Department of Climate Change, Energy, the Environment and Water

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General Purpose Water Accounting Report for the Border Rivers Catchment 2022–23

Acknowledgement of Country

The Department Climate Change, Energy, the Environment and Water acknowledges that it stands on Aboriginal land. We acknowledge the people of the Bigambul, Githabul, Gomeroi/Kamilaroi, Kambuwal, Kwiambul and Ngarabal Nations and that the land and waters of the New South Wales Border Rivers River catchment area are of spiritual, cultural, customary and economic importance.

We recognise the intrinsic connection of Traditional Owners to Country and acknowledge their contribution to the management of the New South Wales Border Rivers River catchment landscape and natural resources.

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General Purpose Water Accounting Report

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More information

Water Analytics Unit, Department Climate Change, Energy, the Environment and Water

Acknowledgements

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Contents

Abbreviations

Abbreviation	Description
ARCGIS	mapping and spatial analysis platform for designing and managing solutions through the application of geographic knowledge
AWAS 1	Australian Water Accounting Standard 1
AWD	available water determination
CAIRO	computer-aided improvements to river operations
CARM	computer aided river management
GPWAR	general purpose water accounting report
MDBA	Murray–Darling Basin Authority
ML	megalitres (1,000,000 litres)
ML/d	megalitres per day
SILO	climatic data provision system run by the Queensland government for the provision of both measured and modelled data

Glossary

Term	Definition
allocation	the specific volume of water allocated to water allocation accounts in a given season, defined according to rules established in the relevant water plan
allocation assignments	the transfer of water between licence holder allocation accounts as a result of a trade agreement The assignment becomes part of the receiver's current year allocation account water.
allocation account	water account attached to an access licence used to track the balance of account water
available water determination (AWD)	the process by which water is made available for use and shared amongst water users who hold a water access licence It determines the volume of water that is to be added to an individual's licence allocation account.
Australian Water Accounting Standard (AWAS)	a national standard that prescribes the basis for preparing and presenting a general-purpose water accounting report (GPWAR) It sets out requirements for the recognition, quantification, presentation and disclosure of items in a GPWAR.
back-calculation	a calculation approach using a mass balance to determine an unknown variable (used to calculate storage inflows based on balancing the change in storage volume where inflow is the only unknown)
basic rights	the non-licensed right to extract water to meet basic requirements for household purposes (non-commercial uses in and around the house and garden) and for watering of stock It is available for anyone who has access to river frontage on their property.
computer aided river management (CARM)	a spreadsheet-based water balance model used for optimising river operations (orders and releases). Formally known as CAIRO.
carryover	the volume or share component that may be reserved by a licence holder for use in the subsequent year
catchment	the areas of land that collect rainfall and contribute to surface water (streams, rivers, wetlands) or to groundwater A catchment is a natural drainage area, bounded by sloping ground, hills or mountains, from which water flows to a low point.

Term	Definition
dead storage	the volume in storage that is generally considered unavailable for use (e.g. water level below release valves) due to access and often poor water quality
effective storage	the total volume of storage minus the dead storage component—the volume generally considered as useable
effluent	flow leaving a place or process Sewage effluent refers to the flow leaving a sewage treatment plant. An effluent stream is one which leaves the main river and does not return.
entity	a defined geographical area or zone within the accounting region Transactions and reports are produced for each entity.
end of system	the last defined point in a catchment where water information can be measured and/or reported
environmental water	water allocated to support environmental outcomes and other public benefits Environmental water provisions recognise the environmental water requirements and are based on environmental, social and economic considerations, including existing user rights.
evaporation	the process by which water or another liquid becomes a gas Water from land areas, bodies of water, and all other moist surfaces is absorbed into the atmosphere as a vapour.
evapotranspiration	the process by which water is transmitted as a vapour to the atmosphere as the result of evaporation from any surface and transpiration from plants
extraction	the pumping or diverting of water from a river or aquifer by licensed users for a specific purpose (irrigation, stock, domestic, towns, etc.) The volume is measured at the point of extraction or diversion (river pump, diversion works, etc.).
general purpose water accounting report (GPWAR)	a report prepared according to the Australian Water Accounting Standard It comprises a number of components including a contextual statement, a statement of water assets and water liabilities, a statement of change in water assets and water liabilities, a statement of physical water flows, notes and disclosures, and an assurance and accountability statement.
General Security licence	a category of water access licence implemented under the *Water Management Act 2000* This forms the bulk of the water access licence entitlement volume in NSW and is a low-priority entitlement (i.e. it only receives water once essential and High Security entitlements are met in the available water determination process).

Term	Definition
groundwater	Water location beneath the ground in soil pore spaces and in the fractures of rock formations
High Security licence	a category of water access licence implemented under the *Water Management Act 2000* It receives a higher priority than General Security licences but less priority than essential requirements in the available water determination process.
HYDSTRA database	a database used by NSW Department Climate Change, Energy, the Environment and Water to store continuous, time-series data such as river flow, river height, and water quality
inflows	surface water runoff and deep drainage to groundwater (groundwater recharge) and transfers into the water system (both surface and groundwater) for a defined area
inter-valley trade	trade of licence holder allocation account water via allocation assignment from one catchment to another catchment (or state)
intra-valley trade	trade of licence holder allocation account water via allocation assignment within the same catchment
median	the middle point of a distribution, separating the highest half of a sample from the lowest half
non-physical transaction	an accounting transaction representing a process that is not a component of the water cycle (e.g. an available water determination)
physical transaction	an accounting transaction representing a process of the water cycle (e.g. an extraction)
regulated river	a river system where flow is controlled via one or more major man-made structures such as dams and weirs For the purposes of the *Water Management Act 2000*, a regulated river is one that is declared by the minister to be a regulated river. Within a regulated river system, licence holders can order water against a held entitlement.
share component	an entitlement to water specified on the access licence, expressed as a unit share or, in the case of specific purpose licences (e.g. Local Water Utility, Major Water Utility and Domestic and Stock), a volume in megalitres The amount of water a licence holder is allocated as a result of an available water determination and the amount they can take in any year is based on their share component.
storage	a state-owned dam, weir or other structure that is used to regulate and manage river flows in the catchment and the water bodies impounded by these structures

Term	Definition
storage reserve	proportion of water in a storage reserved in the resource assessment process for future essential or High Security requirements (e.g. town water)
storage volume	the total volume of water held in storage at a specified time
supplementary water	unregulated river flow available for extraction under a Supplementary Water licence
surface water	all water that occurs naturally above ground including rivers, lakes, reservoirs, creeks, wetlands and estuaries
tributary	a smaller river or stream that flows into a larger river or stream Usually a number of smaller tributaries merge to form a river.
ungauged catchment	a catchment without a flow gauge to accurately record stream flows Modelled estimates must be used to approximate the contribution of ungauged catchments to the main river.
water accounting	the systematic process of identifying, recognising, quantifying, reporting, assuring and publishing information about water, the rights or other claims to that water, and the obligations against that water
water assets	the physical water held in storage, as well as any claims to water that are expected to increase the future water resource (e.g. external water entering the system through inter-valley trading)
water liabilities	claims on the water assets of the water report entity including water that has been allocated to licence holder accounts or environmental accounts, but yet to be taken at the end of the reporting period
water sharing plan	a water management plan that defines the rules for sharing of water within a region under the *Water Management Act 2000*

Director's foreword

This is the twelfth annual release of the general-purpose water accounting report (GPWAR) for the New South Wales (NSW) Border Rivers Regulated River Water Source. It has been prepared for the accounting period 1 July 2022 to 30 June 2023 (***reporting period***), under the Australian Water Accounting Standard 1 (AWAS 1) (WASB, 2012).

The GPWAR provides stakeholders with a consolidated, comparable and publicly accessible set of water accounting information for the water source. The information presented is also used internally for a range of water planning functions and legislative reporting obligations.

Included in the GPWAR are:

- a contextual statement summarising the climatic conditions, water resources, environmental holdings, water trading market and water resource management in the water source for the reporting period
- a physical flow diagram illustrating changes in storage volumes and the associated inflows and outflows
- water accounting statements presenting the opening and closing balances, and itemised changes to these balances for available water resources (water assets) and licenced allocation accounts (water liabilities)
- disclosure notes (linked to the figures within the water accounting statements) providing detailed information of accounting components including:
  - access licence account balances
  - planned and held environmental water account balances
  - available water determination detailed report
  - temporary trading by licence category
  - supplementary announcements and usage by river reach
  - physical inflows and outflows to the system for the water year.

Detailed information on groundwater sources is excluded from the GPWAR.

Reporting datasets used in the GPWAR are available by sending an email request of your required information to water.wams@dpi.nsw.gov.au

As Director Water Analytics, NSW Department Climate Change, Energy, the Environment and Water, I hereby declare:

- the information presented in these accounts is a faithful representation of the management and operation of the NSW Border Rivers Regulated River Water Source for the reporting period
- all data presented in this report provides the best accounting information available at the time of publication
- the Department Climate Change, Energy, the Environment and Water has to the best of its ability prepared this GPWAR in accordance with the Australian Water Accounting Standard 1.

Danielle Baker
Director Water Analytics
NSW Department Climate Change, Energy, the Environment and Water

Contextual statement

The Border Rivers consist of the catchments of the Dumaresq, Severn, Macintyre and Barwon Rivers, which drain from the Great Dividing Range between Inverell in far northern New South Wales (NSW) and Warrenbayne in Southern Queensland. The catchment occupies an area of approximately 49,500 square kilometres, of which approximately 24,500 square kilometres are situated within NSW. The Dumaresq River, Macintyre River and part of the Barwon River downstream of the Weir River form the border between NSW and Queensland for approximately 470 kilometres.

The Border Rivers are regulated by 3 dams: Glenlyon Dam on Pikes Creek (Queensland), Coolmunda Dam on Macintyre Brook (Queensland), and Pindari Dam on the Severn River (NSW). The main tributaries draining from Queensland are Pikes Creek and Macintyre Brook, which enter the Dumaresq River, and the Weir River, which enters the Macintyre River. The lower end of the catchment is characterised by a complex series of anabranching channels. The junction of the Weir and Macintyre Rivers marks the start of the Barwon River, and the town of Mungundi on the Barwon River marks the downstream end of the Border Rivers catchment.

The catchment supports a population of around 50,000 people. In NSW, the population is concentrated in the major centres of Glen Innes, Inverell, and Tenterfield, which support around 30,000 people between the 3 local government areas. The largest towns in the Queensland part of the catchment are Goondiwindi and Stanthorpe, which both have populations of around 5,000 people. The Border Rivers flows through lands previously occupied by the Kamilaroi and Bigambul Aboriginal people.

The main agricultural use of land is for grazing and dryland cropping, and this covers around 90% of the catchment. Irrigation for the production of cotton occurs on the western plains between Goondiwindi and Mungindi.

A more detailed description of the catchment can be found in the document *Water resources and management overview—Border Rivers catchment*, which is available from the NSW Department Climate Change, Energy, the Environment and Water website.

Accounting extent

The accounted river extent for this general-purpose water accounting report (GPWAR) is illustrated in Figure 1 and includes the area managed by the water sharing plan for the New South Wales Border Rivers Regulated River Water Source.

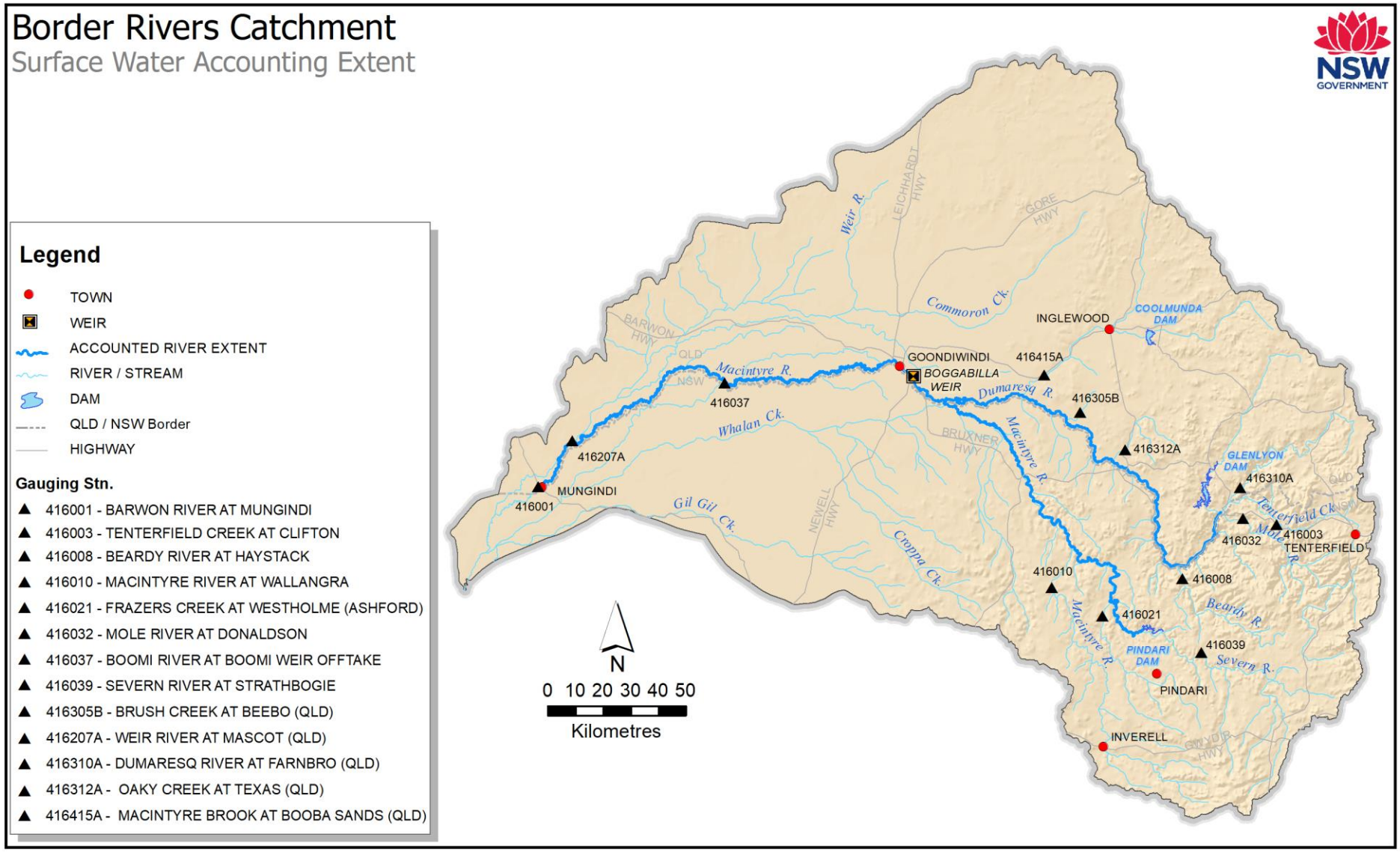
The GPWAR considers the water resources and associated water users on the Severn River from Pindari Dam to its junction with the Macintyre River, the Dumeresq River from Glenlyon Dam to the junction with the Macintyre River, and the Macintyre River downstream to Mungindi.

The gauged inflow reported consists of inflow from Macintyre Brook, The Mole River, Frazers Creek, Weir River, Tenterfield Creek, Beardy River and Macintyre River (the unregulated component upstream of the junction with the Severn River).

This GPWAR is an account for NSW access to the regulated Border Rivers, and therefore only Pindari and Glenlyon Dam volumes are included as major storage assets. Flow exiting the Macintyre Brook (regulated by Coolmunda Dam) is treated as an inflow to the NSW Border Rivers. Aside from this, the Coolmunda system is excluded as it is not a NSW resource.

Groundwater volumes interacting with the regulated river are only indirectly included in the GPWAR statements (that is, they form part of the unaccounted difference required to balance the river storage). Other groundwater flows and groundwater management are excluded from this GPWAR.

Figure 1: Surface water geographical extent of the accounts

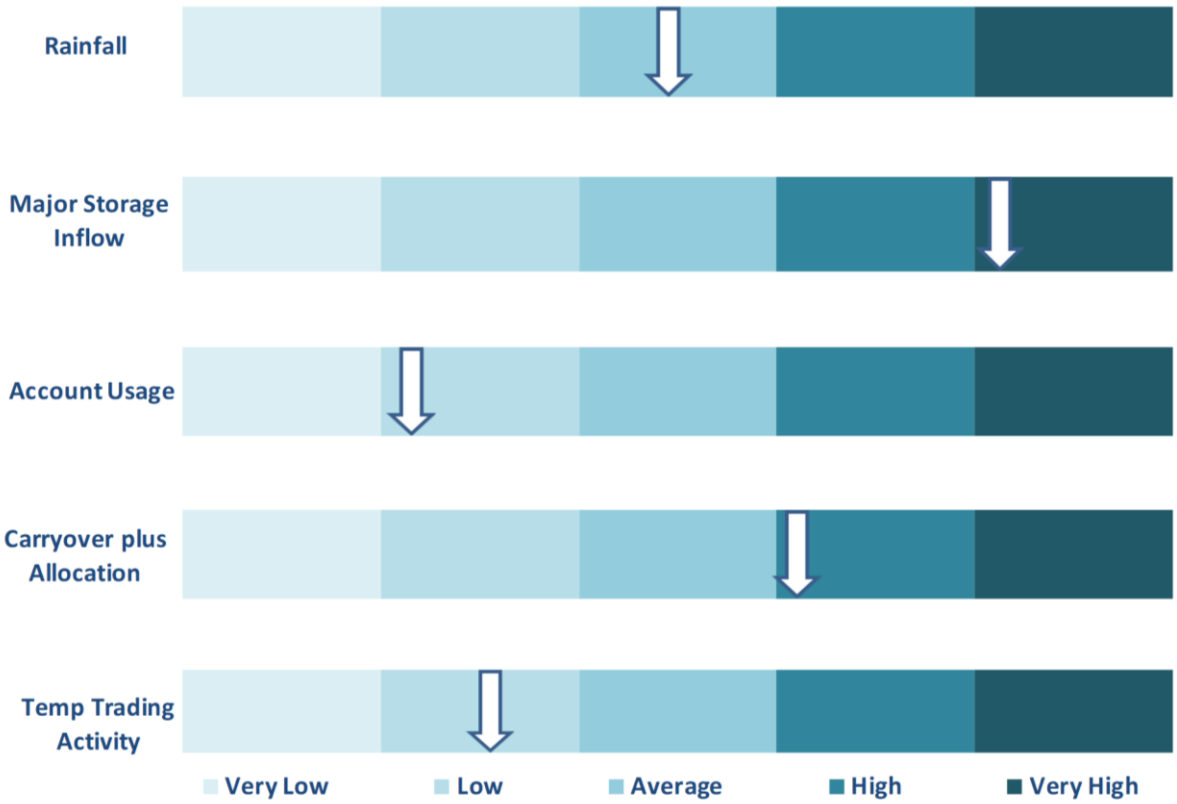


Snapshot

The key indicators for the reporting period relative to other years under water sharing plan management conditions are presented in

Figure 2. Rainfall and Inflow to major headwater storages were both in the very high range (80th to 100th percentile exceedance). Effective allocation (carryover plus available water determinations) was in the high range. Account usages and temporary trading activity for the reporting period were both in the low range.

Figure 2: 2022–23 Summary indicators



Climate

At Pindari Dam (upper catchment), 815 mm of rainfall was recorded in the reporting period (Table 1). Comparatively this volume of rainfall is:

- 111% of the long-term historical median rainfall for this location
- 78% of the highest annual (July to June) rainfall on record for this location.

The highest monthly rainfall totals were in October 2022 (173 mm) and January 2023 (112 mm).

At Mungindi (lower catchment), 487 mm of rainfall was recorded in the reporting period (Table 2). Comparatively this volume of rainfall is:

- 103% of the long-term historical median rainfall for this location
- 49% of the highest rainfall on record at this location.

The highest monthly rainfall totals occurred in October 2022 (163 mm) and September 2022 (88 mm) (Figure 3). Variance from median rainfall for the reporting period at Pindari Dam and Mungindi is presented in Figure 4.

Spatially, rainfall was above average across the catchment (Figure 5 and Figure 6).

Figure 3: Monthly rainfall for the reporting period compared to historical monthly median rainfall at Pindari and Mungindi

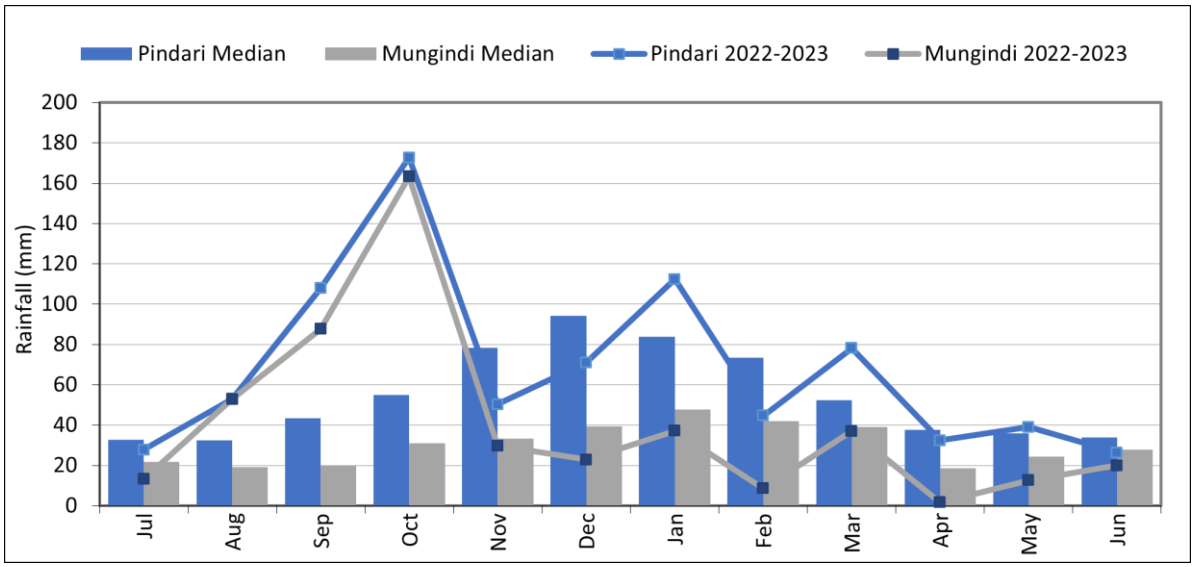


Figure 4: Monthly rainfall deviation from historical medians at Pindari and Mungindi

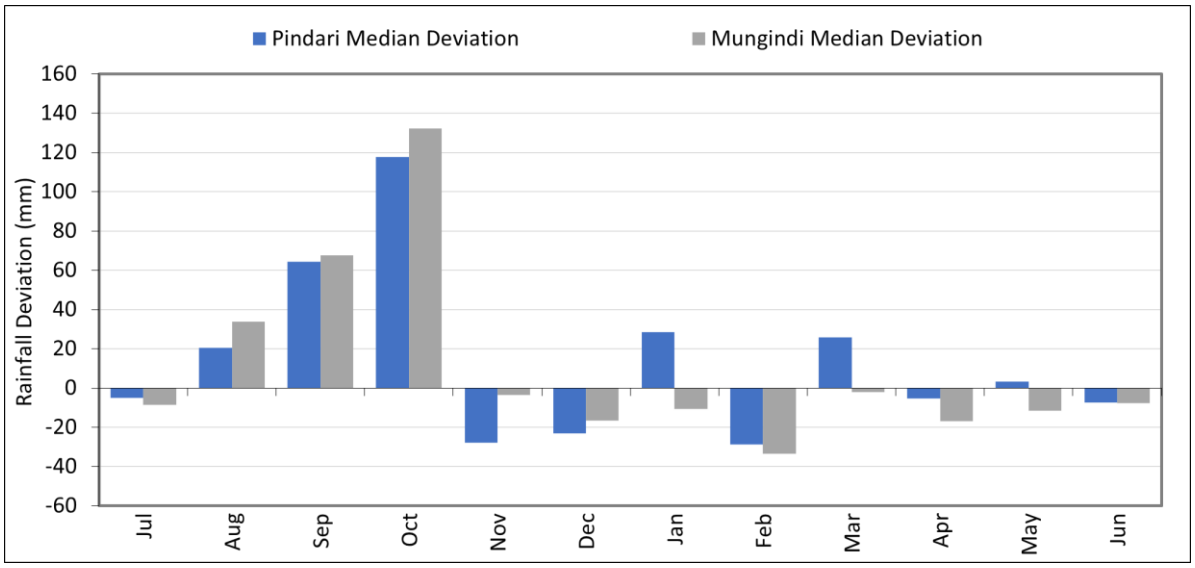

Pindari Median Deviation
Mungindi Median Deviation
Rainfall Deviation (mm)
160
140
120
100
80
60
40
20
0
-20
-40
-60
Jul
Aug
Sep
Oct
Nov
Dec
Jan
Feb
Mar
Apr
May
Jun

Table 1: Monthly rainfall and historic monthly rainfall statistics at Pindari[1]—measurements in millimetres

Month	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Annual
Pindari 2022-2023	**27.7**	**53.0**	**107.8**	**172.6**	**50.2**	**71.1**	**112.3**	**44.6**	**78.1**	**32.3**	**39.0**	**26.3**	**815.0**
Mean	41.9	37.3	48.0	65.2	84.9	89.7	91.5	77.4	70.7	43.3	42.4	38.5	726.2
Pindari Median	32.9	32.6	43.5	54.9	78.2	94.2	83.7	73.3	52.4	37.6	35.8	33.8	737.0
Lowest	1.8	0.0	0.0	8.4	3.0	5.8	10.4	12.4	1.1	0.0	0.8	0.0	380.0
Highest	152.2	100.1	156.0	175.8	245.6	186.4	283.7	248.8	235.2	216.4	169.6	108.6	1050.2
Highest Year	1998	2016	2016	1975	2000	2004	1978	1976	1975	1988	1983	1981	2016-2017

Table 2: Monthly rainfall and historic monthly rainfall statistics at Mungindi[1]—measurements in millimetres

Month	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Annual
Mungindi 2022-2023	**13.2**	**52.9**	**87.7**	**163.2**	**29.8**	**22.8**	**37.2**	**8.6**	**37.0**	**1.6**	**12.6**	**20.0**	**486.6**
Mean	32.1	25.4	28.0	39.0	45.9	51.1	70.0	62.9	52.3	30.0	34.3	33.3	504.5
Mungindi Median	21.9	19.1	20.0	31.1	33.3	39.3	47.8	42.0	39.0	18.6	24.3	27.7	473.1
Lowest	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	165.0
Highest	257.2	146.8	148.5	197.7	256.6	191.9	406.2	366.0	274.5	251.0	170.0	118.4	990.8
Highest Year	1950	1966	1906	1969	2000	1942	1974	1976	1894	1988	1983	1930	1889-1890

[1] Long-term statistics are derived from the Bureau of Meteorology—climate data online. The data presented is collected from the stations '54104—Pindari Dam' and '52020—Mungindi Post Office'. Historic statistics uses data from 1971 to 2022 for Pindari and 1887 to 2022 for Mungindi

Figure 5: Border Rivers total annual rainfall (reporting period) [2]

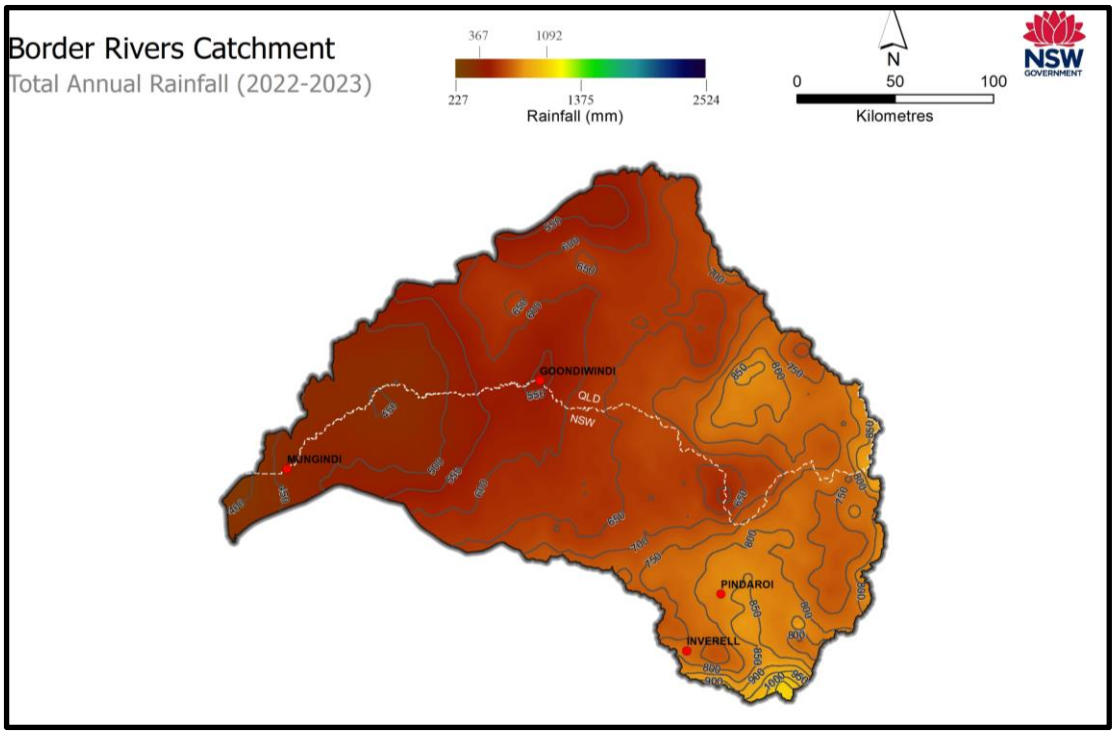
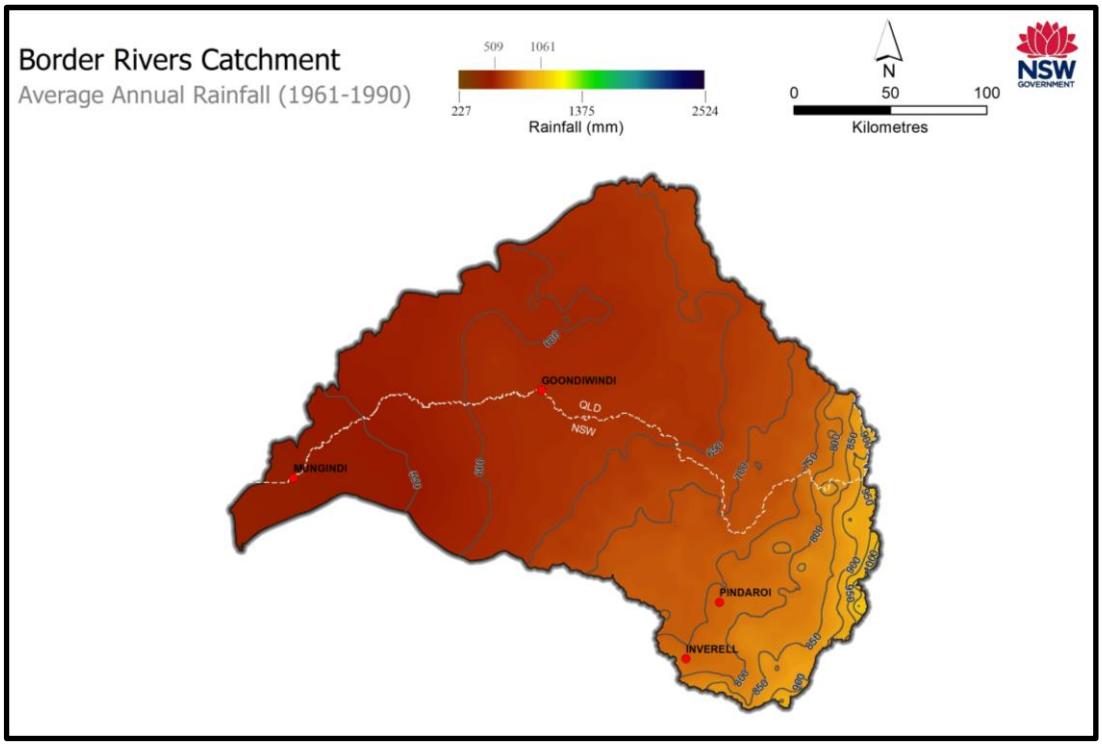


