

Department of Climate Change, Energy, the Environment and Water



General Purpose Water Accounting Report Murrumbidgee Catchment

2022-2023



Acknowledgement of Country

The Department of Climate Change, Energy, the Environment and Water acknowledges Aboriginal people as Australia's First Peoples practicing the oldest living culture on earth and as the Traditional Owners and Custodians of the lands and waters on which we rely.

We acknowledge the people of the Barapa Barapa, Mutthi Mutthi, Nari Nari, Nyeri Nyeri, Wadi Wadi, Wolgalu, Wemba Wemba, Weki Weki and Wiradjuri Nations hold the land and waters of the Murrumbidgee River catchment area is 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 Murrumbidgee River catchment landscape and natural resources.

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Contents

Director’s foreword	9
Contextual statement	10
Accounting extent.....	11
Snapshot	13
Surface water resources and management	23
Significant water accounting policies	50
2022–23 Murrumbidgee physical flow mass balance diagram	51
Statement of water assets and water liabilities	52
Changes in water assets and water liabilities.....	52
Reconciliation and future prospect descriptions	58
Note 1—Allocation accounts	64
Note 2—Available water determination (allocation announcement)	68
Note 3—Allocation account usage	75
Note 4—Allocation assignments (temporary trading)	77
Note 5—Intervally Trade Account (IVT)	80
Note 6—Held environmental water	84
Note 7—Environmental provisions	90
Note 8—Snowy required annual release	98
Note 9—Prior year account adjustment	101
Note 10—Surface water storage	102
Note 11—River channel storage.....	103
Note 12—Storage inflow	104
Note 13—Storage evaporation and storage rainfall	106
Note 14—Gauged tributary inflow, other inflow	107
Note 15—Ungauged runoff estimate	110
Note 16—River evaporation and river rainfall	112
Note 17—Return flows (including re-credit)	113
Note 18—Dam releases, river inflow from dam releases	115
Note 19—End of system flow	118
Note 20—Diversions to Lowbidgee	120
Note 21—Extractions from river	121
Note 22—Basic rights extractions	123
Note 23—Supplementary/Uncontrolled Flow extractions	124
Note 24—Unaccounted volume	137
Note 25—River and groundwater interaction.....	139
Note 26—Snowy River allocation transfer	141
References	143

Abbreviations

Abbreviation/acronym	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
BoM	Bureau of Meteorology
CAIRO	Computer-aided improvements to river operations
CARM	computer-aided river management
DRB	Daily release balance
ECA	environmental contingency allowance
GIS	geographic information system
GPWAR	general purpose water accounting report
IQQM	integrated quantity and quality model
MDBA	Murray–Darling Basin Authority
ML	megalitres (1,000,000 litres)
ML/d	megalitres per day
MODFLOW	modular, three-dimensional, finite-difference groundwater flow model
PSV	Provisional storage volume
SILO	climatic data provision system run by the Queensland Government for the provision of both measured and modelled data
WAS	Water accounting system
WASB	Water Accounting Standards Board
WaterNSW	WaterNSW is a New South Wales Government–owned statutory corporation that is responsible for supplying the state’s bulk water needs, and operating the state’s river systems and dams
WLS	Water licencing system
WSP	water sharing plan

Glossary

Term	Meaning
allocation	the specific volume of water allocated to water allocation accounts in each 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). CARM is the updated version of the previously named 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.
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.

Term	Meaning
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 several 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 <i>Water Management Act 2000</i> 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).
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 <i>Water Management Act 2000</i> 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 of 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)

Term	Meaning
regulated river	<p>a river system where flow is controlled via one or more major man-made structures such as dams and weirs</p> <p>For the purposes of the <i>Water Management Act 2000</i>, 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.</p>
share component	<p>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</p> <p>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.</p>
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
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 licence
surface water	all water that occurs naturally above ground including rivers, lakes, reservoirs, creeks, wetlands and estuaries
tributary	<p>a smaller river or stream that flows into a larger river or stream</p> <p>Usually, several smaller tributaries merge to form a river.</p>
ungauged catchment	<p>a catchment without a flow gauge to accurately record stream flows</p> <p>Modelled estimates must be used to approximate the contribution of ungauged catchments to the main river.</p>
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 licencing system	Database system administered by WaterNSW to manage NSW licence water licences, approvals and associated dealings
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, 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 <i>Water Management Act 2000</i>

Director's foreword

This is the 14th annual release of the general-purpose water accounting report (GPWAR) for the Murrumbidgee Regulated River Water Source. It has been prepared for the accounting period 1 July 2022 to 30 June 2023 (the reporting period), under the Australian Water Accounting Standard 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), licenced allocation accounts (water liabilities) and planned environmental water 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
 - a detailed available water determination report
 - temporary trading by licence category
 - supplementary announcements and usage by river reach
 - physical inflows and outflows to the system for the water year.

While groundwater has not been directly included in this GPWAR (aside from those processes that directly affect the regulated river), annual groundwater summary reports by water source are published separately and accessible via the department's website at [DCCEEW Website](#)

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

- the information presented in these accounts as a faithful representation of the management and operation of the Murrumbidgee Regulated River Water Source for the reporting period
- all data presented in this report is based on the best available information at the time of publication
- NSW Department of 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 of Climate Change, Energy, the Environment and Water

Contextual statement

The Murrumbidgee catchment covers 84,000 square kilometres of southern New South Wales. It is bordered by the Great Dividing Range to the east, the Lachlan catchment to the north and the Murray catchment to the south.

The Murrumbidgee River spans almost 1,600 kilometres, rising in the Monaro Plains near Cooma and flowing westward towards its junction with the Murray River near Balranald. The climate is extremely diverse ranging from alpine conditions in the Snowy Mountains where elevations are over 2,200 metres to semi-arid conditions on the Riverina plains where elevations are less than 50 metres.

The Murrumbidgee River is regulated by Burrinjuck Dam located near Yass at the junction of the Yass and Goodradigbee Rivers. The valley also receives water from the Snowy Mountains Scheme which is stored in Blowering Dam on the Tumut River. Downstream of Narrandera the major effluent of Yanco Creek leaves the river, feeding a series of regulated creeks that flow southwest to eventually join the Murray River. The lower end of the Murrumbidgee River is known as the Lowbidgee, a broad floodplain where the river degrades into a complex area of effluent channels and swamps.

The Murrumbidgee River flows through lands previously occupied by the Wiradjuri people, the largest Aboriginal nation in NSW. Today the Murrumbidgee catchment supports a population of approximately 600,000 people. It includes the Australian Capital Territory and national capital Canberra (432,000 people) and Wagga Wagga, the largest inland city in NSW (69,000 people). The catchment also supports numerous regional cities and towns including Cooma, Tumut, Narrandera, Griffith, Leeton, Hay and Balranald.

Major irrigation districts have developed around Griffith, Leeton and Coleambally producing fruit, vegetables, wine, cotton and rice. Water is delivered to these areas from the river through offtakes at Berembred and Gogeldrie Weirs. Outside of these areas, the dominant agricultural land uses are grazing and dryland cropping.

Groundwater is also an important source of water for industry and agriculture in the catchment. The groundwater and surface water systems in the catchment have a range of connectivity which varies from being highly connected on a permanent or seasonal basis to being permanently disconnected. The interaction is influenced by surface and groundwater use, climate and flood frequency, significance and duration.

Supporting a complex range of natural ecosystems, the Murrumbidgee catchment contains many significant wetland habitats such as the extensive Lowbidgee wetlands and the Tuckerbill and Fivebough Swamps listed under the international Ramsar Agreement for their ecological importance. Extensive areas of riparian river red gum forest along the middle and lower reaches of the river provide valuable riparian habitat for waterbirds and a variety of threatened fauna species.

More detailed information on the catchment is available in the [Catchment Snapshots](#) available from the department's website.

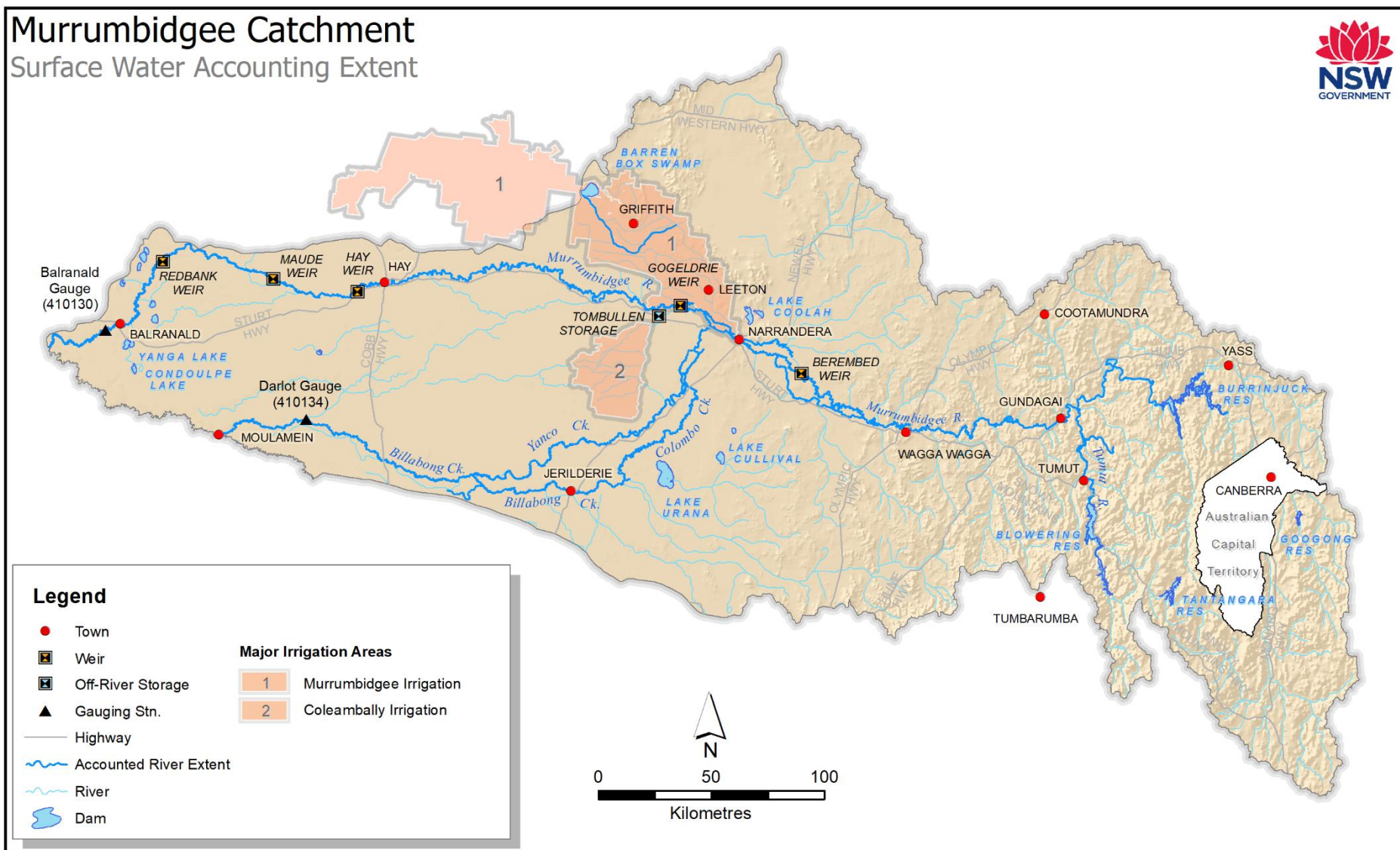
Accounting extent

This report covers the extent illustrated in Figure 1 and details the water management associated with that area. It includes the Tumut River from Blowering Dam to the river's confluence with the Murrumbidgee River, the Murrumbidgee River from Burrinjuck Dam to its confluence with the Murray River (downstream of Balranald), Billabong Creek to its junction with the Edward River downstream of Darlot, Yanco Creek and Colombo Creek.

A full list of the water courses considered to be part of the regulated Murrumbidgee River can be obtained in the *Water Sharing Plan for the Murrumbidgee Regulated River Water Source 2016* (see [DCCEEW Website](#))

While physical groundwater volumes that interact with the regulated river are included in GPWAR statements where possible (and any interactions not directly estimated form part of the unaccounted difference) all other groundwater flows and groundwater management are excluded from the GPWAR.

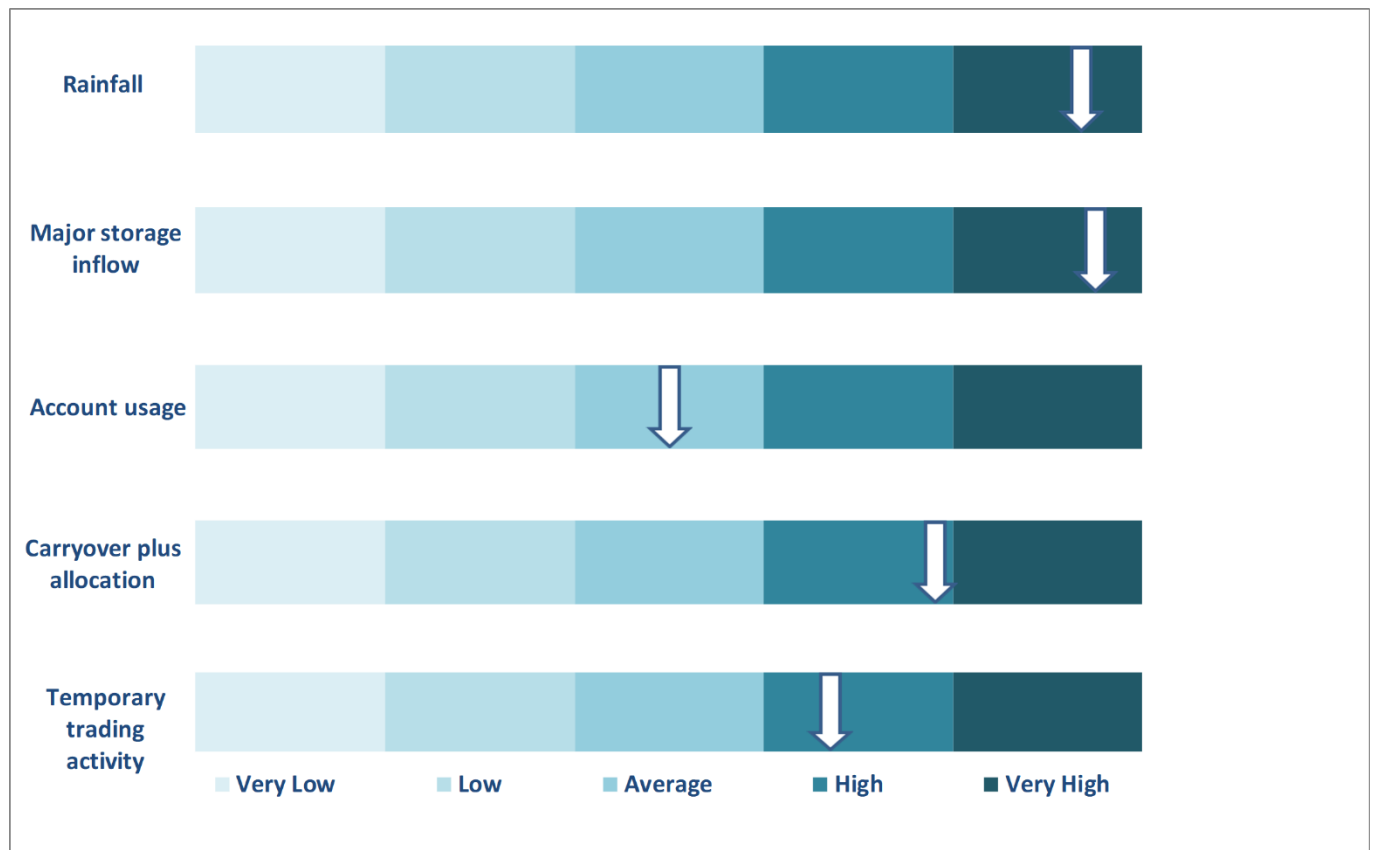
Figure 1: Surface water geographical extent of the accounts



Snapshot

The key indicators for the reporting period relative to other years under water sharing plan management conditions are presented in Figure 2. Rainfall across the catchment and major storage inflow were in the very high range while effective allocation (carryover plus allocation) and Temporary Trading were comparatively high. Account usage for the reporting period was average due to the high rainfall which reduced irrigation water requirements.

Figure 2: 2022–23 Summary indicators for the reporting period



Climate

At Tumbarumba (upper catchment) 1,345 mm of rainfall was recorded in the reporting period (Table 1). Comparatively this volume of rainfall is:

- 138% of the long-term historical median rainfall for this location
- 81% of the highest annual (July-June) volume on record at the location (1,663 mm).

Significant rainfall fell in the months of August 2022 (198 mm) and November 2022 (193 mm) (Figure 3 and Figure 4).

At Hay (lower catchment) 555 mm of rainfall was recorded in the reporting period (Table 2). Comparatively this volume of rainfall is:

- 161% of the long-term historical median rainfall for this location

- 62% of the highest annual (July-June) volume on record at the location (893) mm.

Significant rainfall fell in October 2022 (155 mm) and November 2022 (104 mm) (Figure 3 and Figure 4).

A spatial comparison of rainfall in the reporting period against a longer term rainfall is presented Figure 5 (reporting period) and Figure 6 (average annual rainfall 1961–90). Spatially, rainfall totals during the reporting period were above average across the full extent of the catchment.

Figure 3: Monthly rainfall compared to historical median at Tumbarumba and Hay

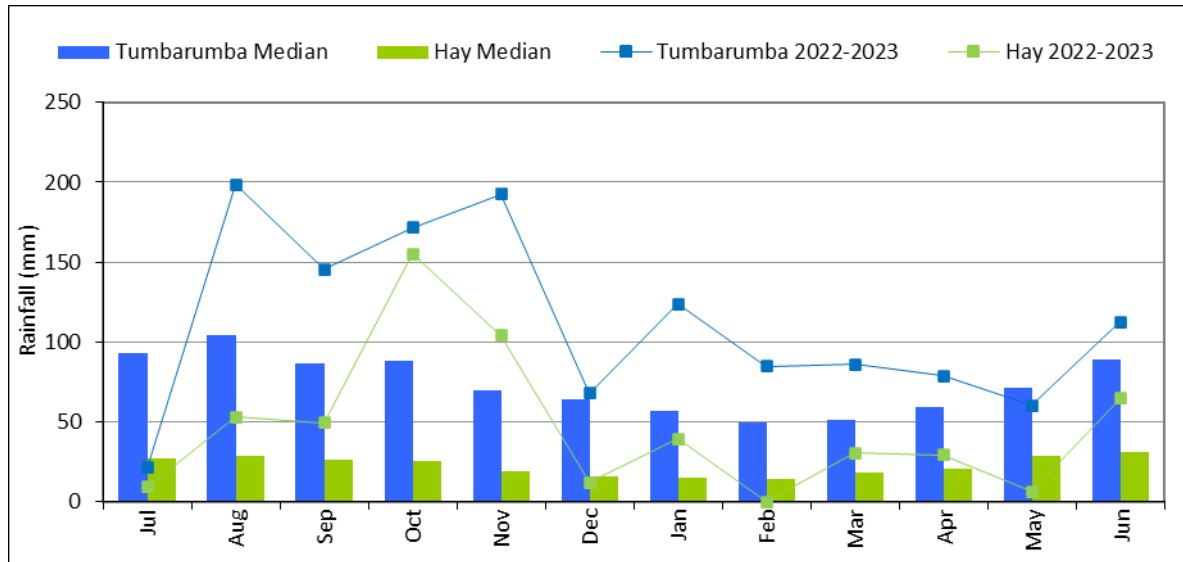


Figure 4: Deviation from historical median rainfall at Tumbarumba and Hay

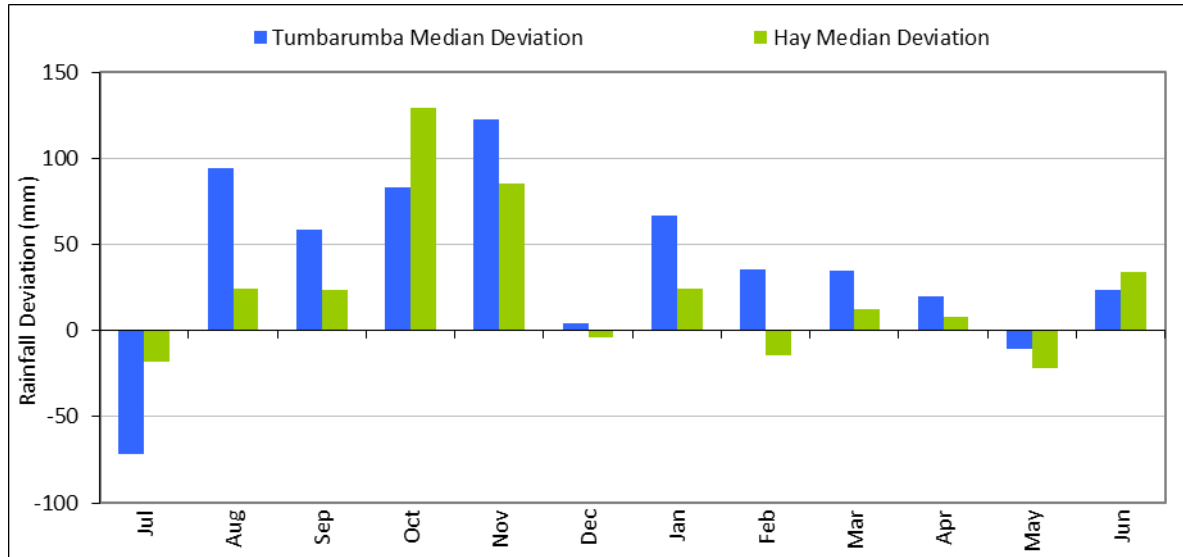


Table 1: Monthly rainfall and historical monthly statistics at Tumbarumba¹—measurements in millimetres

Tumbarumba	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Annual
2022–23	21.4	198.4	145.6	171.6	192.6	68.0	124.0	85.0	86.2	78.8	60.4	112.8	1344.8
Historical Mean	104.0	106.6	90.3	95.4	77.2	70.9	64.2	54.6	66.3	66.2	82.3	101.9	981.5
Historical Median	93.1	104.1	87.0	88.7	69.8	64.0	57.2	49.7	51.6	59.1	71.3	89.3	975.0
Lowest	14.2	8.6	9.6	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.5	6.0	523.6
Highest	254.6	246.6	225.3	259.7	240.2	212.4	203.2	252.2	260.4	224.6	295.4	322.1	1663.2
Highest Year	1985-86	1938-39	1959-60	1975-76	2010-11	1918-19	1896-97	2010-11	1905-06	1973-74	1941-42	1922-23	1955-56

Table 2: Monthly rainfall and historical monthly statistics at Hay¹—measurements in millimetres

Hay	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Annual
2022–23	9.5	53.0	49.6	155.2	104.3	12.2	39.6	0.0	30.8	29.3	6.7	65.0	555.2
Historical Mean	30.5	32.0	30.9	35.3	27.6	27.2	28.0	27.8	28.9	28.3	34.7	35.6	365.7
Historical Median	27.3	28.7	26.3	25.7	18.9	15.9	15.0	14.7	18.3	21.0	28.8	31.2	345.2
Lowest	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.8	142.1
Highest	100.8	107.5	105.9	155.2	152.2	152.4	191.2	203.7	199.7	151.2	133.5	115.6	892.5
Highest Year	1955-56	1888-89	1902-03	2021-22	1911-12	1991-92	1973-74	1972-73	1955-56	1973-74	1987-88	1922-23	1973-74

¹ Long-term statistics are derived from the Bureau of Meteorology—climate data online. The data presented is collected from stations '72043—Tumbarumba Post Office' and '75031—Hay (Miller Street)'. Historical statistics uses data from June 1886 to June 2023 for Tumbarumba and June 1881 to June 2023 for Hay.

Figure 5: Annual rainfall for the reporting period

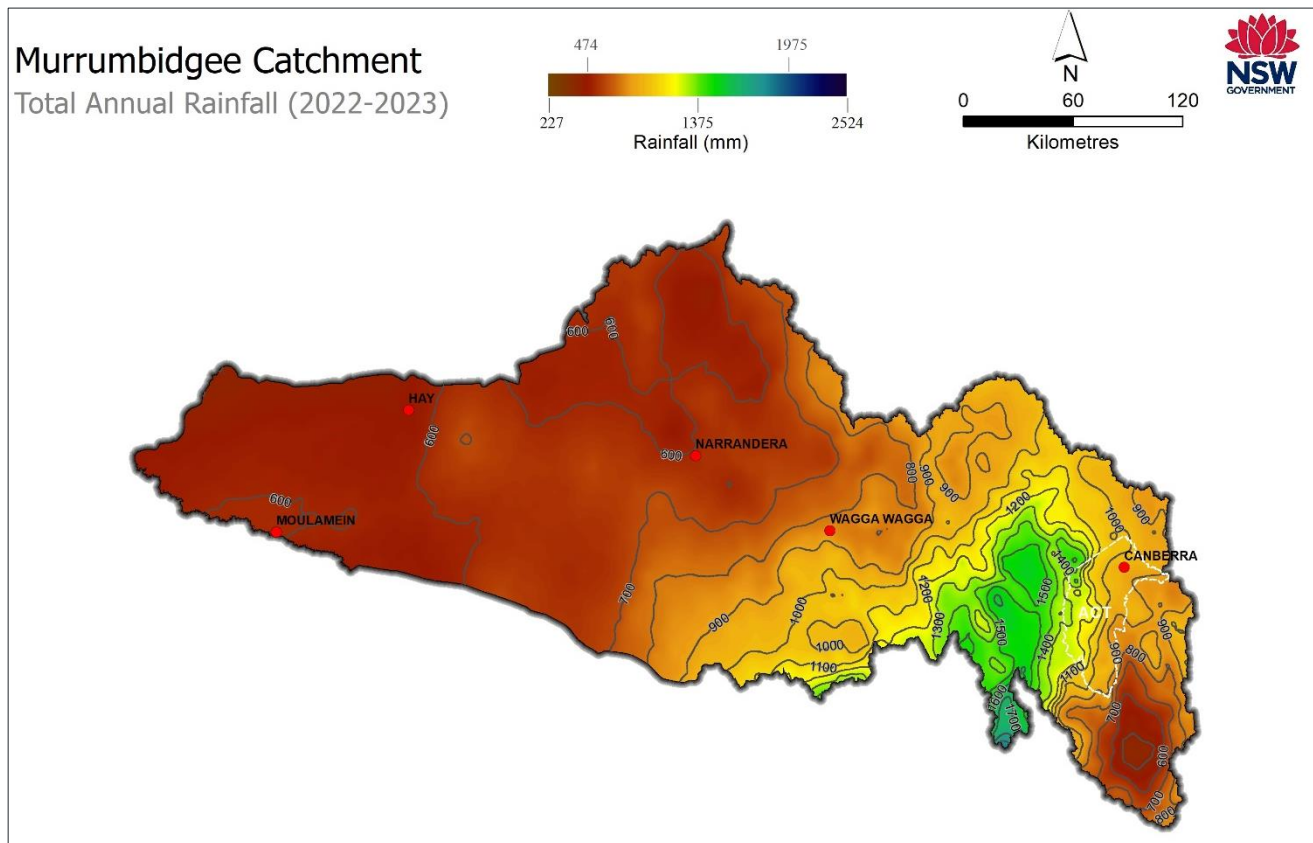
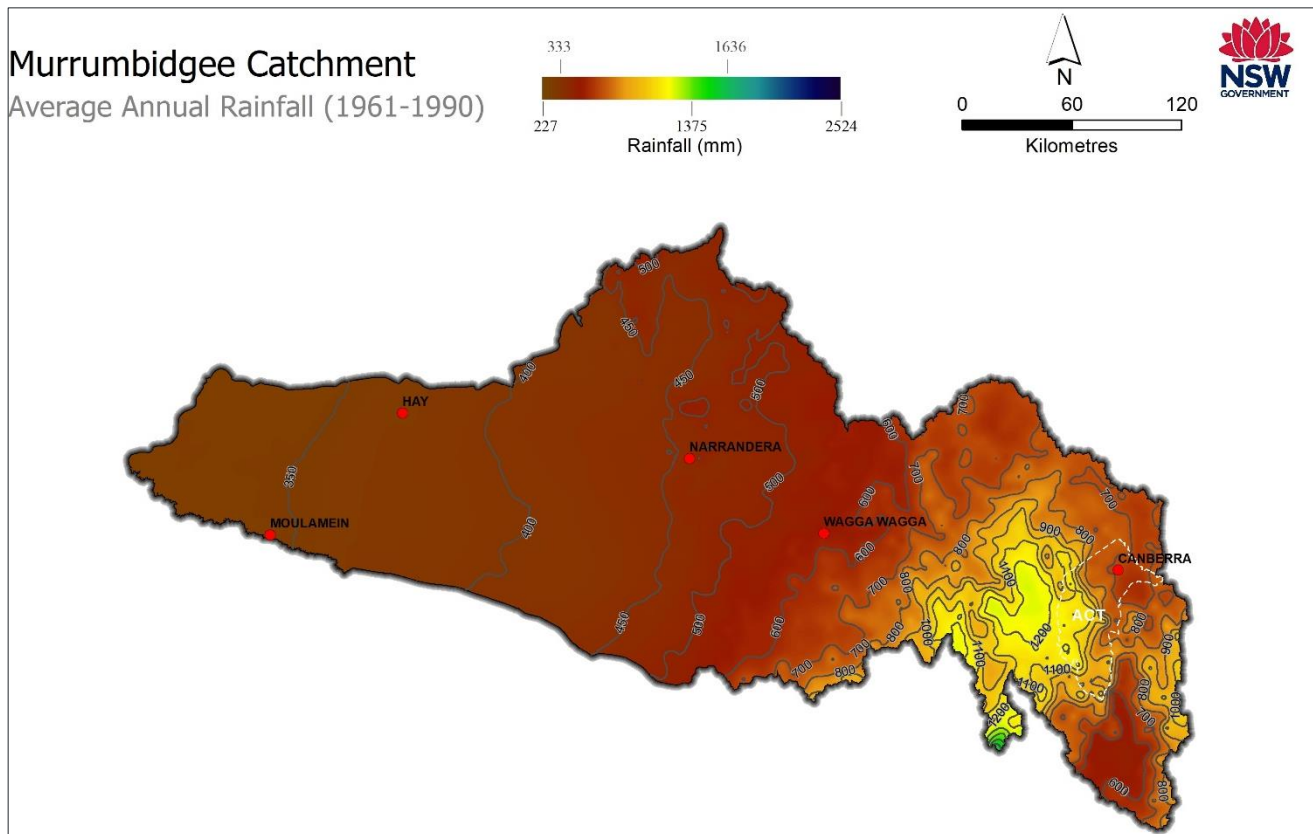


Figure 6: Average annual rainfall (1961–90)



Dam inflows

Historically, the long-term average annual flow (inflow) at the Burrinjuck Dam site has varied significantly cycling through prolonged periods of wet and dry flow regimes. Broadly, the data (Figure 7) illustrates predominantly:

- dry conditions 1900 to 1950
- wet conditions 1950 to 1990
- dry conditions 1990 to present.

For the reporting period, the inflow to Burrinjuck Dam was 3,322,001 megalitres (Figure 9) which is:

- 334% of the long-term median annual inflow (993,185 megalitres per year)
- Comparatively very high to the historical record, exceeding 95% of years on record (1890-91 to 2022-23)
- the 3rd consecutive year of above average inflow for this storage.

The maximum mean daily inflow rate for the reporting period was 173,601 megalitres, occurring on 5 August 2022 (Figure 10).

Daily inflow figures for Blowering Dam (which receives regulated inflows from the Snowy Mountains Scheme) are presented in Figure 11.

Storage volume

Burrinjuck

- Volume at the commencement of the reporting period was 883,994 megalitres or 86% of full supply capacity (Figure 12).
- Volume held at the end of the reporting period was 931,967 megalitres or 91% of full supply capacity, an increase of 5% for the year.
- The maximum volume held during the reporting period was 1,090,403 megalitres or 106% of full supply capacity on 9 October 2022.

Blowering

- Volume at the commencement of the reporting period was 1,592,228 megalitres or 98% of full supply capacity (Figure 14).
- Volume held at the end of the reporting period was 1,525,466 megalitres or 94% of full supply capacity, a decrease of 4% for the year.
- The maximum volume held during the reporting period was 1,691,625 megalitres or 104% of full supply capacity on 4 November 2022.

