



MURRUMBIDGEE WATER RESOURCE PLAN

# Prerequisite Policy Measures: Procedures Manual for the Murrumbidgee Regulated River

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Prerequisite Policy Measures: Procedures Manual for the Murrumbidgee Regulated River

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### **More information**

Water Planning Implementation | Water Planning

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Paul Simpson Consulting Pty Ltd

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# Abbreviations

| Abbreviation | Description   |
|--------------|---|
| CEWO         | Commonwealth Environmental Water Office                   |
| HEW          | Held Environmental Water                                  |
| MDB          | Murray-Darling Basin                                      |
| MDBA         | Murray-Darling Basin Authority                            |
| PPM          | Prerequisite Policy Measure                               |
| PPM IP       | NSW Prerequisite Policy Measure Implementation Plan       |
| SCBEWC       | Southern Connected Basin Environmental Watering Committee |
| SDL          | Sustainable Diversion Limit                               |
| TLM          | The Living Murray   |
| WMA          | <i>Water Management Act 2000</i>                          |
| WRP          | Water Resource Plan                                       |
| WSP          | Water sharing plan  |

# 1. Introduction

Pre-requisite Policy Measures (PPMs) seek to maximise the beneficial outcomes of water recovered for the environment under the Basin Plan. In developing the Basin Plan, the Murray-Darling Basin Authority (MDBA) assumed that rivers will be managed to maximise environmental outcomes with the water available without impacting on the reliability of other water users. This concept was being explored by Basin States for the multi-site environmental watering trials in the River Murray. The intended outcomes were for:

- Environmental water flows throughout the length of the river, and between rivers; and protected from extraction, re-regulation or substitution, and
- To allow the release of environmental water on top of other in-stream flows, including unregulated flow events.

These outcomes were intended to be achieved through the unimplemented policy measures described under 7.15 of the Basin Plan, and are now referred to as PPMs:

- Credit environmental return flows for downstream environmental use,
- Allow the call of held environmental water (HEW) from storage during unregulated flow events.

Implementing PPMs is critical to achieving the environmental outcomes of the Basin Plan with the water identified for recovery. The implementation of PPMs will assist to minimise the volume of water recovered by allowing for more efficient and effective use of HEW to maximise environmental outcomes under the Basin Plan, without impacting on the reliability of other water users.

PPMs are applied during the operation of the SDL Adjustment Mechanism in the Basin Plan. Any increase to the SDL resulting from supply measures will be calculated by adding notified supply measures and removing any unimplemented PPMs from the benchmark conditions of development, while maintaining equivalent environmental outcomes and no detrimental impacts on reliability of supply of water to the holders of water access rights that are not offset or negated.

In developing the PPMs, the NSW government is discharging its obligations to implement water reform and deliver on the Basin Plan. PPMs are supported by the NSW *Water Management Act 2000* and will enable the effective and efficient delivery of environmental water for beneficial outcomes.

## 1.1. Background

PPMs allow the use of HEW at multiple sites along the length of the river, and between rivers (environmental flow reuse), and provides for HEW to be ordered from a headwater storage during unregulated flow events (piggybacking). These measures are significant changes to the way that water is managed and accounted for in the Murray-Darling Basin. In NSW, HEW is environmental water that is held as part of a licensed volumetric entitlement (see Appendix B).

Under the *Intergovernmental Agreement on Implementing Water Reform in the Murray-Darling Basin 2013*, NSW agreed to deliver a Prerequisite Policy Measures Implementation Plan by June 2017 to the Murray-Darling Basin Authority (MDBA).

The NSW Prerequisite Policy Measures Implementation Plan (PPM IP) was endorsed by the MDBA in May 2017.

## 1.2. Principles underpinning NSW PPM implementation

The NSW PPM IP sets out four guiding principles for the implementation of PPMs:

1. NSW will only implement PPMs to the extent that detrimental impacts on the access rights of licence holders can be mitigated or offset, whilst also enabling optimum environmental outcomes.
2. NSW will develop operational tools that are simple, practical to implement and cost effective.
3. Reliability and access characteristics of licensed entitlements held for environmental water purposes are the same as other licensed entitlements.
4. Adaptive management is required.

The development of this Manual has been based on these principles. The application of the processes in this manual will be guided by these principles to seek to maximise the beneficial outcomes of water recovered for the environment under the Basin Plan while maintaining reliability to other licence holders. Where there is uncertainty, NSW will adopt a precautionary approach to minimise potential detrimental impacts.

It is recognised that there are also benefits stemming from the implementation of PPMs. In some instances, these benefits may offset any impacts over the longer term. However, until the benefits and impacts can be determined, NSW will continue to implement PPMs based on the above principles.

PPM Assessment Guidelines were provided by the MDBA to inform the content and format of states' implementation plans for PPMs. The Guidelines require the arrangements for the implementation of PPMs by the states' to meeting the following criteria:

- Are secure and enduring,
- Are fully operable,
- Are transparent,
- Identify and mitigate risks,
- Provide for releases of Held Environmental Water from storages on top of other in-stream flows, including unregulated events, and
- Allow environmental water to flow throughout the length of the river, and between rivers; and be protected from extraction, re-regulation or substitution.

These criteria will be used by the MDBA to assess the implementation of PPMs.

## 1.3. Relationship to other plans and legislation

The management of environmental water in accordance with PPMs occurs within the NSW water management framework, guided by the *Water Management Act 2000*.

PPMs are implemented within NSW through the NSW PPM IP and this Manual, together with supporting changes to Water Sharing Plans (WSPs) in each water source and the WaterNSW water supply Works Approval.

This Manual provides more detailed codification of the operation of PPMs in the Murrumbidgee regulated river water source, consistent with the higher level principles and approaches set out in the NSW PPM IP.

To establish statutory support for the process set out in the NSW PPM IP and the Manual, amendments will be made to the *Water Sharing Plan for the Murrumbidgee Regulated River Water Source 2016*. These changes will go on public exhibition and be gazetted along with other plan amendments being made as part of the NSW water resource plan development process. Amendments to the water sharing plan require concurrence from the NSW Minister for Environment.

The roles and obligations of the river operator to implement PPMs is also recognised through the inclusion of specific conditions to the WaterNSW Murrumbidgee water supply works approval.

A table demonstrating how PPMs relate to Commonwealth and State plans and legislation is provided in Appendix A.

## **1.4. Overview of the PPM Procedures Manual**

This Procedures Manual (this Manual) has been prepared to provide a detailed framework for the operation and continual improvement of Prerequisite Policy Measures (PPMs) in the Murrumbidgee regulated river water source. The implementation of PPMs will maximise the efficient use and beneficial outcomes from the use of held environmental water (HEW).

The objective of this Manual is to sufficiently codify the operational process of delivering PPMs in the Murrumbidgee regulated river water source to achieve an appropriate balance between providing protection for other water licence holders, and allowing for the efficient and effective use of environmental water licences to achieve the environmental outcomes envisaged under the Basin Plan.

This Manual document is part of NSW's commitment to implement PPMs by June 2019.

This Manual will be made publicly available by Department of Planning, Industry and Environment - Water, and will be reviewed annually via the process set out in this Manual. Changes may arise from the annual review, or as a result of proposals brought forward for consideration. The publicly available Manual will be kept updated as changes are approved.

This Manual is set out as described in Table 1.

Table 1: Overview of the Manual

| Section   | Content   |
|-----------|---|
| Section 1 | <p>Introduction</p> <ul style="list-style-type: none"> <li>• Background to PPMs</li> <li>• NSW principles and objectives for PPMs</li> <li>• Relationship of the Manual to other plans and legislation</li> <li>• Overview of the NSW PPM Procedures Manuals</li> </ul> |
| Section 2 | <p>Overview of PPMs in NSW</p> <ul style="list-style-type: none"> <li>• Call of water from storage</li> <li>• Environmental flow reuse</li> <li>• Operability of PPMs in NSW</li> </ul>   |
| Section 3 | <p>Framework for the operation of PPMs</p> <ul style="list-style-type: none"> <li>• Key framework components</li> <li>• Roles and responsibilities</li> <li>• Consultation</li> </ul>   |
| Section 4 | <p>The Murrumbidgee system:</p> <ul style="list-style-type: none"> <li>• Environmental water sites</li> <li>• Delivery pathways</li> <li>• Murrumbidgee actions</li> <li>• Risk mitigation</li> </ul>   |
| Section 5 | <p>Adaptive management:</p> <ul style="list-style-type: none"> <li>• Annual reporting</li> <li>• Annual evaluation and review for continuous improvement</li> </ul>   |

## 2. Overview of PPMs in NSW

This section describes how the PPM requirements to call water from storage and recognise environmental flows that are returned to the water source for downstream environmental benefits are enabled in current NSW legislative and policy settings. This NSW overview includes arrangements for both the Murrumbidgee and NSW Murray and Lower Darling regulated rivers. These NSW arrangements will be strengthened and refined through the processes described in this Manual.

