



# Stocktake of northern Basin connectivity water management rules

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Discussion paper

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# 1 Purpose of the discussion paper

The purpose of this paper is to provide a better understanding of:

- 1) the provisions in the *Water Management Act 2000*
- 2) current rules in the relevant water sharing plans (WSPs) that may support hydrological connectivity in the northern Murray-Darling Basin.

## 2 Introduction

Efficient and effective delivery of water in the northern Basin valleys (that is, NSW Border Rivers, NSW Intersecting Streams, Namoi, Gwydir, Macquarie and Barwon-Darling River upstream of Menindee Lakes) relies on understanding how water sharing plans interact, and the associated opportunities and challenges (Figure 1). This is especially relevant for achieving hydrological connectivity that relies on tributary contributions to the Barwon-Darling River. It is also relevant for getting the greatest benefit from water that remains in the river system after extraction.

Hydrological connectivity in this paper refers to the ability for each valley to provide surface water flow into and along the Barwon-Darling River. Some valleys, such as the Namoi and Border Rivers, transmit flows into the Barwon-Darling River with a relatively high level of efficiency. Other valleys, such as the Gwydir and Macquarie, contain large floodplain and wetland systems that absorb significant volumes of water just upstream from the junction with the Barwon-Darling River. Hydrological connectivity is an essential part of river systems as it facilitates the transfer of energy, matter and organisms throughout the system.<sup>12</sup>

## 3 Background

In December 2017, the NSW Government released the Water Reform Action Plan. This was in response to the *Independent investigation into NSW water management and compliance* by Ken Matthews AO (also known as the Matthews Report) and the Murray-Darling Basin Authority's *Murray-Darling Basin Water Compliance Review*.

An interagency working group (IWG) with New South Wales and federal agency representation was established in February 2018 to develop ways the NSW Government could better manage environmental water.

The NSW Government is progressing the recommendations of the IWG's interim solutions package to better manage environmental water, which was released in June 2018.

This includes work to better understand northern connectivity. Improving our knowledge through monitoring, evaluating and reporting on connectivity outcomes over time will help us understand how we can improve management of environmental water across the northern Basin.

The Better management of environmental water – Northern Murray-Darling Basin Snapshot brochure (released in December 2018) summarises the NSW Government's commitments to better manage environmental water in the NSW northern Murray-Darling Basin, progress to date and next steps.

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<sup>1</sup> Pringle. C. M. 2001. Hydrologic connectivity and the management of biological reserves: a global perspective. *Ecological Applications* **11**(4), 981-998.

<sup>2</sup> Pringle. C. M. 2003. What is hydrologic connectivity and why is it ecologically important. *Hydrological Processes* **17**, 2685–2689

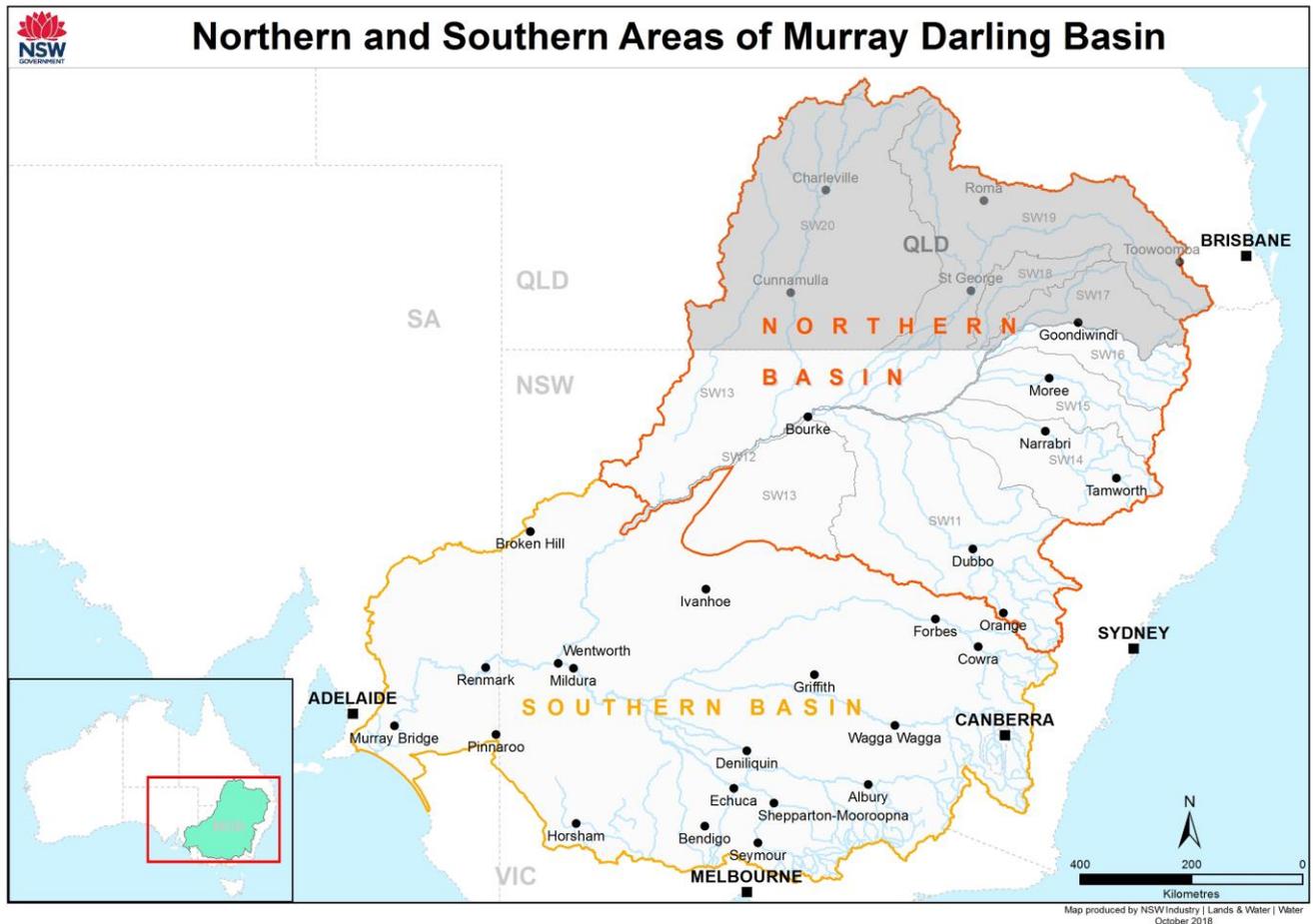


Figure 1 The valleys of the NSW Border Rivers (SW16), NSW Intersecting Streams (SW13), Gwydir (SW15), Namoi (SW14), Macquarie (SW11) and Barwon-Darling River upstream of Menindee Lakes (SW12) are the focus of the stocktake of northern Basin connectivity

## 4 Water Management Act 2000 provisions for hydrological connectivity

The water management principles in the *Water Management Act 2000* (WM Act) state that the sharing of water from a water source must protect the water source, its dependent ecosystems and basic landholder rights. Sharing of water extraction under any other right must not prejudice these principles.

Table 1 offers the details of provisions in the WM Act that may support hydrological connectivity, along with a brief description.

Table 1 Provisions in the *Water Management Act 2000* (WM Act) that may support hydrological connectivity. The table outlines the provisions as detailed in the WM Act and some additional description for the provisions, outlining how it may support hydrological connectivity.

WM Act section	Provision	Contribution to hydrological connectivity
3 (a, b, c, e, f, g, h)	<b>3 Objects</b>	Hydrological connectivity is considered an important aspect in achieving many of these objects. For example the

WM Act section	Provision	Contribution to hydrological connectivity
	<p>The objects of this Act are to provide for the sustainable and integrated management of the water sources of the State for the benefit of both present and future generations and, in particular:</p> <ul style="list-style-type: none"> <li>(a) to apply the principles of ecologically sustainable development, and</li> <li>(b) to protect, enhance and restore water sources, their associated ecosystems, ecological processes and biological diversity and their water quality, and</li> <li>(c) to recognise and foster the significant social and economic benefits to the State that result from the sustainable and efficient use of water, including: <ul style="list-style-type: none"> <li>(i) benefits to the environment, and</li> <li>(ii) benefits to urban communities, agriculture, fisheries, industry and recreation</li> <li>(iii) benefits to culture and heritage, and</li> <li>(iv) benefits to the Aboriginal people in relation to their spiritual, social, customary and economic use of land and water,</li> </ul> </li> <li>(e) to provide for the orderly, efficient and equitable sharing of water from water sources,</li> <li>(f) to integrate the management of water sources with the management of other aspects of the environment, including the land, its soil, its native vegetation and its native fauna,</li> <li>(g) to encourage the sharing of responsibility for the sustainable and efficient use of water between the Government and water users,</li> <li>(h) to encourage best practice in the management and use of water.</li> </ul>	<p>equitable sharing of water (along and between water sources) or protecting, enhancing and restoring water sources, their associated ecosystems, ecological processes and biological diversity and their water quality.</p>
<p>5 (1), (2), (3)(a),</p>	<p><b>5 Water management principles</b></p> <ul style="list-style-type: none"> <li>(1) The principles set out in this section are the water management principles of this Act.</li> <li>(2) Generally: <ul style="list-style-type: none"> <li>(a) water sources, floodplains and dependent ecosystems (including groundwater and wetlands) should be protected and restored and, where possible, land should not be degraded, and</li> <li>(b) habitats, animals and plants that benefit from water or are potentially affected by managed activities should be protected and (in the case of habitats) restored, and</li> <li>(c) the water quality of all water sources should be protected and, wherever possible, enhanced</li> </ul> </li> </ul>	<p>A range of principles are set out that enable protection, enhancement and restoration of the structure and function of water-dependent ecosystems, of which hydrologic connectivity will assist.</p>

WM Act section	Provision	Contribution to hydrological connectivity
	<p>(3) In relation to water sharing:</p> <p>(a) sharing of water from a water source must protect the water source and its dependent ecosystems</p>	
<p>6 (2)(a), (b),(c), (3)(c)</p>	<p><b>6 State Water Management Outcomes Plan</b></p> <p>(2) The objects of a State Water Management Outcomes Plan are as follows:</p> <p>(a) to set the over-arching policy context, targets and strategic outcomes for the management of the State's water sources, having regard to:</p> <p>(i) relevant environmental, social and economic considerations</p> <p>(b) to promote the water management principles established by this Act,</p> <p>(c) to give effect to any State government policy statement in relation to salinity strategies.</p> <p>(3) The State Water Management Outcomes Plan must be consistent with</p> <p>(c) State government policy, including State government policy in relation to the environmental objectives for water quality and river flow.</p>	<p>The State Water Management Outcome Plan (SWMOP) was established in 2002 and provided direction for the development of management plans.</p> <p>The SWMOP has effect for a period of 5 years from the date of publication in the Gazette. Thus, the SWMOP has ceased to have effect.</p> <p>If, in the future, updated SWMOP (or similar) are developed it could include reference to hydrological connectivity outcomes.</p>
<p>8 (1)(a), (b)</p>	<p><b>8 Environmental water</b></p> <p>(1) For the purposes of this Act, <b>environmental water</b> comprises the following:</p> <p>(a) water that is committed by management plans for fundamental ecosystem health or other specified environmental purposes, either generally or at specified times or in specified circumstances, and that cannot to the extent committed be taken or used for any other purpose (<b>planned environmental water</b>),</p> <p>(b) water (<b>licensed environmental water</b>) that is:</p> <p>(i) committed by an adaptive environmental water condition under section 8B, 8C, 8D or 63B, or</p> <p>(ii) taken or permitted to be taken under a licence of an environmental subcategory, or</p> <p>(iii) taken or permitted to be taken under a licence of a class prescribed by the regulations for the purposes of this paragraph.</p>	<p>The WM Act enables the establishment of planned environmental water and licenced environmental water. Individual water sharing plans may include provisions that specifically target hydrological connectivity or ecological outcomes that rely on hydrological connectivity.</p>
<p>8 (1A), (2), (3)</p>	<p>(1A)A management plan is to commit water as planned environmental water in at least 2 of the following ways (whether by 2 separate ways or a combination of 2 ways):</p>	<p>Water remaining in the water source often contributes to hydrological connectivity.</p>