Figure 7: Long-term annual flow upstream of Burrinjuck Dam cumulative deviation from the mean

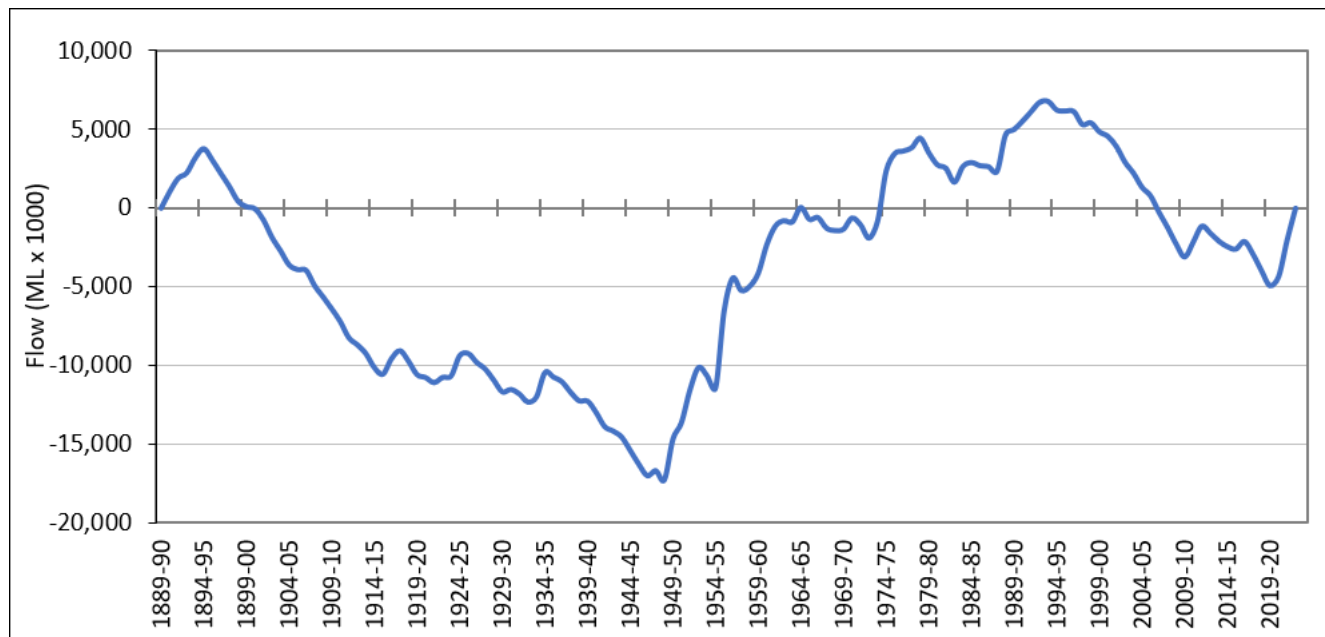


Figure 8: Long-term sequence of years below mean inflow

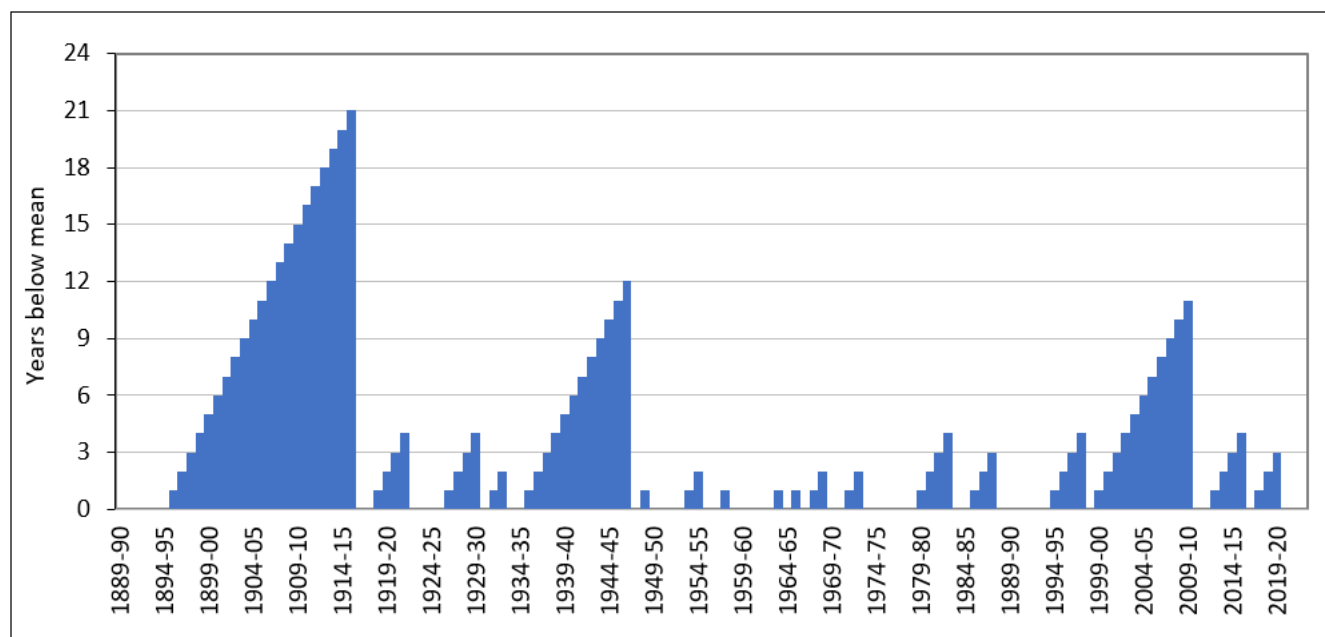


Figure 9: Long-term inflows to Burrinjuck Dam against mean and reporting year inflow

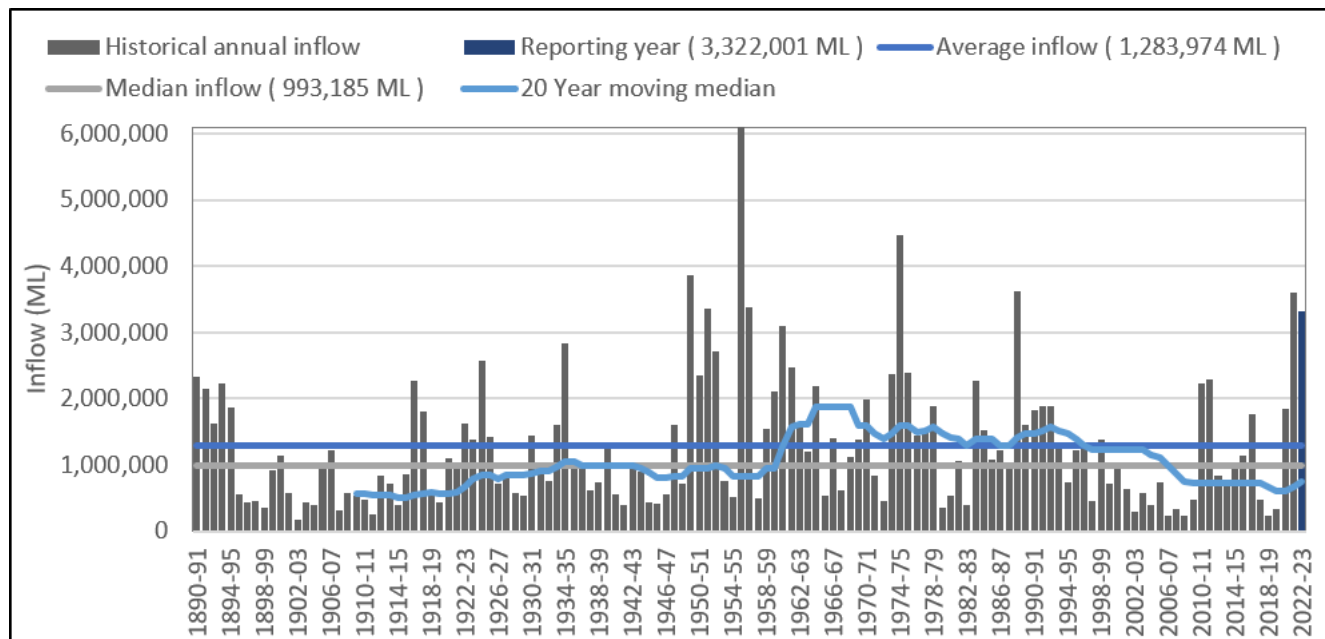


Figure 10: Daily inflows to Burrinjuck Dam and rainfall (reporting period)

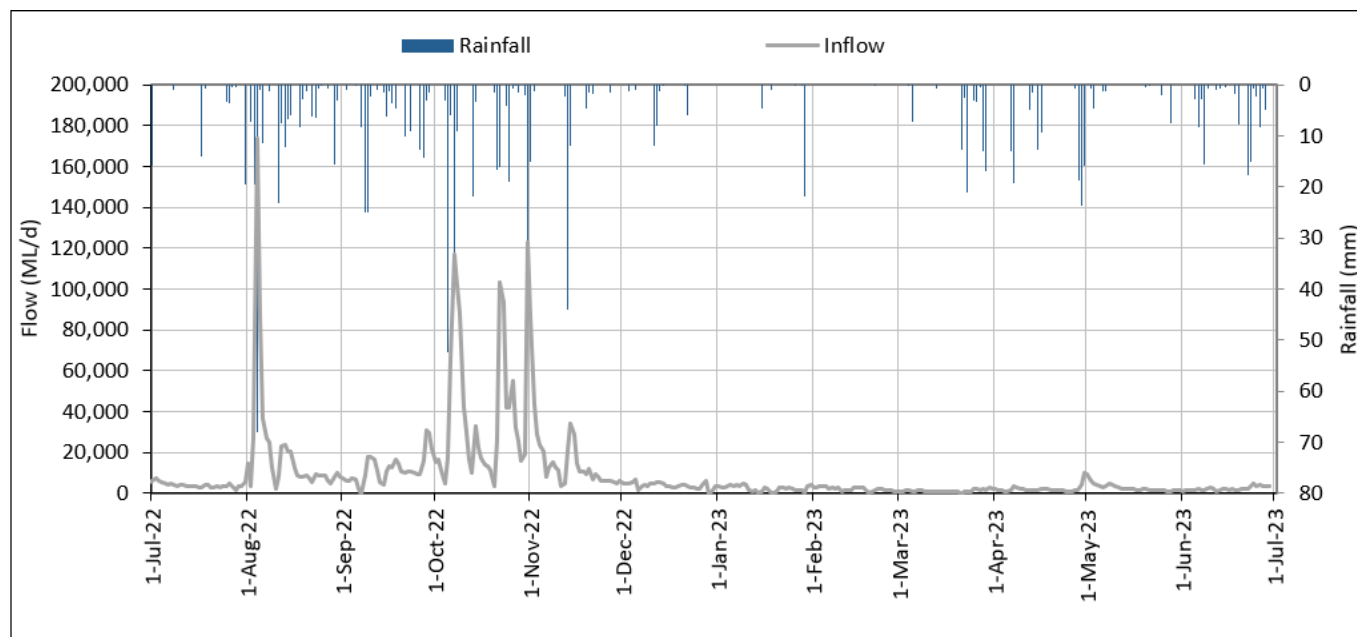


Figure 11: Daily inflows to Blowering Dam and rainfall (reporting period)

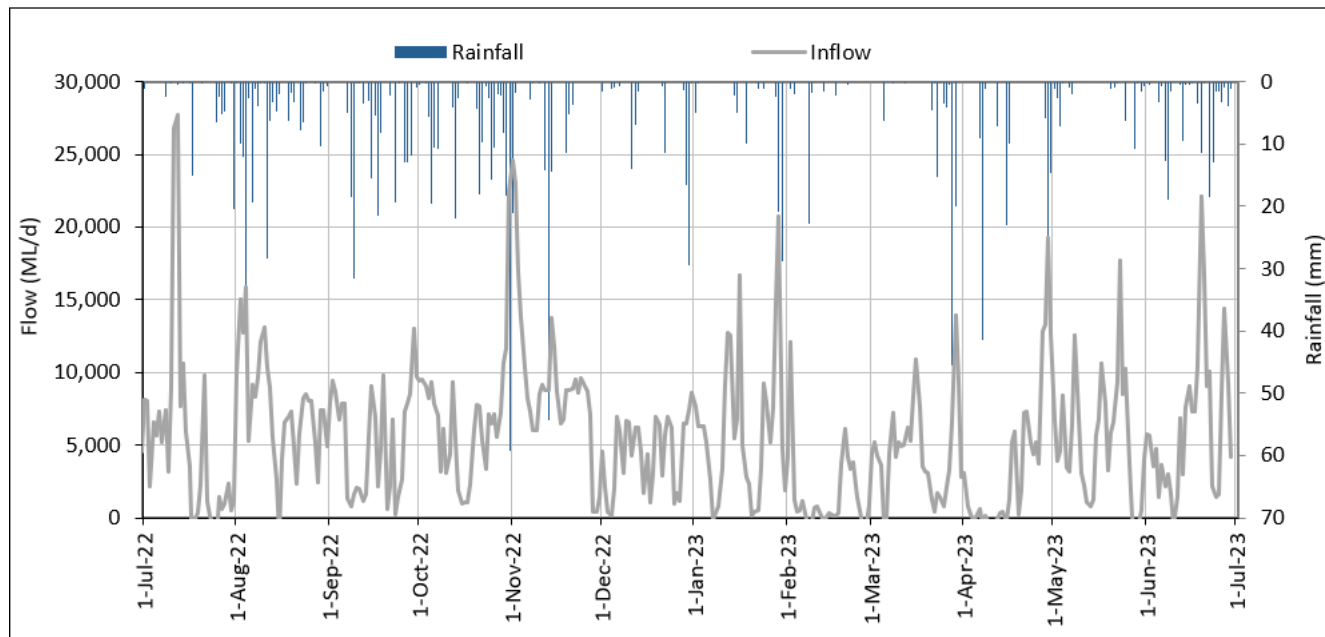


Figure 12: Burrinjuck Dam storage volume and percentage full

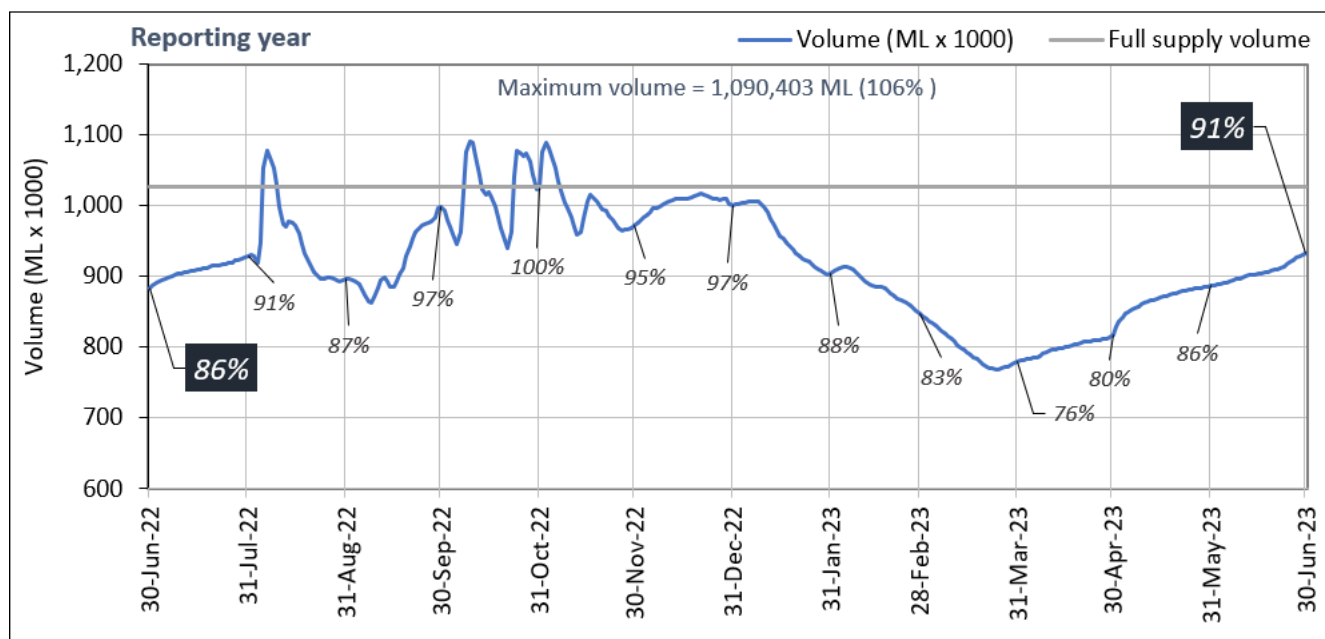


Figure 13: Burrinjuck Dam historical storage volumes

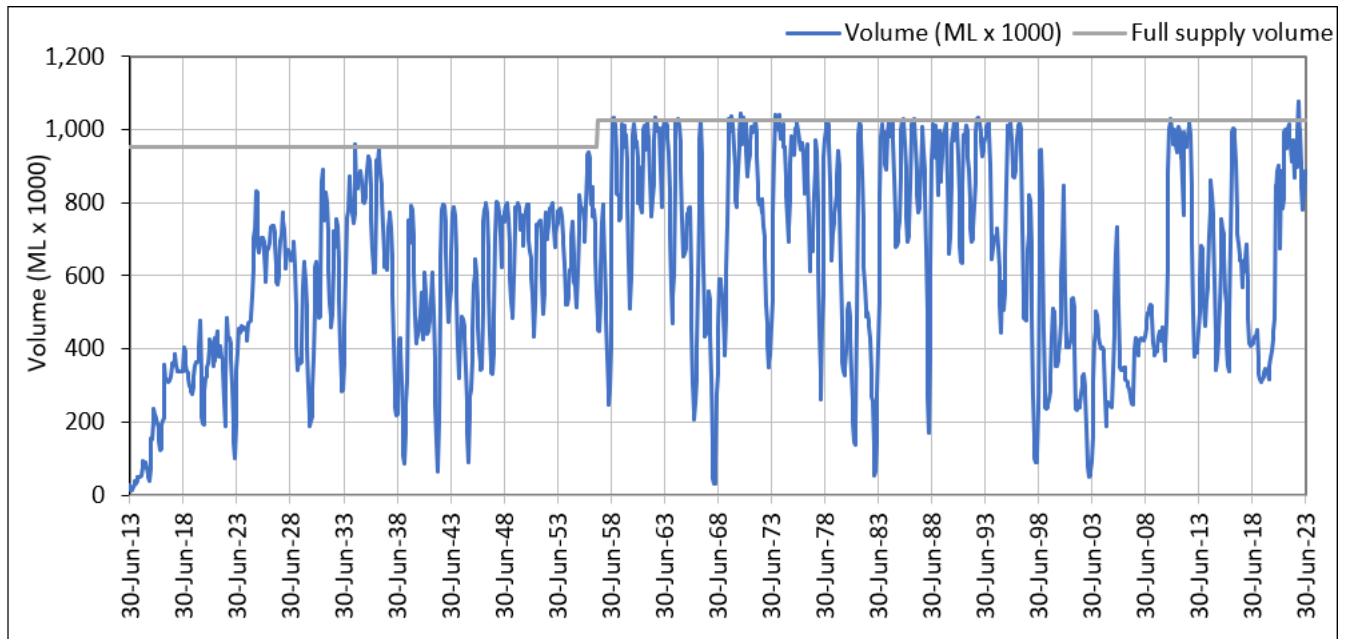


Figure 14: Blowering Dam storage volume and percentage full

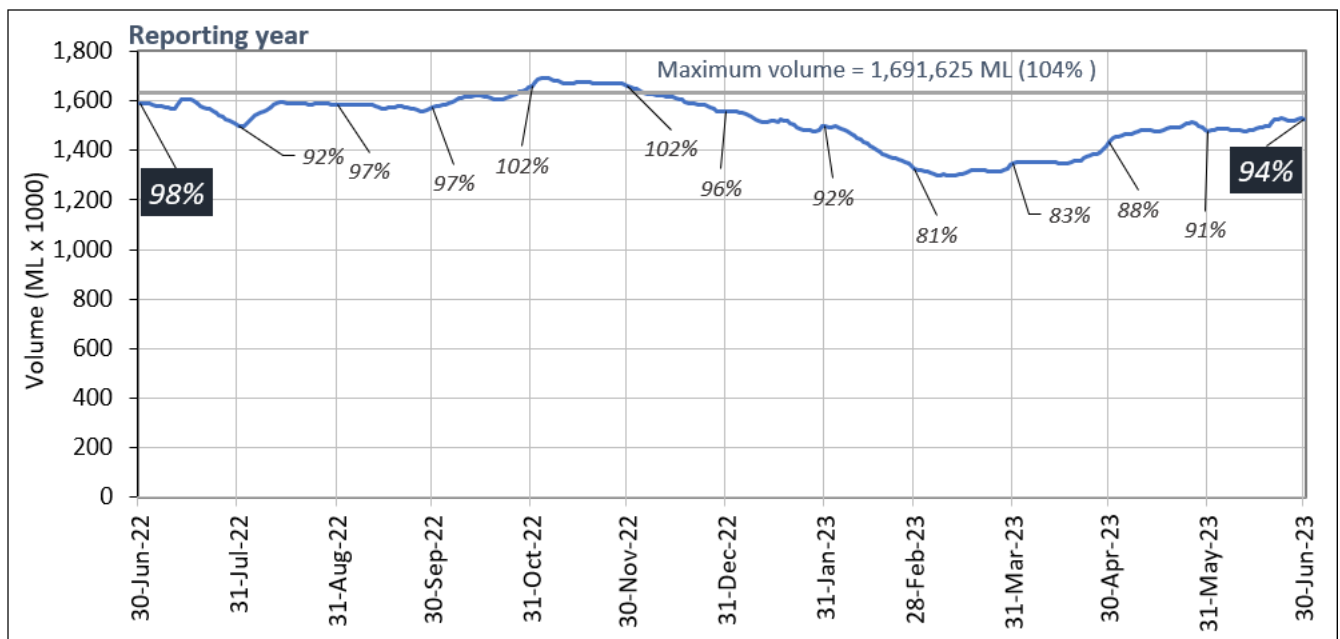
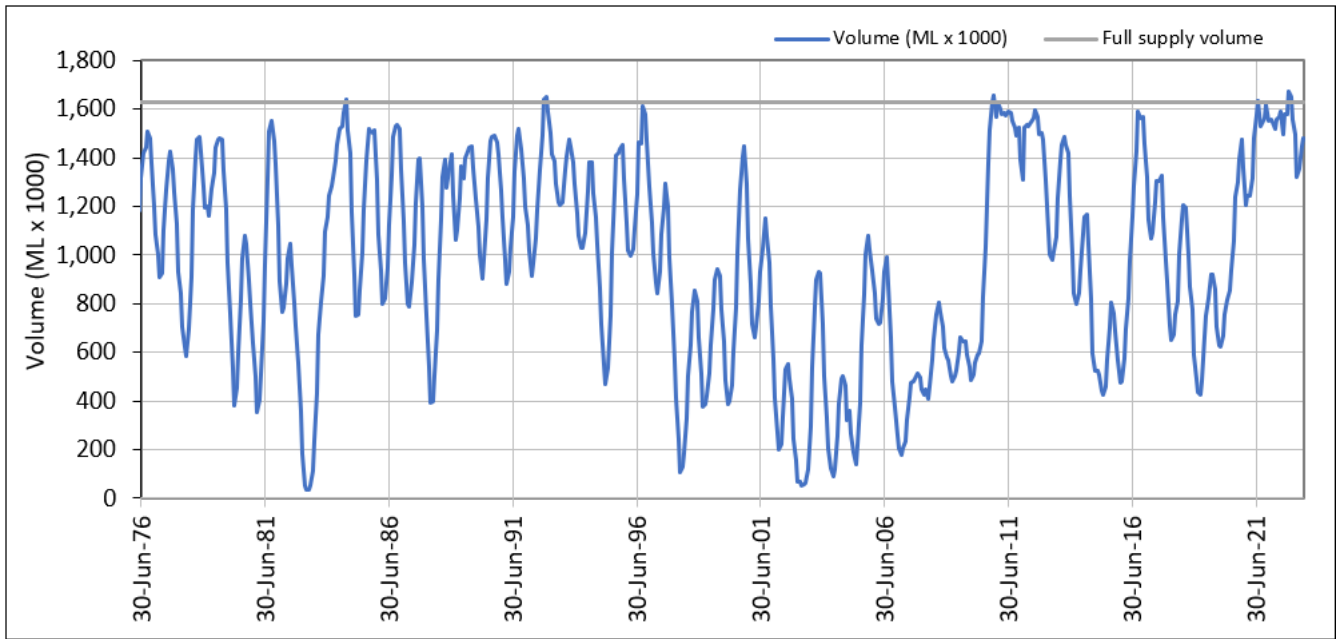


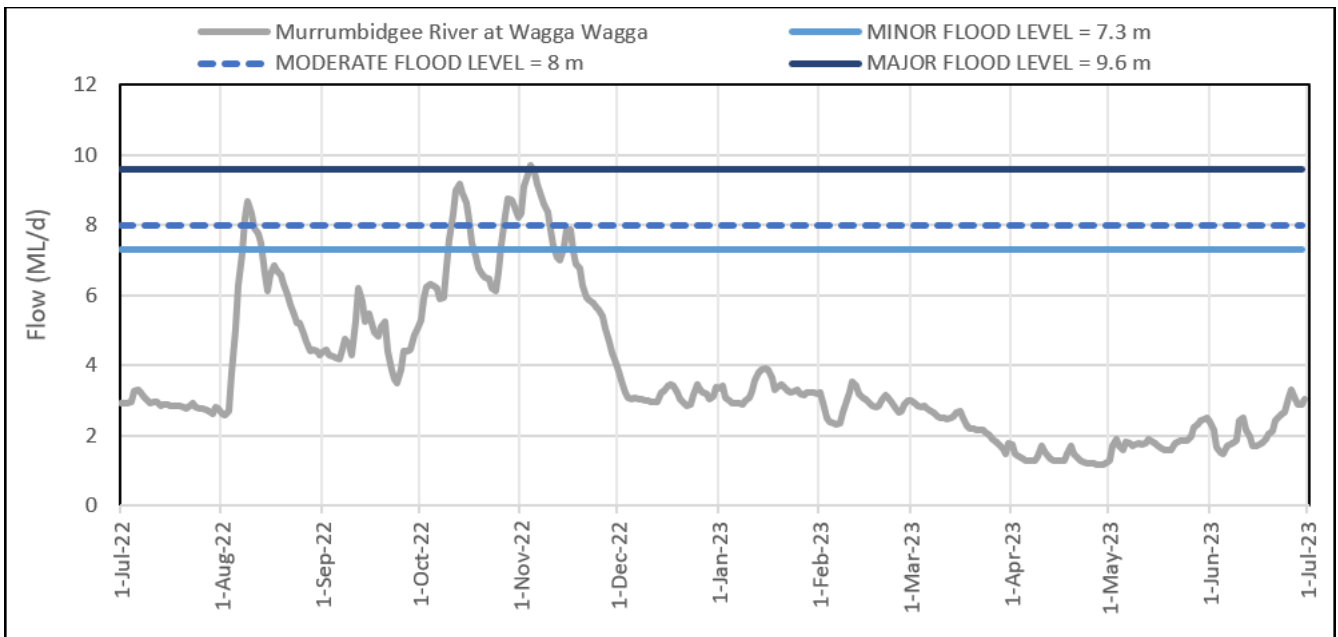
Figure 15: Blowering Dam historical storage volumes



Major high flow events

There were three separate events that exceeded the flood level indicators for the Murrumbidgee River at Wagga Wagga within the reporting period. The river height at Wagga Wagga exceeded the major flooding indicator level of 9.6 metres on 4 November 2022 and peaking at 9.7 metres on the same day. The second largest event occurred in October 2022 with a peak of 9.2 metres on the 13 October 2022. The third event occurred in August 2022 with a peak of 8.7 metres on the 9 August 2022. No additional high flow events occurred in the Murrumbidgee from 16 November 2022 for the remainder of the reporting period (Figure 16).

Figure 16: Murrumbidgee River at Wagga Wagga maximum daily flow heights²



² Flood indicator levels sourced from the Bureau of Meteorology

Surface water resources and management

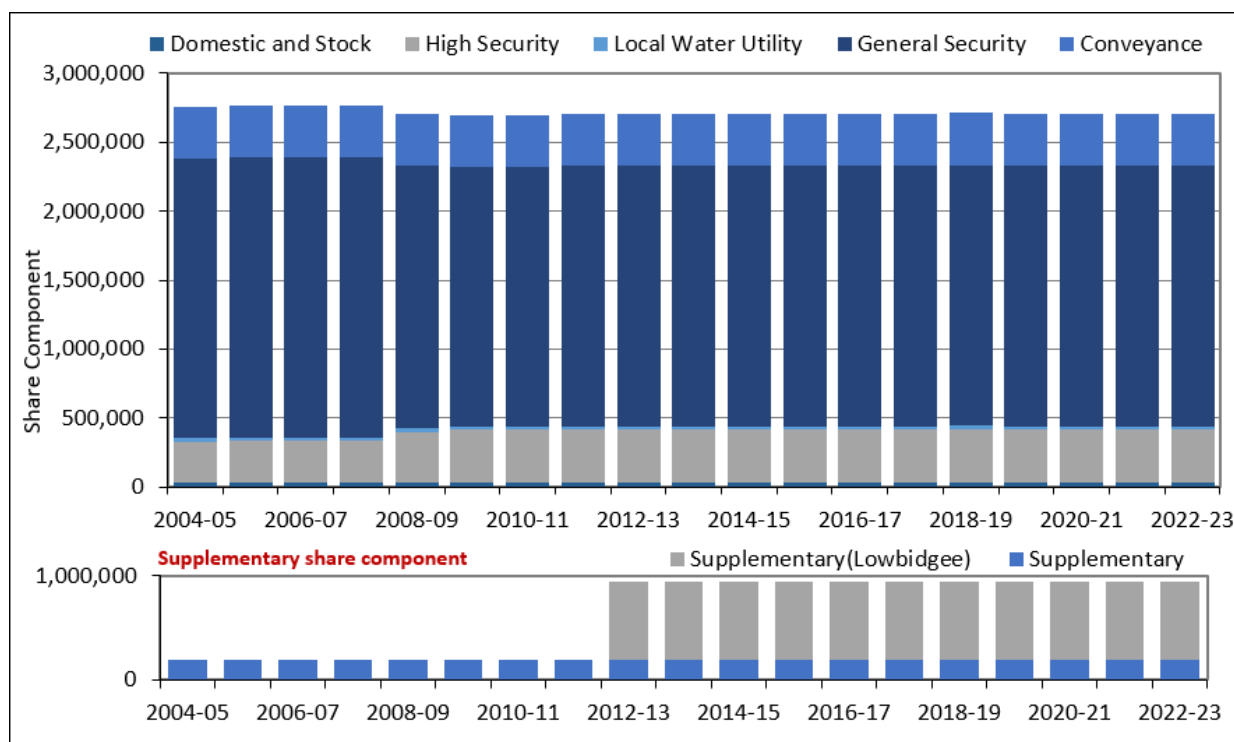
Policy and management

The Murrumbidgee Regulated River Water Source was managed under the conditions set out in the *Water Sharing Plan for the Murrumbidgee Regulated River Water Source 2016*. This plan commenced on 1 July 2016 and will remain active until 30 June 2026 or alternatively until a replacement plan is gazetted. 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 increased in the reporting period by 2 shares (Figure 17) with domestic and stock licences decreasing by 150 shares, high security licences increasing by 147 shares and general security increasing by 5 shares. Domestic and stock licences are non-tradeable “specific purpose” licences. Entitlement will commonly vary as unwanted licences are surrendered to avoid further water charges, or alternatively, new licences issued following approved applications for new specific purpose water access licences.
- Total issued share on 30 June 2023 was 3,654,216, which includes 198,780 shares of supplementary access licences and 747,000 shares of supplementary (Lowbidgee) access licences (Table 3).

Figure 17: Murrumbidgee share component since the commencement of the water sharing plan³



³ Includes all access licences issued under the water sharing plan and therefore held environmental water.

Table 3: Issued share component annual change

Licence category	Share component 30 June 2022	Share component 30 June 2023	Share change
Domestic and Stock	30,158	30,008	(150)
Local Water Utility	23,816	23,816	0
High Security	386,498	386,645	147
General Security	1,891,995	1,892,000	5
Conveyance	375,968	375,968	0
Supplementary	198,780	198,780	0
Supplementary (Lowbidgee)	747,000	747,000	0
Total	3,654,214	3,654,216	2

Access licence account management

An annual accounting (with carryover) procedure is implemented in this water source allowing for general security (and conveyance) access licence holders to mitigate the risk of future shortfalls and carryover up to 0.30 megalitres per share (30%). A limit of 1 megalitre per share (100%) for carryover plus water received from available water determinations applies.

