
Prerequisite Policy Measures Implementation in South Australia

*Overview of arrangements and mechanisms used
to implement Prerequisite Policy Measures*



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Head Office
Level 5
81-95 Waymouth St
ADELAIDE SA 5000

Internet: www.environment.sa.gov.au

Report prepared by:
River Murray Operations
Water Group
Department for Environment and Water

Copies of the report can be obtained from:
www.environment.sa.gov.au

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1 Summary

Pre-requisite policy measures (PPMs) are policy measures designed to maximise the beneficial outcomes of the water recovered for the environment under the Basin Plan, without impacting on the reliability for other water users. These policy measures may be embedded in statutory instruments, river operating procedures and/or policy or planning documents.

Previously referred to as 'unimplemented policy measures', PPMs are defined in section 7.15 of the Basin Plan as measures consisting of a policy to:

- a. Credit environmental return flows for downstream environmental use (PPM1);¹ and
- b. Allow the call of held environmental water from storage during unregulated flow events (PPM2).²

For the purposes of assessing implementation the Murray Darling Basin Authority (MDBA) has identified five assessment criteria in its *Pre-requisite Policy Measures Assessment Guidelines* (the MDBA Guidelines, 2015), namely that the relevant arrangements:

- are secure and enduring
- are fully operable
- are transparent
- provide for release of held environmental water from storages on other in-stream flows, including unregulated flows (i.e. call water from storage); and
- allow environmental water to flow throughout the length of a river, and between rivers, and be protected from extraction, re-regulation or substitution (i.e. return flows).

This document, *An overview of the arrangements and mechanisms used to implement Prerequisite Policy Measures* (PPM Overview), summarises how the Basin Plan's PPM requirements are met in South Australia and identifies the contribution of the relevant statutory instruments, policies and procedures. In so doing, the document has regard to the *Pre-requisite Policy Measures Assessment Guidelines* (the MDBA Guidelines, 2015), as well as the South Australia's original PPM Implementation Plan (SA, 2016).

Building on long-standing statutory protections both in South Australia and under the MDB Agreement, which remain in effect, South Australia's original PPM Implementation Plan identified a number of additional workplan actions to address the Basin Plan PPM requirements, as well as improve the overall transparency of River Murray operations in South Australia. These workplan actions were as follows:

¹ Flows between rivers are not applicable in South Australia as there are no major tributary inflows along the South Australian River Murray. However, there are flows between WRP regions in South Australia – i.e. from Lake Alexandrina into the Coorong in the SA Murray Region water resource plan area and from the Eastern Mount Lofty Ranges tributaries into the River Murray at Lake Alexandrina

² The PPM relating to the release of environmental water from headwater storage is not relevant to South Australia, as there are no headwater storages or tributaries in South Australia. Hence PPM 2 is not addressed further in this document, except where it is relevant to the estimation of return flows and in relation to the delivery of environmental water from the Lower Lakes to the Coorong.

	Action	Timing
1	Develop a South Australian Objectives and Outcomes document for the River Murray in South Australia, including Specific Objectives and Outcomes where required for river operations activities and the use of environmental water.	June 2019
2	Continue to develop the River Murray Annual Operating Plan and improve annual reporting (ongoing improvements annually in response to feedback).	Annually
3	Explore the potential for publicly communicating the Annual Operating Plan.	June 2017
4	Refine and operationalise the Source Model – with respect to the tracking and reporting of environmental water	June 2019
5	Develop a Basin Plan compliant water resource plan.	June 2019
6	Undertake additional modelling for the quantification of losses associated with the use of environmental water in SA from the border to the barrages border to the barrages.	June 2017
7	Develop principles and/or rules for the application of a loss rate and incorporate these in a standard operating procedure for the calculation of losses.	December 2017
8	Finalise the draft Return Flow Policy and Procedure and develop a standard operating procedure for return flow accounting.	December 2016

Statutory protections that already support PPM implementation are addressed briefly in section 2 of this document and at greater length in South Australia's water resources plans, all of which were submitted to the MDBA for assessment by the 28 February 2019 deadline. Among other things, these statutory protections ensure that all environmental water is protected along the length of the South Australian River Murray and into the Coorong.

The policies and procedures that have been put into effect under the workplan to address other relevant Basin Plan PPM requirements are summarised in section 3 of this document. These include the following:

- Unregulated flow policy and procedure
- Transmission losses policy and procedure
- Refined Source model and technical report
- Return flow policy and procedure
- Procedure for environmental water accounting in South Australia
- Environmental water delivery and use accounting spreadsheet
- Additional policy and procedure for Minister's Reserve.

These policies and procedures complement any environmental watering schedules agreed with environmental water holders, notably the schedules agreed with the Commonwealth Environmental Water Holder.

Ongoing adherence to these policies and procedures will ensure that environmental water accounting is accurate, reliable and credible – which is fundamental to the successful implementation of PPMs.

From 1 July 2019, any exercise of delegated Ministerial authority for River Murray operations in South Australia will be conditional on acting consistently with the abovementioned policies and procedures, as well as with any agreements reached with environmental water holders about environmental water delivery. In other words, River Murray operations pertaining to all environmental water delivery in South Australia will be subject to these policies and procedures, as well as any relevant agreement. These arrangements will serve to provide additional security and transparency in respect of environmental water delivery and ensure that the relevant policies and procedures remain fully operable.

Finally, additional arrangements that seek to further support PPM implementation through planning or by providing extra guidance and transparency in relation to River Murray planning, operations and reporting are outlined in section 4.

Beyond the implementation of its PPM work program, the South Australian Department for Environment and Water (DEW) remains committed to the ongoing refinement and improvement of overall PPMs implementation. DEW will continue to work with individual environmental water holders and stakeholders to provide confidence and assurance that environmental water is managed consistently with Basin Plan requirements and objectives. In addition to the accountability mechanisms outlined in this document, this would include South Australian participation in any structured evaluation program for the Southern Connected Basin.

2 Statutory framework for River Murray water management

Natural Resources Management Act (NRM) 2004

There are long-standing statutory rights and obligations that protect environmental water in South Australia.

Water resources are managed under the *Natural Resources Management Act 2004 (the NRM Act)*, which provides the statutory framework for the:

- management of activities that can affect water, for example control of the location and construction of wells and dams or any other infrastructure that collects or diverts water
- control of the taking and use of water through prescription of water resources and a water licensing regime.

The South Australian River Murray was prescribed on 10 August 1978 and take from the River Murray is governed by the Water Allocation Plan (WAP) for River Murray Prescribed Watercourse (the "River Murray WAP").

Principles 1 and 4-46 under the River Murray WAP (SAMDB NRMB 2019b) provide a statutory obligation that defines the consumptive pool and places an upper limit on the volume that can be allocated. The River Murray WAP sets out how much water can be taken annually for consumptive use in a way that meets the long-term sustainable diversion limit under the Murray Darling Basin Plan, as set out in detail in the South Australian River Murray Water Resource Plan (WRP), which was submitted to the MDBA on 28 February 2019.

There is a further requirement under the NRM Act that the River Murray WAP should seek to further the objects of the *River Murray Act 2003* and be consistent with the Murray-Darling Basin Agreement and any relevant Ministerial Council resolution the under that agreement, as well as consistent with the Basin Plan under the Commonwealth *Water Act 2007*.

