Basin is troubling. Also concerning is that this issue is not new. For example, the Independent Review of the Water Act (released in 2014) found that duplication and/or

fragmentation of monitoring and evaluation activities led to the ‘real risk that those activities would not fit together to provide a clear and coherent Basin-wide picture on outcomes’ (Australian Government 2014, p. 13).

The establishment of the Northern Basin Commissioner, whose role includes monitoring, auditing and reporting annually on the ‘[achievement of] Basin Plan environmental outcomes in the northern Basin’ (DAWR 2018k) risks adding further confusion.

FINDING 13.2

The 2014 Basin-wide evaluation framework is unclear and there is no clear strategy to coordinate the collection of the information needed to monitor the outcomes of the Plan. This means that:

- actions taken to monitor outcomes in the Basin are fragmented and inadequately integrated
- there is the potential for information gaps that may result in future evaluations being unable to accurately and comprehensively assess the impacts and outcomes of the Plan
- there is a risk of monitoring activity being duplicated
- the ability of Basin Governments to clearly communicate the outcomes of the Plan is impeded.

How can arrangements be improved?

Substantial improvements are required to enhance the clarity and effectiveness of the arrangements for monitoring and evaluating the Plan. These improvements will help to ensure that all parties who have a role in monitoring and evaluation understand what their role is, what monitoring activities they are to undertake and how these will fit together. This will allow for accurate and comprehensive evaluations of the outcomes and effectiveness of the Plan across a range of scales.

To improve arrangements for monitoring and evaluation, Basin Governments and the MDBA should:

- revise the Basin Plan evaluation framework
- develop a monitoring strategy to give effect to this evaluation framework.

The Basin Plan evaluation framework

That the MDBA acknowledges a revised framework is needed, and work is underway to deliver this, is a positive development. That said, details on the content of the revised framework are not yet publicly available. As such, the Commission cannot assess the extent

to which the revised framework will provide an effective anchor for the 2020 and 2025 evaluations of the Plan.

However, to be effective, the revised framework needs to have a range of specific features.

Specific questions should be defined

The Basin Plan evaluation framework should define the specific evaluation questions that will be used to evaluate the outcomes and effectiveness of the Plan. The primary objective of the framework should be to ensure there is a clear basis for evaluating the Plan in 2020 and 2025, and that these evaluations will be a useful source of evidence for reviewing the Plan in 2026.

Set out in the Plan are ‘key evaluation questions’ that the MDBA must consider when undertaking evaluations (box 13.3). However, these questions are too high level and generic to provide clarity and guidance on how the Plan will be evaluated. The framework should identify more specific questions.

Box 13.3 Key evaluation questions

The ‘key evaluation questions’ as set out in section 13.06 of the Plan are:

- to what extent has the intended purpose of the Basin Plan set out in section 20 of the [Water] Act been achieved?
- to what extent have the objectives, targets and outcomes set out in the Basin Plan been achieved?
- how has the Basin Plan contributed to changes to the environmental, social and economic conditions in the Murray-Darling Basin?
- what, if any, unanticipated outcomes have resulted from the implementation of the Basin Plan?
- how could the effectiveness of the Basin Plan be improved?
- to what extent were the actions required by the Basin Plan suited to meeting the objectives of the Basin Plan?
- to what extent has the program for monitoring and evaluating the effectiveness of the Basin Plan contributed to adaptive management and improving the available scientific knowledge of the Murray-Darling Basin?

In defining evaluation questions, the framework should recognise that the Plan has a range of outcomes. These outcomes are environmental, social, cultural and economic. For each of these broad outcome classes, the framework should define the questions that will be used to determine the extent to which the Plan has been effective in meeting its objectives.

The framework will also need to acknowledge that the outcomes of the Plan will occur on a range of scales, and set evaluation questions relevant to these scales. The framework should recognise that the most meaningful insights on the effectiveness of the Plan often come from

examining outcomes at relatively localised scales. As such, the framework questions should place due emphasis on evaluating the local and regional outcomes of the Plan, while maintaining the flexibility to synthesise or supplement these to evaluate outcomes for the Basin as a whole.

The framework should also consider the extent to which the Plan is contributing towards Australia's obligations under international agreements (while recognising that the Basin Plan is only one of a suite of policies that assist with meeting Australia's international commitments).

The importance of counterfactual analysis should be acknowledged in the framework, given that an important part of answering whether the Plan has met its objectives involves comparing the environmental, social, cultural and economic condition of the Basin to what it would likely be in the absence of the Plan. This allows assessments of the extent to which the Plan is responsible for changes in the condition in the Basin, versus other causes or factors.

The framework should be tested with stakeholders

The MDBA should test the framework with those responsible for collecting monitoring information, including DAWR, the CEWH and the Basin States. This is an important step for confirming the validity and workability of the evaluation framework, and helps to generate buy-in from those parties who are responsible for collecting the data and information that will populate the framework.

Testing the framework with stakeholder groups (for example, the Basin Community Committee) is also important. This will help to ensure that evaluation questions map to issues that have prominence in the community and that the information generated through evaluations of the Plan is valued by the Basin communities that it seeks to inform.

The process for finalising the framework should be publicly outlined as soon as possible.

The framework should be public

Making the framework public places discipline on governments to ensure the information required to answer the questions set out in the framework is collected and available. In short, it makes governments accountable for populating and applying the framework. Publicly releasing the framework also provides a degree of certainty to stakeholders about the criteria against which the effectiveness of the Plan will be assessed. Any revised framework should be finalised by the end of 2019 and made publicly available to give stakeholders and governments sufficient time to prepare for the 2020 evaluation of the effectiveness of the Plan.

RECOMMENDATION 13.2

The Murray-Darling Basin Authority (as Basin Plan Regulator) should develop a revised Basin Plan evaluation framework. This framework should define the specific questions that are to be used to evaluate the outcomes and effectiveness of the Plan, and the scales and times at which these questions will be answered.

The process through which the framework will be developed should be made public as soon as possible.

The evaluation framework should be finalised by the end of 2019, and be made publicly available.

The Basin Plan monitoring strategy

As outlined above, the evaluation framework should establish the questions that will inform evaluations of the effectiveness of the Plan. The monitoring strategy should describe the process by which the information needed to answer these questions is collected. Put simply, the strategy provides the ‘who, what, when, where and how’ for populating the evaluation framework. This means that the strategy should:

- describe the roles and responsibilities of the MDBA, the Basin States, the CEWH and DAWR with respect to undertaking monitoring and information gathering within the Basin
- describe what information needs to be collected to inform evaluations of the Plan (given the evaluation questions specified in the framework) and methodologies for collection and analysis
- identify the timeframes for which this information will be collected and on what scales this will occur
- identify the resourcing needed to collect this information and articulate how these resourcing requirements will be met by Basin Governments (including setting out cost-sharing arrangements).

A part of the strategy would be a process to conduct a ‘stocktake’ of the monitoring information currently being collected (both by governments and other parties) and undertaking an assessment of how this aligns with what will be required to answer the evaluation questions. This would allow for information gaps to be identified. The 2017 evaluation likely provides useful experience to draw upon when determining where these information gaps are.

Where a gap is identified, the strategy would be the vehicle to outline how this gap will be closed. This includes identifying the party responsible for addressing the gap, and outlining the process by which it will be addressed (which could include extending an existing monitoring program, commissioning new research or consideration of citizen science).

The strategy should be agreed to by all Basin Governments. Having all Basin Governments agree to the strategy signals joint ownership of, and a shared commitment towards, the approach that will be used to collect the information needed to evaluate the Plan. The strategy should also be made public.

RECOMMENDATION 13.3

Basin Governments should develop a monitoring strategy to give effect to the evaluation framework for the Basin Plan. This should describe the process by which the information needed to answer the evaluation questions set out in the framework will be collected. This includes:

- outlining what information will be collected and by whom
- identifying any information gaps, who will be responsible for addressing them and the process by which they will be addressed
- establishing the arrangements for sharing the costs of monitoring and evaluating the Plan between Basin Governments.

This monitoring strategy should be developed by Basin Governments, supported by the Murray-Darling Basin Authority (as the agent of governments).

The monitoring strategy should be finalised by the end of 2019, and be made publicly available.

13.5 Looking towards the 2026 review

The Plan is to be reviewed in 2026.¹⁷¹ Undertaking this review is the responsibility of the MDBA.

A process for the review is set out in the Water Act

When undertaking the review, the MDBA is required to:

- prepare a discussion paper. In preparing this paper, the MDBA must consult with Basin States, the Basin Officials Committee and the Basin Community Committee (as well as other stakeholders as the MDBA sees fit). The discussion paper must set out the issues to be addressed in the review
- accept submissions from the public and publish these on the MDBA's website
- prepare a report of the results of the review (which must be provided to the Australian Minister for Water and the relevant Ministers of the Basin States, and published on the MDBA's website).

¹⁷¹ Water Act, ss. 50-51. Under s. 50(2) of the Act, a review may be initiated before 2026 if either the Australian Minister for Water or all of the Basin States request the MDBA to undertake a review.

If, as a result of the review, the MDBA is satisfied the Plan should be amended, it may prepare an amendment of the Plan and give it to the Australian Minister for Water for adoption. If the MDBA does prepare an amendment, the process for amending the Plan is triggered,¹⁷² initiating further consultation.

The scope of the review is not defined

Although the process for the 2026 review is clear, neither the Water Act nor the Plan provides explicit guidance on the objectives and scope of the review. It will be the responsibility of the MDBA (with guidance from Basin Governments) to define these, and to operationalise the process set out in the Act.

While the scope of the review is yet to be defined, the review should be forward looking, and consider issues that are not within the scope of the 2020 and 2025 evaluations (which are backward looking, and seek to assess outcomes and improve arrangements within the confines of the Plan’s existing settings). The 2026 review represents an opportunity to:

- *Consider the extent to which the outcomes of the Plan accord with expectations* and the extent to which the Plan is delivering on its objectives and targets. The 2020 and 2025 evaluations will provide some of the information needed to do this. Where the Plan is not meeting its objectives and targets, the review will need to ascertain why and consider the implications of this.
- *Consider key emerging risks* that may impact on the Plan. The effects of climate change on the Basin is an example of such a risk, given its potential to impact on streamflows, on the environmental condition of key Basin assets and on sea levels (which may affect the operation of the barrages and the capacity to meet the objectives and targets for the Lower Lakes, Coorong and Murray Mouth). Any risks as a result of non-compliance with the Plan should also be considered. The Basin Plan and the Water Act identify other risks that may impact on water resources in the Basin that will need to be considered in the review.¹⁷³

The 2026 review is also an opportunity to *draw upon updated knowledge* to improve the Plan. Some of this updated knowledge will come from ongoing monitoring of the Plan’s impacts and outcomes. Some will also come from initiatives and work already underway — for example, Basin Governments are pursuing a range of ways to better understand how to effectively provide for cultural values in the Basin (chapter 7).

¹⁷² This process is set out in Subdivision F of Part 2, Division 1 of the Water Act.

¹⁷³ Chapter 4 of the Plan identifies risks to the condition, or continued availability, of Basin water resources and strategies to manage or address these risks. Risks identified include insufficient water available for the environment, water being of a quality unsuitable for use and poor health of water-dependent ecosystems.

However, on some matters, new knowledge will need to be actively generated. The Commission understands that efforts are underway to shape planning for new knowledge generation in the Basin. These efforts include:

- a Basin Science Platform, which is being progressed by Basin Governments through an inter-jurisdictional working group (DAWR, pers. comm., 6 November 2018)
- a Knowledge Framework, which is currently being implemented by the MDBA. The Framework is designed to assist the MDBA to identify and prioritise knowledge needs across the MDBA to inform budgets and planning activities
- a Knowledge Strategy, which is currently being developed by the MDBA. Among other things, the Strategy will inform the MDBA's approach to building effective collaborations with the research and knowledge community (MDBA, pers. comm., 4 December 2018).

The MDBA has also updated the role of the Advisory Committee on Social, Economic and Environmental Sciences (ACSEES).¹⁷⁴ ACSEES is a panel of seven professors whose function is to deliver:

... advice on Basin Plan implementation and the broader scientific context of the MDBA's work, including environmental watering, adaptive management, climate change and the monitoring and evaluation of Basin Plan outcomes. The communication of science-related matters within academic, community and industry networks is also an important part of the committee's role. (MDBA 2018g)

Significant preparatory work is needed

It is a positive sign that Basin Governments are developing strategies for new knowledge generation. However, investments in new science and research to inform the review can only be effectively targeted and resourced if the objectives and scope of the review are defined and there is a clear process through which this research will be used.

Significant preparatory work will be required to enable knowledge generated to be targeted and the 2026 review to be done well. Given that new knowledge can take significant time and rigour to collect, vet and analyse, this planning needs to commence soon to effectively guide investments. This is the responsibility of the MDBA. The Australian Government and the Basin States also have a substantial role to play, both in providing input into planning and by taking action to identify and close knowledge gaps that may hinder the review's effectiveness.

There is little evidence to suggest that the MDBA and Basin Governments have commenced appropriate planning for the review.

¹⁷⁴ ACSEES is an advisory committee established under s. 203 of the Water Act.

The Commission expects that the MDBA will be in a position to publicly detail the approach it will take for the 2026 review after it completes the 2020 evaluation of the Plan's effectiveness. In outlining its approach, the MDBA should establish:

- the broad objectives and scope of the review
- how the process as set out in the Water Act will be undertaken, including establishing the timing of the review's discussion paper
- a clear process for identifying and addressing knowledge gaps that may hinder the review
- how the review will be resourced.

The Commission will assess progress in planning for the 2026 review when it next examines the Plan's implementation in 2023.

RECOMMENDATION 13.4

After the completion of the 2020 evaluation of the effectiveness of the Basin Plan, the Murray-Darling Basin Authority (as Basin Plan Regulator) should publicly outline the approach it will take for the 2026 review of the Plan. This should include establishing:

- the broad objectives and scope of the review
- how the process as set out in the Water Act will be undertaken, including establishing the timing of the review's discussion paper
- a clear process for identifying and addressing knowledge gaps that may hinder the review
- how the review will be resourced.

14 Institutions and governance

Key points

- The institutional arrangements for implementing the Basin Plan are complex. The Water Act and the Basin Plan are instruments of the Australian Government, while the Basin States have constitutional responsibility for the management of water resources. Also, the waters of the Murray-Darling Basin are shared and managed by Basin Governments under joint arrangements, in accordance with the Murray-Darling Basin (MDB) Agreement.
- Good governance arrangements involve: clear roles and responsibilities, including managing or separating conflicting functions; effective collaborative processes; effective accountability mechanisms; and transparent decision making with meaningful stakeholder engagement.
- There are serious shortcomings in the current governance and institutional arrangements.
 - It is unclear who is responsible for leading the implementation of the Plan — the Murray-Darling Basin Authority (MDBA) or Basin Governments. This has resulted in a lack of strategic leadership and direction. There is uncertainty about who should respond to issues as they arise.
 - The MDBA has conflicting roles. It is funded by Governments to support them as their agent under the MDB Agreement and it helps them to implement the Plan. It is also an independent authority ensuring compliance with, evaluating the effectiveness of, and ultimately reviewing the Plan. Both roles are critical to the next phase of implementation and the long-term success of the Plan, and the conflicts between them will intensify.
- The deficiencies in institutional arrangements have led to a lack of transparency and accountability, and weakened processes for intergovernmental collaboration. Key risks have not been managed, timelines have slipped and implementation has been managed through last-minute negotiations as a crisis emerges or a deadline looms.
- Stakeholders are frustrated by the efforts made to engage them due to a perceived lack of responsiveness — they do not feel heard. Much of the community dissatisfaction is driven by the way Governments have sought to negotiate and navigate their way through issues.
- A complex task lies ahead for Basin Governments as they implement supply and efficiency measures and embed the Plan in normal water resource management processes. The significant risks to implementation cannot be managed effectively under current institutional and governance arrangements. Reform is required to successfully navigate the next phase.
- Basin Governments should demonstrate strategic leadership, take joint responsibility and drive the implementation of the Basin Plan. The Murray-Darling Basin Ministerial Council should delegate responsibility for leading Plan implementation to the Basin Officials Committee (BOC). BOC, as steward of the Basin's water resources, must drive adaptive management to incorporate the Plan into Governments' day-to-day activities.
- The MDBA is inherently conflicted, required to be both a trusted adviser as the agent of Basin Governments and a credible, impartial regulator. Basin Governments should agree to split the MDBA into two separate institutions: the Murray-Darling Basin Agency (the agent of governments supporting Basin Governments to implement the Plan, and to manage joint programs and shared resources) and the Basin Plan Regulator (an independent regulator with compliance and evaluation functions, and responsibility for the review of the Plan in 2026).

14.1 Current institutional and governance arrangements

Water management in the Basin is a joint responsibility

The institutional and governance arrangements for the Basin Plan are complex, reflecting the differences in jurisdictional responsibilities across the Basin.

The *Water Act 2007* (Cwlth) and the Basin Plan 2012¹⁷⁵ are national instruments that provide the legal basis for setting the new sustainable balance and establishing a new Basin-wide sustainable water management system. These instruments establish a significant and ongoing role in water management in the Basin for the Australian Government. However, State and Territory Governments have constitutional responsibility for the management of water resources, and they do so in accordance with their State laws.

Basin Governments¹⁷⁶ share the water resources of the Basin in accordance with the Murray-Darling Basin Agreement (2008) (MDB Agreement). This agreement builds on more than a century of cooperative management, which began when the River Murray Waters Agreement came into effect in 1915. Under the MDB Agreement, in shared and highly connected systems, such as the River Murray, the Murray-Darling Basin Authority (MDBA) is assigned responsibility to act as the agent of Basin Governments, delivering many State-based responsibilities on their behalf — such as those for river operations and asset management.¹⁷⁷

The Basin Officials Committee (BOC) is established under the MDB Agreement and the Water Act confers functions on BOC in addition to those set out in the Agreement. BOC facilitates cooperation between Basin Governments in managing Basin water resources and joint natural resource management programs. It comprises representatives from the Australian, New South Wales, Victorian, South Australian, Queensland and ACT Governments. Its chair is appointed by the Australian Government and the Water Act requires that the Chair be a senior Australian Government official.¹⁷⁸

The institutional arrangements agreed by Basin Governments for the development and implementation of the Basin Plan recognise the constitutional responsibilities of the Basin States. In effect, the Basin Plan arrangements were super-imposed on long standing settings, including those of the MDB Agreement (figure 14.1). This has resulted in key institutions having multiple roles. The MDBA is:

¹⁷⁵ An instrument of the Water Act (part 2, division 1).