Additionally, general security account holders have access to a provision under the water sharing plan (uncontrolled flow access) to further mitigate potential shortfalls in dry years with low allocations. During periods of announced access, general security holders are eligible to extract water from unregulated events downstream of the major storages, without debit to the access licence balance. Should allocations improve part or all of any unregulated take may revert to become accountable against the licence. The triggers and limits for access to this water are summarised in Table 5. Further information on uncontrolled flow access is available in note 23 of this GPWAR.

All other categories of licence have a maximum credit of 100% or 1 megalitre per share, and do not have any carryover provisions available. The access licence accounting rules are summarised in Table 4.

Table 4: Murrumbidgee licenced allocation accounting rules

Licence Category	AWD plus carryover limit	Carryover limit	Annual use limit	Maximum AWD
Coleambally Irrigation (Conveyance)	1 ML/share	0.30 ML/Share	N/A	1 ML/share
Domestic and Stock [All categories]	N/A	0 ML/Share	N/A	100%
Local Water Utility	N/A	0 ML/Share	N/A	100%
Murrumbidgee Irrigation (Conveyance)	1 ML/share	0.30 ML/Share	N/A	1 ML/share
Regulated River (Conveyance)	1 ML/share	0.30 ML/Share	N/A	1 ML/share
Regulated River (General Security)	1 ML/share	0.30 ML/Share	N/A	1 ML/share
Regulated River (High Security) [All categories]	N/A	0 ML/Share	N/A	1 ML/share
Supplementary Water	N/A	0 ML/Share	N/A	1 ML/share
Supplementary Water (Lowbidgee)	N/A	0 ML/Share	N/A	1 ML/share

Table 5: Murrumbidgee uncontrolled flow access provision

Uncontrolled Flow Access (UCF) licence category	AWD limit for UCF	AWD plus carryover limit for UCF	AWD plus UCF usage limit	AWD plus carryover plus UCF limit
Regulated River (General Security)	0.70 ML/share	0.85 ML/Share	0.85 ML/share	1 ML/share

Extreme events stage and temporary water restrictions

The NSW Extreme Events Policy was released in October 2018 to provide a framework for managing extreme events in the major river systems of the NSW. 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 NSW *Water Management Act 2000* and have been implemented in several river valleys in the recent drought to preserve water for critical needs.

Table 6 outlines the conditions that may be associated with different stages of criticality for surface water quality. Further information is available at industry.nsw.gov.au/water/what-we-do/legislation-policies/eep

Table 6: 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.

Stage	Stage description	Stage evidence base
4	Critical drought	Only able to deliver restricted town water supply, stock and domestic and other restricted high priority demands.

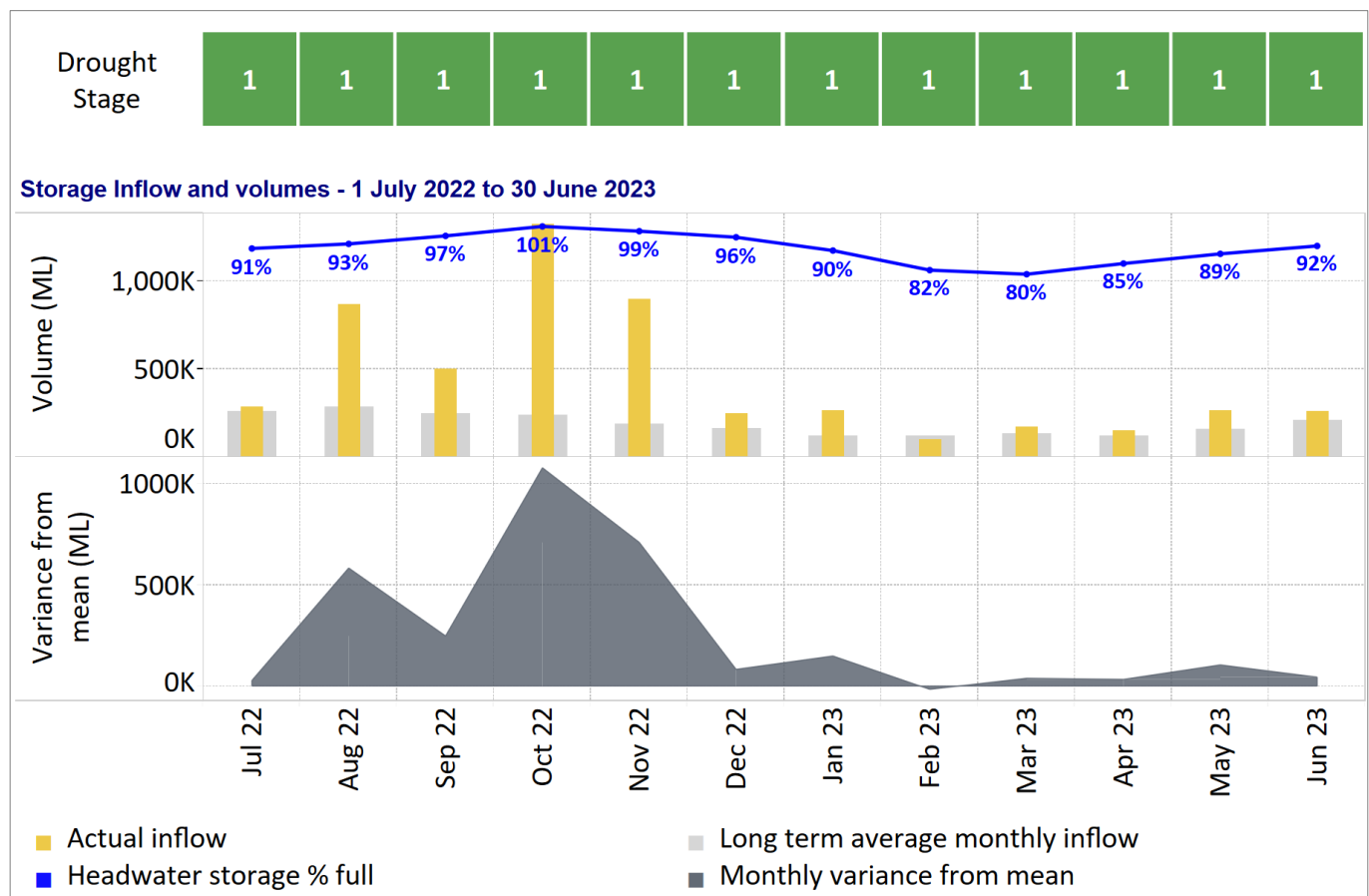
Extreme events stage

The Murrumbidgee regulated river remained in stage 1 (normal operation) for the entirety of the reporting period (Figure 18).

Temporary water restrictions

No restrictions on access licences occurred in the reporting period.

Figure 18: Drought stage for the reporting period referenced with monthly headwater storage inflows, monthly storage inflow variance from mean



Water resources and availability

Regulated supply

- Domestic and Stock, Local Water Utility and subcategories of High Security licences received an opening available water determination (AWD) of 100%, the maximum allowable under the water sharing plan.
- High security access licences (no subcategory) received an opening AWD of 0.95 megalitres per share (95% equivalent). An additional 0.05 was allocated on 16 January 2023 (as general security reached full)

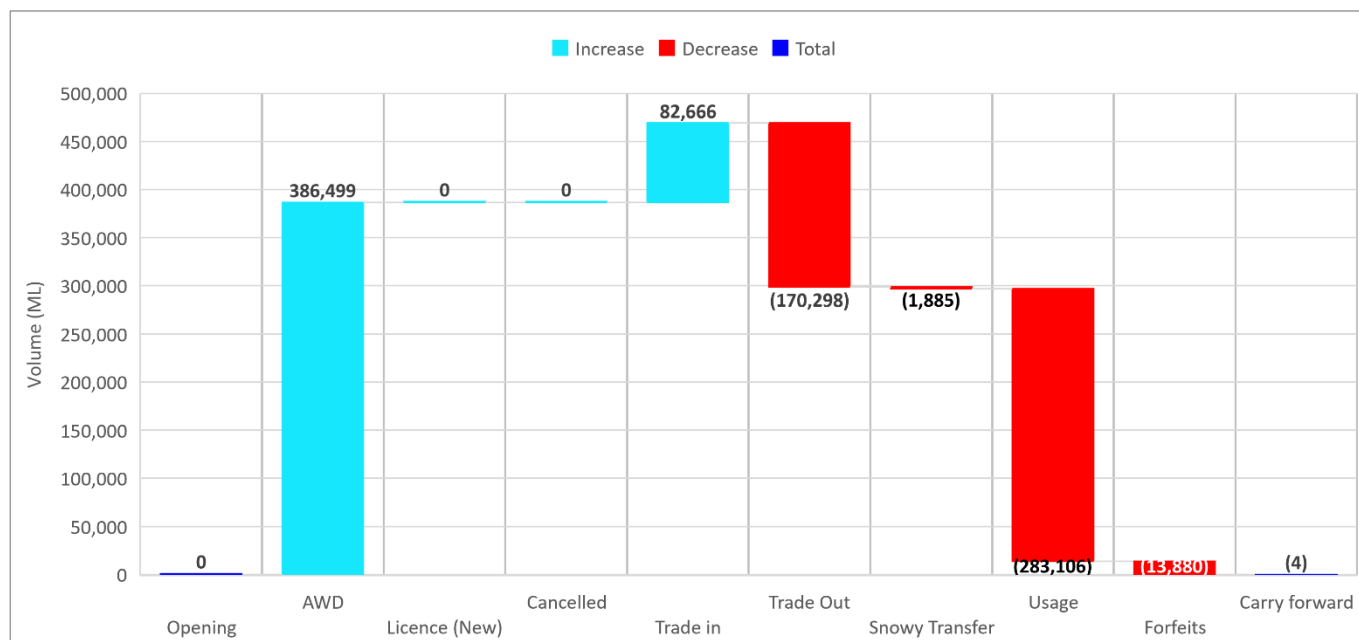
allocations). This cumulative allocation of 1 megalitre per share (100% equivalent) is the maximum allowable under the water sharing plan.

- Regulated river (Conveyance), Murrumbidgee Irrigation (Conveyance) and Coleambally Irrigation (Conveyance) had a combined carry over of 105,440 megalitres. These licences received equivalent opening AWD's of 35%, 70% and 70%, respectively with increased AWD during the reporting period resulting in equivalent cumulative AWD's of 80%, 73% and 71% at end of reporting period.
- General security access licences had a carryover of 520,613⁴ megalitres into the reporting period, equating to 28% of share (maximum carryover limit being 30%).
- General security access licences received an opening AWD of 0.35 megalitres per share (35%).
- General security access licences received 11 additional AWD announcements taking the total water availability (carryover plus allocation) to 100% by 16 January 2023 (Figure 22).
- Across all categories, by volume, this was the third consecutive water year that all categories of access licence reached maximum allocation and the 7th occurrence under water sharing plan management conditions (Figure 23).
- Full allocation announcement details are available in note 2 of this GPWAR.

Allocation account summary

A summary illustration of the accounting for High Security, Conveyance and General Security access licence categories in the Murrumbidgee 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 Murrumbidgee High Security



⁴ Carryover figure presented prior to adjustments for snowy transfer (water for rivers program) licences. These accounting adjustments are presented in the account balances report presented in Note 1, Table 11 of the GPWAR.

Figure 20: Annual water account summary Murrumbidgee Conveyance

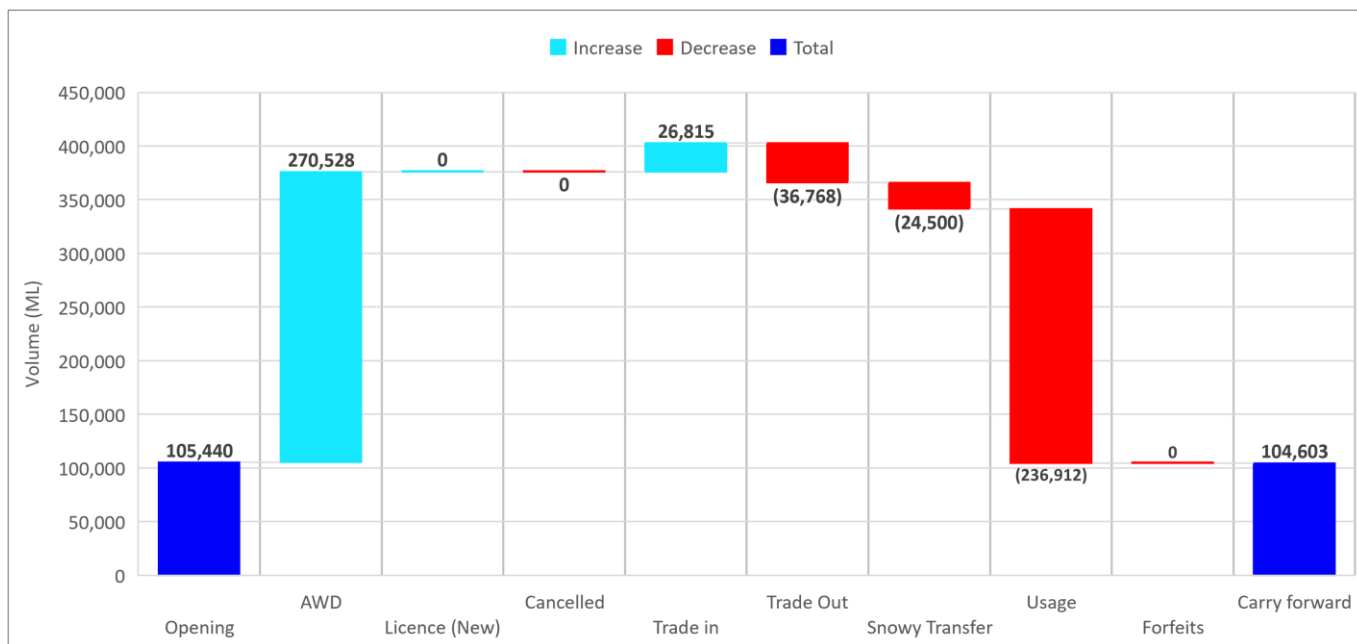
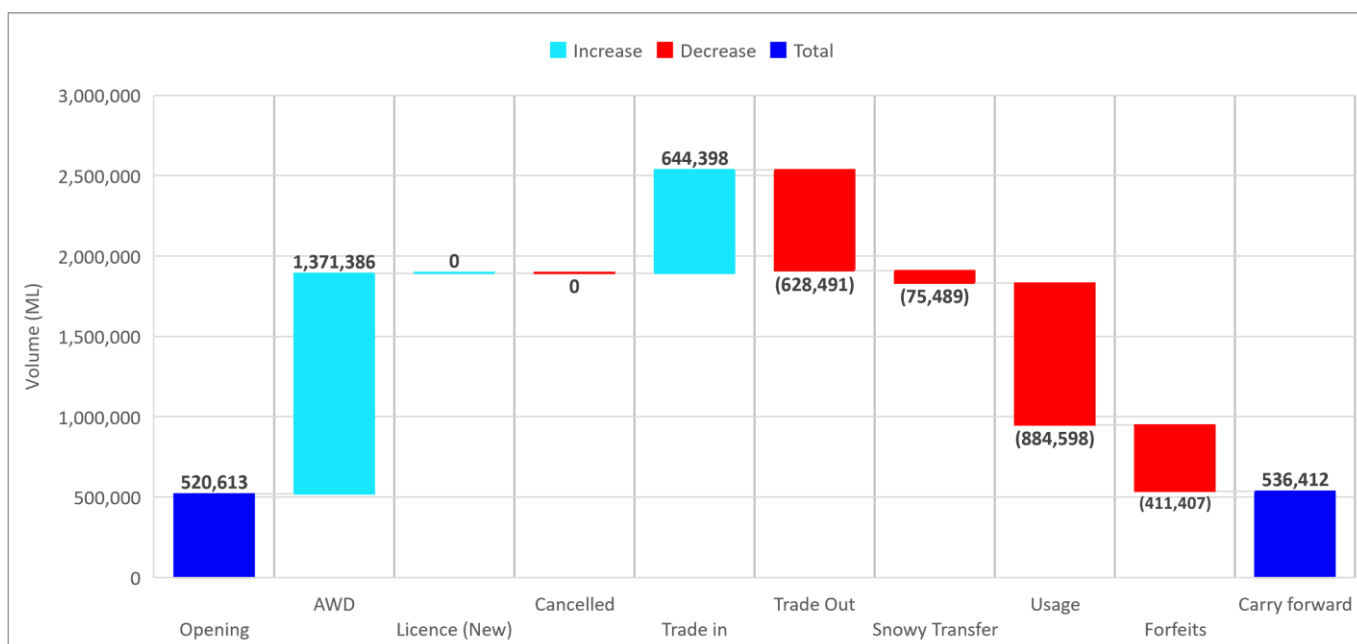


Figure 21: Annual water account summary Murrumbidgee General Security



Supplementary access and tributary inflow

- Supplementary access licences including the sub-category of supplementary water (Lowbidgee) received an opening AWD of 1 megalitre per share (100% equivalent), the maximum allowable under the water sharing plan. Access to the allocation is dependent on operational announcements for supplementary access throughout the year.
- At water source level 325 days of supplementary access was available in the reporting period (Figure 24).
- By volume 44% of total tributary inflow to the regulated Murrumbidgee River, downstream of the major storages was contributed by the Goobarragandra River and Tarcutta Creek (Figure 25)

- Detailed supplementary announcement details and section usages are available in note 23 of this GPWAR.

Figure 22: Incremental available water determinations and carryover volumes for general security as a proportion of share component

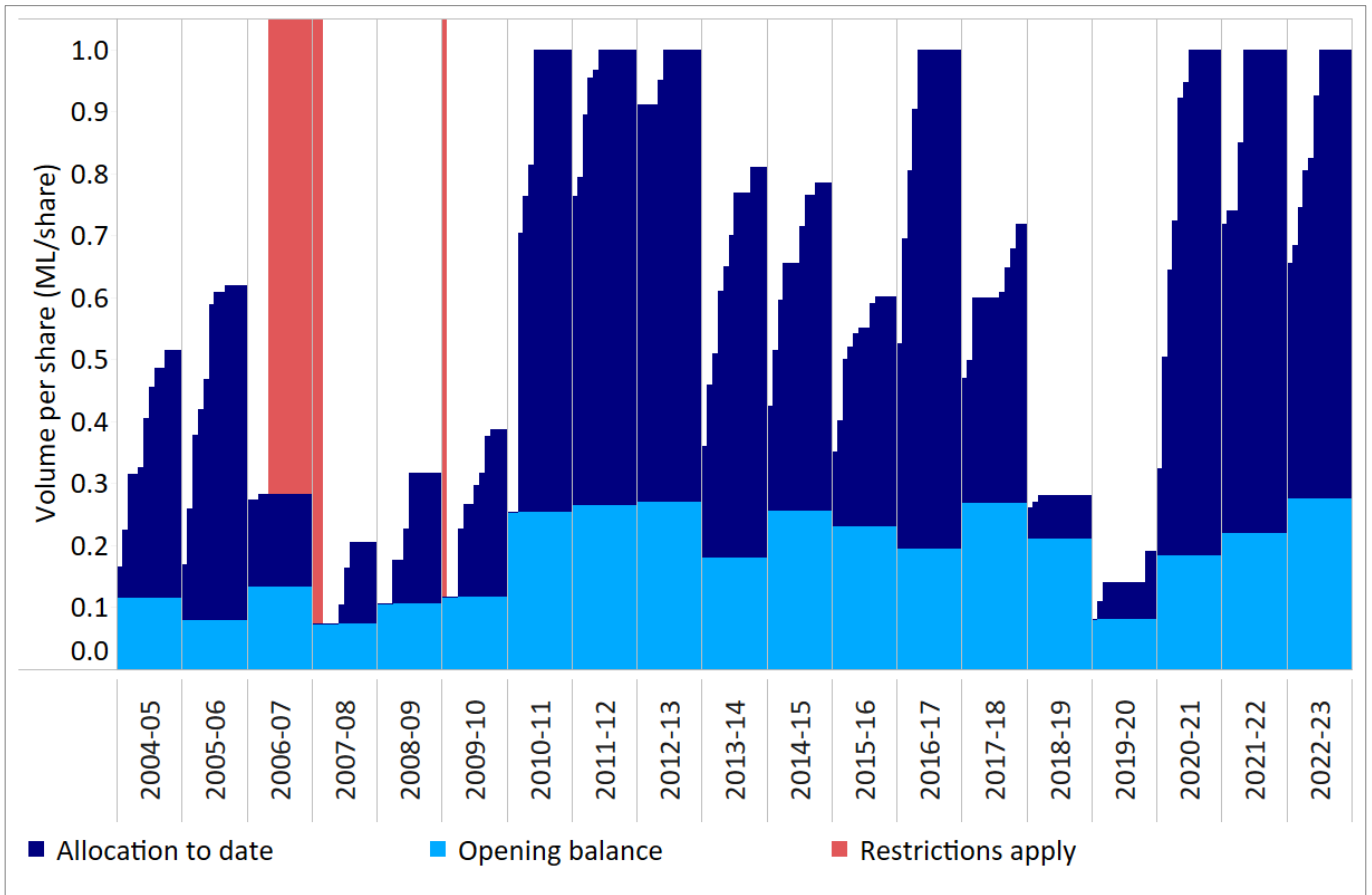
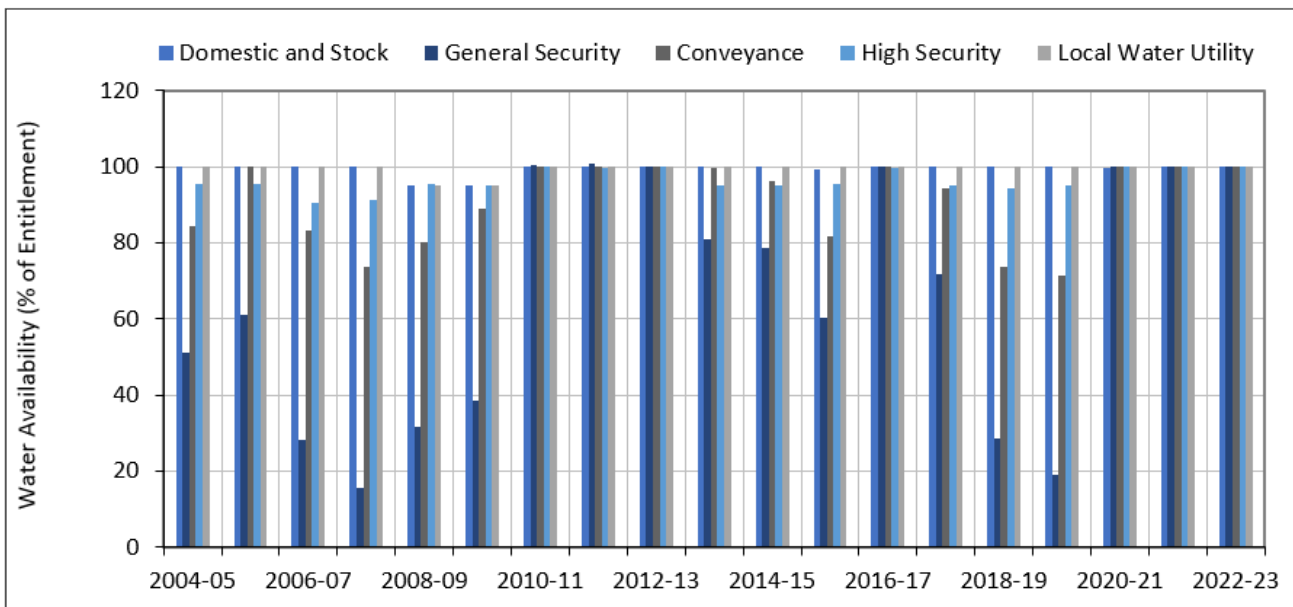


Figure 23: Murrumbidgee water availability (carryover plus available water determinations)⁵



⁵ Water availability refers to the sum of water that was made available in accounts and does not take into account annual use limits. It is calculated as the total carryover for a licence category plus the total available water determinations for the year.

Figure 24: Supplementary event access⁶

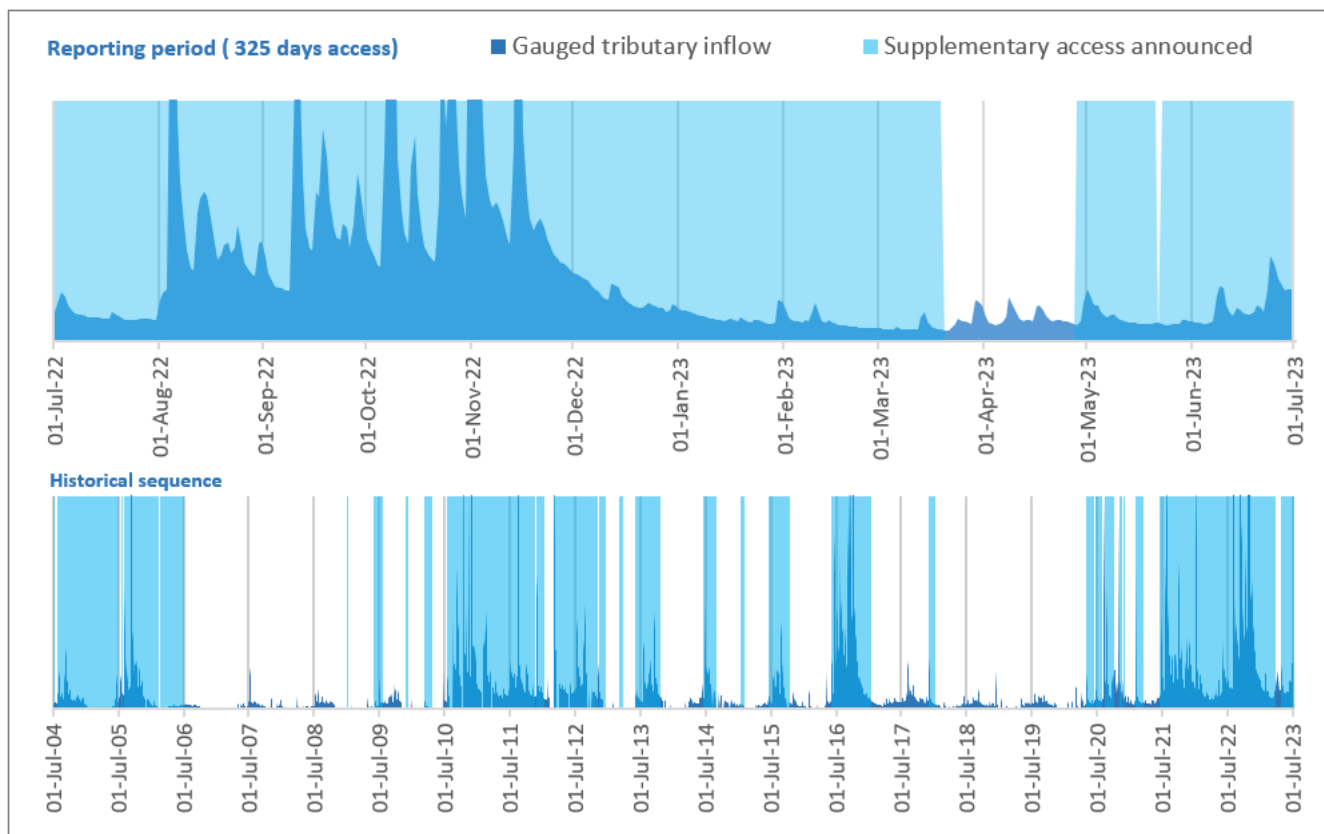
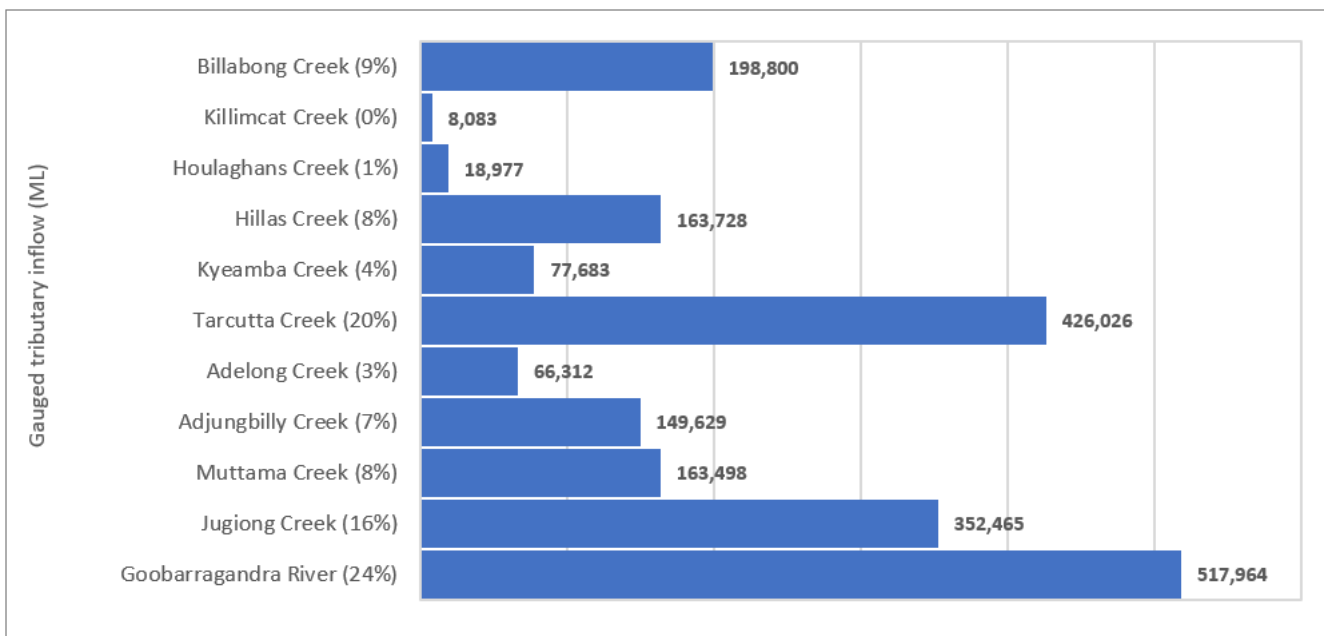


Figure 25: Measured tributary inflow contributions



⁶ Chart shows supplementary access if there is at least one river section that has access to supplementary water on any given day during the reporting period.

Account usage

Account usage from regulated supply (excluding supplementary and uncontrolled flow access) was 1,438,837 megalitres for the reporting period (Figure 26).

In addition to this supply:

- 133,964 megalitres was used by Supplementary access licence holders (Figure 27)
- 10,120 megalitres was used by Supplementary (Lowbidgee) access licence holders (Figure 27)

Usage (all forms of take) totalled 1,582,921 megalitres, which was close to average when considered against the water sharing plan management conditions (Figure 28). The average usage (all forms of take) was 1,470,650 megalitres per year or 1,326,128 megalitres per year excluding supplementary and uncontrolled flow (2004-05 to 2022-23).

Of the total account usage 80% was apportioned to consumptive access licences and 20% to held environmental access licences (refer to ‘Held Environmental Water’ for further details).