Figure 6: Border Rivers average annual rainfall, 1961 to 1990 [2]



[2] Data source: Australian Bureau of Meteorology

Storage inflows and volume

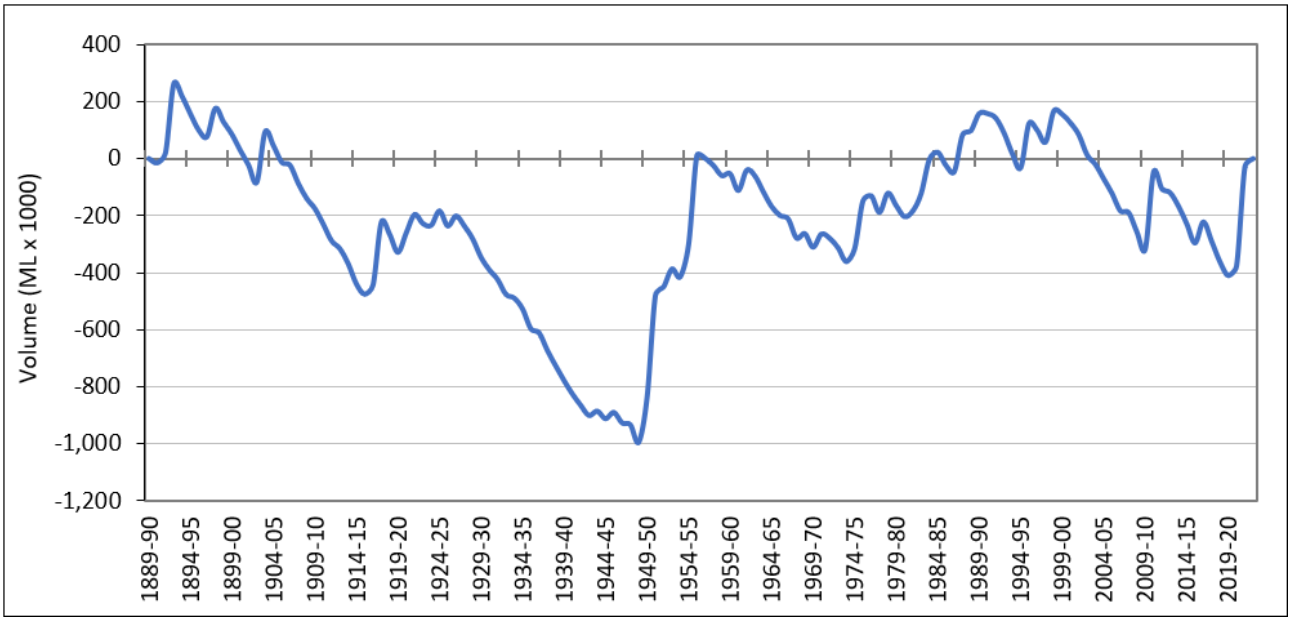
Inflows

Glenlyon

Historically, the long-term average annual inflow[3] at Glenlyon dam has varied significantly, cycling through prolonged periods of wet and dry flow regimes. Broadly, the data (Figure 7) illustrates:

- predominately dry conditions from 1900 to 1950
- a 10-year return to wet conditions from 1950 to 1960
- a 15-year dry cycle from 1960 to 1975
- predominately wet conditions from 1975 to 2000
- predominately dry conditions from 2000 to 2020.
- wet conditions from 2020 to current.

Figure 7: Long-term annual flow upstream of Glenlyon Dam, cumulative deviation from mean



For the reporting period, total inflow to Glenlyon Dam was 107,817 megalitres (Figure 8), which:

- is 239% of the long-term median annual inflow (45,069 megalitres per year)
- exceeded 77% of years in the long-term inflow sequence for the storage (1890-91 to 2022-23) (Figure 9)
- is the 3rd consecutive year of above average inflow
- The maximum mean daily inflow rate to Glenlyon Dam was 10,208 megalitres per day occurring on 31 March 2023 (Figure 10).

[3] Inflows are back-calculated storage inflow for the period from storage construction and gauged or rainfall runoff modelled flow for the prior period.

Figure 8: Long term annual inflow to Glenlyon Dam

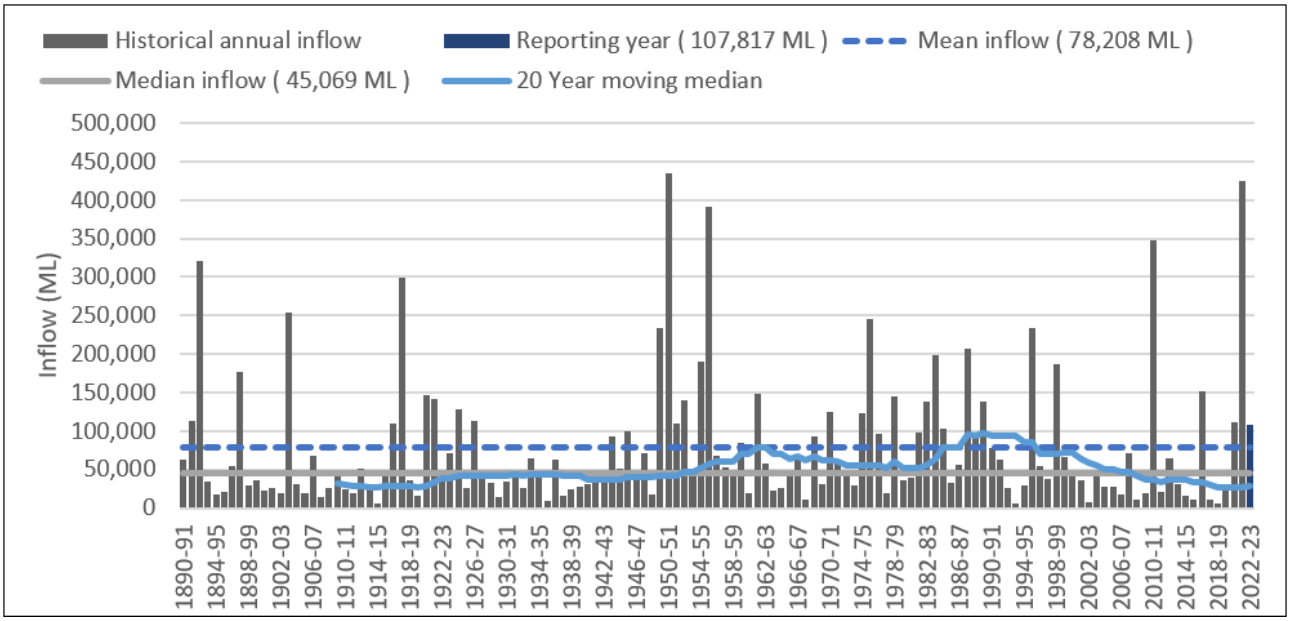


Figure 9: Long-term sequence of years below mean inflow for Glenlyon Dam

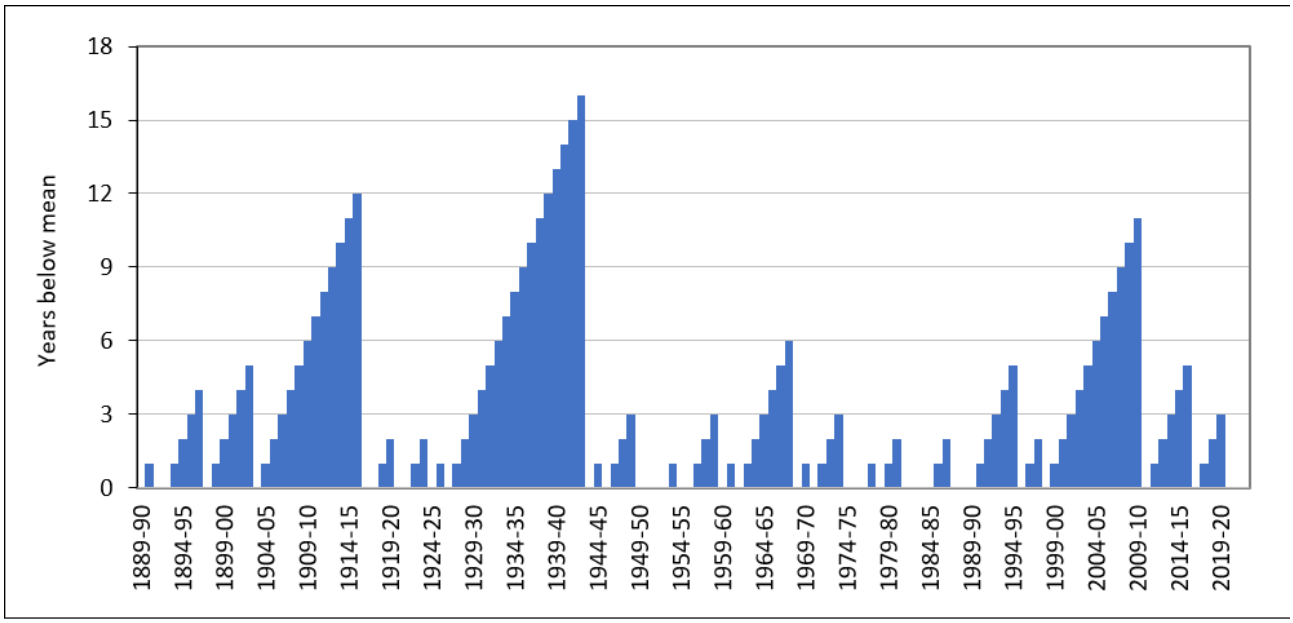
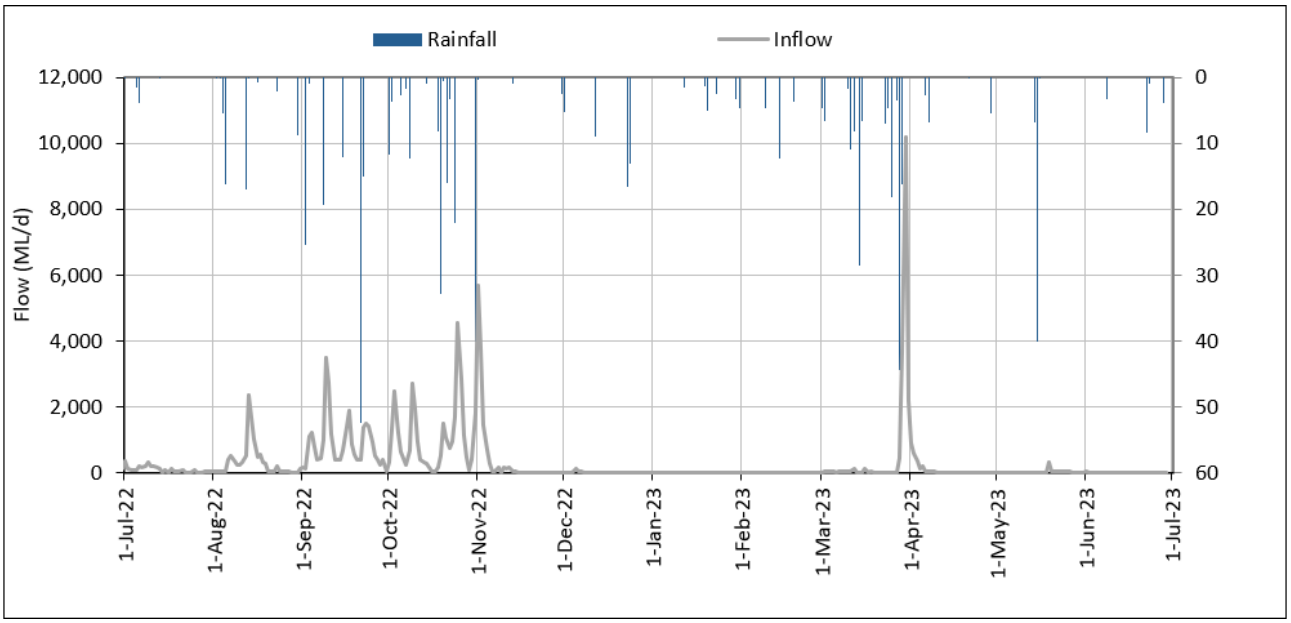


Figure 10: Daily inflows and rainfall at Glenlyon Dam for the reporting period



Pindari

The total inflow to Pindari storage for the reporting period was 359,008 megalitres (Figure 11), which:

- is 280% of the long-term median annual inflow (128,286 megalitres per year)
- exceeded 88% of years in the long-term inflow sequence for the storage (1890-91 to 2022-23)
- is the 3rd consecutive year of above average inflow.

The maximum mean daily inflow rate to Pindari storage 38,244 megalitres per day occurring on 22 October 2022 (Figure 12).

Figure 11: Long-term annual inflow to Pindari Dam

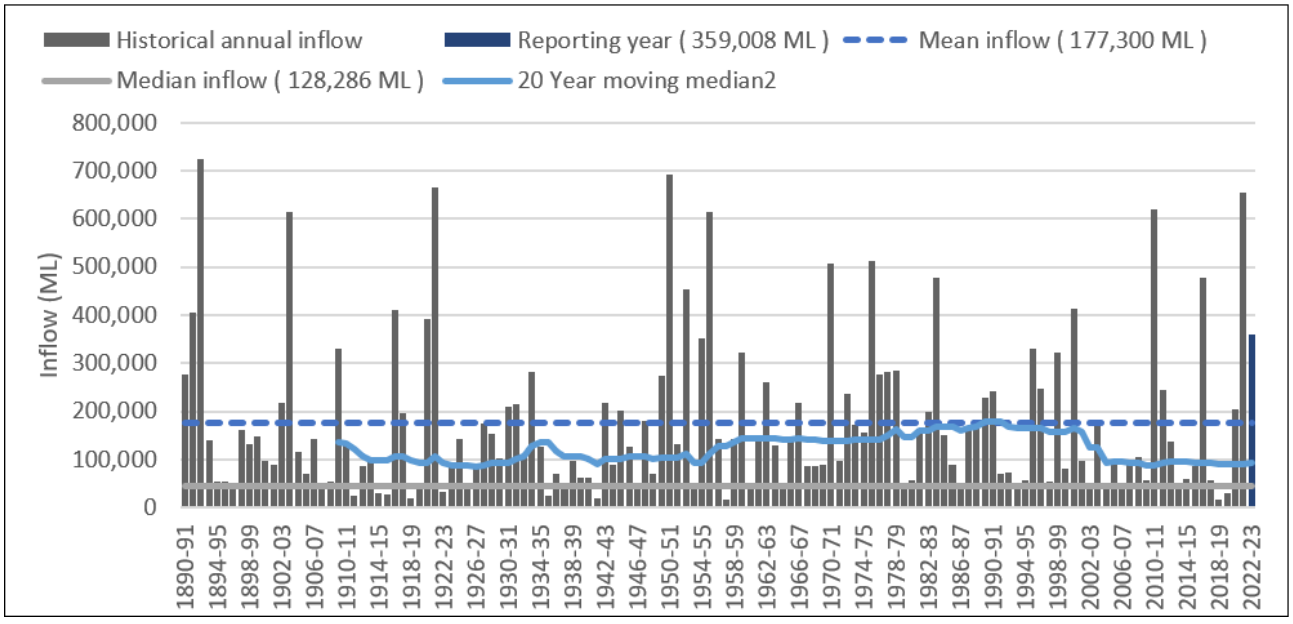
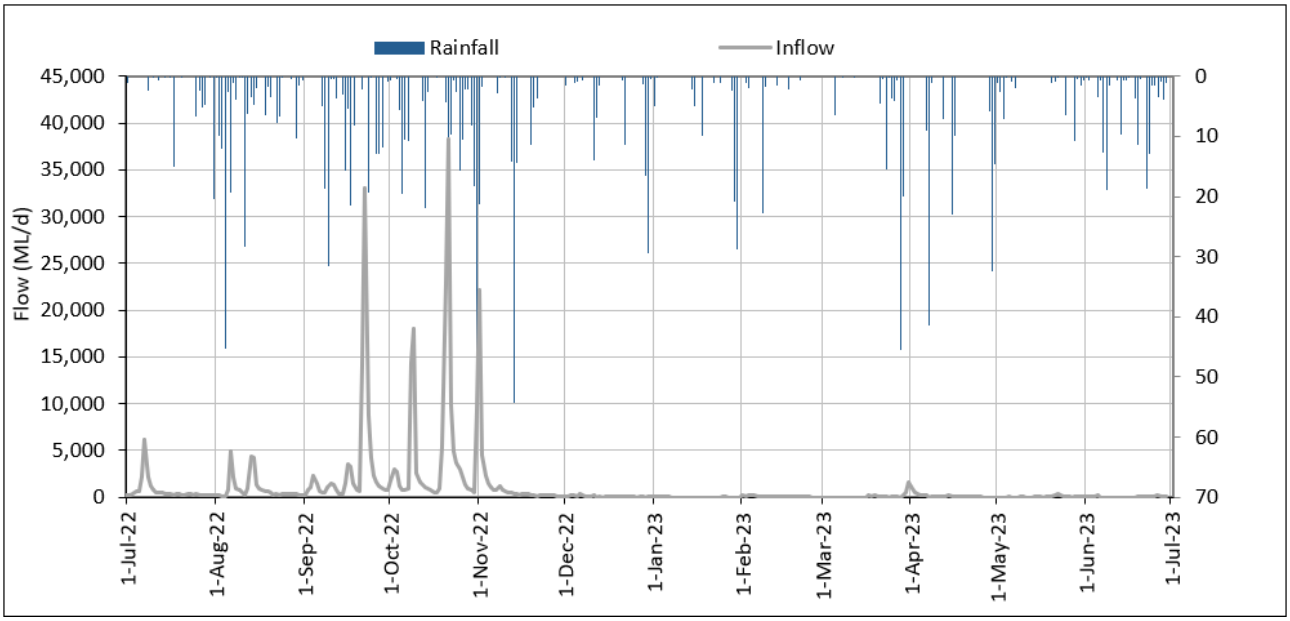


Figure 12: Daily inflows and rainfall at Pindari Dam for the reporting period



Storage volume

Glenlyon

- The volume at the start of the reporting period was 254,093 megalitres or 100% of full supply capacity (Figure 13).
- The volume held at the end of the reporting period was 247,673 megalitres or 97% of full supply capacity, a decrease of 3% for the reporting period.
- The maximum volume held in storage during the reporting period was 261,027 megalitres, or 103% of full capacity, on 3 November 2022.

Figure 13: Glenlyon Dam volume and percentage for the reporting period

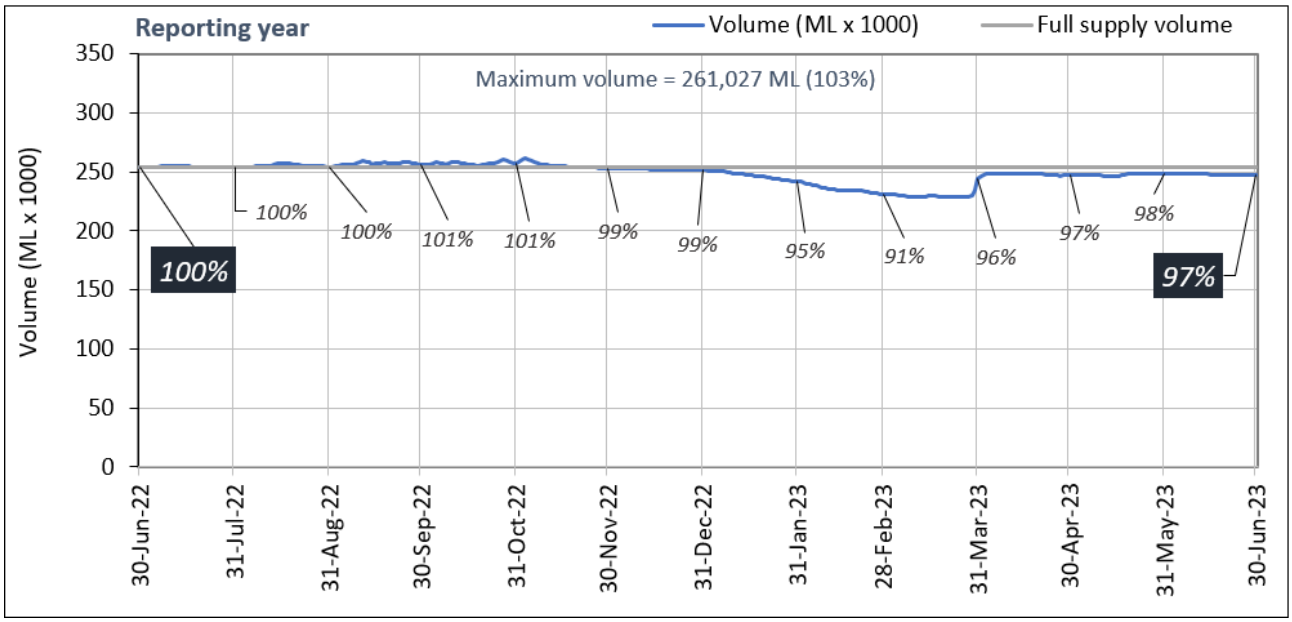
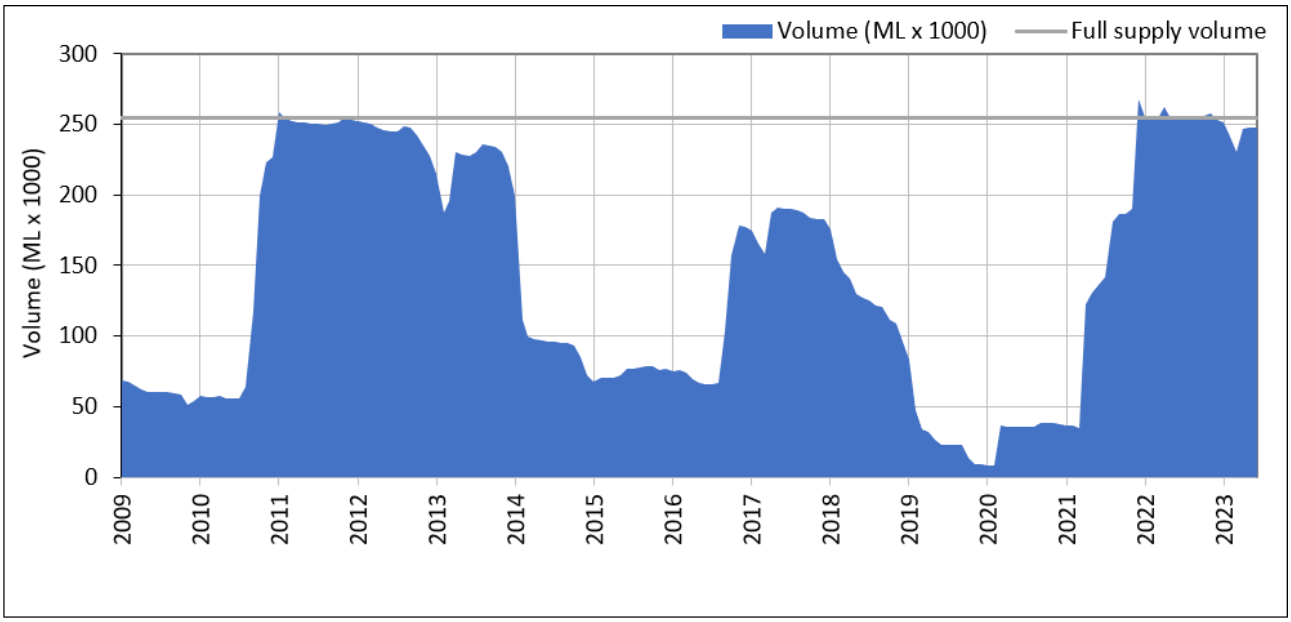


Figure 14: Glenlyon Dam historical storage volumes



Pindari

- The volume at the start of the reporting period was 312,583 megalitres or 100% of full supply capacity (Figure 15).
- The volume held at the end of the reporting period was 262,301 megalitres or 84% of full supply capacity, a decrease of 16% for the reporting period.
- The maximum volume held in storage during the reporting period was 321,329 megalitres, or 103% of full capacity, on 22 October 2022.

Figure 15: Pindari Dam volume and percentage for the reporting period[4]

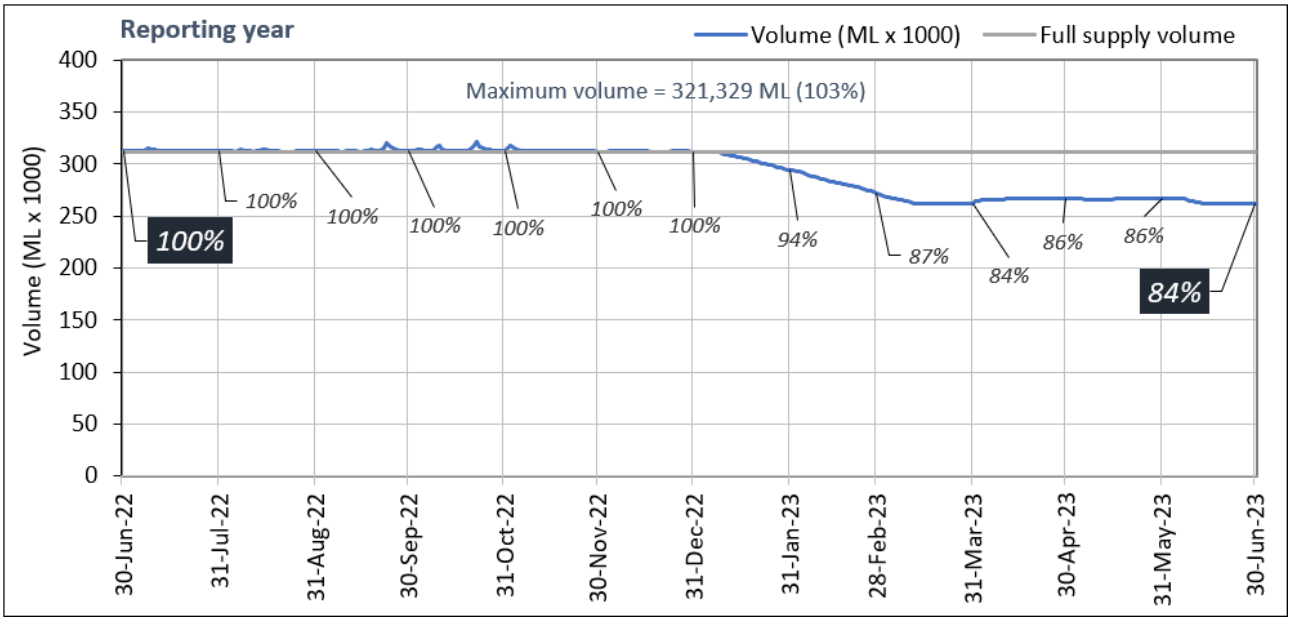
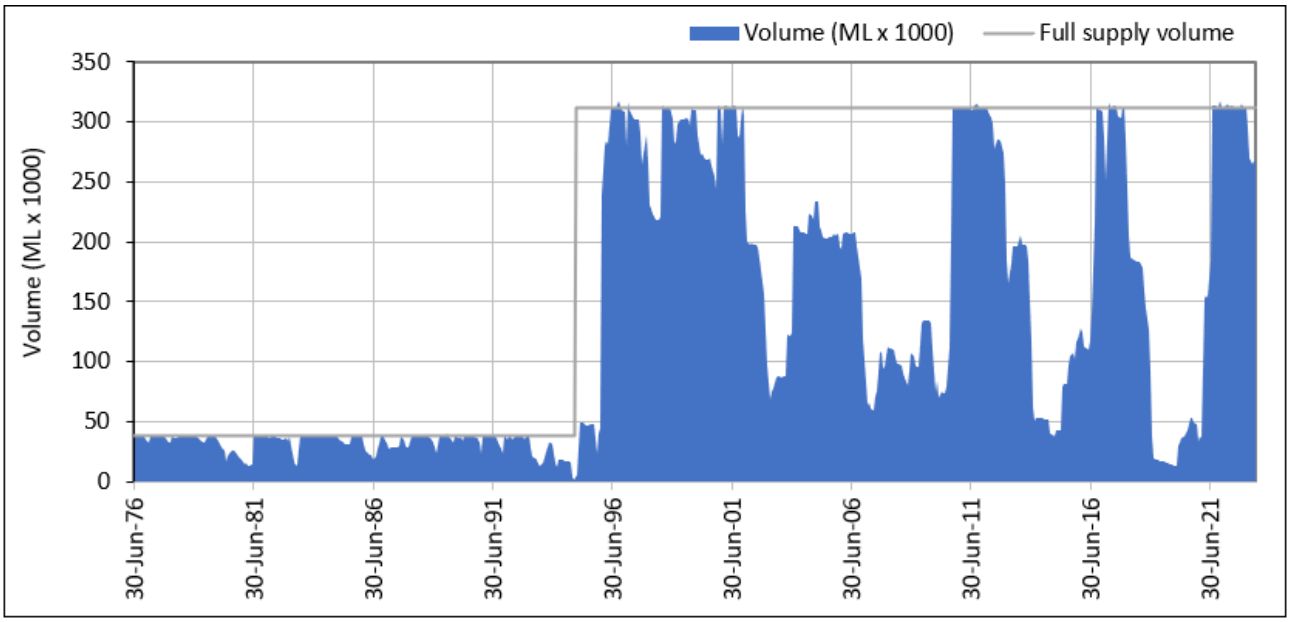


Figure 16: Pindari Dam historical storage volumes

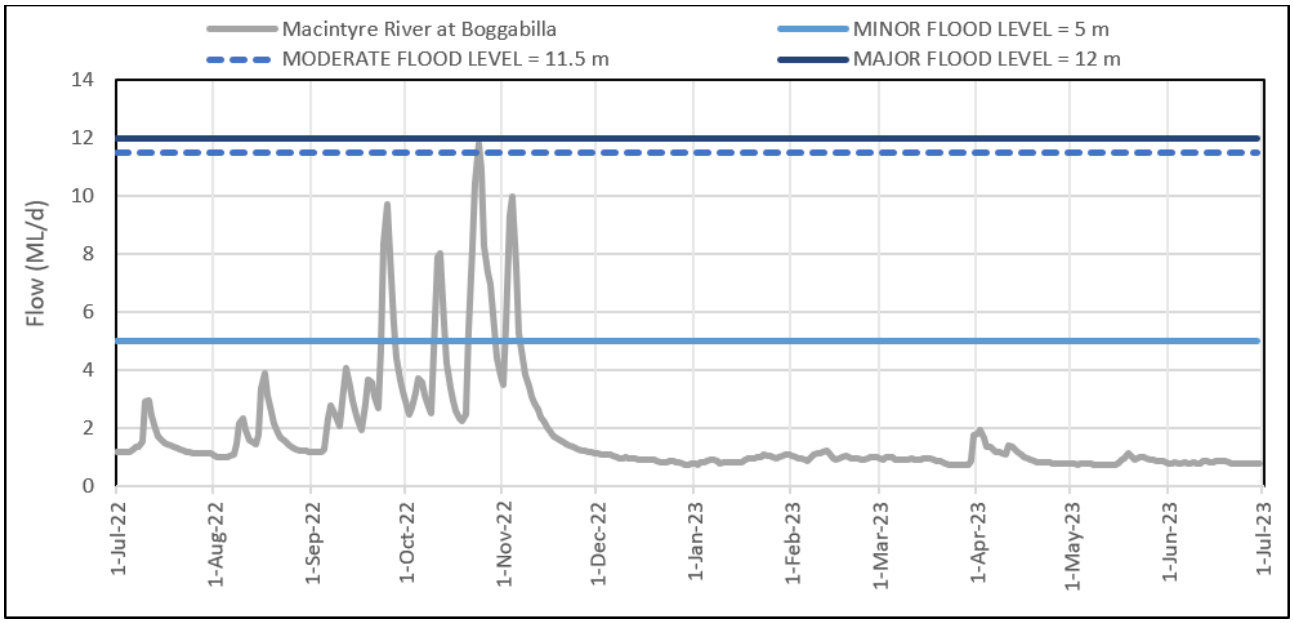


Major flow events

There were four separate events that exceeded the flood level indicators for the Macintyre River at Boggabilla within the reporting period. River height at Boggabilla remained below the major flooding indicator level of 12 metres for the entire year. The Largest event occurred in October 2022 with a peak of 11.8 metres on the 24 October 2022. The next largest event occurred in November 2022 with a peak of 10 metres on the 4 November 2022. (Figure 17).