### 2.1. Call water from storage

PPMs enable HEW to be ordered from a headwater storage during unregulated flow events (piggybacking). Piggybacking allows the environmental water holders to target flows to nominated delivery points along the river.

The Department of Planning, Industry and Environment – Biodiversity and Conservation (formerly NSW Office of Environment and Heritage (OEH)), as the NSW environmental water manager works with WaterNSW to develop a water order including the target flow and location. This process is an extension of the consultation already undertaken via the EWAGs. The water order can request that the order be met from a headwater storage. Piggybacking allows such a water order to be placed during delivery of other system demands, including during unregulated flow events, with agreement from WaterNSW on matters such as the rates of releases, accounting arrangements, and flood/water quality risk mitigation measures. The planning, ordering and delivery process for HEW orders is set out in more detail in Section 2.3.

As the river operator, WaterNSW is required to meet system orders subject to operating constraints of the system. In the Murrumbidgee, flows that result from water orders made using piggybacking cannot be used to meet other access licence water orders, planned environmental water rules or general system operational rules. HEW is recognised as it moves through the system through the delivery of target volumes according to the agreed water order and requires ongoing monitoring of flows along the river reach.

For shared resources in the Murray and Lower Darling, when water is called from storage, WaterNSW approves orders placed by Department of Planning, Industry and Environment - Biodiversity and Conservation, following consultation with MDBA where necessary. WaterNSW then directs the MDBA to release orders in accordance with the Murray-Darling Basin Agreement and the 'Objectives and Outcomes for River Operations in the River Murray System' document.

The methodology adopted in the Murrumbidgee and NSW Murray and Lower Darling for calculating the volume to be debited from an environmental account is to determine the difference between releases made with the environmental water holder's order and the releases that would have been made without the environmental water holder's order.

### 2.2. Environmental flow reuse

This section describes how the PPM requirement to recognise environmental flows that are returned to the water source for downstream environmental benefits is implemented in NSW.

Environmental flow reuse recognises the return flow of water downstream of an environmental watering event, allowing that water to be used for downstream environmental benefits and use at multiple sites. These return flows are protected from extraction and re-regulation, including in the downstream system.

The procedures for environmental flow reuse of HEW in the Murrumbidgee are provided in this Manual:

- A delivery pathway is nominated to describe the intended environmental watering event. The nominated delivery pathway allows a water order using HEW to nominate multiple

environmental use sites along the length of a river, subject to delivery capacity and operating constraints.

- For environmental sites that are not considered accurate, an assumed use method is required. The assumed use method is used to estimate the delivery of environmental water and the downstream return flows.
- For each order using an assumed use method, an Assumed Use Statement is required for the purposes of debiting accounts of HEW licences.
- Flows that result from water orders made using environmental flow reuse cannot be used to meet other access licence water orders, planned environmental water rules or other general system operational rules. HEW is recognised as it moves through the system in line with the assumed use method.

Environmental flow reuse also applies when HEW is delivered into a downstream river system, such as inflow from the Murrumbidgee to the River Murray).

HEW inflows from the Murrumbidgee River into the River Murray are managed under the bulk entitlement delivery arrangement provided under the Murray Darling Basin Agreement (Clause 98 MDBA's Role in the Operation of Storages). NSW advises the MDBA that any flows passing beyond the point of delivery (Balranald) not be re-regulated for any use. Under this arrangement, NSW instructs the MDBA to recognise the volume of (HEW) flows being delivered to the SA border without reregulation into Lake Victoria. NSW will provide appropriate loss factors for the MDBA to apply for deliveries from NSW tributaries, including the Murrumbidgee. These accounting arrangements are outlined in Section 2.3.3 of this Manual.

For shared resources in the Murray system, to recognise and protect downstream environmental flows in the River Murray, NSW also uses Clause 98 of the Murray Darling Basin Agreement to direct the MDBA to deliver a bulk volume of NSW HEW to South Australia. These instructions reflect the assumed uses specified in the relevant Specific Objective and Outcome (SO&O).

Inter-state environmental flow reuse will be facilitated by 'in-stream' adjustments. Endorsed by BOC (BOC 65), the 'in-stream' adjustment trial allows for the adjustment of environmental return flows between NSW and Victoria and provides an enabling mechanism to allow return flows in Victoria to be traded for immediate delivery in NSW and vice versa. Existing provisions can facilitate these actions, through allocation trade of returned flows for immediate delivery, and where necessary reallocation of resources between Victoria and NSW under clause 113 of the Murray-Darling Basin Agreement.

The 'in-stream' adjustment trial allows the use of HEW in an efficient manner. This option is available for use, on a trial basis, at any time(s) in the three years from 1 July 2019 to 30 June 2022. BOC will consider the permanent adoption of the arrangements following a review of the results.

If an individual watering action is proposed to use inter-state trade of return flows between NSW and Victoria, it will be assessed by State Constructing Authorities in collaboration with MDBA River Operators. The State Constructing Authorities (WaterNSW in the case of NSW) provides written approval for the action to MDBA, recognising that the in-stream accounting option is used to make the trade adjustment. MDBA's monthly accounts model is revised as necessary to document the volume of trade which was adjusted in-stream, the month(s) of delivery and the river reaches involved. In addition, the volumes of trade adjustment in Hume that are reversed are also documented. The operation of the in-stream adjustments for inter-state trades are also reported as part of River Murray Operations' Annual Summary of River Operations, and be reviewed by the Independent River Operations Review Group in September of the year following any individual trial.

## 2.3. Operability of PPMs in NSW

PPMs are operationalised through the valley-specific Procedures Manuals and supporting conditions in the NSW Water Supply Work Approvals. This Manual codifies the operational process of delivering PPMs in the water source so that an appropriate balance is achieved between allowing for the efficient and effective use of environmental water licences to achieve the environmental outcomes envisaged under the Basin Plan and providing protection for water licence holders.

Relevant NSW agencies (Department of Planning, Industry and Environment - Water as the regulator, WaterNSW as the river operator and Department of Planning, Industry and Environment - Biodiversity and Conservation as the environmental water manager) have provided a joint letter of commitment to MDBA confirming that PPMs will continue to be implemented as per the arrangements described in the Procedures Manuals from 1 July 2019. This letter remains in effect until the new clauses in the relevant WSPs are gazetted and amendments to the Water Supply Work Approvals are finalised.

The sections set out below detail the requirements and responsibilities to develop and agree on operating arrangements for the delivery of HEW using PPMs, including event planning, water ordering, delivery, accounting, reporting and review processes.

### 2.3.1. Planning

Environmental watering events are complex and require a process for developing and placing water orders. This process includes a requirement for river operators to be involved in the development process to ensure that events can be managed over a range of climatic and operational conditions. Existing forums such as the environmental water advisory groups (EWAGs) are used by the environmental water managers for consultation required at various stages in the development of environmental watering events. Environmental water holders (CEWO and Department of Planning, Industry and Environment - Biodiversity and Conservation) also work together to develop watering schedules which outline the purpose, conditions and arrangements for environmental watering events in NSW that use Commonwealth environmental water. Environmental water holders develop annual environmental watering priorities and plans which consider a range of weather and water availability scenarios.

The environmental water holders will work with WaterNSW to develop a proposal including the target flow and location.

An iterative process may be required during this planning phase and requires cooperation between the regulator, the river operator and the environmental water holders, including agreement on any assumed use rates, consideration of impacts (both positive and negative) and risks, and any mitigation measures to be applied.

For significant environmental watering events, development of water orders must commence well in advance of the target release period to allow sufficient time for collaboration between environmental water managers and WaterNSW.

### 2.3.2. Ordering and release of water

Following the above process for planning and consultation, the NSW environmental water manager (Department of Planning, Industry and Environment - Biodiversity and Conservation) prepares an initial proposal for the delivery of any environmental watering events that relies on the use of PPMs. These watering proposals contain:

- A general description of the proposed event, including the environmental objectives of the event,
- The PPM actions intended to be used, including target flow and/or diversion rates and locations,

- An initial estimate of the likely volume of licensed account water that will be required, and the licences that are proposed to be debited,
- The proposed delivery path, including the debiting points and expected timing and delivery of any return flows and
- The decision making process proposed to manage any potential variation in weather conditions or other relevant factors.