WM Act section	Provision	Contribution to hydrological connectivity
	<ul style="list-style-type: none"> <li>(a) by reference to the commitment of the physical presence of water in the water source,</li> <li>(b) by reference to the long-term average annual commitment of water as planned environmental water,</li> <li>(c) by reference to the water that is not committed after the commitments to basic landholder rights and for sharing and extraction under any other rights have been met.</li> </ul> <p>(2) A management plan must contain provisions for the identification, establishment and maintenance of planned environmental water (environmental water rules). The environmental water rules relating to a water source do not need to specify that a minimum quantity of water is required to be present in the water source at all times.</p> <p>(3) Environmental water rules are to be established for all of the water sources in the State as soon as practicable after the commencement of this section.</p>	
8A (1), (2)	<p><b>8A Planned environmental water</b></p> <ul style="list-style-type: none"> <li>(1) The Minister may cancel any category or subcategory of licence prescribed by the regulations that is held by the Minister and commit an equivalent amount of water as determined in accordance with the management plan as planned environmental water for the water source to which the licence related.</li> <li>(2) Planned environmental water committed under this section is to be used for only those purposes specified in the relevant management plan.</li> </ul>	Water sharing plans may direct the use of this water, this may include for hydrological connectivity in the water source.
8B, 8C, 8D, 8E(3), (4)	<p><b>8B Adaptive environmental water through dedication of existing water entitlements</b></p> <ul style="list-style-type: none"> <li>(1) The holder of an access licence may request that the Minister impose an adaptive environmental water condition in respect of the whole or a part of the access licence.</li> <li>(2) A condition imposed under this section may be amended, and is to be revoked, by the Minister at the request in writing of the holder of the access licence, except as provided by the regulations.</li> </ul> <p><b>8C Adaptive environmental water through system improvements</b></p> <ul style="list-style-type: none"> <li>(1) The Minister may grant an access licence of a category or subcategory determined by the Minister to the Minister, Local Land Services or another public body, without the need for an application to be made for the licence in accordance with Part 2 of Chapter 3, so long as:</li> </ul>	<p>Water access licences can have adaptive environmental water conditions imposed on them in a variety of ways, these are:</p> <ul style="list-style-type: none"> <li>1) at the request of an access licence holder</li> <li>2) through system improvements</li> <li>3) after a surrender of a licence</li> </ul> <p>Licences subject to adaptive environmental water conditions may be used to support hydrological connectivity.</p>

WM Act section	Provision	Contribution to hydrological connectivity
	<p>(a) works or other actions result in water savings in the system being made in the water source in respect of which the licence is granted, and</p> <p>(b) the share component of the licence is equivalent to the value of water savings in the system made, and</p> <p>(c) an adaptive environmental water condition is imposed on the licence.</p> <p>(2) In this section, <b>system</b> means that part of a water source to which a management plan applies that is not identified by the plan for commitments to basic landholder rights and for sharing and extraction under any other rights.</p> <p><b>8D Adaptive environmental water conditions after surrender of licences</b></p> <p>(1) The Minister may keep an access licence surrendered by the holder of the licence or transfer it to Local Land Services or another public body, and may change the licence to a different category or subcategory, if:</p> <p>(a) the share component of the licence is equivalent to the share component of the surrendered licence (subject to the application of any conversion factor prescribed by the access licence dealing principles or the regulations), and</p> <p>(b) an adaptive environmental water condition is or has been imposed on the licence.</p> <p>(2) The Minister may cancel an access licence surrendered by the holder of the licence and transfer the share component of the surrendered licence (subject to the application of any conversion factor prescribed by the access licence dealing principles or the regulations) to another licence if an adaptive environmental water condition is or has been imposed on the licence.</p> <p><b>8E General provisions relating to access licences with adaptive environmental water conditions</b></p> <p>(3) The terms of an adaptive environmental water condition imposed in respect of an access licence are to further the objectives of the relevant management plan.</p> <p>(4) If the adaptive environmental water condition on an access licence requires the water to be left in the water source for environmental purposes, then the water allocation account is to be debited when the water is available in accordance with the condition.</p>	
8F	<b>8F Auditing of compliance with extraction limits</b>	Auditing of compliance with extraction limits may support hydrological connectivity.

WM Act section	Provision	Contribution to hydrological connectivity
	<ul style="list-style-type: none"> <li>(1) This section applies for the purpose of auditing compliance with the long-term extraction limit (however expressed) under a management plan.</li> <li>(2) The long-term extraction limit is taken to be varied by the amount of any change to the amount of water committed as licensed environmental water.</li> <li>(3) The variation in the long-term extraction limit is to be determined in accordance with a methodology approved by the Minister and published in the Gazette.</li> <li>(4) To avoid doubt, water savings in a system (within the meaning of section 8C) are not to be taken into account when determining the variation.</li> <li>(5) Water committed as licensed environmental water is not to be accounted for as extraction.</li> </ul>	
<p>20 (1)(a), (e), (2f)</p>	<p><b>20 Core provisions</b></p> <ul style="list-style-type: none"> <li>(1) The water sharing provisions of a management plan for a water management area or water source must deal with the following matters: <ul style="list-style-type: none"> <li>(a) the establishment of environmental water rules for the area or water source,</li> <li>(e) the establishment of a bulk access regime for the extraction of water under access licences, having regard to the rules referred to in paragraphs (a) and (d) and the requirements referred to in paragraphs (b) and (c).</li> </ul> </li> <li>(2) The bulk access regime referred to in subsection (1) (e): <ul style="list-style-type: none"> <li>(f) must be consistent with the water management principles.</li> </ul> </li> </ul>	<p>Water sharing plan provisions may support hydrological connectivity.</p>
<p>21 (d), (e)</p>	<p><b>21 Additional provisions</b></p> <p>The water sharing planning provisions of a management plan for a water management area or water source may also deal with the following matters:</p> <ul style="list-style-type: none"> <li>(d) water sharing measures for the protection and enhancement of the quality of water in the water sources in the area or for the restoration or rehabilitation of water sources or their dependent ecosystems,</li> <li>(e) measures to give effect to the water management principles and the objects of this Act,</li> </ul>	<p>Water sharing plan provisions may support the quality of water through hydrological connectivity.</p>
<p>24 (c), (d), (e)</p>	<p><b>24 Additional provisions</b></p> <p>The water use provisions of a management plan for a water management area may also deal with the following matters:</p>	<p>These provisions do not preclude being used to support hydrological connectivity.</p>

WM Act section	Provision	Contribution to hydrological connectivity
	<ul style="list-style-type: none"> <li>(c) requirements for the restoration or rehabilitation of land or water sources or their dependent ecosystems,</li> <li>(d) protection of the habitats or pathways of animals and plants</li> <li>(e) the preservation and enhancement of the quality of water of the water sources in the area affected by water use and related practices</li> </ul>	
<p>45 (1)(a), (3)</p>	<p><b>45 Minister may amend or repeal management plan</b></p> <ul style="list-style-type: none"> <li>(1) The Minister may at any time, by order published on the NSW legislation website, amend a management plan: <ul style="list-style-type: none"> <li>(a) if satisfied it is in the public interest to do so,</li> </ul> </li> <li>(3) Before amending a management plan, the Minister must obtain the concurrence of the Minister for the Environment to the amendment.</li> </ul>	<p>A water sharing plan may be amended to include additional or amended rules designed to support hydrological connectivity if it is in the public interest to do so.</p>
<p>324 (1)</p>	<p><b>324 Temporary water restrictions</b></p> <ul style="list-style-type: none"> <li>(1) If satisfied that it is necessary to do so in the public interest (such as (but not limited to) to cope with a water shortage, threat to public health or safety or to manage water for environmental purposes), the Minister may, by order in writing, direct that, for a specified period, the taking of water from a specified water source is prohibited, or is subject to specified restrictions, as the case requires.</li> </ul>	<p>The provision allows for a temporary restriction on the taking of water from a water source to manage water for environmental purposes where it is in the public interest to do so. Temporary water restrictions could be applied to support hydrological connectivity within and between valleys if in the public interest.</p>

## 5 Water sharing plan rules that may support hydrological connectivity *Water Management Act 2000* provisions for hydrological connectivity

The main tool in the WM Act for managing the state’s water resources and hydrological connectivity is water sharing plans. Water sharing plans detail objectives and rules for the sharing of water in a particular water source or group of water sources.

There are a range of rules within water sharing plans that may support hydrological connectivity and associated environmental, cultural, social and economic outcomes within the individual valleys in the northern Basin and between those valleys and the Barwon-Darling River. This report focuses on water sharing plans containing surface water rules. Groundwater to surface water connectivity is not considered in this paper.

The key surface water rules are discussed in the section below (and summarised in

Figure 2) and further details are provided in Table 7. There are 12 plans that operate across the 6 valleys relevant to this paper:

- Barwon-Darling River  
*Water Sharing Plan for the Barwon-Darling Unregulated and Alluvial Water Sources 2012*

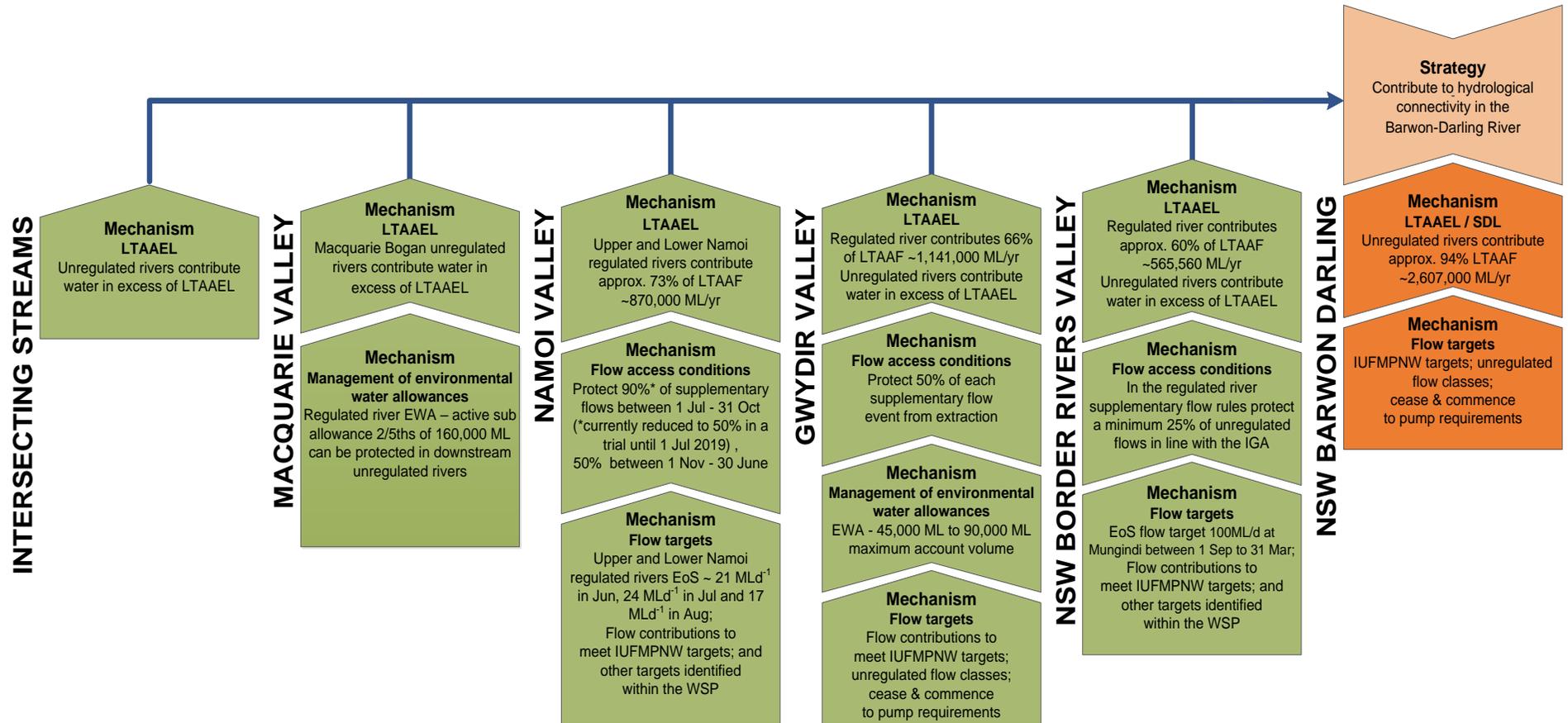


Figure 2 Water sharing plan rules that may contribute to hydrological connectivity in the Barwon-Darling River

- NSW Intersecting Streams  
*Water Sharing Plan for the Intersecting Streams Unregulated and Alluvial Water Sources 2011*
- NSW Border Rivers  
*Water Sharing Plan for the NSW Border Rivers Regulated River Water Source 2009*  
*Water Sharing Plan for the NSW Border Rivers Unregulated and Alluvial Water Sources 2012*
- Gwydir Valley  
*Water Sharing Plan for the Gwydir Regulated River Water Source 2016*  
*Water Sharing Plan for the Gwydir Unregulated and Alluvial Water Sources 2012*
- Namoi Valley  
*Water Sharing Plan for the Upper Namoi and Lower Namoi Regulated River Water Sources 2016*  
*Water Sharing Plan for the Peel Valley Regulated, Unregulated, Alluvium and Fractured Rock Water Sources 2010*  
*Water Sharing Plan for the Namoi Unregulated and Alluvial Water Sources 2012*
- Macquarie Valley  
*Water Sharing Plan for the Macquarie and Cudgegong Regulated River Water Source 2016*  
*Water Sharing Plan for the Macquarie Bogan Unregulated and Alluvial Water Sources 2012*  
*Water Sharing Plan for the Castlereagh River Unregulated and Alluvial Water Sources 2011*

## 5.1 Long-term average annual flow (LTAAF)

Under water sharing plans, water must be reserved for the fundamental health of a river or aquifer and the ecosystems that depend on it.