Figure 26: Licenced usage from regulated supply (excluding supplementary and uncontrolled flow access) by licence category

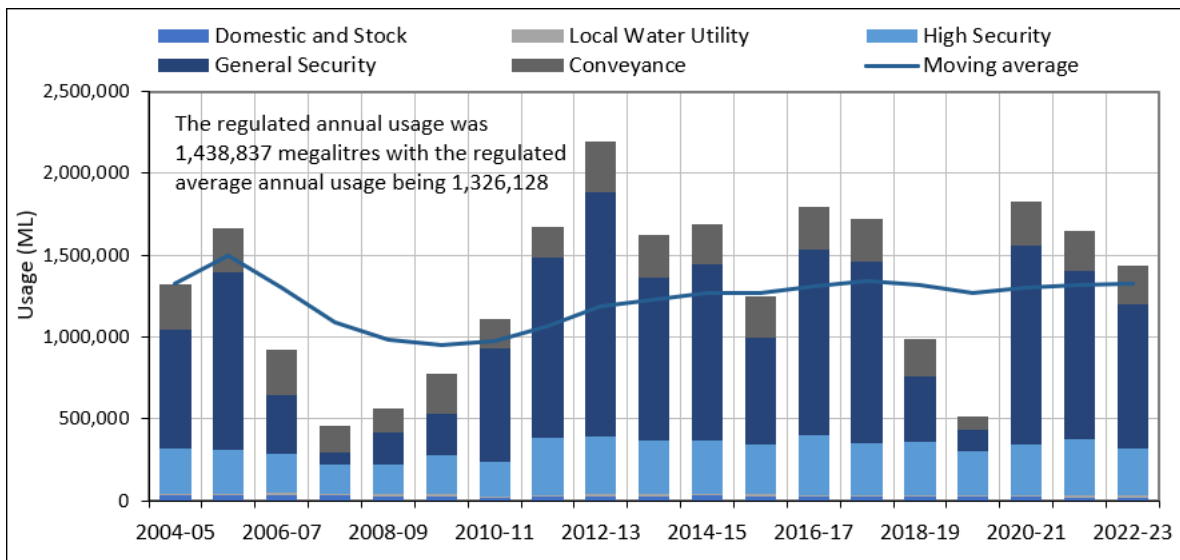


Figure 27: Murrumbidgee supplementary and uncontrolled flow usage⁷

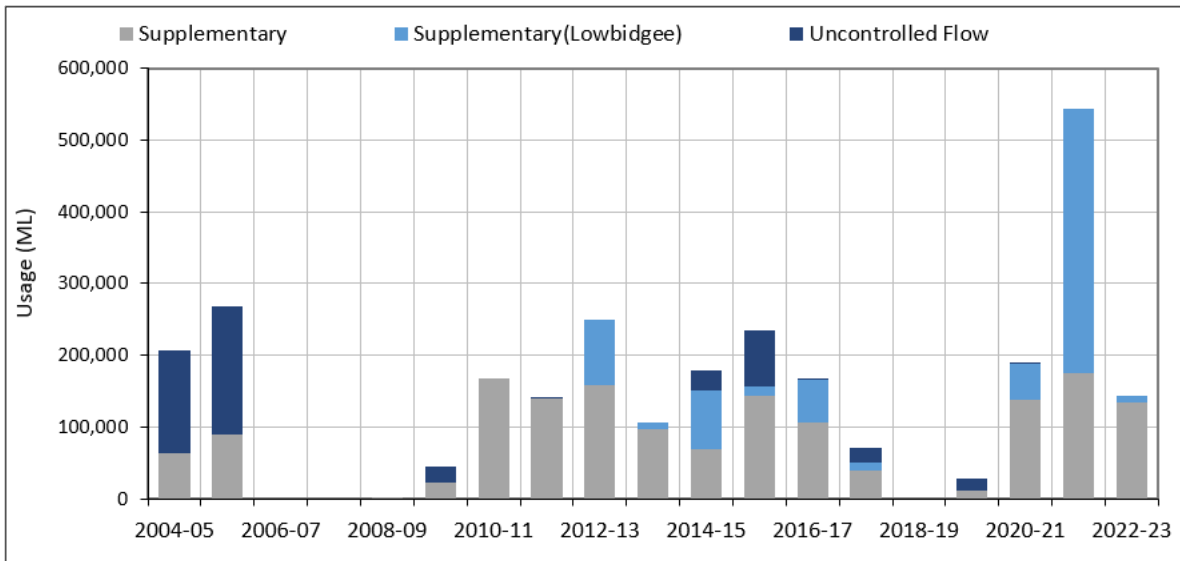
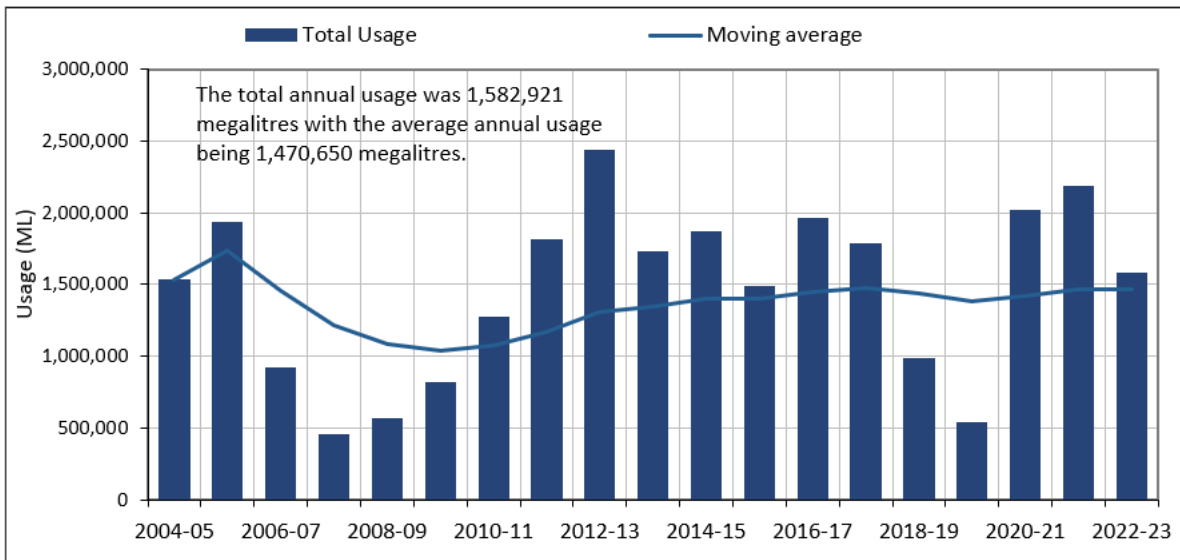


Figure 28: Total account and moving average usage under water sharing plan management



Utilisation and inactive share

An access licence is considered to be 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 relative to the maximum amount available for use.

- 8% of general security access licence share component was inactive for the reporting period an increase of 3% on the prior year (Table 7).
- 2% of high security access licence share component was inactive for the reporting period, which is equal to the prior year inactivity.

⁷ Supplementary Water (Lowbidgee) licences were introduced in 2012-13 water year.

- 12% of supplementary water (including Lowbidgee access) was inactive, an increase of 4% on the prior year still indicating good access to excess flows, downstream of the major storages. Access to this water is from unregulated supply (opportunistic access) and activity is largely climate driven.
- Utilisation of available water from regulated supply decreased from 68% to 61% from the prior reporting period (Figure 29).

Figure 29: Murrumbidgee utilisation of regulated water available ⁸

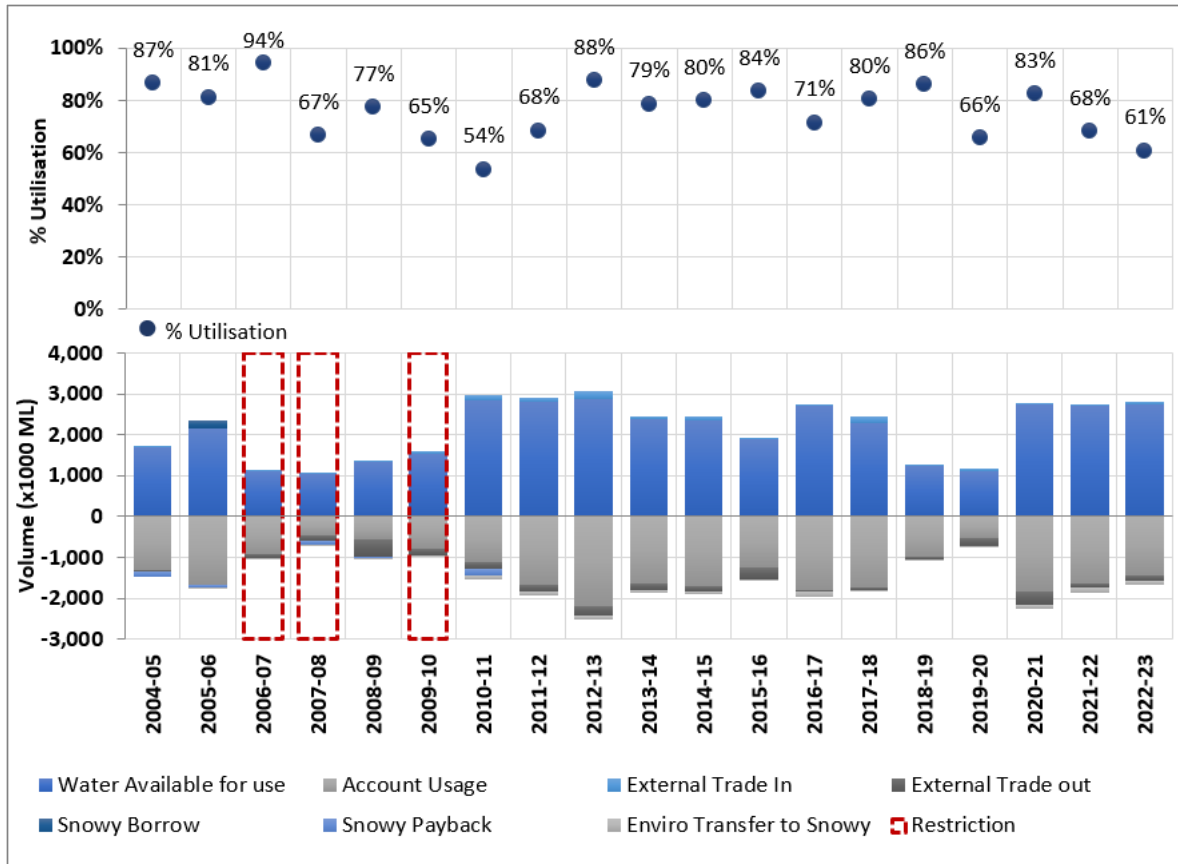


Table 7: Murrumbidgee inactive licence summary

Licence category	Inactive licences (number) 2022–23	Inactive share component 2022–23	Inactive share % of total 2022–23	Inactive share % of total prior year 2021–22
Domestic and Stock	197	3,828	20%	17%
Domestic and Stock [Domestic]	42	116	43%	41%
Domestic and Stock [Stock]	123	907	9%	10%
Regulated River (Conveyance)	2	1,000	34%	34%
Coleambally Irrigation (Conveyance)	1	3,500	3%	3%
Murrumbidgee Irrigation (Conveyance)	1	20,000	8%	8%
High Security	127	7,275	2%	1%
High Security [Aboriginal Cultural]	0	0	0%	0%
High Security [Research]	0	0	0%	0%

⁸ Water usage excludes water taken under a supplementary access licence or under uncontrolled flows access. Total water availability excludes supplementary access licences.

Licence category	Inactive licences (number) 2022–23	Inactive share component 2022–23	Inactive share % of total 2022–23	Inactive share % of total prior year 2021–22
High Security [Town Water Supply]	0	0	0%	0%
Local Water Utility	2	10	0%	0%
General Security	502	160,630	8%	5%
Total	997	197,267	7%	5%
Unregulated (flow dependant) supply Supplementary Water	132	18,466	9%	2%
Unregulated (flow dependant) supply Supplementary Water (Lowbidgee)	22	98,371	13%	10%
Unregulated (flow dependant) supply Total	154	116,837	12%	8%

Temporary trading

- The total volume of allocation assignments into Murrumbidgee access licences (excluding supplementary) was 753,879 megalitres⁹ (Figure 30).
- The total volume of allocation assignments out of Murrumbidgee access licences (excluding supplementary) was 836,757 megalitres resulting in a net assignment out of the Murrumbidgee of 82,878 megalitres (Figure 30).
- An additional 157,073 megalitres of internal supplementary access licence allocation assignment occurred in the reporting period.
- A total of 48,006 megalitres was traded into the Murrumbidgee from external water sources while 130,883 megalitres was traded out of the Murrumbidgee to external water sources (Figure 31).
- The majority of water moved out of the Murrumbidgee was to the NSW Murray regulated river water source (Figure 31).
- The Murrumbidgee intervalley trade account closed at 88,954 megalitres (owed to external) on 30 June 2023, down from 127,570 in the prior period (Figure 32). Refer to disclosure note 5 (Table 18) of this GPWAR for further detail.

⁹ Excluding trade between supplementary licences

Figure 30: Allocation assignments and net trade out of the Murrumbidgee¹⁰

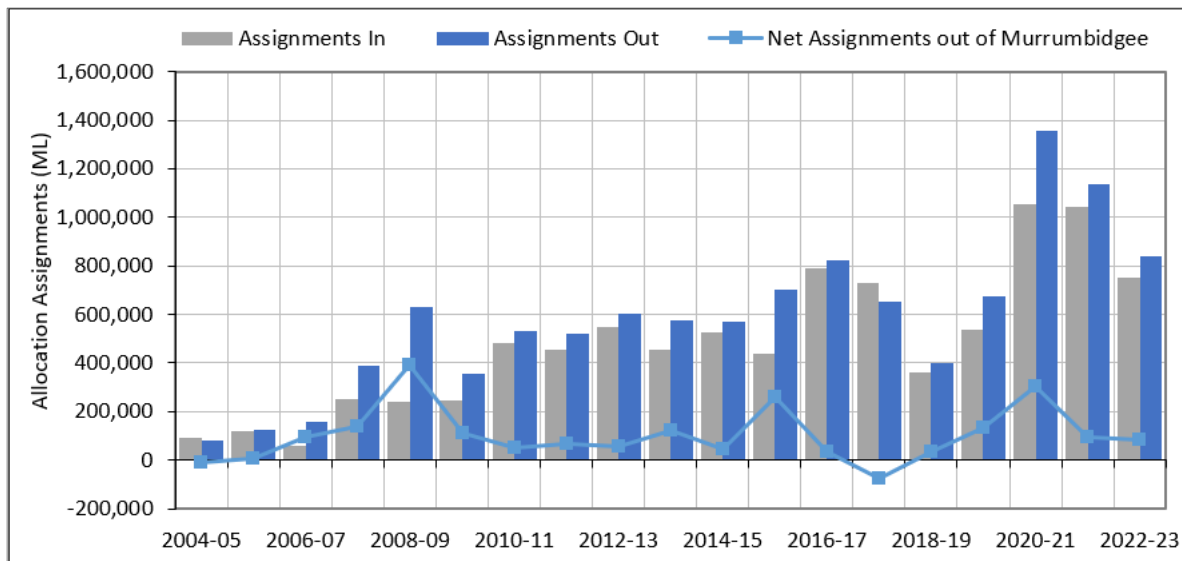
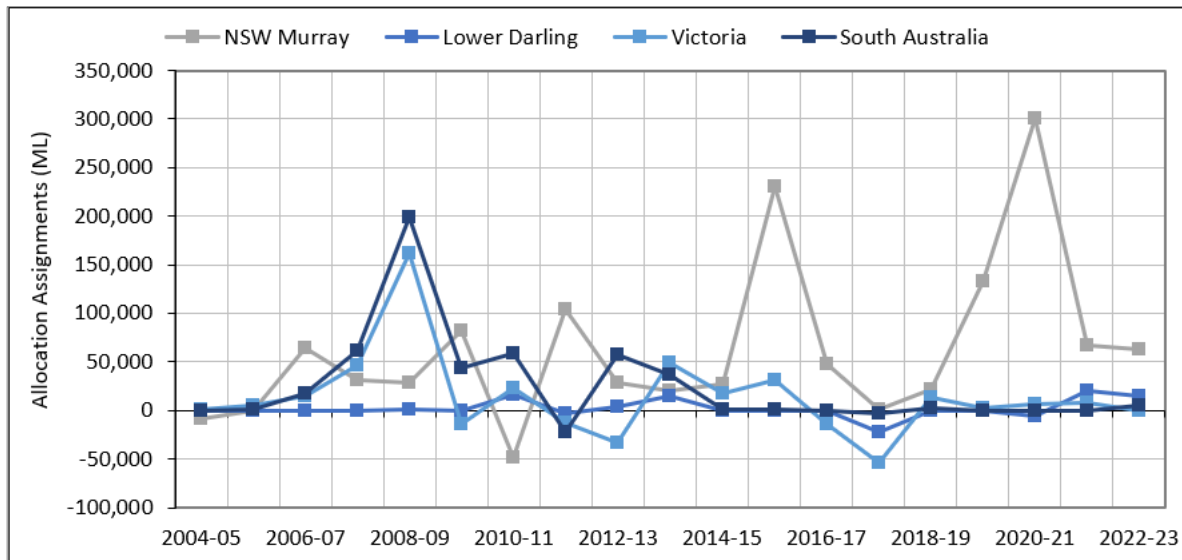
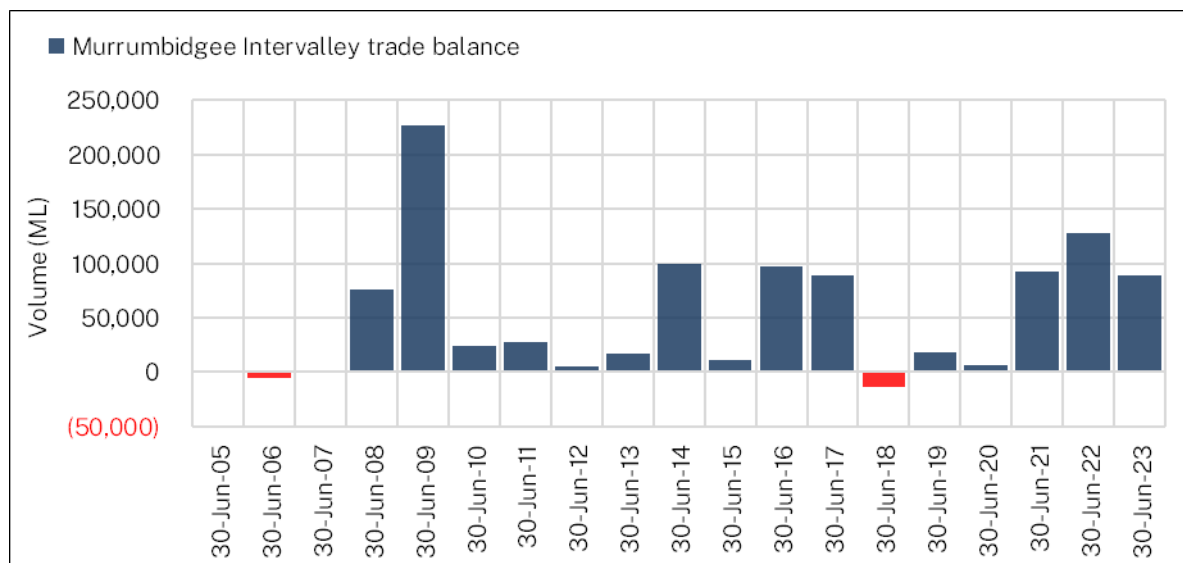


Figure 31: Net assignment out of the Murrumbidgee by water source location



¹⁰ Excludes supplementary trading but including intravalley, intervalley and interstate trades.

Figure 32: Murrumbidgee intervalley trade account balance on 30 June

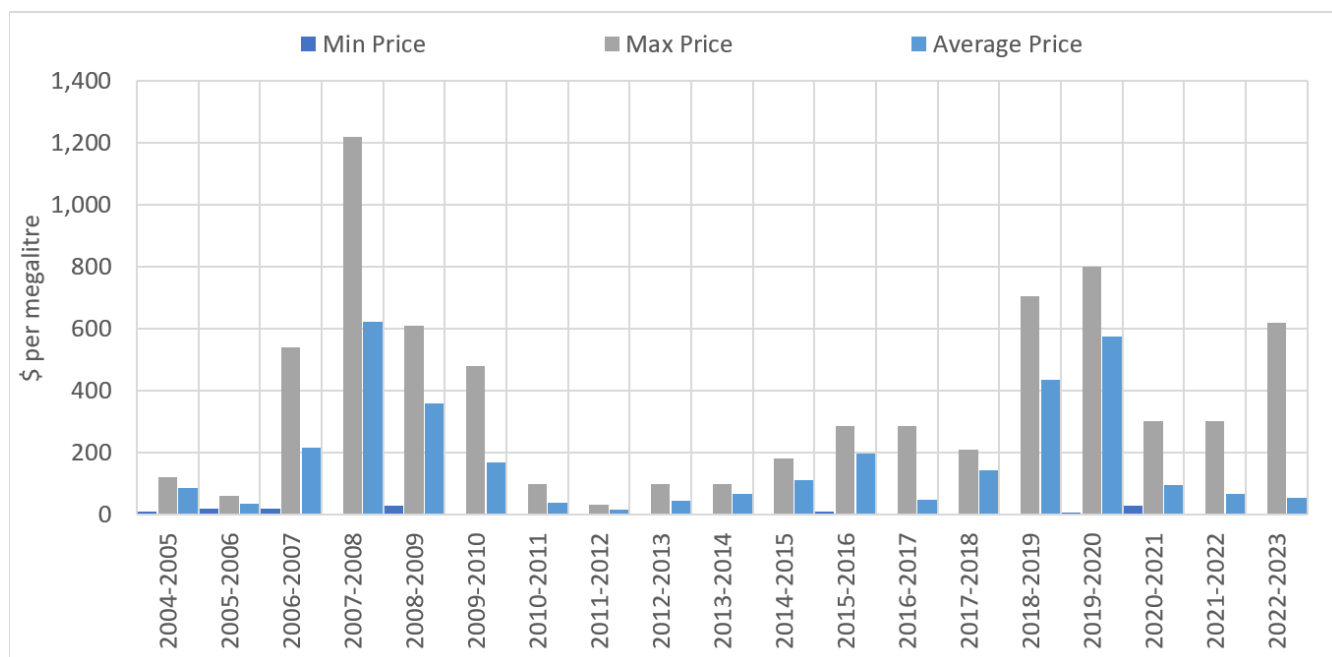


Temporary commercial statistics

For the reporting period, considering commercial trades only (considerations greater than \$1 per megalitre), 651 transactions were processed (Figure 34) with the following characteristics:

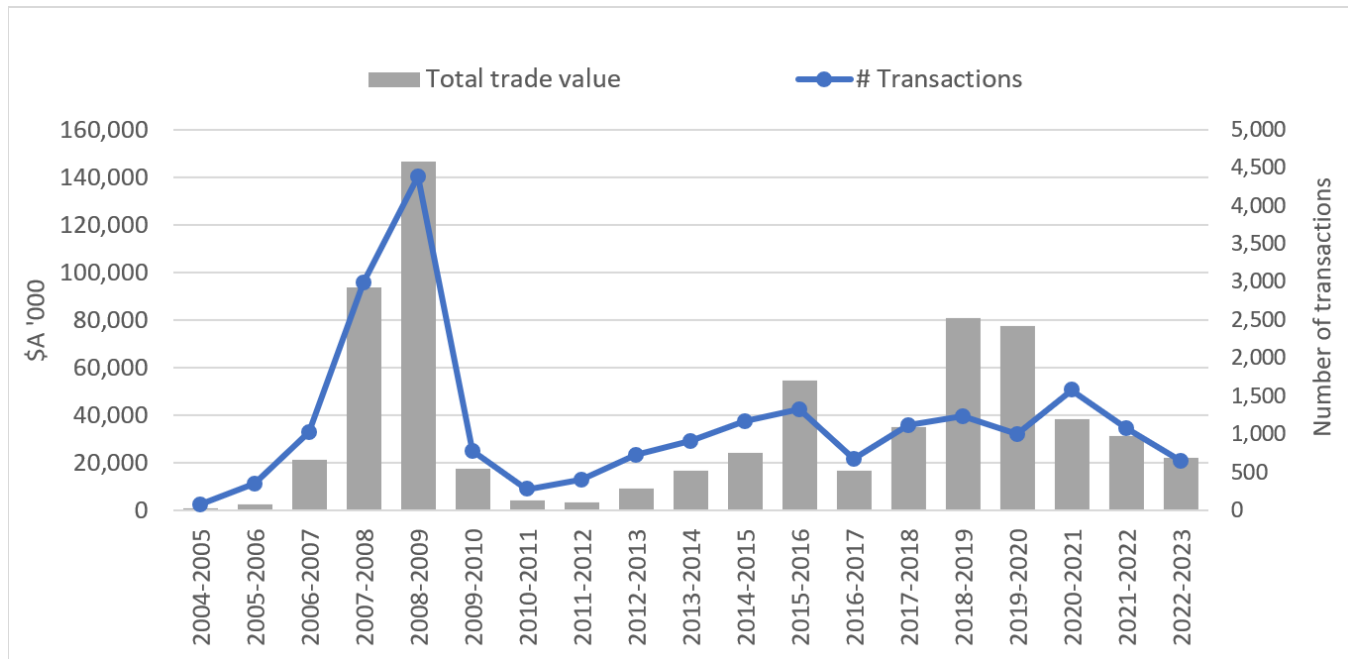
- The average price for water was \$54 per megalitre a 18% decrease on the prior reporting period and the lowest since 2016–17.
- The maximum price for water was \$620 per megalitre.
- The total trade value was \$22,485,680, a 29% decrease on the prior reporting period and a 5-year low.

Figure 33: Allocation assignment commercial price statistics¹¹



¹¹ Only includes transactions where the total consideration of the dealing exceeds \$1. A maximum limit is applied equal to the mean plus 3 times the standard deviation

Figure 34: Allocation assignment commercial value statistics



Permanent commercial statistics

For the reporting period, considering commercial trades only (> than \$1 per megalitres), 27 general security share assignment transactions (Figure 36) were processed with the following characteristics:

- The average price for general security was \$2,582 per share a 7% increase on the prior year average.
- The maximum price was \$2,750 per share a 4% increase on the prior year
- The total trade value was \$23,785,920 which was a 45% decrease relative to the prior reporting period
- The general security sale price within the Murrumbidgee relative to other NSW regulated river water sources selling share in the reporting period is provided in Figure 37.

A total of 19 high security commercial transactions were processed (Figure 39) with the following characteristics:

- The average price was \$8,940 per share, a 9% increase to the prior reporting period
- The maximum price was \$9,300 per share
- The total trade value was \$25,059,450 which was a 29% increase relative to the prior reporting period.
- The high security sale price within the Murrumbidgee relative to other NSW regulated river water sources selling share in the reporting period is provided in Figure 40.

Considering environmental licences, 0 shares were associated with environmental purchases (Figure 41).

In addition to share assignments, a total of 26,610 shares (all categories of licence considered) were subject to a change of holder for commercial purposes through 27 transactions (Figure 42). 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.

Figure 35: Share assignments commercial price statistics—General Security

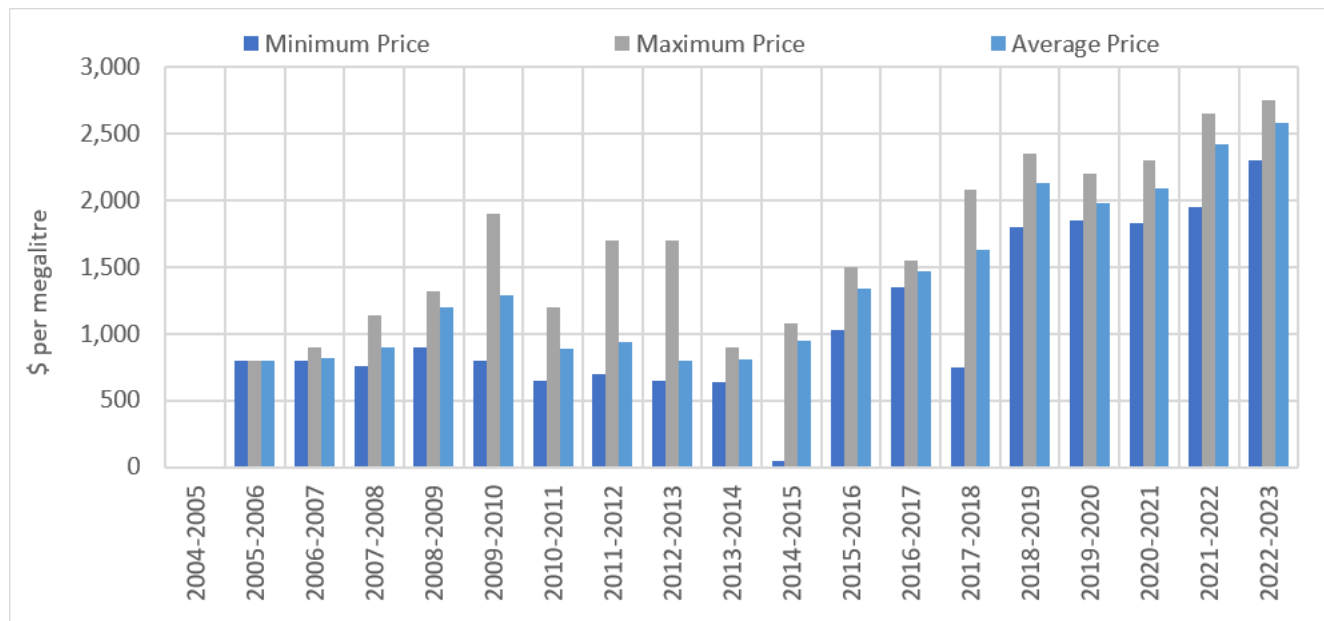


Figure 36: Share assignments commercial value statistics—General Security

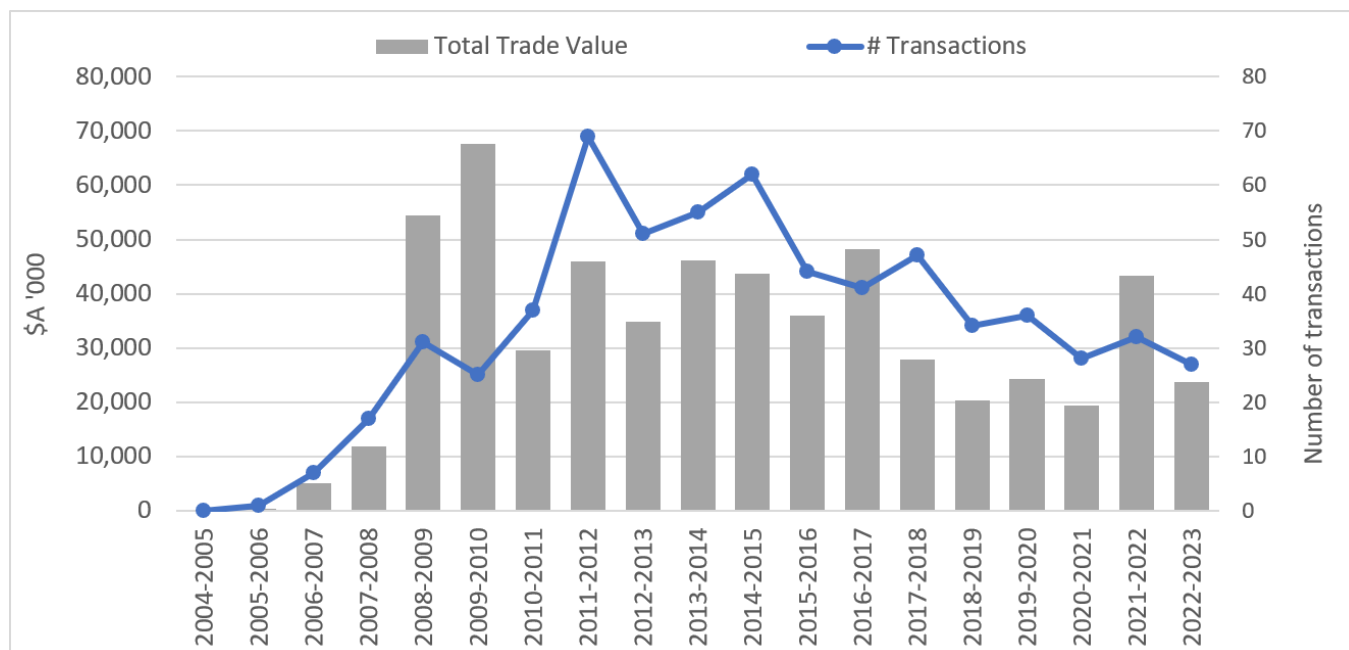


Figure 37: General Security average share price relative comparison for reporting period