[4] An enlargement to Pindari Dam was completed in 1995 increasing storage capacity from 37,540 megalitres to 473,293 megalitres.

Figure 17: Maximum daily river height—Macintyre River at Boggabilla



Surface water resources and management

Legislation

The water source was managed under the rules and requirements set out in the *Water Sharing Plan for the NSW Border Rivers Regulated River Water Source 2021* for the entirety of the reporting period. This water sharing plan commenced on 1 July 2021.The water sharing plan was produced to meet the water management principles outlined in the *Water Management Act 2000*.

Access rights

- Access licence share components remained constant throughout the reporting period (Figure 18).
- Total share on issue on 30 June 2023 was 386,360 shares, including 120,001 shares of supplementary access (

  Table 3).

Figure 18: Issued share component since the commencement of the water sharing

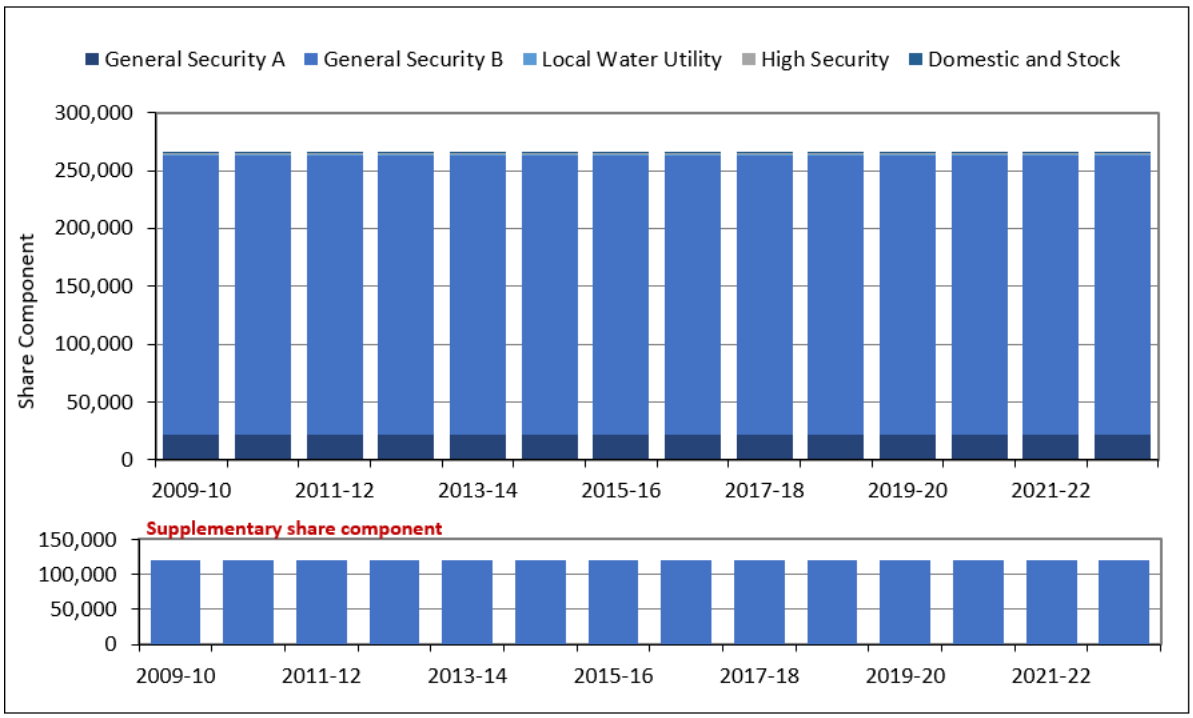


Table 3: Issued share component on 30 June 2022

Category	Issued share component
Domestic and Stock	850
Domestic and Stock [Domestic]	51
Domestic and Stock [Stock]	100
Local Water Utility	640
Regulated River (General Security A)	22,007
Regulated River (General Security B)	241,211
Regulated River (High Security)	1,500
Supplementary Water	120,001
Floodplain Harvesting	**51,665**
Total	**438,025**

Allocation account summary

A summary illustration of the accounting for High Security, General Security A and General Security B access licence categories in the Border Rivers is provided in Figure 19, Figure 20 and Figure 21 respectively. Detailed information on the water accounts for all categories of licence issued are provided in Note 1 of this report.

Figure 19: Annual water account summary Border Rivers High Security

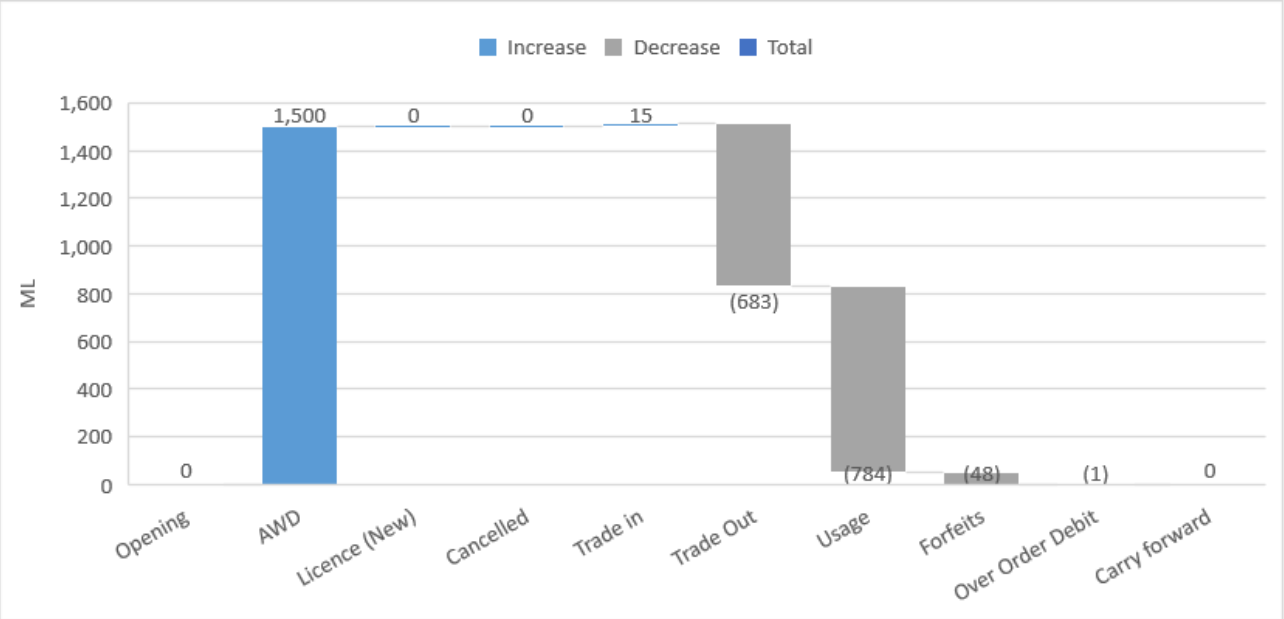


Figure 20: Annual water account summary Border Rivers General Security A

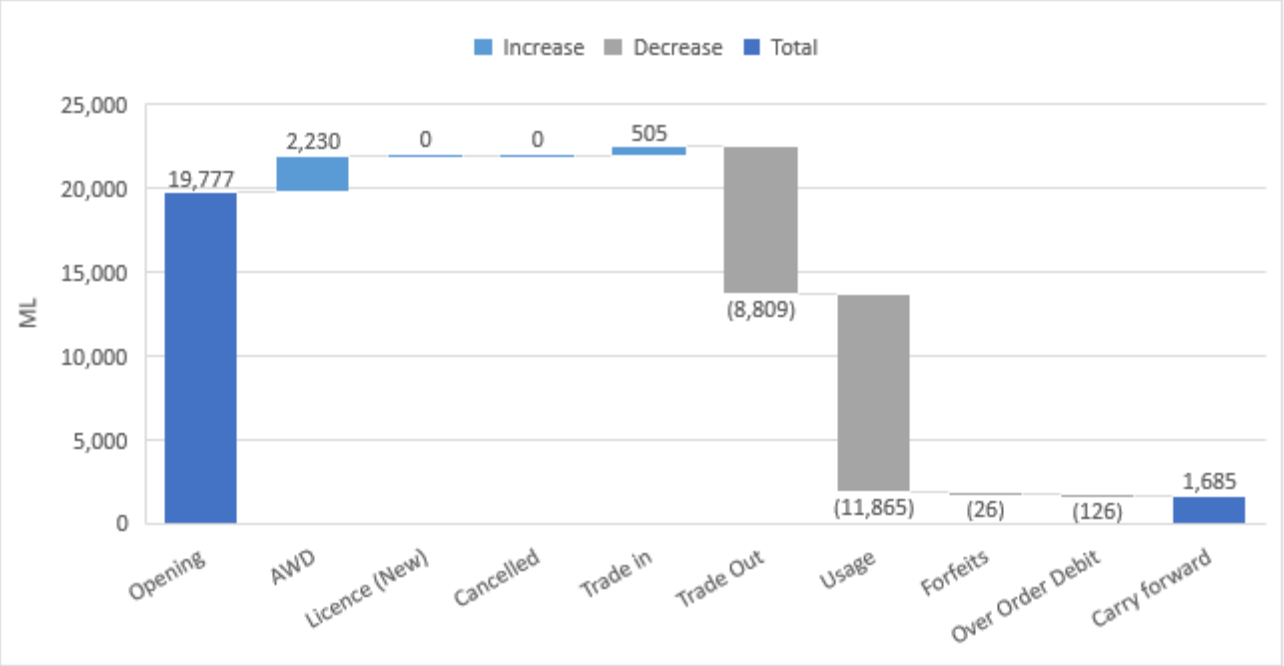
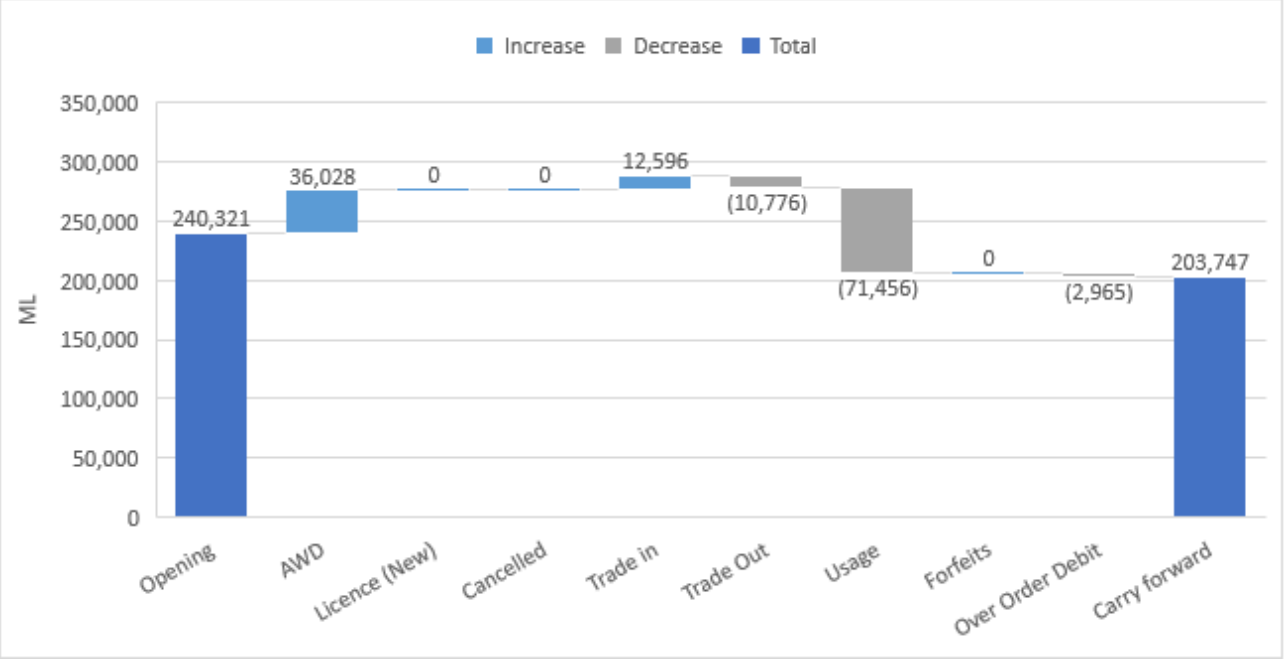


Figure 21: Annual water account summary Border Rivers General Security B



Access licence account management

A continuous accounting procedure is implemented in this water source, with additional available water determinations (AWDs) considered with any increase to system resources.

All access licences accounts are limited to hold a maximum of one megalitre per share (or 100% of issued share component). Licence holders are also limited to a maximum AWD of one megalitre per share (or 100% of issued share component) with the exception of General Security B access licence holders (which have no cap on water received from the AWD process).

The rules enforce that all categories of licence are effectively limited to an annual use of one megalitres per share (or 100% of issued share component) with the exception of general-security licences, which adjust for net trade volumes.

The access licence accounting rules are summarised in Table 4.

Table 4: Access licence accounting rules applicable for reporting period

Licence Category	Account limit	Carryover limit	Annual use limit	Maximum AWD	AWD plus carryover limit
Domestic and Stock	100%	0%	N/A	100%	N/A
Domestic and Stock [Domestic]	100%	0%	N/A	100%	N/A
Domestic and Stock [Stock]	100%	0%	N/A	100%	N/A
Local Water Utility	100%	0%	N/A	100%	N/A
General Security A	1 ML/Share	1 ML/Share	1 ML/Share[5]	1 ML/Share	1 ML/Share
General Security B	1 ML/Share	1 ML/Share	1 ML/Share[5]	N/A	N/A
High Security	1 ML/Share	0 ML/Share	N/A	1 ML/Share	N/A
Floodplain Harvesting	5 ML/Share	5 ML/Share	N/A	1 ML/Share	NA
Supplementary Water	1 ML/Share	0 ML/Share	N/A	1 ML/share	N/A

Extreme events stage and temporary water restrictions

The NSW Extreme Events Policy was released in October 2018 and updated in August 2023 include drought measures with drought stages. The policy provides a framework for managing extreme events in the major river systems of the NSW Murray–Darling Basin. This framework is based on a staged approach, providing a range of measures for water managers to implement as conditions deteriorate.

Temporary water restrictions are an example of the type of measures that can be implemented to manage a water shortage. These restrictions are issued under section 324 of the *Water Management Act 2000* and have been implemented in several river valleys in the current drought to preserve water for critical needs.

Table 5 outlines the conditions that may be associated with different stages of criticality for surface water quantity. Further information is available at NSW Extreme events policy

[5] Limit applies to water taken or assigned out of accounts. Annual use limits include net allocation assignments (i.e. plus assignments in, minus assignments out).

Table 5: Determination of stages of criticality for surface water quantity

Stage	Stage description	Stage evidence base
1	Normal management	Can deliver all account water under normal river operations practices.
2	Emerging drought	Unable to deliver 100% of high priority account water and maximum expected use of General Security under normal river operations practices.
3	Severe drought	Only able to deliver restricted high priority demands and restricted remaining General Security account water.
4	Critical drought	Only able to deliver restricted town water supply, stock and domestic and other restricted high priority demands.

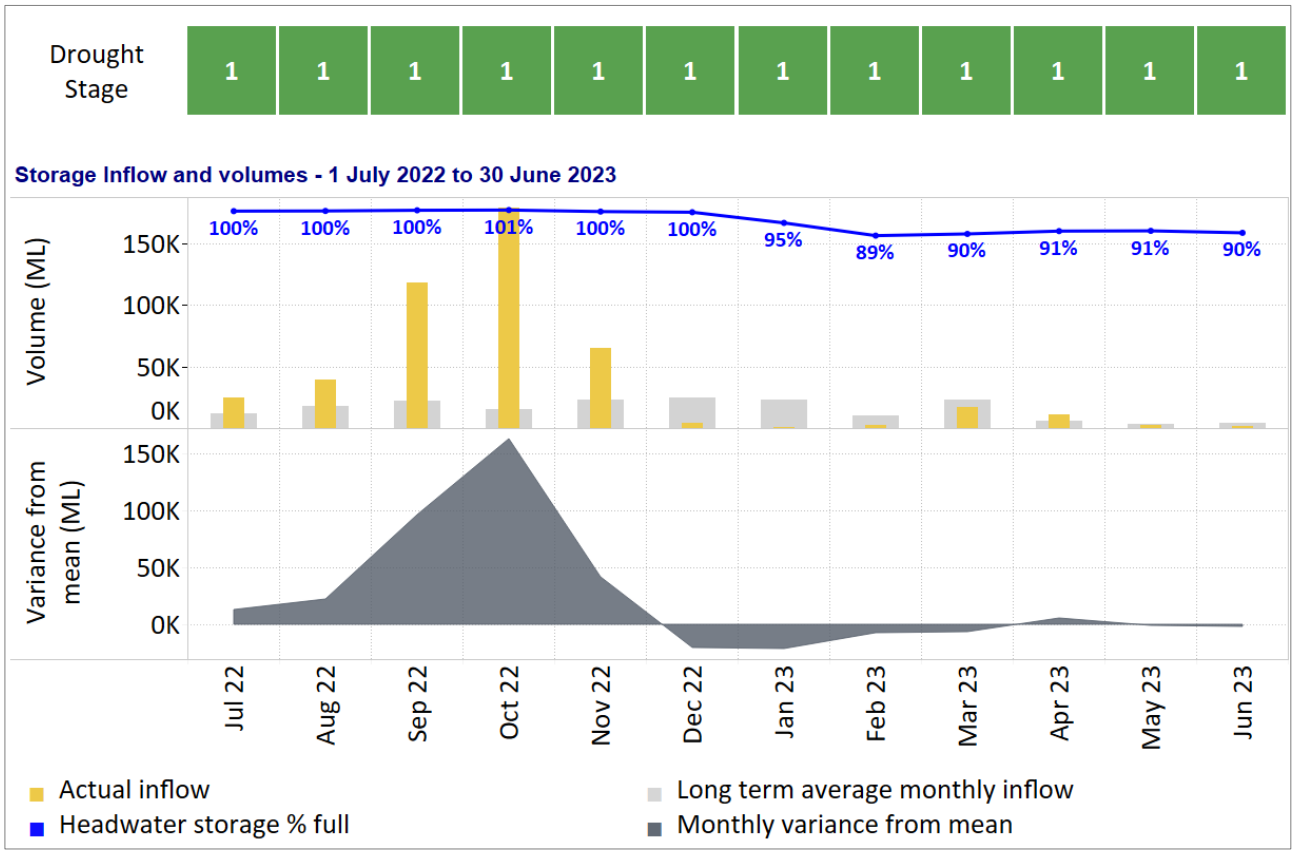
Temporary water restrictions

- No temporary water restrictions were applicable during the reporting period.

Extreme events stage

- The NSW Border Rivers was in Stage 1 Normal management throughout the 2022–23 water year (Figure 22).
- Headwater storages where 100% at the start of the reporting period, reaching a peak of 101% In October 2022. Storages were 90% at the end of the reporting period.
- The actual inflow was higher than long-term inflow for the first 5 months of the water year and for April 2023. December January and February were all well below while May and June 2023 were close to the long-term average inflow.

Figure 22: Drought stage for the reporting period referenced with monthly headwater storage inflows, monthly storage inflow variance from mean and 2-year cumulative inflow sequence



Water availability

Regulated supply

- Domestic and Stock, Local Water Utility, High Security access licences (including sub-categories of these) received an opening available water determination (AWD) of 100%, the maximum allowable under the water sharing plan. Incremental announcements for High Security are presented in Figure 25.
- General Security A access licences had a carryover of 19,777 megalitres into the reporting period, equating to 90% of total issued General Security A share.
- General Security A access licences received an opening AWD of 1 megalitre per share (100%). Historical incremental announcements for General Security A are presented in Figure 23.
- General Security B access licences had a carryover of 240,321 megalitres into the reporting period, equating to approximately 100% of total issued General Security B share.
- General Security B access licences received an opening AWD of 1 megalitre per share to give an effective allocation (carryover plus available water determinations) of 100%. As water was used, General Security B licences received additional allocations bring total announcements to 115% by 24 May 2023. Historical incremental announcements for General Security B are presented in Figure 24.
- Detailed available water determinations are provided in note 2 of this GPWAR.

- From an annual perspective, water availability[6] for categories with regulated (storage) was the 2nd highest since 2016–17 (Figure 26).

Floodplain harvesting

NSW is at an early stage of implementing floodplain harvesting measurement requirements and compliant measurement equipment (which includes telemetry) was not required to be installed during the reporting period.

While alternative methods for determining the volume of take under floodplain harvesting access licences for are being looked at there were no results available at the time of writing.

The reported volume of take under floodplain harvesting access licences for the 2022-23 reporting period is 0 ML.

Supplementary access and tributary inflow

- Supplementary access licences received an opening AWD of 0.74 megalitre per share (74% equivalent), reduced from the usual 1 megalitre per share as a growth in use action pending commencement of the floodplain harvesting licences. Following the commencement of flood plain harvesting licences a further AWD of 0.26 megalitre per share was received in August 2022 equating to 100% Supplementary Water announcement for the water year.
- Access to the allocation is dependent on operational announcements for supplementary access throughout the year. At water source level 266 days of supplementary access was available in the reporting period (Figure 27).
- By volume almost 37% of total tributary inflow to the regulated NSW Border Rivers, downstream of the major storages, was contributed by the Weir River, however significant entitlement is situated above this contribution. The unregulated flows from Macintyre River and Mole River, collectively, contributed approximately 28% of the regulated river tributary inflow (Figure 28).
- Detailed information on operational supplementary announcements and usages by river section is available in Note 21 of this GPWAR.

[6] Includes all access licences issued under the water sharing plan and therefore held environmental water. Does not consider use limits.

Figure 23: Incremental available water determination and carryover volumes for General Security A as a proportion of share component

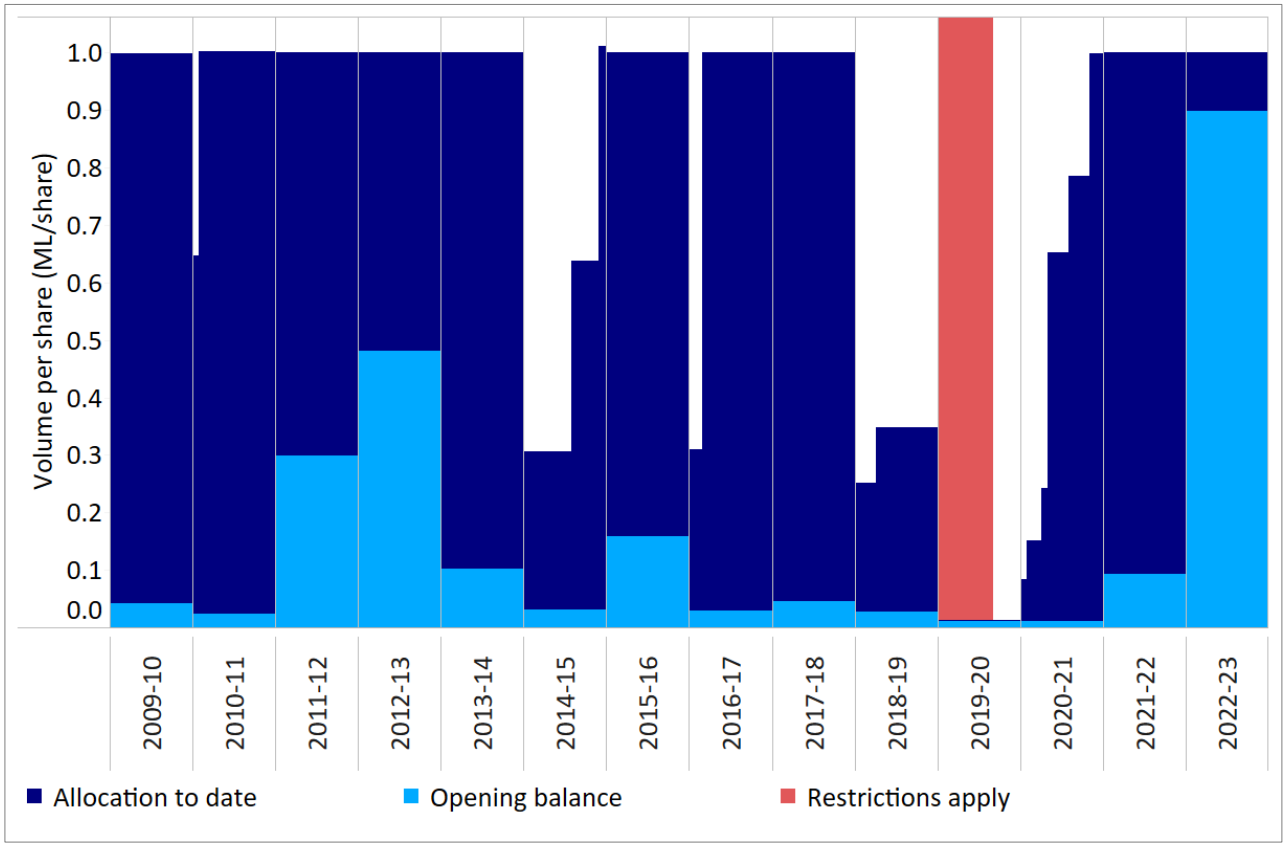


Figure 24: Incremental available water determination and carryover volumes for General Security B as a proportion of share component

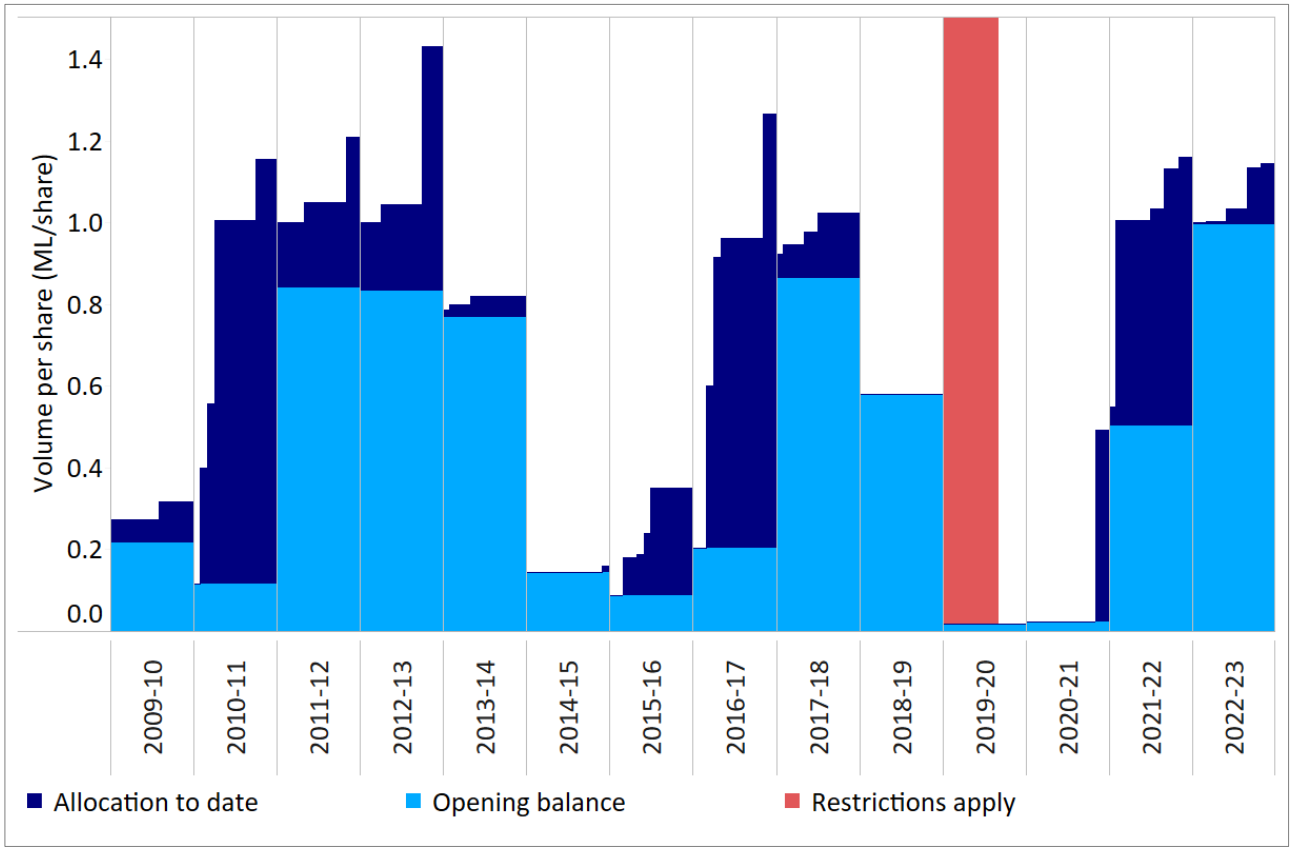


Figure 25: Incremental available water determination and carryover volumes for High Security as a proportion of share component