Under the River Murray WAP, all water allocated to South Australian licences for consumptive use is strictly from Entitlement Flow, which is determined by and delivered in accordance with clause 88 (a) and (b) of the Murray-Darling Basin Agreement.³ Principle 5 of the WAP also prohibits any additional quantities of water from being allocated or used for consumptive purposes.

This means that all Held Environmental Water (HEW) delivered from New South Wales and Victoria is protected and is not available for allocation or non-environmental consumptive purposes. The same applies to all environmental water delivered under Bulk Entitlement Delivery (BED) arrangements from

³ With the exception of class 9 environmental water, which has even greater protections, water held on licence for environmental purposes in the South Australian River Murray has the same rights, protections and characteristics as the water held for consumptive purposes under the same class. In other words, water held for environmental purposes on a South Australian River Murray licence – whether it be held by the Commonwealth, The Living Murray or the South Australian Minister – cannot be re-allocated or used for consumptive purposes.

New South Wales. Similarly, all return flow from environmental watering events within the River Murray in South Australia is protected and is not available for non-environmental consumptive purposes.

As outlined in section 5.3 of the SA River Murray WRP, the current River Murray WAP also increases the protection for planned environmental water in the SA River Murray, which cannot be taken for consumptive purposes. The specific categories of planned environmental water for the SA River Murray are outlined in section 5.3.2 of the WRP.

In terms of connected water resources, volumes which cannot be allocated or used for consumptive purposes under the Eastern Mount Lofty Ranges Water Allocation Plan (SAMDB NRMB 2013) and which reach Lake Alexandrina are recognised as planned environmental water for the purposes of the River Murray WAP and WRP. Similarly, held environmental water from the SA River Murray WRP area for delivery to the Coorong is to be accounted as held environmental water over the barrages. However, for the purposes of the non-prescribed SA Murray Region WRP area, this water is recognised as planned environmental water and is protected as such once in the lagoons of the Coorong (under the rules of the regional NRM Plan).

Finally, all licensed consumptive take in the South Australian River Murray is required to be metered. Licences are issued with a condition that a meter must be installed and read quarterly.

In combination, the above arrangements ensure that all environmental water is protected from extraction, re-regulation or substitution throughout the length of the River Murray in South Australia.

Murray-Darling Basin Act 2008

The *Murray-Darling Basin Act 2008* facilitates the operation of the Murray-Darling Basin Agreement 2008 (Schedule 1 of the Water Act 2007 (Cwlth)) to promote and co-ordinate effective planning and management of the water and other natural resources of the Murray-Darling Basin.

The South Australian Minister for Environment and Water is appointed as a State Constructing Authority under the Murray-Darling Basin Agreement 2008. The Constructing Authority carries out the obligations of the State of South Australia under the Murray-Darling Basin Agreement in particular to construct, operate and maintain works and to implement measures authorised by the Murray-Darling Basin Authority ("the Authority").

A Memorandum of Understanding between the Murray-Darling Basin Authority and the Minister records the responsibilities of the parties pursuant to the MDB Agreement. The Minister has conferred on SA Water and the Department for Environment and Water (DEW) the function of acting as an operational agent of the Constructing Authority and other infrastructure management and projects in accordance with a Memorandum of Administrative Arrangement (MAA) dated 19 January 2018.

The Chief Executive of DEW has a delegation made pursuant to section 18 of the Murray-Darling Basin Act 2008 for the operation and control of works for the purpose of implementing the Annual Environmental Watering Priorities for the South Australian River Murray Water Resource Plan Area. The Chief Executive of DEW has sub-delegated the above responsibility to the Group Executive Director, Water and Director, River Murray Operations. The powers sub-delegated by the Chief Executive cannot be further sub-delegated.

This Act gives effect to arrangements agreed between the Contracting Governments to give effect to the Basin Plan, the Water Act and State water entitlements. The operation of works listed in Schedule A of the Murray-Darling Basin Agreement 2008 and programs for environmental outcomes in the Annual Corporate Plan and Annual Work Plan are authorised through this Act.

River Murray Act 2003

The River Murray Act 2003 came into operation on 24 November 2003. The Act aims to protect, restore and enhance the River and its natural resources (including water, soil, ecosystems and heritage associated with the River). It also aims to ensure that the River and natural resources are used and managed in a sustainable way. One way in which the Act helps to protect the River is through imposing a ‘duty of care’. The ‘duty of care’ is a duty to take reasonable precautions to ensure that your actions do not cause harm to the River. The duty applies to everyone.

The RM Act also authorises the Minister for Environment and Water to institute, supervise or promote programs to protect, maintain or improve the River Murray. This includes the construction, maintenance, operation or removal of works and the entering into management agreements to further the objects of the Act or the Objectives for a Healthy River Murray (ORMs). The Minister also has the power under this Act to do anything necessary to further the purposes of the Basin Plan, the objects of the Murray-Darling Basin Act 2008 or giving effect to the terms or requirements of the Murray-Darling Basin Agreement.

The Chief Executive of DEW has a delegation pursuant to section 12 of the River Murray Act 2003 for the construction, maintenance and operation of works under this Act. The Chief Executive of DEW has sub-delegated the above responsibility to the Group Executive Director, Parks and Regions, Group Executive Director, Water, Director, River Murray Operations and Regional Director, South Australian Murray-Darling Basin. The powers sub-delegated by the Chief Executive cannot be further sub-delegated.

The operation of works and programs for environmental outcomes not part of the Murray-Darling Basin Agreement 2008 are authorised through the River Murray Act 2003 and the MAA.

Table 1: SA governance and responsibilities for River Murray operations

Entity	Authority	Responsibility
Minister for Environment and Water	The Minister responsible for the <i>Murray-Darling Act 2008 (SA)</i> is appointed as a State Constructing Authority under the MDB Agreement The operation of assets not included in Schedule A of the MDB Agreement is authorised by the <i>River Murray Act 2003 (SA)</i> .	The Constructing Authority is appointed by the <i>Murray-Darling Basin Act 2008 (SA)</i> ⁴ to carry out the obligations of the State of South Australia (“the State”) under the Murray-Darling Basin Agreement approved by the <i>Murray-Darling Basin Act 2008 (SA)</i> (“the Agreement”), and in particular to construct, operate and maintain works and to implement measures authorised by the Murray-Darling Basin Authority (“the Authority”). A Memorandum of Understanding between the Murray-Darling Basin Authority and the Minister records the

⁴ Section 9 (b)