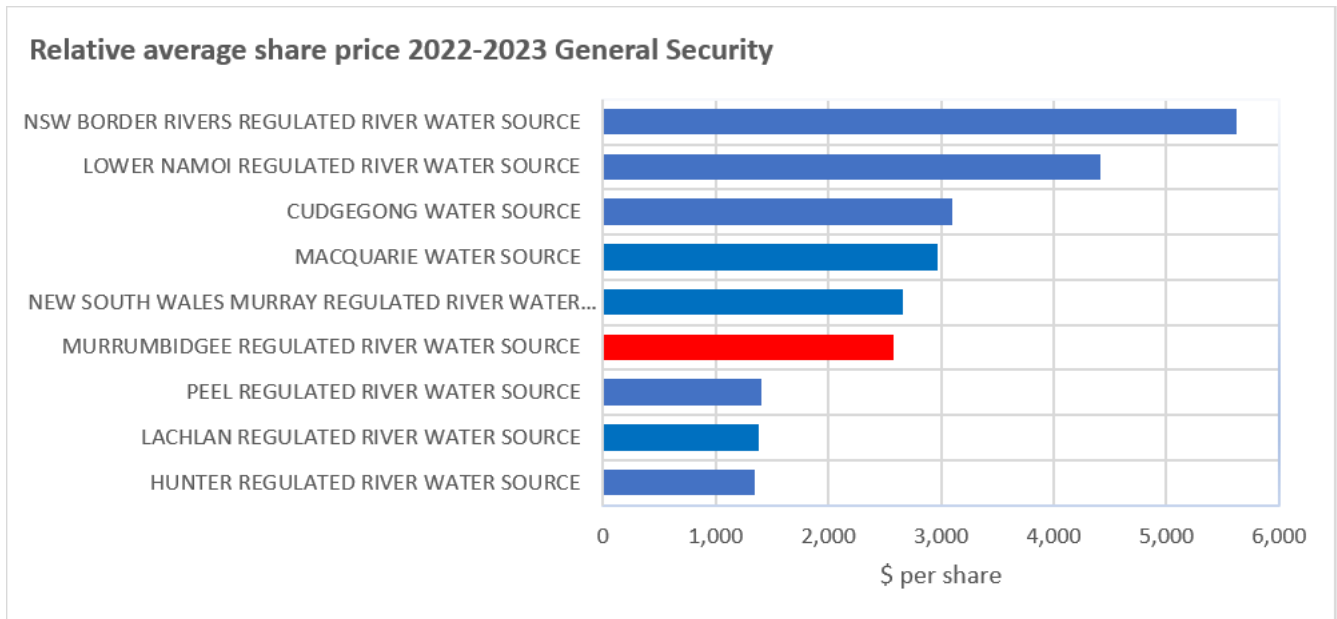


Figure 38: Share assignments commercial price statistics—High Security

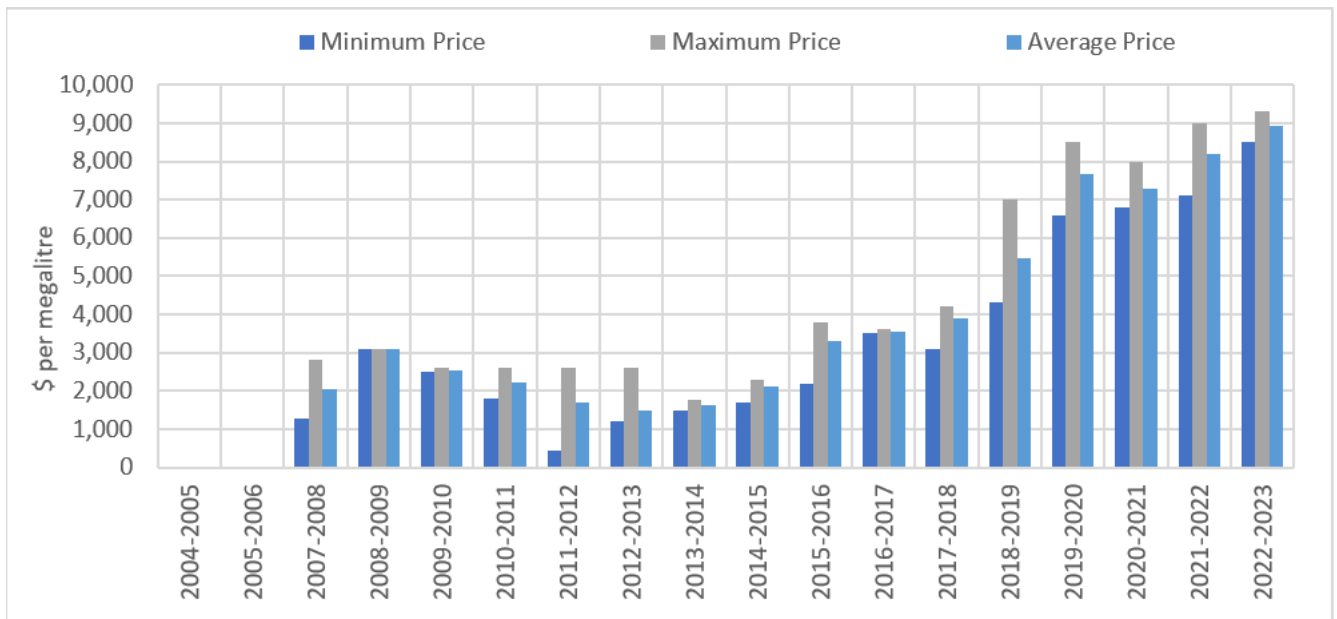


Figure 39: Share assignments commercial value statistics—High Security

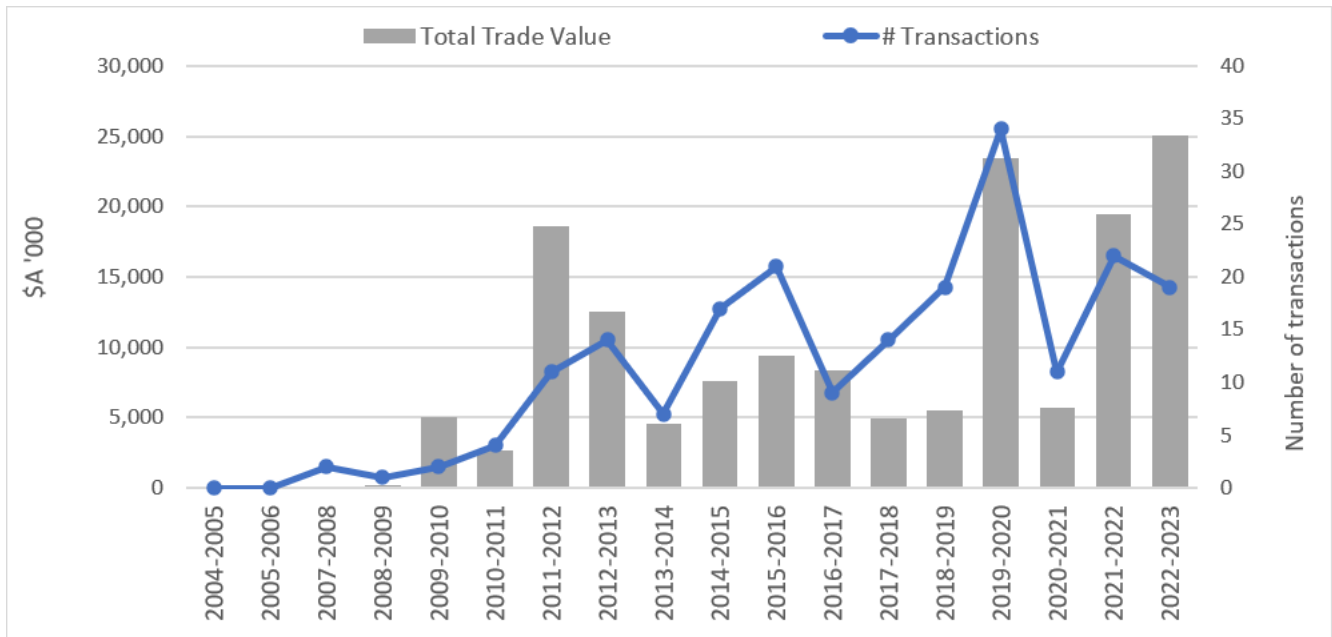


Figure 40: High Security average share price relative comparison for reporting period

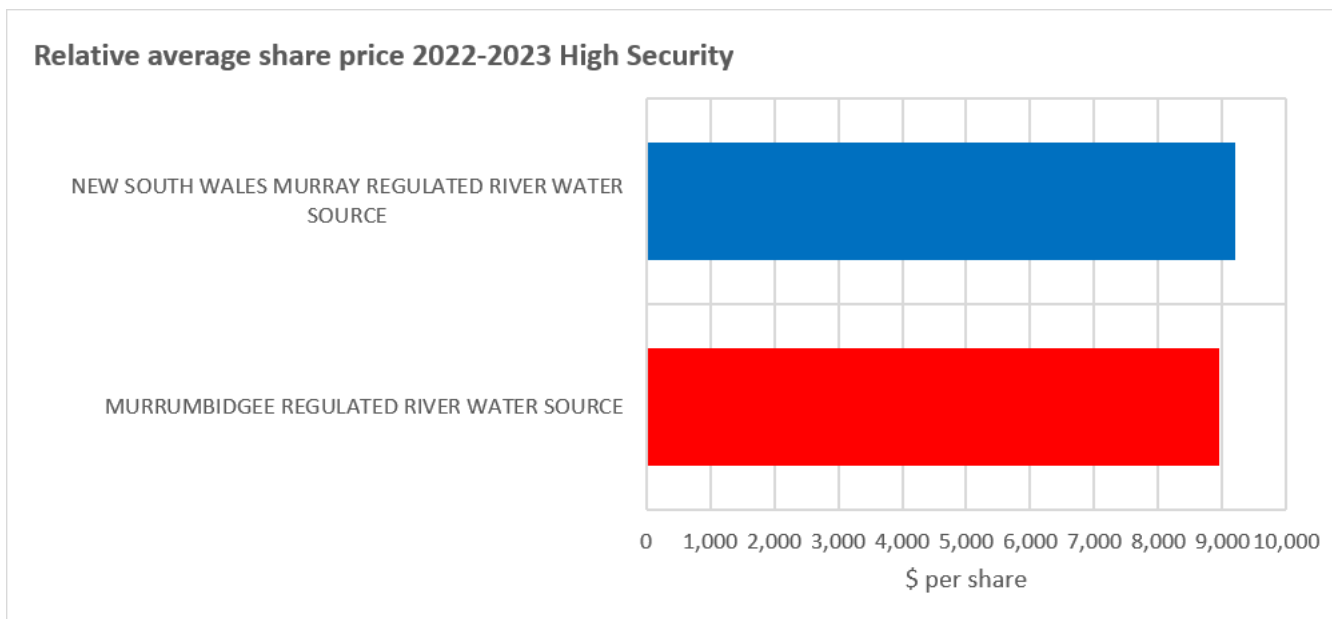


Figure 41: Total share assignments and held environmental purchases¹²

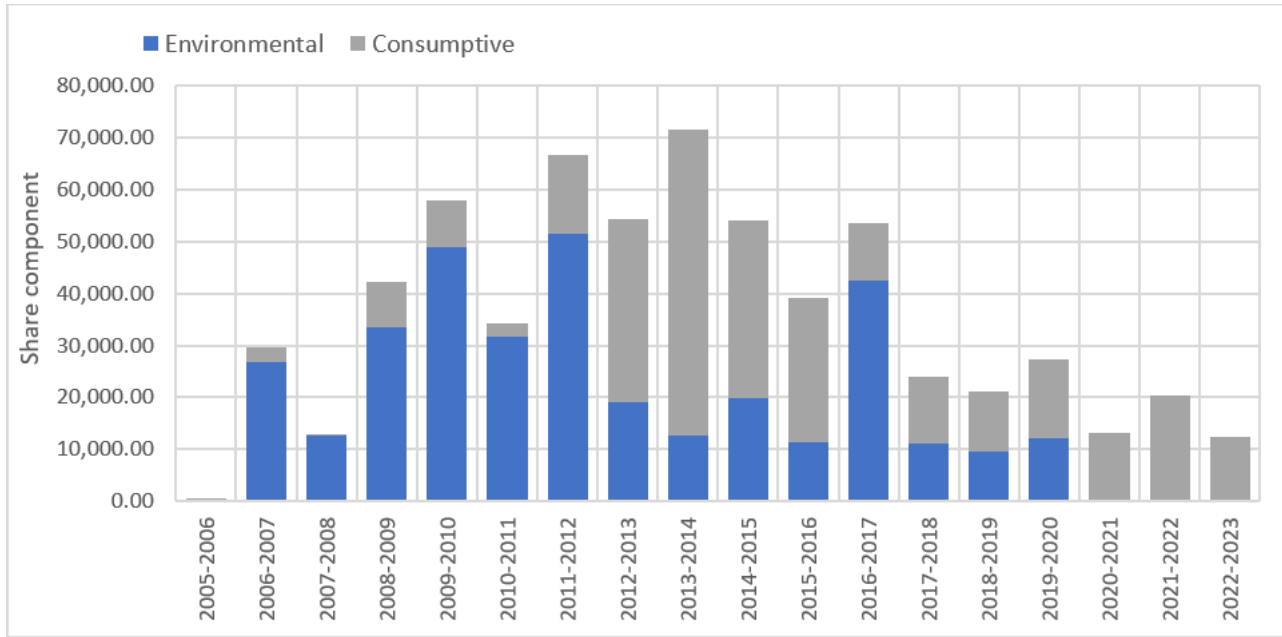
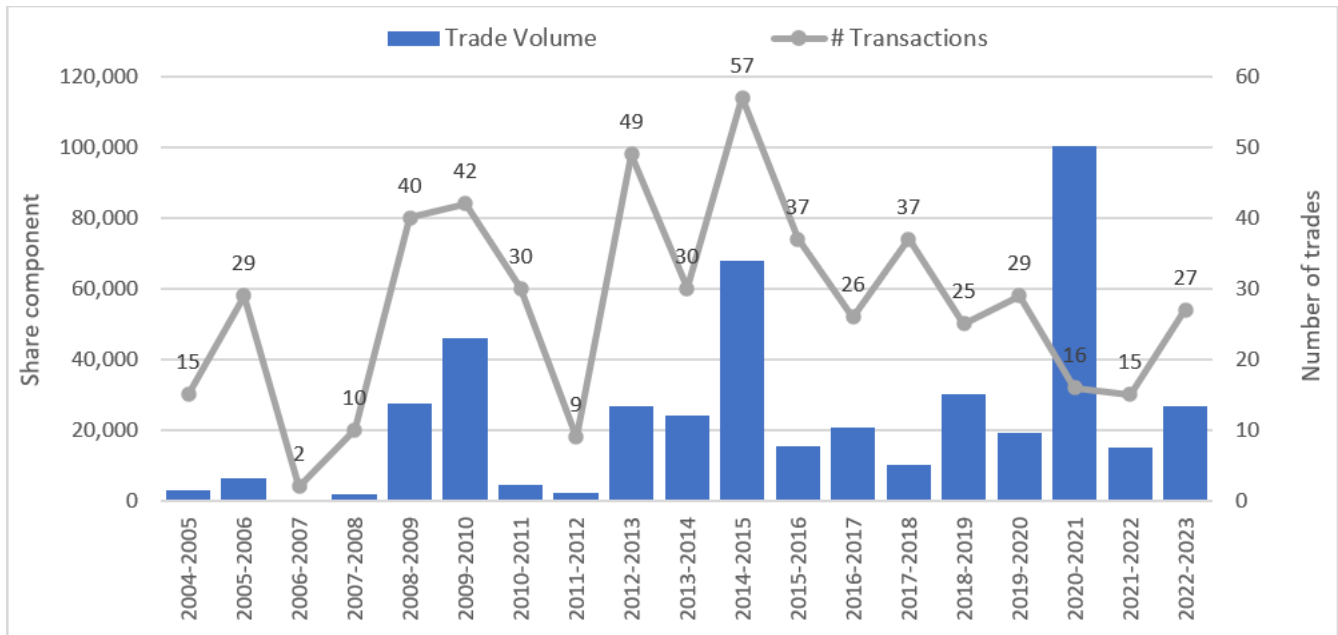


Figure 42: Change of holder commercial statistics¹²

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Held environmental water

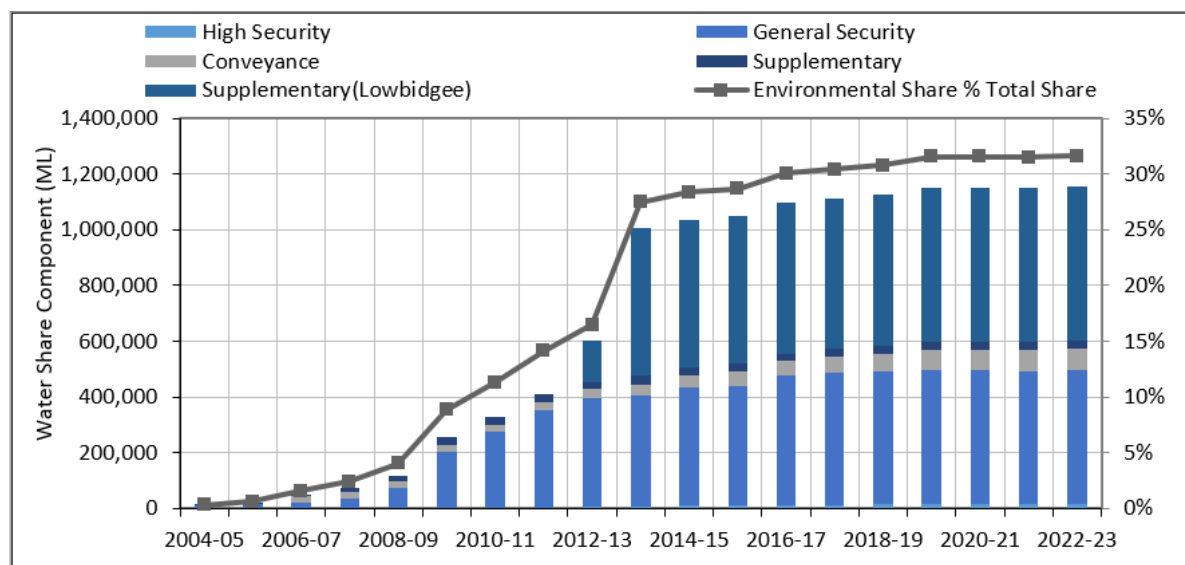
- There were 2,790 shares of Murrumbidgee Irrigation (conveyance) water added to the held environmental water portfolio in the reporting period (Figure 43). This was via the first tranche of savings made through the New South Wales Murrumbidgee Irrigation Automation Finalisation Project. The project will modernise and improve the efficiency of the Murrumbidgee Irrigation Area (MIA) through completing the automation of more than 360 control structures, replacing and converting 1,500 metered outlets, refurbishing and

¹² Only includes transactions where the total consideration of the dealing exceeds \$1. All license categories have been included.

piping the remaining 20 kilometres of open channels, and constructing a new 5,000 megalitre surge reservoir. It will return 6,290 megalitres per year of water, to enhance the environmental outcomes of the Basin Plan. For more details see [NSW off-farm-efficiency-program](#)

- A total of 1,155,398 shares (across all categories of access licence) were managed for environmental purposes as of 30 June 2023¹³.
- A total of 323,304 megalitres (usage) was debited against held environmental licences, the highest usage under water sharing plan management conditions (Figure 44).
- In addition to the account usage 101,874 megalitres accumulated in Murrumbidgee held environmental access licences ([acquired under the water for rivers recovery program](#)) was re-assigned for environmental releases in the Snowy, Snowy Montane and Murray River (Figure 45)¹⁴.
- Held environmental water utilisation of available water from regulated supply decreased from 78% to 77% from the prior reporting period (Figure 46).
- Further details on held environmental account water is available in Note 6 of this document, while detailed information on where the water was used and the benefits achieved is available on the department’s Environment, Energy and Science website (www.environment.nsw.gov.au) and the Australian Government’s Department of Agriculture, Water and Environment website (www.environment.gov.au).

Figure 43: Held environmental water share component in the Murrumbidgee¹⁵



¹³ Excludes environmental savings acquired that have not been converted to an access licence.

¹⁴ For further details see note 26 and <https://water.dpie.nsw.gov.au/plans-and-programs/snowy-scheme/snowy-water-initiative/snowy-water-recovery>

¹⁵ Figures represent share at the conclusion of the water year. The licence category Supplementary (Lowbidgee) was created in 2012–13. Figures represent share at the conclusion of the water year.

Figure 44: Held environmental water account usage in the Murrumbidgee

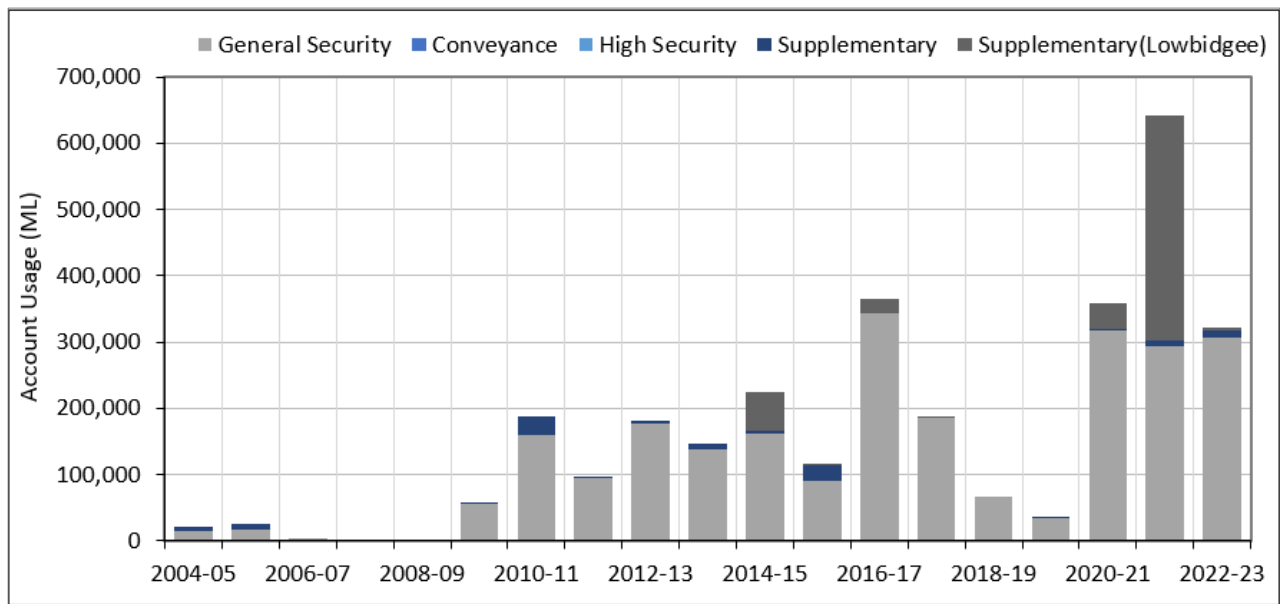


Figure 45: Murrumbidgee allocation transferred out of the Murrumbidgee (water for rivers program)

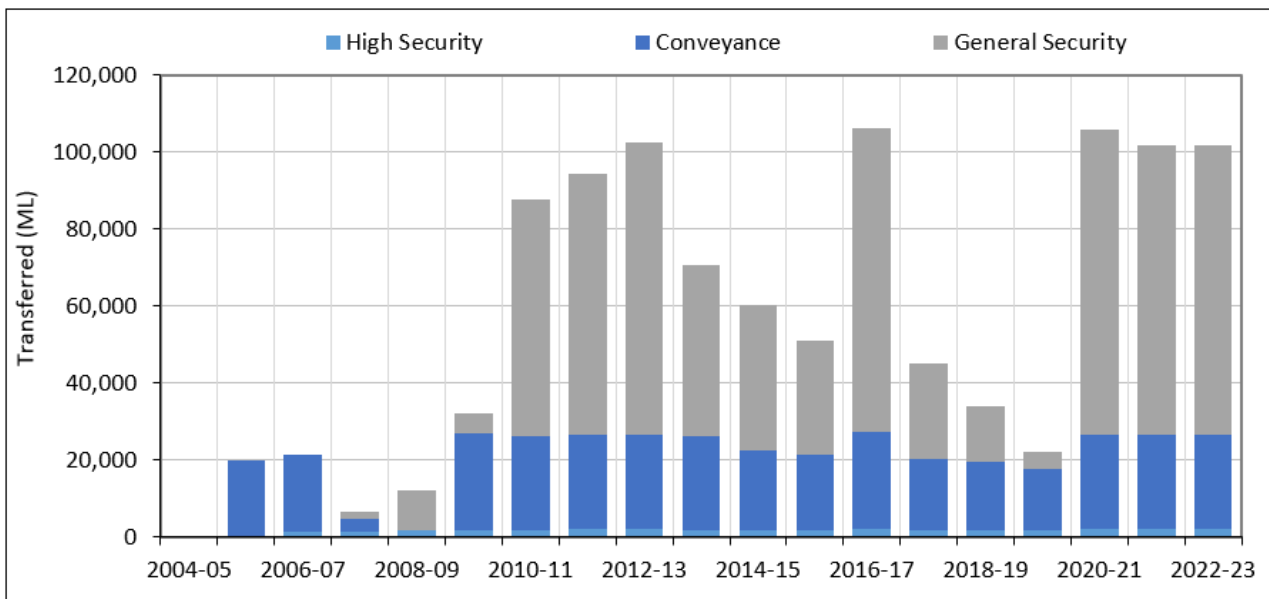
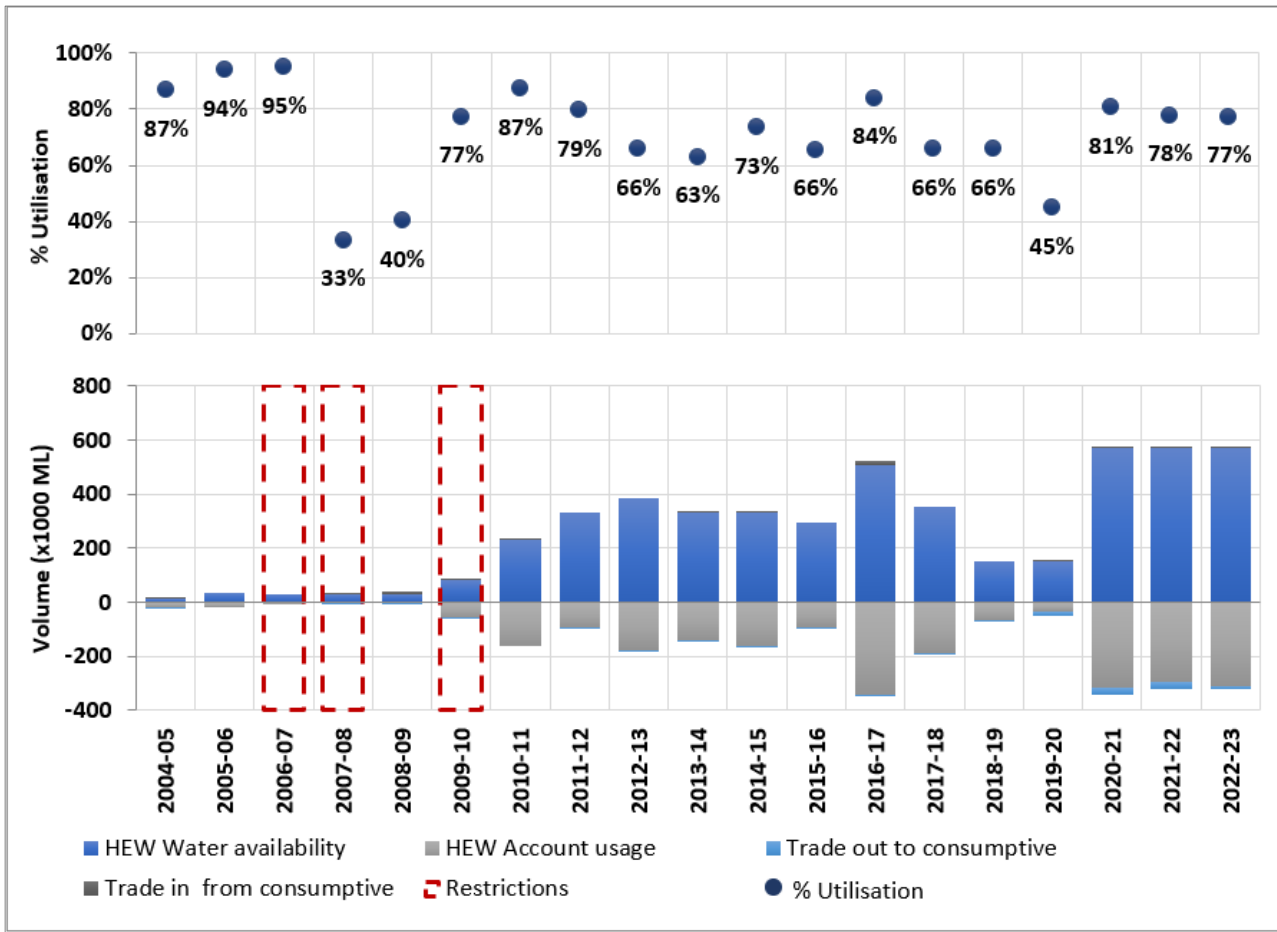


Figure 46: Murrumbidgee held environmental water utilisation of regulated water available



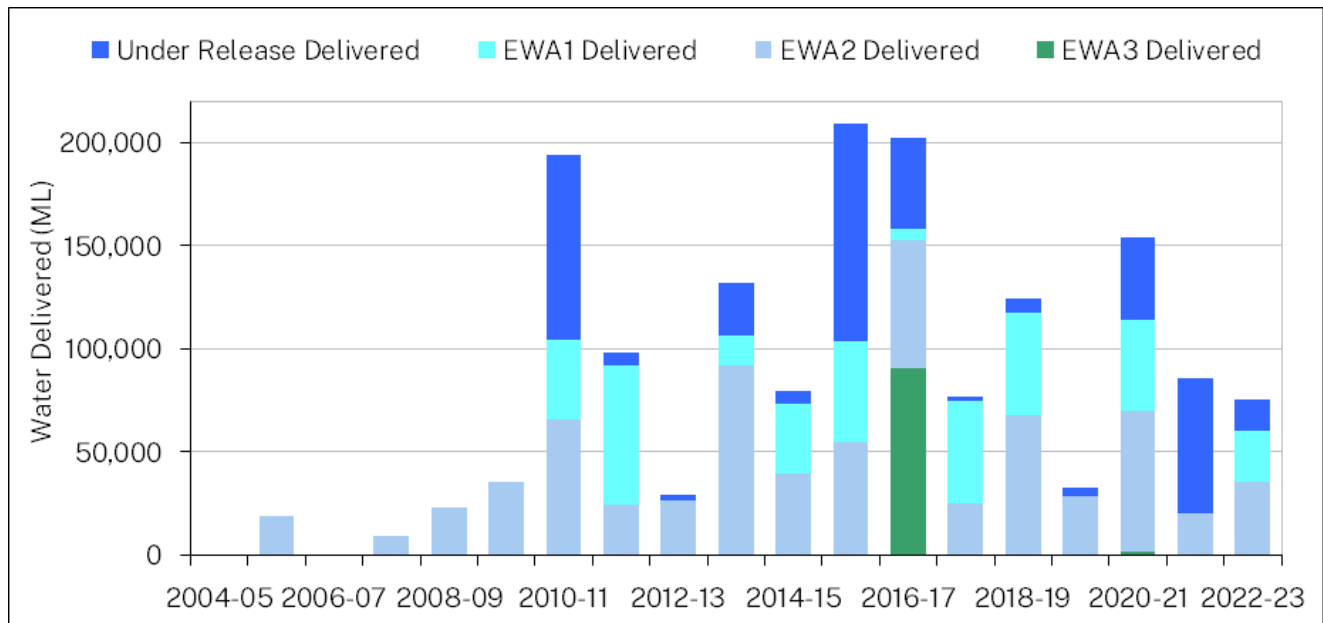
Planned environmental water

A wide range of environmental provisions including fixed volumetric targets (e.g. end of system targets), rules based (e.g. translucent storage releases), and account based (discretionally utilised for environmental assets, e.g. environmental water allowance accounts) are implemented through the water sharing plan. A full description of these provisions is provided in Note 7.

- Of the account based planned environmental water a total of 75,141 megalitres of planned environmental water was delivered during the reporting period. This volume was made up of deliveries from the translucent/transparent under release account, the Environmental Water Allowance 1 account (EWA1), Water Allowance 2 account (EWA2) and the Environmental Water Allowance 3 (EWA3) account (Figure 47).
- Additionally, the total water released from Burrinjuck Dam under the translucent/transparent rules of the water sharing plan was 363,752 megalitres (Figure 48).
- Transparent releases from Blowering Dam were considered always met during the reporting period. A total volume of 203,241 megalitres passed Blowering storage under this requirement.
- The required transparent and translucent environmental releases from Burrinjuck storage for the reporting period are presented in Figure 49, along with the actual storage releases.

- The required transparent environmental releases from Blowering storage for the reporting period are presented in Figure 50, along with the actual storage releases.
- Performance against minimum flow requirements for Balranald and Darlot are illustrated in Figure 51 and Figure 52 respectively. Refer to Note 19 for further details.

Figure 47: Total planned environmental water deliveries from Burrinjuck Dam¹⁶



¹⁶ Under release delivered refers to releases made above the minimum required environmental translucent or transparent releases. The water is effectively used to offset any occurrences where the actual release was less than the required release.