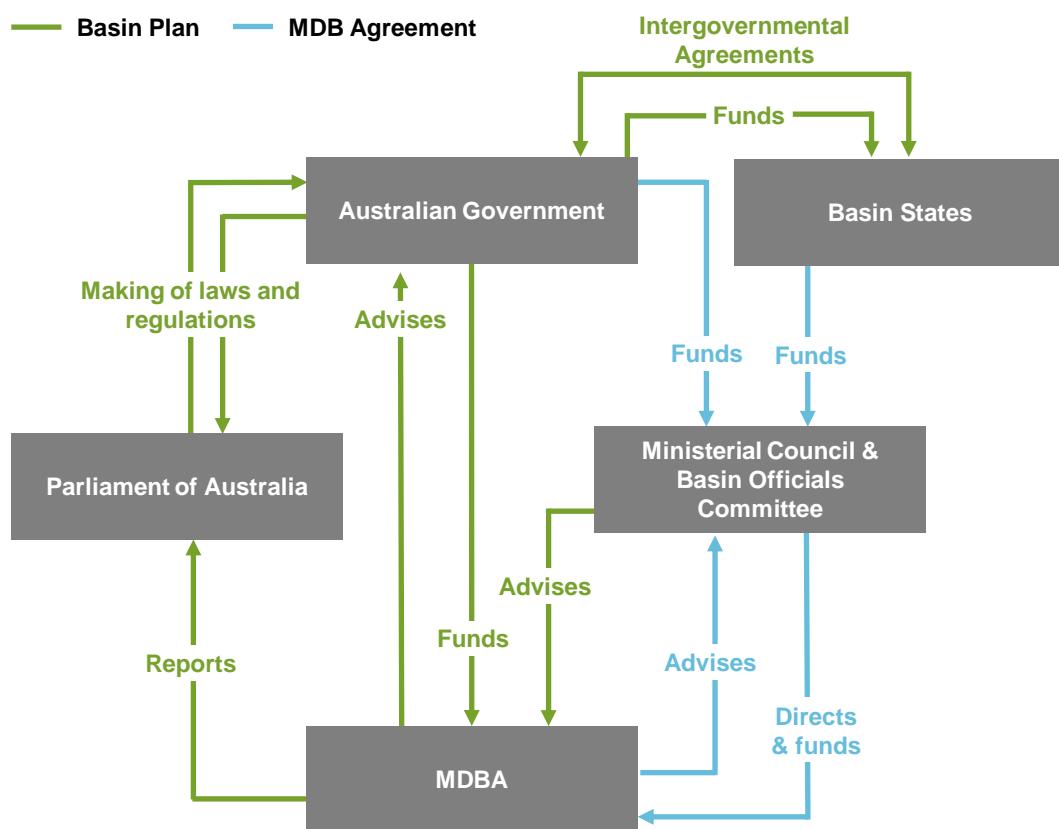
¹⁷⁶ Basin Governments are the Australian Government and the Governments of each Basin State. The Basin States are New South Wales, Victoria, Queensland, South Australia, and the Australian Capital Territory.

¹⁷⁷ Each Basin State has passed laws to refer a limited range of their constitutional powers for water to the Commonwealth to enable the MDBA to act as their agent under the MDB Agreement. A Service Level Agreement between the MDB Ministerial Council and the MDBA describes the roles and responsibilities of each party. The MDB Ministerial Council approves an annual corporate plan and budget for programs and activities delivered by the MDBA.

¹⁷⁸ Water Act (s. 201A).

- an independent authority that provides advice to the Australian Government in its role to prepare and recommend the Basin Plan and any amendments to the Plan
- a regulator that ensures compliance with the Plan and reports on the implementation of the Plan by Basin Governments
- a service provider, acting as the agent of Basin Governments, funded and directed by them under the MDB Agreement, to deliver River Murray operations and other joint programs.

Figure 14.1 Current institutional settings and relationships



Sources: Basin Plan 2012 (Cwlth); Water Act 2007 (Cwlth).

And BOC has two roles:

- under the MDB Agreement, BOC directs the MDRA on MDB Agreement functions. It approves the MDRA's operating plan and budget for these functions, before the Murray-Darling Basin (MDB) Ministerial Council formally endorses them
- under the Water Act and Basin Plan, BOC is required to provide advice and facilitate co-operation between the MDRA and jurisdictions during the development and implementation of the Plan, and to notify the MDRA in regard to supply and efficiency measures (chapters 4 and 5).

Basin States provide the majority of the joint funding the MDBA requires to operate the River Murray systems and to support the management of river assets, structures and other joint programs. These costs are shared based on periodic assessments of the relative benefit that each State derives from these joint activities (Buckley 2014). For natural resource management programs, after allowing for contributions from Queensland and the ACT, the balance of costs are shared equally between the Australian Government, New South Wales, Victoria and South Australia (Buckley 2014). The Australian Government funds the MDBA's Basin Plan roles.

The roles (individually and jointly) of Basin Governments for the Basin Plan, and water resource management more broadly are set out in table 14.1.

The key change arising from the Water Act and the Basin Plan has been a more prominent role for the Australian Government. It has had a central role in resetting the balance by establishing Sustainable Diversion Limits (SDLs), recovering water to bridge the gap to SDLs (chapter 3) and investing in the SDL adjustment measures (chapters 4 and 5). These roles will conclude when these activities are finalised.

The Australian Government also has ongoing roles under the new water resource management arrangements established by the Water Act and the Basin Plan. These include the management of the Commonwealth Environmental Water Holdings (assigned to the Commonwealth Environmental Water Holder (CEWH)), the setting of Basin-wide environmental watering priorities (chapter 11), ensuring compliance with the Plan (chapter 12) and reviewing the Plan in 2026 (chapter 13) — all of which are assigned to the MDBA.

These strategic, Basin-wide roles are a key feature of the new management arrangements of the Plan. However, ultimately the Plan will be implemented through State-based water resource management arrangements and, for shared water resources, the joint arrangements set out in the MDB Agreement (which include the Australian Government). The long-term success of the Plan will depend on how Governments (individually and jointly) integrate the implementation of the Plan into their normal water resource management processes.

Table 14.1 Basin Plan and water resource management roles

	Australian Government ^a	Basin States	Joint Basin Governments ^b	MDA	Productivity Commission
Resetting the balance					
Setting and reviewing SDLs				▲	
Recovering water	▲				
Implementing SDL adjustment measures	▲	▲	▲	■	
Reconciling SDL adjustment measures				▲	
Delivering structural adjustment programs	▲				
Funding to improve Indigenous outcomes	▲				
Management arrangements					
Water resource planning	▲	▲	●	▲	
Environmental water management	▲	▲	●	■	▲ ■
Facilitating water trading	▲	▲ ■ ●	■	▲ ■	
Facilitating Indigenous values and uses	▲	▲ ■ ●	■	▲ ■	
Meeting critical human water needs	▲ ■ ●		■	▲ ■	
Managing water quality and salinity	▲ ■ ●	■	■	▲ ■	
Ensuring compliance with SDLs and Basin Plan				▲	
Ensuring compliance with water take rules		■ ●			
Reporting, monitoring and evaluation	▲	▲ ●	■	▲ ■	▲
River management	■ ●		■ c	■ c	
Asset management and operation	■ ●		■ c	■ c	
Resource manager	■ ●		■ c	■ c	

^a Includes the roles of the Commonwealth Environmental Water Holder, Department of Agriculture and Water Resources, and Department of Infrastructure, Regional Development and Cities. ^b Consists of Basin States and the Australian Government. ^c River Murray only.

▲ Basin Plan ■ MDB Agreement ● State water resource management laws

Sources: Basin Plan 2012 (Cwlth); COAG (2004); Water Act 2007 (Cwlth).

14.2 Have institutional and governance arrangements been effective?

Principles for effective institutional and governance arrangements

The Commission has used six key principles to assess the effectiveness of the current institutional and governance arrangements: role clarity; managing conflicting functions; effective accountability mechanisms; effective collaborative processes; adequate capabilities; and effective stakeholder engagement (box 14.1).

These principles draw primarily on the work of the OECD and the Australian National Audit Office in relation to best practice institutional and governance arrangements, particularly where there are shared responsibilities between governments.

A foundational principle is clarity of roles and responsibilities. Clear specification of the purpose, functions and powers assigned to each institution is a fundamental driver of effective institutional arrangements. When roles and responsibilities are unclear, there is a very real risk that the other key governance mechanisms (such as those to ensure accountability, to facilitate collaboration, and to ensure access to the right capability) are inefficient or less effective than they would otherwise be. Sound institutional and governance arrangements also facilitate effective engagement with stakeholders. Where there are shortcomings in arrangements, there is a risk that any efforts by agencies to engage with stakeholders become muddled.

The current arrangements are deficient

The Commission has assessed current institutional and governance arrangements against the above principles, and found serious deficiencies in the areas of role clarity, conflicting functions, and stakeholder engagement. Less fundamental shortcomings were found in other areas.

The assignment of roles and responsibilities for ‘leading implementation’ is not clear

The Water Act confers on the MDBA the functions to ‘prepare, evaluate and review’ the Basin Plan and it assigns the MDBA as the ‘appropriate enforcement agency’ for contraventions relating to the Basin Plan.

Box 14.1 Principles for effective institutional arrangements and good governance

Clear roles and responsibilities

Role clarity supports clear expectations and accountabilities among collaborating institutions by ensuring that each understands its own role as well as the roles and responsibilities of its partner institutions. It enables governments and external stakeholders to have clear expectations of key institutions, which promotes accountability, public trust and confidence.

Role clarity requires:

- clearly specifying the purpose and objectives to be achieved by each institution
- clearly specifying the powers and functions assigned to each institution, and ensuring that these powers and functions are sufficient for the entity to fulfil its responsibilities
- clearly assigning responsibilities for decision making between a governing body and its CEO.

Conflicting objectives and functions are effectively managed

Conflicts can arise where an institution has multiple functions that could compromise its capacity (or the perception of its capacity) to perform each function impartially and effectively. In public institutions, this can be avoided by separating regulatory, service delivery, and policy-making functions into separate institutions. This principle has been a long-standing feature of Australian public policy since the introduction of competition policy reforms in the 1990s.

Effective mechanisms for accountability

Public institutions are accountable to the relevant Minister or governing body for achieving their stated objectives and performing their required functions efficiently, effectively and impartially. Government institutions have a responsibility to fulfil their duties towards regulated entities (in the case of a regulatory body) or provide services as agreed (in the case of a service delivery agency). Public entities are also accountable to the broader community for exercising their powers and functions as expected and contributing to intended policy objectives. Accountability is supported by:

- an effective framework for monitoring, reporting and assessing the progress of implementation
- open and transparent processes that enable stakeholders to understand the reasons behind decisions and how their views have been taken into consideration. Transparency includes making publicly available the rules, data and information that inform policy, operational, and compliance decisions (except where confidentiality is required), together with any necessary guidance material to support understanding.

Effective processes for collaboration

Coordination among government institutions helps streamline decision making and avoids overlaps and duplication. Effective cross-entity collaboration requires that:

- all parties have a genuine commitment to shared goals and cooperative working arrangements
- arrangements for collaboration are clearly documented — including how collaborative work is to be undertaken, and how collaborative activities are overseen, tracked and reported on
- information about shared programs and functions is communicated across entities
- shared risks are identified and managed
- potential overlaps and gaps (between entities' roles) are identified and addressed.

(continued next page)

Box 14.1 (continued)

Capability

All institutions should have appropriate resources and capabilities to comply with legislative obligations, discharge their functions, and achieve policy objectives. In this context, capability includes:

- providing adequate budgetary resources to cover the costs of efficient operations, with a level of certainty to support forward planning, and flexibility to respond as needed to circumstances as they arise.
- ensuring that responsible agencies have the core technical capabilities to perform their functions, as well as access to people with appropriate expertise.

Effective engagement of stakeholders

Constructively engaging stakeholders in government decision making supports the identification of new opportunities or potential problems (and possible solutions). Done well, it is a key mechanism to manage risks, both through better program design and smoother implementation. Engagement also facilitates openness and transparency, which promotes accountability.

Meaningful stakeholder engagement: enables governments to prioritise and adjust their activities to take into account stakeholder and community views; offers valuable feedback on how their activities are viewed by the community; and builds public confidence in decision making. It is characterised by:

- fair consideration of the diverse interests and expectations of all affected stakeholders
- consultation methods that are fit-for-purpose and that offer stakeholders genuine opportunities to influence decisions
- providing stakeholders with the information, analysis and time to support their deliberations so they can meaningfully contribute
- a culture of engagement, where stakeholders' views are valued
- decisions being communicated to stakeholders in an open, transparent and accessible way.

Meaningful engagement with stakeholders involves identifying stakeholders that may be materially affected and those that may be interested in the outcomes of a particular decision or program of work. Stakeholders should be involved in the design of the processes for engagement.

Sources: ANAO (2014, 2018b); OECD (2014); PC (2016, 2017a).

Following the refusal of the Basin States to refer their constitutional responsibility for water management in full to the Australian Government, Basin Governments agreed in 2008 that the MDBA's role is 'to prepare, implement, monitor and enforce the Basin Plan' (COAG 2008a). This agreement acknowledged that the MDBA would play a central role in the planning, analysis and consultation to develop the Plan. The agreement also detailed roles for implementation. Once the Plan was made, Basin States would implement the Plan by managing their water resources in a way that was consistent with the Plan. For implementation, the role of the MDBA would evolve to one of 'monitoring, reporting and enforcements', ensuring that the States' water management arrangements complied with the Plan (COAG 2008a).

However, as a result of the intense negotiations during its development, the Plan agreed to in 2012 was more complicated than originally envisaged. For many elements (such as the SDL adjustment mechanism and associated constraints easing) the Plan set out decision making frameworks and the timeframes by which decisions had to be made. The clear and straightforward transition from ‘plan development’ to ‘plan implementation’ foreshadowed in 2008 did not eventuate.

The 2013 *Intergovernmental Agreement on Implementing Water Reform in the Murray-Darling Basin* (COAG 2013) was silent on assigning clear responsibility for leading the implementation. It is now not clear who is responsible for leading implementation: the MDBA or Basin Governments.

Basin Governments have taken a more central role in negotiating how the Plan would be implemented because responsibility for water resource management resides with them. For example:

- Basin States have been responsible for developing Water Resource Plans (WRPs), for working with environmental water holders to plan and manage environmental water, and for ensuring water take compliance
- Basin Governments (through BOC) have worked together, with technical support from their own specialists and those of the MDBA, to further develop key elements, such as the supply, constraints easing and efficiency measures.

The MDBA views its focus as an organisation is to: ‘implement and review an integrated plan for the sustainable use of the Basin’s water resources’ and to ‘build a culture of compliance to ensure the Basin Plan is implemented effectively ...’ (among other roles) (MDBA 2018p, p. 7). It has positioned itself to ‘lead the implementation of the Basin Plan in collaboration with Basin state and territory governments and other Australian government agencies’, a goal clearly identified in its corporate plans (MDBA 2018p, p. 14). This positioning is a key source of stakeholder confusion about roles and responsibilities for implementation. Some stakeholders perceive it to be an Authority that is directly in charge of water resources in the Basin.¹⁷⁹ In reality, the situation is more complex. In most areas of implementation it does not have the authority to directly intervene. Implementation is primarily undertaken by Basin Governments, because of their constitutional responsibilities for land and water management.

As the Plan has transitioned from development to implementation, the shift in responsibility from the MDBA to Basin Governments has been implicit. Basin Governments have not sought to challenge the position the MDBA has adopted, or explicitly claim this leadership role. This has left Basin Governments and the MDBA open to accusations from stakeholders that they are blame shifting and not taking responsibility for, or being accountable for, their actions.¹⁸⁰

¹⁷⁹ McBride (sub. 78), Australian Floodplain Association (sub. 41), Leeton Shire Council (sub. 17), Goulburn Murray Irrigation District (GMID) Water Leadership (sub. 62).

¹⁸⁰ Goulburn Murray Irrigation District (GMID) Water Leadership (sub. 62), McBride (sub. 78).

The lack of clear responsibility and accountability has made it difficult for stakeholders to navigate the institutional landscape for implementing the Plan. There is confusion about who to contact when issues arise, and concerns about the costs of duplication.¹⁸¹

The implicit shift in responsibility for implementation has also contributed to ineffective arrangements for intergovernmental collaboration to implement the Plan. Participants in the inquiry¹⁸² have commented that there have been:

- too many multi-jurisdictional committees and groups, resulting in duplication and inefficiency
- a lot of ‘process’, but little decision making
- a focus on short-term operational matters and not enough consideration of strategic issues.

Basin Governments themselves have identified shortcomings in their arrangements for intergovernmental collaboration, and have instigated an independent review (Australian Department of Agriculture and Water Resources, sub. DR103).

Ultimately, the absence of clearly assigned responsibility for implementation means that key risks to successful implementation have not been managed strategically.

- Timelines for decisions, such as the notification of supply measures have slipped and had to be amended (chapter 4).
- Approaching deadlines to resolve key issues, such as the implementation of pre-requisite policy measures and provisions to protect environmental water are at risk of not being met by some jurisdictions (chapter 11).
- There has been uncertainty about who should respond to issues (such as water take compliance) as they arise, and as such issues have been managed reactively.

Effectively, no one has been in charge. Basin Governments have managed implementation through last-minute negotiations as a crisis emerges or a deadline looms.