Water orders must be sufficiently detailed to provide guidance for river operators over a range of potential climatic conditions and may also require protocols for within-event decision making.

The river operator is required under their water supply Works Approval to provide timely advice regarding system flow limits, any matters that might vary the volume of water that would be required, and risks in delivery of the proposed order. An iterative process may be required to settle complex water orders and will require cooperation between the river operator and the environmental water manager.

Environmental water holders are responsible for estimating the volume of water required to meet their environmental objectives in their water orders, having regard to advice from WaterNSW.

The river operator is responsible for operating the river including approving a water order. Operational risks and the available mitigation measures are to be considered by WaterNSW when considering water orders that require the release of water using PPMs. This will be undertaken in consultation with the environmental water manager prior to approval (or rejection) of an order using PPMs. Any orders that are refused/rejected will be documented in the annual environmental release river operations report, together with supporting explanations and rationale.

When an order that relies on the use of PPMs is accepted by the river operator, the release of water to meet that order should be incorporated into delivery planning for the valley, and included in any advice regarding operation of the regulated river system to licensed water users and publicly for the community. The environmental water manager, in placing a water order relying on PPMs, is required to undertake appropriate communication actions to ensure that potentially affected landholders and the general community are aware of the proposed watering event.

The river operator is required to provide operational reporting on release of held environmental water, including regular environmental water use accounting during events.

### 2.3.3. Accounting

WaterNSW maintains water allocation accounts that record water allocation announcements, water ordered, water taken and carry over for each water access licence, including those licenses owned by environmental water holders. They are responsible for determining and debiting volumes of held environmental water as a result of environmental watering actions using PPMs.

As accounting methods become established through the application of the Procedures manual, the site and event-specific arrangements will be codified in the Manual (see Section 4).

Where there is accurate measurement of take and return, the net take of water is debited from the account. The net take for an environmental site is the difference between the water leaving the water source at the relevant extraction point minus the amount of water returning to the water source from that extraction point. These points are nominated on the water order.

For environmental sites where measurement is not considered accurate, an assumed use method is used to estimate the delivery of held environmental water:

1. WaterNSW will provide an assumed use statement to the environmental water manager that sets out the calculation of the volumes of water to be debited from water access licence accounts.
2. Where relevant, the volume of water accounted as held environmental water that is to be passed into the Murray.
3. Summary information for each element of the assumed use method, including loss rates.

4. The source of data used, any assumptions, and a summary of the calculations used.
5. The volumes of water of water to be debited from water access licence based on the above.

These statements capture the decisions made during the planning and ordering phases between the regulator, the river operator and the environmental water holders, including agreement on any assumed use rates and mitigation measures to be applied. Existing dispute resolution procedures are to be applied in the event of a dispute.

Bulk accounting arrangements for the shared resources in the River Murray System are detailed in the Specific Objective and Outcomes for directed release and assumed use in the Objectives and Outcomes for River Operations in the River Murray System document.

Murrumbidgee end-of-system flows will be recognised in the Murray. Additional flows arriving at Balranald are calculated as the difference between actual flows at Balranald and those that are estimated would have occurred without the environmental water order. The volume of additional flow at Balranald will be managed as a Bulk Entitlement Delivery in the NSW Murray Valley. WaterNSW will provide the River Murray Operator (MDBA) with the daily flow volume of HEW passing Balranald, which will be adjusted by RMO for travel time to the SA border and reduced proportionally for transmission loss conditions. A proportional loss rate in the NSW Murray is currently used, and is assessed based on being commensurate with the prevailing conditions, outlook and level of risk. Incremental loss will be reviewed as more data becomes available and potentially deemed appropriate and implementable.

As much as practicably possible, losses applied to environmental water will be based on the 'incremental loss' resulting from the additional flow created by environmental water (i.e. the difference between the actual transmission losses and those that would have occurred without the environmental releases that rely on PPMs occurring). For example, where environmental water makes up a large portion of flow in the river the environment bears most of the system losses and a high percentage of loss is applied to the delivery. Conversely where only a small proportion of environmental water is added to the river flow a much smaller loss rate is applied.

Determining loss rates is based on best available information, and will become more accurate through experience and use of PPMs. In the early stages, a more conservative or higher loss rate is applied to ensure no detrimental impacts to reliability for licensed water users. This method will become more refined and accurate through application in successive years.

Assumed use methods and accounting arrangements must be consistent with legal instruments, including bulk entitlements and the Murray-Darling Basin Agreement. As much as practicably possible, assumed used methods are to:

- Use accurate metering and measurement where and when available (as nominated in the Manual)
- Fit-for-purpose with appropriate balance between rigour and practicality of implementation
- Balance the delivery of HEW using PPMS for its efficient and effective use without generating unacceptable adverse impacts to licensed water holders
- The level of conservatism is proportional to the confidence in the assumed use method and risks
- Be reviewed over time and improved as experience and knowledge grows.

### 2.3.4. Reporting

The river operator provides operational reporting on releases of environmental water during events.

An Annual Environmental River Operations Report is to be prepared by the River Operator that documents the application of the specific PPM watering actions used in that water year, including the accounting of river flows, transmission losses, and water delivery that occurred. Where

information is available, the report includes comparisons of assumed use with actual/estimated river transmission losses and use, associated with watering actions that rely on that assumed use methods.

The environmental water manager will prepare an Annual Environmental Watering Statement that documents any issues that arose in the ordering or delivery and accounting of environmental water using PPMs. The environmental water manager consults with other environmental water holders and stakeholders including the CEWO and EWAGs when preparing these reports.

These annual reports forms the basis for the annual review process.

### **2.3.5. Review**

The NSW PPM framework includes an adaptive management process to provide for the continuous improvement of the PPM processes set out above, for improved environmental water management.

The Department of Planning, Industry and Environment – Water as the regulator will conduct an annual review of the implementation of PPMs that considers the outcomes of undertaking PPM watering actions. The review will be guided by the principles set out in the NSW PPM IP, this Manual and the assessment guidelines set out by the MDBA. The Department of Planning, Industry and Environment - Water is responsible for ensuring that appropriate changes to the regulatory framework are made to give effect to any recommendations arising from this review, in consultation with key stakeholders including Department of Planning, Industry and Environment - Biodiversity and Conservation and WaterNSW.

The PPM Working Group will consider the review and any recommendations. The Department of Planning, Industry and Environment – Water will prepare and publish a report on the review each year, including any findings of the review and recommendations.

This framework provides the necessary flexibility to enable the regulator, the environmental water holders and river operators to learn, adapt and refine as environmental watering evolves. A structured review process is provided to allow for refinement and improvement to the framework for PPM operation, to capture learnings from environmental watering actions as they are carried out and to facilitate continuous improvement for effective and efficient delivery of water for the environment.

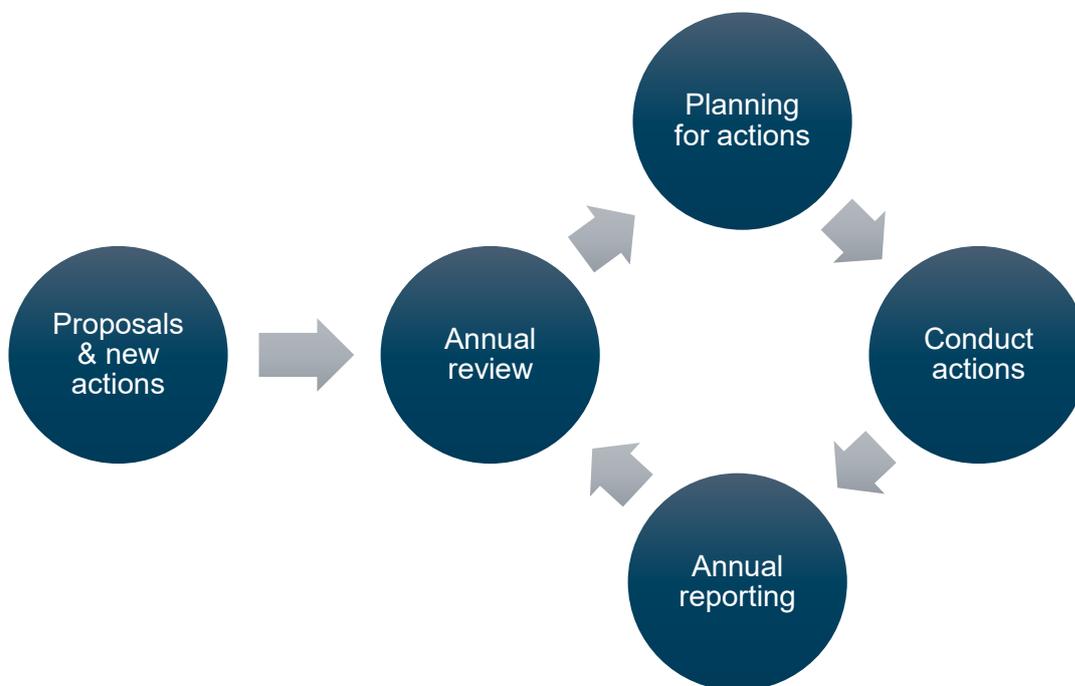
## 3. Framework for the operation of PPMs

### 3.1. Key framework components

The operational framework for PPMs consists of the following components:

- PPM actions agreed and approved for use
- Operational processes for ordering and delivering PPMs (as set out in Section 2 of this Manual),
- Accounting methods for managing environmental water and debiting accounts.
- An annual review process to provide transparency regarding use of PPMs in that year, and inform consideration of any changes or new measures that may be appropriate.

