

LTAAEL compliance assessment for Belubula Regulated River Water Source

Executive summary

This report describes the methods used to assess if extractions in the Belubula 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 2021-22 water year.

Background and purpose

The Water Sharing Plan (WSP) for the Belubula 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 of Planning and Environment - Water (DPE Water) 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 Belubula Regulated River Water Source. The assessment was based on best available models, using climate data from 1895 to 2022.

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 Belubula regulated river, the selected model scenarios are reported in Table 1.

A new model of the Belubula system has recently been completed in the 'Source' platform and submitted as part of the review by the Murray-Darling Basin Authority for the Lachlan Water Resource Plan. An update to both the LTAAEL and Current Conditions scenarios are proposed, as the 'Source' BDL scenario used in 2021 was developed for the Basin Plan water resource plan and pre-dated the commencement of the water sharing plan (WSP). Scenario input sets representing WSP conditions have been added to the Water Resource Plan model. The end of system minimum flow rule of 10 ML/d in the WSP has been included in the input sets, however the Current Condition scenario has the rule conditionally suspended as this better reflects the 2021-2022 year operation conditions, consistent with a WSP amendment in December 2022 revising the end-of-system flow rule. The 'Source' based scenario models have the highest level of documentation and review of models for the Belubula Regulated River Water Source and are hydrologically consistent. A Cap

scenario model was embedded in the previous Lachlan model developed in the ‘IQQM’ platform, however, this is not hydrologically consistent nor has this been updated in Lachlan IQQM for Belubula WSP or current conditions.

Table 1: Model scenarios selected for Belubula Regulated River Water Source for LTAEL assessment purposes

Model scenario	System file	Input data set
WSP conditions	BELB_5.0.0_2022.rsproj	LTAEL
Current conditions	BELB_5.0.0_2022.rsproj	WSP_InPractice

LTAEL compliance results

LTAEL assessment

The LTAEL is the modelled long-term average annual extractions calculated over the duration of the available climate record using either the Cap or the WSP scenario model, whichever is the lesser. For this assessment the modelling period 1895-2022 is used. As there is only one hydrologically consistent WSP scenario model currently available, our LTAEL is in this instance based solely on results from that scenario model of 4,676 megalitres per year (ML/y) as reported in Table 2. There are also unmodelled extractions (for water taken under basic landholder rights) estimated at 200 ML/y. These unmodelled estimates have not changed and are not included in LTAEL compliance assessment

Table 2: Modelled long term average annual extractions (1895-2022) for WSP scenario model (ML/y)

Extraction category	Water Sharing Plan scenario model
Modelled extractions	
General Security	1,479
Supplementary access	2,267
High security	815
Stock and domestic	115
Total modelled extractions	4,676
Unmodelled extractions	
Basic Rights	200

This WSP 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 LTAEL scenario, the modelled long term average annual extractions from the current conditions model scenario are reported in Table 3. The current water sharing plan defines non-compliance if long term average annual extractions exceed LTAEL by 3% or more.

The results show current conditions long term average annual extractions are less than LTAEL, and therefore extractions in the Belubula Regulated River Water Source is compliant with LTAEL. However, further work is needed to confirm this, which will be the subject of an independent review of the Belubula scenario model build and configuration.

Table 3: Modelled long term average annual extractions (1895-2022) for Current and LTAEL scenario models (ML/y)

Extraction category	LTAEL scenario model	Current scenario model
Modelled extractions		
General Security	1,479	1,610
Supplementary access	2,267	1,200
High security	815	887
Stock and domestic	115	133
Total modelled extractions	4,676	3,830

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 1895-2009 (ML/y)

Extraction category	LTAAEL scenario model	Current scenario model
Modelled extractions		
General Security	1,473	1,616
Supplementary access	2,288	1,200
High security	829	896
Stock and domestic	117	135
Total modelled extractions	4,707	3,855