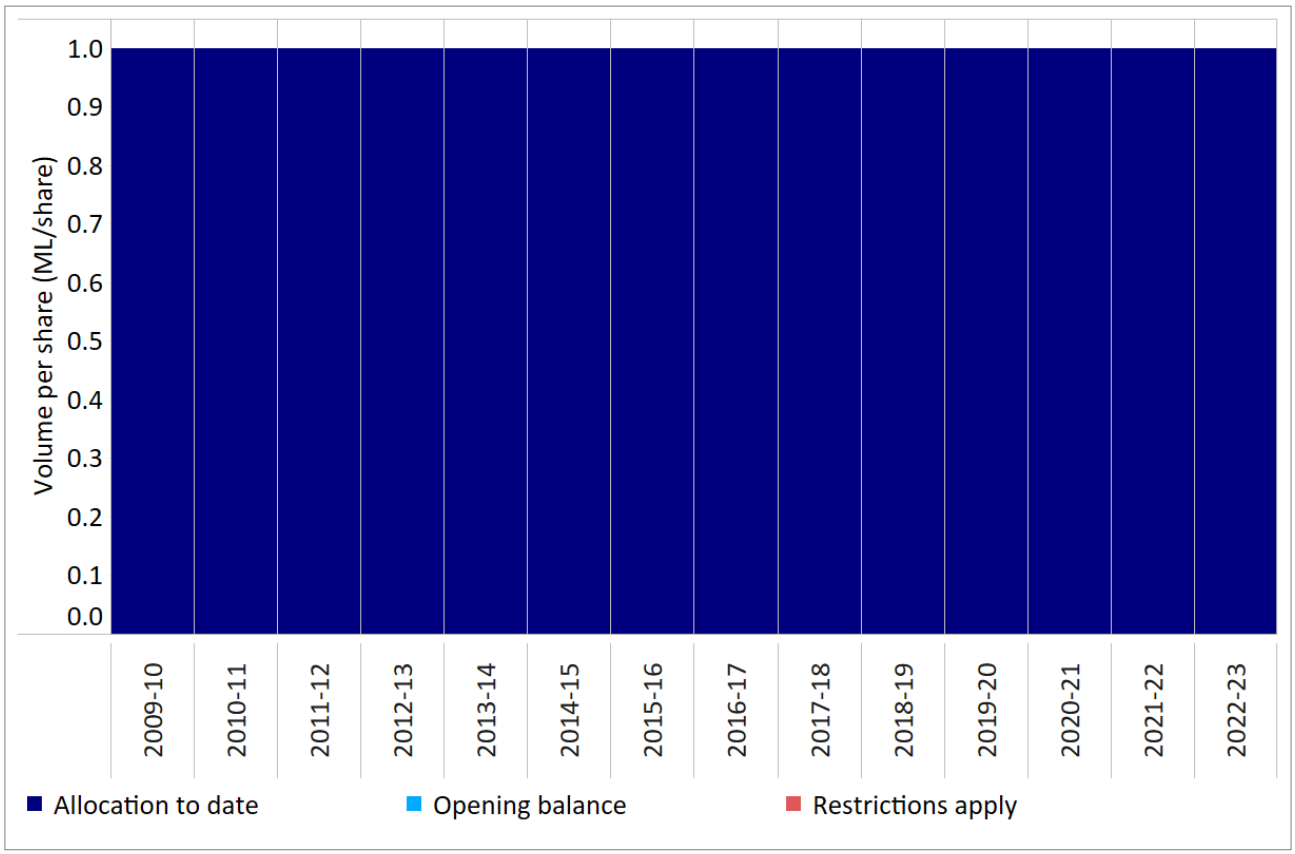


Figure 26: Water availability (AWD plus carry over)

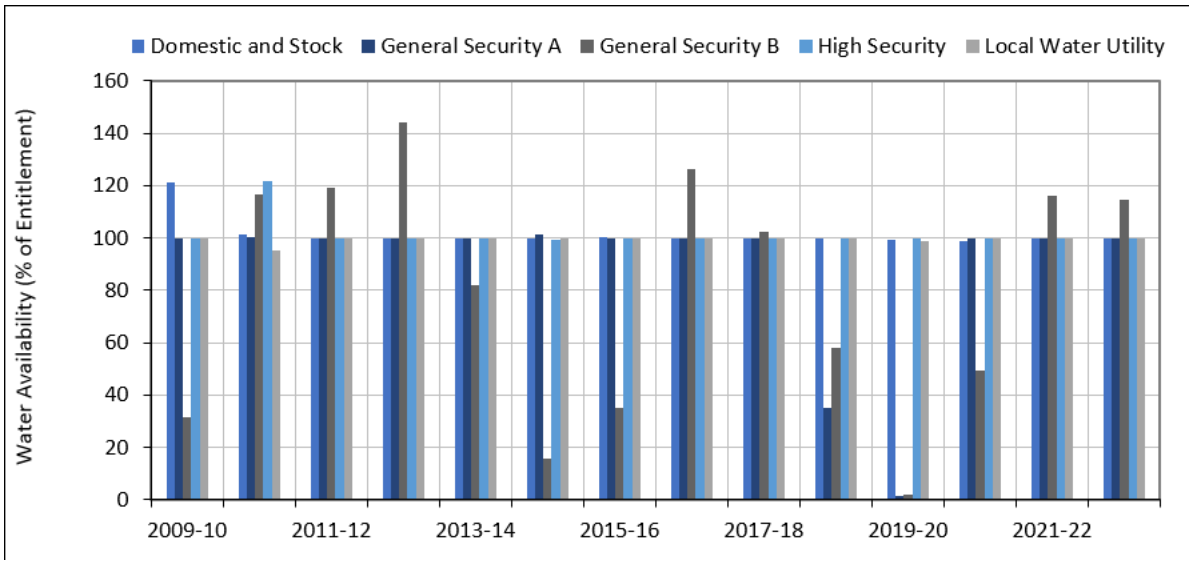


Figure 27: Supplementary event access

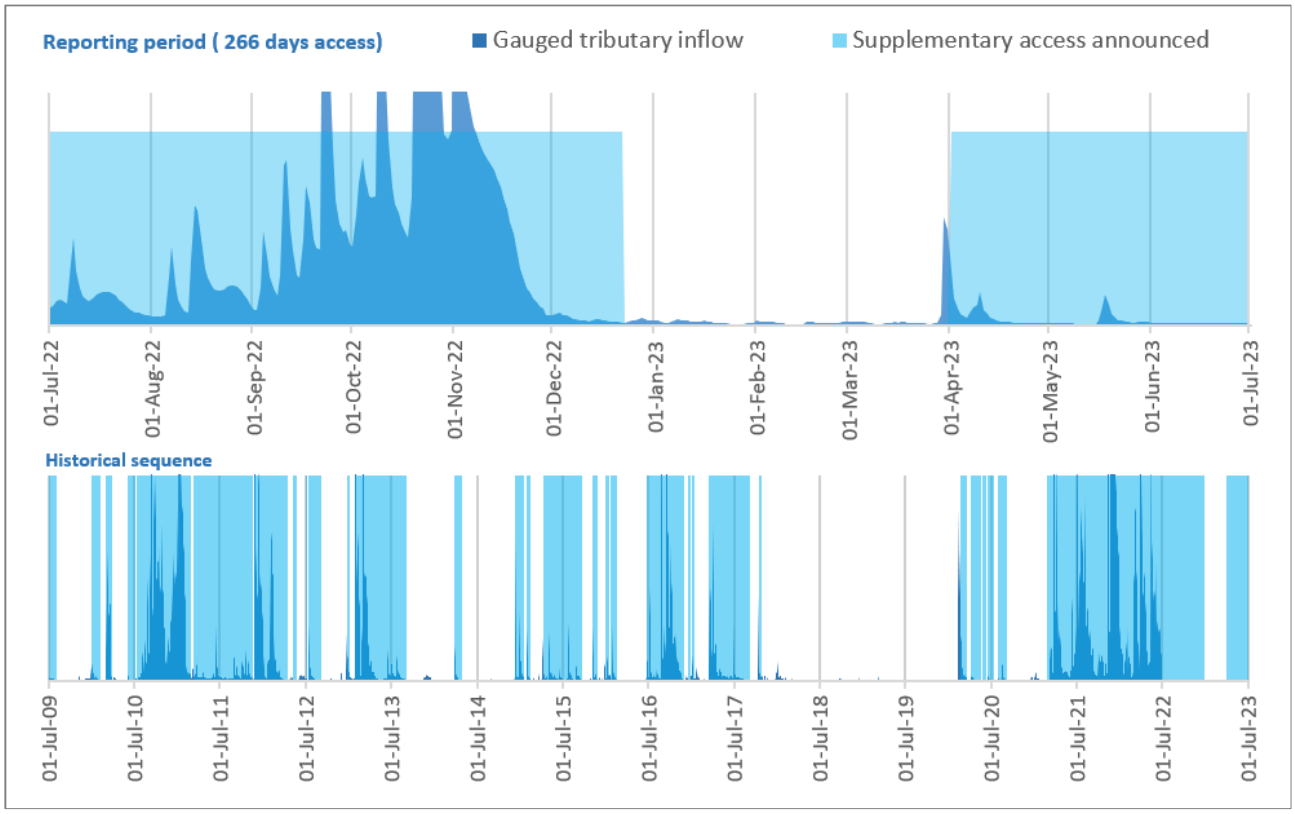
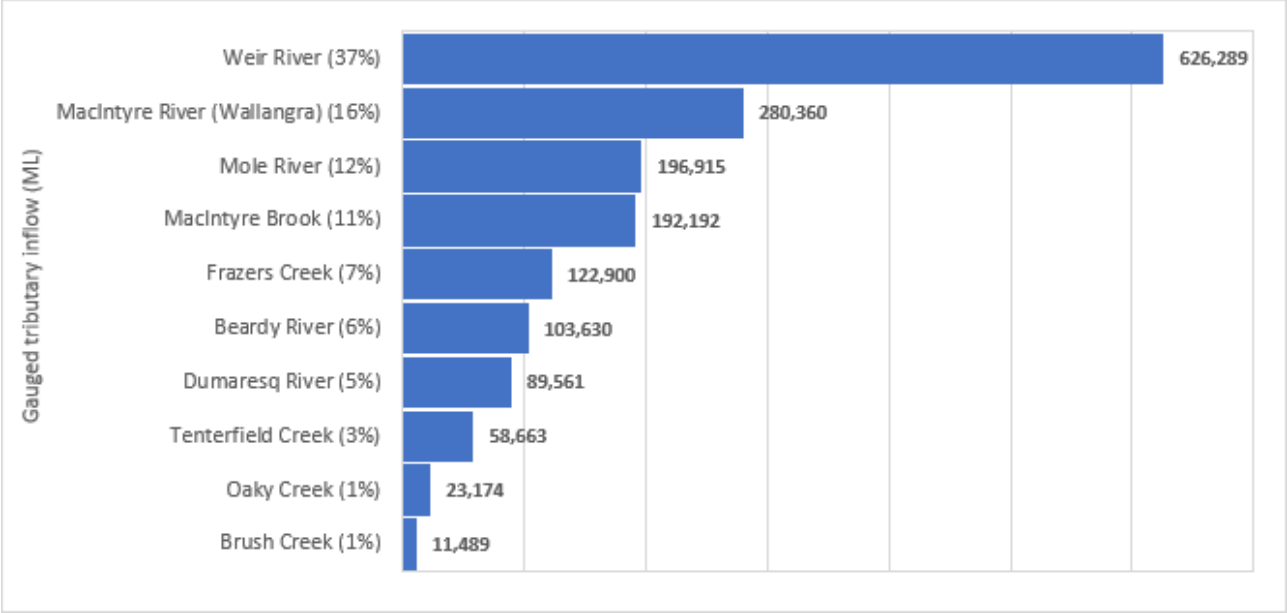


Figure 28: Measured tributary inflow contributions

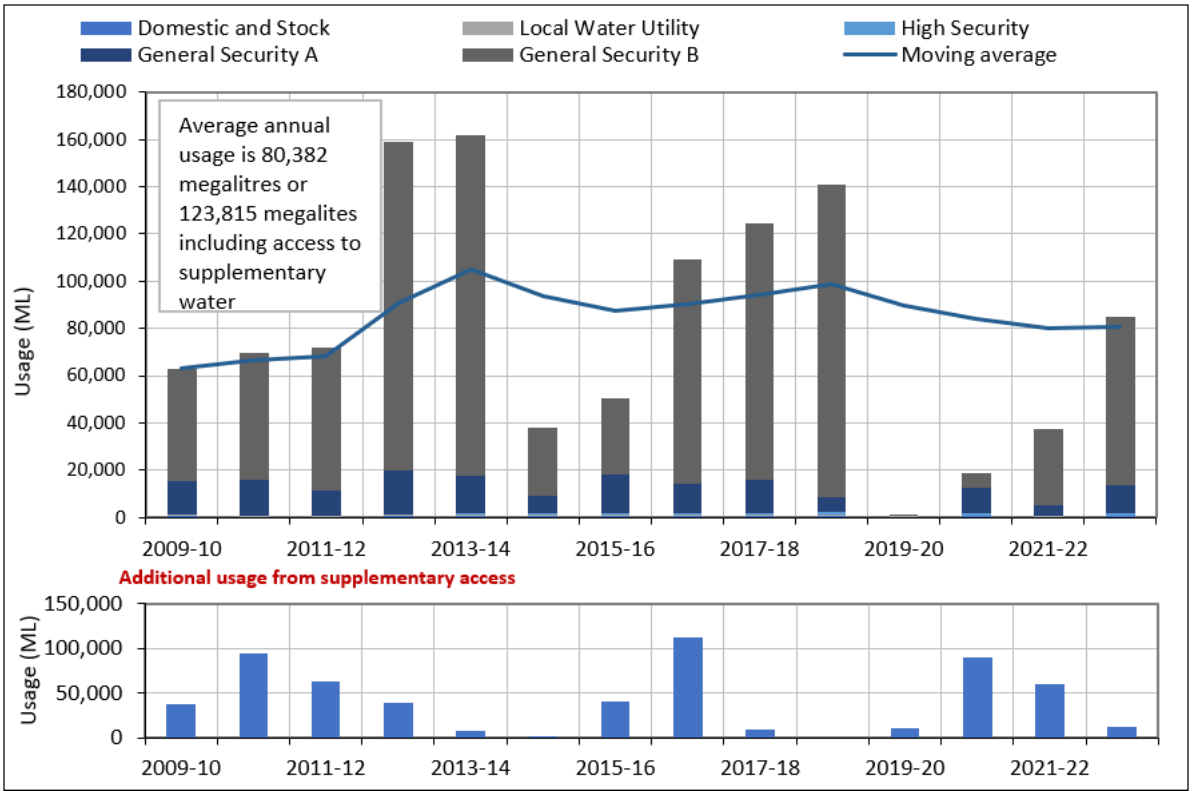


Account usage

Account usage refers to the total volume of water debited against an access licence.

- Total account usage (including supplementary) was higher than the previous 3 reporting periods. However, the total account usage was only slightly above average when compared to all years.
- The total account usage from the regulated supply totalled 84,927 megalitres for the reporting period (Figure 29). In addition, 11,457 megalitres was accessed by supplementary access licence holders. Average annual usage under water sharing plan management sits at 80,706 megalitres per year or 121,855 megalitres per year including supplementary supply (Figure 29).

Figure 29: Total usage since the commencement of the water sharing plan against entitlement



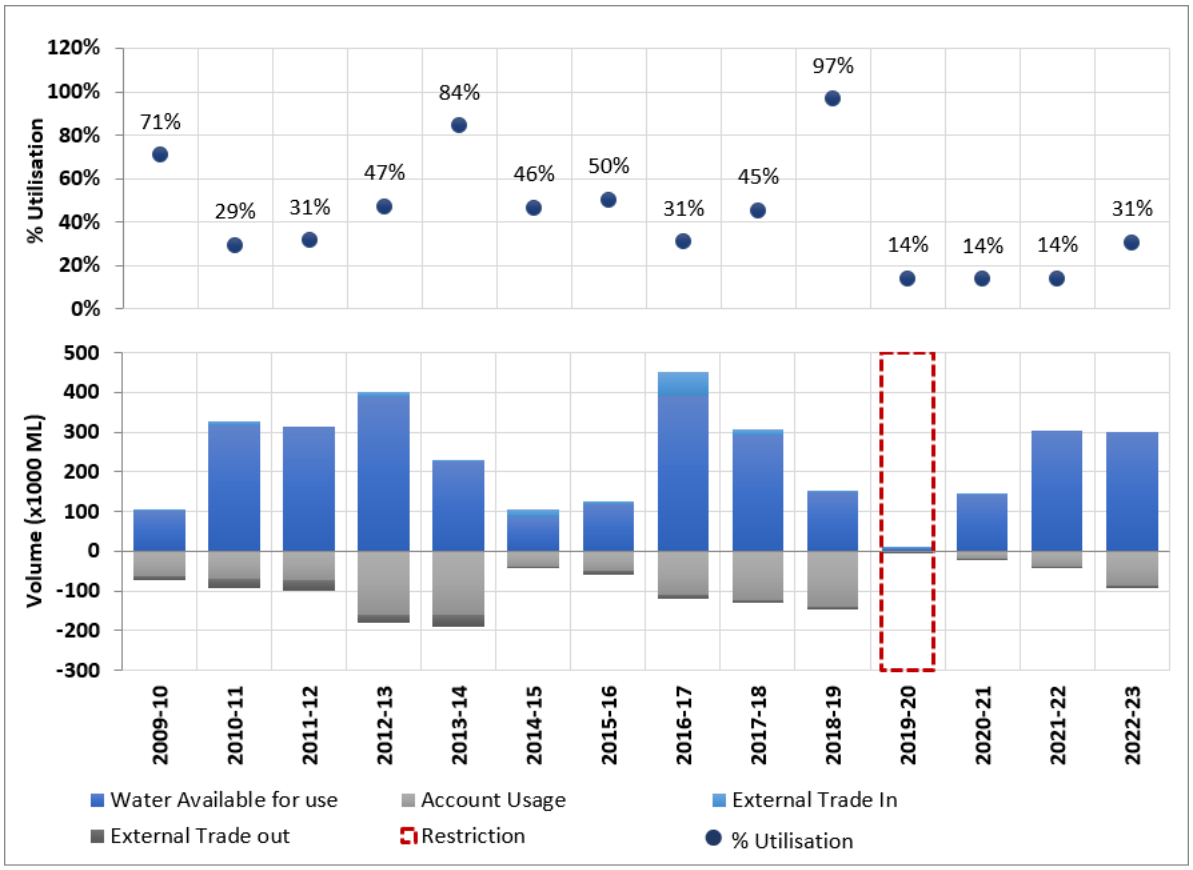
Utilisation and inactive share

We consider an access licence entitlement inactive if the holding does not use water or access the temporary trade market for the reporting period. Utilisation reflects the amount of water used from regulated supplies (excludes supplementary water), relative to the maximum amount available for use.

- The percentage of inactive licences during the reporting period decreased substantially from the previous reporting period as requirement to order water increased due to an average climatic season (Table 6).
- 8% of General Security A share component was inactive for the reporting period, 70% lower than the prior reporting.
- 9% of General Security B share component was inactive for the reporting period, 18% lower than prior reporting period.

- 5% of supplementary share component was inactive for the reporting period, 2% lower than prior reporting period.
- Considering all categories of access licence, 8% were inactive for the reporting period, compared to 32% in the prior reporting period (decreased activity).
- Utilisation of available water from regulated supplies (excludes supplementary) increased to 31% from 14% (Figure 30).

Figure 30: Percentage use of NSW allocation (water availability against account usage and trade out to Qld)[7].



[7] Usage of supplementary water or QLD allocation taken in NSW is not considered in this analysis

Table 6: NSW Border Rivers inactive licences summary

Licence Category	Inactive Licences (number)	Inactive Share Component	Inactive Share Component % of total	Inactive Share Component % of total prior year 2021_22
DOMESTIC AND STOCK	20	298	35%	55%
DOMESTIC AND STOCK [DOMESTIC]	12	48	94%	100%
DOMESTIC AND STOCK [STOCK]	10	65	65%	95%
LOCAL WATER UTILITY	1	20	3%	3%
REGULATED RIVER (GENERAL SECURITY A)	35	1,782	8%	79%
REGULATED RIVER (GENERAL SECURITY B)	41	22,623	9%	27%
REGULATED RIVER (HIGH SECURITY)	1	-	0%	86%
SUPPLEMENTARY WATER	64	5,831	5%	7%
Grand Total	184	30,667	8%	32%

Temporary trading

Important note: This water accounting report is produced from the perspective of water balances, usages and temporary trades associated with NSW water access licences. Additional activities such as transfer of water between permanently linked works from QLD to NSW, and temporary interstate trading implemented under the Border River Intergovernmental agreement from QLD to NSW whereby trade is held in and delivered from temporary holding accounts has not been considered[8].

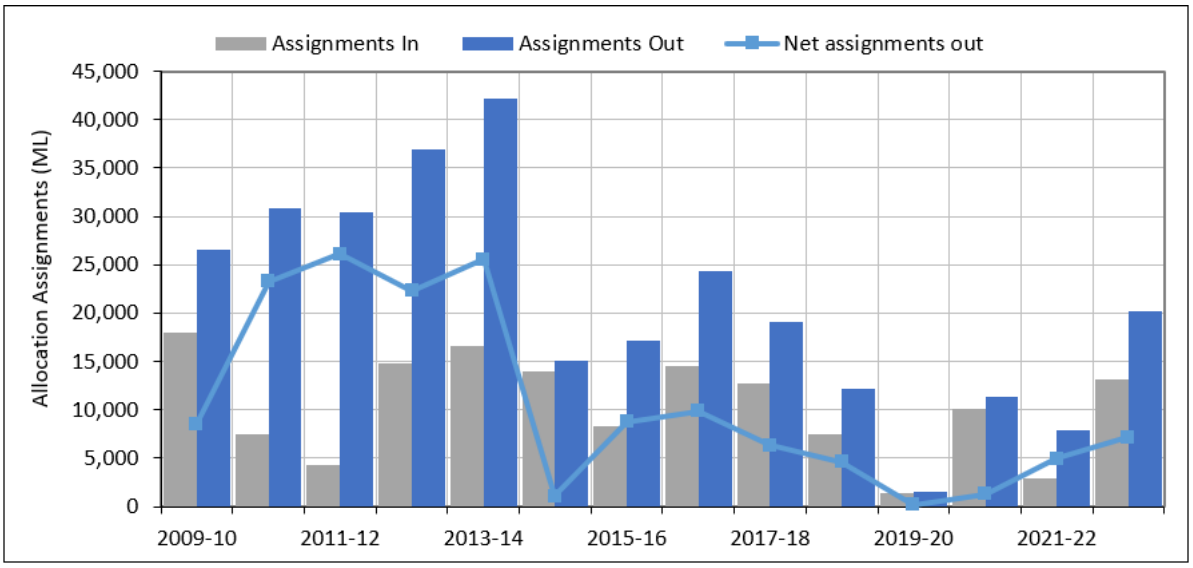
Temporary trading is implemented in this water source under the clause 71T (assignment of water allocations between access licences) and 71V (interstate assignment of water allocations) of the *Water Management Act 2000*.

For the reporting period:

- a total of 18,270 megalitres was traded into NSW access licences.
- a total of 25,422 megalitres was traded from NSW access licences, resulting in a net trade out of the water source (to Queensland) of 7,152 megalitres (Figure 31).
- trade volumes were 100% higher than the prior reporting period.

[8] For reference purposes a total of zero megalitres regulated supply was traded from Qld to NSW, and 129 megalitres of non-regulated supply (equivalent to supplementary access). Of the water traded, all was used. The usage forms no part of the accounting process against NSW access licences. A historical summary of these historical trade movements between NSW and QLD under the state of origin accounting principle is provided in Note 5

Figure 31: Net trade out of the NSW Border Rivers (excluding supplementary)



Commercial-based statistics

Excluding supplementary water, and considering *only* those assignments processed for commercial purposes (assumed as trades greater than $1 per megalitre for this purpose of this GPWAR):

- 56 transactions were processed, moving a total of 6,882 megalitres between accounts for a commercial value of $741,427
- the average consideration for the reporting period was $128 per megalitre, a 111% increase on the prior period.
- the maximum consideration for temporary water was $200 per megalitre (Figure 32).

Figure 32: NSW Border Rivers allocation assignments trade market price statistics

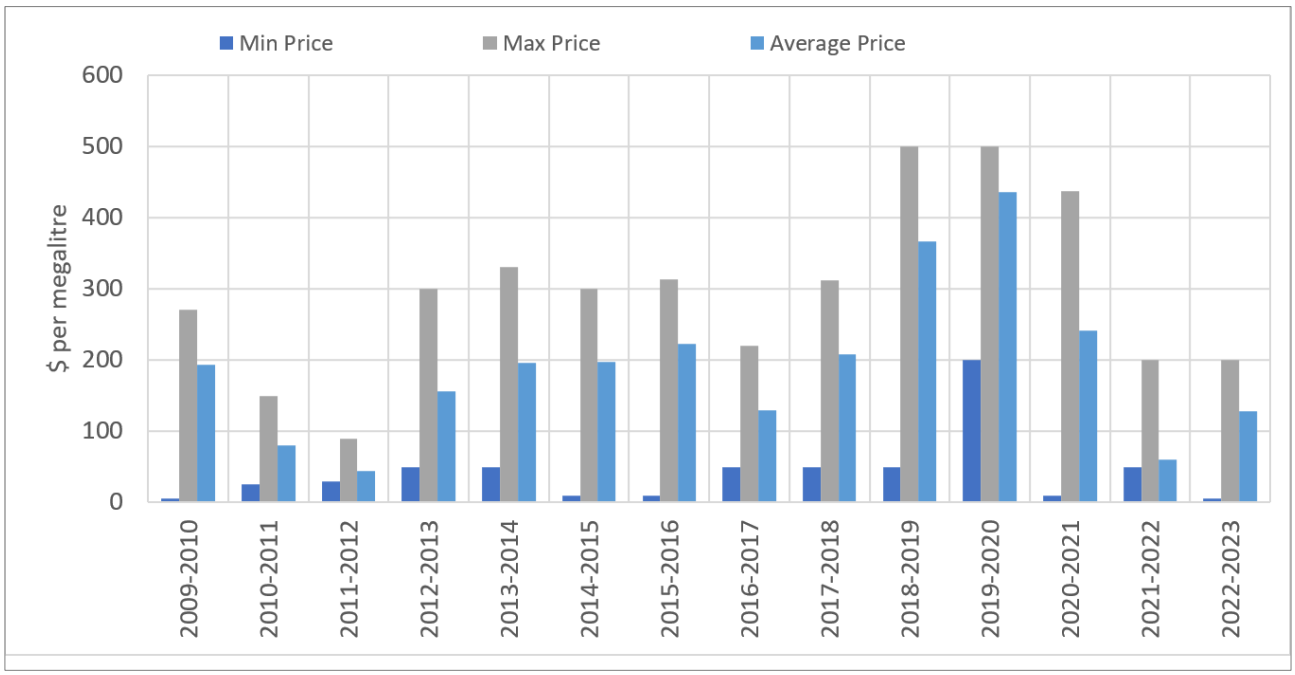
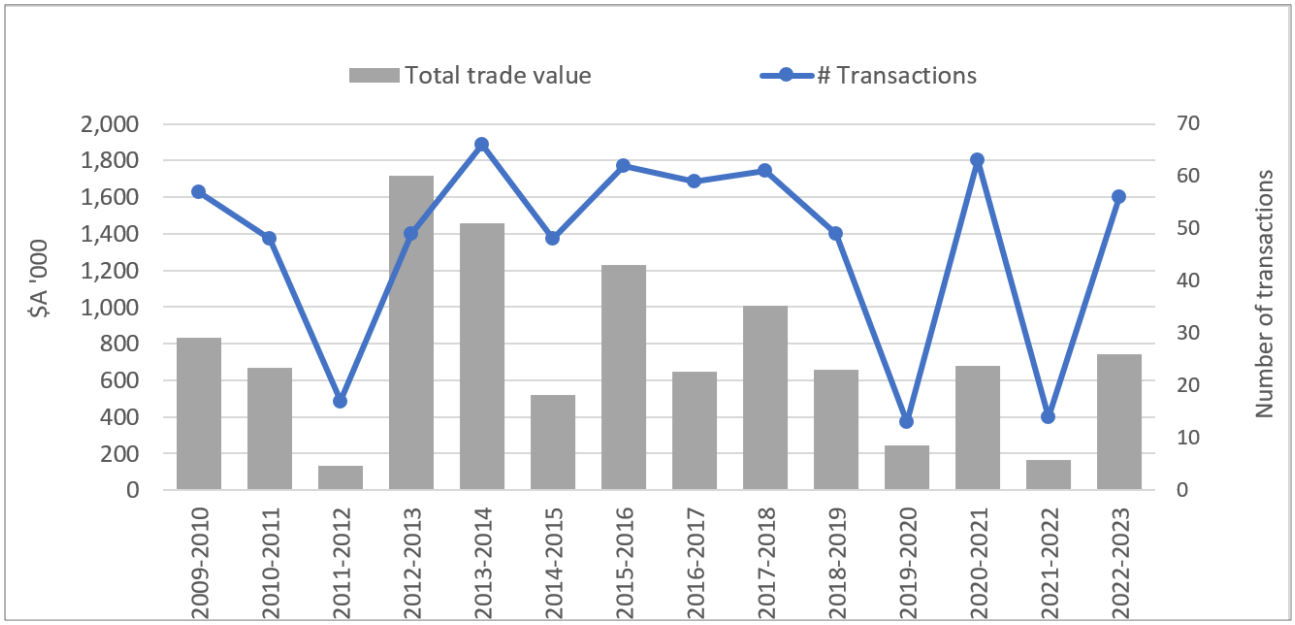


Figure 33: NSW Border Rivers allocation assignments trade value market statistics



Permanent trading

Commercial-based statistics

Division 4 (dealings with access licences) of the *Water Management Act 2000* allows for a range of dealing options that permanently affect the title of the water access licence. Two of the more common dealing practises under this division are assignments of rights under access licences (clause 71Q) and transfer of access licences (clause 71M). With consideration to these dealing types:

- The average price for general security was $5,625
- The maximum price was $5,750
- The total trade value for the reporting period was $145,500 with a total of 2 transaction for the reporting period).
- Historical assignment of shares are in the tables below, General Security A (Table 7), General Security B (Table 8) and Supplementary (Table 9)

In addition to share assignments, a total 24,560 shares (all categories of licence considered) were subject to a change of holder for commercial purposes through 11 transactions (Figure 34). Note that reliable pricing information for change of holder dealings is unavailable as often the sale is bundled with a purchase of land and/or a number of different licence categories. A breakdown for each licence class is shown in

Table 10.