Entity	Authority	Responsibility
		<p>responsibilities of the parties pursuant to the MDB Agreement.</p> <p>The Minister has conferred on SA Water and the Department for Environment and Water (DEW) the function of acting as an operational agent of the Constructing Authority in accordance with a Memorandum of Administrative Arrangement (MAA) dated 19 January 2018.</p> <p>The <i>River Murray Act 2003</i> (SA) authorises the Minister to institute, supervise or promote programs to protect, maintain or improve the River Murray⁵.</p> <p>This includes the construction, maintenance or removal or works and any work the Minister thinks fit to further the objects of the Act or the Objectives for a Healthy River Murray (ORMs) and the entering into management agreements.</p>
DEW	<p>Under the MAA DEW is responsible for:</p> <ul style="list-style-type: none"> • Projects approved and funded by the Ministerial Council, Basin officials Committee and Authority as part of its Non-River Management Programmes; • Investigations into new silt interception schemes • Operation and maintenance of the hydrometric network from Lock 9 to the Lower Coorong • Delivery of Run of River Surveys at the request of SA Water; and • Any other project specified and agreed by the parties, and attached to the MAA as a Service Schedule <p>The Chief Executive of DEW has a delegation made pursuant to section 18 of the <i>Murray-Darling Basin Act 2008</i> for the operation and control of works for the purpose of implementing the Annual Environmental Watering Priorities for the South Australian River Murray Water Resource Plan Area.</p> <p>The Chief Executive of DEW has sub-delegated the above responsibility to the Group Executive Director, Water and Director, River Murray Operations. The powers sub-delegated by the Chief Executive cannot be further sub-delegated.</p> <p>The Chief Executive of DEW has a delegation pursuant to section 12 of the <i>River Murray Act 2003</i> for the construction, maintenance and operation of works under this Act.</p>	<p>DEW facilitates environmental water delivery and watering events within the River Murray Water Resource Plan Area including impacts on third parties and management of environmental and water quality risks.</p> <p>DEW is responsible for accounting of environmental water in South Australia.</p> <p>DEW supports the statutory responsibilities of e-water holders in the use of HEW delivered into SA.</p> <p>DEW reports on environmental outcomes in SA.</p> <p>DEW has the primary responsibility for PPM implementation in South Australia through the instruments outlined in this document (policies, procedures and water accounting practices).</p>

⁵ Section 9 (1) (f)

Entity	Authority	Responsibility
	The Chief Executive of DEW has sub-delegated the above responsibility to the Group Executive Director, Parks and Regions, Group Executive Director, Water, Director, River Murray Operations and Regional Director, South Australian Murray-Darling Basin. The powers sub-delegated by the Chief Executive cannot be further sub-delegated.	
SA Water	Under the MAA, SA Water is responsible for the construction, operation and maintenance of infrastructure related works and measures authorised under the Agreement funded either by the Authority in accordance with the terms of the Agreement (except the programmes DEW is responsible above) or by the Constructing Authority.	Operate the Structures in accordance with the Operations Plan and further instructions from DEW regarding the operation and control of works for the purpose of implementing the Annual Environmental Watering Priorities for the South Australian River Murray Water Resource Plan Area.
MDBA	The MDBA is manager of RMO assets and River Murray operations as prescribed by the MDB Agreement.	<p>Determines procedures and directions for the operation of works constructed or measures implemented pursuant to the MDB Agreement.⁶</p> <p>Assesses the possible effect of any proposal on the flow, use, control or quality of the water in the River Murray in South Australia and authorise works for the benefit of State Contracting Governments.⁷</p> <p>Provides advice on flows to the South Australian border and other relevant matters.</p>

⁶ Clauses 61, 65, 66, 68 MDB Agreement

⁷ Clauses 49, 63, MDB Agreement

3 Additional policies and procedures to support PPM implementation

Policies and Procedures to manage return flows (PPM1)

The policy and procedure arrangements described below have been designed to support the implementation of PPMs and to clearly articulate the arrangements and processes that apply to the delivery and management of all environmental water in South Australia. These documents are approved at the chief executive level in DEW and will be subject to a biennial review process, unless otherwise required. The documents have been informed by input and advice from the MDBA and Commonwealth Environmental Water Office (CEWO), who will also be involved in the regular review of these documents. For more detail refer to the individual policies and procedures.

From 1 July 2019, any exercise of delegated Ministerial authority for River Murray operations in South Australia will be conditional on acting consistently with these abovementioned policies and procedures, as well as with any agreements reached with the relevant environmental water holder about environmental water delivery.

As outlined further below, water delivery schedules are developed to give effect to the Commonwealth Environmental Water Delivery Plans. The schedules outline: the proposed volumes of Commonwealth water for use; expected ecological outcomes; operational strategies; delivery and accounting considerations; roles and responsibilities; reporting arrangements; monitoring; delivery and risk management.⁸

3.1 Unregulated flow policy and procedure

This policy and procedure guides the use of unregulated flow in the South Australian River Murray. The River Murray Water Allocation Plan for the South Australian River Murray protects unallocated water from extraction for consumptive use. This policy provides clarity regarding the potential environmental use of unregulated flow in South Australia. It is important to note that, under the WAP, South Australia does not provide for supplementary access to unregulated flows when environmental water may be delivered and it is protected from extraction in line with the requirements of the Murray Darling Basin Agreement.

3.2 Transmission losses policy and procedure

The policy for application of losses to environmental water entitlements sets out the following guidelines:

- Under regulated conditions, incremental losses will be calculated based on the advice provided in the technical report *Methodology for calculation of losses to environmental water in SA*

⁸ While water delivery schedules have only been developed with the CEWH to date, water orders are placed with the MDBA, following consideration by the Southern Connected Basin Environmental Watering Committee (SCBEWC), for other forms of environmental water that are in addition to the SA entitlement. Even if there are no schedules in place, the relevant environmental water will be managed in accordance with the policies outlined in section 3 of this document and will be subject to reporting and other arrangements as outlined in section 4.

(Montazerri & Gibbs 2019). Losses relating to weir pool manipulation actions and floodplain infrastructure use will require modelled net water use calculations;

- When environmental water and unregulated flows occur at the same time, no losses are applied to environmental water;
- Where losses are required to be calculated, they will be done so in accordance with the model and method set out in the above technical report *Methodology for calculation of losses to environmental water in SA* (Montazerri & Gibbs 2019). This work was undertaken using the most up to date information and science.

The procedure sets out the steps that need to be taken in order to apply losses to environmental water. Losses that are calculated and applied are recorded in the SA environmental water accounting spreadsheet and associated documentation.

3.3 Refined Source model and technical report

The technical report *Methodology to Calculate Water Use Losses for Environmental Water Delivery in South Australia* (Montazerri & Gibbs 2019) details the model used to calculate losses associated with environmental water in SA. The document identifies how the model is run and the assumptions.

Use of the model is adopted when calculating all losses, according to the relevant policies and procedures detailed below for transmission losses, return flows and unregulated flow, for environmental water in SA. This is with the exception of the Lower Lakes where a different approach is taken to calculating water use at the barrages through the barrage calculator. The application and estimation of losses is negotiated and reviewed with the relevant environmental water holders.

3.4 Return flow policy and procedure

The Environmental Water Return Flow Policy guides the use of return flow from environmental watering actions in the River Murray system in the South Australian Murray-Darling Basin (SA MDB) by ensuring that the accounting of return flow from environmental watering actions in the South Australian River Murray enables return flow from one site to be re-used for environmental outcomes downstream.

The policy sets out the following guidelines:

- Return flow from environmental watering actions will not be available for consumptive extraction purposes.
- The environmental water use associated with an environmental watering action will be accounted using the MDBA modelled 'net water use' method. The return flow volume will equal the total volume required to implement the action (i.e. the volume delivered) minus the estimated volume associated with evaporation and infiltration and the estimated volume retained on-site ("environmental use").