The long-term average annual extraction limit (LTAAEL) determines the maximum volume of water that may be extracted under access licences, domestic and stock rights and native title rights from all water sources. This is within each extraction management unit in a valley, on a long-term average annual basis.

In both the regulated river and unregulated water sources, the water sharing plans (WSPs) reserve all water in excess of the specified LTAAEL as planned environmental water. This water may contribute to hydrological connectivity as the water is not available for extraction and remains in that water source.

The volumes of water set aside for the environment vary between valleys and are subject to the rules and specifications within the individual water sharing plans. These limits are set to ensure that water extractions do not increase and therefore erode the water for the environment and also the security of supply to water users.

Table 2 summarises estimates of how much water will be protected.

**Table 2 Summary of estimated long-term average annual flows remaining after extraction in the northern Basin**

Water sharing plan	Estimated long-term average annual flow	Estimated volume ML/yr
NSW Border Rivers Regulated River Water Source	60%	565,560
Gwydir Regulated River Water Source	66%	1,141,000
Upper Namoi & Lower Namoi Regulated River Water Sources	73%	870,000
Barwon-Darling Unregulated River Water Source	94%	2,607,000

Water sharing plan	Estimated long-term average annual flow	Estimated volume ML/yr
NSW Border Rivers Unregulated Water Sources	water in excess of the LTAAEL	
Intersecting streams Unregulated Water Sources	water in excess of the LTAAEL	
Gwydir Unregulated Water Sources	water in excess of the LTAAEL	
Macquarie Bogan Unregulated Water Sources	water in excess of the LTAAEL	

\*Note, flows arising in the Peel Valley Regulated and Unregulated Water Sources, the Namoi Unregulated Water Sources and Castlereagh Unregulated Water Sources are not connected directly and do not have specific protection through to the Barwon-Darling Unregulated River Water Source and so are not included in the above list.

## 5.2 Supplementary water

Supplementary water results from rainfall events that cannot be captured (regulated) for future use in storage structures such as dams or weirs. This water is not needed to meet current extractive demands or commitments.

When these conditions are identified for a particular river, a period of supplementary access is announced and details of the river reaches and time periods for supplementary access are published. Supplementary water access licence holders can only pump water against these licences during these announced periods.

Water sharing plans detail both the criteria to be met before supplementary access is announced, and individual access rules applying during a supplementary event. The latter may share flows between the environment, extraction and other priority commitments. Supplementary flows allow for a range of environmental benefits in a valley and are important as they are naturally occurring. They provide for a variety of ecosystem processes, including seasonal and temperature triggers. Reserving portions of supplementary flows for the environment can preserve proportions of natural tributary inflows, which help to protect important rises in water levels, contribute to maintaining natural flow variability and hydrological connectivity between important refugia.

Rules for supplementary access differ between water sharing plans to take into account the unique circumstances in each regulated river.

Supplementary access rules may contribute to hydrological connectivity in the water source and between water sources, as a proportion of supplementary flows remains in the river.

Table 3 summarises the water sharing plan rules.

**Table 3 Summary of supplementary flow rules or requirements that protect a portion of flows for the environment in the northern Basin**

Water sharing plan	Supplementary flow rule/requirement
NSW Border Rivers Regulated River	The plan rules aim to meet the requirements in the Intergovernmental Agreement <sup>3</sup> (IGA) of a minimum of 25% of uncontrolled flows for the environment
Gwydir Regulated Rivers	The plan protects 50% of supplementary flows for the environment

<sup>3</sup> New South Wales – Queensland Border Rivers Intergovernmental Agreement 2008

Water sharing plan	Supplementary flow rule/requirement
Upper Namoi & Lower Namoi Regulated Rivers	The plan protects 90% of supplementary flows between 1 July and 31 October and 50% of supplementary flows for the environment between 1 November and 30 June for the environment*.

### 5.3 Environmental water allowances (EWA) or release

An environmental water allowance creates a 'bank' or volume of water reserved for storage that can be released for specific environmental purposes, such as flushing blue-green algal blooms, reducing in-river salinity concentrations or supporting bird breeding and fish spawning events. These accounts are provided for as planned environmental water (PEW). Rules for these accounts vary between valleys.

Releases can be based on rules or at the discretion of the environmental manager who may be advised by a technical panel. Water sharing plans may specify release windows, or a range of circumstances in which the allowance can be used. Accrual of EWA account water is determined by water sharing plan rules.

Table 4 summarises the water sharing plan rules.

**Table 4 Summary of environmental water allowances or releases in the northern Basin**

Water sharing plan	Environmental water allowances (EWA) or release
Gwydir Regulated Rivers	The plan provides up to 90,000 ML maximum account volume
The Macquarie and Cudgegong Regulated River Water Source	The plan provides an account volume of 160,000 ML and the sub-allowance is to receive two fifths.
<i>Other related details</i>	
NSW Border Rivers Regulated River	Has a stimulus flow rule that is protected for the environment up to the confluence of the Severn River and Frazers Creek.
The Macquarie Bogan Unregulated Water Sources	The plan protects releases from the environmental water allowance <i>active</i> sub-allowance in the Macquarie and Cudgegong Regulated Rivers.

### 5.4 Held environmental water

Held environmental water (HEW) is an entitlement that can arise from water recovery projects (Adaptive Environmental Water) or through the purchase of water licences. HEW accounts accrue water through available water determinations (AWDs) in accordance with water sharing plan rules relevant to their access licence category. HEW is used at the discretion of the access licence holder, usually an environmental water manager. The entitlement arising from these licences is not specified in water sharing plans and hence volumes are not listed in this stocktake.

### 5.5 End-of-system flow rules

End-of-system (EoS) flow rules require minimum flows to pass through the end of a water source or river system or a specified point or gauge. This ensures that flow is maintained below the areas of major extraction and can assist in providing for hydrological connectivity into the downstream water source. End-of-system flow rules can contribute to a range of environmental outcomes and individual rules will vary between valleys.

Table 5 summarises the water sharing plan rules.

**Table 5 Summary of end-of-system flow rules in the northern Basin**

Water sharing plan	End-of-system flow rules
NSW Border Rivers Regulated River	100 ML per day at Mungindi between 1 September to 31 March. This then flows into the Barwon-Darling Unregulated River.
Upper Namoi & Lower Namoi Regulated Rivers	A minimum flow in June, July and August, which is equivalent to 75% of the natural 95th percentile daily flow for each month at the Namoi River at Walgett gauge. These target flows are currently estimated as 21 ML per day in June, 24 ML per day in July and 17 ML per day in August

## 5.6 Flow classes and cease-to-pumps and commence-to-pump rules

There are several water sharing plans for unregulated water sources that define flow classes, which is the framework for sharing water on a daily basis. These flow classes are usually linked with cease-to-pump and commence-to-pump rules that require users to start or stop taking water when flow reaches a set level. These types of rules are used to control extraction from specific portions of the hydrograph (that is, low, medium or high flows). Water remaining in the river systems may support hydrological connectivity in that water source or downstream.

## 5.7 Interim Unregulated Flow Management Plan for the North West (IUFMPNW)

The Interim Unregulated Flow Management Plan for the North West (IUFMPNW) was released in 1992 and was intended to operate for the 1992–93 irrigation season.

The IUFMPNW set out circumstances under which access to supplementary flow events in the tributary water sources could be restricted or prohibited to protect flows into the Barwon-Darling River. In addition, B and C Class access in the Barwon-Darling River could also be restricted or prohibited to achieve various flow targets at downstream locations.

Rules to support the implementation of the IUFMPNW were included in the water sharing plans for the NSW Border Rivers<sup>4</sup>, Gwydir and Namoi Regulated River Water Sources (the tributary water sources), along with a note included in the *Water Sharing Plan for the Barwon-Darling Unregulated and Alluvial Water Sources 2012*.

The Macquarie valley was also included in the IUFMPNW, although it specified the Macquarie valley could only make modest contributions to the Barwon-Darling River through the Northern Marsh Channel and the Bogan River. Rules were not included in either the *Water Sharing Plan for the Macquarie and Cudgegong Regulated River Water Source 2016* or the *Water Sharing Plan for the Macquarie Bogan Unregulated and Alluvial Water Sources 2012*.

The flow targets in the IUFMPNW were for basic landholder rights (BLR), algal suppression and fish migration (Table 6). The targets were based on flows at seven existing gauge sites along the Barwon-Darling River from Mungindi in the north to Wilcannia in the south. Riparian flow (basic landholder rights) targets were set for each of these seven locations (some differences dependent

<sup>4</sup> The New South Wales – Queensland Border Rivers Intergovernmental Agreement 2008 indicates that both States (NSW and Queensland) agree to continue to consider the provisions in the IUFMPNW.

on tributary location); the algal suppression flow target is based on flows at Wilcannia; and the fish migration flow targets were based on flows at Brewarrina and Bourke.

The requirements of the IUFMPNW are presented in Table 6.

**Table 6 Objectives and flow targets of the Interim Unregulated Flow Management Plan for the North West.**

Objective	Flow target
Provide opportunity for the passage of fish across the major weirs in the Barwon-Darling River	Achieve: <ul style="list-style-type: none"> <li>• a flow of 14,000 ML per day in the Darling River at Brewarrina for 5 consecutive days, and/or</li> <li>• a flow of 10,000 ML per day in the Darling River at Bourke for 5 consecutive days</li> </ul> during the period September to February inclusive, providing two such flow events have not already occurred during that period in that water year
Protect flows needed to suppress blue-green algae blooms	Achieve a flow of at least 2,000 ML per day in the Darling River at Wilcannia for 5 consecutive days during the period October to April, inclusive, providing flows of this quantity have not already been reached during the preceding three months within the October to April period
Protect flows needed to meet basic landholder rights requirements along the Barwon-Darling River	Achieve a flow of: <ol style="list-style-type: none"> <li>(i) 150 ML per day in the Darling River at Wilcannia</li> <li>(ii) 280 ML per day in the Darling River at Louth</li> <li>(iii) 390 ML per day in the Darling River at Bourke</li> <li>(iv) 550 ML per day in the Darling River at Brewarrina</li> <li>(v) 700 ML per day in the Barwon River at Walgett</li> <li>(vi) 760 ML per day in the Barwon River at Collarenebri</li> <li>(vii) 850 ML per day in the Barwon River at Mungindi.</li> </ol>

## 6 Specific water sharing plan rules that may support hydrological connectivity

Table 7 gives details of the specific rules in the relevant northern Basin water sharing plans, along with additional description for that rule. The table details whether resultant flows are protected into the downstream water source or whether they contribute to the resource assessment in the downstream water source (that is, whether that water is available for extraction in the downstream water source).