There are conflicts in the MDBA’s roles

In its submission, the MDBA acknowledged its multiple roles in relation to water management in the Basin, but highlighted the benefits of integrating these roles. Having the Basin Plan and MDB Agreement responsibilities in one institution generates ‘important synergies’, as ‘each of these functions benefit from the presence of the others within the agency’ (MDBA, sub. DR136, p. 13).

¹⁸¹ Cotton Australia (sub. 47), Ricegrowers’ Association of Australia Inc. (sub. 70), New South Wales Irrigators’ Council (sub. 80).

¹⁸² Murray-Darling Basin Authority (sub. 86), Queensland Government (sub. 87).

However, an alternative view, expressed by many participants in this inquiry, is that the MDBA's multiple roles can create conflicts.¹⁸³ The MDBA's roles include:

- providing independent advice to the Australian Government to make, evaluate, review and amend the Basin Plan
- being a regulator that ensures compliance with the Basin Plan
- acting as the agent of Basin Governments, providing services under the MDB Agreement.

There are conflicts between these roles:

- the MDBA developed the Plan and is involved in implementing it, and it is also responsible for evaluating the impacts and effectiveness of the Plan — it 'marks its own homework'¹⁸⁴
- as the agent of Basin Governments, the MDBA works with them and is then responsible for calling Governments out when they are not compliant with the Plan.

Marking its own homework

The MDBA is responsible for assessing the outcomes and effectiveness of the Plan (chapter 13). As a party responsible for implementation and as the agent assisting governments implement their obligations, the MDBA is assessing its own performance. Where evaluations are not undertaken by an independent party, there is a high risk that the public will view these evaluations sceptically — or even dismiss them.

Trusted adviser and credible independent regulator

Areas where the conflict is greatest between the MDBA's role as the agent of governments and its role to regulate and evaluate the implementation of the Basin Plan include:

- under the MDB Agreement, functions of the MDBA in relation to inter-valley and interstate water trade include the development of protocols to 'prohibit, restrict or regulate' the transfer of entitlements. This is in conflict with its role to ensure compliance with Basin Plan Trading Rules, including the making of declarations in relation to trade restrictions and enforcing compliance when State rules are inconsistent (chapter 10)

¹⁸³ Inland Rivers Network (sub. 23), Murray Irrigation (sub. 26), NSW Nature Conservation Council (sub. 43), Australian Dairy Industry Council Inc. (sub. 44), Murray River Council NSW (sub. 50) Murray Darling Association Inc. (sub. 52), Goulburn Murray Irrigation District (GMID) Water Leadership (sub. 62), Lower Edward River Pumpers and Landholders (sub. 63), Newman (sub. DR115), Environment Victoria (sub. DR117), Conservation Council of South Australia (sub. DR118), River Lakes and Coorong Action Group Inc. (sub. DR124), MacMillan (sub. DR134).

¹⁸⁴ Lower Edward River Pumpers and Landholders (sub. 63), Murray Valley Private Diverters Inc. (sub. 69), Murray Darling Association Inc. (sub. 52), New South Wales Irrigators' Council (sub. 80; sub. DR128).

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- as the operator of the River Murray (as the agent of governments), the MDBA will provide crucial technical support to Basin States to implement key supply measure projects. It will then be responsible for judging the effectiveness of its own activities when it reconciles SDLs in 2024 (chapter 4)
 - as the agent of governments, the MDBA is chair of the Southern Connected Basin Environmental Watering Committee. In this role, the MDBA has assisted the Basin Governments to coordinate environmental watering activities by encouraging cooperation between water holders and river operators. It is then responsible for assessing whether these activities align with the Plan and the effectiveness of these activities in achieving the outcomes of the Plan (chapter 11)
 - as the agent of governments the MDBA operates salt interception schemes, which are a key influence on whether the salinity targets in the Plan are achieved (chapter 8)
 - as the agent of governments, the MDBA is required to operate the River Murray system in a way that is consistent with the Basin Plan¹⁸⁵ and WRPs. As regulator, it is responsible for compliance with the Plan and WRPs, including taking enforcement action when river operators and others act in a way that is inconsistent with the Plan or a WRP (chapter 6, chapter 12).

The MDBA manages the conflict between its agent of governments role under the MDB Agreement and its independent Basin Plan role by internal delegations. Amendments to the Water Act made in 2008 included the MDB Agreement as a schedule to the Act. These amendments also included transitional provisions that delegated all functions and powers (except for making, amending and reviewing the Basin Plan) to the Chief Executive.¹⁸⁶ These delegations are still in place.

These delegations means that the six member appointed Authority has no role in MDB Agreement functions. However, because of these delegations, the Chief Executive has conflicting responsibilities. This position has full responsibility for MDB Agreement roles and is a member of the appointed Authority that oversees the MDBA's Basin Plan role.

The MDBA does not actively communicate its internal controls to stakeholders, and based on the contributions of participants to this inquiry, these provisions are not widely understood.

The conflicts in the MDBA's functions are largely the result of it being necessary, efficient and effective for States to rely on their agent to provide them with the technical capabilities to manage shared water resources and other joint programs. Basin Governments and the MDBA have built these capabilities to enable the MDBA to deliver its MDB Agreement functions.

¹⁸⁵ Including the provision of critical human water needs and the Environmental Watering Plan

¹⁸⁶ Water Amendment Act 2008 (Cwlth), Schedule 3, part 3, section 7.

Accountability mechanisms have not been used effectively

Key mechanisms for stakeholders to hold Basin Governments accountable for implementing the Basin Plan include:

- annual reporting by Basin Governments against Category B matters in Schedule 12, the schedules of the Basin Plan Implementation Agreement and the reporting and assessment of the milestones set out in the National Partnership Agreement (NPA)
- the MDBA's role in ensuring compliance with the Plan.

Open and transparent decision making by Governments also aids accountability.

As discussed in detail in chapters 10, 12 and 13, these accountability mechanisms have not been used to full effect, including:

- key shortcomings in the design of the milestones in the NPA and in the process to assess progress against these (chapter 13)
- the MDBA's approach to resolving compliance issues with Basin States on Basin Plan water trading rules has not been effective or timely (chapters 10 and 12).

Many stakeholders raised concerns about a lack of transparency in the decision making of key institutions.¹⁸⁷ Participants stated that publicly available information has been inadequate regarding the:

- business cases for supply measure projects notified by Basin Governments under the SDL adjustment mechanism (chapter 4)
- likely costs, benefits and impacts of supply measure projects on environmental outcomes (chapter 4)
- value for money of strategic water purchases, and whether these align with the needs of the environment (chapter 3).

This lack of transparency has resulted in stakeholders seeking information through other means, including Freedom of Information requests and orders for the production of documents in the Australian Parliament. The absence of transparency has engendered an environment of low confidence and trust in Governments.

Shortcomings in accountability mechanisms have also manifested in the additional commitments that the Australian Government had to make to secure the passage of amendments to the Plan through the Parliament (following the initial rejection of the Northern Basin Review amendment). The establishment of a Northern Basin Commissioner

¹⁸⁷ Colloff, Williams and Grafton (sub. 12), Goulburn Valley Environment Group Inc. (sub. 13), Beer (sub. 9), Leeton Shire Council (sub. 17), Murray Darling Association Inc. (sub. 52), Murray Valley Private Diverters Inc. (sub. 69), National Parks Association of NSW (sub. 76), Harvey (sub. 51), Warren Shire Council (sub. 22), Wentworth Group of Concerned Scientists (sub. 42), Moles (sub. 67), Australian Food and Agriculture Company Ltd (sub. DR92), Fonterra Australia and Bonlac Supply Company (sub. DR121).

to monitor and advise on the implementation of the Toolkit measures and compliance reforms in the northern Basin have sought to add an additional layer of accountability. The Australian Government has indicated that it will fund these commitments from existing resources by diverting funding from other implementation activities.

The resources and capability of the MDBA

The Australian Government committed long-term funding for its water functions in the 2016–17 Mid-Year Economic and Fiscal Outlook, providing a secure funding stream for the MDBA’s Basin Plan functions (MDBA 2017e, p. 74). The adequacy of these funding arrangements has not been questioned by participants in this inquiry.

The MDBA has a broad, longer-term Strategic Workforce Plan 2016–26 which identifies key workforce requirements and sets out its approach to proactively managing risks associated with workforce capacity, capability and flexibility. It has conducted specific assessments to inform capability and resourcing decisions. And the MDBA has responded when shortcomings in capability have been identified (such as those arising from compliance reviews, chapter 12). The MDBA’s resource allocation decisions will need to adjust as the relative importance of its functions change over time (for example when the WRP accreditation process is completed or the forthcoming 2020 evaluation).

Some participants in the inquiry expressed a lack of confidence in the capabilities of the MDBA to execute its functions. In particular, participants questioned the quality of the MDBA’s technical analysis conducted to inform decision making.¹⁸⁸

The MDBA commissions peer reviews of its technical and scientific work when the work is used to support significant decisions (MDBA, pers. comm., 13 July 2018). It has updated the role of the Advisory Committee on Social, Economic and Environmental Sciences to help ‘ensure the Basin Plan is confidently implemented with the support of robust methodology, science and knowledge’ (MDBA 2018g).

Peer review processes are an important check to provide confidence to decision makers and to the community that the technical and scientific analyses used to support decision making are sound.

Stakeholder engagement has not been successful

Despite acknowledging the importance of working together to effectively engage local communities, Basin Governments have not always demonstrated this in practice. The way stakeholders were consulted in the development of supply measures (which lacked detailed information and was perceived by stakeholders as tokenistic) is a key example of the lack of

¹⁸⁸ Colloff, Williams and Grafton (sub. 12), Murray River Council NSW (sub. 50), Moles (sub. 67), Murray Valley Private Diverters Inc. (sub. 69).

a coordinated and meaningful approach to engaging with stakeholders on major decisions that they are concerned about.

For the most part, participants to this inquiry expressed dissatisfaction with the community engagement processes of government agencies.¹⁸⁹ A common concern was that stakeholder engagement involved one-way communication (from governments to communities), where government officials ‘come out to tell the community what has already been decided’ (Goulburn Murray Irrigation District (GMID) Water Leadership, sub. 62, p. 19).

Many stakeholders do not perceive that Basin Governments have taken the necessary time to listen to and understand their concerns, to conduct the evidenced-based analysis required to understand potential impacts and to explore options for managing these. They are also concerned that governments have been unwilling to listen and respond to community views, and they have not considered these views in decision making, or clearly communicated the reasons for their decisions.

This has led to distrust, a lack of confidence and growing scepticism on the ability and commitment of Basin Governments to successfully implement and achieve the outcomes of the Basin Plan. Much of the community dissatisfaction is driven by the way Governments have sought to negotiate and navigate their way through issues.

There are significant challenges ahead

Basin Governments are transitioning to a complex phase of implementation and the task ahead is challenging. To finalise the task of achieving the adjusted SDLs, Governments need to:

- ensure that supply measures (including constraints easing) deliver the expected equivalent environmental outcomes and offer taxpayers value for money (chapter 4)
- recover water through efficiency measures in a way that delivers the enhanced environmental outcomes set out in Schedule 5 of the Plan (chapter 5)
- implement the Northern Basin Toolkit to support effective management of environmental water in the northern Basin (chapter 4)
- finalise WRPs, which in some cases will take more time to resolve complex changes to state water resource planning instruments (chapter 6)
- implement pre-requisite policy measures to support the efficient use of environmental water in the southern Basin (chapter 11)
- address shortcomings in the framework for monitoring and evaluating the impacts of the Plan (chapter 13).

¹⁸⁹ Beer (sub. 9), Goulburn Valley Environment Group Inc. (sub. 13), Country Mayors Association of New South Wales (sub. 7), NSW Farmers’ Association (sub. 60), Goulburn Murray Irrigation District (GMID) Water Leadership (sub. 62), Lower Edward River Pumpers and Landholders (sub. 63), New South Wales Irrigators’ Council (sub. 80), Australian Food and Agriculture Company Ltd (sub. DR92), Fonterra Australia and Bonlac Supply Company (sub. DR121).

The roles of both Basin Governments and the MDBA will be crucial for successful implementation of the Plan. Both the MDBA's roles as the agent of governments and as an independent regulator of the Plan will become increasingly important in the next stage of implementation. The conflict between these two roles will intensify when:

- its role in ensuring compliance with the Plan comes into full effect when WRPs are accredited (chapter 12)
- it conducts the first required evaluation of the impacts of the Plan in 2020 (chapter 13)
- Basin Governments need its technical capability and river operations skills to implement supply measures (including constraints easing) and to effectively integrate these into the operations of shared resources (chapter 4).

Structural conflicts are likely to be exacerbated by the very different operational culture and approach that will be required to perform each of these roles effectively.

As the agent of Basin Governments, the MDBA provides services, advice and capability. More than that, it actively facilitates coordination and collaboration, and helps to drive the consensus decision-making process of Governments. The MDBA delivers the century-old role of custodian of the River Murray, actively supporting Basin Governments with their responsibilities as stewards of water resources. Having to regulate and 'stand in judgment' of Governments undermines the MDBA's credibility as a collaborative leader, and its ability to work closely and openly as a trusted adviser to Basin Governments.

However, the MDBA's position as a trusted adviser to Basin Governments compromises its ability to be a firm and impartial regulator, calling out Basin Governments when they are non-compliant with the Plan. The MDBA lacks true independence to report on progress and evaluate the impacts and outcomes of the Plan. While the MDBA remains a party to implementation, there is a risk that its reports on progress and evaluations will not be viewed credibly by stakeholders, or the public more broadly.

The intensifying conflict is best illustrated by the MDBA's roles in the implementation of supply measures. Basin Governments will need the proactive technical support of the MDBA to further develop and implement key projects (such as Hydro-cues, constraints easing, Menindee Lakes and River Murray rules changes), and incorporate these into the operations of shared resources. However, as the MDBA is also the regulator of the Basin Plan, it will be responsible for assessing (against environmental equivalence) the success or otherwise of supply measures when SDL adjustments are reconciled in 2024.

Similarly, conflicts are evident in the area of water trading rules. In its role as a proactive resource manager, the MDBA will need to support Basin Governments to monitor and make timely responses to risks associated with changes in trade patterns and water use, the resulting pressures on delivery capacity and effects on the environment and third parties (chapter 10). On the other hand, the MDBA in its role as regulator must transparently review and assess the compliance of existing and new restrictions on trade.

The MDBA has already taken steps to separate some conflicting functions in its structure by establishing an Office of Compliance (chapter 12) and delegating responsibilities to the Chief Executive under the MDB Agreement. The Commission considers that these internal controls are insufficient to resolve the inherent conflict that undermines the ability of the MDBA to perform these functions effectively and credibly. Governments have put the MDBA in an impossible position. In its current form, it is extremely difficult for the MDBA to be a trusted adviser to Basin Governments and a credible regulator. For these two roles to be performed well, quite distinct cultures and institutional incentives are required.

Basin Governments should address the shortcomings identified in the institutional and governance arrangements to enable them to manage the significant risks to successful implementation. This is essential to building community confidence that the sizable investment made in the Basin Plan has led to meaningful change in the way water resources in the Basin are managed.

The National Water Commission (2013, p. 28), in its first review of implementation of the Basin Plan, warned that the institutional and governance arrangements:

... run the risk of being complex and therefore not well understood by implementing parties or communities. Lack of clarity about who is responsible for what and by when would impede effective implementation.

The risks associated with the lack of clarity of roles foreshadowed by the National Water Commission have been realised.

FINDING 14.1

There are major shortcomings in the current institutional and governance arrangements.

- Responsibility for leading the implementation of the Basin Plan is not clear and there has been a lack of strategic leadership. There is uncertainty about who should respond to issues as they arise.
- The Murray-Darling Basin Authority has conflicting roles. Its ability to effectively perform its collaborative service delivery functions (as the agent of governments) and be an independent and credible regulator that ensures compliance with the Plan is compromised by these conflicts.

These key deficiencies in institutional and governance arrangements have led to:

- a lack of transparency and accountability
- ineffective processes for intergovernmental collaboration
- stakeholders who are confused and frustrated by the efforts made to engage them due to a perceived lack of responsiveness
- key risks not being strategically managed and timelines slipping
- implementation being managed through last-minute negotiations as a crisis emerges or a deadline looms.

The shortcomings in institutional and governance arrangements pose a significant risk to the next phase of implementation of the Basin Plan.

14.3 Reform of institutional and governance arrangements is required

Since the Basin Plan was made in 2012, the attention of Basin Governments has been on negotiating and reaching agreement on the detailed settings of the Plan. The interests of their individual constituencies have been their central focus in finalising these negotiations, and their role as stewards of the Basin's water resources has often been relegated to a distant second place. With the settings now largely settled, Basin Governments should commit to implementing the agreed Plan.

A complex task lies ahead for Basin Governments in the next phase of implementation. To navigate this successfully, Basin Governments will need to prioritise their joint stewardship role and collaborate effectively.

A fundamental foundation of collaboration is commitment to, and accepting responsibility for, implementation and being held accountable. Commitment and accountability must manifest themselves through the actions of Basin Governments. Reform is required to improve cooperative working arrangements, so that collaborative efforts are coordinated and significant risks are managed effectively. Reform is required to:

-
- ensure Basin Governments can effectively work together and be jointly held accountable for implementation of the Plan
 - enable the dual roles of the MDBA to be effectively fulfilled, as both its independent regulator role and its agent of governments role will be increasingly important in the next five years.

Basin Governments should lead and be accountable for implementing the Basin Plan

The Basin Plan is (and must be) a joint responsibility of Basin Governments. For the outcomes of the Basin Plan to be achieved and sustained, the Plan must be integrated into State water resource management frameworks and in the joint arrangements for shared water resources.

For many elements of the Plan, this integration occurs when WRPs are accredited. For others, there are significant risks to successful implementation, particularly with the delivery of supply measures and constraints easing projects. In managing this program of projects Basin Governments will need to make joint decisions to ensure consistent approaches (including those for engaging stakeholders) and for logical sequencing. To navigate the next five years of implementation successfully, Basin Governments will need to work together.

Basin Governments, through the MDB Ministerial Council, should provide strategic leadership, take joint responsibility and be accountable for implementing the Plan. As the key forum for intergovernmental co-operation, BOC should take a central role, with delegated responsibility to drive intergovernmental collaboration and to manage risk strategically and effectively.