Table 7: Permanent assignments of share statistics General Security A access licences

Water year	Number	Total share	Average price ($/share)	Sum of value ($)	Volume weighted average ($/share)
2010–11	0	0	N/A	0	N/A
2011–12	2	55	3,500	192,500	3,500
2012–13	2	120	3,125	375,000	3,125

Water year	Number	Total share	Average price ($/share)	Sum of value ($)	Volume weighted average ($/share)
2013–14	0	0	N/A	0	N/A
2014–15	3	123	3,278	418,000	3,398
2015–16	1	90	3,000	270,000	3,000
2016–17	2	40	3,275	131,500	3,288
2017–18	1	51	3,850	196,350	3,850
2018–19	0	0	N/A	0	N/A
2019–20	1	24	5,000	120,000	5,000
2020–21	0	0	N/A	0	N/A
2021–22	0	0	N/A	0	N/A
2022-23	2	27	5,625	145,500	5,750

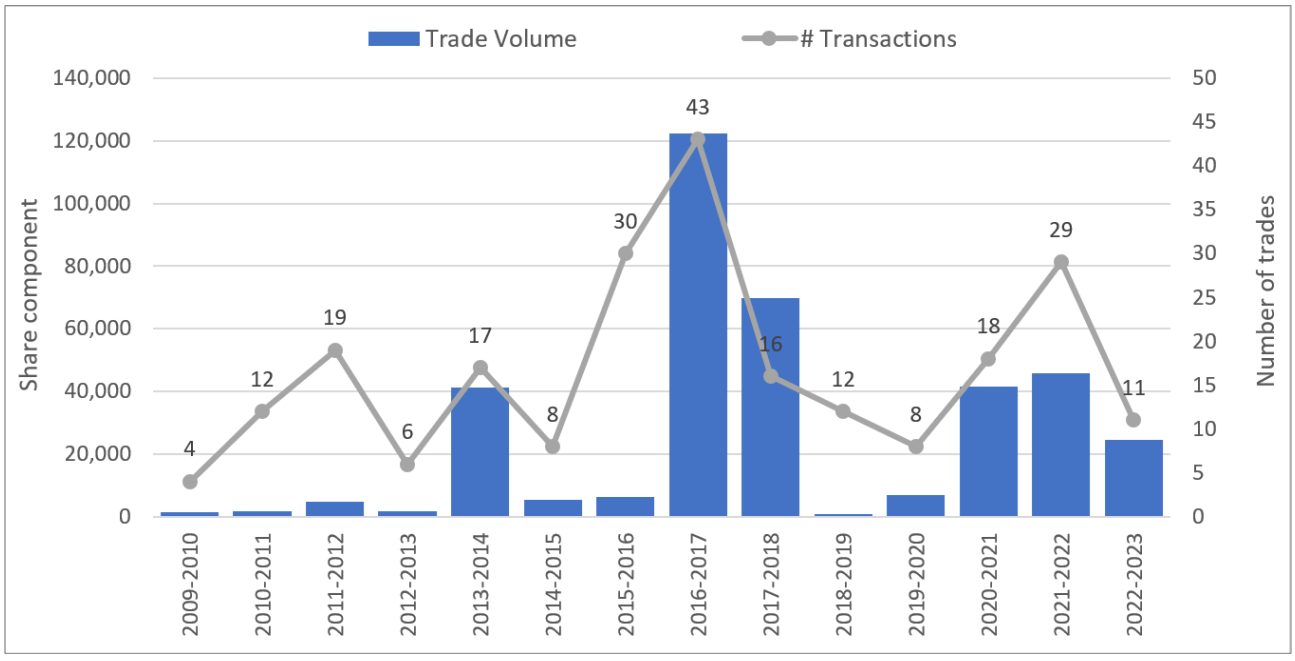
Table 8: Permanent assignments of share statistics General Security B access licences

Water year	Number	Total share	Average price ($/share)	Sum of value ($)	Volume weighted average ($/share)
2010–11	3	269	1,950	524,550	1,950
2011–12	1	5,500	1,859	10,225,050	1,859
2012–13	1	39	1,950	76,050	1,950
2013–14	0	0	N/A	0	N/A
2014–15	1	912	1,809	1,649,808	1,809
2015–16	3	1,635	2,720	3,382,908	2,069
2016–17	1	99	2,000	198,000	2,000
2017–18	3	1,378	2,036	2,862,014	2,077
2018–19	0	0	N/A	0	N/A
2019–20	0	0	N/A	0	N/A
2020–21	0	0	N/A	0	N/A
2021–22	0	0	N/A	0	N/A
2022–23	0	0	N/A	0	N/A

Table 9: Permanent assignments of share statistics supplementary access licences

Water year	Number	Total share	Average price ($/share)	Sum of value ($)	Volume weighted average ($/share)
2010–11	0	0	N/A	0	N/A
2011–12	2	77	1,800	123,400	1,603
2012–13	1	27	800	21,600	800
2013–14	2	469	1,000	469,000	1,000
2014–15	1	440	1,000	440,000	1,000
2015–16	3	724	1,000	724,000	1,000
2016–17	3	931	975	914,500	982
2017–18	3	422	1,200	545,300	1,292
2018–19	0	0	N/A	0	N/A
2019–20	0	0	N/A	0	N/A
2020–21	0	0	N/A	0	N/A
2021–22	0	0	N/A	0	N/A
2022–23	0	0	N/A	0	N/A

Figure 34: NSW Border Rivers transfer of access licence holder[9]



[9] Only includes transactions where the total consideration of the dealing exceeds $1 per share. All licence categories are included

Table 10: Change of licence holder for commercial purposes by licence category

Licence category	Shares transferred	Number of transactions
General Security A	1,043	3
General Security B	15,907	4
High Security		0
Domestic and Stock		0
Supplementary Water	8,420	4
Total	**24,560**	**11**

Tagged work arrangements

NSW access licences may choose to tag an extraction work in QLD to the holding. Commonly the establishment of this arrangement is known as a tagged trade. Volumes utilised under these arrangements are combined with the use from interstate allocation assignments to determine the total volume of NSW allocation extracted in QLD.

- There were no new tags established during the reporting period.
- 6,805 megalitres was extracted in QLD through linked works during the reporting period
- With allocation assignments moved to QLD for extraction, the total physical extraction of NSW allocation in QLD was 13,957 megalitres (Table 11).

Table 11: Physical extractions of NSW allocation in QLD

Licence category	Volume (ML)
General Security A	933
General Security B	2975
High Security	650
Supplementary Water	2,247
Total	**6,805**
Allocation moved to QLD via temporary trading	*7,152*
Total NSW allocation extracted in QLD	**13,957**

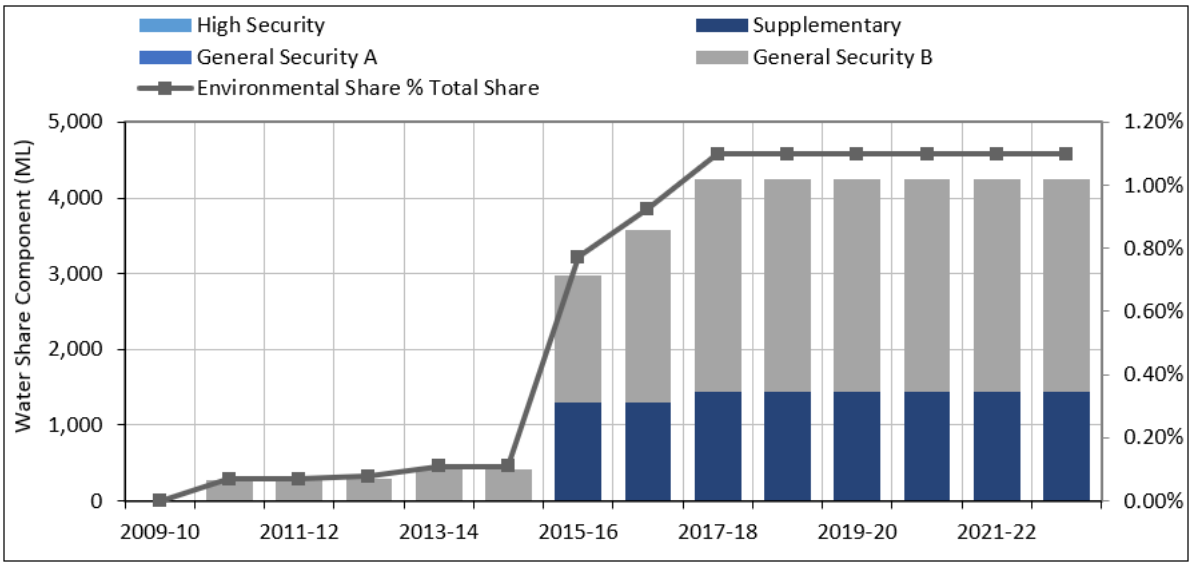
Environmental water

Held environmental water

Held environmental water refers to access licences that are managed for the purpose of sustaining and improving environmental outcomes within the system.

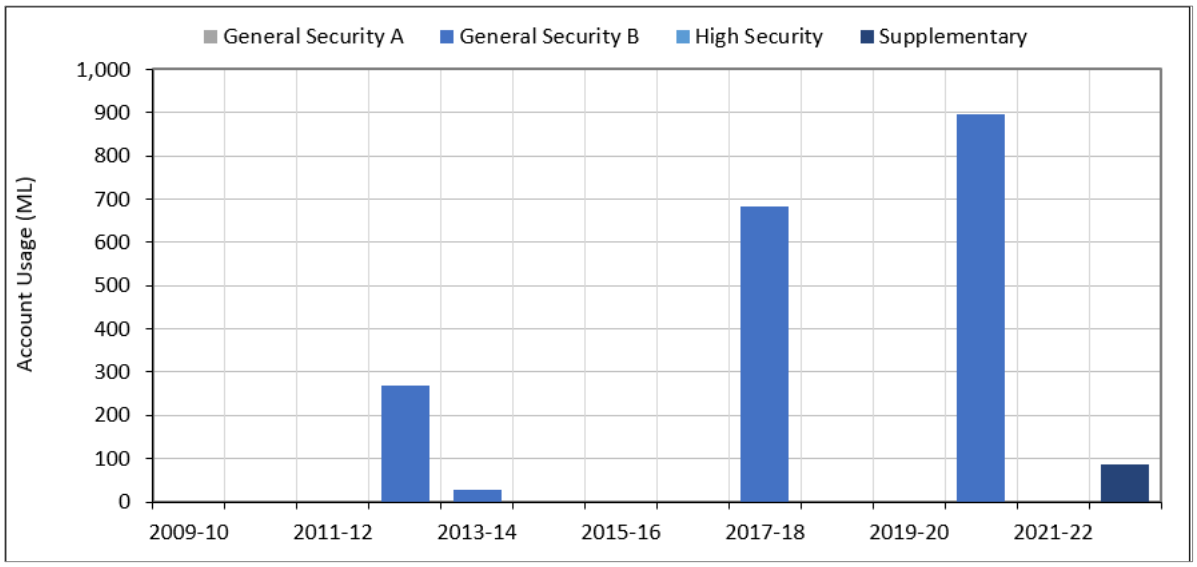
- Held environmental water volume did not change in the reporting period.
- A total of 2,806 General Security B shares and 1,437 supplementary shares were held and managed for environmental purposes as of 30 June 2023, which represents 1.1% of total share issued in the NSW Border Rivers (Figure 35).
- 86 ML of supplementary water use occurred in the reporting period (Figure 36).
- More information about held environmental water is available in Note 7 of this GPWAR.

Figure 35: Held environmental water share component in the NSW Border Rivers[10]



[10] A licence with zero share component in General Security A and High Security has been held since 2010–11

Figure 36: Held environmental usage



Planned environmental water

Planned environmental water refers to a range of environmental allowances and provisions that are implemented under the water sharing plan to improve environmental outcomes.

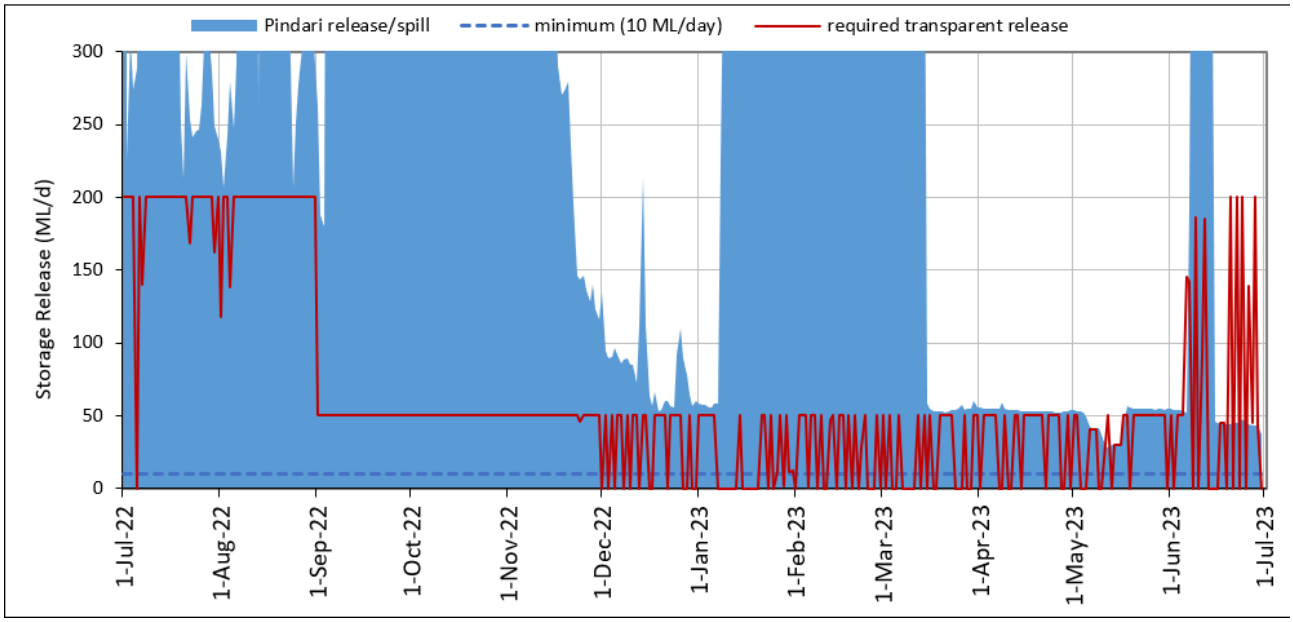
The stimulus flow trigger for the 2022-23 water year was met but there was no stimulus release made from Pindari Dam during the reporting period. This was due to the 2022-23 water year being one of the wettest years on record and the river system was flowing from downstream tributary flows, particularly during the first half of the water year. A full account summary of the environmental stimulus account is in Note 8 of this GPWAR.

Minimum flow requirements from Pindari dam (10 megalitres per day) were delivered during the reporting period. Transparent releases are considered met throughout the reporting period.

The Pindari actual releases and the water sharing plan targets for minimum and transparent releases are illustrated in Figure 37. Any days that showed transparent releases not being met were data anomalies due to storage gauge fluctuations.

Further information on storage releases and transparent releases is provided in Note 19.

Figure 37: Pindari releases against water sharing plan transparent and minimum flow requirements[11]



Replenishment flows

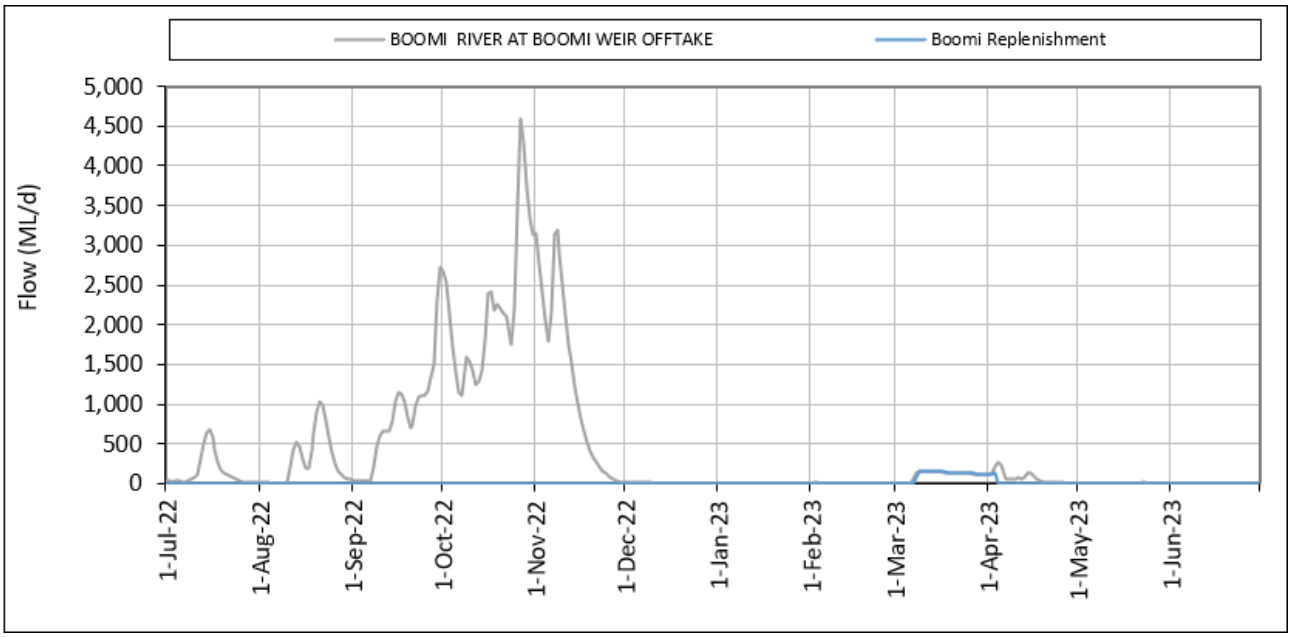
As required, up to 2 replenishment events are to be supplied to the Boomi River each year. The annual replenishment should not exceed a combined total of 10,000 megalitres.

- 1 release was made from Pindari Dam to deliver a replenishment flow during 2022 -23. An estimated 3600 megalitres was delivered between 8 March 2023 and 3rd of April 2023. In addition to that release flow was diverted to the Boomi River in line with the New South Wales – Queensland Border Rivers Intergovernmental Agreement 2008 (IGA) conditions from downstream tributary flows (Figure 38).
- The total flow recorded at the Boomi River off take for the 2022–23 water year, including replenishment flow, natural flow and water diverted under Intergovernmental agreement rules[12], was 150,049 megalitres.

[11] Releases obtained from the operations spreadsheet being used to assess release requirements, which use provisional information for the 24 hours to 9 am. All other storage releases in this GPWAR for Pindari use the downstream storage gauge, midnight to midnight release.

[12] dnrm.qld.gov.au/ data/assets/pdf file/0006/105963/intergovernment-agreement.pdf

Figure 38: Boomi River flows and replenishment



Water accounting statements

Significant water accounting policies

We have used an accrual accounting basis for the water accounting statements in this GPWAR. All figures are in megalitres (ML).

The 'Statement of Physical Flows' specified under the AWAS 1 has been excluded from this GPWAR, as all transactions have been presented in the statements 'Water Assets and Liabilities' and 'Changes in Water Assets and Water Liabilities'.

We have included a 'Physical Flow Diagram' that represents the physical movements of water to provide a clearer picture of this process.

For generic information on how to interpret the NSW Department Climate Change, Energy, the Environment and Water GPWAR statements, refer to the *Guide to General Purpose Water Accounting Reports* available for download from NSW Department Climate Change, Energy, the Environment and Water website (https://www.nsw.gov.au/departments-and-agencies/dcceew).

Quantification of data

Data accuracy

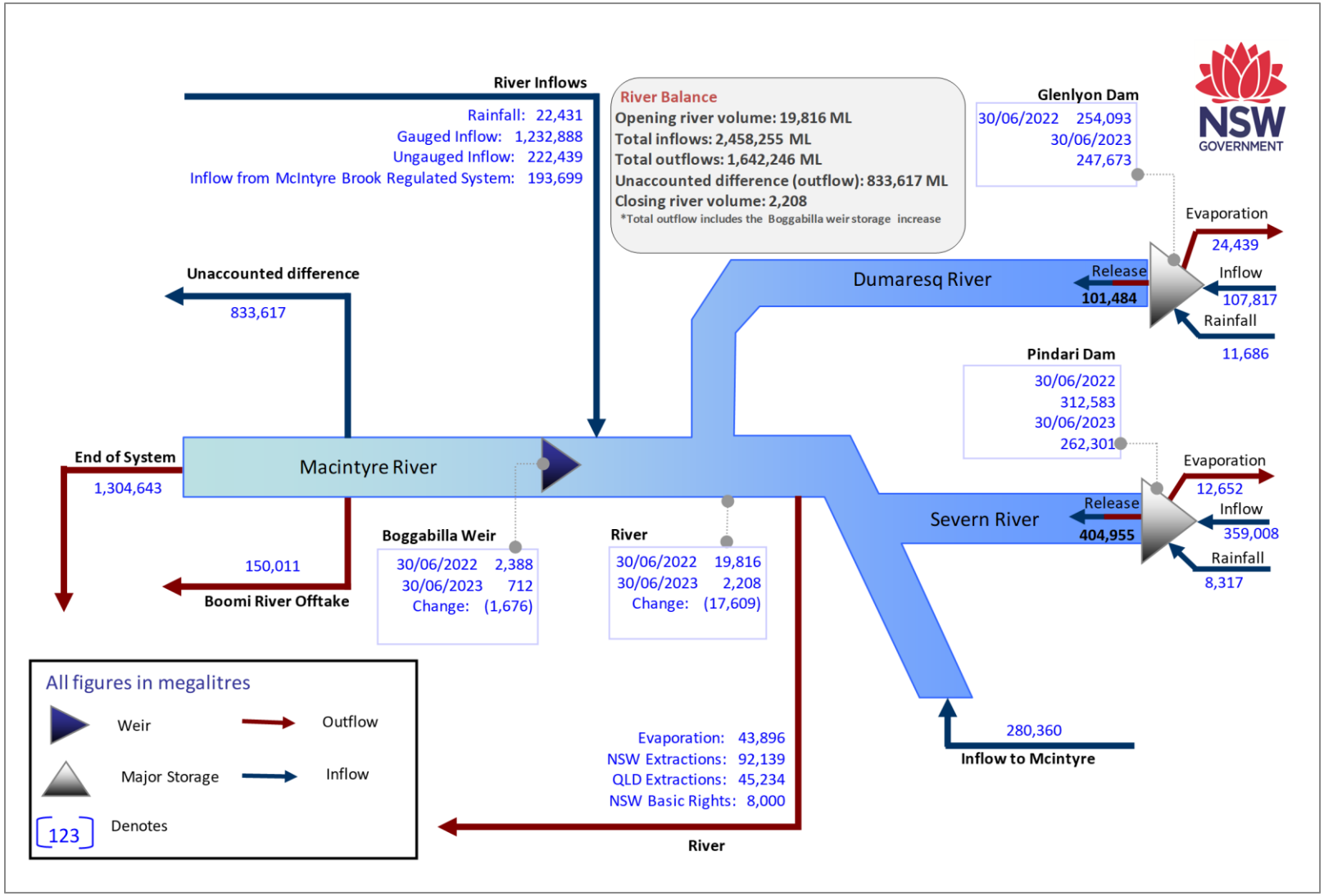
The data used to account for water movement and management in the reporting entity has been obtained from a variety of sources and systems. The data ranges from observed values we anticipate high accuracy through to modelled results and estimates where accuracy can be highly variable, depending on a range of factors. To improve accuracy and prevent misuse of the data in the accounts, we have added an accuracy assessment to all figures in the water accounting statements (Table 12).

Table 12: Water account data accuracy estimates key

Accuracy	Description
A1[13]	± 0% Data is determined rather than estimated or measured. Therefore, the number contains no inaccuracies.
A	± 10%
B	± 25%
C	± 50%
D	± 100%

[13] Non-physical administration items, such as available water determinations, trading and carryover volumes, are assumed to have no inherent error for the purposes of this report. Items are reported as extracted from the NSW Department Climate Change, Energy, the Environment and Water corporate database.

2022–23 Physical flows mass balance diagram



Statement of water assets and liabilities

For the year ended 30 June 2023

In all tables (..) denotes a negative value.

Surface water assets

1. Surface water storage	Accuracy	Notes	30-06-2023	30-06-2022
Glenlyon Dam	A	10	247,673	254,093
Pindari Dam	A	10	262,301	312,583
Boggabilla Weir	A	10	712	2,388
River	B	11	1,776	19,385
Total surface water storage (Asws)	-	-	512,462	588,449
Change in surface water storage	-	-	(75,987)	**230,116**

Surface water liabilities

2. Allocation account balance	Accuracy	Notes	30-06-2023	30-06-2022
Domestic and stock	A1	1	0	0
Domestic and Stock[Domestic]	A1	1	0	0
Domestic and Stock[Stock]	A1	1	(5)	(5)
Regulated River (General Security A)	A1	1	1,685	19,777
Regulated River (General Security B)	A1	1	203,747	240,321
Regulated River (High Security)	A1	1	0	0
Local Water Utility	-	-	(76)	0
Total allocation account balance (Lsws)	-	-	205,351	260,093
Change in allocation account balance	-	-	**(54,742)**	**136,958**

3. Environmental stimulus flow account balance	Accuracy	Notes	30-06-2023	30-06-2022
Stimulus flow account (Lesf)	A1	8	**4,000**	4,000
Change in environmental stimulus flow account balance	-	-	**4,000**	400

Net surface water assets

4. Net changes	30-06-2023	30-06-2022
Net surface water assets (Asws – Lsws – Lesf)	**303,111**	**324,356**
Change in net surface water assets	**(21,245)**	**92,757**

Statement of changes in water assets and liabilities

1 July 2022 to 30 June 2023

In all tables (..) denotes a negative value.

1. Changes in surface water storage (physical water balance)

Surface water storage increases	Accuracy	Notes	2022–23	2021–22
Glenlyon Dam	-	-	-	-
Inflow	A	12	107,817	424,696
Rainfall	B	13	11,686	17,073
Pindari Dam	-	-		-
Inflow	A	12	359,008	655,571
Rainfall	B	13	8,317	10,746
River	-	-		-
Rainfall	B	14	22,431	35,386
Gauged inflow	A	15	1,706,947	3,791,788
Ungauged inflow	C	16	222,439	1,313,000
Inflow other	B	-		-
Inflow from storage releases	A	19	506,439	831,128
Total surface water storage increases (Isws)	-	-	**2,945,083**	**7,079,388**

Surface water decreases	Accuracy	Notes	2022–23	2021–22
Glenlyon Dam	-	-	-	-
Releases	A	19	24,439	22,094
Evaporation	B	13	101,484	307,299
Pindari Dam	-	-	-	-
Evaporation	B	13	**12,652**	12,761
Releases (other)	A	19	**404,955**	523,829
River	-	-	-	-
Evaporation	C	14	43,896	50,855
Flows leaving system	A	17	1,454,655	2,701,569
Basic landholder rights extractions	C	6	**8,000**	8,000
Licenced extractions in NSW	A	18	92,139	90,747
Licenced extractions in QLD	A	20	45,234	71,260
Total surface water storage decreases (Dsws)	-	-	2,179,452	3,788,415
Unaccounted difference (balancing item) (Usws)	D	22	833,617	3,060,858

Net surface water storage changes	30-06-2023	30-06-2022
Net surface water storage inflow (Isws-Dsws-Usws)	**(75,987)**	**230,116**

2. Changes in claims to water

Allocation account increases	Accuracy	Notes	30-06-2023	30-06-2022
Available water determinations	-	-	-	-
Domestic and Stock	A1	2	850	850

Allocation account increases	Accuracy	Notes	30-06-2023	30-06-2022
Domestic and Stock [Domestic]	A1	2	51	51
Domestic and Stock [Stock]	A1	2	100	100
Regulated River (General Security A)	A1	2	2,230	19,978
Regulated River (General Security B)	A1	2	36,028	158,990
Regulated River (High Security)	A1	2	1,500	1,500
Local Water Utility	A1	2	640	640
New licences	A1	1	**0**	0
Allocation assignments —buyers	A	5	13,116	2,906
Supplementary water (demand)[14]	A1	21	11,457	59,745
Total allocation increases (Iaa)	-	-	**65,972**	244,760

Allocation account decreases	Accuracy	Notes	30-06-2023	30-06-2022
Account usage	-	-	-	-
Domestic and Stock	A1	3	469	292
Domestic and Stock [Domestic]	A1	3	3	0
Domestic and Stock [Stock]	A1	3	30	0
Regulated River (General Security A)	A1	3	11,865	4,440
Regulated River (General Security B)	A1	3	71,456	32,532
Regulated River (High Security)	A1	3	784	0
Local Water Utility	A1	3	320	271
Supplementary Water	A1	3	11,457	59,745
Account forfeiture	-	-	-	-
Domestic and Stock	A1	1	373	558
Domestic and Stock [Domestic]	A1	1	48	51
Domestic and Stock [Stock]	A1	1	70	99
Regulated River (General Security A)	A1	1	26	0
Regulated River (General Security B)	A1	1	0	1
Regulated River (High Security)	A1	1	48	1,295
Local Water Utility	A1	1	397	370
Water ordering debiting (orders > usage)	-	-	-	-
Domestic and Stock	A1	4	9	0
Domestic and Stock (Stock)	A1	4	0	0
Domestic and Stock (Domestic)	A1	4	0	0
Regulated River (General Security A)	A1	4	126	0
Regulated River (General Security B)	A1	4	2,965	312
Regulated River (High Security)	A1	4	1	0
Licences cancelled	-	-	-	-
Domestic And Stock	A1	1	0	0
Domestic And Stock (Domestic)	A1	1	0	0
Domestic And Stock (Stock)	A1	1	0	0

[14] Only usage is disclosed for supplementary holdings in the water accounting statements due to the opportunistic nature of the water right. Full account balances for supplementary may be obtained in Note 1 of the GPWAR.