Table 7 Summary of water sharing plan (WSP) rules that relate to northern Basin valley hydrological connectivity. The table outlines the objectives and rules as detailed in the relevant WSP, some additional description for the rules, how rules contribute to hydrological connectivity and Basin Plan requirements

Relevant water sharing plan	Clause (subclause)	Water sharing plan rule (as detailed in the relevant water sharing plan)	Additional description	Contribution to hydrological connectivity
NSW Border Rivers Regulated River Water Source 2009	12 (a, b) <b>Planned environmental water</b>	<p><b>12: Planned environmental water</b></p> <p>(a) water in excess of the long-term extraction limit established in clause 28 of this Plan may not be taken from this water source or used for any purpose,</p> <p>(b) water availability is to be managed as specified in clause 30 of this Plan to ensure water volume in excess of the long-term extraction limit is not being taken</p>	<p>By limiting long-term average annual extractions to an estimated 194,500 megalitres per year this Plan attempts to ensure that approximately 60% of the long-term average annual flow in this water source at Mungindi (estimated to be 565,560 megalitres per year) will be preserved and will contribute to the maintenance of basic ecosystem health.</p> <p>The New South Wales – Queensland Border Rivers Intergovernmental Agreement 2008 - <i>End of System Flow 23</i>, 'The States agree that each State will initialise their respective water plans to achieve an end-of-system flow of at least 60.8% of the pre-development flow pattern as determined using scenario BOR0609U of the IQQM computer program. This flow objective will be met on initialisation of the plans only and has been achieved by varying access arrangements for unregulated flows in the Border Rivers'.</p> <p>This rule assists in providing for hydrological connectivity in the water source.</p>	<p>Water remaining in the river after extraction may provide for hydrological connectivity in that water source.</p> <p>This water then contributes to the resource assessment in downstream valley</p>
	12 (m) <b>Planned environmental water</b>	<p><b>12: Planned environmental water</b></p> <p>(m) during the period from 1 September of each year to 31 March of each following year, the holder of an access licence is not permitted to take uncontrolled stream flow from this water source, which, after taking into account stream losses, would result in a flow in the Barwon River at Mungindi of 100 ML per day or less.</p> <p><b>Note.</b></p> <p>This rule is outlined in the IGA which has the objective of improving low flows at the end of the Border Rivers system to support a healthy riverine environment.</p>	<p>This rule provides restrictions on supplementary flows (uncontrolled flows) to achieve end-of-system flows at Mungindi of &gt;100 ML per day. Thus, providing hydrological connectivity to the end of the valley.</p> <p>This rule is outlined in the New South Wales – Queensland Border Rivers Intergovernmental Agreement 2008 - <i>Access arrangements 32</i>. 'During the period from 1 September of each year to 31 March of each following year, the States must not take water from that portion of natural inflows to the Border Rivers that, after taking into account losses and when combined with any other natural inflows flowing simultaneously in the Border Rivers, would result in a flow over the weir in the Barwon River at Mungindi of up to 100 ML per day'.</p>	<p>This rule provides for hydrological connectivity to the end of the system.</p> <p>This water then contributes to resource assessment in downstream valley</p>
	<b>Supplementary water upstream Macintyre River and Dumaresq River junction</b>			
45 (6, 7, 8, 9, 10, 11) <b>Supplementary access</b>	<p><b>45: Taking of water under supplementary water access licences upstream of the Macintyre River and Dumaresq River junction</b></p> <p>(6) Access to the uncontrolled flow volume in the Dumaresq River is to be shared between NSW and Queensland, and may be permitted to be taken under the supplementary water access licences referred to in subclause (1), during a supplementary water event.</p> <p><b>Note.</b></p> <p>Sharing uncontrolled flows during a supplementary water event on the Dumaresq River is provided for in the IGA.</p>	<p>This rule provides restrictions on supplementary extraction to help meet environmental provisions in the Plan amongst other things. Restrictions are based on season (summer and winter), start and stop flow triggers and a measurement location. There are also restrictions to require direct irrigation onto crop and a maximum extraction rate at 6 ML per day, this requires extractors to use the available water and not store for future use.</p>	<p>Water not extracted by supplementary access licences remains in the river system and may contribute to hydrological connectivity in that water source.</p>	

Relevant water sharing plan	Clause (subclause)	Water sharing plan rule (as detailed in the relevant water sharing plan)	Additional description	Contribution to hydrological connectivity																																								
		<p>(7) For the purpose of subclause (5), the uncontrolled flow volume during a supplementary water event is the volume of inflows to this water source which occurs between the time that inflows increased to a level sufficient to produce uncontrolled flows in this water source and the time they then decreased to a level which was no longer sufficient to produce uncontrolled flows in this water source, minus the volume of inflows that is required to provide sufficient flow to:</p> <p>(a) meet the environmental provisions of this Plan</p> <p>(8) The maximum volume of water that may be taken during each period of time to which an announcement under subclause (2) applies in the section of this water source from Pindari Dam water storage to the Macintyre River and Dumaresq River junction may not exceed the volume of flow occurring between the supplementary water event start flow and supplementary water event finish flow as specified below:</p> <table border="1" data-bbox="626 701 1596 1058"> <thead> <tr> <th>Season</th> <th>Supplementary water event start flow (ML/day)</th> <th>Supplementary water event finish flow (ML/day)</th> <th>As measured at</th> </tr> </thead> <tbody> <tr> <td><b>Summer</b></td> <td>500</td> <td>150</td> <td>Ashford</td> </tr> <tr> <td>1 Sep–31 Mar</td> <td>1000</td> <td>250</td> <td>Holdfast</td> </tr> <tr> <td><b>Winter</b></td> <td>100</td> <td>50</td> <td>Ashford</td> </tr> <tr> <td>1 Apr–31 Aug</td> <td>150</td> <td>50</td> <td>Holdfast</td> </tr> </tbody> </table> <p>plus the volume of water required to:</p> <p>(i) meet the environmental provisions of this Plan,</p> <p>(ii) satisfy downstream domestic and stock rights and native title rights,</p> <p>(iii) satisfy the total NSW and Queensland water orders placed by access licences, including associated losses,</p> <p>(iv) provide any required replenishment flows specified in clause 58, and</p> <p>(v) satisfy Queensland share for water harvesting licences.</p> <p>(9) The maximum volume of water that may be taken during each period of time to which an announcement under subclause (2) applies in the section of this water source from the Dumaresq River and Pike Creek junction to the Macintyre River and Dumaresq River junction may not exceed the volume of flow occurring between the supplementary water event start flow and supplementary water event finish flow is specified below:</p> <table border="1" data-bbox="626 1556 1596 1871"> <thead> <tr> <th>Season</th> <th>Supplementary water event start flow (ML/day)</th> <th>Supplementary water event finish flow (ML/day)</th> <th>As measured at</th> </tr> </thead> <tbody> <tr> <td><b>Summer</b></td> <td>750</td> <td>250</td> <td>Glenarbon</td> </tr> <tr> <td>1 Sep–31 Mar</td> <td>750</td> <td>250</td> <td>Glenarbon</td> </tr> <tr> <td><b>Winter</b></td> <td>150</td> <td>50</td> <td>Glenarbon</td> </tr> <tr> <td>1 Apr–31 Aug</td> <td>150</td> <td>50</td> <td>Glenarbon</td> </tr> </tbody> </table> <p>plus the volume of water required to:</p> <p>(i) meet the environmental provisions of this Plan,</p>	Season	Supplementary water event start flow (ML/day)	Supplementary water event finish flow (ML/day)	As measured at	<b>Summer</b>	500	150	Ashford	1 Sep–31 Mar	1000	250	Holdfast	<b>Winter</b>	100	50	Ashford	1 Apr–31 Aug	150	50	Holdfast	Season	Supplementary water event start flow (ML/day)	Supplementary water event finish flow (ML/day)	As measured at	<b>Summer</b>	750	250	Glenarbon	1 Sep–31 Mar	750	250	Glenarbon	<b>Winter</b>	150	50	Glenarbon	1 Apr–31 Aug	150	50	Glenarbon	<p>This rule is outlined in the New South Wales – Queensland Border Rivers Intergovernmental Agreement 2008 - <i>Access arrangements</i> 33. 'The States agree to the access arrangements for unregulated flows in the Border Rivers as described in section 3 of Schedule D, subject to an environmental share of a minimum of 25% of the available volume during periods of access to unregulated flow being protected from take from the point of inflow downstream to Mungindi.'</p>	<p>This water then contributes to resource assessment in downstream valley.</p>
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Relevant water sharing plan	Clause (subclause)	Water sharing plan rule (as detailed in the relevant water sharing plan)	Additional description	Contribution to hydrological connectivity
		<p>(ii) satisfy downstream domestic and stock rights and native title rights,</p> <p>(iii) satisfy the total NSW and Queensland water orders placed by access licences, including associated losses,</p> <p>(iv) provide any required replenishment flows specified in clause 58, and</p> <p>(v) satisfy Queensland share for water harvesting licences.</p> <p>(10) For those supplementary water access licences specified in Schedule 3, the maximum volume of water that may be taken during each period of time to which an announcement under subclause (2) applies must not exceed the provisions provided under:</p> <p>(a) subclause (8) where the uncontrolled flow originates from the Macintyre River, and</p> <p>(b) subclause (9) where the uncontrolled flow originates from the Dumaresq River.</p> <p>(11) The taking of water pursuant to subclauses (8), (9) and (10) is also subject to the following provisions:</p> <p>(a) water taken may only be used for direct irrigation and is not to be pumped into on-farm storages, and</p> <p>(b) a maximum extraction rate of 6 ML per day per diversion work pump at the commencement of this Plan, is to apply.</p>		
	<p>45 (12, 13,14) <b>Supplementary access</b></p>	<p><b>45: Taking of water under supplementary water access licences upstream of the Macintyre River and Dumaresq River junction</b></p> <p>(12) Taking of water under supplementary water access licences nominating works on the Macintyre River shall not be permitted, or shall be restricted, when this is required to ensure the passage to the Barwon-Darling of locally generated uncontrolled flows needed to meet the requirements of the Interim Unregulated Flow Management Plan for the North West.</p> <p><b>Note.</b> The Interim Unregulated Flow Management Plan for the North West is also known as the North-West Unregulated Flow Management Plan.</p> <p><b>Note.</b> Any restriction of supplementary access in NSW as a result of the application of the IUFMP does not impact on QLDs ability to extract in accordance with the IGA.</p> <p>(13) The requirements of the Interim Unregulated Flow Management Plan for the North West are:</p> <p>(a) a flow of 14,000 ML per day in the Darling River at Brewarrina for 5 consecutive days, or 10,000 ML per day in the Darling River at Bourke for 5 consecutive days, during the period September to February inclusive, providing two such flow events have not already occurred during that period in that water year.</p> <p><b>Note.</b> This subclause is intended to provide opportunity for the passage of fish across the major weirs in the Barwon-Darling.</p> <p>(b) a flow of 2,000 ML per day in the Darling River at Wilcannia for 5 consecutive days during October to April, inclusive, providing flows of this quantity have not already been reached during the preceding three months within the October to April period, and</p> <p><b>Note.</b> This subclause is intended to protect flows needed to suppress blue-green algae blooms.</p> <p>(c) a flow of:</p> <p>(i) 150 ML per day in the Darling River at Wilcannia,</p>	<p>This rule provides for the restriction of extraction of supplementary water to achieve flow targets in the Barwon-Darling River.</p> <p>Flow targets are intended to :</p> <ul style="list-style-type: none"> <li>• Provide opportunity for the passage of fish across the major weirs in the Barwon-Darling</li> <li>• Protect flows needed to suppress blue-green algae blooms</li> <li>• Protect flows needed to meet basic landholder rights requirements along the Barwon-Darling River</li> </ul>	<p>This rule can provide for hydrological connectivity between valleys.</p>

Relevant water sharing plan	Clause (subclause)	Water sharing plan rule (as detailed in the relevant water sharing plan)	Additional description	Contribution to hydrological connectivity
		<p>(ii) 280 ML per day in the Darling River at Louth,                      (iii) 390 ML per day in the Darling River at Bourke,                      (iv) 550 ML per day in the Darling River at Brewarrina, and                      (v) 700 ML per day in the Barwon River at Walgett.</p> <p><b>Note.</b>                      This subclause is intended to protect flows needed to meet basic landholder rights requirements along the Barwon-Darling River.</p> <p>(14) The Minister may alter or replace the rule set out in subclause (12) or the requirements set out under subclause (13) should the Interim Unregulated Flow Management Plan for the North West be altered, or replaced by new management arrangements, providing that such action:</p> <p>(a) only affects the taking of water under supplementary water access licences,                      (b) only relates to the taking of water under supplementary water access licences and does not jeopardise critical environmental needs or the supply of water to basic rights holders, domestic and stock access licence holders and local water utility access licence holders in the Barwon Darling, and                      (c) in the Minister’s opinion, does not substantially alter the long-term average volume of water that can be taken under supplementary water access licences in the Border Rivers Regulated River Water Source.</p>		
<b>Supplementary water downstream of the Macintyre River and Dumaresq River junction</b>				
	<p>46 (6)  <b>Supplementary access</b></p>	<p><b>46: Taking of water under supplementary water access licences downstream of the Macintyre River and Dumaresq River junction</b></p> <p>(6) When all uncontrolled flows are arising from inflows to this water source upstream of Goondiwindi, the taking of water under the supplementary water access licences referred to in subclause (1):</p> <p>(a) should not commence until the flow volume entering, or expected to enter this water source over a two-day period at Goondiwindi is a minimum of 10,000 ML, plus the volume of water required to:</p> <p>(i) meet the environmental provisions of this Plan,                      (ii) satisfy downstream domestic and stock rights and native title rights,                      (iii) satisfy the total NSW and Queensland water orders placed by access licences, including associated losses,                      (iv) provide any required replenishment flows specified in clause 58, and                      (v) satisfy Queensland share for water harvesting licences.</p> <p><b>Note.</b>                      The two day flow at Goondiwindi is the 24 hour flow at Goondiwindi on the day of the assessment plus the flow for the previous 24 hours in the Macintyre Brook at Booba Sands plus the Dumaresq River at Glenarbon Weir plus the Macintyre River at Holdfast.</p> <p>(b) should cease when the flow volume entering this water source over a two-day period at Goondiwindi falls below 3,650 ML, plus the volume of water required to:</p> <p>(i) meet the environmental provisions of this Plan,                      (ii) satisfy downstream domestic and stock rights and native title rights,                      (iii) satisfy the total NSW and Queensland water orders placed by access licences, including associated losses,                      (iv) provide any required replenishment flows specified in clause 58, and</p>	<p>This rule provides restrictions on supplementary extraction to help meet environmental provisions in the Plan amongst other things. Restrictions are related to commence and cease to pump flow rates when flows are arising upstream of Goondiwindi.</p> <p>This rule is outlined in the New South Wales – Queensland Border Rivers Intergovernmental Agreement 2008 - <i>Access arrangements</i> 33. ‘The States agree to the access arrangements for unregulated flows in the Border Rivers as described in section 3 of Schedule D, subject to an environmental share of a minimum of 25% of the available volume during periods of access to unregulated flow being protected from take from the point of inflow downstream to Mungindi.’</p>	<p>Water not extracted by supplementary access licences remains in the river system and may contribute to hydrological connectivity in that water source.</p> <p>This water then contributes to resource assessment in downstream valley.</p>

