

## Active Management

### *Proposed amendments to the Water Sharing Plan for the Macquarie Bogan Unregulated and Alluvial Water Sources 2012 to facilitate active management*

We propose to put in place an increased level of management in the Lower Macquarie River and Marthaguy Unregulated Water Sources. Known as active management, this will allow environmental water used in-stream for environmental purposes, referred to as active environmental water, to be protected from extraction.

To implement active management change is required to the water sharing rules that regulate access to flows in the *Water Sharing Plan for the Macquarie Bogan Unregulated and Alluvial Water Sources 2012* (the WSP).

## Proposed additional amendment for active management

The proposed changes for active management are in addition to the water sharing plan changes exhibited in November 2018 - February 2019. At that time, we were still developing the approach to active management.

Clause 81 (2) (i) of the WSP allows access rules to be amended to implement active management.

Comment on the draft Macquarie-Castlereagh Surface Water Resource Plan and other proposed amendments to the *Water Sharing Plan for the Macquarie Bogan Unregulated and Alluvial Water Sources 2012* has closed. We are currently considering the submissions we received on these.

We now welcome your comments on the *Active Management in unregulated rivers – Draft policy for public consultation, September 2019* and additional proposed amendments to the *Water Sharing Plan for the Macquarie Bogan Unregulated and Alluvial Water Sources 2012* to facilitate active management.

The draft policy has guided the proposed amendments to the water sharing plan rules and will guide the development of Active Management Procedures Manual (procedure manual).

## Why the proposed change

The New South Wales (NSW) Government is committed to improving the way we manage water for the environment in the NSW northern Murray–Darling Basin to maximise environmental outcomes that improve the health of the Basin.

The NSW and Commonwealth Governments have made significant investments to recover water for the environment across the Murray–Darling Basin. Water held under these recovered licences is referred to as held environmental water.

Water sharing plans do not currently protect this water from extraction in unregulated rivers if it is used in-stream for environmental purposes. For example, the WSP does not protect held environmental water released from storages in the regulated Macquarie River when it flows into the unregulated Lower Macquarie River Water Source.

Temporary water restrictions are the only regulatory tool currently available to control take by unregulated river access licences once the licence access conditions, including commence to pump thresholds, have been met.

Active management is a new operational tool that ensures that water released for the environment remains in-stream to be used for its intended environmental purpose.

## Proposed changes to the water sharing plan rules

Under the current WSP unregulated river access licence holders must check flows at reference points (that is, either gauges or visible flow at the site where water is extracted) to determine if flow is above commence/cease to pump (CtP) thresholds for their licence before pumping. Some licences do not have CtP thresholds linked to a river flow gauge. They can currently take water provided there is visible flow at the pump site and all other access conditions are met.

Each water access licence specifies the access conditions under which water can be taken. The proposed amendments take into account the current access conditions which vary between and within each management zone.

CtP thresholds won't be adjusted. Instead the proposed amendments:

- prohibit access by unregulated river access licences if there is only active environmental water present and
- allow the Minister to determine and announce a volumetric limit for each unregulated river access licences to protect active environmental water from extraction.

The procedures manual will set out how the volume is to be determined and shared among licences. The distribution could be based on a proportion of the shares or a combination of the shares and an expression of interest. We are seeking feedback on stakeholders on the preferred method for distributing the available water to unregulated river licence holders.

All other access conditions will continue to apply.

We are also adding provisions to allow unregulated river access licence holders in the Lower Macquarie River and Marthaguy Creek Water Sources to leave some or all of the water permitted to be taken under their licences in-stream for environmental purposes. The water allocation account will be debited by the volume to be managed in-stream.

The proposed amendments require the Department of Planning, Industry and Environment to develop an active management procedures manual to be published on the department's website. These procedures will set out operational details for implementing active management, including how the volume of active environmental water managed in-stream will be determined.

We are proposing a new management zone for the Marthaguy Creek downstream of the Terrigal Creek confluence to allow access rules for active management to apply only in that section of the Marthaguy where active environmental water is delivered.