The annual process involving these elements is shown in Figure 1. Roles and responsibilities are detailed in Section 3.2.



**Figure 1: An overview of the PPM process**

#### 3.1.1. Actions

In consultation with WaterNSW and environmental water holders, Department of Planning, Industry and Environment – Water can agree to actions that will allow HEW to be managed in new ways to improve delivery of PPMs. Actions must operate in conjunction with a number of supporting measures of the NSW PPM framework, including:

- A delivery pathway,
- An assumed use method,
- Linked mitigation measures.

Actions and their supporting measures will be considered to mitigate or offset any detrimental impacts on the access rights of licensed water holders and any impacts to the efficient use of held environmental water. Actions can include mitigation measures to offset these risks as necessary.

The Department of Planning, Industry and Environment – Water in its role as the regulator is responsible for approving actions and any subsequent variations following review.

Recognising that environmental watering actions will require ongoing development over time, an adaptive management approach is required. To provide for changes over time, the actions can be modified or new actions agreed, by the Department of Planning, Industry and Environment – Water in its role as the regulator. Changes will be made after consultation with the environmental water managers, WaterNSW and key stakeholders, as set out in Section 3.3.

While each of the PPMs can be implemented separately, it is important to note that at times both PPMs (i.e. piggybacking and environmental flow reuse) will operate together. For example, when the environmental licence holder makes an order from a nominated water storage (piggybacking), whether during a regulated or unregulated flow event, it will likely request the use of “environment flow reuse” to move that order through different environmental sites and between river systems.

In recognition that actions and their supporting measures will need to be tested to build a body of knowledge, particular actions and supporting measures may be trialled initially. These trial actions will ensure that material risks are appropriately identified and mitigated and that the actions are operable. Trial actions will also operate in conjunction with supporting measures including a delivery pathway, an assumed use method and linked mitigation measures. Trial actions and their supporting measures must be reviewed and re-approved annually. If the application of a trial action proves successful, then it may be determined as an (ongoing) action following the annual review of the operation of PPMs.

### 3.1.2. Supporting measures

Watering actions rely on a number of supporting measures of the framework in order to operate. These are:

- **Delivery pathways:** describe the intended environmental watering event, and show how the watering actions, assumed use methods and mitigation measures link together.
- **Assumed use methods:** a method of estimating the delivery of environmental water is required whenever that use cannot be accurately measured. These methods will be used to produce Assumed Use Statements for the purposes of debiting accounts of HEW licences.
- **Mitigation measures:** any measures that must be taken to ensure that detrimental impacts on the access rights of licensed water holders are mitigated or offset.

## 3.2. Roles and responsibilities

The key roles and their responsibilities within the framework for the operation of PPMs are set out in Table 2.

**Table 2: Roles and responsibilities for the implementation of PPMs**

| Role      | Organisation   | Responsibilities   |
|-----------|--|--|
| Regulator | NSW Department of Planning, Industry and Environment - Water | <ul style="list-style-type: none"> <li>• The effective implementation of PPMs via NSW’s policy and regulatory framework</li> <li>• Adhere to the principles of the NSW PPM IP</li> <li>• Review and approve actions and any subsequent variations following the review phase of PPM operations including trials</li> <li>• Ensure the required statutory instruments are in place to give effect to agreed actions</li> <li>• Undertake annual review of the implementation of PPMs</li> <li>• Assess assumed use/in-stream loss rates/methods as per</li> </ul> |

| Role           | Organisation | Responsibilities   |
|----------------|--------------|--|
|                |              | <p>principles and rules in this Manual</p> <ul style="list-style-type: none"> <li>• Consult with WaterNSW, Department of Planning, Industry and Environment - Biodiversity and Conservation, MDBA, SCBEWC, and CEWO when conducting each annual review</li> <li>• Approve proposed trials of new actions if suitable conditions and mitigation measures are demonstrated</li> <li>• Undertake consultation with water users following any determination to trial or agree a new action or supporting measure</li> <li>• Classification of take/return measurement at recognised environmental watering sites</li> </ul>  |
| River Operator | WaterNSW     | <ul style="list-style-type: none"> <li>• Work collaboratively with Department of Planning, Industry and Environment - Biodiversity and Conservation to develop orders for environmental water that rely on agreed and trial actions and recommend appropriate mitigation strategies</li> <li>• Develop assumed use/in-stream loss rates/methods as per principles and rules in this Manual</li> <li>• Undertake risk assessment of proposed actions and recommended mitigation strategies in collaboration with Department of Planning, Industry and Environment - Biodiversity and Conservation prior to approval or rejection of water orders that rely on actions based on assessments of proposed actions and their mitigation strategies</li> <li>• Operate the river to give effect to actions for the delivery of PPMs, including advice and action on events (e.g. rain/inflows) that trigger changes to the action</li> <li>• Prepare an assumed use statement for an environmental watering event that relies on an assumed use method</li> <li>• Provide operational reporting on release of environmental water, including regular environmental water use accounting during events</li> <li>• Submit an annual Environmental Releases River Operations Report on river operations involving actions</li> <li>• Consult with licensed water users or their representative groups prior to submitting the annual Environmental River Operations Report</li> <li>• Support the development of new proposals and trial actions for the operation of PPMs</li> <li>• Classification of take/return measurement at recognised environmental watering sites</li> </ul> |

| Role                        | Organisation   | Responsibilities   |
|-----------------------------|--|--|
| Environmental Water Holders | Department of Planning, Industry and Environment - Biodiversity and Conservation | <ul style="list-style-type: none"> <li>• Work collaboratively with other environmental water holders (i.e. CEWO and SCBEWC) in the planning and coordinated use of environmental water in consultation with river operators, including risk assessments and mitigation measures</li> <li>• Work collaboratively with the river operator when developing orders for environmental water that rely on actions</li> <li>• In collaboration with other environmental water managers, submit an annual environmental watering statement to the Department of Planning, Industry and Environment – Water that reports on the environmental outcomes of environmental watering relying on the use of PPMs</li> <li>• Development of new proposals for the operation of PPMs</li> <li>• As the environmental water manager for NSW, responsible for placing water orders with WaterNSW</li> </ul>                              |
|                             | Commonwealth Environmental Water Office  | <ul style="list-style-type: none"> <li>• Work collaboratively with Department of Planning, Industry and Environment - Biodiversity and Conservation in the planning and coordinated use of environmental water in consultation with river operators, including risk assessments and mitigation measures</li> <li>• Work collaboratively with Department of Planning, Industry and Environment - Biodiversity and Conservation for developing orders for environmental water that rely actions and their mitigation measures</li> <li>• Provide input into the annual environmental watering statement prepared by Department of Planning, Industry and Environment - Biodiversity and Conservation</li> <li>• Work collaboratively with Department of Planning, Industry and Environment - Biodiversity and Conservation to contribute to and develop new proposals for the operation of PPMs</li> </ul>               |
|                             | MDBA via The Living Murray Initiative  | <ul style="list-style-type: none"> <li>• Through the Southern Connected Basin Environmental Watering Committee (SCBEWC), work collaboratively with other environmental water holders in the planning and best use of environmental water in consultation with river operators</li> <li>• Work collaboratively with the river operator when developing orders for environmental water that rely on agreed or trial actions</li> <li>• Work collaboratively with Department of Planning, Industry and Environment - Biodiversity and Conservation and the CEWO to support the annual environmental watering statement prepared by Department of Planning, Industry and Environment - Biodiversity and Conservation</li> <li>• Work collaboratively with Department of Planning, Industry and Environment - Biodiversity and Conservation to contribute to and develop new proposals for the operation of PPMs</li> </ul> |

### 3.3. Consultation

Consultation is an important element in the annual delivery of environmental water that relies on trial or agreed actions via PPMs, as it provides transparency regarding the operation of the actions and the performance of any mitigation measures.