Relevant water sharing plan	Clause (subclause)	Water sharing plan rule (as detailed in the relevant water sharing plan)	Additional description	Contribution to hydrological connectivity
		<p>(v) satisfy Queensland share for water harvesting licences.</p> <p><b>Note.</b> The IGA provides for access to supplementary flow event by each state downstream of the point of inflow.</p>		
	<p>46 (7) <b>Supplementary access</b></p>	<p><b>46: Taking of water under supplementary water access licences downstream of the Macintyre River and Dumaresq River junction</b></p> <p>(7) When all uncontrolled flows are arising from inflows to this water source downstream of Goondiwindi, the taking of water under the supplementary water access licences referred to in subclause (1):</p> <p>(a) should not commence until the flow volume entering, or expected to enter the system over a two-day period is a minimum of 2,000 ML, plus the volume of water required to:</p> <p>(i) meet the environmental provisions of this Plan,</p> <p>(ii) satisfy downstream domestic and stock rights and native title rights,</p> <p>(iii) satisfy the total NSW and Queensland water orders placed by access licences, including associated losses,</p> <p>(iv) provide any required replenishment flows specified in clause 58,</p> <p>(v) satisfy Queensland share for water harvesting licences, and</p> <p>(b) should cease when the flow volume entering the system falls below 1,550 ML over a two-day period, plus the volume of water required to:</p> <p>(i) meet the environmental provisions of this Plan,</p> <p>(ii) satisfy downstream domestic and stock rights and native title rights,</p> <p>(iii) satisfy the total NSW and Queensland water orders placed by access licences, including associated losses,</p> <p>(iv) provide any required replenishment flows specified in clause 58, and</p> <p>(v) satisfy Queensland share for water harvesting licences.</p>	<p>This rule provides restrictions on supplementary access to help meet environmental provisions in the Plan amongst other things. Restrictions are related to commence and cease to pump flow rates when flows in this water source arise downstream of Goondiwindi.</p>	<p>Water not extracted by supplementary access licences remains in the river system and may contribute to hydrological connectivity in that water source.</p> <p>This water then contributes to resource assessment in downstream valley.</p>
	<p>46 (8, 9, 10) <b>Supplementary access</b></p>	<p><b>46: Taking of water under supplementary water access licences downstream of the Macintyre River and Dumaresq River junction</b></p> <p>(8) Taking of water under the supplementary water access licences referred to in subclause (1) which nominate a work on the Macintyre River shall not be permitted, or shall be restricted, when this is required to ensure the passage to the Barwon-Darling of locally generated uncontrolled flows needed to meet the requirements of the Interim Unregulated Flow Management Plan for the North West.</p> <p><b>Note.</b> The Interim Unregulated Flow Management Plan for the North West is also known as the North-West Unregulated Flow Management Plan.</p> <p><b>Note.</b> Any restriction of supplementary water access licences in NSW as a result of the application of the Interim Unregulated Flow Management Plan for the North West does not impact on QLDs ability to extract in accordance with the IGA.</p> <p>(9) The requirements of the Interim Unregulated Flow Management Plan for the North West are:</p> <p>(a) a flow of 14,000 ML per day in the Barwon River at Brewarrina for 5 consecutive days, or 10,000 ML per day in the Darling River at Bourke for 5 consecutive days, during the period September to February inclusive, providing two such flow events have not already occurred during that period in that water year.</p>	<p>This rule provides for the restriction of extraction of supplementary water to achieve flow targets in the Barwon-Darling River.</p> <p>Flow targets are intended to :</p> <ul style="list-style-type: none"> <li>• Provide opportunity for the passage of fish across the major weirs in the Barwon-Darling</li> <li>• Protect flows needed to suppress blue-green algae blooms</li> <li>• Protect flows needed to meet basic landholder rights requirements along the Barwon-Darling River</li> </ul>	<p>This rule can provide for hydrological connectivity between valleys.</p>

Relevant water sharing plan	Clause (subclause)	Water sharing plan rule (as detailed in the relevant water sharing plan)	Additional description	Contribution to hydrological connectivity
		<p><b>Note.</b></p> <p>This subclause is intended to provide opportunity for the passage of fish across the major weirs in the Barwon-Darling.</p> <p>(b) a flow of 2,000 ML per day in the Darling River at Wilcannia for 5 consecutive days during October to April, inclusive, providing flows of this quantity have not already been reached during the preceding three months within the October to April period, and</p> <p><b>Note.</b></p> <p>This subclause is intended to protect flows needed to suppress blue-green algae blooms.</p> <p>(c) a flow of:</p> <ul style="list-style-type: none"> <li>(i) 150 ML per day in the Darling River at Wilcannia,</li> <li>(ii) 280 ML per day in the Darling River at Louth,</li> <li>(iii) 390 ML per day in the Darling River at Bourke,</li> <li>(iv) 550 ML per day in the Barwon River at Brewarrina, and</li> <li>(v) 700 ML per day in the Barwon River at Walgett.</li> </ul> <p><b>Note.</b></p> <p>This subclause is intended to protect flows needed to meet basic landholder rights requirements along the Barwon-Darling River.</p> <p>(10) The Minister may alter or replace the rule set out in subclause (8), or the requirements set out under subclause (9), should the Interim Unregulated Flow Management Plan for the North West be altered, or replaced by new management arrangements, providing that such action:</p> <ul style="list-style-type: none"> <li>(a) only affects the taking of water under the supplementary water access licences referred to in subclause (1),</li> <li>(b) only relates to the taking of water under the supplementary water access licences referred to in subclause (1) and does not jeopardise critical environmental needs or the supply of water to basic rights holders, domestic and stock access licence holders and local water utility access licence holders in the Barwon Darling, and</li> <li>(c) in the Minister’s opinion, does not substantially alter the long-term average volume of water that can be taken under supplementary water access licences in this water source.</li> </ul>		
<p><i>NSW Border Rivers Unregulated and Alluvial Water Sources 2012</i></p>	<p>15 (1)</p> <p><b>Planned environmental water</b></p>	<p><b>15: Commitment and identification of planned environmental water</b></p> <p>(1) Water is committed and identified as planned environmental water in these water sources, excluding the NSW Border Rivers Upstream Keetah Bridge Alluvial Groundwater Source, in the following ways:</p> <ul style="list-style-type: none"> <li>(a) by reference to the commitment of the physical presence of water in these water sources,</li> <li>(b) by reference to the long-term average annual commitment of water as planned environmental water, and</li> <li>(c) by reference to the water that is not committed after the commitments to basic landholder rights and for sharing and extraction under any other rights have been met.</li> </ul>	<p>Preserve water above the LTAAEL for the environment. The LTAAEL is referred to in clause 28(3), this relates to the Croppa Creek and Whalan Creek Extraction Management Unit as this EMU joins the Barwon through the Boomi River.</p>	<p>Water remaining in the river after extraction may provide for hydrological connectivity in that water source.</p> <p>This water then contributes to resource assessment in downstream valley.</p>

Relevant water sharing plan	Clause (subclause)	Water sharing plan rule (as detailed in the relevant water sharing plan)	Additional description	Contribution to hydrological connectivity
<i>Intersecting Streams Unregulated and Alluvial Water Sources 2011</i>	16 (2) <b>Planned environmental water</b>	<p><b>15: Commitment and identification of planned environmental water</b></p> <p>(1) Planned environmental water is committed and identified in these water sources as set out in this clause.</p> <p>(2) Water is committed and identified as planned environmental water in these water sources in the following ways:</p> <p>(a) by reference to the commitment of the physical presence of water in these water sources,</p> <p>(b) by reference to the long-term average annual commitment of water as planned environmental water, and</p> <p>(c) by reference to the water that is not committed after the commitments to basic landholder rights and for sharing and extraction under any other rights have been met.</p>	Preserve water above the LTAAEL for the environment.	<p>Water remaining in the river after extraction may provide for hydrological connectivity in that water source.</p> <p>This water then contributes to resource assessment in downstream valley.</p>
<i>Gwydir Regulated River Water Source 2016</i>	13 (a,b) <b>Planned environmental water</b>	<p><b>13: Planned environmental water</b></p> <p>This Plan establishes the following planned environmental water rules:</p> <p>(a) water volume in excess of the long-term extraction limit established in clause 29 of this Plan may not be taken from this water source and used for any purpose,</p> <p>(b) water availability is to be managed as specified in clause 31 of this Plan to ensure water volume in excess of the long-term extraction limit is not being taken,</p>	By limiting long-term average annual extractions to an estimated 392,000 megalitres per year this Plan ensures that approximately 66% of the long-term average annual flow in this water source (estimated to be 1,141,000 megalitres per year) will be preserved and will contribute to the maintenance of basic ecosystem health.	<p>Water remaining in the river after extraction may provide for hydrological connectivity in that water source.</p> <p>This water then contributes to resource assessment in downstream valley.</p>
	14 <b>Planned environmental water</b>	<p><b>14: Planned environmental water</b></p> <p>This Plan establishes the following planned environmental water rules:</p> <p>a) an environmental contingency allowance (hereafter ECA) is to be set aside in Copeton Dam water storage,</p> <p>(b) an account of the water credited to and released from the ECA is to be kept,</p> <p>(c) whenever an available water determination for regulated river (general security) access licences is made, the ECA account shall be credited with a volume equal to the lesser of:</p> <p>(i) 45,000 megalitres multiplied by the number of megalitres per unit share specified in that available water determination, and</p> <p>(ii) 90,000 megalitres minus the volume currently in the account</p>	An environmental contingency allowance is provided for in the Gwydir and contributes to connectivity in the Gwydir valley	<p>This discretionary environmental water may contribute to hydrological connectivity in that water source.</p> <p>This water then contributes to resource assessment in downstream valley.</p>
	47(5) <b>Supplementary access</b>	<p><b>47: Taking of water under supplementary water access licences</b></p> <p>(5) No more than 50% of the supplementary water event volume may be permitted to be taken under supplementary water access licences during a supplementary water event</p>	This rule allows no more than 50% of supplementary water to be extracted, as such; this rule protects 50% of supplementary water for the environment.	<p>Water not extracted by supplementary access licences remains in the river system and may contribute to hydrological connectivity in that water source.</p> <p>This water then contributes to</p>