No changes are proposed to access rules for domestic and stock and local water utility access licences.

## What does this mean for licence holders

Water must not be taken if the Minister has determined and announced that there is only Active Environmental Water present in the respective management zone.

The maximum volume of water permitted to be taken may be limited if there is flow arising from both active environmental water in-stream and other sources of flows in order to protect active environmental water present in-stream from extraction. The maximum volume of water that can be taken cannot exceed the volume permitted to be taken in accordance with the announcement if made.

The concept is illustrated by an example in Figure 1 where 150 ML/day of active environmental water is present in scenarios 2 – 5 and the base CtP threshold for a licence is 200 ML/day.

Access will be permitted if:

- there is no active environmental water in-stream and flows are above the base CtP threshold for the licence, provided all other access conditions and account management requirements are met, as illustrated in scenario 1 in Figure 1, or
- there is active environmental water in-stream and flows are above the base CtP threshold for the licence plus the amount of active environmental water present, provided all other access conditions and account management requirements are met, as illustrated in scenario 5 in Figure 1. In this case a volumetric limit permitted to be taken (hashed blue area) will be determined in order to protect the active environmental water present in-stream and distributed among licence holders.

Access will be prohibited if:

- only active environmental water is in-stream, as illustrated in scenario 2 in Figure 1
- flow is below the base CtP threshold, as illustrated in scenario 3 in Figure 1, or
- flow is above the base CtP threshold (due to the presence of active environmental water) but below the base CtP threshold had environmental water not been present, as illustrated in scenario 4 in Figure 1

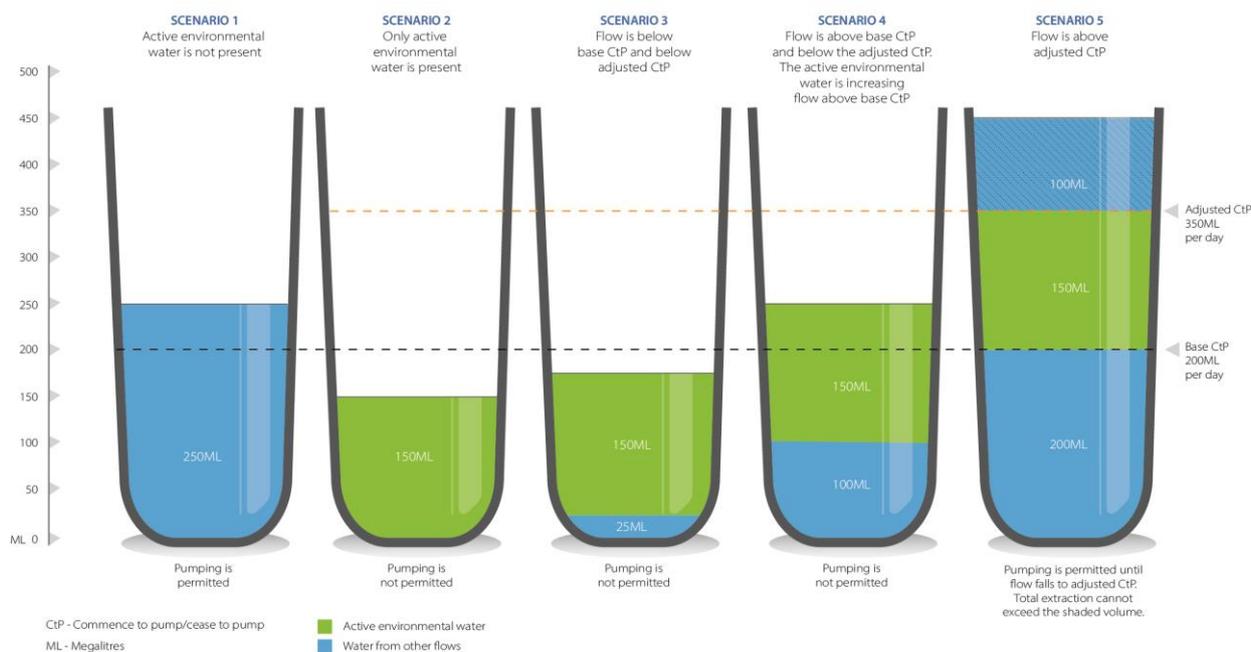
The procedures manual will outline when a volumetric limit is to be applied, how it is to be determined and how it is to be shared. We will further investigate how a volumetric limit could be determined and applied to protect active environmental water while developing the procedures manual. The river operator will need to forecast flows to determine the volume of active environmental water in-stream. There are some uncertainties in forecasting river flows and transmission losses given the inherent variability in natural river systems and environmental watering activities.