The minimum consultation requirements associated with the operation of the trial and agreed actions are:

- The regulator (Department of Planning, Industry and Environment - Water) will consult with WaterNSW, NRAR, Department of Planning, Industry and Environment - Biodiversity and Conservation, MDBA, SCBEWC, and the CEWO when conducting each annual review,
- The regulator (Department of Planning, Industry and Environment - Water) will consult with licensed water users or their representative groups regarding any proposal for change to the agreed actions, or to implement any new trial actions,
- The river operator (WaterNSW) will consult with licensed water users or their representative groups prior to submitting the Annual Environmental Releases River Operations Report, and
- The environmental water manager (Department of Planning, Industry and Environment - Biodiversity and Conservation) will consult with:
  - The river operator regarding proposed watering actions before placing an order,
  - Stakeholders when developing, and the community more generally when delivering, environmental water orders relying on the use of agreed and trial actions as appropriate, and
  - Other environmental water managers and stakeholders (including environmental water advisory groups (EWAGs),) when preparing annual environmental watering statement reporting on environmental outcomes from delivering environmental water orders relying on the use of PPMs.

A NSW PPM Working Group will be established and will include relevant NSW and Commonwealth agencies to provide a forum regarding the operation, implementation and review of PPMs.

## 4. Murrumbidgee system

### 4.1. Environmental sites

The assessment of the accuracy of take and return of environmental sites is intended to provide transparency and support the development of appropriate mitigation measures.

#### Classifications

All take and return of flows by sites will be assessed for accuracy and categorised as described in Table 3. Individual classifications are to be based on a supporting assessment report prepared by a suitably qualified professional. The assessment approach will be dependent on the measurement method used. The classification will be undertaken between the Department of Planning, Industry and Environment – Water and WaterNSW.

**Table 3: Classification of take/return measurement at recognised environmental watering sites**

| Classification                  | Description   |
|---------------------------------|---|
| Category 1:<br>Accurate (+/-5%) | Take is metered or accurately measured, meeting the requirements of the NSW Non-Urban Water Metering Policy, and is suitable for water account debiting |
| Category 2:                     | Does not meet requirements for Category 1; take is measured or estimated, but requires mitigation measures to address uncertainty                       |

Examples of methods of take measurement that could be used include:

- Meters (including direct measurement devices using ultra-sonic or infra-red sensors at major canal offtakes),
- Hydrographic flow measurement (with QA system for measurement and rating table),
- Estimation method (including operationally estimated loss rates/method, calculations based on areas of inundation, simplified rules based on modelling results etc.).
- Models (including hydro-dynamic models, or hydrologic such as IQQM/Source).

If no site classification is provided, then a site will be deemed to be Category 2.

Environmental sites that receive water via PPM actions provided for under this Manual must:

- Be recognised in Table 4, and
- Have their point(s) of take and return assessed for accuracy.

Table 4: Register of environmental sites for PPMs

| Environmental site                                | Description  | Take/return measurement method  | Classification |
|---|--|---|----------------|
| Mid Murrumbidgee wetlands                         | Floodplain wetlands and forest between Wagga and Hay that is progressively inundated as flows exceed 20,000 ML/day (TBC) at Wagga Wagga: <ul style="list-style-type: none"> <li>For subsequent delivery to Murray</li> <li>For subsequent delivery to Lowbidgee</li> </ul> | TBD (e.g. water balance between dams/Wagga and Balranald as per BED trials)<br><br>Return flows to be recognised in the Murray are recognised at Balranald.       | TBD            |
| Lowbidgee (Nimmie/Caira)                          | Wetlands and forest to the south of the Murrumbidgee River watered from the Nimmie, Caira, and North Caira regulators within the Maude Weir pool.  | <u>Take:</u><br>Meters at flow gauge d/s of 3 x undershot sluice gate regulators.<br><u>Return flows:</u><br>TBD (e.g. Rating table to flow gauge on Yanga Creek) | Category 1     |
| Lowbidgee (Redbank South)                         | Wetlands and forest to the south of the Murrumbidgee River watered from the Yanga, and Waugorah regulators within the Redbank Weir pool.   | Meters at offtakes  | Category 1     |
| Lowbidgee (Redbank North)                         | Wetlands and forest to the north of the Murrumbidgee River watered from the Glenn Dee, and Juanbung regulators, and Patto's pipes within the Redbank Weir pool.  | Meters at offtakes  | Category 1     |
| Lowbidgee overbank flows                          | Flows in excess of ~ 6,000ML/d d/s Redbank cause overbank flows into Lowbidgee. Higher flows break out further upstream  | Water balance between Hay and Balranald   | TBD            |
| Gooragool Lagoon (Mid-Murrumbidgee wetlands)      | TBD  | Regulator / irrigation pump meter (Kooba station)   | TBD            |
| Yarradda (Mid-Murrumbidgee wetlands)              | TBD  | Pump  | TBD            |
| Coonancoocabil Lagoon (Mid-Murrumbidgee wetlands) | TBD  | Regulator   | TBD            |
| Yanco Creek system                                | Lagoon and overbank flows  | Water balance between inflows and Darlot TBD  | TBD            |

| Environmental site                            | Description  | Take/return measurement method  | Classification |
|---|--|---|----------------|
| Beavers/Old Man Creek system                  | For fish and habitat condition flows, particularly outside irrigation season.  | <p><i>Take:</i><br/> Mundowey Weir on Beavers Creek – ratings table</p> <p><i>Return flows:</i><br/> Potentially Old Man Creek at Kywong ratings table (but this is ~15 km from end of system) or<br/> Old Man Creek at Brewarrana Lane (41000215) – which is close to the end of system, unsure if always reading and rated.</p>               | TBD            |
| Murrumbidgee main channel and key anabranches | Productivity and fish spawning/condition/ dispersal flows that remains in channel and are able to be used downstream in the Lowbidgee or Murray. | <p><i>Take: Additional flows ordered from headwater storages or Tombullen or ordered at a particular river gauge (above other system requirements and orders).</i></p> <p><i>Return flow:</i><br/> Additional flow recorded (above system requirements/orders) at Maude or Redbank (for use in Lowbidgee) or Balranald (for use in Murray).</p> | TBD            |

## 4.2. Water delivery pathways

Water delivery pathways describe the intended environmental watering event, and show how the watering actions, assumed use methods, and mitigation measures link together. An example is the release of environmental water from the major storages (Blowering and/or Burrinjuck dams) to coincide with downstream tributary inflows, often referred to as a “piggybacking” release, with the intent of:

- Creating a peak flow of sufficient duration to inundate the many wetlands along the Murrumbidgee River – principally between Wagga Wagga and Hay,
- Watering wetlands and forests in the Lowbidgee area, and/or
- Flow through to the Murray River and into South Australia.

The following are general environmental watering pathways (Table 5) for delivering PPMs in the Murrumbidgee, subject to approval of appropriate supporting measures. Watering pathways for the application of PPMs in the Murrumbidgee regulated river water source will continue to be reviewed and refined in accordance with this Procedures manual.