Relevant water sharing plan	Clause (subclause)	Water sharing plan rule (as detailed in the relevant water sharing plan)	Additional description	Contribution to hydrological connectivity
				resource assessment in downstream valley.
	47 (7, 8, 9, 10) <b>Supplementary access</b>	<p><b>47: Taking of water under supplementary water access licences</b></p> <p>(7) Taking of water under supplementary water access licences nominating works on the Mehi River, Carole Creek, or on rivers which receive effluent flows from the Mehi River or Carole Creek, shall not be permitted, or shall be restricted, when this is required to ensure the passage to the Barwon-Darling River of locally generated uncontrolled flows needed to meet the requirements of the Interim Unregulated Flow Management Plan for the North West.</p> <p><b>Note.</b></p> <p>The Interim Unregulated Flow Management Plan for the North West is also known as the North-West Unregulated Flow Management Plan.</p> <p>(8) For the purposes of subclause (7), locally generated uncontrolled flows shall mean any uncontrolled flow or portion of any uncontrolled flow in these rivers that is not the result of inflows from the Gwydir River.</p> <p>9) The requirements of the Interim Unregulated Flow Management Plan for the North West are:</p> <p>(a) a flow of 14,000 ML per day in the Darling River at Brewarrina for 5 consecutive days, or 10,000 ML per day in the Darling River at Bourke for 5 consecutive days, during the period September to February inclusive, providing two such flow events have not already occurred during that period in that water year,</p> <p><b>Note.</b></p> <p>This paragraph is intended to provide opportunity for the passage of fish across the major weirs in the Barwon-Darling River.</p> <p>(b) a flow of 2,000 ML per day in the Darling River at Wilcannia for 5 consecutive days during the period October to April, inclusive, providing flows of this quantity have not already been reached during the preceding three months within the October to April period, and</p> <p><b>Note.</b></p> <p>This paragraph is intended to protect flows needed to suppress blue-green algae blooms.</p> <p>(c) a flow of:</p> <p>(i) 150 ML per day in the Darling River at Wilcannia,</p> <p>(ii) 280 ML per day in the Darling River at Louth,</p> <p>(iii) 390 ML per day in the Darling River at Bourke,</p> <p>(iv) 550 ML per day in the Darling River at Brewarrina, and</p> <p>(v) 700 ML per day in the Barwon River at Walgett,</p> <p><b>Note.</b></p> <p>This paragraph is intended to protect flows needed to meet basic landholder rights requirements along the Barwon-Darling River.</p> <p>(10) The Minister may, under section 45 (1) (b) of the Act and by order published on the NSW legislation website, alter or replace the rule set out in subclause (7) or the requirements set out under subclause (9) should the Interim Unregulated Flow Management Plan for the North West be altered, or replaced by new management arrangements, providing that such action:</p> <p>(a) only affects the taking of water under supplementary water access licences,</p>	<p>This rule restricts extraction of supplementary water to achieve flow targets in the Barwon-Darling River.</p> <p>Flow targets are intended to :</p> <ul style="list-style-type: none"> <li>• Provide opportunity for the passage of fish across the major weirs in the Barwon-Darling</li> <li>• Protect flows needed to suppress blue-green algae blooms</li> <li>• Protect flows needed to meet basic landholder rights requirements along the Barwon-Darling River</li> </ul>	<p>This rule can provide for hydrological connectivity between valleys.</p>

Relevant water sharing plan	Clause (subclause)	Water sharing plan rule (as detailed in the relevant water sharing plan)	Additional description	Contribution to hydrological connectivity
		<p>(b) only relates to ensuring the taking of water under supplementary water access licences does not jeopardise critical environmental needs or the supply of water to basic rights holders, domestic and stock access licence holders and local water utility access licence holders in the Barwon-Darling River, and</p> <p>(c) in the Minister’s opinion, does not substantially alter the long-term average volume of water that can be taken under supplementary water access licences in the Gwydir Regulated River Water Source.</p>		
<p><i>Gwydir Unregulated and Alluvial Water Sources 2012</i></p>	<p>16 <b>Planned environmental water</b></p>	<p><b>16: Commitment and identification of planned environmental water</b></p> <p>Water is committed and identified as planned environmental water in these water sources in the following ways:</p> <p>(a) by reference to the commitment of the physical presence of water in the water source,</p> <p>(b) by reference to the long-term average annual commitment of water as planned environmental water, and</p> <p>(c) by reference to the water that is not committed after the commitments to basic landholder rights and for sharing and extraction under any other rights have been met.</p>	<p>Preserve water above the LTAAEL for the environment contributing to hydrological connectivity.</p>	<p>Water remaining in the river after extraction may provide for hydrological connectivity in that water source.</p> <p>This water then contributes to resource assessment in downstream valley.</p>
	<p>43 (1 to 7 and Table B) <b>Flow classes</b></p>	<p><b>42: Flow classes</b></p> <p>(1) This Plan establishes the flow classes specified in Column 3 of Table B as the basis for the sharing of flows on a daily basis in the Gwydir Unregulated River Water Sources.</p> <p>(2) The flow classes in Column 3 of Table B and the flow reference points specified in Column 6 of Table B are established for each water source specified in Column 1 and each management zone specified in Column 2 of Table B.</p> <p>(3) Subject to subclause (4), a flow class applies in the respective water source or management zone on the day specified in Column 7 of Table B when the flow (ML per day) as measured at the flow reference point specified in Column 6 of Table B is equal to the flow specified in Column 5 of Table B.</p> <p>(4) If, in the Minister’s opinion, accurate flow data is not available on a particular day from a flow measuring gauge used to determine a flow class, the Minister may determine the flow class that applies for that day and notify the licence holder in writing of the flow class that applies for that day. For the purpose of this subclause, notification includes publishing a notice on the Department’s website.</p> <p>(5) For the purpose of determining the flow class that applies on a particular day under subclause (4), the Minister may take into consideration evidence of past and current flows and readings at other functioning upstream and downstream gauges.</p> <p><b>Note.</b></p> <p>On days that accurate flow data is not available, holders of access licences may contact the Department’s office at the address listed in Appendix 5 or check the Department’s website to find out what flow class applies on that day.</p> <p>(6) The flow classes commence in the year specified in Column 4 of Table B.</p> <p>(7) For the purpose of Table B, Year 1 of this Plan means from the date of commencement of this Plan.</p> <p><b>Note.</b></p> <p>Only those water sources for which flow classes have been established at the commencement of this Plan are shown in Table B.</p>	<p><i>Gingham watercourse</i></p> <p>Flow class restrictions on Gingham watercourse to protect water entering from the regulated river and may contribute to connectivity to the Barwon-Darling River.</p> <p>Flow class restriction on Gingham Watercourse Water Source has a commence to pump at 250 ML per day at Tillaloo bridge gauge (418076), 250 ML per day corresponds to the estimated 10th percentile flow.</p> <p>Minimum flow depth of 1 m on the Gingham Bridge Gauge and a cumulative flow of 4,000 ML past the Gingham Bridge and a visible flow at Morialta Road. 1 metre on the gauge corresponds to the estimated 21st percentile flow, and 4,000 ML per year corresponds to the estimated 2<sup>nd</sup> percentile flow</p> <p><i>Gwydir watercourse</i></p> <p>Flow class restriction on Gwydir water source to protect water entering from the regulated river and may contribute to connectivity to the Barwon-Darling River. Gwydir Water Source has a commence to pump at 250 ML per day at Millewa gauge (418066), 250 ML per day corresponds to the estimated 9<sup>th</sup> percentile flow.</p>	<p>Water remaining in the river after flow class restrictions may provide for hydrological connectivity in that water source.</p> <p>This water then contributes to resource assessment in downstream valley.</p>

Relevant water sharing plan	Clause (subclause)	Water sharing plan rule (as detailed in the relevant water sharing plan)	Additional description	Contribution to hydrological connectivity																																																				
		<p><b>Table B—Flow Classes</b></p> <table border="1"> <thead> <tr> <th>Column 1</th> <th>Column 2</th> <th>Column 3</th> <th>Column 4</th> <th>Column 5</th> <th>Column 6</th> <th>Column 7</th> </tr> <tr> <th>Water source</th> <th>Management zone</th> <th>Flow class</th> <th>Commencement</th> <th>Flow (ML/day)</th> <th>Flow reference point</th> <th>Day on which flow class applies</th> </tr> </thead> <tbody> <tr> <td rowspan="3">Gingham Watercourse Water Source</td> <td rowspan="2">Upper Gingham Watercourse Management Zone</td> <td>Very Low Flow Class</td> <td>Year 1 of this Plan</td> <td>Less than or equal to 250 ML/day</td> <td>Gingham channel at Tillaloo bridge gauge (418076)</td> <td>Same day</td> </tr> <tr> <td>A Class</td> <td>Year 1 of this Plan</td> <td>More than 250 ML/day</td> <td></td> <td>Same day</td> </tr> <tr> <td>Lower Gingham Watercourse Management Zone</td> <td>Very Low Flow Class</td> <td>Year 1 of this Plan</td> <td>Less than or equal to the minimal flow depth of 1.0 metre on the Gingham Bridge gauge (418079) or less than or equal to 4000 ML/year at the Gingham Bridge gauge or no visible flow at the Gingham Watercourse at Morialta Road</td> <td>Gingham channel at Gingham Bridge gauge (418079) and Gingham Watercourse at Morialta Road</td> <td>Same day</td> </tr> <tr> <td rowspan="2">Gwydir Water Source</td> <td></td> <td>A Class</td> <td>Year 1 of this Plan</td> <td>More than the minimal flow depth of 1.0 metre on the Gingham Bridge gauge and more than 4000 ML/year at the Gingham Bridge gauge and a visible flow at the Gingham Watercourse at Morialta Road</td> <td></td> <td>Same day</td> </tr> <tr> <td></td> <td>Very Low Flow Class</td> <td>Year 1 of this Plan</td> <td>Less than or equal to 250 ML/day</td> <td>Gwydir River at Millewa gauge (418066)</td> <td>Same day</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	Column 1	Column 2	Column 3	Column 4	Column 5	Column 6	Column 7	Water source	Management zone	Flow class	Commencement	Flow (ML/day)	Flow reference point	Day on which flow class applies	Gingham Watercourse Water Source	Upper Gingham Watercourse Management Zone	Very Low Flow Class	Year 1 of this Plan	Less than or equal to 250 ML/day	Gingham channel at Tillaloo bridge gauge (418076)	Same day	A Class	Year 1 of this Plan	More than 250 ML/day		Same day	Lower Gingham Watercourse Management Zone	Very Low Flow Class	Year 1 of this Plan	Less than or equal to the minimal flow depth of 1.0 metre on the Gingham Bridge gauge (418079) or less than or equal to 4000 ML/year at the Gingham Bridge gauge or no visible flow at the Gingham Watercourse at Morialta Road	Gingham channel at Gingham Bridge gauge (418079) and Gingham Watercourse at Morialta Road	Same day	Gwydir Water Source		A Class	Year 1 of this Plan	More than the minimal flow depth of 1.0 metre on the Gingham Bridge gauge and more than 4000 ML/year at the Gingham Bridge gauge and a visible flow at the Gingham Watercourse at Morialta Road		Same day		Very Low Flow Class	Year 1 of this Plan	Less than or equal to 250 ML/day	Gwydir River at Millewa gauge (418066)	Same day									
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		Very Low Flow Class	Year 1 of this Plan	Less than or equal to 250 ML/day	Gwydir River at Millewa gauge (418066)	Same day																																																		
<p><i>Upper Namoi &amp; Lower Namoi Regulated River Water Sources 2016</i></p>	<p>13 <b>Planned environmental water</b></p>	<p><b>13: Planned environmental water</b></p> <p>This Plan establishes the following planned environmental water rules:</p> <p>(a) water volume in excess of the long-term extraction limit established in clause 30 of this Plan may not be taken from these water sources and used for any purpose, and</p> <p>(b) water availability is to be managed as specified in clause 31 of this Plan to ensure water volume in excess of the long-term extraction limit is not being taken.</p>	<p>By limiting long-term average extractions to an estimated 238,000 megalitres per year this Plan ensures that approximately 73% of the long-term average annual flow in these water sources (estimated to be 870,000 megalitres per year) will be preserved and will contribute to the maintenance of basic ecosystem health.</p>	<p>Water remaining in the river after extraction may provide for hydrological connectivity in that water source.</p> <p>This water then contributes to resource assessment in downstream valley.</p>																																																				
	<p>14 (1, 2, 3) <b>Planned environmental water</b></p>	<p><b>14: Planned environmental water</b></p> <p>(1) This Plan establishes the rule in subclause (2) as a planned environmental water rule.</p> <p>(2) In the months of June, July and August, a minimum daily flow which is equivalent to 75 % of the natural 95<sup>th</sup> percentile daily flow for each month shall be maintained in the Namoi River at Walgett (streamflow gauging station number 419091).</p> <p>(3) Subclause (2) shall not apply when the sum of the water stored in Keepit Dam and Split Rock Dam is less than 120,000 megalitres.</p>	<p>Minimum daily flow requirements maintained at Namoi River at Walgett.</p> <p>The target flows are currently estimated as 21 ML per day in June, 24 ML per day in July and 17 ML per day in August;</p> <p>These rules are aimed at restoring a proportion of natural flows to the end of the regulated Namoi River system.</p>	<p>This rule provides for hydrological connectivity to the end of the system.</p> <p>This water then contributes to resource assessment in downstream valley</p>																																																				
	<p>48 (5, 6, 7, 8) <b>Supplementary access</b></p>	<p><b>48: Taking of water under supplementary water licences in the Lower Namoi Regulated River Water Source</b></p> <p>(5) Taking of water under supplementary water access licences in the Lower Namoi Regulated River Water Source shall not be permitted, or shall be restricted, when this is required to ensure outflows from the Lower Namoi Regulated River Water Source contribute to meeting the requirements of the Interim Unregulated Flow Management Plan for the North West.</p>	<p>This rule provides for the restriction of extraction of supplementary water to achieve flow targets in the Barwon-Darling River.</p> <p>Flow targets are intended to :</p> <ul style="list-style-type: none"> <li>Provide opportunity for the passage of fish across the major weirs in the Barwon-Darling</li> </ul>	<p>This rule can provide for hydrological connectivity between valleys.</p>																																																				