Strategies, such as adaptively adjusting river transmission loss forecasts based on observations, will be used to manage risks to licence holders and active environmental water associated with forecasting uncertainty. The detail of how this is done will be documented in the procedures manual.

## Active Management Concept

In this example, when active environment water is not present, licence holders can commence to pump when flows exceed 200ML/day (base CtP) and must cease to pump if flow drops to 200ML/day or less.

When 150ML/day of active environmental water is present (scenarios 2-5) licence holders can commence to pump when flows exceed 350ML/day (the adjusted CtP) and must cease to pump if flows drop to 350ML/day or less.



**Figure 1: Active management concept**

### Licence holders who want to leave their water in-stream for environmental purposes

Licence holders (such as environmental water holders) wanting to leave their water in-stream for environmental purposes will need to notify the Minister and their water allocation account will be debited by the volume to be actively managed through downstream zones. This allows unregulated held environmental water to be active managed in the unregulated water source.

### The benefits of active management

Active management will increase certainty by reducing the need to use temporary water restrictions to manage active environmental water being used in-stream and help improve water sharing, compliance and transparency by:

- protecting active environmental water used in-stream for environmental purposes
- making it clearer for licence holders to understand when they can take water
- increasing public understanding on when water can and cannot be taken.

Active management in the Macquarie will contribute to maximising environmental outcomes from:

- regulated held environmental water released from upstream storages that flows through the Lower Macquarie River and Marthaguy Creek Water Sources.

- releases of Macquarie Environmental Water Allowance - sub-allowance 2 from Burrendong Dam (this is planned environmental water in the regulated Macquarie River that is already protected by the rules in the Macquarie unregulated water sharing)
- planned environmental water from upstream water sources that is assessed as additional to the inflows considered when the WSP commenced in that established the bulk access regime for the Macquarie unregulated water sharing plan
- unregulated held environmental water licences held in the Lower Macquarie River and Marthaguy Creek Water Sources being used in-stream

This will help to reach the intended outcomes from the Murray Darling Basin Plan.

## Active Management Procedures Manual

Access to flows will be determined as per the procedures manual. The procedures manual will be developed in accordance with the Active Management Policy and will outline:

- where the procedures manual applies
- what water will be protected from extraction (active environmental water)
- how flows are forecast
- how losses are calculated and shared
- how operational uncertainty is managed (for example, adjustments to flow forecasts)
- how the volume of active environmental water is determined
- how the volumetric limits are determined
- the form of an announcement and what information announcements must contain
- what unregulated licence holders who want to leave their water in-stream will need to do and how their water allocation account will be debited for water managed in-stream
- reporting requirements
- timeframes, circumstances, procedures and responsibilities for review of the procedure manual who approved the procedures manual and when

The *Active Management in Unregulated Rivers – Draft policy for public consultation, September 2019* has been written to guide the preparation of the Procedures Manual.

We are currently seeking your comments to finalise this draft policy before a procedures manual is developed.

The department will consult on development of the procedures manual before active management is implemented.