**Table 5: General delivery pathways for the Murrumbidgee Valley**

| Pathway Reference   | Description   |
|---|---|
| (1) Headworks storages to Murray River  | Directed release from either, or both of, Blowering and Burrinjuck dams to provide flows within the normal operating limits to achieve outcomes within the Murrumbidgee River, and then to be delivered to the Murray River.  |
| (2) Headworks storages to Lowbidgee   | Directed release from either, or both of, Blowering and Burrinjuck dams to provide flows within the normal operating limits to achieve outcomes within the Murrumbidgee River, and then to be delivered to the Lowbidgee offtake regulators in the Maude and Redbank Weir pools.  |
| (3) Headworks storages to Murray River via mid-Murrumbidgee wetlands  | Directed release from either, or both of, Blowering and Burrinjuck dams to provide flows above the normal operating limits to achieve outcomes within the Murrumbidgee River and the mid-Murrumbidgee wetlands, and then to be delivered to the Murray River.   |
| (4) Headworks storages to Lowbidgee via mid-Murrumbidgee wetlands   | Directed release from either, or both of, Blowering and Burrinjuck dams to provide flows above the normal operating limits to achieve outcomes within the Murrumbidgee River and the mid-Murrumbidgee wetlands, and then to be delivered to the Lowbidgee offtake regulators in the Maude and Redbank Weir pools and overbank into Lowbidgee.         |
| (5) Yanco Offtake and Coleambally escapes to Murray River via Yanco-Billabong Creek system  | Directed release through Yanco Creek Offtake or through Coleambally Irrigation Area escapes to provide flows to achieve outcomes within the Yanco-Billabong Creek system and then to be delivered to the Murray River system (Edward River).  |
| (6) Headworks storages and enroute storages to Murray River via mid-Murrumbidgee wetlands.  | Directed release from either, or both of, Blowering and Burrinjuck dams, supplemented by releases from Tombullen storage and Hay Weir, to provide flows above the normal operating limits to achieve outcomes within the Murrumbidgee River and the mid-Murrumbidgee wetlands, overbank into Lowbidgee, and then to be delivered to the Murray River. |
| Note 1: Associated Assumed Use methods for these pathways are to be nominated in Section 4.3.                                     |   |
| Note 2: Normal operating limits refers to historical practice of operating the river based on time of year and system conditions. |   |

## 4.3. Murrumbidgee actions

PPMs allow HEW to be managed in new ways. The actions described in this manual include agreed actions which have been approved for ongoing use, as well as trial actions which are to be approved annually. These watering actions are developed in consultation with WaterNSW and environmental water holders (see Section 2 and Section 3.3).

Actions are shown in Table 6, together with their linked delivery pathways, relevant assumed use methods and mitigation measures.

The trialling of new actions is also expected to be important to balance the effective implementation of PPMs with ensuring that there are no detrimental impacts to the reliability of licensed entitlements. The regulator (Department of Planning, Industry and Environment - Water) may agree to trial an action for a period, with additional conditions applied where appropriate and developed according to the processes described in Section 2 of this Manual. Trials and supporting measures, including mitigation measures, will be considered by the Department of Planning, Industry and Environment - Water, WaterNSW, environmental water holders and the PPM Working Group. Trial actions must be re-assessed each year as part of the annual review process.

All actions and the supporting measures have been considered to minimise or offset, where necessary, potential detrimental impacts to the reliability of licensed water users.

Recognising that environmental watering actions using PPMs will require ongoing development over time, the adaptive management approach in Section 5 provides a process for including further actions or variations to existing actions and their supporting measures.

Table 6: Actions and supporting measures for the Murrumbidgee Valley

| Action  | Delivery Pathway  | Assumed Use Method  | Mitigation Measure/s   |
|---|---|---|--|
| Ordered flow                                      | Directed releases from storage to meet target flow at Wagga Wagga                           | Releases from storage:<br>+ d/s tributary flows<br>– consumptive flow requirement d/s Wagga   | Daily debits capped at the lesser of:<br>order + 10%, or<br>observed flow<br>Post event accounting using actual water use d/s Wagga.   |
| Directed releases from storage                    | (i) Headworks storages to Murray River via mid-Murrumbidgee wetlands                        | Additional releases from storage, calculated as the difference between the actual releases from storage and those that are estimated would have been made without the environmental water order | <ul style="list-style-type: none"> <li>• Release rates are limited to ensure downstream flows remain within the channel capacity limits (as per WSP).</li> <li>• Orders are subject to “out-of-balance” assessment to consider any possible implications to delivery from storages. This includes:               <ol style="list-style-type: none"> <li>a. water unable to be released from Blowering in time to meet demands due to Tumut River channel capacity, and</li> <li>b. Blowering Dam emptying before inflows from the Snowy Scheme arrive (assumed to be available when announcing allocations)</li> </ol> </li> </ul> |
|   | (ii) Headworks storages and en-route storages to Murray River via mid-Murrumbidgee wetlands |   |  |
| Recognition of flows along the Murrumbidgee River | Release from storage  | Protection is limited to additional release volumes, with appropriate reductions for incremental transmission losses.   |  |

| Action   | Delivery Pathway     | Assumed Use Method  | Mitigation Measure/s  |
|--|----------------------|---|---|
| Recognition of Murrumbidgee end-of-system flows in the Murray  | HEW at end of system | <p><u>Additional flows arriving at Balranald</u> calculated as the difference between actual flows at Balranald and those that are estimated would have occurred without the environmental water order.</p> <p>Note: The volume of additional flow at Balranald will be managed as a Bulk Entitlement Delivery in the NSW Murray Valley.</p> <p>Murray River in regulated conditions*:<br/>Proportional loss rate</p> | <p>Proportional loss rate in the NSW Murray will be assessed based on being commensurate with the prevailing conditions, outlook and level of risk.</p> <p>WaterNSW will provide RMO with the daily flow volume of HEW passing Balranald which will be adjusted by RMO for travel time to the SA border and reduced proportionally for transmission loss conditions*.</p> |
| <p><i>*While proportional loss is currently applied, incremental loss will be reviewed as more data becomes available and potentially deemed appropriate in the future</i></p> |                      |   |   |
| <p>Note: normal operating limits/levels refers to historical practice of operating the river based on time of year and system conditions.</p>                                  |                      |   |   |

## 4.4. Risk mitigation

The release and use of held environmental water using PPMs is a change to the way that water has traditionally been managed and accounted for in the Murrumbidgee. Managing environmental water in different ways can potentially result in positive or negative impacts to water users. Possible risks include impacts on the reliability of allocations due to directed releases and impacts to the efficient use of held environmental water. Both positive and detrimental effects of PPMs will be taken into account when considering any potential impacts and their mitigation measures to achieve an appropriate balance between allowing for the efficient and effective use of held environmental water licences to achieve the environmental outcomes and providing protection for other water licence holders.

Where there is uncertainty, initially conservative estimates of environmental water use will be applied. These methods and approaches will be improved over time as a body of knowledge is developed and more accurate measurement and modelling becomes available. These estimates will be based on best available information and subject to review, refinement and improvement. The level of conservatism applied will be proportional to the confidence in the assumed use and level of risk. Over time, new and more innovative approaches to environmental watering will likely be developed and there needs to be flexibility in the way that rules are applied.

A description of possible risks and the mitigation measures that could be applied is shown below in Table 7. Mitigation measures will be considered in collaboration with the environmental water holders and the river operator.

Environmental watering is still relatively new in the Murrumbidgee. New environmental watering actions are being developed and implemented every year, and additional implications may become evident over time. Clear processes for review are described in Section 6 to provide an opportunity to review and reassess risks over time.

Mitigation measures for actions are set out in Table 6 and further described in supporting documents as necessary.

**Table 7: Potential risks and mitigation measures associated with the operation of PPMs**

| Potential risk  | Relevant Action / supporting measure | Possible mitigation measure  |
|---|--------------------------------------|--|
| Lower reliability of allocations due to lower utilisation of tributary inflows below major dams through directed releases from dams   | Directed releases from dams          | Additional debits may be applied at a future point in based on assessment of reduced utilisation of tributary inflows downstream of the dams. Increased reliability could also be recognised.  |
| Under/over-estimating the volume of environmental water used: <ul style="list-style-type: none"> <li>Inaccurate measurement</li> <li>Environmental water use estimated based on averages</li> </ul> | Directed releases from storage       | Use appropriate estimates of unaccounted differences and operational decisions when estimating the 'without environmental order' when calculated additional release from storage   |
|   | Protection of flows along the river  | Assumed use/river transmission loss estimates when: <ul style="list-style-type: none"> <li>Sharing access to flows with consumptive water users, and</li> <li>Environmental flows exceed normal operating levels.</li> </ul> Post event accounting<br>Improved management of |

| Potential risk   | Relevant Action / supporting measure                               | Possible mitigation measure   |
|--|--|---|
|  |  | supplementary<br>Water use based on total volume of water released for directed releases  |
| Increased river transmission losses, as a larger proportion of licensed water is required to be released for the end of the river system                 | Protection of flows along the river                                | Possible mitigation measures for this potential risks will be considered as PPMs are implemented and there is better understand of environmental watering use under PPMs  |
| "Out of balance" or deliverability issues exacerbated by large volume of directed releases from Burrinjuck Dam   | Directed releases from dams (particularly at high rate)            | "Out-of-balance' assessment by WaterNSW   |
| Over-estimating the proportion of flows that are environmental along the river system, resulting in unduly restricted access for consumptive water users | Protection of flows along the river                                | Conservative assumed use estimates.<br>Closer management of supplementary access  |
| Under-estimating the proportion of flows that are environmental water in the river system resulting in excessive consumptive use                         | Protection of flows along the river                                | Regular assessment and review of assumed use<br>Post event reconciliation   |
| Unwanted inundation  | Directed releases from dams for environmental watering             | Release rates limit to ensure flow remains within channel capacity limits as nominated in WSP<br>Evidence of consultation with potentially impacted landholders   |
| Mitigation measures are unduly conservative that impacts the efficient and/or effective use of HEW   | Directed releases from dams<br>Protection of flows along the river | Mitigation measures are evidence based and proportionate to actual risks<br>Post event accounting<br>Assumed use methods reviewed and refined<br>Documentation of procedures and methods<br>Consultation with environmental water holders<br>Annual review process<br>Assessments based on best available information/science |
| Note: normal operating limits/levels refers to historical practice of operating the river based on time of year and system conditions.                   |  |   |

#### 4.4.1. Consideration of impacts

Some impacts to licensed water users are a result of existing operations and practices within the NSW water management framework. For example, water users can purchase and activate or trade previously unused water access licences, subject to rules within in the relevant water sharing plan. Alternatively, a large irrigator may change their water ordering behaviour which may impact the amount of water available in the dam for other water users.