The use of return flows must be managed consistently with the requirements of water holders and documented in individual watering schedules for specific events.

Steps to manage return flows in SA and account for them are set out in the procedure. This includes steps such as recording return flows in the environmental water delivery and use accounting spreadsheet.

Development of the policy and procedure was done in consultation with the CEWO and MDBA.

3.5 Procedure for environmental water accounting in South Australia

The Procedure for environmental water accounting in South Australia (including the associated environmental water accounting spreadsheet) takes into account environmental water across the two WRP areas. The water accounting spreadsheet is designed to track the delivery of environmental water and associated actions from the South Australian border to the Coorong. The water accounting spreadsheet will also be used to underpin the register of HEW required under section 10.09(2) of the Basin Plan.

3.6 Environmental water delivery and use accounting spreadsheet

An environmental water accounting procedure and spreadsheet has been developed to assist with managing environmental water throughout the River Murray WRP area and into the Coorong. This has been designed to meet the five overarching PPM assessment criteria, with a major focus on transparency and location of environmental water use. Information provided by the Murray-Darling Basin Authority on environmental water delivery volumes at the South Australian border is used to populate the spreadsheet, aligned with actions as agreed between DEW and environmental water holders.

Environmental water can be delivered to South Australia in a range of different ways, including from directed releases from storages, return flows and during both regulated and unregulated flow periods. Accounting of environmental water is guided by modelled estimates of water use, meter readings (where applicable) and the barrage discharge calculator. The technical report and procedures has been developed to outline how environmental water use is calculated or estimated and represented in the spreadsheet, including return flows.

Monthly water use reporting occurs with key environmental water holders, in particular the CEWO. Additionally information is provided in DEW's weekly River Murray Flow Report and to a range of community groups.

DEW is committed to a process of continual improvement in relation to the accounting of environmental water and aligned to national standards where possible, on a case by case basis.

3.7 Additional policy and procedure for Minister's Reserve

The DEW Environmental Water Team, in the River Murray Operations Branch, manages the Minister's Reserve licence and account, including advising environmental asset managers of the volumes available prior to, and during, the water year. The Director, River Murray Operations is authorised by the Minister for Environment and Water to approve use of the water on the Minister's reserve licence and account.

A policy and procedure has been developed to provide guidance on how the water allocated on the Minister's water access entitlement on the Minister's Reserve Licence, or traded to this account, can be used for environmental benefit in the South Australian River Murray system and how the decision regarding use can be made in a fair, effective and transparent way.

The Minister's Reserve licence and account were established in June 2012 in response to the *Implementation Plan for Augmentation of the Adelaide Desalination Plant* Agreement between the South Australian Government and the Commonwealth Government and includes 6 GL of high reliability water entitlement held and managed by the South Australian Government for environmental purposes in the River Murray.

4 River Murray planning, operations and reporting

4.1 South Australian River Murray Long-Term Environmental Watering Plan

The Long-term environmental watering plan (LTWP) was prepared under Chapter 8 of the Basin Plan and is informed by the Basin-wide Environmental Watering Strategy. The purpose of the LTWP is to set out the priority environmental assets (PEAs) of the South Australian River Murray Water Resource Plan Area (SA River Murray WRP Area) and the environmental objectives, targets and environmental water requirements (EWRs) to be achieved for those assets over the longer term. This LTWP also incorporates the Coorong. Although considered by the Basin Plan to be part of the South Australian Murray Region Water Resource Plan Area, ecological outcomes in the Coorong are driven by surface water inputs from the River Murray via the Lower Lakes and the Coorong, Murray Mouth and Lower Lakes have been and are managed as a single asset. Therefore, the Coorong is addressed in this LTWP.

A landscape-scale approach has been used to define the environmental assets to reflect the ecological importance of the mosaic of habitats, ensuring that a holistic approach is taken to environmental water planning, delivery and evaluation.

Three priority environmental assets have been identified for the SA River Murray WRP Area:

- the Coorong, Lower Lakes and Murray Mouth Priority Environmental Asset is equivalent to the Coorong, Lakes Alexandrina and Albert Ramsar Wetland of International Importance;
- the South Australian River Murray Channel Priority Environmental Asset consists of the area between Wellington, South Australia, and the border inundated at flows up to 40,000 ML/day under normal River operations; and
- the South Australian River Murray Floodplain Priority Environmental Asset consists of the area that is inundated when flows are between 40,000 ML/day and 80,000 ML/day (under normal River operations).

The outer floodplain requires flows above 80,000 ML/day at the border to be inundated and is not included as part of the Floodplain PEA as the Basin Plan defines a priority environmental asset as an environmental asset that can be managed with environmental water (s8.49) and Murray-Darling Basin Authority (MDBA) modelling indicates that 80,000 ML/day QSA is the maximum flow rate at which active management of environmental water can occur.

The River Murray WAP reflects these EWRs and provisions in Chapter 3, consistent with the River Murray LTWP. The River Murray LTWP provides direction for the effective and efficient use of environmental water, and guides decision making and coordination of environmental watering. The LTWP will be reviewed once the South Australia River Murray WRP has been accredited by the Federal Water Minister under section 63 of the *Water Act*.

4.2 Annual Environmental Watering Priorities

Annual environmental watering priorities are informed by the Basin Plan, Basin-wide Environmental Watering Strategy and LTWP and are compiled from environmental watering proposals submitted by site managers which document the environmental watering needs for sites and assets in SA.

The watering proposals incorporate specific watering actions under the different water resource availability scenarios from very dry through to very wet. These proposals along with a multi-site watering proposal for SA (identifying how the various site proposals can be coordinated to optimise water delivery through the SA River Murray to the CLLMM) are submitted to the MDBA and the Southern Connected Basin Environmental Watering Committee (SCBEWC) and CEWO.

South Australia's annual priorities developed in partnership with water managers and local communities are combined with priorities from across the Basin to help with environmental water planning and delivery at a catchment scale. All parties who hold South Australian water access entitlements for environmental use are involved in this annual planning process and consultation occurs prior to finalising the annual plans.

The *SA River Murray Annual Environmental Watering Plan* presents SA priority environmental water needs and informs water holders and stakeholders of the preferred patterns of delivery and watering actions and is published and available on the DEW website.

South Australia undertakes a range of annual condition and event monitoring activities to assess watering outcomes, support planning and help determine whether environmental outcomes are being met. Environmental outcomes for each year are reported in the annual *South Australia's River Murray Water for the Environment Report* and Basin Plan reporting to the MDBA.

The state's annual priorities inform the agreements made with environmental water holders for the delivery of held environmental water to South Australia.

4.3 Commonwealth Environmental Water Holder Schedules

In South Australia, the Commonwealth Environmental Water Holder (CEWH) has arrangements and schedules with the Department for the Environment and Water, Nature Foundation South Australia, Renmark Irrigation Trust, South Australian Murray-Darling Basin Natural Resources Management Board, Banrock Station and the Ngarrindjeri Regional Authority to give effect to the Commonwealth Environmental Water Holder's annual *River Murray Valley – Commonwealth Environmental Water Delivery Plan*.