Allocation account decreases	Accuracy	Notes	30-06-2023	30-06-2022
General Security A	A1	1	0	0
General Security B	A1	1	0	0
High Security	A1	1	0	0
Local Water Utility	A1	1	0	0
Allocation assignments —sellers	A1	5	20,268	7,837
Total allocation account decreases (Daa)	-	-	**120,713**	**107,801**

Net change in allocation accounts	30-06-2023	30-06-2022
Net allocation account balance increase (Iaa – Daa)	**(54,742)**	**136,958**

3. Change in environmental stimulus flow account balance

Increases	Accuracy	Notes	30-06-2023	30-06-2022
Account increases	A1	8	4,000	4,000
Adjusting increases to water liabilities (PEW)	A1		0	0
Total PEW account increases (Ieca)			4,000	4,000

Decreases	Accuracy	Notes	30-06-2023	30-06-2022
Account usage	A1	8	0	0
Other account decreases	A1	8	4,000	3,600
Adjusting decreases to water liabilities (PEW)	A1			
Total PEW account decreases (Deca)			4,000	3,600
Net Environmental Contingency Allowance increase (Ieca - Deca)			0	400

4. Overall changes

Change in Net Surface Water Assets (Isws-Dsws-Usws_Iaa+Daa+Ieca+Deca			**(21,245)**	**92,757**

Note disclosures

Reconciliations and future prospects

This section contains reconciliation and future prospects for the regulated Border Rivers water source.

Reconciliation of change in net water asset to net change in physical water storage	2022–23 ML	2021–22 ML
Change in net surface water assets	92,757	157,921
Non-physical adjustments	-	-
plus net increase in allocation accounts	136,958	117,468
plus net change in environmental stimulus account	400	(400)
Net change in physical surface water storage	230,116	274,989

Reconciliation of closing water storage to total surface water assets	30 June 2023 ML	30 June 2022 ML
Closing water storage	-	-
Glenlyon	247,673	254,093
Pindari	262,301	312,583
Boggabilla Weir	712	2,388
River	2,208	19,385
Total surface water assets	512,894	588,449
Less Glenlyon QLD water share	(106,499)	(108,490)
Volume remaining to settle current NSW commitments and future demand	406,395	479,959

Water assets available to settle water liabilities and future commitments within 12 months of reporting date

Final datasets for reporting in the GPWAR, including meter readings by field staff were not available in time to produce an informative 12-month forecast for report users.

In lieu of this, the links below give the latest water availability information for the NSW Border Rivers. This includes carryovers and available water determinations at the time of reporting, along with probability information about the Border Rivers system's reliability.

Latest water availability

You can find the latest information on water availability, including water allocation statements, water allocations summaries on the NSW Department Climate Change, Energy, the Environment and Water webpage at Allocations | Water (nsw.gov.au)

You can also subscribe to receive the latest updates.

Latest storage volumes

See real-time information on storage volumes in the Border Rivers at realtimedata.waternsw.com.au

Significant events since 2022–23

- The start of 2023-24 as seen below average rainfall. As of January 2024, Pindari and Glenlyon Dams are at 54.5% and 65.3% of full supply capacity, respectively.
- Domestic and Stock, Local Water Utilities and High Security licence categories, were give an AWD of 100% or 1.0 megalitre per share on 1 July 2023.General security A received an AWD of 0.06 megalitres per share on 1 July 2023 with an increase of 0.94 megalitres per share on 21 July 2023. General security B was given and AWD of 0.19 megalitres per share on the 21 July 2023.

System reliability analysis

Long-term planning model (IQQM) reflecting a water sharing plan management scenario in the NSW Border Rivers provides indicative system reliability information for the start and closure of a watering season[15].

In a given year, the simulation indicates High Security entitlements are likely to have full allocation maintained 100% of the time. General Security A holders have a slightly lower reliability, with opening water availability at maximum levels 95% of the time (Figure 39). By the end of the water year, reliability for General Security A holders is rarely below 100% (Figure 40).

The lower security licence category of General Security B is subject to much higher variation in reliability. At the start of a water year, simulation results indicate availabilities in exceedance of 67% of issued entitlement for 50% of the time and exceeding 100% for 24% of the time (Figure 41).

Throughout the water year, reliability significantly improves for General Security B holders. While account holders have a holding limit of one megalitre per share, the continuous accounting approach in the Border Rivers allows for usage from General Security B holder accounts to be topped up as resources become available in storage. The effective water availability (calculated as carryover plus available water determination volumes or total water placed in accounts) for this category can therefore exceed 100% of issued entitlement throughout the year. Under the demand simulation of the long-term planning model, General Security B holders exceed 100%, 55% of the time (Figure 42).

[15] The IQQM model simulation uses a water year of October to September. Simulation period one October 1890 to 30 September 2015. As model's are continually revised to reflect changes in water management rules, and improved understanding of system behaviour (data), information is guiding only and may not reflect the latest modelling information available.

Figure 39: Start of water year simulated availability for General Security A and High Security licences

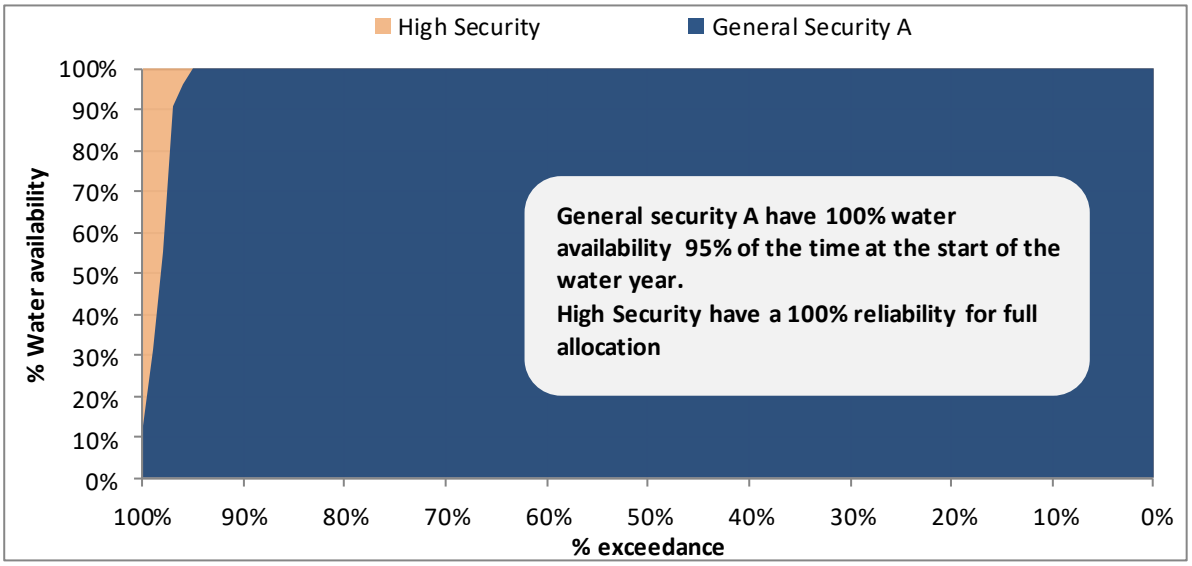


Figure 40: End of water year simulated availability for General Security A and High Security licences

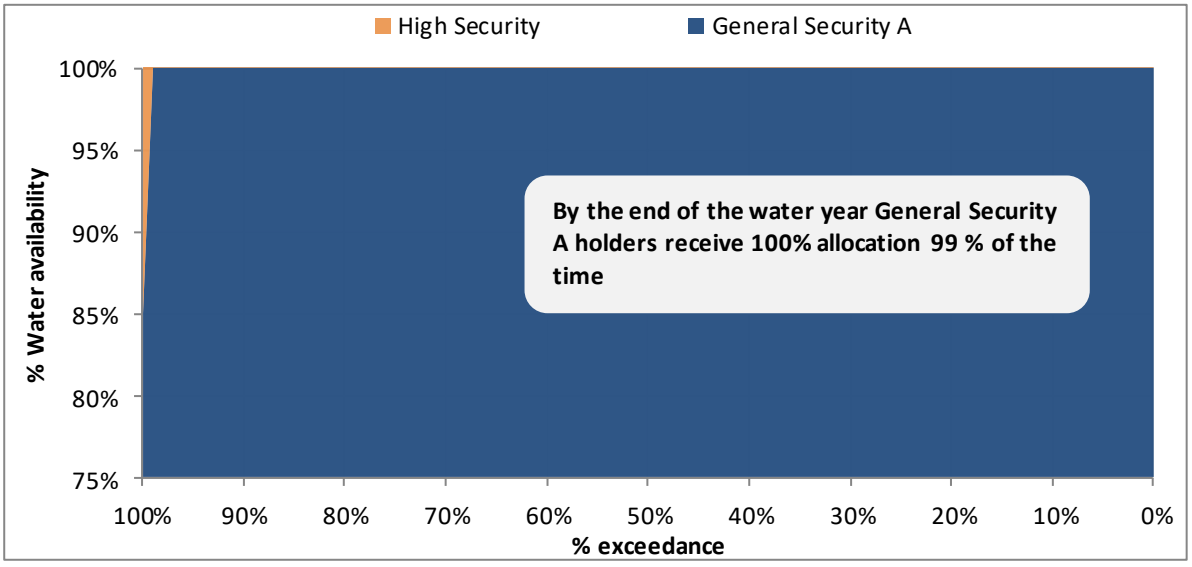


Figure 41: Start of water year availability for General Security B licences

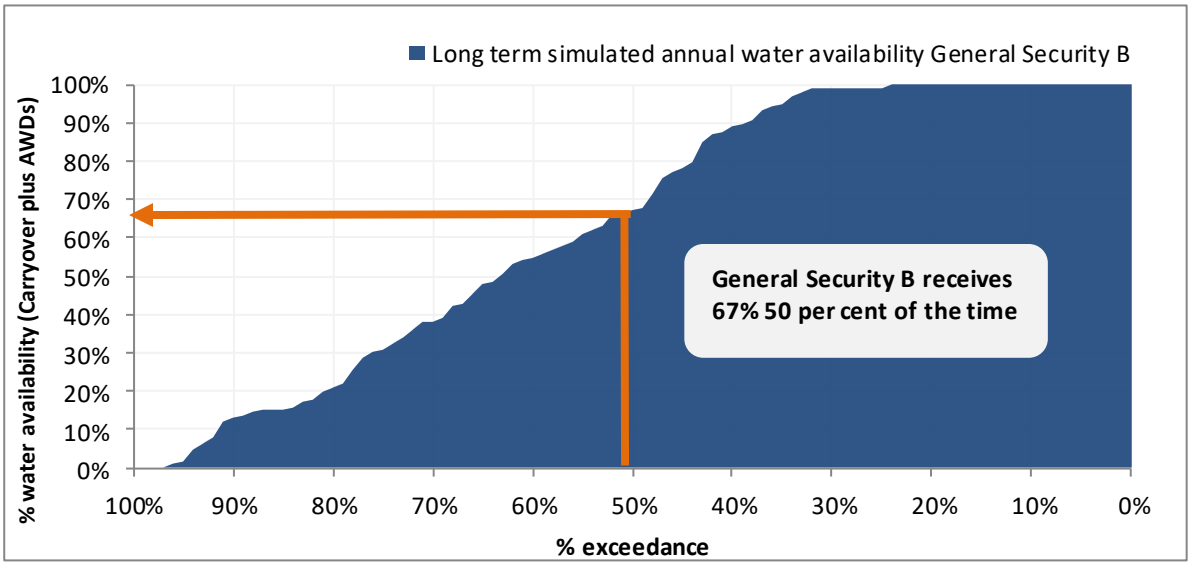
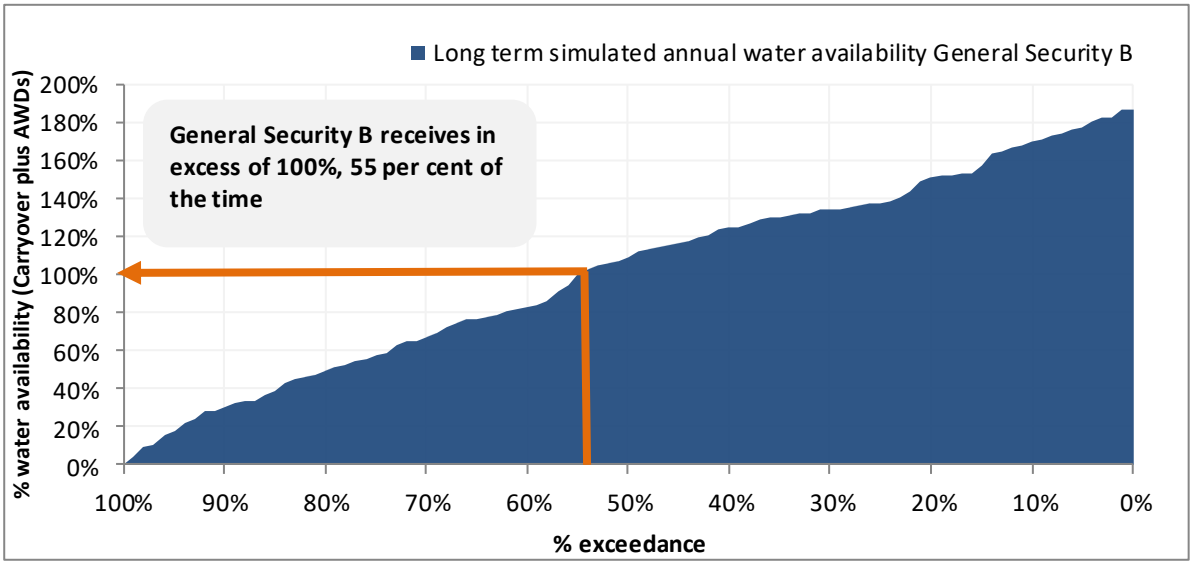


Figure 42: Full year water year availability for General Security B licences



Carryovers and available water determinations sifnce this reporting period[16]

Table 13: Carryovers and available water determinations 2023–24 (as of January 2024)

Date	Individual announcement	Share component	Allocation volume (ML)	Cumulative volume (ML)	Allocation volume (%)	Cumulative volume (%)	Balance available (ML)	Balance not available (ML)	Balance total (ML)	Balance available (%)	Balance total (%)
Domestic and Stock											
1-Jul-23	Opening	850					0	0	0	0.0%	0.0%
1-Jul-23	AWD 100.0 %	850	850	850	100.0%	100.0%	850	0	850	100.0%	100.0%
Domestic and Stock [Domestic]											
1-Jul-23	Opening	51	-	-	0.0%	0.0%	0.0	0.0	0.0	0.0%	0.0%
1-Jul-23	AWD 100.0%	51	51	51	100.0%	100.0%	51.0	0.0	51.0	100.0%	100.0%
Domestic and Stock [Stock]											
1-Jul-23	Opening	100	-	-	0.0%	0.0%	0	0	0	0.0%	0.0%
1-Jul-23	AWD 100.0%	100	100	100	100.0%	100.0%	100	0.0	100	100%	100%
Flood Plain Harvesting											
1-Jul-23	Opening	-	-	-	0.0%	0.0%	51,665	0	0	0.0%	0.0%
15-Aug-23	AWD 1.0 ML per Share	51,665	51,665	51,665	100.0%	100.0%	103,330	0	51,665	100.0%	100.0%
Local Water Utility											
1-Jul-23	Opening	640					(76)	0	(76)	(11.9)%	(11.9)%
1-Jul-23	AWD 100.0%	640	640	640	100.0%	100.0%	564	0	564	88.1%	88.1%
Regulated River (General Security A)											
1-Jul-23	Opening	22,007					1,685	0	1,685	7.7%	7.7%
1-Jul-23	AWD 0.06 ML per Share	22,007	1,236	1,236	5.6%	5.6%	2,921	0	2,921	13.3%	13.3%
21-Jul 23	AWD 0.94 ML per Share	22,007	19,050	20,286	86.6%	92.2%	21,971	0	21,971	99.8%	99.8%
Regulated River (General Security B)											
1-Jul-23	Opening	241,211					203,836	0	203,836	84.5%	84.5%
1-Jul-23	AWD 0.0 ML per Share	241,211	0	0	0.0%	0.00%	203,836	0	203,836	84.5%	84.5%

[16] Detailed announcements for reporting period are presented in Note 2

Date	Individual announcement	Share component	Allocation volume (ML)	Cumulative volume (ML)	Allocation volume (%)	Cumulative volume (%)	Balance available (ML)	Balance not available (ML)	Balance total (ML)	Balance available (%)	Balance total (%)
21-Jul-23	AWD 0.19 ML per Share	241,211	28,791	28,791	11.9%	11.9%	229,785	2,842	232,627	95.3%	96.4%
31-Oct-23	AWD 0.04 ML per Share	241,211	8,378	37,169	3.5 %	15.4 %	230,699	10,306	241,005	95.6%	99.9%
Regulated River (High Security)											
1-Jul-23	Opening	1,500	-	-	0.0%	0.0%	0.0	0.0	0.0	0.0%	0.0%
1-Jul-23	AWD 1.0 ML per Share	1,500	1,500	1,500	100.0%	100.0%	1,500	0.0	1,500	100.0%	100.0%
Supplementary Water											
1-Jul-23	Opening	120,001					0	0	0	0.0%	0.0%
1-Jul-23	AWD 1.0 ML per Share	120,001	120,001	120,001	100.0%	100.0%	120,001	0	120,001	100.0%	100.0%

Detailed item notes

Note 1—Allocation accounts

This note is reference for the volume held in the allocation accounts at the time of reporting and is also relevant for the various processes that occur to either increase or decrease an allocation account throughout the water year.

The volume of water that is in the licence allocation accounts at the time of reporting is a net balance for the relevant licence category and represents that water that can be carried forward to the next water year, as dictated by the carryover rules in place for that year or required under the water sharing plan.

A negative number for the carryover figure indicates that more usage has occurred than has been allocated to the account, and the deficit must be carried forward to the next season.

Water that is in the accounts at the end of a water year but is not permitted to be carried over is forfeited and has been represented as a decrease in water liability.

The accounting presented is relevant to licence category and is therefore inclusive of licences held by environmental holders (these are also detailed separately in Note 7).

Data type

Derived from measured data

Policy

- Water Sharing Plan for the NSW Border Rivers Regulated River Water Source 2021

Available on the NSW Department Climate Change, Energy, the Environment and Water website at https://www.nsw.gov.au/departments-and-agencies/dcceew

Data accuracy

A1—Nil inaccuracy ± 0%

Providing agency

NSW Department Climate Change, Energy, the Environment and Water

Data source

- Water Accounting System

Methodology

The carryover volume of water in the allocation account for each licence category is determined once all transactions and end-of-year forfeit rules have been applied. Below is list of typical transactions that can apply to an allocation account throughout the year:

- available water determination (AWD) (detailed in Note 2)
- allocation account usage (detailed in Note 3)
- over-order debits
- forfeiture due to:

  - no carryover being permitted (end-of-year forfeit)
  - allocation account limits
- licence conversion
- trade of allocation water between accounts (detailed in Note 5)
- carryover rules.

Additional information

Table 15 summarises the water allocation accounts for each category of access licence. Table 14 describes each of the components of this summary and those in Table 22, the environmental account summary. All figures are in megalitres.

Table 14: Explanatory information for account summary tables (Table 15 and Table 22)

Heading	Description
Share	Total volume of entitlement in the specific licence category on the specified date
Opening balance	Volume of water carried forward from the previous year's allocation account
AWD	Available water determination: The total annual volume of water added to the allocation account because of allocation assessments
Lic New	Licences – New: Increase in account water because of issuing new access licences
Lic Can	Licences – Cancelled: Decrease in account water because of licence cancellation
Drought sus In	Drought suspension – In: Temporary water restriction applied, reducing account water available for use in reported water year
Drought sus Out	Drought suspension – Out: Temporary water restriction re-credit increasing account water available for use in reported water year
Asn In	Assignment – In: Increase in account water because of temporary trade in
Asn Out	Assignment – Out: Decrease in account water because of temporary trade out
Account usage	Volume of water extracted or diverted from the river under controlled river conditions and is accountable against the licence
Over-order debit	Volume of water ordered that exceeded the recorded usage for corresponding periods that must also be accountable against the licence (excluding supplementary licence holders)
During-year forfeit	Water forfeited throughout the year because of the accounting rules specified in the water sharing plan, such as account limits being reached, conversions between licence categories and various other licence dealings
EoY Avail	End of year balance – Available: That part of the remaining account balance that is available to be taken at the conclusion of the water year
EoY NA	End of year balance – Not available: That part of the remaining account balance that is not available to be taken at the conclusion of the water year

Heading	Description
EoY forfeit	End of year forfeit: Account water forfeited at the end of the water year as a result of carryover rules that restrict the carry forward volume
Carry fwd	Carry forward: Account water permitted to be carried forward into the next water year, as determined by the carryover rules.

Table 15: Allocation account balance summary for the NSW regulated Border Rivers (reporting period). See Table 14 for explanation of headings.

Category	Share	Opening balance	AWD	Lic New	Lic Can	Drought sus In	Drought sus Out	Asn In	Asn Out	Account usage	Over order debit	During year forfeit	EoY Avail	EoY NA	EoY forfeit	Carry fwd
Domestic and Stock	850	0	850	0	0	0	0	0	0	469	9	0	373	0	373	0
Domestic and Stock [Domestic]	51	0	51	0	0	0	0	0	0	3	0	0	48	0	48	0
Domestic and Stock [Stock]	100	0	100	0	0	0	0	0	0	30	0	0	70	0	70	0
Local Water Utility	640	0	640	0	0	0	0	0	0	320	0	0	321	0	397	(76)
General Security A	22,007	19,777	2,230	0	0	0	0	529	8,833	11,865	126	26	1,685	0	0	1,685
General Security B	241,211	240,321	36,028	0	0	0	0	12,596	10,776	71,456	2,965	0	170,522	33,226	0	203,747
High Security	1,500	0	1,500	0	0	0	0	15	683	784	1	0	48	0	48	0
Supplementary Water	120,001	0	120,001	0	0	0	0	5,654	5,654	11,457	0	0	108,544	0	108,544	0
Floodplain Harvesting	51,665	0	51,665	0	0	0	0	0	0	0	0	0	51,665	0	0	51,665

Note 2—Available water determination (AWD) (allocation announcement)

This is the process by which the regulated surface water asset available for use within the regulated system is determined and shared. The process calculates the volume of water that is to be added to an individual's licence allocation account. Announcements of allocations are made on a seasonal basis, usually corresponding with the financial year, and are updated on a regular basis or following significant inflow events. Under the *Water Management Act 2000* the announcements are termed available water determinations.

Data type

Derived from measured data

Policy

- *Water Act 1912*
- *Water Management Act 2000* (NSW)
  - Chapter 3—Part 2 Access Licences.
    - Clause 59—Available Water Determinations.
- *Water Sharing Plan for the NSW Border Rivers Regulated River Water Source 2021*
  - Part 6—Limits to the availability of water
    - Division 5—Available Water Determinations

Available on the NSW Department Climate Change, Energy, the Environment and Water website at https://www.nsw.gov.au/departments-and-agencies/dcceew

Data accuracy

A1—Nil inaccuracy ±0%

Providing agency

NSW Department Climate Change, Energy, the Environment and Water

Data source

- Water Accounting System
- Available Water Determination Register: waterregister.waternsw.com.au

Methodology

In the Border Rivers Regulated Water Source, AWDs are calculated based on a concept of continuous accounting that assesses the resource (water) contained in the headwaters storage, periodically updating projections and distributing the regulated (stored) resource available. All projections are for one year from the date of the assessment. Under continuous accounting, the AWDs are based on the actual volume of water in storage at the time of the resource assessment. This does not account for sequences of future

inflows. However, these future inflows will assist in the delivery of essential requirements beyond the one year.

The process firstly involves the assessment of the effective storage, which is the available storage volume after storage losses are accounted for. This is to account for storage losses that cannot be controlled by a management rule and, therefore, must be provided for first. Following this, existing commitments are taken into account and then any uncommitted water is first committed to essential supplies, then added to the delivery loss account to target a volume equivalent to a maximum of 30% of the deliverable General Security. Water is then allocated to the Environmental Stimulus Flow account. Any remaining uncommitted water is then shared in proportion to the amount of entitlement in the remaining resource categories (General Security).

The essential supplies mentioned above consist of items such as stock and domestic requirements, local water utilities (for example, town water supplies and industrial use), High Security (permanent plantings such as orchards and vineyards), end-of-system flow requirement resulting from the system operation and minimum storage releases.

The volume of water distributed to licence categories is expressed as either a volume per share or as a percentage of share component, depending on the category of licence.

Table 16 details each licence category and how it is announced.

Table 16: Access licence category announcement type

Licence category	Announcement type
General Security	Volume per share
High Security	Volume per share
Domestic and Stock[17]	Percentage of share component
Local Water Utility	Percentage of share component

The AWD for supplementary licence accounts is a separate process and is not dependent on water assets available. It is made once at the start of the year. Unless there is a management change due to the growth in use, the strategy is maintained at the maximum value prescribed in the plan, which is generally 100% of share component. Therefore, it is not considered to create a liability on the system and is only considered in terms of an extraction that reduces the water asset.

Additional information

Table 18 provides the allocation summary report for the reporting period. Table 17 describes each component in the summary report.

[17] Domestic and Stock is further broken down into 3 sub-categories: Domestic and Stock, Domestic and Stock (Domestic) and Domestic and Stock (Stock).

Table 17: Allocation summary report notes

Subject	Note
Opening	Remaining allocation account balances at the conclusion of the previous season that is allowed to be carried forward to this season
Individual announcement	Actual announcement made to each licence category
Share component (entitlement)	Sum of the licensed volume of water within the licence category on the announcement date
Allocation volume	Volume of water credited to accounts within a licence category as a result of the AWD announcement made
Cumulative volume	Cumulative total of the announced volumes for the water year and licence category
Allocation volume (%)	This is the individual announced volume expressed as a percentage of the share component applicable on the particular date.
Cumulative volume (%)	The total announced volume for the year, expressed as a percentage of the total share component for each licence category applicable on the particular date
Balance available	Sum of water available in allocation accounts that has been made available to be taken during the season
Not available	Water allocated that is not accessible at this point in time i.e. considering annual usage limits placed on the accounts as per the water sharing plan
Supplementary water	Water that is not a stored source of water and is only made available if an uncontrolled flow event occurs

Table 18: NSW regulated Border Rivers allocation announcement summary 2022–23

Border Rivers WMA AWD Summary											
Date	**Individual Announcement**	**Share Component**	**Allocation Volume (ML)**	**Cumulative Volume (ML)**	**Allocation Volume (%)**	**Cumulative Volume (%)**	**Balance Available (ML)**	**Balance Not Available (ML)**	**Balance Total (ML)**	**Balance Available (%)**	**Balance Total (%)**
DOMESTIC AND STOCK											
1-Jul-22	Opening	850			0.0%	0.0%	0	0	0	0.0%	0.0%
1-Jul-22	AWD 100.0 %	850	850	850	100.0%	100.0%	850	0	850	100.0%	100.0%
DOMESTIC AND STOCK[DOMESTIC]											
1-Jul-22	Opening	51			0.0%	0.0%	0	0	0	0.0%	0.0%
1-Jul-22	AWD 100.0 %	51	51	51	100.0%	100.0%	51	0	51	100.0%	100.0%
DOMESTIC AND STOCK[STOCK]											
1-Jul-22	Opening	100			0.0%	0.0%	0	0	0	0.0%	0.0%
1-Jul-22	AWD 100.0 %	100	100	100	100.0%	100.0%	100	0	100	100.0%	100.0%
FLOODPLAIN HARVESTING (REGULATED RIVER)											
1-Jul-22	Opening				0.0%	0.0%	0	0	0	0.0%	0.0%
15-Aug-22	AWD 1.0 ML per Share	51,665	51,665	51,665	100.0%	100.0%	51,665	0	51,665	100.0%	100.0%
LOCAL WATER UTILITY											
1-Jul-22	AWD 100.0 %	640	640	640	100.0%	100.0%	640	0	640	100.0%	100.0%
REGULATED RIVER (GENERAL SECURITY A)											
1-Jul-22	Opening	22,007			0.0%	0.0%	19,777	0	19,777	89.9%	89.9%
1-Jul-22	AWD 1.0 ML per Share	22,007	2,230	2,230	10.1%	10.1%	22,007	0	22,007	100.0%	100.0%
REGULATED RIVER (GENERAL SECURITY B)											
1-Jul-22	Opening	241,211			0.0%	0.0%	240,321	0	240,321	99.6%	99.6%
1-Jul-22	AWD 1.0 ML per Share	241,211	890	890	0.4%	0.4%	241,211	0	241,211	100.0%	100.0%
23-Sep-22	AWD 0.57 ML per Share	241,211	550	1,440	0.2%	0.6%	241,344	417	241,761	100.1%	100.2%
21-Dec-22	AWD 0.5 ML per Share	241,211	7,615	9,055	3.2%	3.8%	241,344	8,032	249,376	100.1%	103.4%
31-Mar-23	AWD 0.12 ML per Share	241,211	24,489	33,544	10.2%	13.9%	241,357	32,508	273,865	100.1%	113.5%

Border Rivers WMA AWD Summary											
24-May-23	AWD 0.02 ML per Share	241,211	2,484	36,028	1.0%	14.9%	241,439	34,910	276,349	100.1%	114.6%
REGULATED RIVER (HIGH SECURITY)											
1-Jul-22	Opening	1,500			0.0%	0.0%	0	0	0	0.0%	0.0%
1-Jul-22	AWD 1.0 ML per Share	1,500	1,500	1,500	100.0%	100.0%	1,500	0	1,500	100.0%	100.0%
SUPPLEMENTARY WATER											
1-Jul-22	Opening	120,001			0.0%	0.0%	0	0	0	0.0%	0.0%
1-Jul-22	AWD 0.74 ML per Share	120,001	88,801	88,801	74.0%	74.0%	88,801	0	88,801	74.0%	74.0%
15-Aug-22	AWD 0.26 per Share	120,001	31,200	120,001	26.0%	100.0%	120,001	0	120,001	100.0%	100.0%

Note 3—Allocation account usage

This is the volume of water that is extracted, diverted or measured as usage and is accountable against an access licence. This figure excludes that water accounted as over- order debit, which is accounted for separately (see Note 4).