However, there are other impacts that may arise which are not permitted under the current framework. These kinds of impacts would include allowing one licence holder to request priority of delivery over other water users during times when the amount of water that can be delivered is constrained. Priority of delivery is determined by the category of access licence that is being used to make the order.

NSW has and will continue to develop and implement PPMs in a way that achieves the objective of maximising environmental outcomes through the efficient and effective use of HEW without impacting on the reliability to other water users or by negating or offsetting unacceptable impacts. Where there is uncertainty, NSW will adopt a precautionary approach to minimise detrimental impacts.

## 5. Adaptive management for PPMs

### 5.1. Reporting

Recognising that the environmental watering actions provided by PPMs are different to traditional regulated river system operations and will require ongoing development over time, an adaptive management approach is required. To allow arrangements to evolve and improve over time, an adaptive approach will be adopted, requiring a rigorous process of review and evaluation. It is also recognised that environmental watering actions will evolve and improve over time, and that there are benefits to ensuring that environmental watering actions using PPMs are conducted openly and transparently. To inform the ongoing development of environmental watering actions, and to provide transparency about the management of these watering actions, the adaptive management starts with an annual reporting process that documents the environmental watering actions that have been conducted under the provisions of this Manual. The annual reporting provides the necessary basis to inform an annual analysis and evaluation of the PPM operations.

There are two main reporting elements that are inputs to the annual review process:

- An Annual Environmental Release River Operations Report that documents the application of specific agreed actions, trial actions, and associated supporting measures, including the accounting of river flows, transmission losses, and water delivery that occurred.
- An Annual Environmental Watering statement that documents any issues that arose in the ordering or delivery and accounting of environmental water using the agreed and trial actions.

Both reports must document:

- Any issues encountered in undertaking agreed actions, and any recommendations to address those issues or improve the operation of PPMs, and
- Any feedback from consultation with stakeholders on the actions undertaken.

Submissions may also be invited from other key stakeholders such as the CEWO.

#### 5.1.1. Annual environmental release river operations report

The Annual Environmental River Operations Report shall be prepared by the River Operator (WaterNSW), and be submitted to the regulator (Department of Planning, Industry and Environment - Water) within three months of the end of each water year.

This report will include the following:

- A description of environmental watering actions undertaken during the relevant water year,
- The performance in delivering the environmental water to meet the target flows and volumes requested in the orders,
- The accounting undertaken for these actions, including:
  - a general description of the environmental flow events undertaken that rely on the use of agreed and trial actions,
  - the water orders placed by the environmental water holders,
  - accounts of environmental water use according to agreed methods for Assumed Use Statements,
  - comparisons of assumed use with actual river transmission losses associated with watering actions that rely on that assumed use,

- the volumes of water delivered to the Murray Valley that have been accounted as environmental, and
- Documentation of any issues that arose in the ordering or delivery and accounting of environmental water using the agreed and trial actions and details of how any issues were resolved,
- Documentation of any orders that were refused/rejected and supporting rationale.

The regulator may request additional content that is related to the delivery of environmental water using the agreed and trial actions, following consultation with WaterNSW and other stakeholders.

### **5.1.2. Annual environmental watering statement**

The annual environmental watering statement shall be prepared by the Department of Planning, Industry and Environment - Biodiversity and Conservation, and be submitted to the regulator (Department of Planning, Industry and Environment - Water) within three months of the end of each water year. As the NSW environmental water manager, Department of Planning, Industry and Environment - Biodiversity and Conservation will consult with other environmental water holders and stakeholders including the CEWO and EWAGs as necessary.

This report shall include the following:

- A brief description of environmental outcomes of the watering actions undertaken during the relevant water year, and the degree to which those environmental objectives were able to be satisfied, and
- Documentation of any issues that arose in the ordering or delivery and accounting of environmental water using the agreed and trial actions.

The regulator may request additional content that is related to the delivery of environmental water using the agreed or trial actions, following consultation with Department of Planning, Industry and Environment - Biodiversity and Conservation and other stakeholders.

## **5.2. Annual evaluation and review of PPM operations**

The Department of Planning, Industry and Environment – Water will conduct an annual evaluation and review of the implementation of PPMs that will consider the outcomes of undertaking PPMs actions, based on the two reporting elements described above. This annual review report is to include:

- Whether the current PPM actions and the associated supporting measures provide for the effective and efficient use of held environmental water,
- Whether there are sufficient mitigation measures in place, and whether they have been effective,
- Any proposals for variations or new actions and/or supporting measures that may be brought forward by the river operator or the environmental water holder,
- Any issues relating to PPMs raised through consultation with stakeholders in the valley,
- The results and recommendations of the reporting elements provided by the river operation and environmental water manager,
- Whether the actions and associated supporting measures should be expanded, modified, or remain unchanged,
- Reporting on the implementation of improvements from previous review, including consideration of recommendations provided by the PPM Working Group,
- Whether general operational procedures were followed for the delivery of HEW via PPMs.

The review will be guided by the principles set out in the NSW PPM IP, and the assessment guidelines set out by the MDBA. The review may be undertaken by an independent body.

The Department of Planning, Industry and Environment – Water is responsible for ensuring that appropriate changes to the regulatory framework are made to give effect to any recommendations arising from this review, in consultation with key stakeholders including Department of Planning, Industry and Environment - Biodiversity and Conservation and WaterNSW.

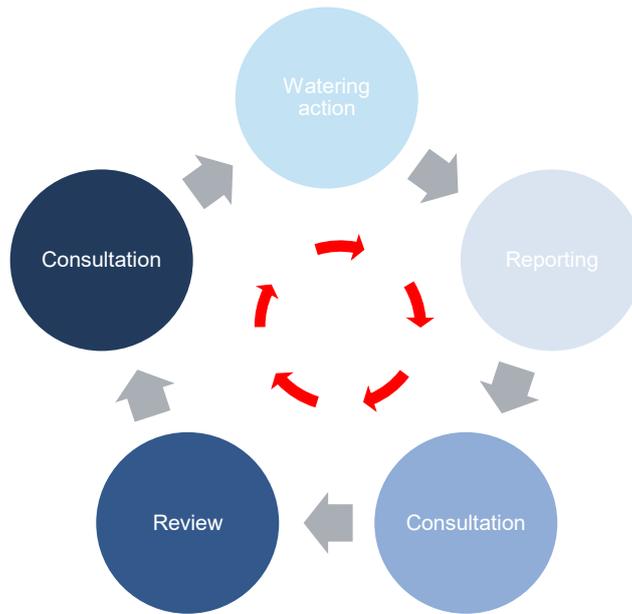
The Department of Planning, Industry and Environment – Water will prepare and publish a report on the review each year, including any findings of the review and recommendations

Proposals to support changes or improvements to the operation of PPMs may be brought forward by either the river operator (WaterNSW) or the environmental water holders (Department of Planning, Industry and Environment - Biodiversity and Conservation and CEWO) for consideration in the review, or at any other time. Any such proposals must be supported by appropriate evidence and analysis and should be developed in collaboration with both the regulator and river operator

It is proposed that the annual review will operate to a two to three-year cycle (Table 8) to adequately allow for reporting, consultation and review, including any consequential amendments that made be required to this Manual. A three-month period has been provided for each review element (e.g. reporting, consultation, review).

