

# LTAEL compliance assessment for Gwydir Regulated River Water Source

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## Executive summary

This report describes the methods used to assess if extractions in the Gwydir Regulated River Water Source are compliant with the limit described in the water sharing plan in the 2021/22 water year. The assessment has found that long term average annual extractions were not compliant in 2021/22 but the commencement of floodplain harvesting licences in the 2022/23 water year is expected to see extractions return to compliance. The Gwydir Regulated River Water Sharing Plan was amended on 29 July 2022 to include rules for floodplain harvesting and the licences became fully operational on 15 August 2022.

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## Background and purpose

The water sharing plan for the Gwydir Regulated River Water Source requires an assessment of compliance with a Long-term Average Annual Extraction Limit (LTAEL). The LTAEL 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. LTAEL compliance requires two scenario models; one to represent the LTAEL and one to represent current conditions. The long-term results from both scenario models are compared to assess compliance.

Each water sharing plan defines the LTAEL, how the compliance assessment is to be completed, triggers for non-compliance and subsequent compliance action. The LTAEL includes multiple types of water use. However, the compliance assessment is based on the total.

This report summarises a compliance assessment for the Gwydir Regulated River Water Source for the 2021/22 water year. The assessment was based on best available models, using updated<sup>1</sup> climate data from 1895 to 2022.

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## 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. For the Gwydir Regulated River Water Source, the selected model scenarios reported in Table 1 are the most appropriate for LTAEL compliance purposes.

The scenarios are based on the floodplain harvesting scenario models which has been documented and published [on our website](#). There are two reports. The [model build report](#) describes the

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<sup>1</sup> During the process of data extension to 30/06/2022 the error of using incorrect version of several residual rainfall-runoff (FORS) models previously (i.e., results from intermediated rather than final calibration) has been identified. Correction of the error resulted in decrease of the long-term average annual of total tributary inflow from Copeton Dam to Pallamallawa by around 11.2 GL or 2.8%.

development of the river system model – its conceptualisation, construction and calibration. The [scenario report](#) describes how the model was used to assess the LTAEL and current conditions as well as other scenarios required for the floodplain harvesting program.

Table 1: Scenario models selected for Gwydir Regulated River Water Source for LTAEL assessment purposes

Scenario model	System file
Cap conditions	CAP_v27_11_2022.sqq
WSP conditions	BDL_v27_11_2022.sqq
Current conditions	CC_v27_11_2022.sqq
Current conditions with floodplain harvesting licences	VSC_v27_11_2022.sqq

**Note:** models above are the same as used in 2020/21 but run using updated in 2022 inputs<sup>1</sup>.

## 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 Water Sharing Plan scenario model, whichever is the lesser. For this assessment, the modelling period 1895-2022 is used. The results of this analysis are reported in Table 2.

The LTAEL for Gwydir Regulated River Water Source is 398.5<sup>2</sup> gegalitres per year (GL/y) based on the water sharing plan scenario model. There are also unmodelled extractions estimated at 6.0 GL/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 Cap and WSP scenario models (GL/y)

Extraction category	Cap scenario model	Water Sharing Plan scenario model
General and high security	208.9	205.0
Supplementary access	109.9	87.6
Local Water Utility	3.8	3.8
Floodplain harvesting <sup>2</sup>	82.5	102.1
<b>Total modelled extractions</b>	<b>405.1</b>	<b>398.5</b>
<b>Unmodelled estimates</b>		
Basic Rights	6.0	6.0

<sup>2</sup> This estimate does not include rainfall runoff harvesting which is now exempt under the Water Management (General) Regulation 2018.

This water sharing plan now includes 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 model scenario, the modelled long term average annual extractions from the current conditions model scenario are reported in Table 3.

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

Extraction category	LTAEL scenario model	Current conditions scenario model
General and high security	205.0	207.6
Supplementary access	87.6	89.3
Local Water Utility	3.8	3.8
Floodplain harvesting <sup>2</sup>	102.1	134.0
<b>Total modelled extractions</b>	<b>398.5</b>	<b>434.7</b>

The key reason for differences between LTAEL and current scenario model results are:

- 31% growth in floodplain harvesting attributable to development of farm infrastructure such as additional pumping and on farm storage capacity. Detailed summary of changes to farm infrastructure can be found in published Gwydir River [scenario report](#).