RECOMMENDATION 14.1

Basin Governments should demonstrate strategic leadership, take joint responsibility and direct the implementation of the Basin Plan.

The Murray-Darling Basin (MDB) Ministerial Council should collaborate to provide the strategic leadership and policy direction required to implement the Plan, and be ultimately accountable for implementation.

In 2019, the MDB Ministerial Council should commence reforms to the institutional and governance arrangements for implementing the Basin Plan by:

- enhancing the role of and delegating accountability for implementation to the Basin Officials Committee (BOC). BOC should be responsible for managing the significant risks to successful implementation and ensuring effective intergovernmental collaboration
- ensuring that formal directions to BOC regarding implementation are publicly available
- ensuring that arrangements to assess progress, evaluate outcomes, and ensure compliance with the Plan are fully independent
- recognising that the Murray-Darling Basin Authority's agent of government role will continue to be key to driving collaboration between and providing technical support to Basin Governments as they implement the Plan
- ensuring that Basin Governments are individually and collectively resourced to perform their roles to implement the Plan.

Structural reform is required to address the MDBA's conflicting roles

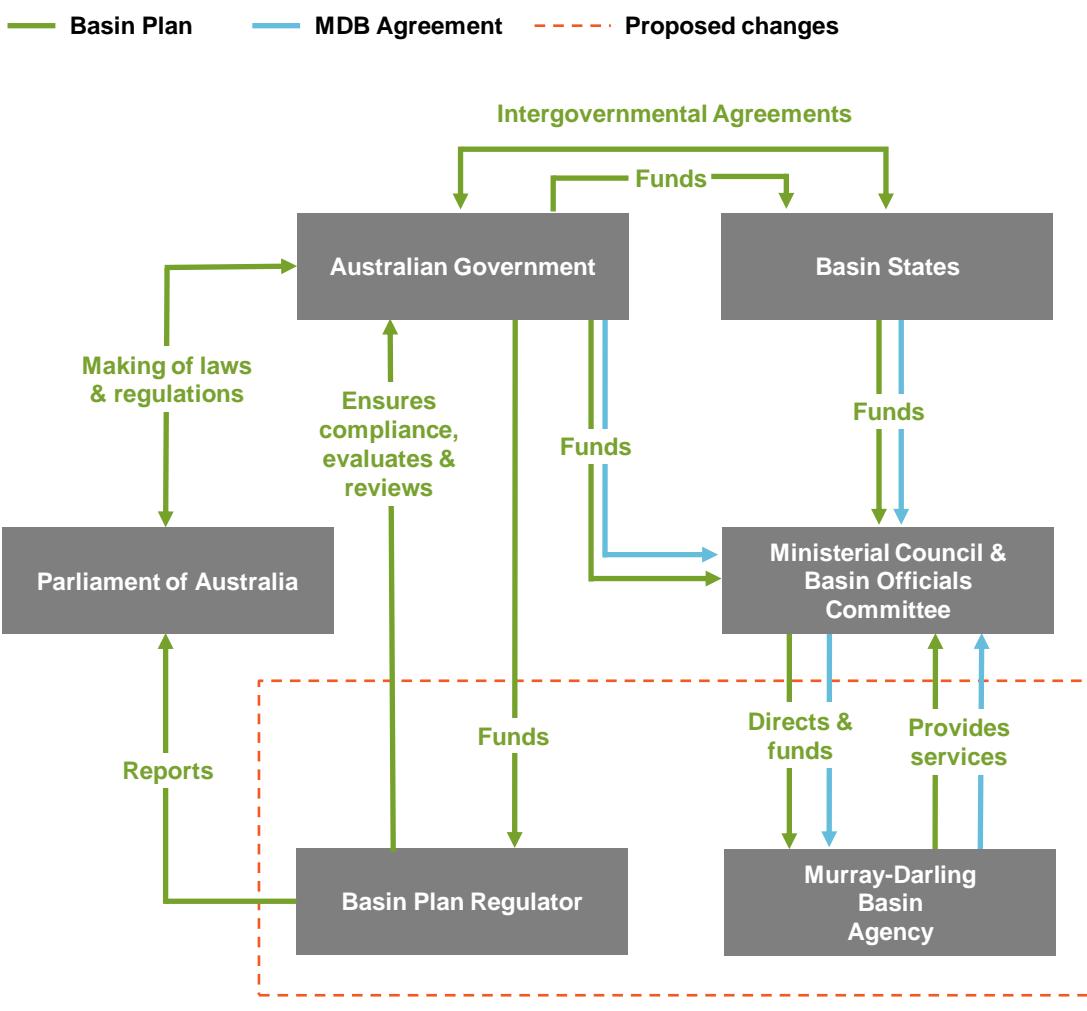
Structural reform to the MDBA is required to address the significant conflicts in its future suite of roles. Complete structural separation is required to assign its agent of governments functions and its regulatory functions to separate entities. This aligns with the principle of role clarity and with recommended practices for managing conflicting functions (box 14.1). Structural separation would involve assigning the MDBA's roles to two separate entities:

- the Basin Plan Regulator — with compliance and evaluation responsibilities
- the Murray-Darling Basin Agency — the agent of governments providing MDB Agreement services and supporting Basin Governments to implement the Plan.

The Agency could be a Corporate Commonwealth Entity (like the MDBA currently is), whereas the Regulator could be a non-corporate Commonwealth entity (as with other Australian Government regulators, such as the Australian Competition and Consumer Commission).

Structural separation would enable the roles to support Basin Plan implementation and deliver services under the MDB Agreement to be clearly delivered as the agent directed and funded by Basin Governments. Regulatory and evaluation functions would be delivered by an independent regulator that operates objectively and at arms-length from those responsible for implementation (figure 14.2). Many inquiry participants expressed support for institutionally separating the MDBA's service delivery and regulatory roles.¹⁹⁰

Figure 14.2 Proposed institutional arrangements



¹⁹⁰ Environment Victoria (sub. DR117), Healthy Rivers Dubbo (sub. DR104), Jensen (sub. DR95), MacMillan (sub. DR134), Meridian Energy Australia Pty Ltd (sub. DR106), Murray Darling Association Inc. (sub. DR93), Murray Irrigation (sub. DR143), Narwie Partners (sub. DR130), National Farmers' Federation (sub. DR129), National Irrigators Council (sub. DR91), Newman (sub. DR115), New South Wales Irrigators' Council (sub. DR128), Ricegrowers' Association of Australia (sub. DR141), Southern Riverina Irrigators (sub. DR132), Victorian Farmers' Federation (sub. DR127).

In their submissions to this inquiry, both the Australian Department of Agriculture and Water Resources (DAWR) and the MDBA stated that they did not support institutional separation of the MDBA's roles.

The Department does not agree that the claimed benefits of two new institutions in place of the MDBA is warranted, and nor does it agree that such an arrangement would deliver better and more cost-effective and efficient public administration. (DAWR, sub. DR103, p. 18)

The Authority ... does not support structural change to the agency. This is a blunt and premature solution, which has the potential to undermine the successful implementation of the Basin Plan. (MDBA, sub. DR136, p. 4)

DAWR, the MDBA and the New South Wales Government raised concerns that institutional reform would be a distraction at a time when Basin Governments need to get on with the job of implementing the Plan.¹⁹¹

However, the Commission considers that a busy work program is insufficient reason to delay necessary reforms. Further, where there is agreement, the process of institutional reform need not be protracted or excessively disruptive. In 2008, the current institutional arrangements were negotiated, agreed and implemented within a year (box 14.2).

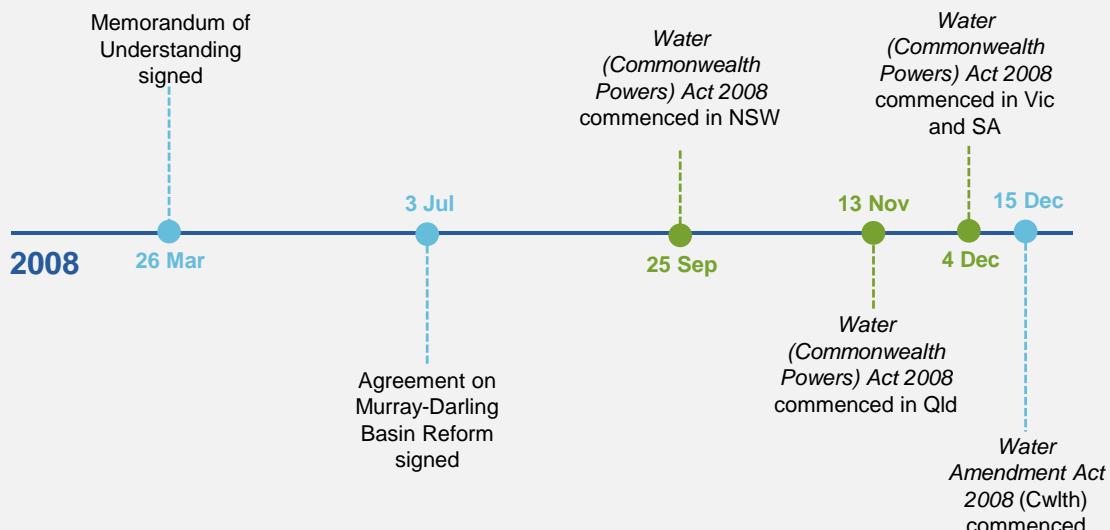
Further, DAWR submitted that the *Review of the Murray-Darling Basin Joint Governance Arrangements* (the Claydon review), due to report in the first quarter of 2019, would be the appropriate avenue for considering current governance arrangements (sub. DR103). Yet, the Claydon review's terms of reference explicitly exclude the MDBA's agency structure from the scope of the review (Australian Department of Agriculture and Water Resources, sub. DR103).

The MDBA's roles as the agent of governments and as an independent regulator of the Plan are both critically important in the next stage of implementation. Failing to proceed with (or postponing) structural separation carries serious short-term risks for the credibility of governments with the community, and in the longer term, the success of the Basin Plan.

In its current form, the MDBA cannot be seen as a trusted and frank adviser to States (a role that involves providing collaborative leadership, advice and technical capability to the Basin States) and a credible regulator (where independence is critical to restoring public confidence in the Plan). However, this is not simply a matter of perceptions. How the MDBA performs its roles will influence its relationships with Basin States and ultimately the management of water resources across the Basin.

¹⁹¹ Australian Department of Agriculture and Water Resources (sub. DR103), Murray–Darling Basin Authority (sub. DR136), NSW Government (sub. DR123).

Box 14.2 Timeline of the 2008 institutional reforms



As the above figure shows, the 2008 reforms to MDB institutional arrangements were completed within a year. After a change of government in November 2007, the following events secured institutional change during 2008.

- On 26 March, Basin Governments signed a Memorandum of Understanding agreeing to bring together the former MDBA and the then Murray-Darling Basin Commission into a single institution (the current MDBA) (COAG 2008b).
- On 3 July, as foreshadowed by the Memorandum of Understanding, Basin Governments signed the Agreement on Murray-Darling Basin Reform, which set out the institutional structure and governance arrangements for the Basin Plan (COAG 2008a). The Agreement described the transition to the new MDBA:

The parties note the work underway by officials to manage the process for bringing the Authority and the Murray-Darling Basin Commission together as the new Authority. This work comprises transferring all Commission staff to the Authority; reviewing assets and liabilities of the Commission; identifying existing program commitments of the Murray-Darling Basin Ministerial Council; and ensuring business continuity on all operational matters. (COAG 2008a, p. 13)
- To enable the necessary legislative changes, Basin States agreed to a limited referral of constitutional powers to the Commonwealth (COAG 2008a). Each Basin State enacted a *Water (Commonwealth Powers) Act 2008* (Senate Legal and Constitutional Affairs References Committee 2011). These Acts commenced:
 - in New South Wales on 25 September
 - in Queensland on 13 November
 - in Victoria and South Australia on 4 December (Australian Government Solicitor 2008).
- The Commonwealth then passed the *Water Amendment Act 2008* to give effect to the institutional amalgamation (as well as other matters). This Act received royal assent on 8 December and commenced 15 December (Australian Government Solicitor 2008).

In the absence of structural reform, in 2024 the MDBA will be responsible for deciding to reconcile the effectiveness of supply measures in achieving equivalent environmental outcomes. It will do this having had a key hand in advising on the implementation, and ultimately, the success or otherwise of these projects. Given the level of community dissatisfaction about supply measures (chapter 4), maintaining the status quo risks the effectiveness of these projects and ongoing scepticism about whether implementing them will be worth it.

The conflict in the MDBA's roles is not just a short-term issue during the implementation of supply measures. As regulator of the Basin Plan, the MDBA will make judgements on whether Basin Governments and river operators manage water resources in a way that is consistent with WRPs.¹⁹² Given the MDBA's role advising governments on water resource management and the water market, and as operator of the River Murray, over the longer term it will be a judge of its own performance in this regard.

If Basin Governments do not commit to and progress structural reform, the credibility of the MDBA (as both regulator and agent of governments) will be extremely compromised, and the likelihood of successful implementation significantly diminished. The institutional incentives created through structural separation outweigh the administrative costs associated with transition.

Structural separation should begin as soon as possible, and should be completed by 2021.

RECOMMENDATION 14.2

Basin Governments should agree to the restructure of the Murray-Darling Basin Authority to separate its service delivery and regulatory functions into two institutions.

The Australian Government should then embark on the necessary institutional reforms to establish the:

- Murray-Darling Basin Agency — as the agent of Basin Governments
- Basin Plan Regulator — an independent Commonwealth Statutory Authority.

These institutional reforms should be in place by 2021.

Responsibilities and functions of the new institutions

Structural separation would involve assigning the MDBA's current roles to one of two new institutions — either the Murray-Darling Basin Agency (the Agency) or the Basin Plan Regulator (the Regulator) (table 14.2).

¹⁹² Water Act, s. 59.

Table 14.2 Proposed roles and functions of the Agency and the Regulator

<i>Role/functions</i>	<i>Murray-Darling Basin Agency</i>	<i>Basin Plan Regulator</i>
River operations	<ul style="list-style-type: none"> • Asset management – including salinity interception schemes • River Murray operations • Resource management 	
Natural resource Management	<ul style="list-style-type: none"> • Joint natural resource management programs 	
Implementation of SDL adjustment measures	<ul style="list-style-type: none"> • Develop and implement key supply measure projects • Provide coordination and technical support for joint projects (e.g. multi-state projects, River Murray rules, Menindee) • Provide hydrological modelling to inform for efficiency measures 	<ul style="list-style-type: none"> • SDL adjustment mechanism reconciliation
Water trading	<ul style="list-style-type: none"> • MDB Agreement functions related to inter-valley and interstate trading rules • Advise Basin Governments on deliverability issues and trade restrictions 	<ul style="list-style-type: none"> • Ensuring compliance with the water trading rules
Environmental flow planning and management	<ul style="list-style-type: none"> • Coordinating environmental water planning and management • Prepare Basin-wide Environmental Watering Strategy 	<ul style="list-style-type: none"> • Ensuring alignment of environmental water planning and management with the requirements of the Basin Plan
Water Resource Plans (WRPs)		<ul style="list-style-type: none"> • Ensuring compliance with WRPs • Recommending the accreditation of changes to WRPs
Water requirements for cultural water uses	<ul style="list-style-type: none"> • Improving knowledge of water requirements for cultural water uses 	<ul style="list-style-type: none"> • Assessing Basin States' processes for identifying indigenous water values and uses when accrediting WRPs
Critical Human Water Needs (CHWN)	<ul style="list-style-type: none"> • Managing River Murray CHWN sharing arrangements 	<ul style="list-style-type: none"> • Ensuring compliance with CHWN provisions in WRPs and the Plan
Water quality	<ul style="list-style-type: none"> • Implementing Basin salinity management strategies 	<ul style="list-style-type: none"> • Ensuring compliance with water quality provisions in WRPs
Ensuring compliance with the Plan		<ul style="list-style-type: none"> • Overall compliance with the Plan • Assurance of State water take compliance arrangements • Ensuring compliance with SDLs
Monitoring and reporting, monitoring and evaluation	<ul style="list-style-type: none"> • Coordinating the collection and collation of monitoring and reporting information (strategy) 	<ul style="list-style-type: none"> • Approving the evaluation framework • Undertaking scheduled evaluations of the impacts of the Plan in 2020 and 2025 • Conducting the 2026 review of the Plan

The Agency — a focus on driving intergovernmental collaboration and strategic service delivery

The Agency's central focus will be supporting and enabling Basin Governments to implement the Basin Plan and manage shared water resources and joint programs. It would do this by providing collaborative leadership, advice and technical capability. The Agency would provide Basin Governments with the capability and coordination necessary to successfully implement supply and constraints easing projects. It would also provide strategic advice and guidance to inform the resource management decisions of policy makers (such as those related to deliverability or the provision of critical human needs), which are fundamental to achieving the outcomes of the Basin Plan. Freed of responsibility for standing in judgment of Basin Governments, the Agency will be able to act as a trusted adviser to Basin Governments as they strategically manage water resources and implement the Plan.

Under the proposed institutional reforms, the Agency would take over the MDBA's current service delivery responsibilities, including those associated with shared resource management and joint programs (under the MDB Agreement) and those related to working in partnership with Basin States to implement the Basin Plan. The Agency would be governed, directed and funded (with cost shares negotiated and agreed) by Basin Governments.

A key role of the Agency will be joint water resource management in the shared resources of the River Murray, in accordance with the MDB Agreement (box 14.3). Participants to this inquiry have expressed heightened concern about significant resource management issues including:

- poor water quality (chapter 8) and the supply of critical human needs (chapter 9) in the Lower Darling
- the ability of resource managers to deliver authorised water orders in the River Murray (chapter 10).

Proactive resource managers actively seek to identify and understand emerging risks, and develop options to address them to help inform policy making. Many risks such as seasonal conditions, longer-term changes to the nature of inflows or the pattern of trade are beyond the immediate control of a resource manager. However, resource managers can understand how these risks affect their ability to achieve the desired objectives and outcomes within the agreed rules and operational procedures, and when these rules and procedures may need to be changed.