Data type

Measured/administration data

Policy

Not applicable

Data accuracy

A—Estimated in the range ± 10%

Providing agency

NSW Department Climate Change, Energy, the Environment and Water

Data source

- Water Accounting System

Methodology

Usage information is determined by either on-farm meters that measure extraction, gauges on diversion works or orders/releases when the volume cannot be effectively metered, such as an environmental watering event.

Meter readings are collected for individual licence holders at intervals during the year and converted via a calibration factor to a volume of water extracted. Water diverted from the river is measured by recording the height at either the gauge or weir with the volume diverted being derived by passing these heights through a rating table. However, with multiple categories of access licences being extracted through the same pumps, additional information and methodologies are required to separate use under the various licence categories:

- Based on periods of announcement—during periods of supplementary water announcements, extractions can be debited against the Supplementary Water licences
- Usage is based on water orders—users place orders for water against an access licence and usages are debited against accounts in proportion to the orders placed.
- Licence category apportionment—if no water orders are available, water extracted is apportioned against categories of access licence in order of priority, as set out in Table 19. The prioritising is based on the nature of and rules around each of the licence categories.

Table 19 provides the order in which extractions are apportioned to access licence categories, starting at priority 1. This is a generic list where not all categories will necessarily appear in this GPWAR. There are also various sub-categories of licence associated with some of the categories.

Table 19: Licence category metered usage apportionment table

Priority	Surface water
1	Supplementary
2	Uncontrolled Flow
3	Domestic and Stock
4	Regulated River High Security
5	Regulated River General Security
6	Conveyance
7	Local Water Utility
8	Major Water Utility

Additional information

Total account usage for the reporting period is presented in Table 20.

Table 20: Account usage summary

Category	Allocation account usage
Domestic and Stock	496
Domestic and Stock [Domestic]	3
Domestic and Stock [Stock]	30
Local Water Utility	320
Regulated River (General Security A)	11,865
Regulated River (General Security B)	71,456
Regulated River (High Security)	784
Supplementary Water	11,457
Total	**96,383**

Note 4—Water order debiting

Currently in the NSW Border Rivers regulated river water source, the allocation accounts are managed using a water order debiting approach. Accounting under this system requires the accounts to be reduced by the greater of the:

- volume of water extracted
- volume of water ordered for extraction against an access licence.

Therefore, the volume appearing in statements against the line-item water order debiting reflects the amount of water ordered against a category of licence that is in excess of the physical extraction that occurred.

Data type

Measured/calculated

Policy

- *Water Sharing Plan for the NSW Border Rivers Regulated River Water Source 2021*
  - Part 8— Operation of water allocation accounts and managing access licences
    - Division 1— Accounting for water allocation accounts
      - Clause 42— Credits to and debits from an individual water allocation account

Available on the NSW Department Climate Change, Energy, the Environment and Water website at: https://www.nsw.gov.au/departments-and-agencies/dcceew

Data accuracy

A1—nil accuracy ± 0%

Providing agency

NSW Department Climate Change, Energy, the Environment and Water

Data source

- Water accounting system

Methodology

Over-order debiting is a required component of balancing the allocation accounts detailed in Note 1. The over-order debit component is calculated by analysing the recorded extractions against orders for the corresponding measurement period. That is, if metered usage is collected monthly, then the corresponding monthly orders are compared and any orders that are in excess of the usage are recorded as over-order debit. Refer to Table 15 for over-order debits applied in the reporting period.

Note 5—Allocation assignments (temporary trading)

This represents the temporary assignment of allocation of water between allocation accounts within the NSW Regulated Border Rivers, or equivalent Queensland licences within the Border Rivers.

Data type

Administration

Policy

- *Water Sharing Plan for the NSW Border Rivers Regulated River Water Source 2021*
  - Part 9 Access licence dealing rules
    - Clause 51 Assignment of water allocations dealings
    - Clause 52 Interstate access licence transfer and assignment of water allocation

Available on the NSW Department Climate Change, Energy, the Environment and Water website at https://www.nsw.gov.au/departments-and-agencies/dcceew

Data accuracy

A1—Nil inaccuracy ± 0%

Providing agency

NSW Department Climate Change, Energy, the Environment and Water

Data source

- Water Accounting System

Methodology

Trading of allocation is permitted between certain categories of access licences and between states. This is detailed in the water sharing plan or stipulated under the licence holder's conditions.

Internal trade within NSW licence categories results in a net effect of zero for a water year. To present the information, however, and for the purposes of this GPWAR, we have accounted for such trades as both a water liability decrease (sellers of water) and a water liability increase (buyers of water). Trades that occur between categories of licence, and between states, result in the associated liability being increased or reduced accordingly.

Additional information

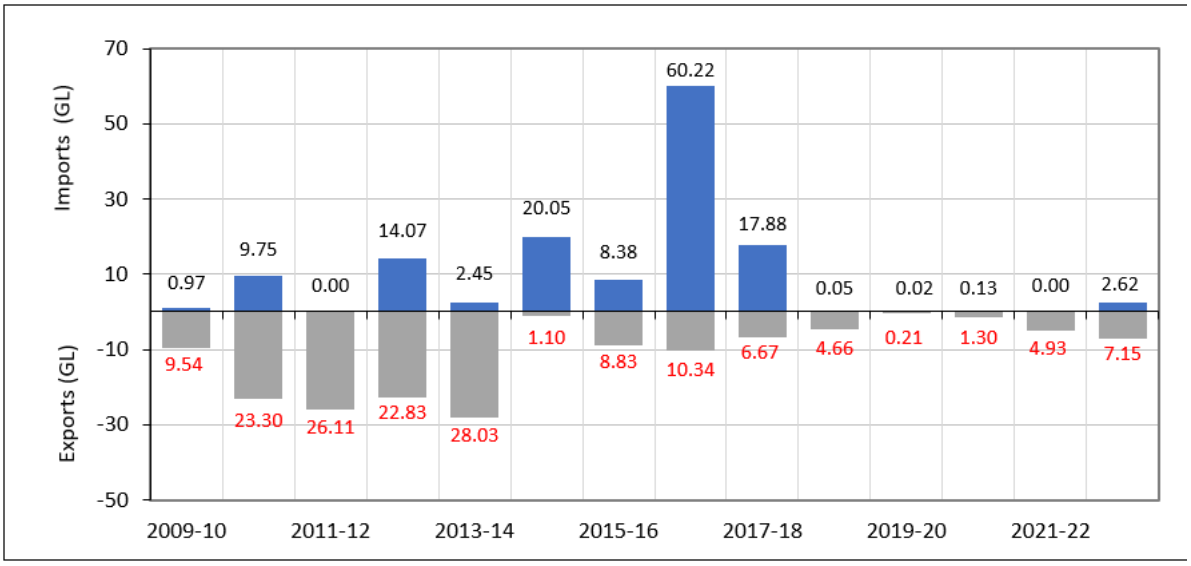
Table 21 shows the allocation assignment figures between licence categories for the Border Rivers. All figures represent a volume in megalitres.

Important note: This water accounting report is about water balances, usages and temporary trades associated with NSW water access licences. This report does not include additional activities such as the transfer of water between permanently linked works in Queensland; and temporary interstate trading implemented under the Border River Intergovernmental agreement, whereby trade is held in and delivered from temporary holding accounts. For reference purposes these volumes traded are presented in Figure 43.

Table 21: Allocation assignment summary NSW access licences

From NSW	To NSW General Security A	To NSW General Security B	To NSW Supplementary Water	To NSW High Security	To QLD Interstate transfer	Total
General Security A	377	7,784	15		633	8,809
General Security B	128	4,219			6,429	10,776
High Security		593			90	683
Supplementary Water				5,154		5,154
Total	505	12,596	15	5,154	7,152	25,422

Figure 43: Temporary trading of water between NSW and QLD licences[18]



[18] Includes allocation assignments NSW to QLD and seasonal assignments from QLD to NSW. All categories of licence are included (QLD trade of supplementary/unsupplemented to NSW). Usage from tagged work arrangements are excluded

Note 6—Basic rights

This is the non-licensed right to extract water to meet basic requirements for household purposes (non-commercial uses in and around the house and garden) and for watering of stock. It is available for anyone who has access to river frontage on their property.

This water cannot be used for irrigating crops or garden produce that will be sold or bartered, for washing down machinery sheds, or for intensive livestock operations.

In times of limited supply, there may be restrictions on taking water for domestic and stock use.

Data Type

Estimated

Policy

- *Water Sharing Plan for the NSW Border Rivers Regulated River Water Source 2021*
  - Division 2 Requirements for water for basic landholder rights
    - Clause 18 Domestic and stock rights

Available on the NSW Department Climate Change, Energy, the Environment and Water website at https://www.nsw.gov.au/departments-and-agencies/dcceew

Data accuracy

C—Estimated in the range ± 50%

Providing agency

NSW Department Climate Change, Energy, the Environment and Water

Data source

- *Water Sharing Plan for the NSW Border Rivers Regulated River Water Source 2021*

Methodology

The estimation of Domestic and Stock rights uses a series of estimates for water usage, stocking rates, population and property shape, based on local knowledge, to calculate riparian (stock and domestic) requirements in megalitres per year. The annual extraction for Domestic and Stock rights in the water accounts is assumed to be the estimated figure stated in the *Water Sharing Plan for the NSW Border Rivers Regulated River Water Source 2021* (8,000 megalitres).

Note 7—Held environmental water

This represents environmental water that is held as part of a licensed volumetric entitlement. These licences are held within the same licence categories as all other water access licences, hence are subject to the same operating rules. They are subject to the following key rules:

- available water determinations (AWD) for their share of the entitlement to be added to accounts
- carryover rules, hence the forfeiting of unused water that cannot be carried over
- provide water orders before use.

These licences are used to provide environmental benefit and outcomes to the catchment by either providing water to, or supplementing water requirements of, specific environmental events or incidents.

Data type

Measured

Policy

- *Water Management Act 2000*
- *Water Sharing Plan for the NSW Border Rivers Regulated River Water Source 2021*

Available on the NSW Department Climate Change, Energy, the Environment and Water website at https://www.nsw.gov.au/departments-and-agencies/dcceew

Data accuracy

A1—Nil inaccuracy ± 0%

Providing agency

NSW Department Climate Change, Energy, the Environment and Water

Data source

- Water Accounting System
- Available Water Determination Register: NSW Department Climate Change, Energy, the Environment and Water website at https://www.nsw.gov.au/departments-and-agencies/dcceew

Methodology

The water held for the environment represents a volume of water in corresponding allocation accounts. This allocation account represents the sum of the remaining volume of held environmental water at the conclusion of the water year once all transactions and forfeit rules have been applied to the accounts. These environmental balances are at the licence category level and represent the water that can be carried

forward for use in the next year. Below is list of typical transactions that can apply to an environmental allocation account:

- AWD (including pro rata of AWD for new licences)
- licensed extractions
- over-order debits
- forfeiture due to:
  - carryover rules
  - account spillage as a result of AWD
  - licence conversions
  - excess orders (where water order debiting is in place)
- licence conversion
- trade of allocation water between accounts
- annual account limit.

In addition, the trade and purchase of environmental water is tracked to capture the movement of environmental entitlement both in number of entitlements, and volume.

Additional information

Table 22 summarises held environmental water for the reporting period. Explanations of the components within this table are given in Table 14

Table 23 summarises changes to the held environmental water portfolio since the previous reporting period.

Table 22: Environmental account summary. See Table 14 for an explanation of headings.

Category	Share	Opening balance	AWD	Lic New	Lic Can	Drought sus In	Drought sus Out	Asn In	Asn Out	Account usage	Over order debit	During year forfeit	EoY Avail	EoY NA	EoY forfeit	Carry fwd
General Security A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
General Security B	2,806	2,806	0	0	0	0	0	0	0	0	0	0	2,806	0	0	2,806
High Security	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Supplementary Water	1,437	0	1,437	0	0	0	0	0	0	86	0	0	1,315	0	1,351	0

Table 23: Annual change summary for environmental licences

Category	Volume 30 June 2022	Volume 30 June 2023	Volume Difference	No. Licences 30 June 2022	No. Licences 30 June 2023	No. Licence Difference
General Security A	0	0	0	1	1	0
General Security B	2,806	2,806	0	2	2	0
High Security	0	0	0	1	1	0
Supplementary Water	1,437	1,437	0	2	2	0

Note 8—Environmental stimulus account

A provision for an environmental stimulus flow is detailed in the plan. It is put aside and called upon to supplement natural flow events when the defined triggers are met. At the beginning of each water year, a volume of 4,000 megalitres must be set aside in the resource assessment process for Pindari dam. If at any time during 1 April to 31 August, inflows to Pindari exceed 1,200 megalitres per day, an environmental stimulus flow shall be released between 1 August and 1 December.

The timing, rate and total volume is to be determined by the NSW Department Climate Change, Energy, the Environment and Water. The unused water held within the account may be carried forward to the following water year; however, the account may not exceed 8,000 megalitres at the beginning of any water year.

Data type

Administration

Policy

- *Water Sharing Plan for the NSW Border Rivers Regulated River Water Source 2021*
  - Part 10 - System operation rules
    - Division 1— Environmental flow rules
      - Clause 55 – Stimulus Flow

Refer to applicable water sharing plan on the NSW Department Climate Change, Energy, the Environment and Water website at https://www.nsw.gov.au/departments-and-agencies/dcceew

Data accuracy

A1—Nil inaccuracy ± 0%

Providing agency

WaterNSW

Data source

- Annual compliance report (internal document)

Methodology

N/A

Additional Information

Historical annual accounting of the stimulus account is presented in Table 24.

Table 24: Stimulus flow account summary

Water Year	Opening Balance	Increase	Usage	End of Year Forfeit	Carry Forward
2009-10	0	4,000	0	4,000	4,000
2010-11	4,000	4,000	0	8,000	4,000
2011-12	4,000	4,000	0	4,000	4,000
2012-13	4,000	4,000	8,000	0	0
2013-14	0	4,000	4,000	0	0
2014-15	0	4,000	0	0	4,000
2015-16	4,000	4,000	5,759	0	2,241
2016-17	2,241	4,000	0	2,241	4,000
2017-18	4,000	4,000	8,000	0	0
2018-19	0	4,000	0	0	4,000
2019-20	4,000	4,000	0	4,000	4,000
2020-21	4,000	4,000	4,400	0	3,600
2021-22	3,600	4,000	0	3,600	4,000
2022-23	4,000	4,000	0	4,000	4,000

Note 9—Account adjustments

This is a line item that is used to correct balances in the allocation account balances. The double entry accounting we apply is a continuous process whereby the closing balance of one year is the opening balance for the next reporting year.

Occasionally, we will need to correct the accounts for a variety of reasons. This includes when we identify a mistake in the previous year's reporting, or when information included in past reports is not available and we must remove the associated asset or liability to maintain the integrity of the statements. This is different to the unaccounted difference component, which is a physical volume required to achieve mass balance after all the known processes have been accounted for.

For errors or updates identified in previously reported physical figures, we directly update the figures and identify the change in the associated note.

Data type

Calculated

Data Accuracy

A1—Nil inaccuracy ± 0%

Providing agency

NSW Department Climate Change, Energy, the Environment and Water

Data source

Not applicable

Methodology

N/A

Additional information

No account adjustments were required for the reporting period.

Note 10—Surface water storage

This is the actual volume of water stored in the individual surface water storages at the closing date of the reporting period (30 June). The volumes provided represent the total volume of water in the storage, including dead storage, which is the volume of water that can't be accessed under normal operating conditions (for example, volume below low level outlet). We assume that the dead storage can potentially be accessed if required via alternative access methods (for example, syphons and pumps).

The volume presented in the statements is the full volume held within Glenlyon and Pindari storages and Boggabilla Weir as of the reporting date. The actual volume available to settle NSW liabilities (removing the Queensland share of the volume) is in the reconciliation and future prospect statements within this GPWAR.

Data type

Derived from measured data

Policy

Not applicable

Data accuracy

A—Estimated in the range ± 10%

Providing agency

NSW Department Climate Change, Energy, the Environment and Water

Data source

- NSW Department Climate Change, Energy, the Environment and Water: HYDSTRA

Methodology

Storage volumes are calculated by processing a gauged storage elevation through a rating table that converts it to a volume. Table 25 breaks down the storage capacities and dead storages.

Table 25: Capacity and dead storage summary table

Storage	Capacity (ML)	Dead storage (ML)
Glenlyon Dam	254,310	160
Pindari Dam	312,000	80
Boggabilla Weir	5,850	410

Note 11—River channel storage

This the estimated volume of water stored in the river channel on the day of reporting.

Policy

Not applicable

Data type

Derived from measured data

Data accuracy

B—Estimated in the range ± 25%

Providing agency

NSW Department Climate Change, Energy, the Environment and Water

Data sources

- CARM

Methodology

For each river section i:

$$Vi = Qi \, x \, Ti$$

The river channel storage will be equal to the sum of all river section volumes.

$$\text{River channel storage} = \sum_{i=0}^{n} Vi$$

Table 26: Summary of river channel storage calculation components

Symbol	Variable	Data Source	Unit
Q	Average flow in the river section. Calculated by averaging the daily flows at the upstream and downstream river gauges.	CARM	ML/d
V	Volume in each river section.	Calculated	ML
T	Average travel time for a parcel of water to travel through the river section.	CARM	days
i	Any river section	CARM	-
n	Total number of river sections	CARM	-

Assumptions and approximations:

- Travel times are estimated to the nearest day.
- We assume daily flow change between gauging sites is linear.

Note 12—Storage inflow—Glenlyon and Pindari Dams

Storage inflow refers to the volume of water flowing into the major headwater storages: Glenlyon Dam and Pindari Dam.

Policy

Not applicable

Data type

Derived from measured data

Data accuracy

A—Estimated in the range ± 10%

Providing agency

NSW Department Climate Change, Energy, the Environment and Water

Data sources

- NSW Department Climate Change, Energy, the Environment and Water: HYDSTRA
- Queensland Department of Natural Resources: SILO

Methodology

In most of the major storages in NSW, there is no direct measurement of inflows. However, it is possible to calculate inflows by using a mass balance approach (based on balancing the change in storage volume) where inflow is the only unknown (seepage is assumed as negligible). This is referred to a back-calculation of inflows.

The back-calculation figures were derived using a one-day time-step, with the total annual inflow calculated according to the equation below. The daily inflows are then summed to provide an annual inflow figure.

$$I = \sum_{i=1}^{n} \left(\Delta S_i + O_i + Se_i + \frac{(E_i - R_i) * A_i}{100} \right)$$

Table 27: Components for back-calculation of inflow

Symbol	Variable	Unit
I	Inflow	ML
ΔS	Change in storage volume	ML/day
O	Outflow	ML/day
Se	Seepage	ML/day
R	Rainfall	mm/day
E	Evaporation (Mortons shallow lake estimation, SILO)	mm/day
A	Surface area—derived from height to surface areas lookup curve	ha

Note 13—Storage evaporation and storage rainfall

This refers to the volume of water effective on Glenlyon and Pindari Dams that is either lost as a result of evaporation or gained as a result of rainfall.

Data type

Derived from measured data

Policy

Not applicable

Data accuracy

B—Estimated in the range ± 25%

Providing agency

NSW Department Climate Change, Energy, the Environment and Water

Data source

- NSW Department Climate Change, Energy, the Environment and Water: HYDSTRA
- Queensland Department of Natural Resources: SILO

Methodology

Daily rainfall and Mortons shallow lake evaporation data (accessed via SILO) are applied to storage surface area time-series from HYDSTRA to achieve a volume in megalitres which is then aggregated to an annual figure. The rainfall and evaporation data utilised is equivalent to the data used in the storage inflow back-calculation (Note 12)

Rainfall:

$$V = \sum_{i=1}^{n} \frac{R_i \times \mathrm{A}_i}{100}$$

Evaporation:

$$V = \sum_{i=1}^{n} \frac{E_i \times \mathrm{A}_i}{100}$$

Table 28: Components for storage evaporation and rainfall

Symbol	Variable	Unit
V	Volume	ML/year
R	Rainfall	mm/day
A	Surface area—derived from height to surface areas lookup curve	Ha

Symbol	Variable	Unit
E	Evaporation (Mortons shallow lake estimation, SILO)	mm/day

Note 14—River evaporation and river rainfall

This is an estimate of the total volume of water interacting with the defined accounted river extent that is either lost as a result of evaporation or gained as a result of rainfall.

Data type

Derived from measured data

Policy

Not applicable

Data accuracy

C—Estimated in the range ± 50%

Providing agency

NSW Department Climate Change, Energy, the Environment and Water

Data source

- NSW Department Climate Change, Energy, the Environment and Water: HYDSTRA, ARCGIS
- Queensland Department of Natural Resources: SILO

Methodology

The volume applied for evaporation and rainfall on the regulated river is achieved by first calculating a daily time-series of river area. This is achieved by breaking the river up into reaches and utilising the cross-sections recorded at river gauging locations to determine the average width of the river with a given daily flow. River length is then determined between 2 gauging locations using ARCGIS and as such an area for each reach can be defined.

Area (m^2) = Average W (m) x L (m)

In the formula, W is the daily width determined from the gauging cross sections and L is the length as determined through ARCGIS analysis.

With daily area determined, various climate stations are then selected based on their proximity to each river reach. Rainfall and evaporation data is then extracted from SILO and applied to the area time-series to achieve a volume in megalitres which is then aggregated to an annual figure.

Rainfall:

$$V = \sum_{i=1}^{n} \frac{R_i \times \mathrm{A}_i}{10^6}$$

Evaporation:

$$V = \sum_{i=1}^{n} \frac{ETO_i \times K_c \times \mathrm{A}_i}{10^6}$$

Table 29: Components for storage evaporation and rainfall

Symbol	Variable	Unit
V	Volume	ML/year
R	Rainfall	mm/day
A	Surface area—derived from height to surface areas lookup curve	m2
ETO	Reference evapotranspiration from SILO	mm/day
Kc	Crop coefficient for open water (1.05)	-

Note 15—Gauged inflow

This is the inflow into the accounted regulated river system that occurs downstream of the headwater storages and is measured at known gauging stations.

Policy

Not applicable

Data type

Measured data

Data accuracy

A—Estimated in the range ±10%

Providing agency

NSW Department Climate Change, Energy, the Environment and Water

Data sources

- NSW Department Climate Change, Energy, the Environment and Water: HYDSTRA

Methodology

The flows are obtained by measuring river heights at gauging stations along the river, and then passing these heights through a rating table that converts them to a daily flow volume.

Additional information

The total gauged inflow for the reporting period is detailed in Table 30

Table 30: Summary of gauged tributary inflow

Station	Station Name	Area (km2)	Flow (ML)
416415A	MACINTYRE BROOK AT BOOBA SAND	4,092	193,699
416003	TENTERFIELD CREEK AT CLIFTON	541	58,663
416207A	WEIR RIVER at MASCOT	13,500	626,289
416310A	DUMARESQ RIVER AT FARNBRO	1,309	89,568
416312A	OAKY CREEK U/S TEXAS	422	23,435
416305B	BRUSH CREEK AT BEEBO	335	11,489

Station	Station Name	Area (km2)	Flow (ML)
416008	BEARDY RIVER AT HAYSTACK	866	103,630
416010	MACINTYRE RIVER AT WALLANGRA	2,020	280,360
416021	FRAZERS CREEK AT WESTHOLME (ASHFORD)	804	122,900
416032	MOLE RIVER AT DONALDSON	1,610	196,915
Total			1,706,947

Note 16—Ungauged inflow

The estimated inflow into the river that occurs downstream of the headwater storages that is not measured.

Policy

Not applicable

Data type

Estimated

Data accuracy

C—Estimated in the range ± 50%

Providing agency

NSW Department Climate Change, Energy, the Environment and Water

Data sources

- HYDSTRA, Water Accounting System, QLD government water monitoring information portal

Methodology

Ungauged inflow is a difficult component to quantify. To derive an estimate a simple mass balance approach was adopted whereby known inflows and outflows were combined with an assumed loss factor. No estimate was made for the areas below the Boggabilla gauge. Ungauged inflows in these lower sections will be reflected in the unaccounted difference of the river balance.

$$UI = FA - SR - GI + E + LE$$

Where:

- **UI** = Ungauged Inflow Estimate
- **FA** = Flow arriving – the mainstream gauged flow at Boggabilla. No further inflow has been estimated downstream for this estimated
- **SR** = Storage release
- **GI** = Gauged inflows
- **E** = Extractions (excluding any that are below the nominated 'EoS')
- **LE =** Estimated losses. This was assumed to be 10% of the measured (gauged flow plus storage releases) entering the system

Note 17—Flow leaving system/replenishments

This refers to flow that leaves the entity and does not return to it. 'Replenishment flows' refers to water that has been set aside as part of the essential requirements for the provision of flows along the Boomi River to supply water to households and stock. The annual requirements and limits associated with this provision are detailed in the water sharing plan.

Data type

Derived from measured data

Policy

Not applicable

Data accuracy

A—Estimated in the range ±10%

Providing agency

NSW Department Climate Change, Energy, the Environment and Water, WaterNSW

Data source

- HYDSTRA
- WaterNSW annual compliance report (internal document)

Methodology

The end-of-system flow is considered to be the total gauged flow at Mungindi. Flow also leaves the entity down the Boomi River, which has been measured with the flow gauge at the Boomi Weir offtake. Water leaving the system down the Boomi River is tagged as 'replenishment' or 'other' based on information in the WaterNSW annual compliance report.

Additional information

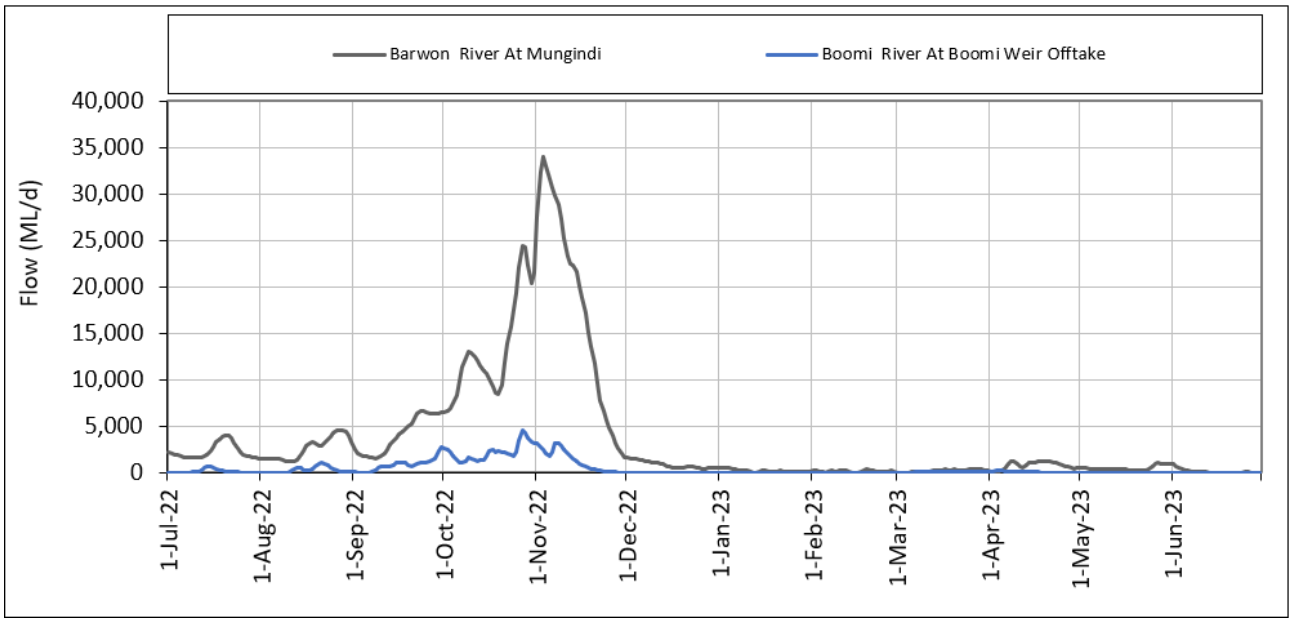
Total flows leaving the accounted entity are provided in Table 31. Daily outflows are illustrated in Figure 44

Table 31: Flow leaving system and replenishment summary

Station	Station name	Volume (ML)	Replenishment (ML)	Other (ML)
416001	Barwon River At Mungindi	1,304,643	N/A	N/A
416037	Boomi River At Boomi Weir Offtake	150,011	3,622	N/A

Station	Station name	Volume (ML)	Replenishment (ML)	Other (ML)
-				
Total	-	1,454,655	N/A	1,454,655[19]

Figure 44: End-of-system flow for Border Rivers Regulated River



[19] Flows sourced from downstream tributaries. May included additional replenishment requirements, uncontrolled flood flow and other diversions allowed for under the New South Wales – Queensland Border Rivers Intergovernmental Agreement 2008

Note 18—NSW extractions from river

Except for basic rights (which have been reported as a separate line item in this GPWAR and detailed in Note 6), this refers to the actual volume of water directly pumped or diverted from the NSW side of the regulated river.

Occasionally (generally in the case of environmental water), volumes are ordered against a licence account for in-stream benefits or for end-of-system flow events. In addition, tagged trading can occur where NSW account water is taken through a Queensland work (pump) and vice versa. As such, the volume reported to be physically extracted from the river will not always be equal to the amount of water debited to accounts for account usage, which has been reported in detail in Note 3. There may also be an over-order debit that has reduced a holder's account but not physically been taken out of the river.

Queensland extractions also form part of the physical volume of water taken from the regulated river and these are detailed in Note 20.

Data type

Measured data

Policy

Not applicable

Data accuracy

A—Estimated in the range ±10%

Providing agency

NSW Department Climate Change, Energy, the Environment and Water

Data source

- Water Accounting System
- Queensland Department of Natural Resources, Mines and Energy

Methodology

For the purposes of this GPWAR, the NSW physical extraction from the river is:

- the total usage volume metered and debited to the NSW allocation accounts, minus any water that can be identified as being used within the system, or ordered to be passed through the system
- plus any Queensland water taken through NSW pumps, minus any NSW water taken through Queensland pumps.