## Have your say

We seek your comments on the:

- Proposed amendments to the *Water Sharing Plan for the Macquarie Bogan Unregulated and Alluvial Water Sources 2012* to facilitate active management, September 2019 available from [https://www.industry.nsw.gov.au/\\_\\_data/assets/pdf\\_file/0020/279002/proposed-amendments-macquarie-bogan-unreg-wsp-for-active-mgt.pdf](https://www.industry.nsw.gov.au/__data/assets/pdf_file/0020/279002/proposed-amendments-macquarie-bogan-unreg-wsp-for-active-mgt.pdf)
- Active Management in Unregulated Rivers – Draft policy for public consultation, September 2019 available from [https://www.industry.nsw.gov.au/\\_\\_data/assets/pdf\\_file/0005/278996/active-mgt-unreg-rivers-draft-policy.pdf](https://www.industry.nsw.gov.au/__data/assets/pdf_file/0005/278996/active-mgt-unreg-rivers-draft-policy.pdf)

# Macquarie Bogan unregulated water sharing plan

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Fact sheet – September 2019

The draft policy has guided the proposed water sharing rule amendments and will guide the preparation of the Active Management Procedures Manual for the Lower Macquarie River and Marthaguy unregulated water sources.

Please note that comment on the draft Macquarie-Castlereagh Surface Water Resource Plan and other proposed amendments to the *Water Sharing Plan for the Macquarie Bogan Unregulated and Alluvial Water Sources 2012* has closed and your submissions on these are currently being considered.

## Make a submission

Use our [online form](#) or send an [email](#) to make a submission. All submissions will be considered when finalising the plan. **Submissions close at 5 pm on Tuesday 29 October 2019.**

## More information

Background information on the Lower Macquarie River Upstream and Downstream Management Zones, Gum Cowal Management Zone and the Marthaguy Creek Water Source is attached.

*Proposed amendments to the Macquarie Bogan unregulated water sharing plan for active management, September 2019* and *Active Management in Unregulated Rivers – Draft policy for public consultation, September 2019* are available from <https://www.industry.nsw.gov.au/water-macquarie-bogan>.

If you want to be kept informed about all of the departments upcoming engagement activities please visit our [website](#) or join our [newsletter](#).

## Lower Macquarie River and Marthaguy Creek background information

This document outlines background information on the Lower Macquarie River and Marthaguy Creek unregulated water sources that was considered when developing the approach to active management in this area. It also outlines issues to be considered while developing the Active Management Procedures Manual for these areas.

### Area where active management is to apply

We are proposing to put in place active management in the:

- Lower Macquarie River Downstream Management Zone
- Lower Macquarie River Upstream Management Zone
- Gum Cowal Management Zone
- Marthaguy Creek (downstream of the Terrigal Creek confluence only)

Changes to the *Water Sharing Plan for the Macquarie Bogan Unregulated and Alluvial Water Sources 2012* are needed to implement active management in these areas.

A map showing the areas where active management will be applied in the Macquarie is at Figure 2

### Description

Flows passing the lower end of the regulated Macquarie River enter the Macquarie Marshes (in the **Lower Macquarie Upstream Management Zone**), spreading out via several flow paths with low flow capacities into an area known as the south marshes and then the north marshes.

If there is sufficient volume of flow, water will eventually pass through the Marshes to the lower Macquarie River (the **Lower Macquarie Downstream Management Zone**) below the flow gauging station at Miltara. The volume of flow passing Miltara is estimated as usually less than 10% of the flows entering the marshes.

Below the Marshes, the Macquarie River continues to flow to the north of the township of Carinda and is then joined by the **Marthaguy Creek** and the Castlereagh River just before the Macquarie River's confluence with the Barwon River.

Under the *Water Sharing Plan for the Macquarie and Cudgegong Regulated Rivers Water Source 2003*, a replenishment flow of up to 50 ML/day is to be provided below the Macquarie Marshes, from "Miltara" to the Barwon River, at least twice each water year.

The unregulated **Marthaguy Creek** arises to the west of Gilgandra, and runs to the north-west until it joins the Lower Macquarie River below the township of Carinda. The lower portion of the Marthaguy Creek receives flows from the regulated Macquarie River via the eastern Macquarie Marshes along the Gum Cowal and Terrigal Creek system.