Figure 48: Transparent/translucent releases from Burrinjuck Dam

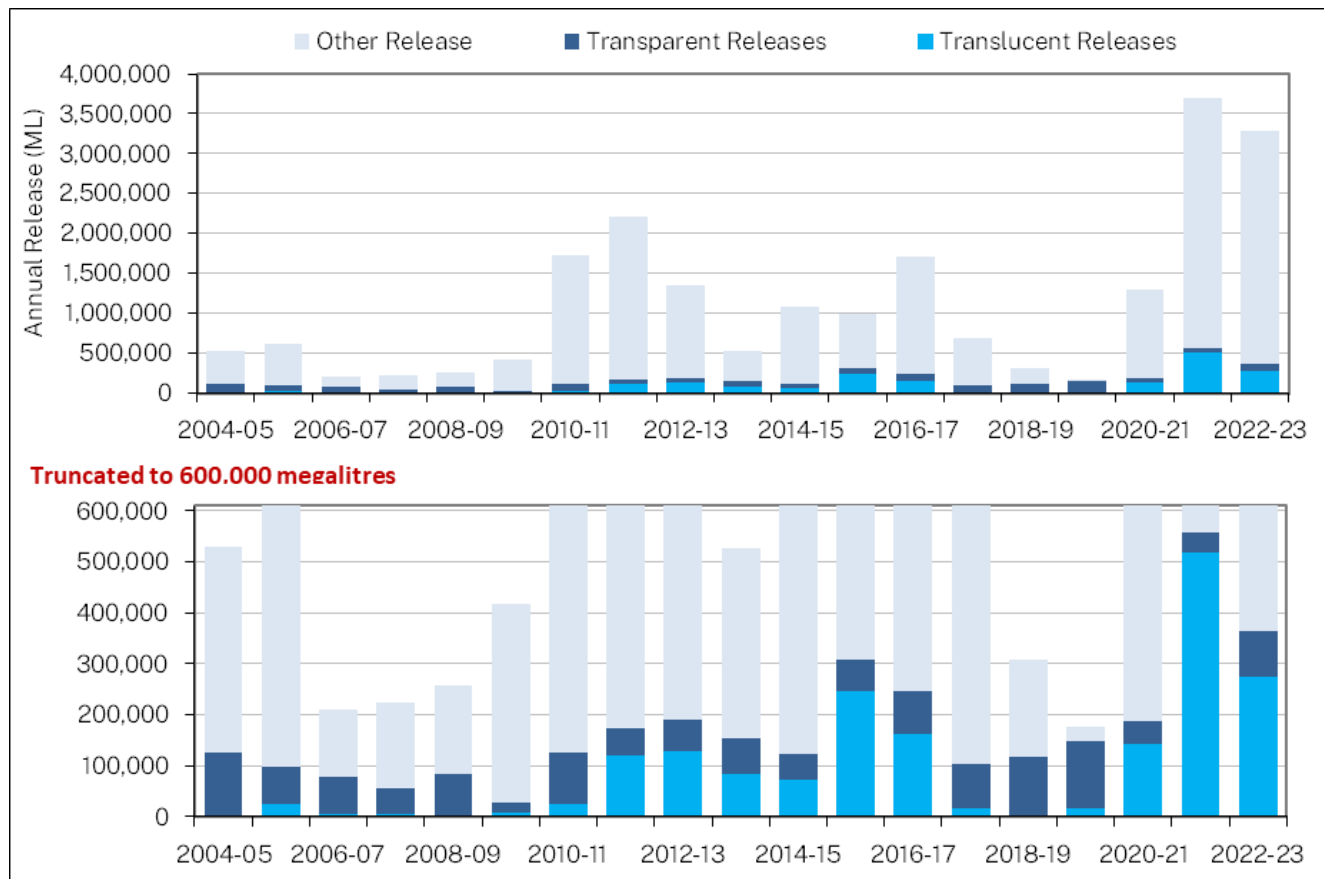


Figure 49: Required environmental releases at Burrinjuck Dam versus actual releases

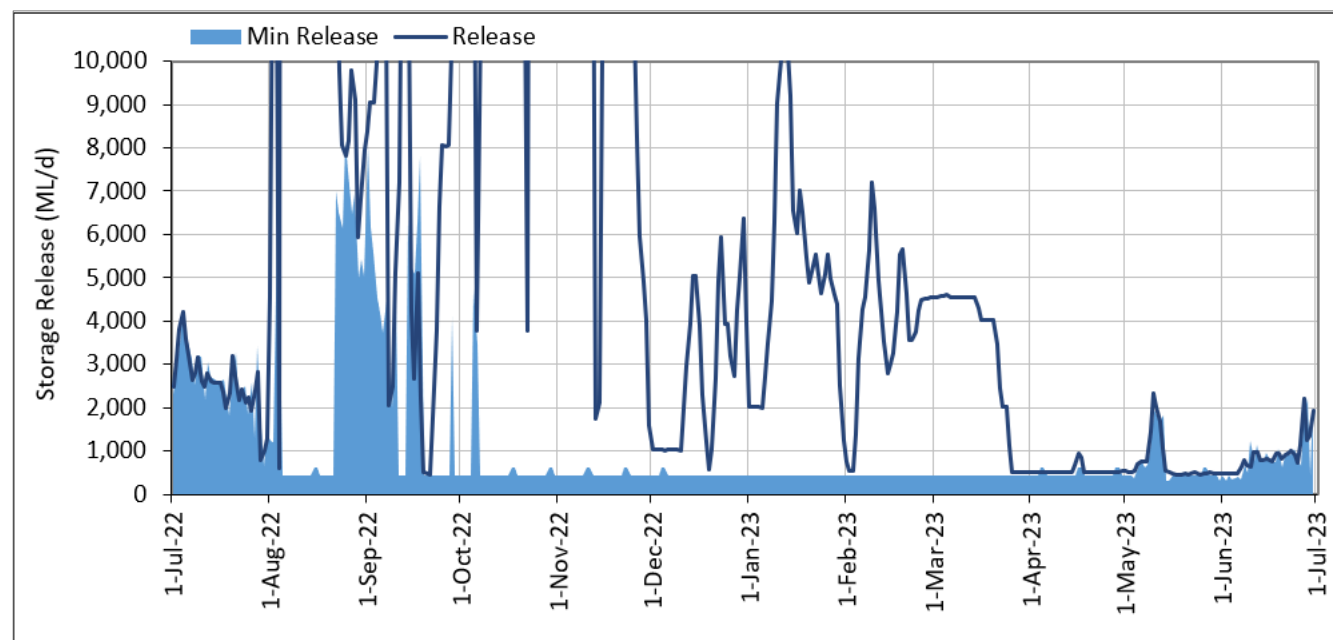


Figure 50: Required environmental releases at Blowering Dam versus actual releases

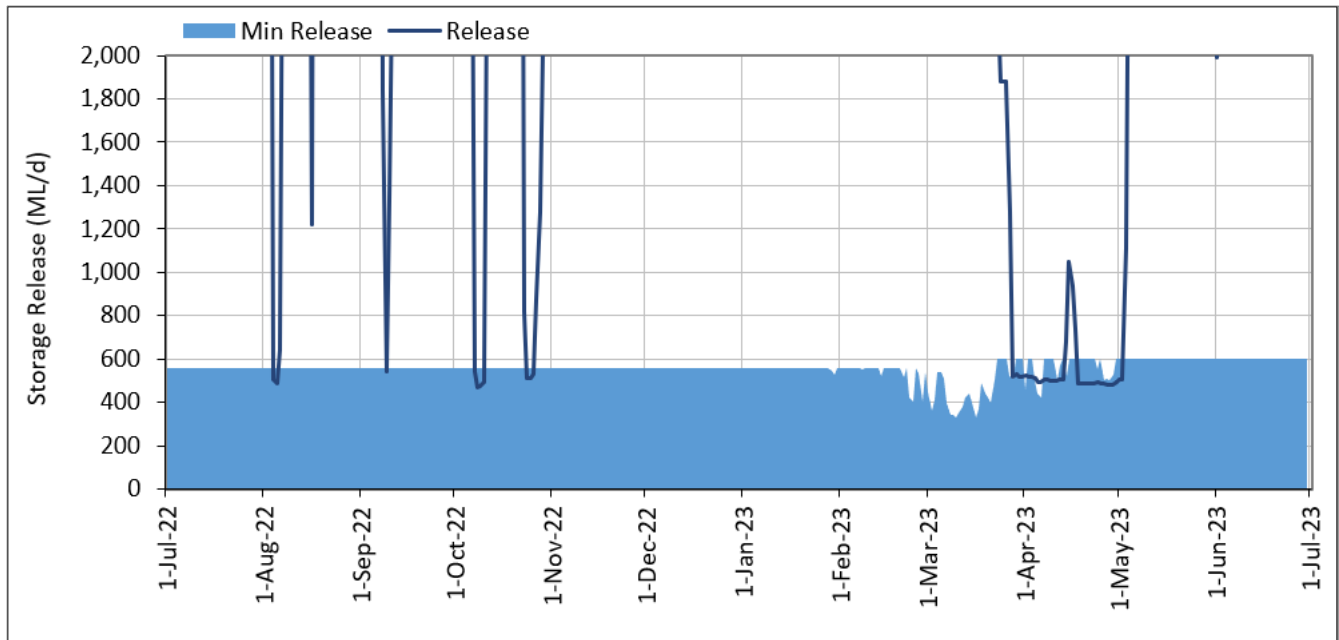


Figure 51: Murrumbidgee River at Balranald minimum flow target and deliveries

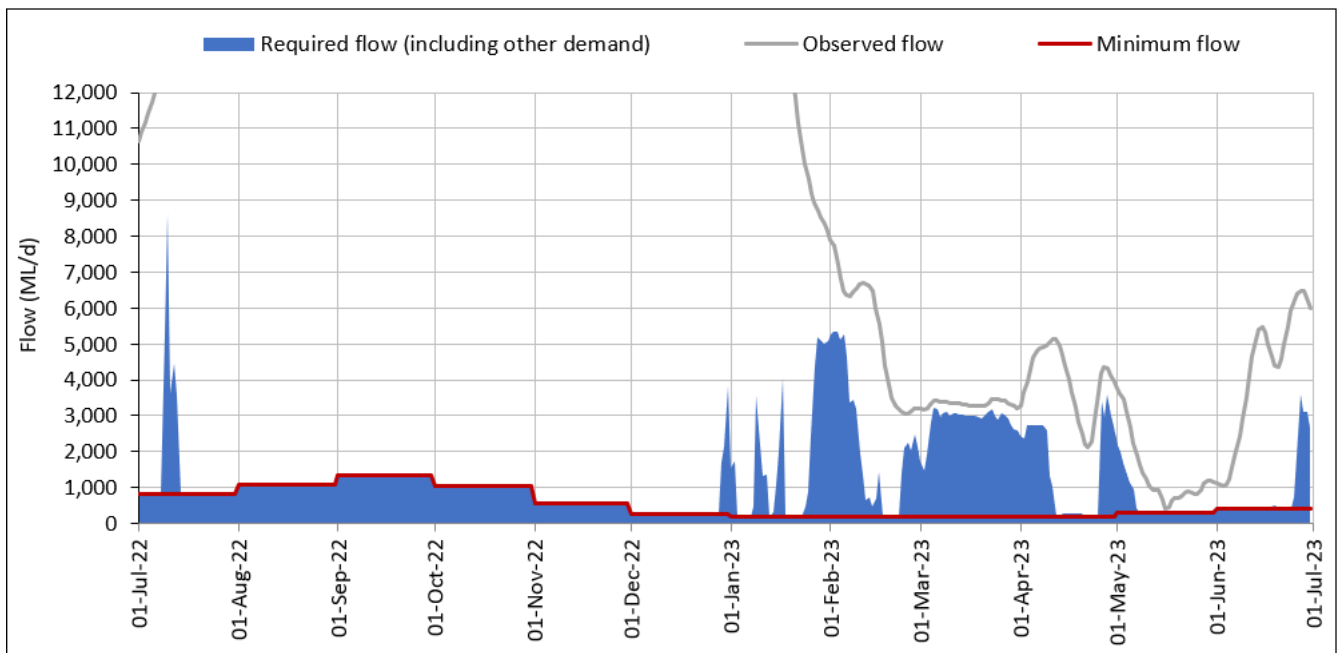
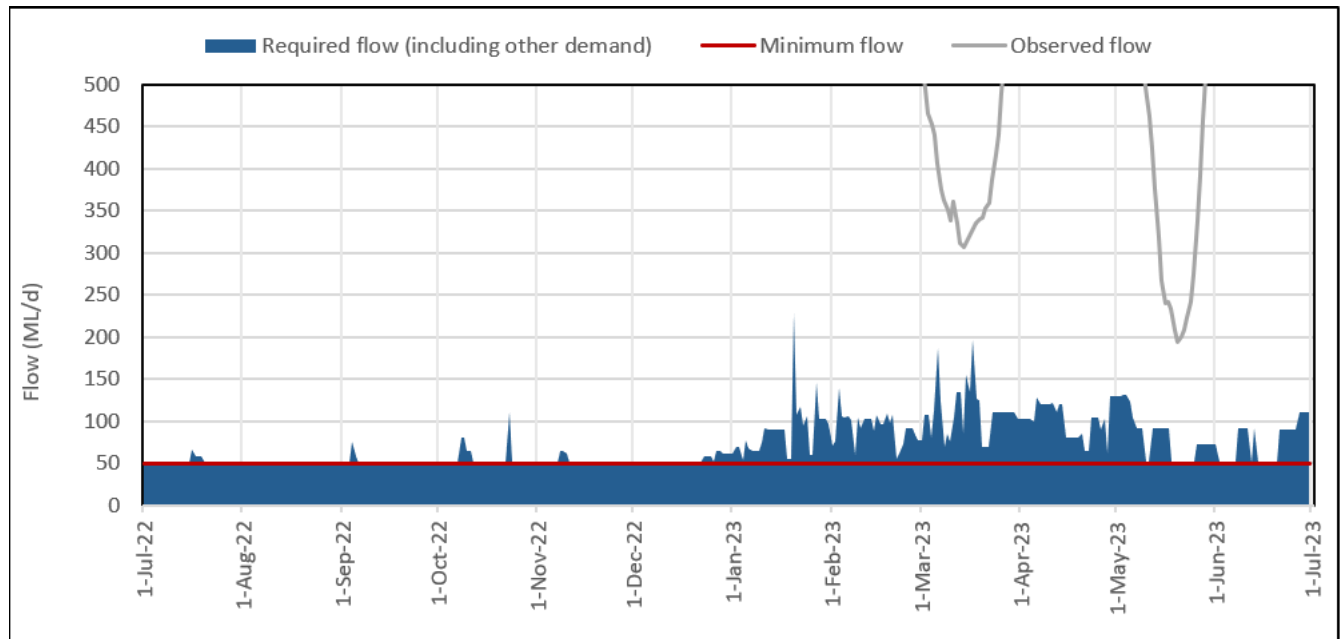


Figure 52: Billabong Creek at Darlot minimum flow target and deliveries



Water accounting statements

Significant water accounting policies

The water accounting statements in this GPWAR have been prepared using an accrual basis of accounting. All figures are in megalitres (ML).

We have excluded the 'Statement of Physical Flows' 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 more clearly depict those accounting processes associated with physical flow movement.

For general information on how to interpret the water accounting statements, refer to the *Guide to General Purpose Water Accounting Reports* available from the department's website at [DCCEEW Website](#)

Quantification of data

Data accuracy

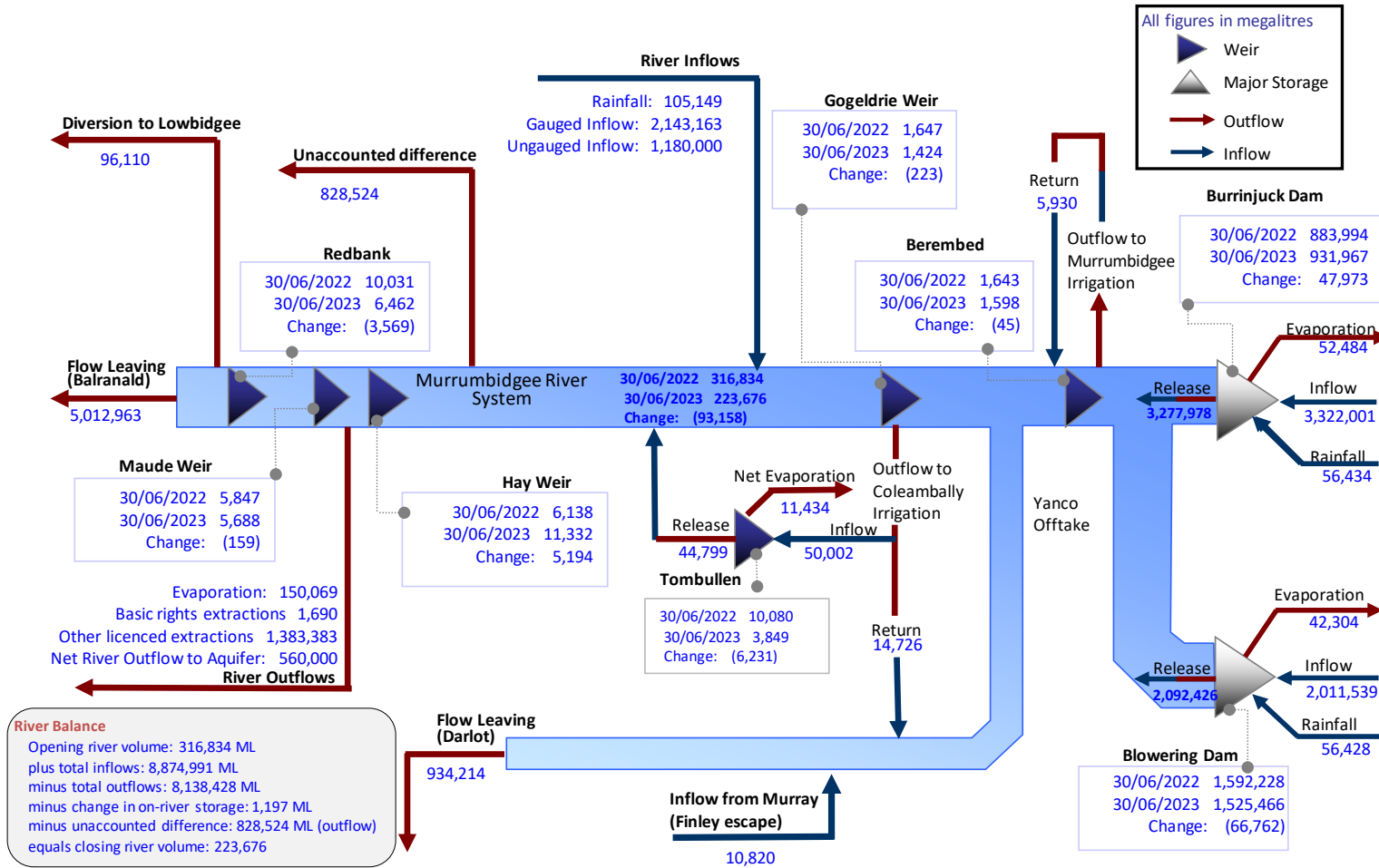
The data used to account for water movement and management in the reporting entity has been obtained from a variety of sources and systems. The data ranges from observed values where a high accuracy would be anticipated through to modelled results and estimates where accuracy can be highly variable depending 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 (see Table 8).

Table 8: Water account data accuracy estimates key

Accuracy	Description
A1 ¹⁷	+/- 0% Data is determined rather than estimated or measured. Therefore, the number contains no inaccuracies.
A	+/- 10%
B	+/- 25%
C	+/- 50%
D	+/- 100%

¹⁷ 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 Department of Climate Change, Energy, the Environment and Water corporate database

2022–23 Murrumbidgee physical flow mass balance diagram



Note: Outflow to Coleambally and Murrumbidgee Irrigation is accounted in the total river extraction transaction. River inflows and outflows are totalled for the regulated accounting extent. River extractions considers gross diversions (recredits), in-stream e-water use and ordered water leaving the system that accounted in other outflow items (detailed in note 21).

Statement of water assets and water 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
Blowering	A	10	1,525,466	1,592,228
Burrinjuck	A	10	931,967	883,994
Redbank Weir	A	10	5,688	5,847
Berembed Weir	A	10	1,598	1,643
Gogeldrie Weir	A	10	1,424	1,647
Hay Weir	A	10	11,332	6,138
Maude Weir	A	10	6,462	10,031
Tombullen Storage	A	10	3,849	10,080
Murrumbidgee River	B	11	223,676	316,834
Total surface water storage (Asws)	-	-	2,711,460	2,828,442
Change in surface water storage	-	-	(116,981)	30,982

2. Claims to water	Accuracy	Notes	30-06-2023	30-06-2022
Daily release balance (DRB)	A1	7	0	2,320

Surface water liabilities

3. Allocation account balances	Accuracy	s	30-06-2023	30-06-2022
Domestic and Stock	A1	1	(2)	(2)
Domestic and Stock (Domestic)	A1	1	0	(4)
High Security	A1	1	(4)	(0)
Regulated River Conveyance	A1	1	590	590
Coleambally Irrigation conveyance	A1	1	37,950	37,950
Murrumbidgee Irrigation Conveyance	A1	1	66,063	66,899
General Security	A1	1	536,412	520,613
Total allocation account balances (Lalloc)	-	-	641,009	626,047
Change in allocation accounts	-	-	14,962	191,582

4. Planned environmental water provisions	Accuracy	Notes	30-06-2023	30-06-2022
Environmental water allowance 1	A1	7	50,000	50,000
Environmental water allowance 2	A1	7	30,555	18,701
Translucent-Transparent under release account	A1	7	(1,431)	(159)
Total PEW balances (Leca)	-	-	79,124	68,542
Change in planned environmental water balances	-	-	10,582	50,260

5. Intervalley trade account	Accuracy	Notes	30-06-2023	30-06-2022
Intervalley trade account (IVT)	A1	5	88,954	127,570

Surface water net assets

6. Surface water net assets	30-06-2023	30-06-2022
Net surface water assets (Asws-Lalloc-Leca)	1,902,374	2,008,604
Change in net surface water assets	(106,230)	(269,993)

Changes in water assets and water liabilities

For the year ended 30 June 2023

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

Surface Water Storage Inflows	Accuracy	Notes	30-06-2023	30-06-2022
Blowering Dam	-	-	-	-
Inflow (see note 12 for components)	A	8 & 12	2,011,539	1,841,707
Rainfall	B	13	56,428	52,081
Burrinjuck Dam	-	-	-	-
Inflow	A	12	3,322,001	3,577,728
Rainfall	B	13	56,434	71,205
Tombullen storage	-	-	-	-
Inflow	A	12	50,002	44,985
Murrumbidgee River	-	-	-	-
Rainfall	B	16	105,149	71,906
Inflow (measured)	A	14	2,143,163	1,447,423
Inflow (estimated)	C	15	1,180,000	1,770,000
Inflow Other (Murrumbidgee and Coleambally irrigation returns (note 17), Finley Escape (note 14))	A	14 & 17	31,476	38,972
River inflow from storage releases (Burrinjuck, Blowering, Tombullen)	A	18	5,415,203	5,561,204
Total Surface Water Storage Increases (Isws)	-	-	14,371,396	14,477,210

Surface Water Storage Outflows	Accuracy	Notes	30-06-2023	30-06-2022
Blowering Dam	-	-	-	-
Evaporation	B	13	42,304	42,081
Release	A	18	2,092,426	1,827,810
Burrinjuck Dam	-	-	-	-
Evaporation	B	13	52,484	54,201
Release	A	18	3,277,978	3,696,309
Tombullen storage	-	-	-	-
Storage release	A	18	44,799	37,086
Net evaporation	B	13	11,434	(1,599)
Murrumbidgee River	-	-	-	-
Evaporation	B	16	150,069	139,784
Flow leaving (Balranald, Darlot, Lowbidgee)	A	19 & 20	6,043,287	4,045,009
Extractions from river	A	21	1,383,383	1,887,114
BLR Extractions	C	22	1,690	1,690
Net river outflow to aquifer	D	25	560,000	604,000
Total Surface Water Storage Decreases (Dsws)	-	-	13,659,853	12,333,483
Unaccounted difference (Outflow) (Usws)	A1	24	828,524	2,112,746
Net Surface Water Storage Inflow (Isws-Dsws-Usws)	-	-	(116,981)	30,982

2. Changes in claims to water

Increases	Accuracy	Notes	30-06-2023	30-06-2022
Daily release balance (DRB)	A1	7	0	0
Total DRB account increases (Idrb)	-	-	0	0

Decreases	Accuracy	Notes	30-06-2023	30-06-2022
Daily release balance (DRB)	A1	7	2,320	23,900
Total DRB account decreases (Ddrb)	-	-	2,320	23,900

3. Changes in allocation accounts

Allocation Account Increases	Accuracy	Notes	30-06-2023	30-06-2022
Available water determination	-	-	-	-
Domestic and Stock	A1	2	19,260	19,260
Domestic and Stock (Domestic)	A1	2	271	274
Domestic and Stock (Stock)	A1	2	10,626	10,626
Coleambally Irrigation conveyance	A1	2	92,050	122,253
Murrumbidgee Irrigation Conveyance	A1	2	176,101	231,261
Regulated River Conveyance	A1	2	2,378	2,968
Local water utility	A1	2	23,816	23,816
High Security	A1	2	364,280	364,280
High Security (Aboriginal)	A1	2	2,150	2,150
High Security (Research)	A1	2	300	300
High Security (Town Water Supply)	A1	2	19,769	19,769
General Security	A1	2	1,371,386	1,476,903
Unregulated flow demand	-	-		
Supplementary water	A	23	133,964	175,428
Supplementary water (lowbidgee)	A	23	10,120	367,370
Uncontrolled flow	A	23	0	0
Assignments in	A	4	753,879	1,041,550
Total Allocation Account Increases (Iaa)	-	-	2,980,349	3,858,209

Allocation Account Decreases	Accuracy	Notes	30-06-2023	30-06-2022
Account usage	-	-	-	-
Domestic and Stock	A	3	12,344	12,567
Domestic and Stock (Domestic)	A	3	91	96
Domestic and Stock (Stock)	A	3	9,052	8,977
Coleambally Irrigation conveyance	A	3	107,366	112,342
Murrumbidgee Irrigation Conveyance	A	3	129,546	128,710
Regulated River Conveyance	A	3	0	0
Local water utility	A	3	12,734	9,711
High Security	A	3	262,394	322,785
High Security (Aboriginal)	A	3	698	1,003
High Security (Research)	A	3	245	300
High Security (Town Water Supply)	A	3	19,769	19,769
General Security	A	3	884,598	1,032,406
Supplementary Water	A	3	133,964	175,428
Supplementary water (Lowbidgee)	A	3	10,120	367,370
Other usage	-	-	-	-
General Security (uncontrolled flow access)	A	23	0	0
Account forfeits	-	-	-	-
Domestic and Stock	A1	1	6,766	6,684
Domestic and Stock (Domestic)	A1	1	176	171
Domestic and Stock (Stock)	A1	1	1,575	1,647
Local water utility	A1	1	9,882	12,905
High Security	A1	1	12,373	6,571
High Security (Aboriginal)	A1	1	1,452	1,147
High Security (Research)	A1	1	55	0
High Security (Town Water Supply)	A1	1	0	0
General Security	A1	1	411,407	208,564
Transfer to Snowy (e-water savings)	-	-	-	-
Coleambally Irrigation conveyance	A1	1 & 26	3,500	3,500
Murrumbidgee Irrigation Conveyance	A1	1 & 26	20,000	20,000
Regulated River conveyance	A1	1 & 26	1,000	1,000
High Security	A1	1 & 26	1,885	1,885
General Security	A1	1 & 26	75,489	75,489
Access licence cancelled	-	-	-	-
Domestic And Stock	A1	1	150	0
Domestic And Stock (Domestic)	A1	1	0	3
Assignments out	A	4	836,757	1,135,596
Total Allocation Account Decreases (Daa)	-	-	2,965,387	3,666,626
Net Allocation Account Balance Increases (Iaa-Daa)	-	-	14,963	191,582

4. Changes in environmental provisions

Increases	Accuracy	Notes	30-06-2023	30-06-2022
Account increases	A1	7	296,935	274,255
Total PEW account increases (Ipew)	-	-	296,935	274,255

Decreases	Accuracy	Notes	30-06-2023	30-06-2022
Account usage	A1	7	60,081	19,860
Other account decreases	A1	7	226,272	204,136
Total PEW account decreases (Deca)	-	-	286,353	223,996
Net Environmental Contingency Allowance increase (Ipew - Dpew)	-	-	10,582	50,260

5. Changes in intervalley trade account

Increases	Accuracy	Notes	30-06-2023	30-06-2022
Accountable inflow from Murray (Finley Escape in/Darlot out)	A1	5	0	0
Water traded out of Murrumbidgee	A1	5	130,883	100,082
Total IVT account increases (Iivt)	-	-	130,883	100,082

Decreases	Accuracy	Notes	30-06-2023	30-06-2022
IVT clearances (via Balranald or Snowy RAR transfer or spill)	A1	5	124,007	95,637
Net tagged trade	A1	5	(2,513)	(36,824)
Water traded into Murrumbidgee	A1	5	48,005	6,037
Total IVT account decreases (Divt)	-	-	169,499	64,850

6. Overall changes

Change in surface water net assets	30-06-2023	30-06-2022
Change in Net Surface Water Assets Isws-Dsws-Usws+Idrb-Ddrb-laa+Daa-Ipew+Dpew-Iivt+Divt	(106,230)	(269,993)

Note disclosures

Reconciliation and future prospect descriptions

This section contains reconciliation and future prospect descriptions for the Murrumbidgee regulated river water source.

Reconciliation of change in net water assets to net change in physical water storage ¹⁸	30 June 2023	30 June 2022
Change in net surface water assets	31,577	(269,993)
Apply non-physical asset and liability adjustments ¹⁹	-	-
<i>plus</i> net increase in Allocation Accounts	14,963	191,582
<i>plus</i> net increase intervalley trade account	(38,616)	35,233
<i>minus</i> net increase in claims to water: Daily release balance	(2,320)	(23,900)
<i>plus</i> net increase in claims to water: EWA1	0	43,753
<i>plus</i> net increase in claims to water: EWA2	11,854	4,395
<i>plus</i> net increase in claims to water: Translucent/Transparent	(1,272)	2,112
total non-physical adjustments	(10,751)	300,975
<i>equals</i> net change in physical surface water storage	20,825	30,982

Reconciliation of closing water storage to total surface water assets ²⁰	30 June 2023	30 June 2022
Closing water storage	-	-
surface water storage	2,711,460	2,828,442
<i>plus</i> other claims to water (DRB)	0	2,320
<i>less</i> other claims to water (IVT)	88,954	127,570
<i>less</i> volume in river	223,676	316,834
Total surface water assets to meet future commitments	2,398,830	2,386,358

¹⁸ All figures can be derived from or found directly in the Water Accounting Statements of the General Purpose Water Accounting Report. All figures are in megalitres.

¹⁹ Non-physical changes to the water asset added back into the 'Change in Net Water Assets' to reflect the physical volumetric change in the water storage from the previous year. All figures are reported in megalitres and can be derived from or found directly in the Water Accounting Statements of this report

²⁰ Reconciliation provides an assessment of the water callable to meet current commitments as of June 30 and provide for new allocations July 1. The assessment does not consider expected inflows in the coming water year. Water owed due to intervalley trading is deducted, as with volume in river to provide a more conservative estimate of useable resources.

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 Murrumbidgee River Water Source. This includes carryovers and available water determinations at the time of reporting, along with probability information about the Murrumbidgee system's reliability.

Latest water availability

You can find the latest information on water availability, including water allocation statements, water allocations summaries and 2023–24 available water determinations, on the NSW Department of Climate Change, Energy, the Environment and Water webpage at industry.nsw.gov.au/water/allocations-availability/allocations

You can also subscribe to receive the latest updates.

Latest storage volumes

Real-time information on current storage volumes is located at realtimedata.waternsw.com.au

Significant events since 2022–23

No significant events have occurred since the conclusion of 2022-23 water year..

System reliability

The latest long-term planning model (Source) reflecting a water sharing plan management scenario in the Murrumbidgee provides indicative system reliability information for the commencement and closure of a watering season for General Security holders²¹.

At the commencement of the water year, the long-term simulation shows that General Security licence holders receive a water availability of 97% for 1% of the time and exceed 58% for 50% of the time (Figure 53).

Availabilities for General Security significantly increase throughout the water year as storages are supplemented with new inflow. By the end of the water year, the simulation results indicate that a water availability of 100% is achieved, 44% of the time, 96% achieved 50% of the time and equalling or exceeding 35% for 97% of the time (Figure 54).