Box 14.3 Management of shared water resources

The effective management of the River Murray system and its assets is a fundamental role of the MDBA. As set out in the Murray-Darling Basin Agreement 2008, the associated Service Level Agreement (Australian Government and MDBA 2014) and the Objectives and Outcomes for River Operations in the River Murray System (MDBA 2018z), the MDBA is responsible for administering river operations and natural resource management operations on behalf of Basin Governments. This role includes (among other aspects):

- developing and implementing strategies for asset management, including managing, maintaining, repairing, renewing and replacing the diverse set of jointly managed river assets
- maintaining a risk management framework, with a structured approach to identifying, assessing, analysing and treating risks to the successful delivery of joint activities
- communicating with all stakeholders about its river operations by providing appropriate, timely and accurate information.

The Objectives and Outcomes for River Operations is authorised by the Basin Officials Committee (BOC) and is the key document that guides the day to day operational procedures of the MDBA for the River Murray. It sets high level objectives for the River Murray, and specific objectives for reaches and storages and how these objectives should be interpreted in operational rules. The MDBA is expected to:

- operate the River Murray System efficiently and effectively to deliver State water entitlements
- maximise the water available to the southern Basin States, after providing for operating commitments in the River Murray System
- ensure that River Murray Operations assets allow the MDBA to manage and deliver water that is fit for the purpose for which it is to be used, efficiently, effectively and safely
- contribute to the safety of communities along the River Murray
- contribute to, and have regard for the economic, social, environmental and cultural activities and values of people using the River Murray System
- ensure the provision of water to meet critical human water needs
- contribute to the protection and, where possible, restoration of priority environmental assets and ecosystem functions within the River Murray System
- use the best available data, tools and systems; keep all stakeholders well informed; act transparently; and be accountable for its actions in accordance with the Murray-Darling Basin Agreement (MDBA 2018z, pp. 4–6).

These objectives and outcomes are developed and implemented in consultation with Basin States through the Water Liaison Working Group and the River Murray Operations Committee. The Independent River Operations Review Group reviews the MDBA's compliance with the agreed rules (MDBA 2018z).

A key benefit arising from institutional separation will be the ability of the Agency to focus and give priority to strategic resource management, such as the risks arising from water trade and changing patterns of water use. This is more than just providing Basin Governments with river operations services. Also required is a focus on providing strategic advice and guidance to policy makers as to how resource management needs to adapt and evolve to manage risks and enable the outcomes of the Basin Plan to be achieved.

The Regulator — a focus on compliance, evaluation and review

In turn, the Regulator would undertake the MDBA's current responsibilities in the areas of compliance, evaluation and the review of the Plan in 2026. The Regulator would take a strong stance as an impartial judge of the Basin Governments' implementation of the Basin Plan, and of the Basin Plan itself.

To achieve the outcomes of the Plan, changes are required in the way that Basin States manage water resources. The creation of a truly independent regulator will hold Basin Governments to account — by ensuring they comply with the Plan. The Regulator's independence would enable it to fairly and fearlessly make judgments about whether States are compliant with the Plan, and to 'call out' non-compliance.

Equally, by not being involved in the implementation of the Plan, the Regulator can evaluate the outcomes and effectiveness of the Plan (including the 2020 and 2025 evaluations and the 2026 review) at genuine arms-length in a way that is credible to stakeholders. This will be critical for helping to rebuild public trust and confidence in the Plan and its institutions.

The Regulator's role in undertaking the 2026 review, in particular, will be crucial. A substantial amount of preparation will need to occur in the next five years to lay the groundwork for this review to be conducted thoroughly (box 14.4). It is not a task that can be reasonably (or effectively) completed in 12 months.

Yet, there is little evidence that, to date, any of this preparatory work has commenced (chapter 13). Under current arrangements, there is a significant risk that necessary planning and preparation is postponed as the MDBA focuses on more pressing issues (such as the implementation of supply measures). This increases the likelihood that the 2026 review will be rushed, and that it will not be based on the most comprehensive and accurate information available, as a lead time is required to collect this information. In turn, this creates a risk that the review will squander the opportunity for Basin Governments to learn from the lessons of the Basin Plan implementation between 2012 and 2026.

Establishing the Regulator as a separate, independent body will help to provide the impetus for a strategic approach to the review. Freed of the responsibilities associated with working in partnership with Basin Governments to implement the Plan, and with a central focus on evaluation and compliance, the Regulator will be better placed to plan for a successful and informative review (recommendation 13.4).

That said, Basin Governments (and the Agency as the agent of these Governments) will be central contributors to the review of the Plan. Given their responsibility for water resource management (and natural resource management more broadly), Governments will be best placed to understand and provide advice on:

- what works (and why), including the lessons of environmental water holders
- emerging risks to the Basin (such as those arising from climate change)
- how the Plan can be improved to more effectively achieve its outcomes

-
- whether the objectives for the Plan remain aligned with the policy objectives of Governments, or if they need to be adjusted
 - whether the core settings of the Plan (such as SDLs) are sufficient to achieve the intended objectives.

As Governments and the Agency will have a central role in the 2026 review, it will be important for the independent Regulator to set a robust framework with clear expectations for the input of Basin Governments to the review process. The oversight of the review by the Regulator would provide the opportunity to bring strategy and discipline to the 2026 review process. It would also provide the Commonwealth Parliament and stakeholders with the independent assurance that any proposed revisions of the Plan are sound, based on best available evidence, and are consistent with the requirements set out in the Water Act.

Box 14.4 The 2026 review

The 2026 review of the Plan is a cornerstone of the Basin Plan's evaluation program. In contrast to the evaluations of the Plan scheduled for 2020 and 2025, the 2026 review is intended to go beyond the Plan's existing settings and assess whether (and how) these arrangements should be changed. Undertaking this review rigorously and effectively will be crucial for ensuring that lessons learnt from the 14 years of the Plan are used to inform the post-2026 approach to water management in the Basin.

The findings from the interim 2017 evaluation, the 2020 and 2025 evaluations, and information from annual progress reports will likely offer useful information for the 2026 review. However, on some issues, new information will need to be generated (for example, in relation to the impacts of climate change) (chapter 13). More broadly, as neither the Water Act nor the Basin Plan provide explicit guidance on the review's objectives and scope, the Murray-Darling Basin Authority will be responsible for determining these matters.

Yet, there is little evidence that the Murray-Darling Basin Authority and Basin Governments have started the necessary planning for the 2026 review (chapter 13). Although the review itself is some years away, a substantial amount of preparatory work will need to be done in the intervening period, including defining the scope of the review, establishing processes and resourcing, and defining and addressing knowledge gaps.

14.4 Transition to the new institutional arrangements

An interim organisational structure for the MDBA

Formal institutional changes will be needed to bring about full structural separation of the MDBA. This will involve legislative change in the Commonwealth and Basin State parliaments. Given this, the agreement of all Basin Governments is essential to progressing reforms.

The MDBA's main compliance role commences in mid-2019 (chapter 12) and the first scheduled evaluation of the impacts of the Plan is to occur in 2020 (chapter 13). While it would be ideal to have these functions commence in the context of a separate Basin Plan Regulator, the Commission acknowledges that institutional reform in this timeframe is not realistic.

As an interim measure that can be undertaken without legislative amendments, the MDBA should ensure its organisational structure aligns as far as possible with the recommended separation of functions. These changes would create incentives for the MDBA to pursue each of its functions more effectively and allow the different cultures required to do both roles well to be cultivated.

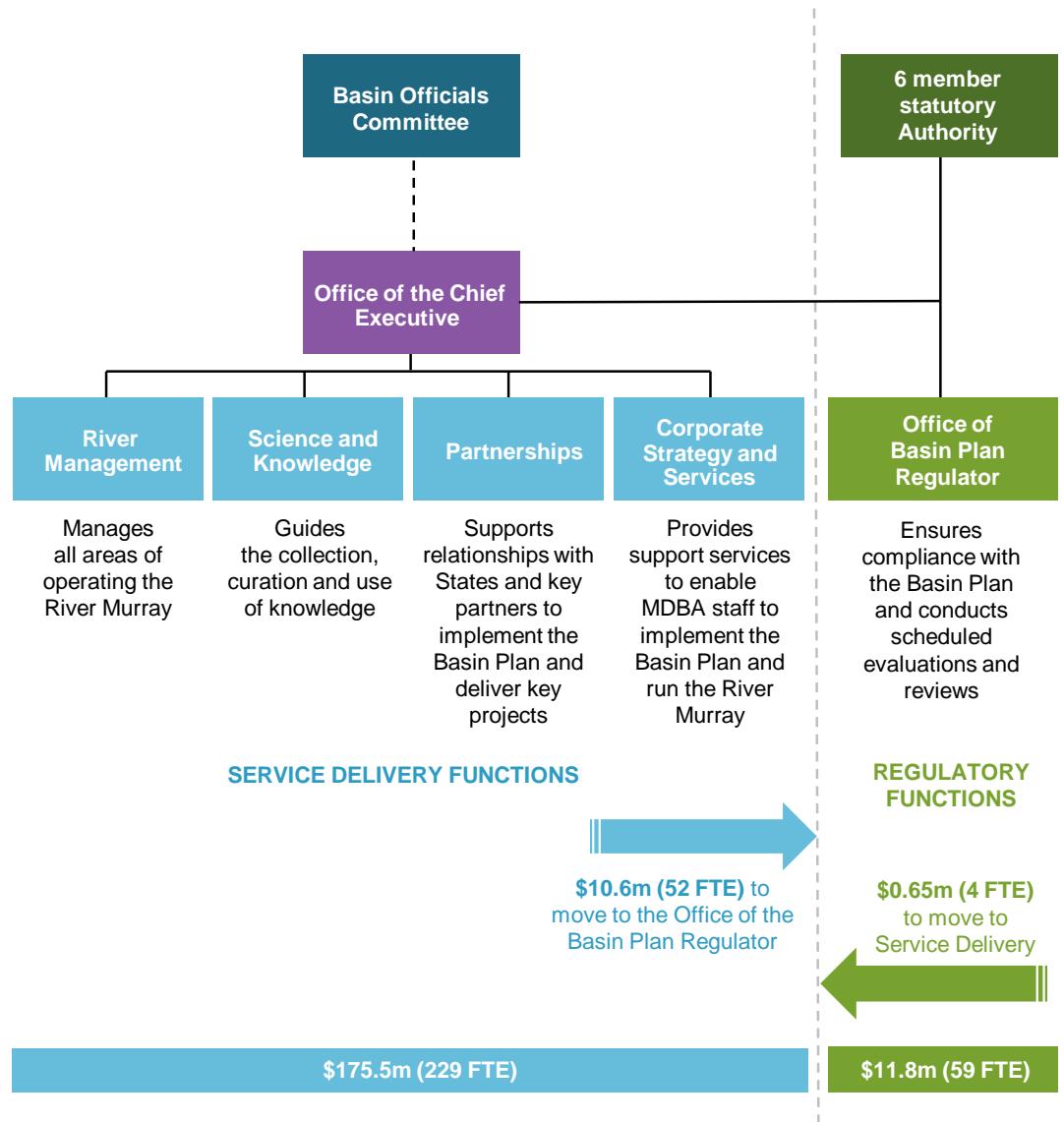
Interim arrangements should involve the consolidation of all compliance (recommendation 12.1) and evaluation functions into the Office of the Basin Plan Regulator. This should continue to be subject to the assurance process of an Independent Assurance Committee. The six appointed statutory Authority members would be responsible for making decisions relevant to these functions including recommending future amendments to the Plan, compliance and enforcement, and evaluation and review.

This interim arrangement would require an adjustment to the MDBA's organisational structure (figure 14.3) and the delegation of responsibility for the Basin Plan service delivery functions from the Authority to the Chief Executive. The MDBA Chair should rescind their role as an observer of BOC under the interim arrangements (an administrative decision).

The Office of the Basin Plan Regulator should identify areas where technical capability or administrative services are required from the service delivery divisions. For each of these areas, formal agreements should be established to provide confidence and transparency that these functions are conducted at arms-length ahead of structural separation.

The MDBA should complete these interim arrangements before July 2019, to ensure that it is ready for the commencement of its full suite of compliance responsibilities and to undertake the preparation required to deliver the 2020 evaluation of the impacts of the Plan.

Figure 14.3 Proposed interim MDBA organisational structure



Sources: Commission estimates using unpublished data supplied by the MDBA; MDBA (2018q).

Implementing these transitional arrangements should not be overly onerous. The proposed interim structure is very similar to the MDBA's current structure, with some minor changes in resource allocation. It is estimated that about 56 full-time equivalent (FTE) staff would need to change divisions, representing 19 per cent of the MDBA's total FTE in 2017-18 (table 14.3). The reallocation would affect an estimated \$11.2 million in funding, or 6.3 per cent of total annual funding.

Table 14.3 Estimated changes in resource allocation required to implement transitional arrangements
By MDBA division^a

Division	Total funding (\$'000)	Cwlth funding (\$'000)	Joint funding (\$'000)	Funding affected ^b (\$'000)	% of funding affected
Compliance ^c	1 896 (11 FTE)	1 248 (7 FTE)	648 (4 FTE)	648 (4 FTE) ^d	34.2
Corporate	6 304 (24 FTE)	5 671 (21 FTE)	633 (3 FTE)	0	0
Partnerships	16 136 (76 FTE)	15 136 (76 FTE)	1 000 (0 FTE)	5 290 (29 FTE) ^e	32.8
River Management	133 524 (76 FTE)	39 341 (16 FTE)	94 183 (60 FTE)	0	0
Science and Knowledge	19 551 (101 FTE)	16 074 (87 FTE)	3 478 (15 FTE)	5 293 (23 FTE) ^f	27.1
Total^g	177 411 (288 FTE)	77 469 (207 FTE)	99 942 (82 FTE)	11 231 (56 FTE)	6.3 (19% of FTE)

^a Analysis based on 2017-18 funding levels. ^b Resources that are expected to move out of the division (and into another division). ^c To become the Office of the Basin Plan Regulator. ^d Joint-funded resources to move out of Compliance and into River Management. ^e Commonwealth-funded resources (working on Water Resource Plans accreditation) to move out of Partnerships and into Compliance. ^f Commonwealth-funded resources (working on evaluation and review) to move out of Science and Knowledge and into Compliance. ^g Totals may differ slightly from column and row totals due to rounding. **FTE** Full-time equivalent staff.

Source: Commission estimates using unpublished data supplied by the MDBA.

These figures likely overstate the impact of the recommended interim changes. Although 29 FTE staff working on WRPs would need to move from the Partnerships division to the Office of the Basin Plan Regulator (table 14.3), more than half of these staff would need to be reallocated anyway once the WRP accreditation process is complete. The MDBA expects WRP staff numbers to peak at 37.8 FTE in 2019-20, before falling to 11.9 from 2020-21 to 2025-26¹⁹³.

The interim arrangement is a practical stepping stone to full structural separation. However, the interim arrangement does not solve the fundamental conflicts embedded in the current legislative settings, whereby the Chief Executive:

- remains accountable to Basin Governments for the delivery of the agent of governments role
- has statutory obligations as a member of the Authority overseeing compliance, evaluation and review functions.

193 As set out in the MDBA Strategic Workforce Plan 2016–26.

Only complete structural separation would create incentives for each institution to pursue its functions more effectively, as well as develop the culture most appropriate for the delivery of these roles.

RECOMMENDATION 14.3

As a transitional measure, and before the Murray-Darling Basin Authority's compliance role comes into full effect in July 2019, the Office of Compliance should be broadened to be the Office of the Basin Plan Regulator, and include compliance, evaluation and Plan review functions.

The role of the Basin Officials Committee should be enhanced to effectively oversee implementation and the Agency

The MDB Ministerial Council confers functions and powers under the MDB Agreement to the BOC. As such, BOC is a key governing entity for joint government activities. With Basin Governments committed to and accepting accountability for implementing the Plan, it is logical for them to direct BOC to take a more central role. The MDB Ministerial Council should assign BOC responsibility for leading the implementation of the Basin Plan and for ensuring that the risks to implementation are effectively managed.

Yet, BOC must be prepared and equipped to be an effective governing entity in order to do justice to this enhanced role. Several inquiry participants expressed concerns about the prospect of giving BOC greater responsibilities,¹⁹⁴ highlighting the need for a shift from the way in which BOC currently operates.

First, rather than being a collection of disparate agents, each chiefly concerned with its own jurisdictional interests, BOC's focus should be on the 'Basin as a whole' and its culture and approach should be that of joint stewards of the Basin. To enable BOC to maintain this focus, senior officials should convene in a separate forum at points of significant Commonwealth-State negotiations (such as the development of new funding agreements) to enable the parties to negotiate in good faith.

Second, rather than focusing on short-term crisis management, BOC should prioritise a long-term strategic approach that emphasises managing the implementation of the Basin Plan and associated risks over the full timeframe of the Plan.

¹⁹⁴ Environment Victoria (sub. DR117), Healthy Rivers Dubbo (sub. DR104), Inland Rivers Network (sub. DR105), National Irrigators' Council (sub. DR91), River Lakes and Coorong Action Group Inc. (sub. DR124).

Clarifying the responsibilities of BOC

The MDB Ministerial Council should adjust the role and focus of BOC to enable it to underpin their strategic leadership effectively. Specifically, the role of BOC should be to:

- provide advice to the MDB Ministerial Council on Basin policy matters
- direct the Agency in relation to MDB Agreement matters
- lead the implementation of the Basin Plan, including managing the significant risks to successful implementation
- direct the Agency in relation to matters where they require support, coordination or joint capability to implement the Plan.

Membership of BOC

BOC currently consists of a representative from each Basin State, with a Chair appointed by the Australian Government Minister¹⁹⁵. The Australian Government is not a neutral chair. Its roles in funding the development and delivery of SDL adjustment measures and in deploying the Commonwealth Environmental Water holdings highlight its active and ongoing role.