Flows leaving the regulated Macquarie River system into the **Gum Cowal** are controlled by a regulator on Bulgeraga Creek, and are measured at a flow gauge just downstream. Lower flows along the Gum Cowal watercourse provide water to the core areas of the eastern Macquarie Marshes. If there is sufficient volume of flow, water will pass through to Terrigal Creek and then enter the lower Marthaguy Creek.

# Macquarie Bogan unregulated water sharing plan



Fact sheet – September 2019

Licences		
Lower Macquarie River Upstream Management zone		
Access licence category	No. licences	Share component
Domestic and stock	4	28
Unregulated river	4	5,498 shares
Lower Macquarie River Downstream Management zone		
Access licence category	No. licences	Share component
Domestic and stock	6	42
Unregulated river	13	39,722
Gum Cowal management zone		
Access licence category	No. licences	Share component
Domestic and stock	1	4
Unregulated river	1	1,458
Marthaguy Creek Water Source		
Access licence category	No. licences	Share component
Domestic and stock	6	30 shares
Unregulated river	12	9,442 shares

Information from NSW Water Register, [www.waternsw.com.au/water-register-frame](http://www.waternsw.com.au/water-register-frame) as at June 2019.

Notes: 2,916 shares in Lower Macquarie River Upstream Management Zone are held environmental water licence. Four licences in the Marthaguy Creek are below the Terrigal Creek confluence where active management will apply the rest are above the Terrigal Creek confluence. Trade is permitted within the Marthaguy Creek Water Source.

## Current access rules for unregulated river access licences

### All licences

Access licences are prohibited from taking water when:

- there is no visible flow in the water source at the location where water is to be taken; or if water is taken from an in-river pool or off-river pool, when the volume of water in that pool is less than at full capacity,
- flows are the result of releases of sub-allowance 2 water from Burrendong Dam, and
- flows are the result of domestic and stock replenishment flows made from the Burrendong Dam under the *Water Sharing Plan for the Macquarie and Cudgegong Regulated Rivers Water Source 2016*. (Water from those replenishment flows may only be taken by domestic and stock licences).

In addition, there are different access conditions in each of the areas as outlined below.

### Lower Macquarie River Upstream Management Zone

Pumping is not permitted when flow at Macquarie @ Oxley (421022) is 500 ML/day or less

### Lower Macquarie River Downstream Management Zone

There is a range of CtP conditions including pumping is not permitted when flow at:

- Macquarie River @ Carinda (421012) is 50 ML/day or less
- Macquarie River @ Carinda (421012) is 75 ML/day or less
- Macquarie River @ Carinda (421012) is 245 ML/day or less
- Macquarie River @ Miltara (421135) is 100 ML/day or less

Remainder of licences - Pumping is not permitted from natural pools when the water level in the pool is lower than its full capacity or there is no visible flow in the water source at the location where water is to be taken.

### Gum Cowal Management Zone

Pumping is not permitted from natural pools when the water level in the pool is lower than its full capacity or there is no visible flow in the water source at the location where water is to be taken

### Marthaguy Creek (downstream of Terrigal Creek only)

- One licence has CtP of 50 ML/day at Marthaguy Creek @ Carinda (421011)
- Remainder of licences - Pumping is not permitted from natural pools when the water level in the pool is lower than its full capacity or there is no visible flow in the water source at the location where water is to be taken

## Unregulated held environmental water licences

There is 1 unregulated held environmental water licence with 2,916 shares, which is located in the Lower Macquarie River Upstream Management Zone. This licence was acquired with the purchase of Pillicawarrina Station by the NSW Government.

There are no unregulated held environmental water licences in the Marthaguy Creek water source, the Lower Macquarie River Downstream Management Zone or the Gum Cowal Management Zone

Information from NSW Environmental Water Register, <https://ewp.water.dpi.nsw.gov.au/ewr/main/erShSearchEWL> as at June 2019

## Environmental flows

Environmental water is frequently delivered to the north and south marshes, and eastern marshes from the regulated Macquarie River system.