²¹ Modelled data simulated as July to June water year. Simulation period 1 June 1890 to 30 June 2016, run rev.112

Figure 53: Start of water year simulated availability for General Security access licences

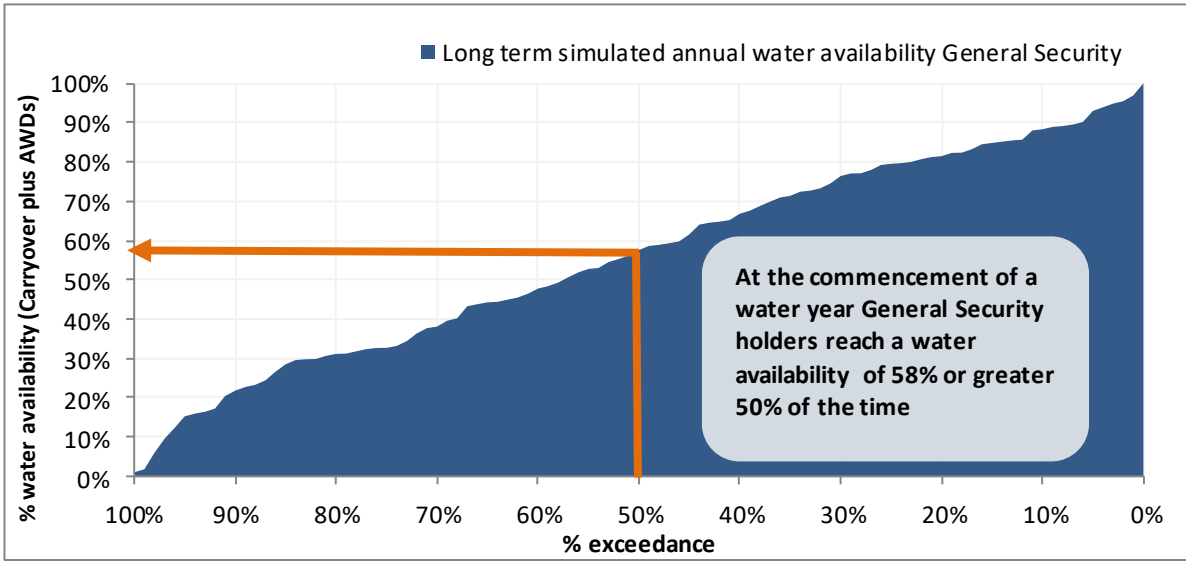
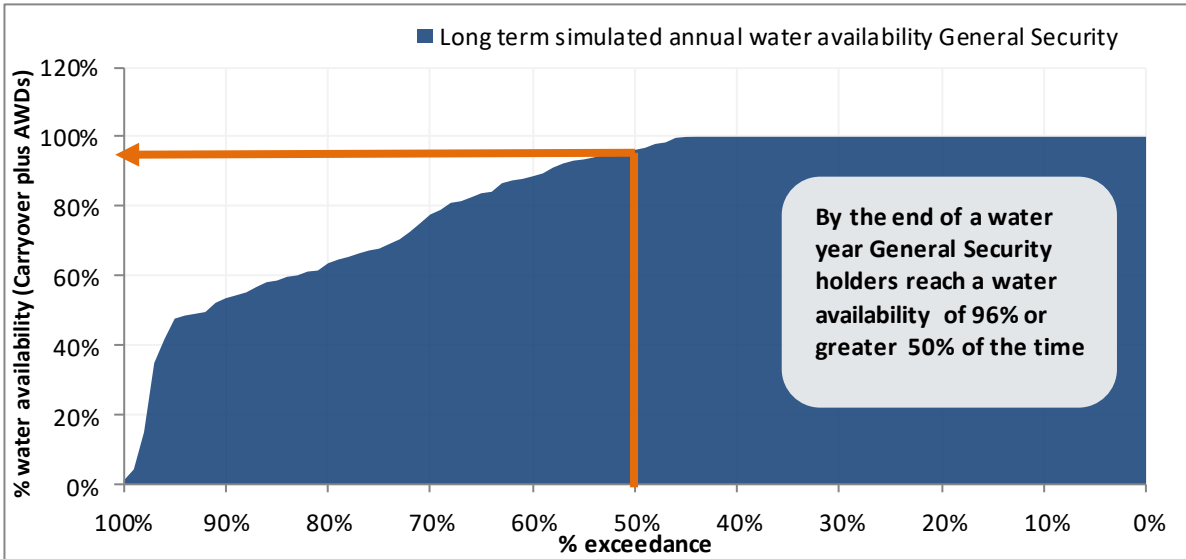


Figure 54: End of water year simulated availability for General Security access licences



Carryovers and available water determinations since this reporting period²²

Table 9. Murrumbidgee carryovers and available water determinations 2023–24 (as of February 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 (%)
Coleambally Irrigation (Conveyance)											
1-Jul-23	Opening	130,000			0.0%	0.0%	37,950	0	37,950	29.2%	29.2%
1-Jul-23	AWD 0.8702 ML per Share	130,000	91,596	91,596	70.5%	70.5%	129,546	0	129,546	99.7%	99.7%
15-Aug-23	AWD 0.0117 ML per Share	130,000	41	91,637	0.0%	70.5%	129,587	0	129,587	99.7%	99.7%
15-Sep-23	AWD 0.0133 ML per Share	130,000	47	91,683	0.0%	70.5%	129,633	0	129,633	99.7%	99.7%
3-Oct-23	AWD 0.0037 ML per Share	130,000	13	91,696	0.0%	70.5%	129,646	0	129,646	99.7%	99.7%
15-Dec-23	AWD 0.015 ML per Share	130,000	53	91,749	0.0%	70.6%	129,699	0	129,699	99.8%	99.8%
2-Jan-24	AWD 0.0112 ML per Share	130,000	39	91,788	0.0%	70.6%	129,738	0	129,738	99.8%	99.8%
15-Jan-24	AWD 0.0112 ML per Share	130,000	39	91,827	0.0%	70.6%	129,777	0	129,777	99.8%	99.8%
1-Feb-24	AWD 0.0637 ML per Share	130,000	223	92,050	0.2%	70.8%	130,000	0	130,000	100.0%	100.0%
Domestic and Stock											
1-Jul-23	Opening	19,110			0.0%	0.0%	(2)	0	(2)	0.0%	0.0%
1-Jul-23	AWD 100.0 %	19,110	19,110	19,110	100.0%	100.0%	19,108	0	19,108	100.0%	100.0%
Domestic and Stock [Domestic]											
1-Jul-23	Opening	271			0.0%	0.0%	0	0	0	0.0%	0.0%
1-Jul-23	AWD 100.0 %	271	271	271	100.0%	100.0%	271	0	271	100.0%	100.0%
11-Jul-23	Pro-rata AWD	273	2	2	0.7%	0.7%	273	0	273	100.0%	100.0%
Domestic and Stock [Stock]											
1-Jul-23	Opening	10,626			0.0%	0.0%	0	0	0	0.0%	0.0%
1-Jul-23	AWD 100.0 %	10,626	10,626	10,626	100.0%	100.0%	10,626	0	10,626	100.0%	100.0%
Local Water Utility											
1-Jul-23	Opening	23,816			0.0%	0.0%	0	0	0	0.0%	0.0%
1-Jul-23	AWD 100.0 %	23,816	23,816	23,816	100.0%	100.0%	23,816	0	23,816	100.0%	100.0%
Murrumbidgee Irrigation (Conveyance)											
1-Jul-23	Opening	243,000			0.0%	0.0%	66,063	0	66,063	27.2%	27.2%
1-Jul-23	AWD 0.779 ML per Share	243,000	172,517	172,517	71.0%	71.0%	238,580	0	238,580	98.2%	98.2%

²² See note 2 for announcements relating to the reporting period

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 (%)
15-Aug-23	AWD 0.0136 ML per Share	243,000	272	172,789	0.1%	71.1%	238,852	0	238,852	98.3%	98.3%
15-Sep-23	AWD 0.034 ML per Share	243,000	680	173,469	0.3%	71.4%	239,532	0	239,532	98.6%	98.6%
3-Oct-23	AWD 0.0136 ML per Share	243,000	272	173,741	0.1%	71.5%	239,804	0	239,804	98.7%	98.7%
15-Dec-23	AWD 0.0798 ML per Share	243,000	1,596	175,337	0.7%	72.2%	241,400	0	241,400	99.3%	99.3%
2-Jan-24	AWD 0.079 ML per Share	243,000	1,580	176,917	0.7%	72.8%	242,980	0	242,980	100.0%	100.0%
15-Jan-24	AWD 0.001 ML per Share	243,000	20	176,937	0.0%	72.8%	243,000	0	243,000	100.0%	100.0%
Regulated River (Conveyance)											
1-Jul-23	Opening	2,968			0.0%	0.0%	590	0	590	19.9%	19.9%
1-Jul-23	AWD 0.37 ML per Share	2,968	1,098	1,098	37.0%	37.0%	1,689	0	1,689	56.9%	56.9%
15-Aug-23	AWD 0.02 ML per Share	2,968	59	1,158	2.0%	39.0%	1,748	0	1,748	58.9%	58.9%
15-Sep-23	AWD 0.05 ML per Share	2,968	148	1,306	5.0%	44.0%	1,896	0	1,896	63.9%	63.9%
3-Oct-23	AWD 0.02 ML per Share	2,968	59	1,365	2.0%	46.0%	1,956	0	1,956	65.9%	65.9%
15-Dec-23	AWD 0.08 ML per Share	2,968	237	1,603	8.0%	54.0%	2,193	0	2,193	73.9%	73.9%
2-Jan-24	AWD 0.06 ML per Share	2,968	178	1,781	6.0%	60.0%	2,371	0	2,371	79.9%	79.9%
15-Jan-24	AWD 0.06 ML per Share	2,968	178	1,959	6.0%	66.0%	2,549	0	2,549	85.9%	85.9%
1-Feb-24	AWD 0.34 ML per Share	2,968	419	2,378	14.1%	80.1%	2,968	0	2,968	100.0%	100.0%
Regulated River (General Security)											
1-Jul-23	Opening	1,892,005			0.0%	0.0%	536,412	0	536,412	28.4%	28.4%
1-Jul-23	AWD 0.37 ML per Share	1,892,005	700,042	700,042	37.0%	37.0%	1,236,454	0	1,236,454	65.4%	65.4%
15-Aug-23	AWD 0.02 ML per Share	1,892,005	37,844	737,886	2.0%	39.0%	1,274,297	0	1,274,297	67.4%	67.4%
15-Sep-23	AWD 0.05 ML per Share	1,892,005	94,598	832,484	5.0%	44.0%	1,368,895	0	1,368,895	72.4%	72.4%
3-Oct-23	AWD 0.02 ML per Share	1,892,005	37,838	870,322	2.0%	46.0%	1,406,733	0	1,406,733	74.4%	74.4%
15-Dec-23	AWD 0.08 ML per Share	1,892,005	151,363	1,021,685	8.0%	54.0%	1,558,096	0	1,558,096	82.4%	82.4%
2-Jan-24	AWD 0.06 ML per Share	1,892,005	113,519	1,135,204	6.0%	60.0%	1,671,615	0	1,671,615	88.4%	88.4%
15-Jan-24	AWD 0.06 ML per Share	1,892,005	113,519	1,248,723	6.0%	66.0%	1,785,134	0	1,785,134	94.4%	94.4%
1-Feb-24	AWD 0.34 ML per Share	1,892,005	106,870	1,355,593	5.6%	71.6%	1,892,004	0	1,892,004	100.0%	100.0%
Regulated River (High Security)											
1-Jul-23	Opening	364,426			0.0%	0.0%	(4)	0	(4)	0.0%	0.0%
1-Jul-23	AWD 0.95 ML per Share	364,426	346,207	346,207	95.0%	95.0%	346,203	0	346,203	95.0%	95.0%
1-Feb-24	AWD 0.05 ML per Share	364,573	18,227	364,434	5.0%	100.0%	364,430	0	364,430	100.0%	100.0%
Regulated River (High Security) [Aboriginal Cultural]											
1-Jul-23	Opening	2,150			0.0%	0.0%	0	0	0	0.0%	0.0%

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 (%)
1-Jul-23	AWD 100.0 %	2,150	2,150	2,150	100.0%	100.0%	2,150	0	2,150	100.0%	100.0%
Regulated River (High Security) [Research]											
1-Jul-23	Opening	300			0.0%	0.0%	0	0	0	0.0%	0.0%
1-Jul-23	AWD 100.0 %	300	300	300	100.0%	100.0%	300	0	300	100.0%	100.0%
Regulated River (High Security) [Town Water Supply]											
1-Jul-23	Opening	19,769			0.0%	0.0%	0	0	0	0.0%	0.0%
1-Jul-23	AWD 100.0 %	19,769	19,769	19,769	100.0%	100.0%	19,769	0	19,769	100.0%	100.0%
Supplementary Water											
1-Jul-23	Opening	198,780			0.0%	0.0%	0	0	0	0.0%	0.0%
1-Jul-23	AWD 1.0 ML per Share	198,780	198,780	198,780	100.0%	100.0%	198,780	0	198,780	100.0%	100.0%
Supplementary Water (Lowbidgee)											
1-Jul-23	Opening	747,000			0.0%	0.0%	0	0	0	0.0%	0.0%
1-Jul-23	AWD 1.0 ML per Share	747,000	747,000	747,000	100.0%	100.0%	747,000	0	747,000	100.0%	100.0%

Note 1—Allocation accounts

This note is reference for the volume held in the allocation accounts at the time of reporting but 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 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 therefore is inclusive of licences held by environmental holders (environmental holdings are specifically detailed in note 6)

Supplementary water was not strictly represented as a water liability in the accounting statements the same way other licence categories were. Details about supplementary usage and events can be found in Note 23.

Data type

Derived from measured data

Policy

Water Sharing Plan for the Murrumbidgee Regulated River Water Source 2016

Available on the department's website at [DCCEEW Website](#)

Data accuracy

A1—Nil inaccuracy +/- 0%

Providing agency

Department of Climate Change, Energy, the Environment and Water

Data source

WaterNSW/Department of Climate Change, Energy, the Environment and Water—Water Accounting System (joint ownership)

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:

- available water determination (detailed in note 2)
- licenced usage (detailed in note 3)
- forfeiture due to:
 - carryover rules
 - account spillage as a result of AWD
 - licence conversions
- environmental allocation transferred for delivery outside of the Murrumbidgee (detailed in note 26).
- trade of allocation water between accounts (detailed in notes 4 and 5)
- determined carryover volume.

Additional information

Table 11 provides a balanced summary²³ of the water allocation and environmental accounts for each category of access licence. Table 10 provides a description of each of the table components for Table 11 and Table 19.

Table 10: Explanatory information for Table 11 and Table 19.

Heading	Description
Licence category	An issued access licence category defined in the management areas water sharing plan. Typically, categories are specific purpose in nature (e.g. for town water supply), or reflect reliability in the resource sharing process (e.g. High Security)
Share	The total volume of units for the specified licence category at 30 June.
Opening balance	The volume of allocation that has been carried forward from the previous year to this accounting period
AWD	The total annual volume of allocation added to the access licences in the specified category by available water determinations (allocation announcements)
Lic New	Licences – New: Increase in account water as a result of issuing new access licences with an opening balance
Lic Can	Licences – Cancelled: Decrease in account water as a result of licence cancellation that was holding allocation
Asn In	Assignments – In: Increase in account water as a result of temporary trade in
Asn Out	Assignments – Out: Decrease in account water as a result of temporary trade out

²³ Final accounting balances include adjustments to carryover, AWD, end of year forfeit and carry forward to allow for the effect of removing allocation account water from a Murrumbidgee access licence in order to call that water for release for Snowy River and Murray increased environmental flows. As a result these accounts will vary from provisional information available on departmental dashboards and from annual allocation summary data provided in the GPWAR (carryover item).

Heading	Description
Snowy trans	Transfer to Snowy for environmental release: Water transferred from Murrumbidgee allocation accounts to allow environmental flows in the Snowy, Snowy Montane and Murray Rivers. This physical delivery is allowed for by reducing the amount of water Snowy Hydro are required to release to the Murrumbidgee valley.
Usage	Account usage – Controlled: Volume of allocation debited to licences that is extracted or diverted from the river, or alternatively released from storage to support environmental outcomes. Allocation is supplied under controlled conditions through regulating structures such as dams and weirs.
Usage Uncont	Account usage – Uncontrolled: Volume of allocation debited to licences that is extracted or diverted from the river, or alternatively protected from extraction to support environmental outcomes. Allocation is supplied under uncontrolled flow conditions - either unregulated water sources, or from event flows in regulated systems unable to be captured in storage.
During year forfeit	This is the account water forfeited throughout the year as a result of the accounting rules specified in the water sharing plan. Forfeited water may occur due to account limits being reached, conversions between licence categories and various types of other licence dealings.
EoY Avail	Available Balance: That part of the remaining account balance that is available to be taken at the conclusion of the water year. The balance is prior to carry forward rules being applied.
EoY NA	Non-Available Balance: That part of the remaining account balance that is not available to be taken at the conclusion of the water year (30 June). The balance is prior to carry forward rules being applied.
EoY forfeit	End of year forfeit: Account water that is forfeited at the end of the water year as a result of carryover rules that restrict the carry forward volume to the next water year
Carry fwd	Carry forward: This represents the account water that is permitted to be carried forward into the next water year as determined by the carryover rules.

Table 11: Allocation account balance summary²³. See Table 10 for explanation of headings.

Licence category	Share 30 June 2023	Opening balance	AWD	Lic New	Lic Can	Asn in	Asn out	Snowy trans	Usage	Usage Uncont	During year forfeit	EoY Avail	EoY NA	EoY forfeit	Carry fwd
Coleambally Irrigation (Conveyance)	130,000	37,950	92,050	0	0	25,226	6,411	3,500	107,366	0	0	37,950.0	0	0	37,950
Domestic and Stock	19,110	(2)	19,260	0	150	0	0		12,344	0	0	6,764.2	0	6,766	(2)
Domestic and Stock (Domestic)	271	(4)	271	0	0	0	0		91	0	0	176.2	0	176	0
Domestic and Stock (Stock)	10,626	0	10,626	0	0	0	0		9,052	0	0	1,574.6	0	1,575	0
Local Water Utility	23,816	0	23,816	0	0	0	1,200		12,734	0	0	9,882	0	9,882	0
Murrumbidgee Irrigation (Conveyance)	243,000	66,900	176,101	0	0	1,588	28,979	20,000	129,546	0	0	66,063.0	0	0	66,063
Conveyance	2,968	590	2,378	0	0	0	1,378	1,000	0	0	0	590.4	0	0	590
General Security	1,892,000	520,613	1,371,386	0	0	644,398	628,491	75,489	884,598	0	0	947,818.8	0	411,407	536,412
High Security	364,426	0	364,280	0	0	82,666	170,298	1,885	262,394	0	0	12,368.8	0	12,373	(4)
High Security (Aboriginal Cultural)	2,150	0	2,150	0	0	0	0		698	0	0	1,451.7	0	1,452	0
High Security (Research)	300	0	300	0	0	0	0		245	0	0	55.4	0	55	0
High Security (Town Water Supply)	19,769	0	19,769	0	0	0	0		19,769	0	0	0.0	0	0	0
Supplementary Water	198,780	0	198,780	0	0	37,073	37,073		0	133,964	0	64,815.9	0	64,816	0
Supplementary Water (Lowbidgee)	747,000	0	747,000	0	0	120,000	120,000		0	10,120	0	736,880.0	0	736,880	0

Note 2—Available water determination (allocation announcement)

This is the process by which the regulated surface water asset available for use within the regulated system is determined and shared. It determines 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, while prior to this under the *Water Act 1912* this process was known as an allocation announcement.

Data type

Derived from measured data.

Policy

Water Management Act 2000 (NSW).

- Chapter 3—Part 2 Access Licences.
- Clause 59—Available Water Determinations.

Water Sharing Plan for the Murrumbidgee Regulated River Water Source 2016

- Part 7—Limits to the availability of water
- Division 2—Available Water Determinations.

Available on the department's website at [DCCEEW Website](#)

Data accuracy

A1—Nil inaccuracy +/- 0%

Providing agency

Department of Climate Change, Energy, the Environment and Water

Data source

WaterNSW/Department of Climate Change, Energy, the Environment and Water—Water Accounting System (Joint ownership of system).

Available Water Determination Register—Department of Climate Change, Energy, the Environment and Water website at [DCCEEW Website](#)

Methodology

The AWD procedure itself is generally divided into 2 sections: the available water asset, and system commitments. Once system commitments have been met the available water asset is then available for distribution to the access licence categories in order of priority (see Table 12). The volume of the announced allocation is expressed as the percentage of share component of the licence.

Table 12: Priority of access licence categories

Licence Category	AWD Priority
General Security	Low
High Security	High
Conveyance	Low
Domestic and Stock ²⁴	Very High
Local Water Utility	Very High

Available water asset—this is calculated by summing the water currently available in storage, future (minimum) inflows to the system, and additional volumes due to recessions of inflows from the current levels to the minimum inflow levels. Also taken into consideration is the reduction of the total inflows to the system for those that arrive too late in the season to be useful.

System commitments—this is an assessment of the existing commitments that must be delivered from the Available Water Asset in either the current or future years. Key components include:

- essential supplies include things such as town water supplies, stock and domestic requirements, industrial use and permanent plantings (e.g. orchards, vineyards) and environmental allowances
- undelivered account water is the water that is already in accounts that is yet to be provided
- end of system flow requirement is an estimate of the flow that to pass through the system as a result of operation of the system
- losses which are estimated as the amount of water that will be lost by the system either through evaporation or in the process of delivering the water via transmission losses.

The AWD for supplementary licence accounts is a separate process and is not dependent on water asset available. It is made once at the start of the year and unless there is a management change due to the growth in use strategy it is maintained at the maximum value prescribed in the plan 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

The following pages contain the annual allocation summary report. Below is a table containing report notes to help interpret the report.

²⁴ Domestic and Stock is further broken down into three subcategories: Domestic and Stock, Domestic and Stock (Domestic) and Domestic and Stock (Stock). For the purposes of this report and the general-purpose water account they have been aggregated.

Table 13: Allocation summary report descriptions

Table heading	Description
Opening	Remaining allocation account balances at the conclusion of the previous season that can 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.
Announced volume	Volume of water credited to accounts within a licence category as a result of the announcement made.
Cumulative volume	Cumulative total of the announced volumes for the water year and licence category.
Percent of share component (Entitlement)	This is the announced volume expressed as a percentage of the entitlement applicable on the date.
Balance made available	Sum of water available in allocation accounts that has been made available to be taken during the season.
Non-available balance	Water allocated that is not accessible at this point in time.
Supplementary water	Water that is not a stored source of water and is only made available if an uncontrolled flow event occurs.

Table 14: Murrumbidgee Regulated River Available Water Determination announcements for the reporting period

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 (%)
Coleambally Irrigation (Conveyance)											
1-Jul-22	Opening	130,000			0.0%	0.0%	37,950	0	37,950	29.2%	29.2%
1-Jul-22	AWD 0.8585 ML per Share	130,000	91,555	91,555	70.4%	70.4%	129,505	0	129,505	99.6%	99.6%
15-Jul-22	AWD 0.0175 ML per Share	130,000	61	91,616	0.0%	70.5%	129,566	0	129,566	99.7%	99.7%
15-Aug-22	AWD 0.0136 ML per Share	130,000	48	91,664	0.0%	70.5%	129,614	0	129,614	99.7%	99.7%
1-Sep-22	AWD 0.0094 ML per Share	130,000	33	91,697	0.0%	70.5%	129,647	0	129,647	99.7%	99.7%
15-Sep-22	AWD 0.0019 ML per Share	130,000	7	91,703	0.0%	70.5%	129,653	0	129,653	99.7%	99.7%
4-Oct-22	AWD 0.0056 ML per Share	130,000	20	91,723	0.0%	70.6%	129,673	0	129,673	99.7%	99.7%
17-Oct-22	AWD 0.0056 ML per Share	130,000	20	91,742	0.0%	70.6%	129,692	0	129,692	99.8%	99.8%
1-Nov-22	AWD 0.0019 ML per Share	130,000	7	91,749	0.0%	70.6%	129,699	0	129,699	99.8%	99.8%
15-Nov-22	AWD 0.0019 ML per Share	130,000	7	91,756	0.0%	70.6%	129,706	0	129,706	99.8%	99.8%
1-Dec-22	AWD 0.0094 ML per Share	130,000	33	91,789	0.0%	70.6%	129,739	0	129,739	99.8%	99.8%
15-Dec-22	AWD 0.0094 ML per Share	130,000	33	91,822	0.0%	70.6%	129,772	0	129,772	99.8%	99.8%
16-Jan-23	AWD 0.0655 ML per Share	130,000	229	92,050	0.2%	70.8%	130,000	0	130,000	100.0%	100.0%
Domestic and Stock											
1-Jul-22	Opening	19,260			0.0%	0.0%	(2)	0	(2)	0.0%	0.0%
1-Jul-22	AWD 100.0 %	19,260	19,260	19,260	100.0%	100.0%	19,258	0	19,258	100.0%	100.0%
Domestic and Stock [Domestic]											
1-Jul-22	Opening	271			0.0%	0.0%	(4)	0	(4)	(1.5)%	(1.5)%
1-Jul-22	AWD 100.0 %	271	271	271	100.0%	100.0%	267	0	267	98.5%	98.5%
Domestic and Stock [Stock]											
1-Jul-22	Opening	10,626			0.0%	0.0%	0	0	0	0.0%	0.0%
1-Jul-22	AWD 100.0 %	10,626	10,626	10,626	100.0%	100.0%	10,626	0	10,626	100.0%	100.0%

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 (%)
Local Water Utility											
1-Jul-22	Opening	23,816			0.0%	0.0%	0	0	0	0.0%	0.0%
1-Jul-22	AWD 100.0 %	23,816	23,816	23,816	100.0%	100.0%	23,816	0	23,816	100.0%	100.0%
Murrumbidgee Irrigation (Conveyance)											
1-Jul-22	Opening	243,000			0.0%	0.0%	66,900	0	66,900	27.5%	27.5%
1-Jul-22	AWD 0.7654 ML per Share	243,000	171,409	171,409	70.5%	70.5%	238,308	0	238,308	98.1%	98.1%
15-Jul-22	AWD 0.0204 ML per Share	243,000	408	171,817	0.2%	70.7%	238,716	0	238,716	98.2%	98.2%
15-Aug-22	AWD 0.0204 ML per Share	243,000	408	172,225	0.2%	70.9%	239,124	0	239,124	98.4%	98.4%
1-Sep-22	AWD 0.034 ML per Share	243,000	680	172,905	0.3%	71.2%	239,804	0	239,804	98.7%	98.7%
15-Sep-22	AWD 0.0068 ML per Share	243,000	136	173,041	0.1%	71.2%	239,940	0	239,940	98.7%	98.7%
4-Oct-22	AWD 0.0204 ML per Share	243,000	408	173,449	0.2%	71.4%	240,348	0	240,348	98.9%	98.9%
17-Oct-22	AWD 0.0395 ML per Share	243,000	790	174,239	0.3%	71.7%	241,138	0	241,138	99.2%	99.2%
1-Nov-22	AWD 0.0132 ML per Share	243,000	264	174,503	0.1%	71.8%	241,402	0	241,402	99.3%	99.3%
15-Nov-22	AWD 0.0132 ML per Share	243,000	264	174,767	0.1%	71.9%	241,666	0	241,666	99.5%	99.5%
1-Dec-22	AWD 0.0658 ML per Share	243,000	1,316	176,083	0.5%	72.5%	242,982	0	242,982	100.0%	100.0%
15-Dec-22	AWD 0.001 ML per Share	243,000	18	176,101	0.0%	72.5%	243,000	0	243,000	100.0%	100.0%
Regulated River (Conveyance)											
1-Jul-22	Opening	2,968			0.0%	0.0%	590	0	590	19.9%	19.9%
1-Jul-22	AWD 0.35 ML per Share	2,968	1,039	1,039	35.0%	35.0%	1,629	0	1,629	54.9%	54.9%
15-Jul-22	AWD 0.03 ML per Share	2,968	89	1,128	3.0%	38.0%	1,718	0	1,718	57.9%	57.9%
15-Aug-22	AWD 0.03 ML per Share	2,968	89	1,217	3.0%	41.0%	1,807	0	1,807	60.9%	60.9%
1-Sep-22	AWD 0.05 ML per Share	2,968	148	1,365	5.0%	46.0%	1,956	0	1,956	65.9%	65.9%
15-Sep-22	AWD 0.01 ML per Share	2,968	30	1,395	1.0%	47.0%	1,985	0	1,985	66.9%	66.9%

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 (%)
4-Oct-22	AWD 0.03 ML per Share	2,968	89	1,484	3.0%	50.0%	2,074	0	2,074	69.9%	69.9%
17-Oct-22	AWD 0.03 ML per Share	2,968	89	1,573	3.0%	53.0%	2,163	0	2,163	72.9%	72.9%
1-Nov-22	AWD 0.01 ML per Share	2,968	30	1,603	1.0%	54.0%	2,193	0	2,193	73.9%	73.9%
15-Nov-22	AWD 0.01 ML per Share	2,968	30	1,632	1.0%	55.0%	2,223	0	2,223	74.9%	74.9%
1-Dec-22	AWD 0.05 ML per Share	2,968	148	1,781	5.0%	60.0%	2,371	0	2,371	79.9%	79.9%
15-Dec-22	AWD 0.05 ML per Share	2,968	148	1,929	5.0%	65.0%	2,520	0	2,520	84.9%	84.9%
16-Jan-23	AWD 0.35 ML per Share	2,968	448	2,378	15.1%	80.1%	2,968	0	2,968	100.0%	100.0%
Regulated River (General Security)											
1-Jul-22	Opening	1,891,995			0.0%	0.0%	520,613	0	520,613	27.5%	27.5%
1-Jul-22	AWD 0.35 ML per Share	1,891,995	662,212	662,212	35.0%	35.0%	1,182,825	0	1,182,825	62.5%	62.5%
15-Jul-22	AWD 0.03 ML per Share	1,891,995	56,749	718,961	3.0%	38.0%	1,239,574	0	1,239,574	65.5%	65.5%
15-Aug-22	AWD 0.03 ML per Share	1,891,995	56,758	775,719	3.0%	41.0%	1,296,332	0	1,296,332	68.5%	68.5%
1-Sep-22	AWD 0.05 ML per Share	1,891,995	94,598	870,317	5.0%	46.0%	1,390,930	0	1,390,930	73.5%	73.5%
15-Sep-22	AWD 0.01 ML per Share	1,891,995	18,921	889,237	1.0%	47.0%	1,409,850	0	1,409,850	74.5%	74.5%
4-Oct-22	AWD 0.03 ML per Share	1,891,995	56,761	945,998	3.0%	50.0%	1,466,611	0	1,466,611	77.5%	77.5%
17-Oct-22	AWD 0.03 ML per Share	1,891,995	56,765	1,002,763	3.0%	53.0%	1,523,376	0	1,523,376	80.5%	80.5%
1-Nov-22	AWD 0.01 ML per Share	1,891,995	18,916	1,021,679	1.0%	54.0%	1,542,292	0	1,542,292	81.5%	81.5%
15-Nov-22	AWD 0.01 ML per Share	1,891,995	18,932	1,040,611	1.0%	55.0%	1,561,224	0	1,561,224	82.5%	82.5%
1-Dec-22	AWD 0.05 ML per Share	1,892,005	94,587	1,135,197	5.0%	60.0%	1,655,810	0	1,655,810	87.5%	87.5%
15-Dec-22	AWD 0.05 ML per Share	1,892,005	94,614	1,229,811	5.0%	65.0%	1,750,424	0	1,750,424	92.5%	92.5%
16-Jan-23	AWD 0.35 ML per Share	1,892,005	141,575	1,371,386	7.5%	72.5%	1,891,999	0	1,891,999	100.0%	100.0%

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 (%)
Regulated River (High Security)											
1-Jul-22	Opening	364,279			0.0%	0.0%	0	0	0	0.0%	0.0%
1-Jul-22	AWD 0.95 ML per Share	364,279	346,068	346,068	95.0%	95.0%	346,068	0	346,068	95.0%	95.0%
16-Jan-23	AWD 0.05 ML per Share	364,279	18,212	364,280	5.0%	100.0%	364,280	0	364,280	100.0%	100.0%
Regulated River (High Security) [Aboriginal Cultural]											
1-Jul-22	Opening	2,150			0.0%	0.0%	0	0	0	0.0%	0.0%
1-Jul-22	AWD 100.0 %	2,150	2,150	2,150	100.0%	100.0%	2,150	0	2,150	100.0%	100.0%
Regulated River (High Security) [Research]											
1-Jul-22	Opening	300			0.0%	0.0%	0	0	0	0.0%	0.0%
1-Jul-22	AWD 100.0 %	300	300	300	100.0%	100.0%	300	0	300	100.0%	100.0%
Regulated River (High Security) [Town Water Supply]											
1-Jul-22	Opening	19,769			0.0%	0.0%	0	0	0	0.0%	0.0%
1-Jul-22	AWD 100.0 %	19,769	19,769	19,769	100.0%	100.0%	19,769	0	19,769	100.0%	100.0%
Supplementary Water											
1-Jul-22	Opening	198,780			0.0%	0.0%	100	0	100	0.1%	0.1%
1-Jul-22	AWD 1.0 ML per Share	198,780	198,780	198,780	100.0%	100.0%	198,880	0	198,880	100.1%	100.1%
Supplementary Water (Lowbidgee)											
1-Jul-22	Opening	747,000			0.0%	0.0%	0	0	0	0.0%	0.0%
1-Jul-22	AWD 1.0 ML per Share	747,000	747,000	747,000	100.0%	100.0%	747,000	0	747,000	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 issued under the water sharing plan. This figure excludes that water accounted as uncontrolled flow which is accounted for separately (see Note 23).