Additional information

Table 32: Reconciliation of NSW physical river extraction to NSW account usage

Balance	Component	Value (ML)
start	(1) NSW account usage	96,383
minus	(2) Use of NSW account water in Qld (debited against NSW access licences, but taken in Qld)	(6,805)
plus	(3) Qld water traded to NSW and used	2,646
minus	(4) instream licenced usage (estimated)	0
minus	(5) licenced usage leaving accounted system (estimated)	0
equals	**Total physical extractions in NSW**	**92,139**

Note 19—Storage releases (including transparent releases)

This is the volume of water released or spilled from either Pindari Dam or Glenlyon Dam. In the accounting, this release is represented as both a decrease in the storage asset and an equal increase in asset to the river asset (shown as the combined total release in the line item 'Inflow from releases'). The policy for planned environmental water outlined in the water sharing plan requires that a transparent flow of up to 200 megalitres in June, July and August, and up to 50 megalitres for all other months, be released from Pindari dam when a range of specified triggers have been met. Releases that satisfy the transparent release requirement have been presented as a separate sub-component of the total release.

Data type

Measured data

Policy

- *Water Sharing Plan for the NSW Border Rivers Regulated River Water Source 2021*
  - Part 10 System operation rules
    - Division 1— Environmental flow rules
      - Clause 54 - Daily environmental release

Refer to applicable Water Sharing Plan on the NSW Department Climate Change, Energy, the Environment and Water website at https://www.nsw.gov.au/departments-and-agencies/dcceew

Data accuracy

A—Estimated in the range ±10%

Providing agency

NSW Department Climate Change, Energy, the Environment and Water, WaterNSW

Data source

- HYDSTRA
- WaterNSW annual compliance report (internal document)

Methodology

The flows are obtained by measuring river heights at a gauging station downstream of the dam release site and then passing these heights through a rating table that converts them to a daily flow volume. The releases have been represented in the Statement of Changes in Water Assets and Water Liabilities as both a decrease in water asset (water leaving the dam) and an equal volume of increases in water asset (water released increasing the volume of the river).

To provide more detail, the dam release for Pindari Dam has been split into the volume released to meet transparent, water sharing plan requirements, and the volume released for other purposes.

Additional Information

Storage releases for the reporting period are presented in Figure 45 and Figure 46.

Figure 45: Storage releases Glenlyon Dam (reporting period)

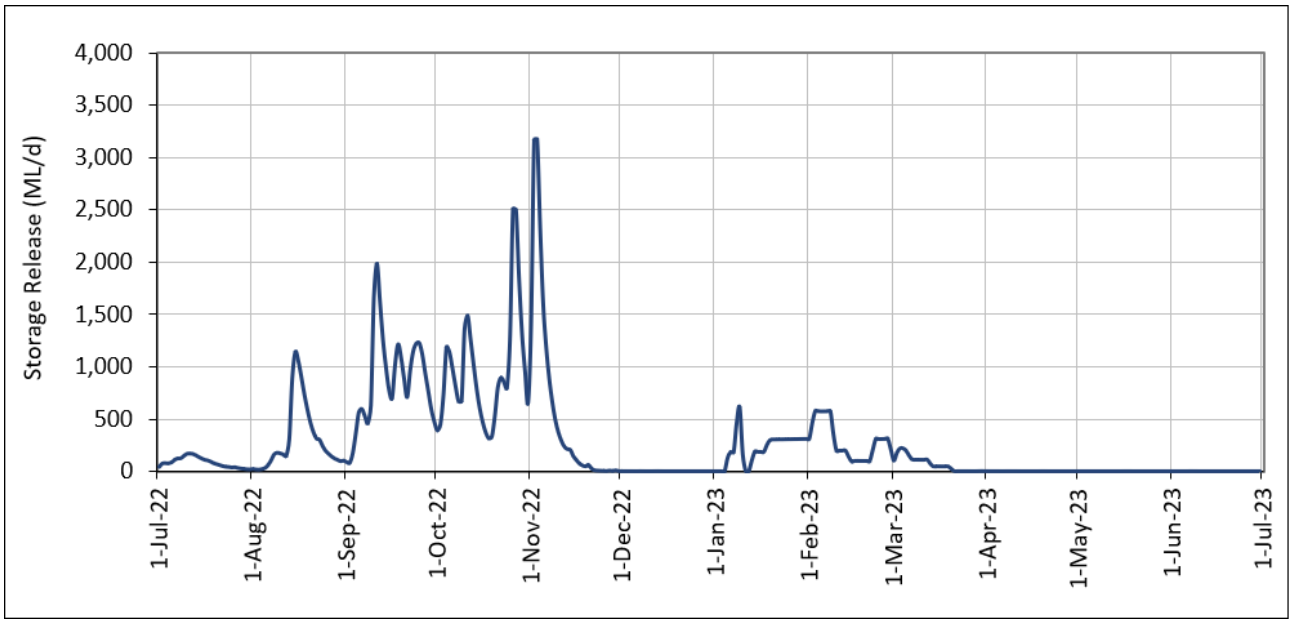
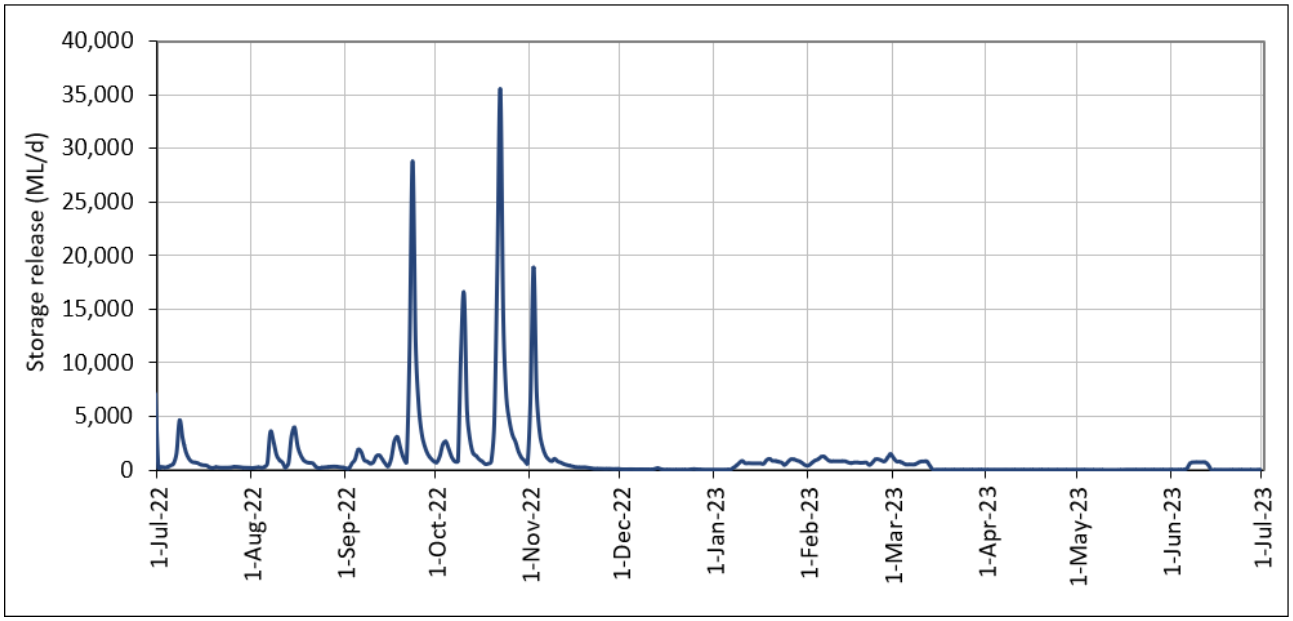


Figure 46: Storage releases for Pindari Dam (reporting period)



Note 20—Queensland extractions

This is the volume of water extracted from the accounted river extent by Queensland licence holders. While detailed information is not presented in this account, it is necessary to include the bulk figures extracted to maintain the integrity of the river physical mass balance. Total volumes extracted are provided in megalitres.

Data type

Measured data

Policy

- *Water Resource (Border Rivers) Amendment Plan 2007*
- *New South Wales–Queensland Border Rivers Intergovernmental Agreement 2008*

Available at the Queensland Department of Environment and Resource Management webpage (www.dnrme.qld.gov.au)

Data Accuracy

A—Estimated in the range ±10%

Providing Agency

Queensland Department of Natural Resources, Mines and Energy

Data Source

N/A

Methodology

Figures are consolidated from data provided by the Queensland Government. Diversions are decreased for tagged trade into NSW and increased for tagged trade to Queensland, in order to achieve the correct physical extraction volumes for each state.

Additional information

A reconciliation of the physical Queensland extraction is allowed for in the statements and can be seen in Table 33.

Table 33: Reconciliation of Queensland physical extractions

Balance	Component	Value
start	(1) Qld Border Rivers licenced usage (excludes Stanthorpe and Macintyre Brook irrigation areas, includes supplemented and non-supplemented)	33,923
minus	(2) Use of Qld water allocation to NSW (via temporary trading or linked works	(2,646)
plus	(3) NSW traded & used in Qld	7,152
plus	(4) tagged extractions (debited against NSW access licences, but taken in Qld)	6,805
equals	**Total physical extractions in Qld**	**45,234**

Note 21—Supplementary extractions

This is the volume of water extracted or diverted under supplementary access licences during announced periods of supplementary water. Supplementary flow events are announced periodically during the season when high flow events occur during the period of extraction. The volume of water to be extracted is based on the rules as set out in the water sharing plans. Supplementary access licences differ from other categories of access licence in that the volume of water in the account refers to an annual upper limit for extractions and its provision is totally reliant on the occurrence of high-flow events.

Data type

Measured data

Policy

- *Water Sharing Plan for the NSW Border Rivers Regulated River Water Source 2021*
  - Part 6 Limits to the availability of water
    - Division 5—Available water determinations
      - Clause 40 Available water determinations for supplementary water access licences
  - Part 8 Operation of water allocation accounts and managing access licences
    - Division 2— Supplementary water events
      - Clause 44 - Taking of water under supplementary water access licences
      - Clause 46 - Announcement of supplementary water events upstream of the Macintyre River and Dumaresq River junction
      - Clause 47 - Announcement of supplementary water events downstream of the Macintyre River and Dumaresq River junction

Refer to applicable water sharing plan on the NSW Department Climate Change, Energy, the Environment and Water website at https://www.nsw.gov.au/departments-and-agencies/dcceew.

Data accuracy

A—Estimated in the range ±10%

Providing agency

NSW Department Climate Change, Energy, the Environment and Water

Data source

- Water Accounting System

Methodology

Supplementary water extraction and diversion data is collected by either on-farm meters that measure extraction or gauges on diversion works. Meter readings are collected for individual licence holders at intervals during the year and converted via a calibration factor to a volume of water extracted.

Water diverted from the river is measured by recording the height at either the gauge or weir with the volume diverted being derived by passing these heights through a rating table. However, with supplementary water being extracted through the same pumps as those extracting water under other categories of access licences, we need more to separate out supplementary extraction. Licence holders must, therefore, notify us of their intention to pump before pumping or diverting water during the declared supplementary event and give meter readings both at the start and end of pumping. This enables the supplementary flow extraction to be assessed independent of other categories of access licences.

Additional Information

Operational announcements for supplementary access are provided in Table 34.

Supplementary usage by river section and total daily supplementary usages are presented in Figure 47 and Figure 48 respectively.

Table 34: Supplementary announcements for reporting period

Date	Use limit (%)	Section	Star Date	End Date	Usage
21-Mar-22	100	Roseneath T/M To Bonshaw Weir	1-Apr-22	30-Jul-22	-
21-Mar-22	100	Bonshaw Weir To Texas Br	1-Apr-22	30-Jul-22	-
21-Mar-22	100	Texas Br To Cunningham Weir	1-Apr-22	30-Jul-22	-
21-Mar-22	100	Cunning Weir To Glenarbon	1-Apr-22	30-Jul-22	-
21-Mar-22	100	Bedwell Downs To Yetman (Gs416005)	1-Apr-22	30-Jul-22	-
21-Mar-22	100	Yetman (Gs416005) To Holdfast T/M	1-Apr-22	30-Jul-22	-
21-Mar-22	100	Pindari Dam To Ashford (Gs416006)	1-Apr-22	30-Jul-22	-
21-Mar-22	100	Ashford (Gs416006) To Macintrye Junction	1-Apr-22	30-Jul-22	-
16-May-22	75	Mungindi Weir (End 22c) To Presbury Weir	16-May-22	30-Jun-22	-
16-May-22	75	Weir River Junction To Mungindi Weir (End 22c)	16-May-22	30-Jun-22	-
16-May-22	75	Dumaresq Junc To B/Billa Weir	16-May-22	30-Jun-22	-
16-May-22	75	B/Billa Weir To G/Windi Weir	16-May-22	27-Jun-22	-
16-May-22	75	G/Windi Weir To Royston	16-May-22	27-Jun-22	-
16-May-22	75	Royston To Trinkie	16-May-22	27-Jun-22	-
16-May-22	75	Avymore To Lockadair	16-May-22	27-Jun-22	-
16-May-22	75	Lockadair To Couralie	16-May-22	27-Jun-22	-
16-May-22	75	Couralie To Boomi Weir	16-May-22	27-Jun-22	-
16-May-22	75	Boomi Weir To Bonanga	16-May-22	27-Jun-22	-
16-May-22	75	Bonanga To Koramba	16-May-22	30-Jun-22	-
16-May-22	75	Corinda To Barra	16-May-22	30-Jun-22	-
16-May-22	75	Barra To Alluri	16-May-22	30-Jun-22	-
16-May-22	75	Alluri To Weir Rr Junc	16-May-22	30-Jun-22	-
1-Jul-22	100	Glenlyon To Roseneath T/M	1-Jul-22	30-Jul-22	-
1-Jul-22	100	Glenarbon To Mcintyre Brk Jubc	1-Jul-22	30-Jul-22	-
1-Jul-22	100	B/Billa Weir To G/Windi Weir	1-Jul-22	30-Jul-22	3
6-Jul-22	74	Mungindi Weir (End 22c) To Presbury Weir	6-Jul-22	5-Aug-22	-
6-Jul-22	74	Weir River Junction To Mungindi Weir (End 22c)	6-Jul-22	5-Aug-22	-
6-Jul-22	74	G/Windi Weir To Royston	6-Jul-22	28-Jul-22	-
6-Jul-22	74	Royston To Trinkie	6-Jul-22	28-Jul-22	-
6-Jul-22	74	Trinkie To Avymore	6-Jul-22	28-Jul-22	-
6-Jul-22	74	Avymore To Lockadair	6-Jul-22	28-Jul-22	-
6-Jul-22	74	Lockadair To Couralie	6-Jul-22	28-Jul-22	-
6-Jul-22	74	Couralie To Boomi Weir	6-Jul-22	29-Jul-22	331
6-Jul-22	74	Boomi Weir To Bonanga	6-Jul-22	30-Jul-22	-
6-Jul-22	74	Bonanga To Koramba	6-Jul-22	31-Jul-22	-
6-Jul-22	74	Corinda To Barra	6-Jul-22	31-Jul-22	-
6-Jul-22	74	Barra To Alluri	6-Jul-22	4-Aug-22	-
6-Jul-22	74	Alluri To Weir Rr Junc	6-Jul-22	4-Aug-22	-
1-Aug-22	100	Glenlyon To Roseneath T/M	1-Aug-22	31-Aug-22	-
1-Aug-22	100	Roseneath T/M To Bonshaw Weir	1-Aug-22	31-Aug-22	15
1-Aug-22	100	Bonshaw Weir To Texas Br	1-Aug-22	31-Aug-22	-
1-Aug-22	100	Texas Br To Cunningham Weir	1-Aug-22	31-Aug-22	-
1-Aug-22	100	Cunning Weir To Glenarbon	1-Aug-22	31-Aug-22	-
1-Aug-22	100	Glenarbon To Mcintyre Brk Jubc	1-Aug-22	31-Aug-22	7
1-Aug-22	100	Macintyre Book Junc To Macintyre River	1-Aug-22	31-Aug-22	-

Date	Use limit (%)	Section	Star Date	End Date	Usage
1-Aug-22	100	Yetman (Gs416005) To Holdfast T/M	1-Aug-22	31-Aug-22	-
1-Aug-22	100	Holdfast T/M To Dumaresq Junc	1-Aug-22	31-Aug-22	-
1-Aug-22	100	Pindari Dam To Ashford (Gs416006)	1-Aug-22	31-Aug-22	-
1-Aug-22	100	Ashford (Gs416006) To Macintrye Junction	1-Aug-22	31-Aug-22	-
10-Aug-22	100	Mungindi Weir (End 22c) To Presbury Weir	14-Aug-22	30-Nov-22	-
10-Aug-22	100	Weir River Junction To Mungindi Weir (End 22c)	14-Aug-22	30-Nov-22	-
10-Aug-22	100	Bedwell Downs To Yetman (Gs416005)	10-Aug-22	30-Nov-22	29
10-Aug-22	100	B/Billa Weir To G/Windi Weir	10-Aug-22	22-Dec-22	256
10-Aug-22	100	G/Windi Weir To Royston	11-Aug-22	29-Nov-22	-
10-Aug-22	100	Royston To Trinkie	12-Aug-22	30-Nov-22	1,062
10-Aug-22	100	Trinkie To Avymore	11-Aug-22	30-Nov-22	-
10-Aug-22	100	Avymore To Lockadair	12-Aug-22	30-Nov-22	-
10-Aug-22	100	Lockadair To Couralie	12-Aug-22	30-Nov-22	-
10-Aug-22	100	Couralie To Boomi Weir	12-Aug-22	30-Nov-22	576
10-Aug-22	100	Boomi Weir To Bonanga	13-Aug-22	30-Nov-22	-
10-Aug-22	100	Bonanga To Koramba	12-Aug-22	30-Nov-22	-
10-Aug-22	100	Barra To Alluri	13-Aug-22	30-Nov-22	851
10-Aug-22	100	Alluri To Weir Rr Junc	15-Aug-22	30-Nov-22	200
29-Aug-22	100	Glenlyon To Roseneath T/M	1-Sep-22	22-Dec-22	-
29-Aug-22	100	Roseneath T/M To Bonshaw Weir	1-Sep-22	22-Dec-22	328
29-Aug-22	100	Bonshaw Weir To Texas Br	1-Sep-22	22-Dec-22	232
29-Aug-22	100	Texas Br To Cunningham Weir	1-Sep-22	22-Dec-22	66
29-Aug-22	100	Cunning Weir To Glenarbon	1-Sep-22	22-Dec-22	63
29-Aug-22	100	Glenarbon To Mcintyre Brk Jubc	1-Sep-22	22-Dec-22	-
29-Aug-22	100	Macintyre Book Junc To Macintyre River	1-Sep-22	22-Dec-22	-
29-Aug-22	100	Dumaresq Junc To B/Billa Weir	1-Sep-22	22-Dec-22	1,319
12-Sep-22	100	Yetman (Gs416005) To Holdfast T/M	12-Sep-22	10-Dec-22	-
12-Sep-22	100	Ashford (Gs416006) To Macintrye Junction	12-Sep-22	10-Dec-22	-
1-Apr-23	100	Glenlyon To Roseneath T/M	1-Apr-23	30-Jun-23	-
1-Apr-23	100	Roseneath T/M To Bonshaw Weir	1-Apr-23	30-Jun-23	181
1-Apr-23	100	Bonshaw Weir To Texas Br	1-Apr-23	30-Jun-23	232
1-Apr-23	100	Texas Br To Cunningham Weir	1-Apr-23	30-Jun-23	340
1-Apr-23	100	Cunning Weir To Glenarbon	1-Apr-23	30-Jun-23	10
1-Apr-23	100	Glenarbon To Mcintyre Brk Jubc	1-Apr-23	30-Jun-23	-
1-Apr-23	100	Macintyre Book Junc To Macintyre River	1-Apr-23	30-Jun-23	-
1-Apr-23	100	Bedwell Downs To Yetman (Gs416005)	1-Apr-23	12-Jun-23	-
1-Apr-23	100	Yetman (Gs416005) To Holdfast T/M	1-Apr-23	12-Jun-23	-
1-Apr-23	100	Holdfast T/M To Dumaresq Junc	1-Apr-23	12-Jun-23	-
1-Apr-23	100	Dumaresq Junc To B/Billa Weir	1-Apr-23	30-Jun-23	726
1-Apr-23	100	B/Billa Weir To G/Windi Weir	1-Apr-23	30-Jun-23	803
1-Apr-23	100	Pindari Dam To Ashford (Gs416006)	1-Apr-23	12-Jun-23	-
1-Apr-23	100	Ashford (Gs416006) To Macintrye Junction	1-Apr-23	12-Jun-23	-
31-Mar-23	6	Mungindi Weir (End 22c) To Presbury Weir	8-Apr-23	12-Apr-23	-
31-Mar-23	6	Weir River Junction To Mungindi Weir (End 22c)	6-Apr-23	12-Apr-23	677
31-Mar-23	6	G/Windi Weir To Royston	4-Apr-23	6-Apr-23	171
31-Mar-23	6	Royston To Trinkie	4-Apr-23	6-Apr-23	514
31-Mar-23	6	Trinkie To Avymore	4-Apr-23	7-Apr-23	109

Date	Use limit (%)	Section	Star Date	End Date	Usage
31-Mar-23	6	Avymore To Lockadair	4-Apr-23	7-Apr-23	1,240
31-Mar-23	6	Lockadair To Couralie	4-Apr-23	8-Apr-23	70
31-Mar-23	6	Couralie To Boomi Weir	4-Apr-23	8-Apr-23	26
31-Mar-23	6	Boomi Weir To Bonanga	4-Apr-23	9-Apr-23	-
31-Mar-23	6	Bonanga To Koramba	4-Apr-23	9-Apr-23	807
31-Mar-23	6	Corinda To Barra	5-Apr-23	10-Apr-23	-
31-Mar-23	6	Barra To Alluri	5-Apr-23	11-Apr-23	214
31-Mar-23	6	Alluri To Weir Rr Junc	6-Apr-23	12-Apr-23	-

Figure 47: Supplementary usage by river section

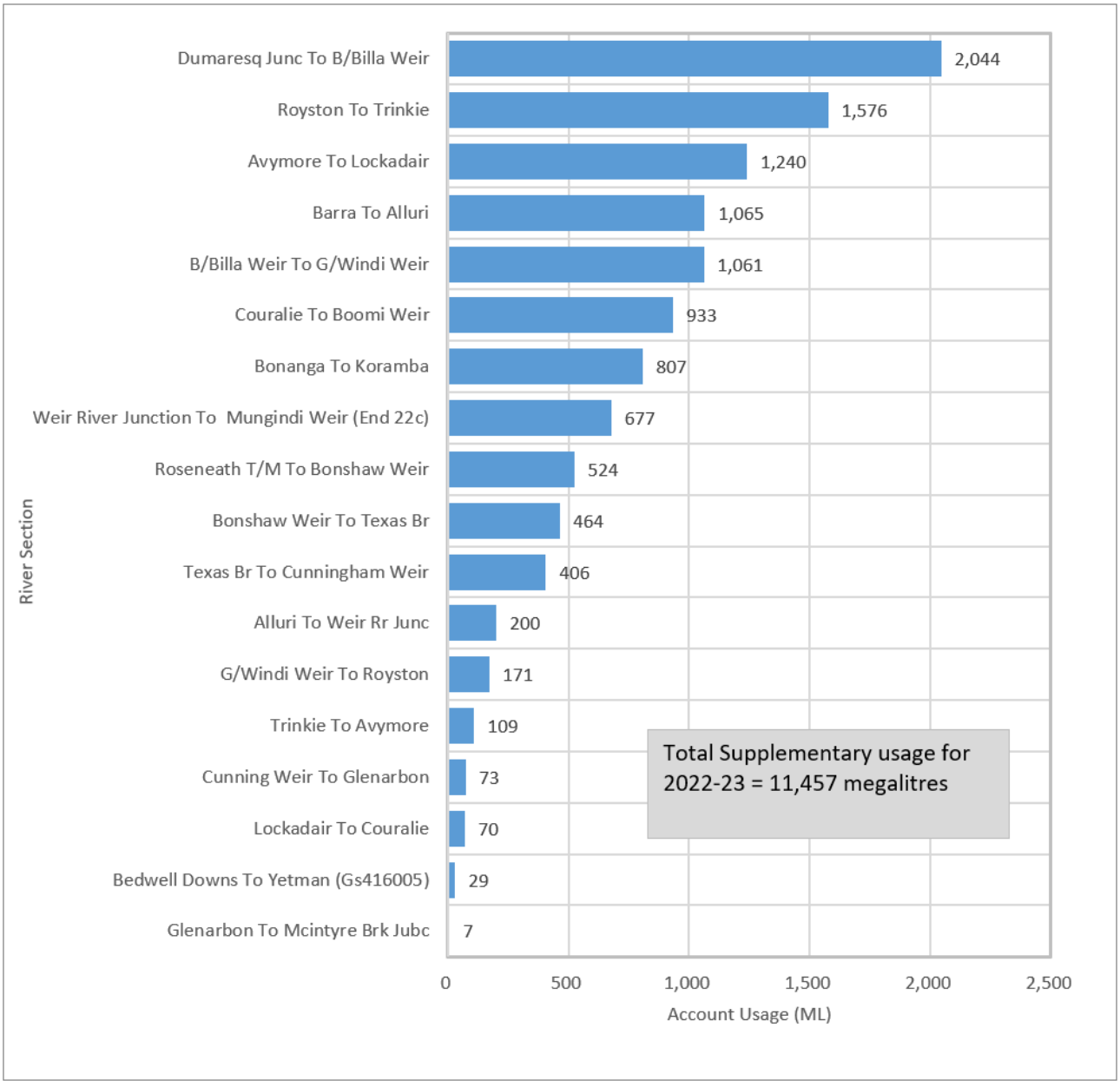
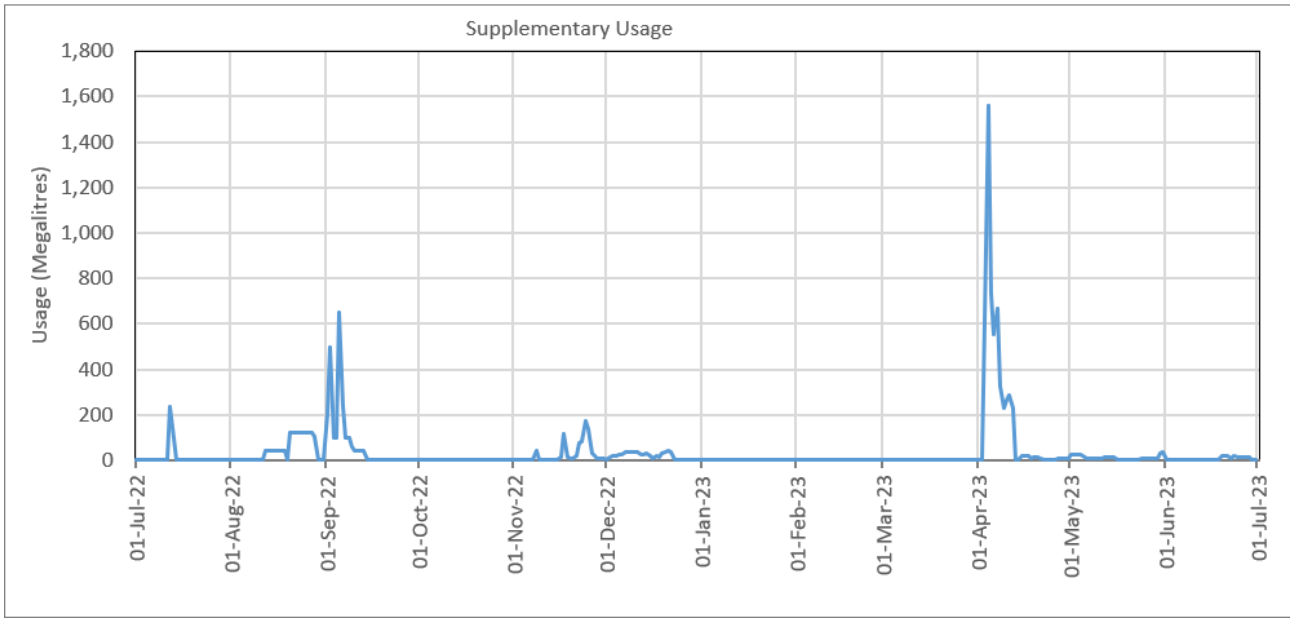


Figure 48: Daily supplementary use for the reporting period.



Note 22—Unaccounted difference

In theory, if all the processes of a water balance could be accurately accounted for, the unaccounted difference would be zero. In reality, because of uncertainty about many the volumes presented in the accounts, the variety of data sources and not all water cycle processes is being accounted for, the statements are not balanced at the end of the accounting process. In order to balance the accounts, a final balancing entry is required, and this is termed the unaccounted difference. As technology improves the accuracy of the account estimates, we anticipate that, relatively, this figure should be lower in future accounts.

Data type

Calculated

Policy

Not applicable

Data accuracy

D[20]—Estimated in the range +/- 100%

Providing agency

NSW Department Climate Change, Energy, the Environment and Water

Data source

Not applicable

Methodology

For surface water, the unaccounted difference is equal to the amount needed to get the correct volume in river at the end of the reporting period, after all the known physical inflows and outflows have been accounted for. The double-entry accounting process attempts to represent the physical movement of water by creating a river asset.

The opening and closing balance of the river volume was estimated according to Note 11.

$$UDSW = Rs - Rc + Ri - Ro$$

Where:

- **UDSW** = Unaccounted difference for Surface Water

[20] The unaccounted differences is rated D accuracy because it is the result of many processes of differing magnitude, and accuracy, and also representing a range of other processes that have not been explicitly represented in the accounts. The figure that is calculated to be the required unaccounted volume in order to balance the accounts is A1 accuracy, +/- 0%

- **Rs** = Opening river volume estimate
- **Rc** = Closing river volume estimate
- **Ro** = Physical outflows from the river (e.g. extractions)
- **Ri** = Physical inflows to the river (e.g. runoff, return flows, dam releases)

Additional information

Table 35: Unaccounted difference summary

Water year	Unaccounted volume	System inflow[21]	Proportion of system inflow
2017–18	71,635	375,995	19%
2018–19	73,645	299,213	25%
2019–20	44,094	217,847	20%
2020–21	407,237	1,114,821	37%
2021–22	3,060,858	5,971,302	51%
2022-23	833,617	2,458,255	34%

[21] System flow refers to the total flow entering the river for the reporting period i.e. gauged Inflow plus storage releases plus ungauged inflow plus rainfall on river.

References

WASB 2012, *Australian Water Accounting Standard 1 Preparation and Presentation of General Purpose Water Accounting Reports* (AWAS 1), Bureau of Meteorology