Environmental water may be delivered concurrently with other flows, but is often delivered to extend inflows to the marshes following a natural flow event, or as a stand-alone watering of important refuge areas in the Marshes.

If there is sufficient volume of flow, water will eventually pass through the south and north Marshes to the lower Macquarie River at the flow gauging station at Miltara, although the volume of flow passing Miltara is usually less than 10% of the flows entering the marshes.

Environmental water is frequently delivered to the eastern marshes from the regulated Macquarie River system via Bulgeraga and the Gum Cowal offtake regulator.

Environmental water may be delivered concurrently with other flows, but is often delivered to extend inflows to the eastern marshes following a natural flow event, or as a stand-alone watering of important refuge areas in the Marshes.

Only a relatively small proportion of the flows into the eastern marshes pass through the Marshes and reach the lower Marthaguy Creek via Terrigal Creek

# Macquarie Bogan unregulated water sharing plan



Fact sheet – September 2019

Infrastructure available to support active management	
Water source/zone	Gauging station
Macquarie regulated river	<p>Macquarie River @ d/s Marebone (40290) – Water NSW uses this gauge at the start of the Macquarie Marshes to categorise the environmental flows according to their source (for example, natural tributary inflows downstream of the dam, Environmental Water allowance Sub-allowance 2, held environmental water, and so on).</p> <p>Bulgeraga Creek @ bifurcation (421145) – a gauging station below the regulator on Bulgeraga Creek downstream of Marebone - measures flows in the Bulgeraga Creek in the north Marsh.</p>
Lower Macquarie River Upstream	Macquarie @ Oxley (421022), this station is closer to the end of the regulated Macquarie system
Lower Macquarie River Downstream	<p>Macquarie River @ Carinda (421012) (Bells Bridge).</p> <p>Macquarie River @ Miltara (421135).</p> <p>Macquarie at Brewon (421907) - temporary gauge funding by Energy, Environment and Science.</p>
Gum Cowal Watercourse	Gum Cowal @ bifurcation (421146) – measures flows entering the Gum Cowal Watercourse (eastern Marsh) after leaving the regulated Macquarie River system.
Marthaguy Creek	<p>Marthaguy Creek at Carinda (421011).</p> <p>A gauge at the Terrigal Creek (Terrigal Creek at upstream Marthaguy Creek (421153) - measures flows entering the Lower Marthaguy River from the Terrigal Creek.</p>

## Issues to be resolved/considered

### Lower Macquarie River - Determining the volume of active environmental water to be protected

The south and north Marshes require significant volumes of water to flow into them before flows reach the Downstream Management Zone. The Marshes naturally delay and reduce flows through to the Miltara flow gauging station.

We will complete further investigation to determine travel times for environmental flows, and the relative proportion of flows that are environmental, taking into account antecedent conditions.

Rainfall may occur in the marshes that can add to existing flows, and further work is needed to establish an appropriate allowance for this when establishing the relative proportions of environmental and other flows downstream of the marshes.

### Marthaguy Creek – determining the volume of active environmental water to be protected

The eastern marshes require significant volumes of water to flow into them before flows reach Terrigal Creek, and the Marshes have the natural effect of delaying and reducing flows through to Marthaguy Creek.

We will complete further investigation to determine travel times for environmental flows, and the relative proportion of flows that are environmental.

### Additional gauging

A further flow gauge on the Marthaguy Creek above the Terrigal Creek confluence may assist in the active management of environmental flows.

# Macquarie Bogan unregulated water sharing plan

Fact sheet – September 2019

## Floodplain harvesting

The Healthy Floodplain Project is developing a licensing and management framework for floodplain harvesting, which may require some harvesting licences to be actively managed in the future.