Lower River Murray, Coorong, Lower Lakes and Murray Mouth Watering Schedule

This schedule between the CEWH and DEW relates to the use of Commonwealth water (including return flows from upstream watering events, the Commonwealth's held SA allocation and direct trades) and covers watering actions in the SA River Murray WRP Area undertaken by DEW. This Schedule covers the largest volume of CEWH water to be delivered in the SA River Murray WRP Area and Coorong. Water delivery under this watering schedule is complemented by wetland watering via the Nature Foundation South Australia, Renmark Irrigation Trust, South Australian Murray-Darling Basin Natural Resources Management Board, Banrock Station and the Ngarrindjeri Regional Authority.

Schedules are developed annually with regard to the Basin Annual Environmental Watering priorities and are consistent with the Basin-wide Environmental Watering Strategy. The Schedule outlines the volumes of Commonwealth water proposed for use, expected ecological outcomes, operational strategies to support the ecological outcomes, delivery and accounting considerations, reporting and monitoring arrangements and communication activities for proposed watering actions in a specific

water year. A risk assessment is attached to the Schedule and assessment of risk occurs throughout watering events.

From 2019-20, the Schedule will be agreed by the Commonwealth Environmental Water Holder and the South Australian Basin Officials Committee member and made available on the DEW website.

4.4 South Australian Objectives and Outcomes for River Operations (SA O&O)

The South Australian Objectives and Outcomes for River Operations document is approved by the Group Executive Director, Water and provides specific details on the expected aims and outcomes for River Murray operations and management in South Australia, including but not limited to environmental water delivery.

The document identifies objectives and outcomes for the following areas:

- Water allocation, storage and management;
- Water accounting;
- RMO assets;
- People and communities;
- Environment;
- Communication and information management;
- Chowilla Floodplain;
- Pike Floodplain;
- Katarapko Floodplain;
- SA RM Floodplain;
- RM Channel;
- In-channel;
- Lower Lakes, Coorong and Murray Mouth.

The document outlines a set of Objectives and Outcomes that the Group Executive Director, Water and Director, River Murray Operations will have regard in respect of river operation functions. This includes an outline of factors that the Group Executive Director, Water will have regard to when, as Basin Officials Committee member, making decisions to defer and store part of South Australia's Entitlement for critical human water needs and private carryover under Schedule G of the Murray Darling Basin Agreement (clause (1)(a)(iii)(B)). Consistent with the water resource plan for the SA River Murray, these factors include:

- the volume of annual Entitlement that is or may be available to South Australia under different scenarios, along with the volumes of Entitlement that have already been set aside in Basin storages.
- the priority given to critical human water needs under the Water Act (2007) and Basin Plan and the responsibility given to Basin states for meeting their critical human water needs.

- an upper limit on annual deferrals for critical human water needs of 100 per cent of the volume identified by the Basin Plan for this purpose (204 GL).
- clause 7.8 of the Agreement on Murray-Darling Basin Reform (COAG 2008), which allows South Australia to defer in storage up to an equivalent of 150 per cent of its annual critical human water needs (306 GL).
- the ability of South Australia to meet demands for private carryover, ahead of any water year in which opening allocations are projected to be 50 per cent or less.
- minimising the risk that net additional reserves would need to be accumulated in below full Entitlement years (i.e. below 1,850 GL), when the environmental and third party impacts of accumulating such reserves would be more severe.
- possible effects on water and natural resources within the Murray–Darling Basin, in accordance with clause 50 of the MDB Agreement.

The SA O&O will be reviewed regularly to ensure that it is up to date and prior to the commencement of the new water year. Consultation on any changes to the SA O&O document will be undertaken in consultation with the CEWO and MDBA.

4.5 South Australia’s River Murray Annual Operating Plan

Clause 10 of the Basin Officials Committee’s Objectives and Outcomes for River Operations in the River Murray System requires the MDBA to prepare and adopt a River Murray System Annual Operating Plan (Basin-wide Plan). At the state level, an annual operating plan (AOP) is prepared each year for the purpose of aligning state operations with the Basin-wide Plan.

The SA Operating Plan has regard for the Annual environmental watering priorities for the South Australian River Murray WRP Area and also for the Coorong, which is part of the Murray Region WRP area.

The SA Operating Plan is approved by the Director, River Murray Operations and the Group Executive Director, Water and sets out defined operating limits within which senior water resource managers can make operational decisions. Operational decision-making outside of these ranges must be made by the Minister or the delegates (as outlined above).⁹

Decisions to operate outside normal operating ranges are made in consultation with the River Murray Operations Working Group (RMOWG). This Group is chaired by the Manager, Water Resource Operations and includes representation from other state agencies and the Commonwealth Environmental Water Holder (as an observer).

A Report on Delivery of South Australia’s River Murray Annual Operating Plan is prepared each year for the purpose of identifying the extent to which DEW has operated consistently with the Plan, including the South Australian Objectives and Outcomes for River Operations, which will be incorporated into the

⁹ The MDBA does not have the power to direct any operation in South Australia but provides support under the Clause 66 of the Murray-Darling Basin (MDB) Agreement.

2019-20 SA Operating Plan. The report also includes information on environmental water delivery to SA during the water year (the report will be publicly available on the DEW website).

The RMOWG has input into both the development of SA Operating Plan and the annual report on delivery of the plan.

4.6 River Murray Action Requests (RMAR)

Major environmental watering sites require dedicated event management plans. All other environmental watering actions must be identified and assessed in order to determine if there are likely to be negative impacts on the River Murray channel or downstream water users. To ensure that actions are unlikely to cause negative impacts on the environment and other users, a RMAR is completed and considered by the River Murray Operations Working Group where infrastructure (regulators, pipes and pumps) is to be used to enable environmental water to be taken from, or returned to, the River Murray.

As part of the process the following information is required from each proponent:

- location and proposed action (physical details);
- timeframe for proposed operation;
- potential risks and impacts resulting from the proposed operation;
- risk assessment (water quality, quantity and potential impact on infrastructure operations); and
- source and volume of environmental water.

Following the consideration of a proposal, the RMOWG will then provide comment as to whether the action is likely or unlikely to cause negative impacts on the River Murray and/or downstream users.

It is important to note that assessment by RMO and the RMOWG *is not an approval process* but a way for RMO to monitor and prevent any negative cumulative or singular impacts from occurring due to River Murray Actions.

As part of the process, all River Murray Action Requests are recorded by DEW as well as any comments made by members of the RMOWG in relation to the action.

A River Murray Action Request form is not required for environmental water used in the Lower Lakes as this is guided by a separate set of arrangements and reporting practices. These alternative arrangements include watering schedules with the CEWH and monthly water use reports that are issued by DEW to the CEWH to demonstrate how environmental water has been used.

