LTAAEL compliance assessment for Macquarie and Cudgegong Regulated Rivers Water Source

Executive Summary

This report describes the methods used to assess if extractions in the Macquarie Regulated River are compliant with the limit described in the Water Sharing Plan. The assessment has found that long term average annual extractions are compliant for the 2022-23 water year.

Background and Purpose

The water sharing plan (WSP) for the Macquarie and Cudgegong Regulated Rivers Water Source (Macquarie Regulated River Water Source) requires an assessment of compliance with a Long-Term Average Annual Extraction Limit (LTAAEL). The LTAAEL is sometimes referred to as the 'plan limit'.

The assessment is to be carried out annually by the Department[1] on behalf of the Minister following the end of each water year. LTAAEL compliance requires two models; one to represent LTAAEL and one to represent current conditions. The long-term results from both models are compared to assess compliance. Each water sharing plan defines the LTAAEL, how the compliance assessment is to be completed, triggers for non-compliance and subsequent compliance action. The LTAAEL includes multiple types of water use however the compliance assessment is based on the total.

This report summarises a compliance assessment for the Macquarie and Cudgegong Regulated Rivers Water Source. The assessment was based on best available models, using climate data from 1895 to 2023.

Scenarios and agreed model version

Model scenarios for Cap, water sharing plan and current conditions were selected based on evaluation against multiple scenario model selection criteria, including whether these had been documented and independently reviewed, how appropriate the management and levels of development are, and consistency of the hydrology. In the case of the Macquarie Regulated River Water Source, the selected model scenarios are reported in Table 1

The model scenarios are based on the floodplain harvesting scenario modelling which has been documented and published on our website. There are two reports. The model build report describes the development of the river system model – its conceptualisation, construction and calibration. The scenario report describes how the model was used to assess the LTAAEL and current conditions as well as other scenarios required for the floodplain harvesting program.

[1] Refers to the current Department of Climate Change, Energy, the Environment and Water (DCCEEW), as well as its predecessor(s) and likely successor(s) over the life cycle of each WSP).

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Table 1 Model scenarios selected for Macquarie Regulated River Water Source for LTAAEL assessment purposes

Model scenario	System file
Cap conditions	MACQ_CAP_20220908.sqq
WSP conditions	MACQ_BDL_202200908.sqq
Current conditions	CC_APT_20230322.sqq

LTAAEL compliance results

LTAAEL assessment

The LTAAEL is the modelled long-term average annual extractions calculated over the duration of the available climate record using either the Cap or the water sharing plan scenario model, whichever is the lesser. For this assessment the modelling period 1895-2023 is used. The results of this analysis are reported in Table 2.

It should be noted that rainfall runoff is exempt under the Water Management (General) Regulation 2018 (Clause 39B). The exempt rainfall runoff volume is excluded from the definition of both floodplain harvesting and LTAAEL with the amended Water Sharing Plan. Consequently, it has been excluded from the compliance assessment.

The LTAAEL for 2022/23 water year for the Macquarie and Cudgegong Regulated Rivers Water Source is 332.8 GL/y based on the WSP scenario model. There are also unmodelled extractions (for water taken under basic landholder rights) estimated at 1.2 GL/y. These unmodelled estimates have not changed and are not included in LTAAEL compliance assessment.

Table 2 Modelled long term average annual extractions (1895-2023) for Cap and WSP scenarios (GL/y)

Extraction category	Cap scenario model	WSP scenario model
Modelled extractions		
General Security and High Security	292.7	276.4
Supplementary access	23.4	13.7
Local water utility	13.3	12.2
Stock and domestic	2.0	2.0
Floodplain harvesting	7.5	28.5
Total modelled extractions	**338.9**	**332.8**
Unmodelled extractions		
Basic Rights	1.2	1.2

This water sharing plan will be revised to include all water take components such as plantation forestry and harvestable right dams to harmonise with reporting required under the Basin Plan. In this regulated river water sharing plan area, the water source boundary is defined by the bank of the regulated river and hence plantation forestry and harvestable rights dams are located within the adjacent unregulated river water source.

In addition, water taken under a basic landholder right has been excluded from the compliance assessment. This is because any unmodelled estimates are excluded if no assessment of change has been made.

Compliance assessment

Compared to the LTAAEL scenario, the modelled long term average annual extractions from the current conditions model scenario are reported in **Error! Reference source not found.**. The key differences between the LTAAEL and current conditions are attributable to an increase in on-farm storage capacity increasing floodplain harvesting diversions, offset by reduced overall diversions from changes in water management and irrigator behaviour.[2]

The current water sharing plan specifies that there is non-compliance if:

- Current conditions extractions exceed LTAAEL by 3% or more; or
- Current conditions extractions exceed the average of Cap and LTAAEL, or
- Current conditions extractions exceed Cap

The total modelled extractions for current conditions scenario model are less than that for the LTAAEL model scenario, so under these criteria the Macquarie and Cudgegong Regulated Rivers Water Source is compliant with LTAAEL.

`Table 3 Modelled long term average annual extractions (1895-2023) for LTAAEL and current model scenarios (GL/y)

Extraction category	LTAAEL scenario model	Current conditions scenario model
Modelled extractions		
General Security and High Security	276.4	240.4
Supplementary access	13.7	13.4
Local water utility	12.2	13.3
Stock and domestic	2.0	2.1
Floodplain harvesting	28.5	33.2
Total modelled extractions	**332.8**	**302.4**

Modelled compliance action

No compliance action is required as the LTAAEL assessment shows compliance.

[2] Floodplain harvesting entitlements for the Macquarie Valley regulated river system (Section 4.2)

Supporting information

Results over Basin Plan assessment period

The results over the Basin Plan assessment period of 1895-2009 are included for reference only. These results will be used to track significance of future model updates.

Table 4 Modelled long term average annual extractions over the Basin Plan reference period; (July 1895 to 30 June 2009), GL/y)

Extraction category	LTAAEL scenario model	Current conditions scenario model
Modelled extractions		
General Security and High Security	280.3	244.1
Supplementary access	13.5	13.2
Local water utility	12.2	13.4
Stock and domestic	2.0	2.1
Floodplain harvesting	27.2	31.5
Total modelled extractions	**335.2**	**304.3**