To encourage and support a shift in the focus of BOC, from operational to strategic and from individual interests to ‘Basin as a whole’, there is strong case for an independent Chair of this Committee. An independent Chair of BOC would be well placed to foster a culture of joint custodianship and a strategic approach to Basin-wide planning and service delivery.

The Murray-Darling Basin Agency (as an agent of Basin Governments) should have observer status within BOC given its role as the agent of governments. The Basin Plan Regulator should not have observer status.

A suggestion made by the MDRA (sub. 86) to include the CEWH as a member of BOC is inappropriate. Together with other environmental water holders in the Basin, the CEWH’s role in the implementation of the Basin Plan is to contribute to coordinated environmental water planning and management. It is an entitlement holder, not a policy maker and it is not responsible for the overall management of water resources. The CEWH supports BOC to deliver its responsibilities for implementing the Plan.

Ensuring capability for joint implementation

Each Basin Government has its own processes for ensuring it has the capability to deliver its individual resource management responsibilities. Collectively, Basin Governments have well-established arrangements for resourcing joint programs and shared responsibilities

¹⁹⁵ The Water Act (s. 201A) specifies that to be eligible for appointment as the Chair of BOC, an individual must be the Secretary of the Department or a senior executive employee of the Australian Government.

under the MDB Agreement. With a shift to collective responsibility, BOC should ensure that it has the shared capability and resourcing required for implementation.

Historically, the shared capability provided by the MDBA has focused on the River Murray and natural resource management programs. However, in the next phase of implementation, there are likely to be areas where enhancing current or developing new areas of joint capability is desirable. In some cases, the Agency may be best placed to house these new capabilities. Examples of this might be the development and delivery of major integrated works programs or in improving the understanding of risks (such as climate change) to Basin water resources.

Consistent with the current process set out in the Service Level Agreement for the MDBA's agent of government role, the new Agency's corporate plans should set out the activities it will deliver for Basin Governments. These corporate plans should include the agreed cost shares for activities and following consideration by BOC, be approved by the MDB Ministerial Council. Cost shares will need to be negotiated and agreed, and the current cost shares for other activities may not be appropriate for Basin Plan implementation activities.

Basin Governments should structure future intergovernmental funding arrangements for the next stages of implementation in a way that clearly recognises the role of the Agency as the agent of governments assisting them to implement the Plan. New agreements should not be a barrier to rapid reform, but rather enable the commencement of the proposed model ahead of full structural reform.

Reviewing the operational processes for collaboration

The structures and processes for operational collaboration for joint resource management and those for the implementation of the Basin Plan have become unwieldy. BOC should conduct a wholesale review of sub-committees and other arrangements to ensure that they:

- are clearly aligned to BOC's functions and the decisions that BOC is responsible for taking (noting that these functions will change should the Commission's recommendations be adopted by Governments)
- comprise membership of those parties with the skills, capability, and technical expertise required to inform these decisions and to implement them
- have clear terms of reference and work programs that are reviewed at regular intervals
- are accountable to BOC for delivering against these work programs.

RECOMMENDATION 14.4

By 2020, to enable it to carry out its enhanced role (recommendation 14.1) the Basin Officials Committee should:

- have an independent Chair, appointed by the Australian Minister for Water in consultation with the Murray-Darling Basin Ministerial Council
- comprehensively review the capability and the resourcing it requires to jointly implement the Plan
- agree on the capability and services Basin Governments require of the Murray-Darling Basin Agency to support them to implement the Plan and for shared water resource management
- establish new arrangements and processes to support ongoing intergovernmental collaboration.

Equipping the Basin Plan Regulator for effective performance

The Australian Government should be responsible for the Basin Plan Regulator

As a regulator of Commonwealth law, the Australian Government should have sole responsibility for the Basin Plan Regulator and ensure that it can perform this role effectively.

A multi-member decision-making model is proposed, to bring diverse perspectives to decision making and reduce the risk of undue influence.

Establishing the Basin Plan Regulator would involve the Australian Government reviewing the provisions of the Water Act to ensure that the:

- objects, functions and powers of the Regulator are clearly established to reflect its new role in ensuring compliance with the Plan and evaluating its impacts
- composition and skills mix of the statutory appointments align with its function as a regulator and evaluator of the Basin Plan.

Consistent with the Australian Government's approach to good corporate governance of other independent statutory authorities¹⁹⁶ the Australian Government Minister for Water, while respecting the independence of the Regulator, should:

- publicly issue an annual statement of expectations to the Regulator, which formally sets out how it should take into account the broader policy frameworks of Government, its relationship with the Government, and for transparency and accountability¹⁹⁷

¹⁹⁶ For example the Australian Taxation Office, the Australian Bureau of Statistics, Australian Energy Regulator, and the Australian Prudential Regulation Authority (Treasury 2018).

¹⁹⁷ This could include, for example, expectations about the 2026 review of the Plan.

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- require the Regulator to respond to this statement, by publicly issuing a statement of intent that sets out how it will respond to these expectations.

Adequate resourcing and appropriately skilled staff will be critical if the Regulator is to have the requisite capabilities and organisational culture to play a strong regulatory role and to evaluate the outcomes of the Plan effectively.

The Australian Government should fund the Regulator.

Ensuring the Regulator has sufficient technical capability

In the proposed separation of functions (table 14.3), the MDBA's core technical capabilities (including hydrological modelling) would go to the Agency, as these are essential for the day to day operations of shared water resources. A key risk is that the Regulator might not have the technical capabilities required to enable it to deliver its functions. Some inquiry participants expressed concern that structural separation could be problematic for the Regulator's ability to access suitably qualified and skilled regulatory staff.¹⁹⁸ The Regulator will be performing the role of a specialist regulator, requiring industry-specific expertise rather than generic regulatory skills (this is analogous to the specialist role of the Australian Energy Regulator).

This does not necessarily mean that the Regulator should duplicate all the technical capabilities of the Agency with ongoing, in-house staff. Flexible solutions could be more appropriate, especially when certain technical skills are only required intermittently. As is the case in other sectors, the Regulator can enact formal and transparent arrangements for the supply of technical capability from the Agency, Basin Governments, or other providers when it is required.

To provide confidence in these types of arrangements, and to manage risk, the Regulator should liaise with the Agency to develop a formal policy and specific arrangements that:

- articulate its requirements in terms of quality assurance, including peer review processes
- require the Agency to develop specific program plans which include an assessment of the capability in place to deliver these
- provide resources to enhance capability where this is required to meet the needs of the Regulator (for example, through staff secondment arrangements).

¹⁹⁸ Watson (sub. DR94), Government of South Australia (sub. DR140), Southern Riverina Irrigators (sub. DR132).

RECOMMENDATION 14.5

In establishing the Basin Plan Regulator by 2021, the Australian Government should ensure that it will be effective, including by reviewing the skills mix of the statutory appointments and establishing a statement of expectations.

When there is a need for additional technical skills not available within the Regulator's staff, the Regulator should organise formal, transparent arrangements for the supply of these capabilities from the Murray-Darling Basin Agency, Basin Governments, or other providers.

14.5 Now is the time for action

Reforming the Basin Plan institutional governance arrangements, in accordance with the recommendations set out above, will be imperative if governments are to effectively navigate the next phase of implementation.

Much is riding on how Governments implement the Basin Plan from this point forward. There is still about \$4.5 billion in Australian Government funding left for implementing the Plan. The implementation of the supply measures, constraints easing and efficiency measures is complex, and success is far from guaranteed.

If major shortcomings in current institutional and governance arrangements are not addressed, these projects are likely to fail or be implemented poorly. Failure will mean that the future cost to taxpayers could be in excess of half a billion dollars, and lower environmental outcomes as the anticipated benefits are either delayed or do not eventuate.

Making the Basin Plan work, and demonstrating to communities and taxpayers that it has been effective, is crucial in rebuilding community confidence and ensuring that the substantial public outlays achieve value for money. The Commission's recommendations in relation to institutional and governance arrangements are fundamental to creating the right cultures and incentives for performing each of the Basin Plan functions optimally. Basin Governments must make important changes now to ensure effective implementation.

A Inquiry conduct and participants

This appendix describes the stakeholder consultation process undertaken for the inquiry and lists the organisations and individuals that have participated.

Terms of reference receipt

The terms of reference for the inquiry — reproduced in the preliminary pages of this report — was received from the Treasurer on 7 March 2018. An initial circular advertising the inquiry was distributed to industry organisations and individuals and the inquiry was advertised in national newspapers.

Consultation

The Commission received 143 public submissions (table A.1) and 14 brief comments (table A.2) during the inquiry — 89 submissions and ten brief comments prior to the release of the draft report and 54 submissions and four brief comments in response to the draft report. Of these submissions and comments:

- 42 were from individuals
- 36 were from State and Local Governments or Government agencies
- 30 were from industry associations, groups or peak bodies
- 30 were from NGOs (community, environmental, Indigenous)
- 10 were from farmers/irrigators and private sector businesses
- 6 were from academics or university groups
- 3 were from rural water services providers.

All public submissions and comments are available on the inquiry website.

In addition, the Commission held separate discussions with businesses, business groups, academics, government agencies, NGOs and individuals (table A.3) and public forums were held in regional centres across all Basin States (table A.4).

In accordance with section 89 of the *Water Act 2007* (Cwlth), the Commission established a stakeholder working group (SWG). The SWG was an important avenue for consultation. It provided a forum to exchange information and views on issues relevant to the inquiry. The

SWG members are listed in table A.5. Meetings of the SWG were held on 2 May 2018, 4 July 2018 and 9 October 2018.

Public hearings were held in Mildura, Murray Bridge, Shepparton, Dubbo and Canberra (table A.6).

The following public documents were prepared by the Commission in this inquiry:

- an issues paper — released 13 March 2018
- a draft report — released 30 August 2018.

The final inquiry was provided to Government on 19 December 2018.

Table A.1 Public submissions received

<i>Participants</i>	<i>Submission no.</i>
Liberal Party of Australia, Victoria, Mildura Branch, Water Advisory Committee	1
Brewarrina Shire Council	2
Patrick Johnston	3
Brian Bycroft	4, DR90
Murrumbidgee Valley Food and Fibre Association	5
Frances Pietroboni	6, 64
Country Mayors Association of New South Wales	7
Paul Connellan	8
Jan Beer	9
Sen. David Leyonhjelm	10, DR97
Bill Bagley	11
Matthew Colloff, John Williams and R. Quentin Grafton	12
Goulburn Valley Environment Group Inc.	13, DR125
EDOs of Australia	14, DR126
National Irrigators' Council	15, DR91
Griffith City Council	16
Leeton Shire Council	17, DR109
Speak Up Campaign Inc.	18, DR114
Frederick Bouckaert, Yongping Wei, Karen Hussey & Ray Ison	19
Lindsay Leake	20
Rel Heckendorf	21
Warren Shire Council	22
Inland Rivers Network	23, DR105
Smartrivers	24
International Association of Hydrogeologists	25
Murray Irrigation	26, DR143
Riverina and Murray Joint Organisation	27, DR101
Dr Anne Jensen	28, DR95
Southern Riverina Irrigators	29, DR132
Dr Bethany Cooper	30
WWF-Australia	31
Edward River Council	32
Bonlac Supply Company	33
Strategic Advisory Committee of Lower Murray Water	34
Sandy MacKenzie	35
Murray River Group of Councils	36
Barrie MacMillan	37, DR134
Coleambally Irrigation Co-operative Limited	38
Murrumbidgee Private Irrigators Inc.	39
Professors Sarah Wheeler, Jeff Connor, Quentin Grafton, Lin Crase and John Quiggin	40
Australian Floodplain Association	41
Wentworth Group of Concerned Scientists	42, DR122

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Table A.1 (continued)

<i>Participants</i>	<i>Submission no.</i>
NSW Nature Conservation Council	43, DR120
Australian Dairy Industry Council Inc.	44
Australian Competition and Consumer Commission	45
Anne Hartnett	46
Cotton Australia	47
Wentworth Shire Council	48
Lachlan Valley Water Inc.	49, DR119
Murray River Council NSW	50
Paul Harvey	51
Murray Darling Association Inc.	52, DR93
Ann Lucas	53, DR99
Alistair Watson	54, DR94
Bob Newman	55, DR115
Macquarie River Food and Fibre	56, DR138
Warren Shire Council	57
Renmark Paringa Council	58
Balonne Shire Council	59
NSW Farmers' Association	60
Queensland Farmers' Federation	61
Goulburn Murray Irrigation District (GMID) Water Leadership	62
Lower Edward River Pumpers & Landholders	63
Islex Australia Pty Ltd	65
Dean Brown AO	66
Sarah Moles	67, DR133
Macquarie Marshes Environmental Landholders Association	68
Murray Valley Private Diverters Inc.	69
Ricegrowers' Association of Australia Inc.	70, DR141
Greater Shepparton City Council	71, DR102
Murray Lower Darling Rivers Indigenous Nations (MLDRIN)	72, DR139
Environment Victoria	73, DR117
Murray Darling Association Region 6	74, DR100
Commonwealth Environmental Water Holder	75, DR110
National Parks Association of NSW	76
National Farmers' Federation	77, DR129
Robert and Katharine McBride	78, DR113
River Lakes and Coorong Action Group Inc.	79, DR124
New South Wales Irrigators' Council	80, DR128
Australian Department of Agriculture and Water Resources	81, DR103
Namoi Water	82
Gwydir Valley Irrigators Association Inc.	83
Brian Mills	84
Government of South Australia	85, DR140
Murray-Darling Basin Authority	86, DR136

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Table A.1 (continued)

<i>Participants</i>	<i>Submission no.</i>
Queensland Government	87
Australian Rivers Deltas	88
Victorian Government	89, DR142
Australian Food and Agriculture Company Ltd	DR92
Jan Beer and Ken Pattison	DR96
Quentin Grafton, Sarah Wheeler, John Williams, Matthew Colloff, Jeff Connor, Lin Crase, Darla Hatton MacDonald, Richard Kingsford and John Quiggin	DR98
Healthy Rivers Dubbo	DR104
Meridian Energy Australia Pty Ltd	DR106
South West Water Users	DR107
Patrick Connolly	DR108
Mildura Rural City Council	DR111
David Arnold	DR112
Robert Campbell	DR116
Conservation Council of South Australia	DR118
Fonterra Australia and Bonlac Supply Company	DR121
New South Wales Government	DR123
Victorian Farmers' Federation	DR127
Narwie Partners	DR130
Bill McClumpha	DR131
NSW Aboriginal Land Council	DR135
Louise Burge	DR137

Table A.2 Brief comments received

<i>Participants</i>	<i>Comment no.</i>
Doug Mackintosh	1
Kerry Tucker	2
Howard Jones	3
Griffith Business Chamber	4
Robert Gillespie	5
Gary Ellett	6
Gwydir Shire Council	7
Rosa Hillam	8
Sunset Strip Residents	9
Western Murray Land Improvement Group	10
Jim Inglis	DR-C11
Robert Hosking	DR-C12
Nature Foundation SA	DR-C13
Liz Frankel	DR-C14

Table A.3 Consultations

ACT Environment, Planning and Sustainable Development Directorate
Aither Pty Ltd
Alexandrina Council
Anabranck Water
Australian Floodplain Association
Australian Government Department of Agriculture and Water Resources
Badger Bates
Balonne Shire Council
Barrie McMillan
Barwon-Darling Water
Basin Community Committee
Basin Officials Committee
Border Rivers Food and Fibre
Bourke Shire Council
Brewarrina Shire Council
Carrathool Shire Council
Chris Brooks
Commonwealth Environmental Water Office
Coorong District Council
Darling River Action Group
David Dawes
David Harriss
Dried Fruits Australia
Geoff Wise
Goondiwindi Regional Council
Goulburn Broken Catchment Management Authority
Goulburn Murray Irrigation District Water Leadership Forum
Goulburn Valley Environment Group
Graeme Pyle
Grey Claydon
Griffith City Council
Gwydir Valley Irrigators Association
Howard Jones
John Cooke
Jon Greer
Katharine McBride
Katrina Humphries
Lower Darling Horticulture Group
Macquarie Marshes Environmental Landholders Association
Macquarie River Food and Fibre
Matthew Colloff and John Williams
Menindee Local Aboriginal Land Council and local Elders
Mick Keelty AO APM — Northern Basin Commissioner

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Table A.3 (continued)

Murray-Darling Basin Authority
Murray Darling Association
Murray Irrigation Limited
Murray Lower Darling Rivers Indigenous Nations
Murray River Action Group
Murray Valley Private Diverters Inc.
Murray Valley Winegrowers
Murrumbidgee Field Naturalists
Murrumbidgee Irrigation
Namoi Water
National Farmers' Federation Water Taskforce
Neil Byron
New South Wales Department of Industry (DOI (NSW))
New South Wales Office of Environment and Heritage
Peter Wilson
Pomona Irrigation Trust
Queensland Department of Natural Resources, Mines and Energy
Queensland Murray-Darling Committee
Renmark Irrigation Trust
Renmark Paringa Council
Ricegrowers' Association of Australia
River Lakes and Coorong Action Group Inc.
Rohan McMahon
Rory Treweeke
Sarah Moles
Smart Rivers
South Australian Department for Environment and Water
South Australian Murray Irrigators
South West Water Users
Southern Alexandrina Business Association
Southern Riverina Irrigators
Speak Up Campaign
The Hon. Tony Burke MP
Tony Slatyer
Victorian Department of Environment, Land, Water and Planning (DELWP (Vic))
Victorian Environmental Water Holder
Victorian Farmers Federation
Wentworth Group of Concerned Scientists
Wentworth Shire Council
Western Murray Irrigation
Yanco Creek and Tributaries Advisory Council

Table A.4 Public Forums

New South Wales

Warren — 21 March 2018
Bourke — 22 March 2018
Deniliquin — 28 March 2018
Moree — 3 April 2018
Griffith — 13 April 2018

Victoria

Shepparton — 26 March 2018
Echuca — 27 March 2018
Mildura — 29 March 2018

Queensland

Goondiwindi — 4 April 2018
St George — 5 April 2018
Dirranbandi — 6 April 2018

ACT

Canberra — 11 April 2018

South Australia

Goolwa — 16 April 2018
Renmark — 17 April 2018

Table A.5 Stakeholder Working Group members

Australian Conservation Foundation
Australian Floodplain Association
EDOs of Australia
Murray Darling Association
Murray Lower Darling Rivers Indigenous Nations
National Farmers' Federation
National Irrigators' Council
Northern Basin Aboriginal Nations

Table A.6 Public Hearings

Mildura (VIC) — 12 October 2018

Barrie MacMillan
South West Water Users
Lower Darling Horticulture Group
Mildura Rural City Council
Wentworth Shire Council
Lindsay Leake
Bill McClumpha
Bindara Station

Murray Bridge (SA) — 15 October 2018

Murray-Darling Association – Region 6
Dr Anne Jensen
Ann Lucas and Lyndal Wilson
Paul Harvey
Bob Newman
River Lakes and Coorong Action Group
Robert McBride
Rosa Hillam
Commonwealth Environmental Water Office

Shepparton (VIC) — 17 October 2018

Goulburn Valley Environment Group
Temba Orchards
Landcare Victoria
Environment Victoria
Bluezone
Speak Up Campaign
Darryl Hogan
Victorian Farmers Federation and United Dairyfarmers of Victoria – West Goulburn Branch
Nicole McKay
Upper Goulburn River Catchment Association
Ken Pattison
Greater Shepparton City Council
Maria Riedl
Yanco Creek and Tributaries Advisory Council
Murray Valley Private Diverters
GMID Water Leadership Group
Neil Eagle

(continued next page)

Table A.6 (continued)

Dubbo (NSW) — 25 October 2018

Healthy Rivers Dubbo
Inland Rivers Network
Macquarie River Food and Fibre
Macquarie Marshes Environmental Landholders Association
Lachlan Valley Water
Michael Job
Margaret McDonald
Barwon-Darling Water

Canberra (ACT) — 26 October 2018

Balonne Shire Council
National Farmers' Federation
Gwydir Valley Irrigators Association
Fonterra Australia
Murray Darling Association
Wentworth Group of Concerned Scientists

B Analysis of the cost of recovering water for the environment

This appendix outlines the analysis that underpins some of the cost estimates discussed in the main body of the report.