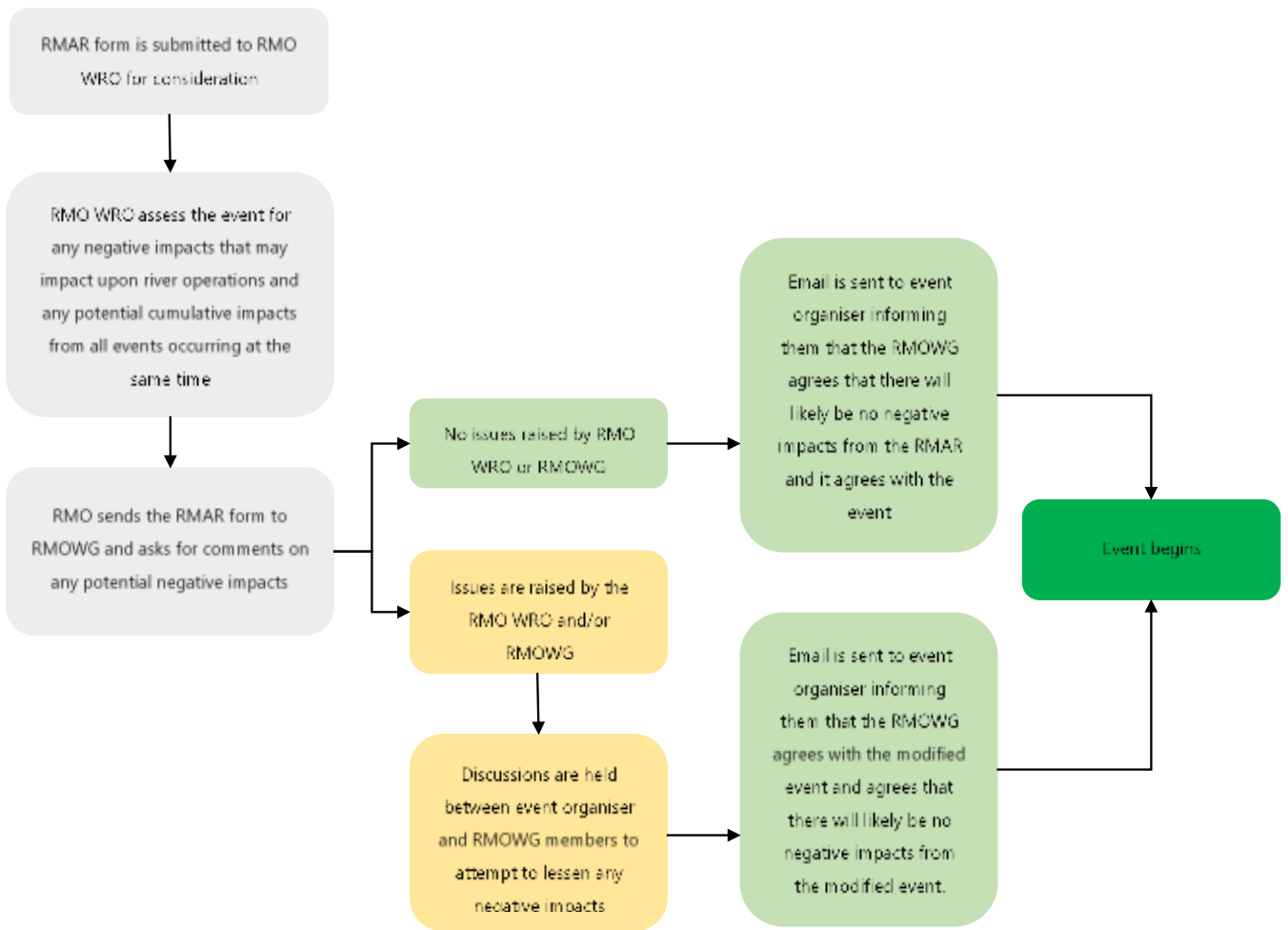


Figure 1: Process for assessing River Murray Action Requests

4.7 Managing environmental water and delivery arrangements

Environmental water is delivered and managed through a structured process that involves a direct and close working relationship with environmental water holders and managers, as well as other stakeholders.

Environmental watering priorities are discussed at the Southern Connected Basin Environmental Watering Committee (SCBEWC) and at annual planning meetings on state priorities attended by all environmental water holders.

Through this process, South Australia provides an overview of the actions to be undertaken and outcomes sought from the delivery of environmental water. There is an expectation that environmental water holders will aim, where possible, to coordinate the delivery of environmental water to meet outcomes along the River Murray System.

Figure 2 outlines how environmental water is managed in the South Australian River Murray.

When information on possible delivery timing is received from water holders, this is discussed with a range of groups that play a part in the delivery and management of environmental water. These groups include:

- Scientific Advisory Group for the CLLMM (Chaired by DEW);
- Barrage Operations Advisory Group (Chaired by MDBA)
- Chowilla Operations Advisory Group (Chaired by DEW);
- Environmental Water Coordination Forum (Chaired by DEW);
- River Murray Operations Working Group (Chaired by DEW);
- Weir Pool Manipulation Steering Committee and Technical Advisory Group (Chaired by DEW); and
- Coorong, Lower Lakes and Murray Mouth Community Advisory Panel (Chaired by Community member).
- Chowilla Community Reference Committee
- Traditional Owner groups in particular the First Peoples of the River Murray and Mallee Region, Mannum Aboriginal Community Association Inc (MACAI) and the Ngarrindjeri Regional Authority (NRA)
- NGO's and industry groups involved in environmental watering in SA including Nature Foundation SA, Renmark Irrigation Trust, Australian Landscape Trust, Ngarrindjeri Regional Authority; Banrock Station.

Environmental water delivery arrangements occur at a number of levels and involve the environmental water holders, DEW, MDBA and SA Water. When a decision is made on the volume of environmental water to be delivered to SA, the environmental water holders, MDBA and DEW work together to develop the delivery arrangement and profile at the SA border, with the MDBA providing notification of the delivery volume and timing to DEW. DEW acknowledges the request and then delivery commences based on a range of different mechanisms – i.e. a direct trade volume (generally a fixed volume) or an “up to” volume (depending on operational conditions at storages such as Lake Victoria).

The delivery arrangements are agreed prior to the water being delivered to ensure there is a clear and transparent process followed by all parties.

The CEWH is the largest delivery partner and regular contact and updates are provided to the CEWO about the timing, delivery and use of environmental water entitlements which are described each water year within agreed Watering Schedules.

Depending upon the operation to be undertaken to deliver environmental water and outcomes, discussions can occur up to several times per week with regular updates provided to the CEWO along with monthly reports for the use of CEWH environmental water in the CLLMM region which includes a three month forward plan.