Map of areas where active management is to apply in the Macquarie Bogan unregulated water sources

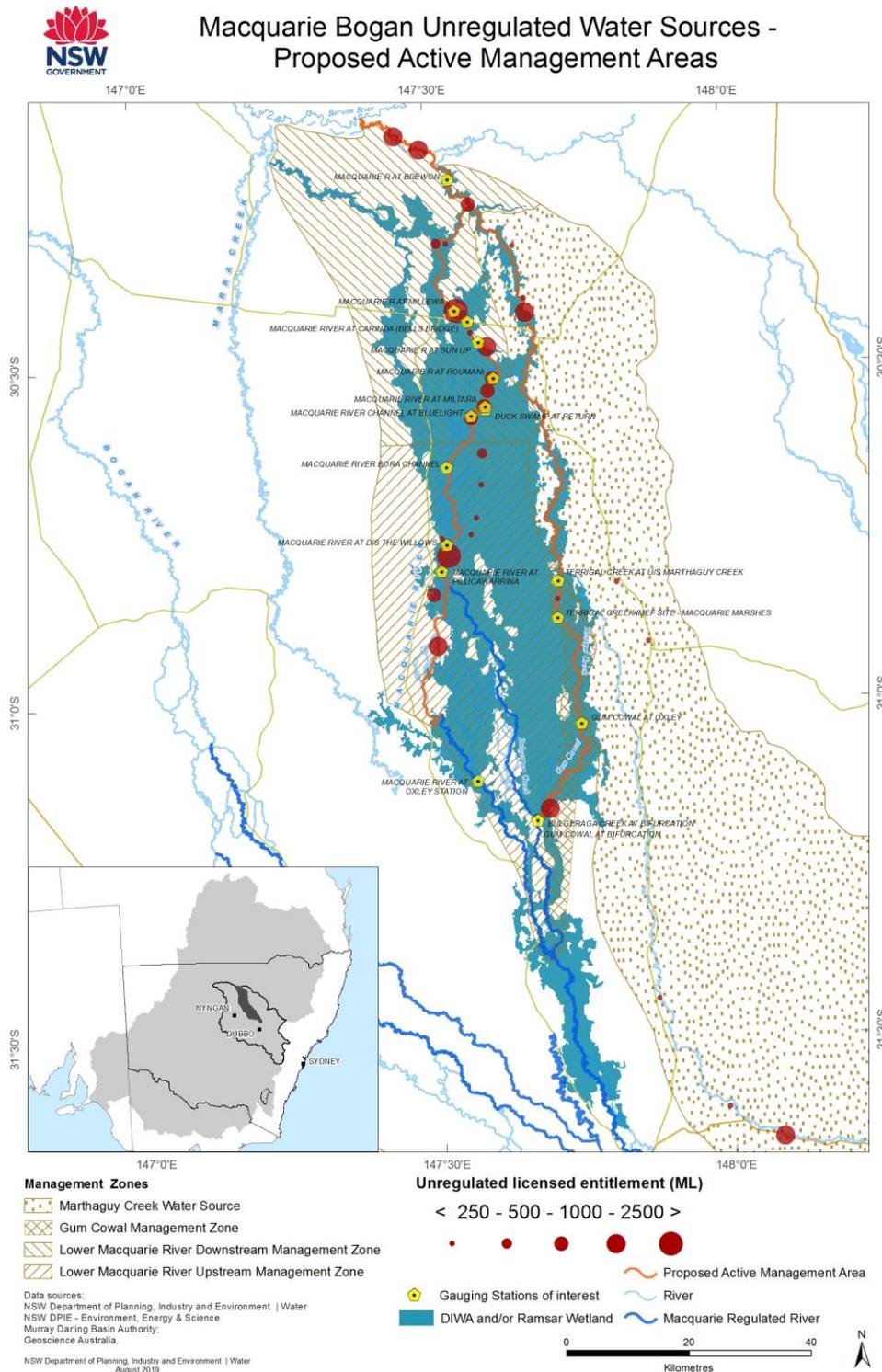


Figure 2: Map of active management areas in the Macquarie Bogan unregulated water sources

# Macquarie Bogan unregulated water sharing plan

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Fact sheet – September 2019

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