Relevant water sharing plan	Clause (subclause)	Water sharing plan rule (as detailed in the relevant water sharing plan)	Additional description	Contribution to hydrological connectivity
		<p><b>Note.</b> The Interim Unregulated Flow Management Plan for the North West is also known as the North-West Unregulated Flow Management Plan.</p> <p><b>Note.</b> The Namoi is one of a number of Barwon-Darling tributary rivers covered by the Interim Unregulated Flow Management Plan for the North West. Flow targets in the Barwon-Darling River specified under that Plan may, at times, be met by flows coming from other rivers or may require contributions of flow from several rivers.</p> <p>(6) The requirements of the Interim Unregulated Flow Management Plan for the North West are:</p> <p>(a) a flow of 14,000 megalitres per day (hereafter <b>ML per day</b>) in the Darling River at Brewarrina for 5 consecutive days, or 10,000 ML per day in the Darling River at Bourke for 5 consecutive days, during the period September to February inclusive, providing two such flow events have not already occurred during that period in that water year,</p> <p><b>Note.</b> This subclause is intended to provide opportunity for the passage of fish across the major weirs in the Barwon-Darling River.</p> <p>(b) a flow of 2,000 ML per day in the Darling River at Wilcannia for 5 consecutive days during October to April, inclusive, providing flows of this quantity have not already been reached during the preceding three months within the October to April period, and</p> <p><b>Note.</b> This subclause is intended to protect flows needed to suppress blue-green algae blooms.</p> <p>(c) a flow of:</p> <ul style="list-style-type: none"> <li>(i) 150 ML per day in the Darling River at Wilcannia,</li> <li>(ii) 280 ML per day in the Darling River at Louth,</li> <li>(iii) 390 ML per day at in the Darling River at Bourke,</li> <li>(iv) 550 ML per day at in the Darling River at Brewarrina, and</li> <li>(v) 700 ML per day in the Barwon River at Walgett.</li> </ul> <p><b>Note.</b> This subclause is intended to protect flows needed to meet basic landholder rights requirements in the Barwon-Darling.</p> <p>(7) The Minister may, under section 45 (1) (b) of the Act and by order published on the NSW legislation website, alter or replace the rule set out in subclause (5) or the requirements set out under subclause (6) should the Interim Unregulated Flow Management Plan for the North West be altered or replaced by new management arrangements.</p> <p>(8) Any action under subclause (7) must:</p> <ul style="list-style-type: none"> <li>(a) only affect the taking of water under supplementary water access licences,</li> <li>(b) only relate to ensuring the taking of water under supplementary water access licences does not jeopardise critical environmental needs or the supply of water to basic rights holders, domestic and stock access licence holders and local water utility access licence holders in the Barwon-Darling River,</li> <li>(c) in the Minister’s opinion, not substantially alter the long-term average volume of water that can be taken under supplementary water access licences in the Lower Namoi Regulated River Water Source.</li> </ul>	<ul style="list-style-type: none"> <li>• Protect flows needed to suppress blue-green algae blooms</li> <li>• Protect flows needed to meet basic landholder rights requirements along the Barwon-Darling River</li> </ul>	

Relevant water sharing plan	Clause (subclause)	Water sharing plan rule (as detailed in the relevant water sharing plan)	Additional description	Contribution to hydrological connectivity
	48 (11) <b>Supplementary access</b>	<p><b>48: Taking of water under supplementary water licences in the Lower Namoi Regulated River Water Source</b></p> <p>(11) The volume of water that may be made available for extraction under supplementary water access licences in the Lower Namoi Regulated River Water Source during each supplementary water event:</p> <ul style="list-style-type: none"> <li>(a) prior to 1 July 2019, should not exceed 50% of the supplementary event volume, and</li> <li>(b) after 30 June 2019, should not exceed: <ul style="list-style-type: none"> <li>(i) 10 % of the supplementary event volume between 1 July and 31 October, and</li> <li>(ii) 50 % of the supplementary event volume between 1 November and 30 June.</li> </ul> </li> </ul> <p><b>Notes.</b></p> <p>The water management rules that were defined in this Plan on 1 July 2004 included limits to the amount of water that could be made available for extraction under supplementary water access licences that were different from those currently specified in clause 48 (11). These limits were 10 % of the supplementary event volume occurring between 1 July and 31 October in any water year and 50 % of the supplementary event volume occurring between 1 November and 30 June in any water year.</p>	<p>This rule protects a portion of supplementary access for the environment. Currently (until 1 July 2019) there is a trial that protects 50% of supplementary water for the environment. This may revert back to the original intent (after 30 June 2019) to protect 90% of supplementary flows for the environment between 1 July and 31 October and 50% of supplementary flows for the environment between 1 November and 30 June.</p>	<p>Water not extracted by supplementary access licences remains in the river system and may contribute to hydrological connectivity in that water source.</p> <p>This water then contributes to resource assessment in downstream valley.</p>
	48 (16 a, b) <b>Supplementary access</b>	<p><b>48: Taking of water under supplementary water licences in the Lower Namoi Regulated River Water Source</b></p> <p>(16) When uncontrolled flows are arising from inflows to the Lower Namoi Regulated River Water Source downstream of Weeta Weir, the taking of water under supplementary water access licences nominating water supply works downstream of Weeta Weir may be permitted after uncontrolled flows have increased to a rate sufficient to:</p> <ul style="list-style-type: none"> <li>(a) ensure a flow of 200 ML per day for 5 days would be achieved in the Namoi River at Walgett, when the total volume of water allocations in regulated river (general security) access licence accounts is greater than 90,000 megalitres, or</li> <li>(b) ensure a flow of 10 ML per day when the total volume of water allocations in regulated river (general security) access licence accounts is less than 90,000 megalitres.</li> </ul>	<p>This rule restricts supplementary access to ensure end-of-system flows are achieved at Namoi River at Walgett. The end-of-system requirements differ depending on the total volume of water allocations in regulated river (general security) access licence accounts is less than or greater than 90,000 ML.</p>	<p>Water not extracted by supplementary access licences remains in the river system and may contribute to hydrological connectivity in that water source.</p> <p>This water then contributes to resource assessment in downstream valley.</p>
	48 (17) <b>Supplementary access</b>	<p><b>48: Taking of water under supplementary water licences in the Lower Namoi Regulated River Water Source</b></p> <p>(17) Taking of water under supplementary water access licences nominating water supply works on the Gunidgera/Pian system shall be managed so that the flow passing Dundee Weir during the period when the taking of water is permitted is the lesser of:</p> <ul style="list-style-type: none"> <li>(a) 50 ML per day, or</li> <li>(b) the inflows entering the Gunidgera/Pian system as a result of rainfall on its catchment downstream of the Gunidgera Creek offtake.</li> </ul> <p><b>Note.</b></p> <p>Taking of water on the Gunidgera/Pian system must not result in subclause (11) or other relevant subclauses being breached. Subclause (17) is an additional provision affecting taking of water on the Gunidgera/Pian system.</p> <p><b>Note.</b></p> <p>Regardless of any announcement permitting supplementary water access, any water orders in the system will be debited against the regulated river (general security) account on release from the Dam as indicated in clause 43 (4). Failure to extract ordered water in the system and the taking of supplementary water</p>	<p>This rule restricts supplementary access so flows passing Dundee Weir is the lesser of 50 ML per day or inflows entering the Gunidgera/Pian systems as a result from rainfall on its catchment downstream of the Gunidgera Creek offtake.</p>	<p>Water not extracted by supplementary access licences remains in the river system and may contribute to hydrological connectivity in that water source.</p> <p>This water then contributes to resource assessment in downstream valley.</p>

Relevant water sharing plan	Clause (subclause)	Water sharing plan rule (as detailed in the relevant water sharing plan)	Additional description	Contribution to hydrological connectivity
		instead will result in a debit to the regulated river (general security) account and recording of use against the supplementary water access licence.		
<p><i>Macquarie and Cudgegong Regulated River Water Sources 2016</i></p>	<p>14 (10,12, 22) <b>Planned environmental water</b></p>	<p><b>14: Planned environmental water</b></p> <p>(10) An environmental water allowance shall be established for environmental purposes downstream of Burrendong Dam and shall be released:</p> <ul style="list-style-type: none"> <li>(a) as specified in this clause to improve environmental outcomes in the Macquarie Marshes and Macquarie River between Burrendong Dam and the Macquarie Marshes, and</li> <li>(b) with appropriate regard to the matters listed in clause 23 (a) to (f).</li> </ul> <p>(12) The volumes credited to and debited from the environmental water allowance are to be calculated according to the following:</p> <ul style="list-style-type: none"> <li>(a) whenever an available water determination is made for regulated river (general security) access licences, the allowance shall be credited with a volume equal to 160,000 megalitres multiplied by the number of megalitres per unit share specified in that available water determination, except when the available water determination is made pursuant to clause 37 (6) or (7),</li> <li>(c) the volume credited to the allowance shall be distributed between two sub-allowances in the following way: <ul style="list-style-type: none"> <li>(i) sub-allowance 1 (translucent) is to receive three fifths of the volume, and</li> <li>(ii) sub-allowance 2 (active) is to receive two fifths of the volume,</li> </ul> </li> </ul> <p>(22) Releases of sub-allowance 2 (active) water are to be made from Burrendong Dam according to the following:</p> <ul style="list-style-type: none"> <li>(a) water carried over from the previous water year shall be released before water that has been credited to sub-allowance 2 (active) in the current water year,</li> <li>(b) releases of sub-allowance 2 (active) water may not be made to meet ecological needs in the Macquarie River or the Macquarie Marshes if these needs will be met by releases under subclause (16), unless releases of sub-allowance 2 (active) water are to be made pursuant to subclause (22) (g), (i) and (j),</li> <li>(c) releases may be made at any time of the year to enhance opportunities for native fish recruitment and dispersal in the Macquarie River and Macquarie Marshes,</li> <li>(d) releases may be made at any time of the year to ensure the successful completion of colonial water bird breeding, except when: <ul style="list-style-type: none"> <li>(i) the volume of sub-allowance 2 (active) water in storage and climate predictions over the breeding event period indicates that the event cannot be sustained, or</li> <li>(ii) all water bird colonies cannot be sustained, then priority will be dependent on the species type, location of breeding site, number of pairs, vulnerability of the population and long-term ecosystem maintenance overrides individual species or present annual wetland requirements,</li> </ul> </li> <li>(e) releases may be made at any time of the year for the purpose of alleviating severe, unnaturally prolonged drought conditions in the Macquarie Marshes where habitat maintenance of semi-permanent wetlands as defined by River Red Gum Woodlands, water couch and common reed is seen as critical,</li> <li>(f) releases may be made at any time of the year for the purpose of any other ecological objectives, identified pursuant to paragraph (g),</li> <li>(g) before the commencement of each water year the Minister should identify any other ecological objects for the purpose of paragraph (f) and develop detailed rules to govern the releases of sub-allowance 2 (active) water to address these ecological objectives and the ecological objectives or contingent events specified in paragraphs (b), (c), (d) (ii) and (e),</li> </ul>	<p>This rule provides for an environmental water allowance of 160,000 ML in Burrendong Dam. An <i>active</i> sub-allowance receives at least two fifths of the volume. This <i>active</i> sub-allowance can be protected between the regulated river into the unregulated section of the Macquarie valley, as per rules detailed in the Macquarie Bogan Unregulated and Alluvial Water Source section below. This may be used to achieve connectivity to the Barwon-Darling River.</p>	<p>This rule provides for hydrological connectivity to the end of the system if used in conjunction with the Water Sharing Plan for the Macquarie Bogan Unregulated and Alluvial Water Source.</p> <p>This water then contributes to resource assessment in downstream valley.</p>