Managing Environmental Water in the SA River Murray WRP Area (DEW lead process)

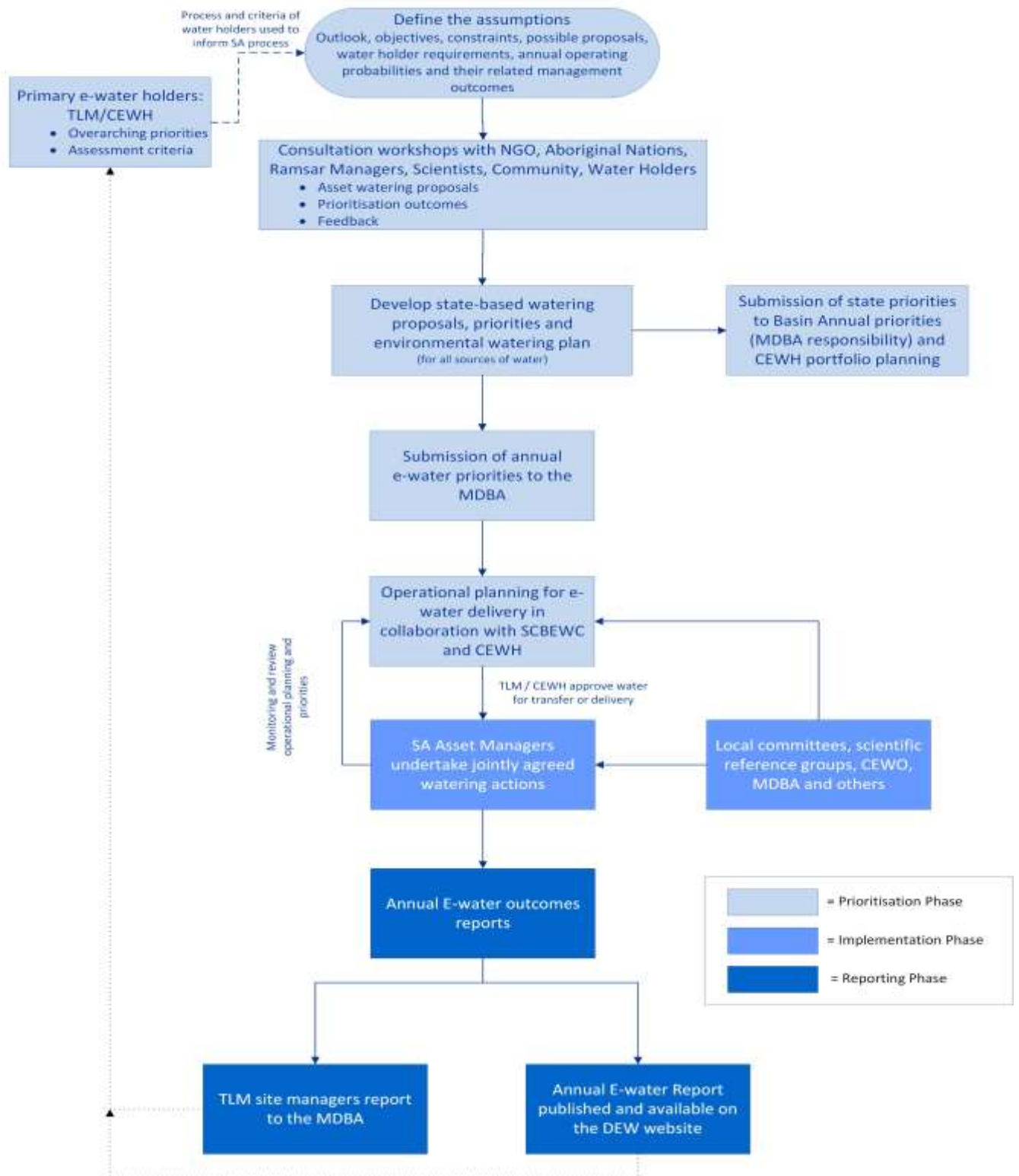


Figure 2: Managing environmental water in the South Australian River Murray

4.8 Reporting and accounting for environmental water use

There are both internal and external processes for disclosing information on environmental water use and management and this includes:

- Weekly River Murray Flow Report (external);
- Monthly Water Resources Update (external);
- Monthly water use and operations reports to the CEWO (internal); and
- Final annual water use acquittal report, special purpose environmental water accounting report and section 71 reporting.

The external information includes where and how much environmental water is being used and is done on a weekly basis through the publicly available River Murray Flow Reports distributed each Friday and the more comprehensive monthly water resources update. The Watering Schedule agreed with the CEWO describes processes and timelines for reporting on the use of specific environmental water allocations.

Monthly reports

Monthly reports are prepared by DEW on outcomes achieved in the Coorong, Lower Lakes and Murray Mouth (CLLMM) from the delivery and use of environmental water. Monthly reports include information on water quality and water levels, flow, ecological monitoring results and summarise any consultation with the broader community on water management in the region.

Annual reports including for the Basin Plan

DEW prepares an annual SA River Murray Environmental Watering report which is publicly available on the DEW website. These reports contain information about the volumes and timing of environmental water delivered in the SA River Murray, sites watered and outcomes achieved.

DEW provides annual reports to the CEWO on the outcomes of weir pool manipulation and pumping to floodplain sites with the use of Commonwealth Environmental Water. NGOs such as Nature Foundation SA also provide annual reports to the CEWO on the use of their water.

Annual report cards for the Chowilla Floodplain and the CLLMM are produced through The Living Murray program by DEW. These report cards outline change in ecological condition as a result of delivery of water for the environment. Report cards are available on the MDBA website.

DEW also contributes to the annual report by the SCBEWC (a public document) and contributes information and case studies on the outcomes of water delivery at key sites.

Annual condition and intervention monitoring reports from the Chowilla and CLLMM icon sites detail the benefits of water for the environment to native fish, waterbird, vegetation, invertebrate and frog populations. These reports are available on the MDBA and DEW websites.

4.9 Interaction between policies and procedures

South Australia's policies, procedures and other arrangements supporting PPM implementation are shown in **Figure 1**.