- B.1 examines the extra cost (or premium) paid by the Australian Government by choosing to recover water for the environment through infrastructure investment rather than purchasing entitlements (chapter 3).
- B.2 examines the potential budgetary cost of recovering water to ‘make good’ should some key projects in the 605 GL supply package not proceed (chapter 4).
- B.3 examines the potential budgetary cost of recovering the extra 450 GL through efficiency measures if future water recovery is based on the approach outlined in the Australian Government’s Murray-Darling Basin (MDB) Water Infrastructure Program (chapter 5).
- B.4 examines the financial cost of recovering additional environmental water before it can be delivered effectively (chapter 5).

B.1 Premium for recovering water through infrastructure investment

Basin Governments (primarily the Australian Government) have recovered almost all of the water needed to ‘bridge the gap’ to the Basin Plan’s Sustainable Diversion Limits (SDLs). The Australian Government acquired much of this water (about 60 per cent) through the direct purchase of entitlements from willing sellers. However, about one-third of this water was recovered through projects that modernise irrigation infrastructure. These projects aim to improve the technical efficiency of water use for irrigated agriculture, and provide a share of the saved water to the Australian Government for environmental use.

Basin Governments chose to recover some water through infrastructure modernisation to help manage the social and economic impacts of reduced water availability. However, water acquired through infrastructure modernisation has a higher cost (per unit) than the prevailing market price. It is a more expensive way to recover a fixed volume of water for the environment compared with directly purchasing the same water entitlements.

To understand the cost implications of this approach to water recovery, the Commission has compared:

1. the cost to the Australian Government of recovering water through infrastructure modernisation, with
2. the estimated cost if the Australian Government had instead purchased the same water entitlements at market prices.

The difference between these two values represents the additional cost incurred of pursuing those additional policy objectives.

A further disadvantage of recovering water through infrastructure projects not considered here is the risk of project delays, or failures to deliver the amount of water specified under their initial contract. For example, the New South Wales Basin Pipes, New South Wales Metering and Victorian Farm Modernisation programs will jointly recover more than 50 GL less than the 88 GL that had been contracted in 2014 (DAWR, pers. comm., 14 November 2018; DOE 2014).

Method and data

The Commission has derived the additional cost of recovering water through infrastructure modernisation from ‘market multiples’ provided by the Department of Agriculture and Water Resources (DAWR) covering the period up to September 2018 (DAWR, pers. comm., 5 November 2018). The market multiple is the ratio of the cost of water (per unit) contracted under an infrastructure program to the prevailing market price (DOE 2014). For example, a market multiple of 2.0 for a project implies that the water recovered cost the Australian Government twice as much as purchasing those same entitlements on the market.¹⁹⁹

The market multiple can be multiplied by the amount of water contracted under a program to provide an estimate of the total additional cost of recovering water through that program, compared with purchasing the same volume in the market.

The implied project premium in table B.1 is calculated as:

$$\text{Project Premium} = \text{Project cost} - \text{Implied market value}$$

Where:

$$\text{Implied market value} = \frac{\text{Project cost}}{\text{Market multiple}}$$

¹⁹⁹ Assuming there are no impacts on prices from the Australian Government’s decision.

Results

Based on the 2018 data, the total amount spent to recover water through infrastructure modernisation to bridge the gap was about \$3.2 billion (table B.1).²⁰⁰ Had that water instead been purchased at the implied market price, recovering the same amount of water would have cost about \$1.2 billion.

This implies that the amount extra paid to recover water through the infrastructure projects in table B.1 was about \$2 billion. This equates to an average premium per unit of about \$2800 per ML in terms of long-term average annual yield (LTAAY).

²⁰⁰ Water recovery volumes provided for three of the programs (Both NSW Water Metering programs, and OFIEP round 2) include non-gap-bridging groundwater. As the Australian Government holds only 6.6 GL of groundwater in the regions associated with these programs (DAWR 2018m), this additional volume does not substantially contribute to the total premium calculation.

Table B.1 Market multiples

For water recovery programs as of September 2018

Program	Amount recovered	Cost to Australian Government	Average unit cost	Market multiple	Implied project premium	Implied market price	Implied premium per unit
	A	B	C = B ÷ A	D	E = B – (B ÷ D)	C ÷ D	E ÷ A
	GL LTAAY	\$m	\$ / ML LTAAY	scalar	\$m	\$ / ML LTAAY	\$ / ML LTAAY
NSW PIIOP (rounds 1 to 3)	159.1	914.2	5 746	2.2	494.5	2 638	3 107
NSW Water Metering (pilot)	5.1	22.1	4 314	3.5	15.7	1 240	3 074
NSW Water Metering (excl. pilot)	9.0	31.5	3 512	2.2	17.2	1 589	1 923
NSW Basin Pipes	10.8	47.2	4 386	2.0	23.6	2 193	2 193
NSW IFM pilot	0.5	6.7	14 222	3.3	4.6	4 336	9 886
NSW IFM	14.2	86.6	6 090	2.3	49.4	2 614	3 476
Nimmie-Caira	173.0	180.1	1 041	2.4	104.0	439	602
Healthy Headwaters	19.6	107.8	5 490	2.2	58.8	2 495	2 995
GMW Connections Stage 2	102.0	956.3	9 375	4.8	757.5	1 949	7 426
NVIRP on-farm	10.2	43.0	4 200	2.2	23.7	1 883	2 316
VFMP	16.6	69.3	4 174	2.3	39.6	1 791	2 383
Sunraysia Modernisation	7.0	103.0	14 714	7.1	88.5	2 075	12 638
SA PIIP	2.7	14.4	5 315	2.5	8.7	2 109	3 206
SARMS ^a	36.0	120.0	3 333	2.5	72.0	1 333	2 000
OFIEP (pilot and rounds 1 to 5)	149.9	504.0	3 363	2.1	261.3	1 620	1 743
TOTAL	716	3 206	4 480		2 019		2 821

^a The figure used here is from 2014, at which point 16.8 GL LTAAY had been recovered within the program (DOE 2014).

Notes: PIIOP = Private Irrigation Infrastructure Operators Program; IFM = Irrigation Farm Modernisation; GMW = Goulburn Murray Water; NVIRP = Northern Victoria Irrigation Renewal Program; VFMP = Victorian Farm Modernisation Program; PIIP = Private Irrigation Infrastructure Program; SARMS = South Australia River Murray Sustainability; OFIEP = On-Farm Irrigation Efficiency Program. NSW Water Metering and OFIEP recovery volumes include some non-gap bridging groundwater.

Source: DAWR (pers. comm., 14 November 2018).

B.2 Cost of making good if key projects in the 605 GL supply package do not proceed

In the southern Basin, a package of 36 supply projects was agreed in May 2018, with funding of up to \$1.0 billion.²⁰¹ These projects provide equivalent environmental outcomes using less water, enabling the water recovery target to be offset by 605 GL.

The Basin Plan requires projects to be fully operational by 30 June 2024, and projects that will not be operational by 2024 must be withdrawn. Many of the supply projects are at the scoping or concept design stages of development. This includes six highly complex projects (Menindee Lakes, four constraints and hydro-cues supply projects). Achieving the 605 GL determination relies heavily on implementing these projects as they could account for between one-third and half of the 605 GL offset (discussed in chapter 4 and below).

If the six key supply projects do not proceed — potentially because of the 2024 deadline — then Basin States or the Australian Government may be required to make good by recovering the water. This example considers the case where the Australian Government is required to make good. To understand the cost implications to the Government of such a scenario, the Commission compared:

1. the cost of the aforementioned key supply projects, with
2. the cost of making good the shortfall in the water recovery target should the projects not proceed (which requires estimating how much of the 605 GL offset is attributable to these projects and how the Government recovers the water).

The difference between the second and first cost represents the net cost to the Government of the projects not going ahead.²⁰² This assumes that all of the project costs are avoided. However, if some of the project costs are incurred prior to the deadline, then the net cost would be larger.

This comparison is of costs only, and does not consider additional long-term environmental benefits the supply measures may offer relative to recovering the volume of water they are deemed to offset. These include the ability to provide additional delivery capacity, greater flexibility for river operations and capacity to water new areas of floodplain.

201 The Australian Government originally made up to \$1.3 billion available for supply measures. The \$1.0 billion figure was determined based on the Intergovernmental Agreement on Implementing Water Reform in the Murray-Darling Basin (also discussed in chapter 4). Constraints projects included in the supply package will also be able to seek up to \$200 million in funding from the Water for the Environment Special Account. Some projects nominated as supply measures (including the Menindee Lakes project) are funded through separate agreements between the Australian Government and Basin States.

202 The analysis considers capital costs only (not any costs of operating the infrastructure built as part of the supply projects, or management costs of holding more water entitlements to meet a revised target).

Method and data

Cost of supply projects

Table B.2 presents the costs of supply projects in the analysis. The Commission obtained cost estimates for five of the projects (Menindee Lakes and constraint easing in the Murrumbidgee, South Australian Murray, Hume to Yarrawonga and Yarrawonga to Wakool) from publicly available business cases. The business case for the hydro-cues project (with permission to publish the included cost estimate) was obtained from the Basin Officials Committee.

Mid-points and upper and lower bounds for the cost of each supply project are included in the table. The mid-points for all four constraint easing projects are the Commission's calculations, as their business cases expressed cost estimates as ranges only. Conversely, the business cases for Menindee Lakes and hydro-cues only provide single estimates. To account for uncertainty in those projects' costs, lower and upper bounds for the costs in proportion to the ranges of the constraints projects were imputed. This was done by calculating the average magnitude of the cost range relative to the magnitude of the midpoint across the constraints projects, and applying the same relative range to the Menindee Lakes and Hydro-cues project costs (box B.1).

Table B.2 Costs of selected supply projects

Project		Mid-point cost (\$ million)	Cost range (\$ million)
Constraints	Menindee Lakes	152	130-174 ^a
	Hydro-cues	27	23-31
	Hume to Yarrawonga	30 ^b	26-34
	Murrumbidgee	139	113-164
	South Australian Murray	47	38-55 ^c
	Yarrawonga to Wakool Junction	284	262-306
Total		678	592-764

^a Range for Menindee Lakes and hydro-cues imputed in proportion to the ranges provided for the constraints projects. ^b Mid-points for all constraints projects calculated from ranges provided in their business cases.

^c Cost estimate released as part of *Senate Motion No. 685 for production of documents* (22 March 2018).

Sources: DELWP (VIC) (2016b); DEWNR (SA) (2016b); DPI (NSW) (2016b), (2016c), (2017b); MDBA (ndb).

Box B.1 Imputed cost ranges for the Menindee Lakes and Hydro-cues projects

The lower and upper bound costs for the projects are imputed respectively as:

$$c^l = c \times \left(1 - \frac{d}{2}\right)$$

$$c^u = c \times \left(1 + \frac{d}{2}\right)$$

Where c is the single cost figure given in the business case, and the average deviation of the four constraints projects, d , is:

$$d = \frac{1}{4} \sum_{i=4}^4 \frac{(c_i^u - c_i^l)}{\frac{1}{2}(c_i^u + c_i^l)}$$

Cost of water recovery to make good

The cost of a water recovery scheme to make good in the event of the projects not going ahead depends on:

- the volume of water recovery required to make good (that is, how much water recovery the supply projects are deemed to offset in achieving equivalent environmental outcomes)
- the manner in which the Government recovers the water.

In determining the offset of the supply measures package, the Murray-Darling Basin Authority (MDBA) was not required to calculate the offset attributable to each project individually. The MDBA has indicated that there is large uncertainty in estimating the offset of individual projects due to ‘the interlinked and interdependent nature of river management’ (MDBA 2017r, p. 29). For example, the environmental benefits of the hydro-cues project are heavily dependent on easing constraints. Estimates made during the development of the package provide some insight into the offset that could be attributed to the six key projects (box 4.3 in chapter 4). These estimates suggest that the contribution of these projects could be in the order of 200-300 GL.

For this analysis, the middle value of this range (250 GL) is taken as the main estimate.

Three policy scenarios were considered for the Government’s method of water recovery:

1. The Government purchases water entitlements to recover the remaining volume (which would require the legislative 1500 GL cap on purchases to be lifted).
2. The Government purchases water entitlements directly up until reaching the 1500 GL cap on purchases, then acquires the remaining volume required through infrastructure modernisation.

3. The Government acquires entitlements solely through infrastructure programs.²⁰³

Under the first scenario the cost of the recovery is given by:

$$C_p = V_r \times P$$

Under the second the cost is:

$$C_c = \begin{cases} V_r \times P, & \text{if } V_r \leq V_c \\ V_c \times P + (V_r - V_c) \times P \times M, & \text{if } V_r > V_c \end{cases}$$

While under the third the cost is:

$$C_i = V_r \times P \times M$$

Where C_p is the total cost of purchasing water without the cap, C_c is the total cost of purchasing water up to the 1500 GL cap before turning to infrastructure modernisation, C_i is the total cost of making good through infrastructure modernisation only, V_r is the volume of water needed to make good, V_c is the volume of water remaining under the 1500 GL purchase cap, P is the average price paid for water entitlements, and M is the average market multiple paid by the Government for entitlements through infrastructure modernisation.

The price of water entitlements is based on the 12 month volume weighted average price per ML for the entitlements listed in table B.4. A volume weighted average price was constructed following the ‘balanced recovery’ approach described in section B.3.²⁰⁴ The price obtained from this process is \$2838 per ML (LTAAY).

The market multiple used here is 1.75, which is the number that sets the maximum funding available for projects which transfer entitlements to the Commonwealth under the MDB Water Infrastructure Program. This multiple is below those of previous infrastructure projects (table B.1) and there is a risk that it may be too low to encourage sufficient participation. The estimated cost of making good through infrastructure programs may represent a lower bound on the true value. Finally, the volume of water purchases remaining to the Government under the 1500 GL purchase cap is 276 GL. Assuming the remaining 29.5 GL yet to be recovered to bridge the gap is obtained through purchase (chapter 3), the amount remaining below the cap is 246.5 GL.

Results

Figure B.1 presents the ranges for the costs of key supply projects (column 1) and water recovery to make good should the projects not proceed (columns 2-4). In the case of the latter three columns, the range stems from the uncertainty in the volume of water to be

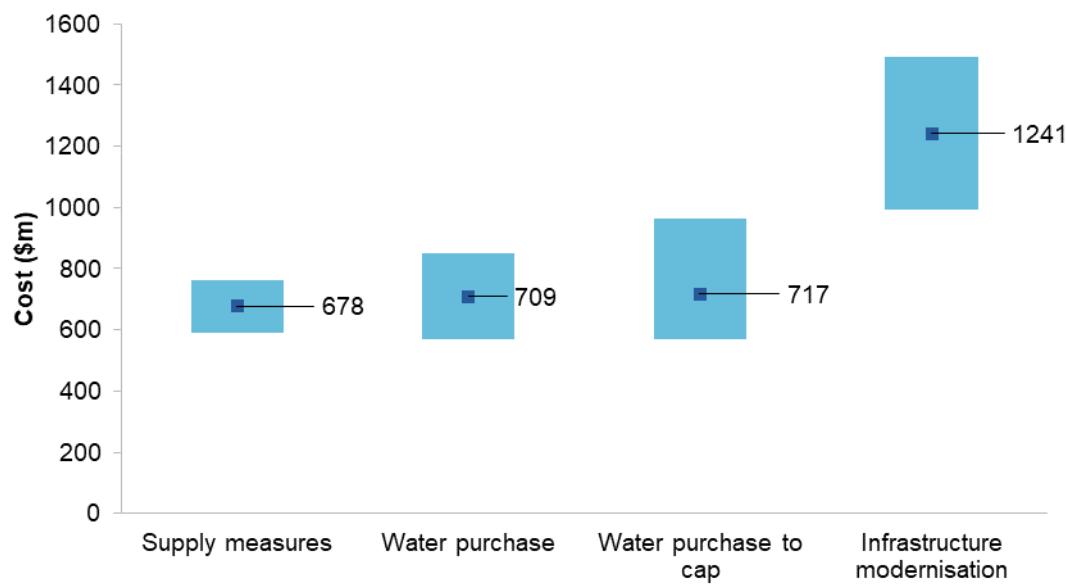
²⁰³ The Australian Government has stated a preference for recovering water in this manner (DOE 2014).