**Table 8: Annual PPM review cycle**

|                  | Review Activity   |  |  |  |  |  |
|------------------|---|--|--|--|--|--|
|                  | Watering Actions  | Reporting  | Consultation   | Review   | Consultation   | Amendments   |
|                  | Department of Planning, Industry and Environment - Biodiversity And Conservation / CEWO, WaterNSW | WaterNSW, Department of Planning, Industry and Environment - Biodiversity and Conservation | WaterNSW, Department of Planning, Industry and Environment - Biodiversity and Conservation | Department of Planning, Industry and Environment - Water | Department of Planning, Industry and Environment - Water | Department of Planning, Industry and Environment - Water |
| <b>July</b>      |   |  |  |  |  |  |
| <b>August</b>    |   |  |  |  |  |  |
| <b>September</b> |   |  |  |  |  |  |
| <b>October</b>   |   |  |  |  |  |  |
| <b>November</b>  |   |  |  |  |  |  |
| <b>December</b>  |   |  |  |  |  |  |
| <b>January</b>   |   |  |  |  |  |  |
| <b>February</b>  |   |  |  |  |  |  |
| <b>March</b>     |   |  |  |  |  |  |
| <b>April</b>     |   |  |  |  |  |  |
| <b>May</b>       |   |  |  |  |  |  |
| <b>June</b>      |   |  |  |  |  |  |



**Figure 2: An overview of the annual PPM review cycle**

# References

MDBA, 2015. *Pre-requisite Policy Measures Assessment Guidelines*. 9 April 2015.

# Appendix A

**Table A: Relationship of NSW PPMs to other plans and legislation**

| Legislation or Plan   | Overview and relationship to Procedures Manual   |
|---|--|
| <b>Commonwealth</b>   |  |
| Water Act 2007 (Commonwealth Government)                          | Makes provision for the management of water resources of the Murray-Darling Basin.   |
| Public Governance, Performance and Accountability Act 2013 (Cwth) | Establishes the requirements of Commonwealth Officials in the use of Commonwealth resources, including both financial and water resources. These requirements relate to procedures associated with risk management, public accountability, governance and reporting.   |
| Murray Darling Basin Plan (MDBA)                                  | <p>A legislative instrument developed as a requirement of the Water Act 2007.</p> <p>Aims to protect and restore key water-dependent ecosystems.</p> <p>Determines the amount of water that can be extracted annually from the Basin for consumptive use.</p> <p><b>PPMs are a requirement of the Plan.</b></p>  |
| Basin-wide Environmental Watering Strategy (MDBA)                 | <p>Sets out the expected outcomes at a whole-of-basin scale that should be achievable with the environmental water available, and efficient and effective strategies to achieve them.</p> <p>This document guides the work of governments, water holders and environmental managers.</p> <p><b>PPMs will assist in achieving expected outcomes.</b></p>  |
| Environmental Watering Plan (MDBA)                                | <p>The purposes of the environmental watering plan are to safeguard existing environmental water; plan for the recovery of additional environmental water; and coordinate the management of existing environmental water.</p> <p><b>PPMs will assist in meeting the purposes of the Environmental Watering Plan.</b></p>   |
| Environmental Watering Schedule (CEWO)                            | <p>Developed by the CEWO in conjunction with water delivery partners, for the purpose of communicating the agreed purpose for the use of Commonwealth water holdings, and giving effect to the CEWH's portfolio management plans.</p> <p><b>PPMs will assist in meeting the outcomes of the Basin-wide environmental watering strategy.</b></p>  |
| Basin Annual Environmental Watering Priorities (MDBA)             | <p>Guide the annual planning and prioritisation of environmental watering across the Basin. They represent annual steps toward the long-term outcomes in the Basin-wide Environmental Watering Strategy.</p> <p>They aim to achieve the most effective use of water for the environment; promote better environmental outcomes across the Basin; and coordinate watering between environmental water holders and water managers.</p> <p><b>PPMs will assist in achieving the aims of the Basin Annual Environmental Watering Priorities.</b></p> |
| Portfolio Management Plan (CEWO)                                  | Sets out plans for managing the Commonwealth environmental water portfolio in the Murrumbidgee for each water year.  |

| Legislation or Plan   | Overview and relationship to Procedures Manual  |
|---|---|
|   | <b>PPMs will assist in managing Commonwealth environmental water portfolio</b>  |
| <b>NSW</b>  |   |
| Water Management Act 2000   | The WMA provides the legislative framework for the sharing of water between industry, communities and the environment in NSW.<br><b>PPMs must be implemented in accordance with the WMA.</b>  |
| Water Management Regulation 2011  | The Regulation is a supporting instrument to the WMA. It provides the administrative direction for the management of NSW's water resources and specifies how issues are to be dealt with at a local level.<br><b>PPMs must be implemented in accordance with the Regulation.</b>  |
| Protection of the Environment Operations Act 1997   | The POEO Act enables the NSW Government to set out explicit protection of the environment policies and adopt more innovative approaches to reducing pollution. The POEO Act includes prohibition of pollution of waters.<br><b>PPMs must be implemented in such a way as to avoid pollution of waters (e.g. triggering of blackwater events)</b>  |
| Murrumbidgee Water Resource Plan  | The WRP outlines how water resources will be managed to be consistent with the Murray-Darling Basin Plan.<br><b>PPMs must be implemented in accordance with the WRP.</b>  |
| Murrumbidgee Water Sharing Plan   | The WSP is a legislative tool under the WMA that sets out rules for access licences and water supply works approvals. The WSP contains rules which specify how water is shared between the environment and water users in a water source.<br><b>PPMs must be implemented in accordance with the WSP.</b>  |
| Annual Watering Priorities (Department of Planning, Industry and Environment - Biodiversity And Conservation) | Outlines the priorities for environmental water use in the coming year, depending on climatic factors and water availability.<br><b>PPMs will assist in meeting the priorities of the Annual Watering Plan.</b>   |
| Water Supply Works Approval (WaterNSW)  | Water Supply Works Approvals manage river operations and are controlled by Department of Planning, Industry and Environment - Water. They will specify the role/obligations of the river operator in implementing PPMs.<br><b>PPM Procedures Manuals will translate how these approval conditions are to be managed in day-to-day river operations.</b>   |
| NSW PPM Implementation Plan   | The PPM Implementation Plan sets out high level principles to guide PPM development and implementation. It identifies preferred implementation options and associated processes required to incorporate PPMs into the regulatory and operational frameworks that guide water management and operation in NSW.<br><b>PPM Implementation Plan and review of this plan by MDBA informs the development of the PPM Procedures Manual.</b> |

## Appendix B

Access licences that are either licensed environmental water under section 8 of the *Water Management Act 2000*, held by the Commonwealth Environmental Water Holder, or are specified in the table below may order water under the Environmental Flow Reuse Rules or the Piggybacking Rules set out in this PPM Procedures Manual for the Murrumbidgee Regulated River Water Source.

| WAL No | Environmental Holder Group             |
|--------|--|
| 3647   | NSW OFFICE OF ENVIRONMENT AND HERITAGE |
| 3648   | NSW OFFICE OF ENVIRONMENT AND HERITAGE |
| 10989  | NSW OFFICE OF ENVIRONMENT AND HERITAGE |
| 10990  | NSW OFFICE OF ENVIRONMENT AND HERITAGE |
| 14876  | NSW OFFICE OF ENVIRONMENT AND HERITAGE |
| 11078  | CROWN LANDS AND WATER DIVISION         |
| 11079  | CROWN LANDS AND WATER DIVISION         |
| 11328  | CROWN LANDS AND WATER DIVISION         |
| 11395  | CROWN LANDS AND WATER DIVISION         |
| 13770  | NSW OFFICE OF ENVIRONMENT AND HERITAGE |
| 14996  | MURRAY DARLING BASIN AUTHORITY         |
| 14997  | MURRAY DARLING BASIN AUTHORITY         |
| 15109  | NSW OFFICE OF ENVIRONMENT AND HERITAGE |
| 15938  | NSW OFFICE OF ENVIRONMENT AND HERITAGE |
| 16355  | CROWN LANDS AND WATER DIVISION         |
| 27788  | CROWN LANDS AND WATER DIVISION         |
| 36146  | MURRAY DARLING BASIN AUTHORITY         |
| 36222  | NSW OFFICE OF ENVIRONMENT AND HERITAGE |
| 36338  | NSW OFFICE OF ENVIRONMENT AND HERITAGE |
| 36610  | NSW OFFICE OF ENVIRONMENT AND HERITAGE |
| 36605  | NSW OFFICE OF ENVIRONMENT AND HERITAGE |