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

- Current condition extractions exceed LTAEL by 3% or more; or
- Current condition extractions exceed the average of CAP and LTAEL; or
- Current condition extractions exceed the Cap.

The results show non-compliance as current conditions extractions exceed LTAEL extractions by 9.1%.

- This assessment is for the 2021-22 water year which means that Floodplain Harvesting licences had not yet commenced.
- The assessment does not include temporary water restrictions which were in place in 2021-22. In that year, there was a reduction to the Supplementary Access entitlement Available Water

Determination (AWD). This reduction was an LTAEL compliance action. This new assessment is checking whether there is a return to compliance without the need for temporary water restrictions.

## Compliance actions

The NSW Government took compliance action in the 2021-22 water year by reducing the available water determinations for Supplementary Access entitlements in the Gwydir Regulated River Water Source to 0.5 megalitres (ML)/share to return extractions to LTAEL. A further compliance action of 0.21 ML/share was taken at the commencement of the 2022-23 water year as the rules in the water sharing plan for floodplain harvesting licensing had not commenced.

Floodplain harvesting licences have now been issued and given legal effect in the Gwydir Regulated River Water Source. Rules for floodplain harvesting licences are defined in amendments made to the Gwydir Regulated River Water Sharing Plan on 29 July 2022. These licences have been fully operational since 15 of August 2022 and will be able to restrict water taken through floodplain harvesting to return extractions to LTAEL. This enabled the lifting of the compliance action and the available water determination for Supplementary Access entitlements was returned to 1.0 ML/share on 15 August 2022.

The floodplain harvesting licensing and accounting framework provides for a partial exemption for runoff into tailwater drains. This exempt rainfall-runoff volume is excluded from the definition of floodplain harvesting and from the definition of LTAEL with the amended water sharing plan.

Compared to LTAEL the modelled long term average annual extractions from the current conditions with FPH licences model scenario are reported in Table 4.

Table 4: Modelled long term average annual extractions (1895-2022) for LTAEL and current conditions model scenarios (GL/y)

Extraction category	LTAEL scenario model	Current conditions with FPH licences scenario model
General and high security	205.0	210.3
Supplementary access	87.6	89.3
Local Water Utility	3.8	3.8
Floodplain harvesting <sup>2</sup>	102.1	95.0
<b>Total modelled extractions</b>	<b>398.5</b>	<b>398.4</b>

The results show extractions under current conditions with floodplain harvesting do not exceed LTAEL. The Gwydir Regulated River Water Source is expected to be compliant under the rules of the water sharing plan of 15 August 2022.

No further compliance action is required.

## Supporting information

### Results over Basin Plan assessment period

Long-term inflow sequences for residual inflows from Copeton Dam to Pallamallawa have been updated this year. This update was required to correct an error in version of rainfall-runoff FORS model/s originally used to estimate residual inflow in this river section<sup>3</sup>. As a result, total long-term average annual inflow in this river section decreased by 11,162 ML (2.8%) over Basin Plan assessment period. This resulted in somewhat lower than previously reported long-term results.

The updated results over the Basin Plan assessment period of 1895-2009 are presented in Table 5 and included for reference only. These results will be used to track significance of future model updates.

Table 5: Modelled long term average annual extractions (1895-2009) for LTADEL scenario model and Current with floodplain harvesting licences scenario model (GL/y)

Extraction category	LTADEL scenario model	Current with floodplain harvesting licences scenario model
General and high security	211.1	216.7
Supplementary access	89.1	91.0
Local Water Utility	3.8	3.8
Floodplain harvesting <sup>2</sup>	103.3	93.5
<b>Total modelled extractions</b>	<b>407.3</b>	<b>405.0</b>

<sup>3</sup> Mistakenly intermediate rather than final calibration version of the FORS model/s were used to build original flow sequences