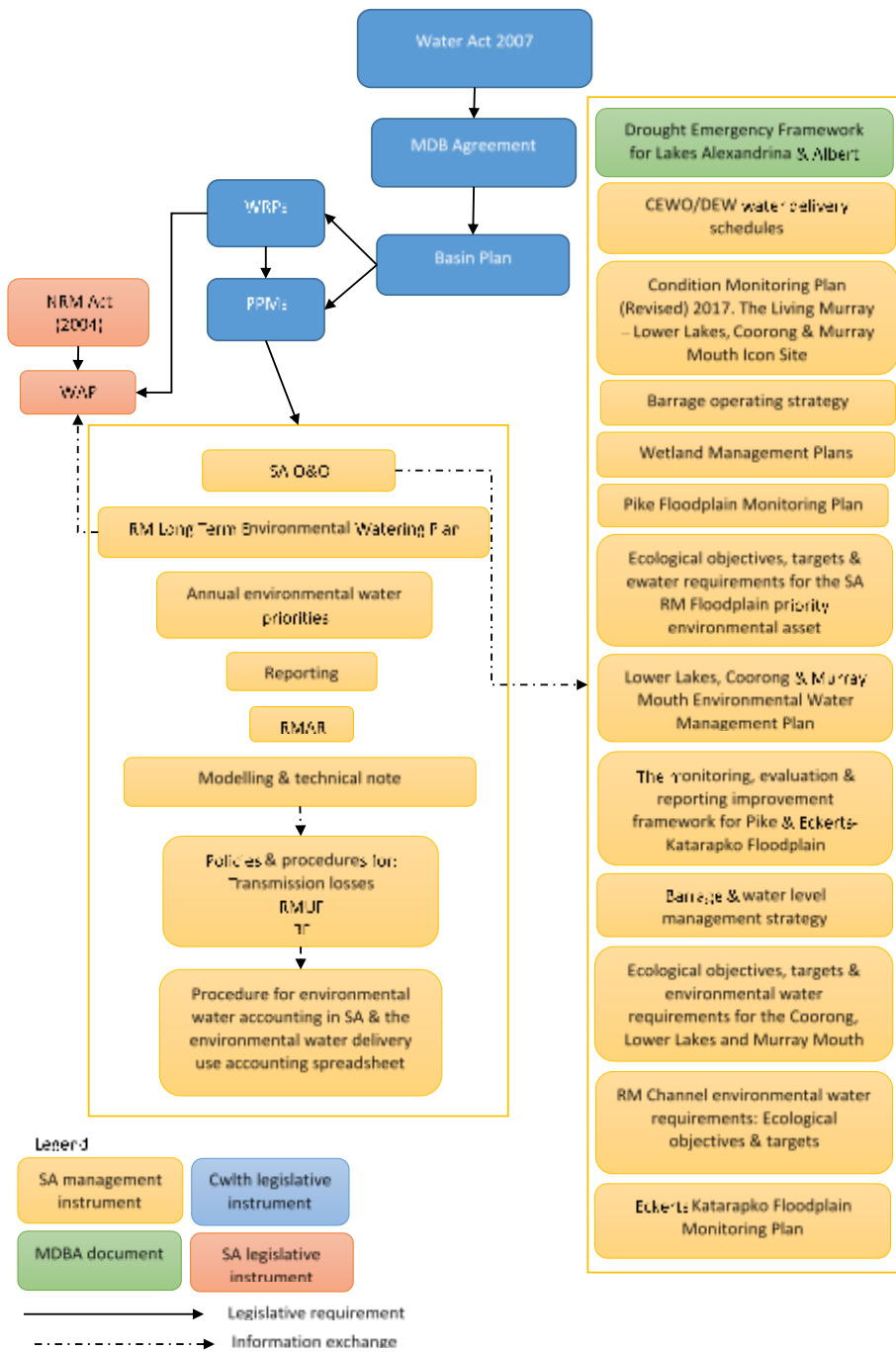


Figure 1: Links between PPM implementation actions for South Australia

5 Next Steps

To ensure ongoing confidence in the outcomes from 1 July 2019, South Australia is committed to a process of continuous improvement for the policies, procedures and underlying models and tools developed for PPM implementation. The future work summary below reflects feedback received from the MDBA and the CEWO on SA's PPM products, as well as additional work proposed by DEW.

The future work is proposed for further prioritisation with MDBA and CEWO and would be collaboratively rolled out based on agreed priorities and timeframes and resourcing requirements.

An initial phase of work will be undertaken with the MDBA and CEWO over six months to identify and further scope priority tasks and identify those specific to SA and those that may be best pursued collectively across the Murray-Darling Basin.

This initial phase of work will result in the development of a more detailed work program. A working group comprising DEW (River Operations, Policy and Science staff), CEWO and MDBA staff will be established to coordinate this work program.

Key principles that will guide the work program include:

- Policy measures provide for the efficient use of held environmental water that is protected from extraction, substitution or unnecessary reregulation.
- Water licence holders are equitably treated, irrespective of the purpose for the water use.
- The management of e-water within SA is based on management arrangements that are transparent to the basin community and enable full public accountability.

Water accounting is a key part of PPM implementation and is a major focus of this work program. Other elements such as planning processes and operational procedures could be further developed based on the input of water holders.

The future work can be broadly categorised under four distinct areas;

- On-going documentation of policies and procedures used for environmental water planning, and accounting practices;
- Model development and improvement;
- Revision and updating of site specific operating plans;
- Consistent and independent processes review and evaluation.

References

Basin Plan 2012 (Cwlth)

DEW, 2018, *2018-19 Annual Environmental Watering Plan for the South Australian River Murray*, Government of South Australia through the Department for Environment and Water

DEW, 2018a, *South Australian Murray Region Water Resource Plan*, Government of South Australia, through the Department for Environment and Water, Adelaide

DEW, 2018b, *South Australia's River Murray Annual Operating Plan 2018-19*, Government of South Australia through the Department for Environment and Water.

DEW, 2018c, *Report on the Delivery of South Australia's River Murray Annual Operating Plan 2017-18*, Government of South Australia through the Department for Environment and Water.

DEW, 2019, *Environmental Water Return Flow Procedure, DEW Environmental Flow Procedure No. 4*, Government of South Australia through the Department for Environment and Water.

DEW, 2019a, *Environmental Water Return Flow Policy, DEW Environmental Flow Policy No. 4*, Government of South Australia through the Department for Environment and Water.

DEW, 2019b, *Policy for Application of Losses to Environmental Water, DEW Environmental Flow Policy No. 10*, Government of South Australia through the Department for Environment and Water.

DEW, 2019c, *Policy for the Use of River Murray Unregulated Flow (RMUF) in the South Australian River Murray, DEW Environmental Flow Policy No. 5*, Government of South Australia through the Department for Environment and Water.

DEW, 2019d, *Procedure for Application of Losses to Environmental Water. DEW Environmental Flow Procedure No. 10*. Government of South Australia through the Department for Environment and Water.

DEW, 2019e, *Procedure for the Use of River Murray Unregulated Flow (RMUF) in the South Australian River Murray, DEW Environmental Flow Policy No. 5*, Government of South Australia through the Department for Environment and Water.

DEW, 2019f, *Procedure to account for environmental water delivery and use in South Australia. DEW Operational Procedure No XX*, Government of South Australia through the Department for Environment and Water.

DEW, 2019g, *Objectives and Outcomes for River Murray Operations in South Australia*, Department for Environment and Water, Adelaide

DEW, 2019h, *South Australian River Murray Water Resources Plan*, Government of South Australia, through the Department for Environment and Water, Adelaide

DEWNR, 2015, *Long term environmental watering plan for the South Australian River Murray water resource plan area*, Government of South Australia through the Department of Environment, Water and Natural Resources

DEWNR, 2016, *South Australia's Prerequisite Policy Measures Implementation Plan for the River Murray in South Australia*, Department of Environment, Water and Natural Resources, Adelaide.

Montazeri, M., Gibbs, M., 2019, *Methodology for Calculation of Losses to Environmental Water in South Australia*, Government of South Australia through the Department for Environment and Water, Adelaide, South Australia.

MDBA, 2014, *Basin-wide environmental watering strategy*, Murray-Darling Basin Authority, Canberra.

MDBA, 2015, *Pre-requisite Policy Measures Assessment Guidelines: Final*, Murray-Darling Basin Authority, Canberra.

Murray-Darling Basin Authority (MDBA) 2015. *Pre-requisite Policy Measures Assessment Guidelines Final*. Murray-Darling Basin Authority, Canberra

MDB BOC, 2018, *Objectives and outcomes for river operations in the River Murray System*, Murray-Darling Basin Authority for the Basin Officials Committee, Canberra.

NR SA MDB, 2019, *Water Allocation Plan for the River Murray Prescribed Watercourse*, Natural Resources SA Murray-Darling Basin, Murray Bridge

Natural Resources Management Act 2004 (SA)

Water Act 2007 (Cwlth)