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		<p>(h) the Minister should seek advice from the Environmental Flow Reference Group if established under subclause (23), at any time within the water year regarding the use of sub-allowance 2 (active) water for the purposes specified in paragraphs (c), (d) (ii), (e) and (f),</p> <p>(i) in the event that the detailed rules referred to in paragraph (g) have not been developed, sub-allowance 2 (active) water shall be released according to the rules applying to sub-allowance 1 (translucent) water once the volume in sub-allowance 1 is exhausted,</p> <p>(j) the rules developed under paragraph (22) (g) may permit sub-allowance 2 (active) water to be used to extend releases of sub-allowance 1 (translucent) water, and</p> <p>(k) at the commencement of each water year the Minister should seek advice from the Environmental Flow Reference Group if established under subclause (23), on:</p> <p>(i) the priority of ecological objectives and the rules that will govern the use of sub-allowance 2 (active) water during the coming water year, and</p> <p>(ii) the circumstances under which releases of sub-allowance 1 (translucent) water may be extended using sub-allowance 2 (active) water when the volume in sub-allowance 1 (translucent) is nearing zero.</p>		
<p><i>Macquarie Bogan Unregulated and Alluvial Water Sources 2012</i></p>	<p>16 <b>Planned environmental water</b></p>	<p><b>16: Commitment and identification of planned environmental water</b></p> <p>(1) Water is committed and identified as planned environmental water in the Macquarie Bogan Unregulated Water Sources and the Talbragar Alluvial Groundwater Source in the following ways:</p> <p>(a) by reference to the commitment of the physical presence of water in the relevant water source,</p> <p>(b) by reference to the long-term average annual commitment of water as planned environmental water, and</p> <p>(c) by reference to the water that is not committed after the commitments to basic landholder rights and for sharing and extraction under any other rights have been met.</p>	<p>Preserve water above the LTAAEL for the environment.</p>	<p>Water remaining in the river after extraction may provide for hydrological connectivity in that water source.</p> <p>This water then contributes to resource assessment in downstream valley.</p>
	<p>53 (27) <b>Access rules</b></p>	<p><b>53: Access rules for the taking of surface water</b></p> <p>(27) Water must not be taken from flows resulting from releases made according to clause 15 (22) of the <i>Water Sharing Plan for the Macquarie and Cudgegong Regulated Rivers Water Source 2003</i> under an access licence with a share component that specifies:</p> <p>(a) the Ewenmar Creek Water Source,</p> <p>(b) the Lower Bogan River Water Source,</p> <p>(c) the Lower Macquarie River Water Source,</p> <p>(d) the Marra Creek Water Source, or</p> <p>(e) the Marthaguy Creek Water Source.</p> <p><b>Note.</b></p> <p>The Minister may make an order under section 324 of the Act to temporarily restrict or prohibit the taking of water from the above-listed water sources, or other water sources, in order to protect environmental releases, if the Minister is satisfied that it is necessary to do so in the public interest</p>	<p>This rule protects releases of sub-allowance 2 (active) water from Burrendong Dam in the regulated river water source through specified unregulated river water sources.</p> <p>This relates to clause 14 (22) in the regulated river section above. The cross reference in the unregulated plan still references to 2003 water sharing plan and not the 2016 plan.</p>	<p>This rule provides for the protection of planned environmental water released in the regulated river to be protected into the downstream unregulated river in the Macquarie valley. This may contribute to hydrological connectivity into the Barwon-Darling River.</p> <p>This water then contributes to resource assessment in downstream valley.</p>

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<p><i>Barwon-Darling Unregulated and Alluvial Water Sources 2012</i></p>	<p>16 (a, b, c) <b>Planned environmental water</b></p>	<p><b>16: Commitment and identification of planned environmental water</b> Water is committed and identified as planned environmental water in these water sources in the following ways:</p> <ul style="list-style-type: none"> <li>(a) by reference to the commitment of the physical presence of water in these water sources,</li> <li>(b) by reference to the long-term average annual commitment of water as planned environmental water, and</li> <li>(c) by reference to the water that is not committed after the commitments to basic landholder rights and for sharing and extraction under any other rights have been met</li> </ul>	<p>At the commencement of this Plan the long-term average annual commitment of water to the environment in the Barwon-Darling Unregulated River Water Source has been estimated to be 2,607 gigalitres per year made using the Barwon-Darling IQQM with system file LT92_30.sqq. This equates to approximately 94% of the long-term average annual flow in this water source.</p>	<p>Water remaining in the river after extraction may provide for hydrological connectivity in that water source.  This water then contributes to resource assessment in downstream valley.</p>
	<p>45 (1 to 7) <b>Flow classes</b></p>	<p><b>45: Flow classes</b></p> <p>(1) This Plan establishes the flow classes specified in Column 3 of Table A for the sharing of flows on a daily basis in the Barwon-Darling Unregulated River Water Source.</p> <p>(2) The flow classes in Column 3 and the flow reference points specified in Column 6 of Table A are established for the water source specified in Column 1 and each management zone specified in Column 2 of Table A.</p> <p>(3) Subject to subclauses (4) and (5), a flow class applies in the respective water source or management zone on the day specified in Column 7 of Table A when flows (the flow of water in ML per day) as measured at the flow reference points specified in Column 6 of Table A are equal to the flows specified in Column 5 of Table A.</p> <p>(4) For flow classes that are determined based on flows at more than one flow measuring gauge, on any day that it is not possible to determine the flow at a flow reference point specified in Column 6 of Table A due to flow data not being available from a flow measuring gauge, then the flow class applies for the relevant management zone when flows as measured at the remaining functioning gauge specified in Column 6 of Table A are equal to the flows specified in Column 5 of Table A for that gauge.</p> <p>(5) Subject to subclause (4), if in the Minister’s opinion, on any day accurate flow data is not available from a flow measuring gauge used to determine a flow class, the Minister may determine the flow class that applies for that day and notify the licence holder in writing the flow class that applies for that day. For the purpose of this subclause, notification includes publishing a notice on the Department’s website.</p> <p><b>Note.</b> There is a general requirement for holders of water supply work approvals to record in a Logbook, where one is required to be kept, a confirmation and means of confirmation that the relevant cease to take conditions do not apply before taking water. Holders of access licences may contact the Department’s Dubbo office at the address listed in Appendix 3 or check the Department’s website to find out what flow class applies that day and note this as required in the Logbook. In determining the flow class that applies that day, the Minister may take into consideration evidence of past and current flows and readings at other functioning upstream and downstream gauges.</p> <p>(6) The flow classes commence in the year specified in Column 4 of Table A.</p> <p>(7) For the purpose of Table A, <b>Year 1 of this Plan</b> means from the date of commencement of this Plan.</p>	<p>Flow classes are specified for the respective water source or management zone for sharing of flows on a daily basis. These flow classes provide commence and/or cease to pump rules for the reference point</p>	<p>Water remaining in the river after flow class restrictions may provide for hydrological connectivity in that water source.  This water then contributes to resource assessment in downstream valley.</p>

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		<p><b>Access rules</b></p> <p>Users must cease to pump when the flow at the reference point is equal to or less than the flow rate specified below for each category of water access licence in the respective management zones.</p> <p><b>Mungindi to Boomi River confluence management zone</b></p> <table border="1"> <tr><td>Domestic and stock</td><td>0 ML/day</td><td>0 ML/day</td></tr> <tr><td>A class</td><td>230 ML/day</td><td>220 ML/day</td></tr> <tr><td>B class</td><td>230 ML/day</td><td>270 ML/day</td></tr> <tr><td>C class</td><td>230 ML/day</td><td>1,500 ML/day</td></tr> <tr><td>Reference points</td><td>Barwon River at Mungindi (gauge 416001)</td><td>Barwon River upstream of Presbury (gauge 416050)</td></tr> </table> <p><b>Boomi River confluence to upstream Mogil Mogil Weir pool management zone</b></p> <table border="1"> <tr><td>Domestic and stock</td><td>0 ML/day</td><td>0 ML/day</td></tr> <tr><td>A class</td><td>220 ML/day</td><td>190 ML/day</td></tr> <tr><td>B class</td><td>270 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Relevant water sharing plan	Clause (subclause)	Water sharing plan rule (as detailed in the relevant water sharing plan)	Additional description	Contribution to hydrological connectivity
		<p><b>Note:</b> These access rules do not apply to:</p> <ul style="list-style-type: none"> <li>licences resulting from <i>Water Act 1912</i> licences listed in schedules 2 and 3 of the plan. Licences listed in schedule 2 have alternate access rules specified in the schedule and licences in schedule 3 are exempt from access rules under state policy.</li> <li>domestic and stock access licences taking water for domestic consumption (up to 1 kL/house/day) for the life of the plan and for stock watering (up to 14 L/ha of grazeable area/day) for the first five years of the plan.</li> <li>water from a runoff harvesting dam</li> </ul> <p><b>Note:</b> Access may be suspended under section 324 of the <i>Water Management Act 2000</i>, including:</p> <ul style="list-style-type: none"> <li>for B or C class access licences to meet the riparian, algal suppression or fish migration targets of the interim plan for the management of unregulated flows in north west NSW.</li> <li>for A, B and C class access licences if there is a critical water shortage, to supply water to Menindee Lakes for Broken Hill's town water.</li> </ul> <p><b>Note:</b> A and B class users may apply for access below their defined cease-to-pump threshold under very limited circumstances as specified in clauses 47-49 of the plan.</p> <p><b>Note:</b> The plan allows for amendment of these access rules after year five to protect an endangered aquatic ecological community or threatened species within that community, as specified in clause 78 of the plan.</p>		
	<p>46 (notes 1 to 5)</p> <p><b>Access rules</b></p>	<p><b>46 Access rules for the taking of surface water</b></p> <p><b>Notes.</b></p> <p>1</p> <p>An order under section 324 of the Act may be made by the Minister to restrict or prohibit the taking of water under unregulated river (B Class) access licences and/or unregulated river (C Class) access licences if the Minister is satisfied that it is necessary to do so in the public interest to meet the requirements of the Interim Unregulated Flow Management Plan for the North-West.</p> <p>2</p> <p>The requirements of the Interim Unregulated Flow Management Plan for the North-West are:</p> <p>(a) a flow of 14,000 ML per day in the Darling River at Brewarrina for five consecutive days, or 10,000 ML per day in the Darling River at Bourke for five consecutive days, during September to February inclusive, providing two such flow events have not already occurred during that period in that water year,</p> <p>(b) a flow of 2,000 ML per day in the Darling River at Wilcannia for five consecutive days during October to April, inclusive, providing flows of this quantity have not already been reached during the preceding three months within the October to April period, and</p> <p>(c) a flow of:</p> <p>(i) 150 ML per day in the Darling River at Wilcannia,</p> <p>(ii) 280 ML per day in the Darling River at Louth,</p> <p>(iii) 390 ML per day in the Darling River at Bourke,</p> <p>(iv) 550 ML per day in the Darling River at Brewarrina,</p> <p>(v) 700 ML per day in the Barwon River at Walgett,</p> <p>(vi) 760 ML per day in the Barwon River at Collarenebri, and</p> <p>(vii) 850 ML per day in the Barwon River at Mungindi.</p> <p>3</p> <p>The intention of the flow requirement in 2 (a) above is to provide opportunity for the passage of fish across the major weirs in the Barwon-Darling.</p> <p>4</p> <p>The intention of the flow requirement in 2 (b) above is to protect flows needed to suppress blue-green algae blooms.</p> <p>5</p>	<p>This note indicates the intention to restrict access B-class and/or C-class using a section 324 to achieve flow targets specified in the Barwon-Darling River.</p> <p>Flow targets are intended to :</p> <ul style="list-style-type: none"> <li>Provide opportunity for the passage of fish across the major weirs in the Barwon-Darling</li> <li>Protect flows needed to suppress blue-green algae blooms</li> <li>Protect flows needed to meet basic landholder rights requirements along the Barwon-Darling River</li> </ul>	<p>Access to B and C-class licences may be restricted in the Barwon-Darling River to facilitate hydrological connectivity from the upstream tributaries to meet flow targets outlined in the Barwon-Darling River.</p> <p>This water then contributes to resource assessment in downstream valley.</p>

Relevant water sharing plan	Clause (subclause)	Water sharing plan rule (as detailed in the relevant water sharing plan)	Additional description	Contribution to hydrological connectivity
		The intention of the flow requirement in 2 (c) above is to protect flows needed to meet basic landholder rights requirements along the Barwon-Darling River.		