²⁰⁴ Weighting instead by the proportions in the Commonwealth Environmental Water Holder’s existing portfolio (‘aligned recovery’) gives only a minimal difference in price.

recovered (i.e. the offset attributable to the six projects). The dark blue squares show the costs computed using the middle value of the supply project cost range, and the middle value of the water volume range.

The results indicate that the relative value of the supply projects depends greatly on the method that the Government uses to acquire water. If it is committed to using infrastructure modernisation, the supply projects could potentially save between \$229 million and \$898 million compared with water recovery (table B.3), with a saving of \$564 million at the middle estimates. Things are less clear if the Government recovers water through direct purchases. At the middle estimates, the supply projects save \$31 million or \$39 million compared with purchasing in full or up to the cap respectively. The estimated saving from the supply projects ranges up to \$259 million with the purchase cap and \$373 million without it, but at the lower bound purchases with or without the cap are \$196 million cheaper than the supply projects.

Figure B.1 Costs of selected supply projects and making good



Source: Productivity Commission estimates.

Table B.3 Costs of selected supply projects and making good

	<i>Supply projects (\$m)</i>	<i>Making good – water purchased without cap (\$m)</i>	<i>Making good – water purchased to cap (\$m)</i>	<i>Making good – infrastructure only (\$m)</i>
Cost	678 (592-764)	709 (568-851)	717 (568-965)	1,241 (993-1,490)
Cost difference relative to supply projects		31 (-196-259)	39 (-196-373)	564 (229-898)

Mid-point estimates with lower and upper bounds in parentheses.

Source: Productivity Commission estimates.

B.3 Cost of recovering an additional 450 GL

This section outlines the potential budgetary cost to the Australian Government of recovering 450 GL through efficiency measures. There have been significant increases in water entitlement prices since the original Water for the Environment Special Account (WESA) budget allocation in 2013 (figure 5.1 in chapter 5). If prices remain at current levels (or increase), there is a material risk that the cost of recovering water will be significantly higher than the WESA budget. The cost of recovering water is dependent on the types of water entitlements recovered, the price of those entitlements and the market multiple offered for infrastructure projects that recover the water. The Commission estimates detailed below consider the cost of efficiency measures based on various recovery strategies.

The cost of efficiency measures could change depending on the type of entitlements recovered by DAWR; primarily the amount of high reliability or general or low reliability entitlements recovered.²⁰⁵

Based on a *balanced recovery* approach (at current market prices and with a market multiple of 1.75) the estimated cost of recovering 450 GL is \$2.2 billion (the basis for these assumptions is outlined below). The WESA budget allocates \$1.575 billion to recover 450 GL of water through efficiency measures. Thus, the cost of recovering 450 GL through efficiency measures could be more than \$600 million higher than the allocated budget.

In summary, these estimates show that there is a significant risk that the cost to the Australian Government of acquiring 450 GL of water through efficiency measures would exceed its budget allocation by hundreds of millions of dollars.

²⁰⁵ Even when converted into long-term average annual yield, high reliability entitlements are more expensive than general or low reliability (table B.5).

Method and data

Modelling that informed the Basin Plan assumed that all of the additional water recovery beyond the benchmark was in the southern Basin (box 5.2 in chapter 5). For this reason, it is assumed that the extra 450 GL worth of entitlements will be recovered from the southern Basin only.²⁰⁶

The cost of recovering water through efficiency measures is calculated as:

$$Cost = \sum^i E_i \times P_i \times M$$

Where:

- E_i is the mix of entitlements recovered as a volume measured in LTAAY
- P_i is the corresponding price of those entitlements as a price per volume in LTAAY
- M is the market multiple.

Various scenarios have been considered, reflecting differences in the suite of entitlements used to recover water. The scenarios are:

- **balanced recovery:** 450 GL of water is recovered proportional (based on the LTAAY of entitlements) to the remaining entitlements on offer in the market (i.e. all entitlements minus the Commonwealth Environmental Water Holder's (CEWH's) current holdings)
- **aligned recovery:** 450 GL of water is recovered proportional (based on LTAAY) to the CEWH's current portfolio
- **rebalanced recovery:** 450 GL of water is recovered so that after the water is recovered, the CEWH's portfolio is proportional to all entitlements on offer
- **415 GL balanced recovery:** 415 GL of water is recovered using the same method as balanced recovery.

These scenarios illustrate possible strategies that could be used by DAWR in recovering 450 GL. They are useful because they demonstrate the potential costs with different proportions of high and general or low reliability entitlements recovered.

The 415 GL scenario is used to consider whether recovery can occur within budget if 35 GL of over-recovered water in the southern Basin is reclassified as efficiency measures, an option that has been raised in a DAWR commissioned analysis of the program (EY 2018).

Also included is some sensitivity analysis for each scenario that estimates the cost if a higher market multiple is needed to attract enough participation.

²⁰⁶ The MDB Water Infrastructure Program is being rolled out Basin-wide, and may recover water in the northern Basin. DAWR has specified that their evaluation of proposed efficiency measures will take into account their contribution to the enhanced environmental outcomes in Schedule 5 (DAWR 2018h).

Entitlements that could be recovered

The only entitlement types included are those where reliable price data are available. Most commonly used entitlements for the major river systems in the southern Basin are captured in the analysis (table B.4). These entitlements account for 83 per cent of the CEWH's holdings in the southern Basin.²⁰⁷ Registered CEWH holdings are correct as of 30 September 2018 (the most recent data publicly available).

Table B.4 Entitlements in the southern Basin

Region	Entitlement type	Registered CEWH entitlements		All entitlements	
		(ML)	LTAAY ^a (ML)	(ML)	LTAAY ^a (ML)
NSW Murray	High	17,858	16,965	191,637	182,054
NSW Murray	General	369,629	299,399	1,672,097	1,354,396
Murrumbidgee	High	10,199	9,689	380,830	361,787
Murrumbidgee	General	282,203	181,250	1,891,995	1,215,168
Goulburn	High	285,205	270,240	1,046,067	991,179
Goulburn	Low	42,467	19,265	456,049	206,885
Vic Murray	High	324,116	308,342	1,244,848	1,184,264
Vic Murray	Low	25,489	10,125	311,581	123,769
SA Murray	High	155,492	139,943	548,287	493,459

^a Long-term average annual yield based on Department of the Environment estimates.

Sources: DEE (2018); MDBA (2016k).

Entitlement prices

Volume weighted average price²⁰⁸ data for the 12 months to September 2018 are used to calculate the potential cost of efficiency measures (table B.5).

Water entitlement prices have increased significantly in recent years (chapter 5). For example, New South Wales Murray high security entitlements have increased in price from approximately \$1500 per ML in 2014 to over \$4000 per ML in 2018 (DAWR 2018g).

Given the inherent uncertainty in predicting future prices, the prices used are current ones, with an understanding that these may not perfectly reflect those paid for future water

²⁰⁷ Other entitlements excluded because of a lack of price data include NSW conveyance and supplementary water entitlements. The CEWH holds a significant amount of NSW supplementary (Lowbidgee) entitlements that were recovered as part of the Nimmie-Caira Project which involved purchasing 19 properties and 381 GL (173 GL in LTAAY) of water entitlements (DOI (NSW) 2018e). This entitlement type was excluded from the analysis because of a lack of reliable price information. Furthermore, the CEWH holds over half of the total amount of this type of entitlement.

²⁰⁸ Volume weighted average price refers to the average price of water entitlements based on eligible trade of entitlements (excludes zero-price trades). The average is weighted based on the volume of water traded.

recovery. Water recovery cost estimates are directly proportional to the price of water entitlements, and any increase in the cost of water entitlements will increase the cost of efficiency measures. For instance, if entitlement prices increased by 10 per cent, the cost of water recovery would increase by 10 per cent.

Current water prices are the highest on record and reflect positive conditions for several irrigated crops (cotton, almonds, citrus and table grapes). Aither (2018b) suggested that some buyers consider the entitlement market fully or overvalued, but that despite this there are few signs that prices are dropping or that competition for purchasing available water will weaken in the medium term.

Table B.5 Entitlement prices in the southern Basin

Region	Entitlement type	Price ^a (\$/ML)	Conversion factor	Price (LTAAY) ^b (\$/ML)
NSW Murray	High	3 774	0.95	3 972
NSW Murray	General	1 575	0.81	1 944
Murrumbidgee	High	3 948	0.95	4 155
Murrumbidgee	General	1 708	0.64	2 660
Goulburn	High	2 947	0.95	3 110
Goulburn	Low	424	0.45	934
Vic Murray ^c	High	3 304	0.95	3 473
Vic Murray ^c	Low	438	0.40	1 102
SA Murray	High	3 259	0.90	3 621

^a Price calculated based on volume weighted average price over the previous 12 months from September 2018. ^b Price converted to long-term average annual yield based on Long-term divergence equivalence factors. ^c Prices for Vic Murray entitlements differ above and below the Barmah Choke. A volume weighted average price was calculated.

Sources: DAWR (2018g); DEE (2018).

Market multiples

The MDB Water Infrastructure Program sets maximum funding for projects at 1.75 times the market price of the water rights transferred to the Australian Government. However, multiple lines of evidence suggest that a maximum market multiple of 1.75 could be inadequate to achieve any reasonable level of participation in the efficiency measures program.

Stakeholders have indicated that a market multiple of 1.75 is unlikely to attract enough participation to allow 450 GL to be recovered by 2024 (EY 2018). This is also evidenced by participation in the Commonwealth On-Farm Further Irrigation Efficiency (COFFIE) pilot program. It has been running in South Australia since 2016 using a maximum market multiple of 1.75 and only has less than 2 GL under contract (chapter 5).

Nearly all other infrastructure recovery programs have had market multiples above 2.0, with a median market recovery multiple for the various infrastructure programs of 2.3 (section B.1). All completed infrastructure programs have had market multiples higher than the proposed maximum market multiple of the MDB Water Infrastructure Program of 1.75.

Programs that target on-farm projects have typically been cheaper than off-farm projects (EY 2018), but on-farm projects have been excluded from the MDB Water Infrastructure Program in Victoria and New South Wales.

It should be noted that some infrastructure projects may have market multiples below the maximum allowable (of 1.75), and good program design is important to ensure that people do not ‘game’ the system and inflate the cost of works (discussed in chapter 5). However, even where a maximum market multiple is in place (for example with COFFIE), this may be exceeded where participation is prioritised over cost.

A market multiple of 1.75 is used here as the base case for the analysis, reflecting the maximum market multiple of the MDB Water Infrastructure Program. Sensitivity analysis using multiples of 2.0 and 2.3 is included to demonstrate the potential costs if higher market multiples are required to attract enough participation.

Results

Water entitlements recovered under the four scenarios are detailed in table B.6. These represent examples of the potential portfolio of entitlements that could be recovered.

Table B.6 Efficiency measure recovery under different scenarios

Region	Entitlement type	Rebalanced (GL LTAAY)	Balanced (GL LTAAY)	Aligned (GL LTAAY)	415 GL balanced (GL LTAAY)
NSW Murray	High	33.8	15.3	6.1	14.1
NSW Murray	General	78.4	97.7	107.3	90.1
Murrumbidgee	High	91.2	32.6	3.5	30.1
Murrumbidgee	General	157.7	95.8	65.0	88.3
Goulburn	High	6.3	66.8	96.9	61.6
Goulburn	Low	38.4	17.4	6.9	16.0
Vic Murray	High	22.0	81.1	110.5	74.8
Vic Murray	Low	24.4	10.5	3.6	9.7
SA Murray	High	- 2.3	32.7	50.2	30.2
Total		450	450	450	415
Per cent high reliability		34%	51%	59%	51%

Source: Productivity Commission estimates.

Based on current market prices, there is a material risk that the cost of recovering 450 GL could exceed \$2.2 billion. If higher market multiples are used, the cost could be as high as \$2.9 billion (table B.7).

The balanced recovery cost of \$2.23 billion is approximately 40 per cent larger than the current budget. At an average market multiple of 2.3, the cost of \$2.94 billion represents an increase in costs by approximately 85 per cent.

The cost of water recovery in this analysis is highly dependent on the composition of water entitlements recovered. For scenarios where a higher proportion of high reliability entitlements are recovered, costs are also higher. However, the extent to which budget issues can be solved by purchasing general or low reliability entitlements may be limited. In the rebalanced scenario, only 34 per cent of entitlements recovered are high reliability, but the estimated cost is still \$588 million higher than the budget. Recovering general or low reliability entitlements should only be the strategy of DAWR if these entitlements align with the requirements of the CEWH in meeting its environmental objectives.

There are other ways that the efficiency measure program may be able to reduce costs (chapter 5). However, costs would need to be reduced by 30 per cent in order to recover 450 GL within the budget. For instance, reclassifying 35 GL of over-recovered water in the southern Basin as efficiency measures would reduce the budget outlay by \$174 million (noting that the cost of recovering 450 GL is not reduced by that amount).

Finding projects that have lower market multiples than the maximum could reduce the cost of recovering water. On-farm infrastructure projects have typically been the lowest cost way of recovering water, but these are currently excluded from the MDB Water Infrastructure Program in New South Wales and Victoria (DAWR 2018h). It may be possible that urban and industrial measures may provide more cost-effective projects, which would help reduce overall cost pressures of the program. However, these projects are unlikely to contribute a significant volume of water to the overall 450 GL (EY 2018).

Table B.7 Cost of efficiency measures

And difference to current budget

<i>Market multiple</i>	<i>Rebalanced (\$m)</i>	<i>Balanced (\$m)</i>	<i>Aligned (\$m)</i>	<i>415 GL balanced (\$m)</i>
1.75	2 163	2 235	2 271	2 061
2.00	2 471	2 554	2 595	2 355
2.30	2 842	2 937	2 984	2 709
Increase compared with current budget of \$1.575 billion				
1.75	588	660	696	486
2.00	896	979	1 020	780
2.30	1 267	1 362	1 409	1 134

Source: Productivity Commission estimates.

B.4 Notional cost saving of extending the water recovery timeframe

The Basin Plan allows for the recovery of an extra 450 GL of water to pursue environmental outcomes additional to those that can be achieved by recovering the equivalent of 2750 GL (outlined in Schedule 5 of the Plan). These enhanced environmental outcomes are dependent on progress in easing or removing constraints. As noted in chapter 4, constraints projects are unlikely to be fully operational by 2024 and may not deliver the full range of required constraint easing. If constraints are not eased, rushing to recover the full 450 GL by 2024 would risk the Australian Government spending money on an asset that potentially cannot be used for some time.

To understand the magnitude of these potential costs, the Commission estimated the financial costs of bringing forward expenditure on water entitlements before they can be used. As there is currently little information on how long it will take to ease constraints or how much water can be used to contribute to enhanced outcomes with partial constraints easing, the numbers used should be treated as illustrative but plausible.

Method and data

Various linear trajectories of water recovery are tested (table B.8) based on the requirement to recover 62 GL by 30 June 2019 and 450 GL by the deadline.

Table B.8 Potential water recovery trajectories considered

Year	Year recovery completed			
	2024	2026	2028	2030
	GL (LTAAY)	GL (LTAAY)	GL (LTAAY)	GL (LTAAY)
2018	2	2	2	2
2019	62	62	62	62
2020	140	117	105	97
2021	217	173	148	133
2022	295	228	191	168
2023	372	284	234	203
2024	450	339	278	238
2025	450	395	321	274
2026	450	450	364	309
2027	450	450	407	344
2028	450	450	450	379
2029	450	450	450	415
2030	450	450	450	450

Source: Productivity Commission estimates.

Future expenditure (in current dollar terms) is discounted to reflect the present value financial cost of that expenditure. This is calculated based on:

$$DC = \sum_{n=0}^N \frac{C_n}{(1+r)^n}$$

Where:

- DC is the discounted cost in present value terms
- C_n is the cost incurred n years into the future
- r is the discount rate.

Results are calculated for four water recovery trajectories.

Future costs are discounted into net present value terms based on rates of 3, 5 and 7 per cent.

The future costs incurred are dependent on the cost of water recovery. The estimated cost is based on costs of \$3500 per ML (the cost per ML given by recovering 450 GL within the WESA budget allocation) and \$4966 per ML (the estimated cost per ML of recovering water in section B.3).

Results

The results show that delaying efficiency measures expenditure reduces the program's net present cost (table B.9). The size of the saving varies significantly depending on the assumptions made about the timing of water recovery, the discount rate and the price of water recovery. Based on a discount rate of 5 per cent and a water recovery cost of \$4966 per ML (LTAAY), completing water recovery in 2030, relative to 2024, would represent a financial saving to the Australian Government of \$203 million.

Any decision to extend the timeframe for recovering water for efficiency measures should consider all factors, including what environmental benefits can be achieved from recovering additional water before constraints are eased.

Table B.9 Potential financial saving from delaying expenditure
Relative to recovering water by 2024

Discount rate	Year recovery completed			
	2024 (\$m)	2026 (\$m)	2028 (\$m)	2030 (\$m)
<i>Cost of \$3500 per ML</i>				
3 per cent	1 419	1 384	1 352	1 320
5 per cent	1 327	1 276	1 228	1 184
7 per cent	1 244	1 180	1 122	1 068
<i>Cost of \$4966 per ML</i>				
3 per cent	2 013	1 964	1 918	1 873
5 per cent	1 883	1 811	1 743	1 679
7 per cent	1 765	1 675	1 592	1 516
<i>Saving relative to 2024</i>				
<i>Cost of \$3500 per ML</i>				
Discount rate	2024 (\$m)	2026 (\$m)	2028 (\$m)	2030 (\$m)
3 per cent	-	34	67	99
5 per cent	-	51	98	143
7 per cent	-	64	122	176
<i>Cost of \$4966 per ML</i>				
3 per cent	-	48	95	140
5 per cent	-	72	140	203
7 per cent	-	90	173	249

Source: Productivity Commission estimates.

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