Data type

Measured/administration data

Policy

Water Sharing Plan for the Murrumbidgee Regulated River Water Source 2016

Available on the department's website at [DCCEEW Website](#)

Data accuracy

A—Estimated in the range +/- 10%

Providing agency

Department of Climate Change, Energy, the Environment and Water

Data source

WaterNSW/ Department of Climate Change, Energy, the Environment and Water—Water Accounting System (Joint ownership of 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. With potentially 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. Below is a description of these:

- based on periods of announcement—during periods of supplementary water announcements extractions can be debited against the supplementary water licences
- usage 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 the table below. The prioritising is based on the nature of and rules around each of the licence categories. Table 15 provides the order in which extractions are apportioned to access licence categories in the water accounting system. 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 15: 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

Table 16: Account usage summary

Category	Account allocation usage	Additional usage ²⁵
Coleambally Irrigation (Conveyance)	107,366	N/A
Domestic and Stock	12,344	N/A
Domestic and Stock [Domestic]	91	N/A
Domestic and Stock [Stock]	9,052	N/A
Local Water Utility	12,734	N/A
Murrumbidgee Irrigation (Conveyance)	129,546	N/A
Regulated River (Conveyance)	0	N/A
Regulated River (General Security)	884,598	0
Regulated River (High Security)	262,394	0
Regulated River (High Security) (Aboriginal Cultural)	698	N/A
Regulated River (High Security) (Research)	245	N/A
Regulated River (High Security) (Town Water Supply)	19,769	N/A
Supplementary Water	133,964	N/A
Supplementary Water (Lowbidgee)	10,120	N/A
Total	1,582,921	N/A

²⁵ Usage without debit to allocation account balance under the water sharing plans access to uncontrolled flow provisions

Note 4—Allocation assignments (temporary trading)

This represents the temporary trading (allocation assignments) of water between allocation accounts within the regulated Murrumbidgee River, or between different water sources.

Data type

Administration

Policy

Water Management Act 2000

Water Sharing Plan for the Murrumbidgee Regulated River Water Source 2016

- Part 10 Access licence dealing rules
 - Clause 76 Assignment of water allocation dealings
 - Clause 77 Interstate access licence transfer and assignment of water allocation

Available on the Department of Climate Change, Energy, the Environment and Water Website at [DCCEEW Website](#)

Data accuracy

A1—Nil inaccuracy +/- 0%

Providing agency

Department of Climate Change, Energy, the Environment and Water

Data source

- WaterNSW/ Department of Climate Change, Energy, the Environment and Water—Water Accounting System (Joint ownership)
- Water Ordering and Usage database

Methodology

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

The net effect of internal trading on committed water is zero for a water year. However, these trades are listed in the accounting statements to provide details on the volumes of water traded.

Trade between water sources will either increase the committed liability for the year (trade into the Murrumbidgee) or decrease the committed liability for the year (trade out of the Murrumbidgee). The imbalance created from trading between water sources is monitored and managed with the intervalley trade account (see note 5).

Additional information

Table 17 shows the internal trading figures between licence categories. All figures represent a volume in megalitres.

Table 17: Total allocation assignments in the Murrumbidgee Regulated River Water Source for the reporting period

From	To M'bidgee CI Convey	To M'bidgee MI Convey	To M'bidgee General security	To M'bidgee High security	To M'bidgee Supplementary	To M'bidgee Supplementary (Lowbidgee)	To NSW Murray General security	To NSW Murray High security	To NSW Murray Convey	To Lower Darling High security	To SA Interstate licence	Total
Lower Darling – General security			340									340
M'bidgee – CI Conveyance	-		6,411	-	-	-	-	-	-	-	-	6,411
M'bidgee – General security	25,226	1,588	461,578	63,808	-	-	62,042	1,730	5,571	2,584	4,364	628,491
M'bidgee – High security	-		107,424	9,870	-	-	36,954	2,448		12,616	986	170,297
M'bidgee – Local Water Utility	-		1,200	-	-	-	-	-	-	-	-	1,200
M'bidgee – MI Conveyance	-		27,391	-	-	-	1,588	-	-	-	-	28,979
M'bidgee – RR conveyance	-		1,378	-	-	-	-	-	-	-	-	1,378
M'bidgee – Supplementary	-		-	-	37,072	-	-	-	-	-	-	37,072
M'bidgee – Supplementary (Lowbidgee)	-		-	-	-	120,000	-	-	-	-	-	120,000
NSW Murray – Conveyance			6,171									6,171
NSW Murray – General security	-		30,183	8,030	-	-	-	-	-	-	-	38,213
NSW Murray – High security	-		2,323	958	-	-	-	-	-	-	-	3,281
Total	25,226	1,588	644,398	82,666	37,072	120,000	100,584	4,178	5,571	15,200	5350	1,041,834

Total internal trading = 863,845 megalitres.

Note 5—Intervalley Trade Account (IVT)

The intervalley trade account provides ongoing tracking of valley debts and claims to water due to the temporary trading of account water between the southern connected valleys of the Murray–Darling Basin.

For the Murrumbidgee this is presented in the accounting statements as a liability account²⁶ whereby a positive balance is indicative of a future obligation (Murrumbidgee owes water). and a negative balance indicative of a claim to water (Murrumbidgee owed water).

Data type

Derived from measured data

Policy

Water Act 2007 (Federal)

- The Murray–Darling Basin Agreement (Schedule 1)—Transferring Water Entitlements and Allocations (Schedule D)

Water Management Act 2000 (NSW)

- Dealings with access licences (Division 4)
 - 71T Assignment of water allocations between access licences
 - 71V Interstate assignment of water allocations

Water Sharing Plan for the Murrumbidgee Regulated River Water Source 2016

- Part 10 Access licence dealing rules
 - Clause 76 Assignment of water allocation dealings
 - Clause 77 Interstate access licence transfer and assignment of water allocation

Available on Department of Climate Change, Energy, the Environment and Water website at [DCCEEW Website](#)

Data accuracy

A1—Nil inaccuracy +/- 0%

Providing agency

Murray–Darling Basin Authority, Department of Climate Change, Energy, the Environment and Water

²⁶ Revised representation commencing 2017–18 GPWAR

Data Sources

- Murray–Darling Basin Authority provided spreadsheet
- WaterNSW-provided spreadsheet and CARM
- Department of Climate Change, Energy, the Environment and Water—Water Accounting System and HYDSTRA

Methodology

The balance of the IVT account is calculated by adjusting the carried forward balance of the IVT account from the previous year and applying a series of transactions to the account as outlined below. A positive balance indicates that the Murray System owes water to the Murrumbidgee System while a negative balance indicates that Murrumbidgee System owes water to the Murray System.

1. The volume of water traded into the Murrumbidgee Valley from the NSW Murray, NSW Lower Darling, Victoria or South Australia will result in the IVT being decreased
2. The volume of water traded out of the Murrumbidgee Valley to the NSW Murray, NSW Lower Darling, Victoria or South Australia will result in the IVT being increased
3. The Murray–Darling Basin Authority (MDBA) requests that NSW deliver a proportion of the water that was traded to users outside of the Murrumbidgee. NSW supplies the requested volume and accounts for it by calculating the resulting addition volume of water passing the Murrumbidgee River at Balranald. The accounted volume supplied is agreed between WaterNSW and MDBA and the IVT account is increased accordingly.
4. On occasion Snowy Hydro Limited may be requested to transfer a portion of either the Murrumbidgee or Murray Required Annual Release (RAR) to assist with the settlement of the IVT account when it gets too far out of balance (although there is no legal obligation on them to perform such releases). These are often referred to as "notional" releases. The following points illustrate this process:
 - Excessive Trade from Murrumbidgee to Murray creates a need to transfer Murrumbidgee RAR via the Murray development thus reducing the IVT account (reducing Murrumbidgee debt to Murray).
 - Excessive trade from Murray to Murrumbidgee creates a need to transfer Murray RAR via the Murrumbidgee development thus increasing the IVT account (reducing Murray debt to Murrumbidgee).
5. Tagged trading is a dealing that occurs when a licence holder within a valley nominates to extract their allocation for that licence from a different water source. Any water delivered to a point of extraction within the Murrumbidgee to meet allocation associated with another water source therefore results in a decrease to the IVT.
6. During periods of high summer demand transfers of water can occur from the Murray to the Murrumbidgee via Murray Irrigation Limited (MIL) infrastructure to bypass delivery constraints in either the Murray (caused by the Murray choke) or the Yanco Creek System and the Coleambally Irrigation channel network. Water passed into the Murrumbidgee via MIL, subject to MIL ability to deliver via their channel system, can help to meet the demands in Billabong Creek. The net change in the IVT as a result is calculated by assessing the difference between the flow diverted from MIL to Billabong Creek (via Finley escape) and the water that leaves the Murrumbidgee via the Billabong Creek at Darlot for the

corresponding period (i.e. estimating volume extracted by users on Billabong Creek). This figure is presented as 'Finley Borrow' in Table 18.

7. A spill process has also been integrated to implementation the Murrumbidgee IVT, that may reduce or eliminate the current IVT balance when Murrumbidgee storages are spilling. The decision whether to spill IVT considers the relative water availabilities of the NSW Murray and Murrumbidgee at the time of spill.

Additional information

The IVT Trade balance summary table provides information compiled from the best information available at the time of publication. These figures may change in the future as updated information becomes available. All figures in the table are in megalitres.

The note references in the table refer to the numbers associated with the text in the methodology above. The presentation of the IVT has been revised in the 2017–18 GPWAR to represent the IVT commitments as a liability on the resource (previously an asset). This means a positive IVT balance results in the Murrumbidgee owing water.

Table 18: Murrumbidgee intervalley trade account summary

Water Year	Opening	(1) Decrease Trade into Murrumbidgee	(2) Increase Trade out of Murrumbidgee	Net trade into Murrumbidgee	(4) Decrease Via Snowy	(3) Decrease Via Balranald	Total IVT clearances	(5) Increase Net tagged use	(7) Decrease IVT spill	(6) Increase Finley borrow	Closing balance
2004-05	0	11,805	3,779	8,026	0	4,185	4,185	0	0	12,211	0
2005-06	0	16,646	21,748	(5,102)	0	20,282	20,282	0	0	10,162	(5,018)
2006-07	(5,018)	1,209	97,195	(95,986)	20,000	70,968	90,968	0	0	0	0
2007-08	0	2,729	141,825	(139,096)	0	63,500	63,500	0	0	728	76,324
2008-09	76,324	17,223	406,976	(389,753)	200,000	44,981	244,981	0	0	6,245	227,341
2009-10	227,341	55,659	166,443	(110,784)	200,000	119,567	319,567	0	0	5,318	23,876
2010-11	23,876	130,929	180,031	(49,102)	0	57,751	57,751	0	0	12,766	27,993
2011-12	27,993	85,062	151,880	(66,818)	78,000	12,083	90,083	0	0	965	5,693
2012-13	5,693	179,426	234,574	(55,148)	(39,000)	87,542	48,542	200	0	5,049	17,148
2013-14	17,148	59,917	180,850	(120,933)	0	40,282	40,282	0	0	1,389	99,188
2014-15	99,188	94,248	139,893	(45,645)	0	148,299	148,299	(4,605)	0	9,882	11,021
2015-16	11,021	14,059	275,373	(261,314)	0	202,431	202,431	(23,081)	0	3,654	96,638
2016-17	96,638	14,564	48,414	(33,850)	0	80,000	80,000	(37,792)	0	0	88,280
2017-18	88,280	151,138	74,221	76,917	0	0	0	25,151	0	0	(13,788)
2018-19	(13,788)	18,091	54,985	(36,894)	0	0	0	5,281	0	583	18,408
2019-20	18,745	63,386	197,072	(133,686)	0	156,726	156,726	(7,976)	0	2,563	6,244
2020-21	6,244	21,988	323,131	(301,143)	0	249,108	249,108	(29,835)	0	4,223	92,337
2021-22	92,337	6,037	100,082	(94,045)	0	0	0	(36,824)	95,637	0	127,570
2022-23	127,570	48,005	130,883	(82,878)	0	0	0	(2,513)	124,007	0	88,954

Note 6—Held environmental water

This represents that 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 and are subject to the same operating rules. Therefore, 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—the forfeiting of unused water that cannot be carried over
- provide water orders prior to use.

These licences are used to provide environmental benefit and outcomes to the catchment by either providing water to, or supplementing water requirements of, a specific environmental events or incidents. On occasion the environmental benefit is achieved by trading the water as opposed to ordering and recording the subsequent usage against the licence.

Data type

Measured

Policy

Water Management Act 2000

- Part 2 Access Licences
 - Division 4 Dealings with access licences
 - 71T Assignment of water allocations between access licences
 - 71V Interstate assignment of water allocations

Water Sharing Plan for the Murrumbidgee Regulated River Water Source 2016

Available on the Department of Climate Change, Energy, the Environment and Water website at [DCCEEW Website](#)

Data accuracy

A1—Nil inaccuracy +/- 0%

Providing agency

Department of Climate Change, Energy, the Environment and Water

Data source

WaterNSW/Department of Climate Change, Energy, the Environment and Water—Water Accounting System (Joint ownership)

Available Water Determination Register—Department of Climate Change, Energy, the Environment and Water website at [DCCEEW Website](#)

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
- forfeiture due to:
 - carryover rules
 - account spillage as a result of AWD
 - licence conversions
 - excess orders (where water order debiting is in place)
- trade of allocation water between accounts.

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 19 provides a summary of held environmental water for the reporting period. Definitions for the processes represented in the summary are defined in Table 10.

Table 20 presents changes to environmental holdings since the previous reporting period.

Table 21 presents trading of temporary water associated with environmental holdings. While environmental holdings occasionally trade to non-environmental holders to achieve delivery of environmental water, this report is presented from a perspective of watering purpose i.e. a trade from an environmental holding to a non-environmental holding has transferred the expected use of that water to a consumptive purpose.

Table 19: Environmental regulated river account summary²⁷. See Table 10 for an explanation of headings.

Category	Share	Opening	AWD	Asn In	Asn Out	Snowy trans	Usage	Usage Uncont	During year forfeit	EoY Avail	EoY NA	EoY forfeit	Carry fwd
Coleambally irrigation (conveyance)	12,658	2,747	9,911	0	6,411	3,500	0	0	0	6,247	0	0	2,747
Murrumbidgee irrigation (conveyance)	61,920	11,739	47,391	0	27,391	20,000	0	0	0	31,739	0	0	11,739
Regulated River (conveyance)	2,968	590	2,378	0	1,378	1,000	0	0	0	590	0	0	590
General security	478,391	113,211	365,180	246,993	224,270	75,489	307,718	0	0	115,170	0	0	117,907
High security	16,065	0	16,066	0	14,181	1,885	0	0	0	0	0	0	0
Supplementary water	28,686	0	28,686	21,986	23,986	0	0	10,072	0	16,614	0	16,614	0
Supplementary water (Lowbidgee)	554,710	0	554,710	120,000	120,000	0	0	4,623	0	550,087	0	550,087	0

Table 20: Annual change summary for environmental licences and environmental holding adjustments

Category	Share 30 June 2022	Share 30 June 2023	Volume change
Coleambally irrigation (conveyance)	12,658	12,658	0
Murrumbidgee irrigation (conveyance)²⁸	59,130	61,920	2,790
Regulated River (conveyance)	2,968	2,968	0
General security	478,391	478,391	0
High security	16,065	16,065	0
Supplementary water	28,686	28,686	0
Supplementary water (Lowbidgee)	554,710	554,710	0

²⁷ The account balance summary includes all licences where the registered holder or part holder is a government department, and the held component is wholly managed for environmental benefit. Water that has been purchased from consumptive users but yet to be moved out to a government holding is not identified in this summary. Generally, in the situation the water is temporarily trade out to an environmental licence until the settlement has been finalised.

²⁸ The increase in the 2022-23 reporting period was via the first tranche of savings made through the New South Wales Murrumbidgee Irrigation Automation Finalisation Project. The project will modernise and improve the efficiency of the Murrumbidgee Irrigation Area (MIA) through automation of control structures, replacing and converting metered outlets, refurbishing and piping, and a new surge reservoir. For details see [NSW off-farm-efficiency-program](#)

Table 21: Environmental trade report summary, movement of environmental allocation between NSW access licences²⁹

Held environmental water temporary trading	To Consumptive M'bidgee General security	To Consumptive M'bidgee High security	To Consumptive M'bidgee Supplementary	To Consumptive South Australia Interstate	To Enviro Lower Darling High security	To Enviro M'bidgee General security	To Enviro M'bidgee Supplementary	To Enviro M'bidgee Supplementary (Lowbidgee)	To Enviro NSW Murray General security	To Enviro Murray Convey	Total
Consumptive M'bidgee General security	-	-	-	-	-	3,300	-	-	634	-	3,934
Consumptive M'bidgee High security	-	-	-	-	-	-	-	-	78	-	78
Environmental M'bidgee CI Conveyance	-	-	-	-	-	6,411	-	-	-	-	6,411
Environmental M'bidgee General security	7,817	2,890	-	1,230	2,384	201,379	-	-	3,000	5,571	224,270
Environmental M'bidgee High security	-	-	-	-	12,616	664	-	-	-	-	13,281
Environmental M'bidgee MI Conveyance	-	-	-	-	-	27,391	-	-	-	-	27,391
Environmental M'bidgee RR conveyance	-	-	-	-	-	1,378	-	-	-	-	1,378
Environmental M'bidgee Supplementary	-	-	2,000	-	-	-	21,986	-	-	-	23,986
Environmental M'bidgee Supplementary (Lowbidgee)	-	-	-	-	-	-	-	120,000	-	-	120,000
Environmental NSW Murray Conveyance	600	-	-	-	-	5,571	-	-	-	-	6,171
Total	8,417	2,890	4,000	1,230	15,000	246,093	21,986	120,000	3,712	4,000	426,900

Total environmental allocation moved to consumptive licences = 14,537 megalitres

Total consumptive allocation moved to environmental licences = 4,012 megalitres

Total environmental to environmental licences = 408,351 megalitres

²⁹ The environmental trading report represents movement of water based on licence type (held environmental or consumptive) and is not intended to report the sale or purchase of environmental allocations. Movement between holdings are purpose inclusive and includes sales/purchases, administration arrangements for the delivery of environmental water, and carryover leasing arrangements.

Table 22: Additional environmental trade movement within NSW irrigation corporation holdings²⁹

From	To Environmental Murrumbidgee General Security	To Environmental NSW Murray General Security	To Consumptive NSW Murray General Security	Total
Environmental Murrumbidgee High Security	900	-	-	900
Total	900			900

Note 7—Environmental provisions

These were introduced as part of the water sharing plans with the aim of enhancing environmental benefits. They consist of a series of rules established around the concept of dam translucency and transparency releases, environmental water allowances (EWA), provisional storages and balancing storages and end of system flows. Below is a brief description of these.

Dam transparency—protects low flows immediately downstream of Burrinjuck and Blowering Dams by passing all inflows up to a defined limit.

Dam translucency—ensures that some degree of natural flow variability is restored downstream of Burrinjuck Dam by releasing a proportion of inflows based on the time of year and the catchment conditions.

End of system flows—maintain a flow of water to the end of the Murrumbidgee River and Billabong Creek ensuring its connectivity with the Murray River.

Environmental water allowances—three water allowances were created to provide direct benefits to the environment. The water is for discretionary environmental management such as wetland inundation, flushes to improve water quality, or providing habitat for waterbird breeding.

Provisional storage volumes—two provisional storage volumes are provided with the intent to increase the size and frequency of spill events for environmental benefits.

Daily release balance—this account maintains a record of the net difference between the minimum transparent dam release and the water credited to environmental water allowance (EWA2 allowance). The daily release balance (DRB) was introduced at the commencement of the water sharing plan to allow the existing translucent and transparent releases to be adopted while also providing for adaptive water. The DRB increases when transparent water releases are made triggering credits to the Environmental Water Allowance 2 (EWA2). The DRB balance is then used to reduce future requirements of translucent water releases.

For additional details on this refer to the environmental rules in the water sharing plan.

Data type

Derived from measured data

Policy

Water Sharing Plan for the Murrumbidgee Regulated River Water Source 2016

- Part 4 Planned environmental water provisions

Available from the Department of Climate Change, Energy, the Environment and Water website at [DCCEEW Website](#)

Data accuracy

A1—Nil inaccuracy +/- 0%

Providing agency

WaterNSW

Data source

EWA accounting spreadsheet—WaterNSW

Methodology

Methods for evaluating the environmental provisions can be found in the water sharing plan.

Transparency releases from Blowering Dam could not be implemented as data for Blowering Dam natural inflows on a daily basis are unavailable. As such it has been treated as a minimum storage release figure of 560 megalitres per day and are not accounted for separately within this GPWAR.

The following tables show account summaries, water deliveries and balances for those accounts established as a result of the environmental provisions as set out in the water sharing plan.

Additional Information

The following group of tables provides a comprehensive summary of the Planned Environmental Water since the commencement of the water sharing plan.

Table 23: Burrinjuck Dam translucent/transparent release summary and history

Year	Translucent release required	Translucent releases	Transparent release required	Transparent releases	Other releases	Total releases ³⁰
2004–05	2,454	3,401	105,192	121,447	404,449	529,297
2005–06	68,748	25,704	73,511	72,961	523,167	621,832
2006–07	25,476	6,462	76,739	71,770	132,233	210,465
2007–08	35,310	6,198	65,140	48,214	171,056	225,468
2008–09	7,609	3,281	110,130	80,769	172,363	256,413
2009–10	28,488	9,101	27,168	18,763	390,156	418,020
2010–11	92,707	24,636	103,785	99,968	1,610,827	1,735,431
2011–12	195,310	121,550	48,900	53,335	2,042,991	2,217,876
2012–13	148,099	127,526	62,780	63,192	1,157,875	1,348,593
2013–14	80,979	82,515	69,366	71,571	372,140	526,226
2014–15	74,002	71,831	52,532	51,972	952,383	1,076,186
2015–16	284,402	246,702	37,262	60,282	693,623	1,000,607
2016–17	169,175	161,737	58,875	85,599	1,455,918	1,703,254
2017–18	17,286	16,593	87,112	87,159	587,517	691,269
2018–19	708	731	110,620	116,470	190,260	307,461
2019–20	15,529	15,943	130,118	131,631	28,193	175,767
2020–21	169,382	143,417	25,830	45,234	1,105,499	1,294,150
2021–22 ³¹	501,496	519,286	39,030	39,030	3,137,993	3,696,309
2022-23	282,377	273,475	77,100	90,277	2,914,226	3,277,978

³⁰ Total release has been recalculated for historical period in this GPWAR. The release is calculated as the total flow at Murrumbidgee River downstream of Burrinjuck Dam (410008). Missing data has been filled with the operator release information (410131)

³¹ Corrections were made to figures reported in 2021-22 report.

Table 24: Environmental water accounts (EWA³²) summary and history³³

Water year	EWA1 Accrued	EWA1 Delivered	EWA1 Spill	EWA1 Balance	EWA1 EoY Forfeit	EWA1 Carry Fwd	EWA2 Accrued	EWA2 Delivered	EWA2 Balance	EWA2 EoY Forfeit	EWA2 Carry Fwd	EWA3 Accrued	EWA3 Delivered	EWA3 Credited to PSV2	EWA3 Balance	EWA3 EoY Forfeit	EWA3 Carry Fwd
2004–05	0	0	0	0	0	0	42,497	0	42,497	0	42,497	0	0	0	0	0	0
2005–06	50,000	0	0	50,000	0	50,000	46,607	19,050	46,607	23,447	46,607	0	0	0	0	0	0
2006–07 ³⁴	0	0	0	50,000	0	50,000	17,303	0	63,910	0	63,910	0	0	0	0	0	0
2007–08	0	0	0	50,000	0	50,000	0	8,822	55,088	0	55,088	0	0	0	0	0	0
2008–09	0	0	0	50,000	0	50,000	0	22,714	32,374	0	32,374	0	0	0	0	0	0
2009–10	0	0	0	50,000	0	50,000	16,560	35,008	13,926	0	13,926	0	0	0	0	0	0
2010–11	50,000	38,319	0	61,681	11,681	50,000	51,975	65,901	0	0	0	27,084	0	27,084	0	0	0
2011–12	50,000	67,683	25,000	7,317	0	7,317	32,760	24,255	8,505	0	8,505	0	0	0	0	0	0
2012–13	50,000	0	7,317	50,000	0	50,000	40,301	26,511	22,295	0	22,295	0	0	0	0	0	0
2013–14	50,000	14,868	35,132	50,000	0	50,000	76,280	91,834	6,741	0	6,741	0	0	0	0	0	0
2014–15	50,000	33,499	16,501	50,000	0	50,000	52,459	39,569	19,631	0	19,631	0	0	0	0	0	0
2015–16	50,000	48,860	1,140	50,000	0	50,000	49,636	54,753	14,514	0	14,514	0	0	0	0	0	0
2016–17	50,000	5,667	25,000	69,334	19,334	50,000	54,186	61,980	6,720	0	6,720	149,673	90,480	59,194	0	0	0
2017–18	50,000	50,000	0	50,000	0	50,000	48,313	24,602	30,431	0	30,431	0	0	0	0	0	0
2018–19	0	49,518	0	482	0	482	50,039	68,006	12,464	0	12,464	0	0	0	0	0	0
2019–20	0	0	0	482		482	64,937	28,640	48,761	0	48,761	0	0	0	0	0	0
2020–21	50,000	44,235	0	6,247	0	6,247	33,705	68,160	14,306	0	14,306	1,627	1,627	0	0	0	0
2021–22	50,000	0	6,248	50,000	0	50,000	24,255	19,860	18,701	0	18,701	0	0	0	0	0	0
2022–23	50,000	25,000	25,000	50,000	0	50,000	46,935	35,081	30,555	0	30,555	0	0	0	0	0	0

³² 50,000 megalitres was borrowed from the EWA accounts and made available for consumptive use as part of the AWDs.

³³ For specific details about the rules around PSV please refer to the water sharing plan.

³⁴ The Water Sharing Plan was suspended on 9 November 2006 and was not reinstated until 16 September 2011.

Table 25: Provisional storage volume account summary and history³⁵

Water year	PSV1 Credit ³⁶	PSV1 EoY forfeit	PSV1 Carry fwd	PSV2 Credit up to previous years forfeit ³⁷	PSV2 Credit not alloc'd EWA3 prev. year ³⁸	PSV2 Credit Nov-Dec EWA3 forgone trans ³⁹	PSV2 Credit 1 Nov 50% unused EWA3 ⁴⁰	PSV2 Credit 1 Jan remaining EWA3 ⁴⁰	PSV2 Balance	PSV2 EoY forfeit	PSV2 Carry fwd
2004–05	0	0	0	0	0	0	0	0	0	0	0
2005–06	0	0	0	0	0	0	0	0	0	0	0
2006–07	0	0	0	0	0	0	0	0	0	0	0
2007–08	0	0	0	0	0	0	0	0	0	0	0
2008–09	0	0	0	0	0	0	0	0	0	0	0
2009–10	0	0	0	0	0	0	0	0	0	0	0
2010–11	200,000	200,000	0	0	0	27,084	0	27,084	54,168	54,168	0
2011–12	200,000	200,000	0	54,168	27,084	0	0	0	81,252	81,252	0
2012–13	200,000	200,000	0	0	0	0	0	0	0	0	0
2013–14	33,750	33,750	0	0	0	0	0	0	0	0	0
2014–15	25,000	25,000	0	0	0	0	0	0	0	0	0
2015–16	25,000	25,000	0	0	0	0	0	0	0	0	0
2016–17	0	0	0	59,194	0	59,194	59,194	0	0	0	0
2017–18	25,000	25,000	0	0	0	0	0	0	0	0	0
2018–19	0	0	0	0	0	0	0	0	0	0	0
2019–20	0	0	0	0	0	0	0	0	0	0	0
2020–21	200,000	200,000	0	1,627	0	0	0	0	1,627	1,627	0
2021–22	200,000	200,000	0	0	0	0	0	0	0	0	0
2022–23	200,000	200,000	0	0	0	0	0	0	0	0	0

³⁵ For specific details about the rules around PSV please refer to the water sharing plan.

³⁶ When general security AWD plus carryover volume exceeds 0.6 megalitres/share PSV1 receive 50,000 megalitres plus an additional 8,750 megalitres for every additional 0.01 megalitres/Share of AWD plus carryover volume in excess of 0.8 megalitres/share.

³⁷ When general security AWD plus carryover volume exceeds 0.8 megalitres/share and requirements for EWA3 and PSV1 have been met any additional excess volume can be credited to PSV2 up to a limit of that water that was forfeited the previous year.

³⁸ From 1 November when general security AWD plus carryover volume exceeds 0.8 megalitres/share the PSV2 account is credited up to a maximum limit of the sum of water not credited to EWA3 in the current year and any water that was not credited in the previous year.

³⁹ Between 1 Nov and 31 Dec EWA3 is credited with 50% of forgone translucent releases when AWD plus carryover volume exceeds 0.8 megalitres/share. The PSV2 account is credited with the other 50%.

⁴⁰ Water is moved from the EWA3 account to the PSV2 account 2 times each year. On the 1st November 50% of remaining account water is moved with any remaining account water moving on 1st January.

Table 26: Water delivered—planned environmental water held in Burrinjuck Dam

Water year	EWA1 delivered	EWA2 delivered	EWA3 Delivered	Under release delivered ⁴¹	Planned environmental water delivered ⁴²
2004–05	0	0	0	0	0
2005–06	0	19,050	0	0	19,050
2006–07 ⁴³	0	0	0	0	0
2007–08	0	8,822	0	0	8,822
2008–09	0	22,714	0	0	22,714
2009–10	0	35,008	0	0	35,008
2010–11	38,319	65,901	0	89,798	194,018
2011–12	67,683	24,255	0	5,895	97,833
2012–13	0	26,511	0	2,843	29,354
2013–14	14,868	91,834	0	25,513	132,215
2014–15	33,499	39,569	0	6,130	79,198
2015–16	48,860	54,753	0	105,832	209,445
2016–17	5,667	61,980	90,480	44,594	202,721
2017–18	50,000	24,602	0	2,391	76,993
2018–19	49,518	68,006	0	7,158	124,682
2019–20	0	28,640	0	4,049	32,689
2020–21	44,235	68,160	1,627	40,043	154,065
2021–22	0	19,860	0	65,830	102,516
2022-23	25,000	35,081	0	15,060	60,081

⁴¹ Under Release water delivered to meet environmental requirements.

⁴² Total volume of water delivered for environmental purposes from planned environmental water provisions set aside in Burrinjuck Dam. It is the sum of EWA1 delivered, EWA2 delivered and Under Release delivered (does not include translucency/transparency releases).

⁴³ The Water Sharing Plan was suspended on 9 November 2006 and was not reinstated until 16 September 2011.

Table 27: End of year balances for total EWA, DRB and translucency/transparency under release

Year	Total EWA carry fwd balance	DRB Increase	DRB Decrease	DRB EoY balance	Under Release ⁴⁴ Below target (credit)	Under Release Above target (debit) ⁴¹	Under Release Paid back from DRB ⁴⁵	Under Release Net under releases EoY balance
2004-05	42,497	22,232	238	21,994	0	0	0	0
2005-06	96,607	15,091	8,879	28,206	26,328	0	0	26,328
2006-07 ⁴³	113,910	12,654	1,271	39,589	(26,328)	0	0	0
2007-08	105,088	10,163	2,853	46,899	0	0	0	0
2008-09	82,374	25,479	911	71,466	0	0	0	0
2009-10	63,926	8,688	3,208	76,946	17,108	0	0	17,108
2010-11	50,000	33,000	11,097	98,849	72,690	89,798	0	0
2011-12	15,822	15,900	20,488	94,260	75,220	5,895	0	69,325
2012-13	72,295	9,956	96,193	7,875	25,059	2,843	87,886	3,655
2013-14	56,741	4,317	8,414	3,778	17,265	25,513	0	(4,593)
2014-15	69,631	2,875	8,446	0	8,913	6,130	0	(1,810)
2015-16	64,514	3,152	3,152	0	117,981	105,832	0	10,339
2016-17	56,720	1,595	634	961	27,852	44,594	0	6,387
2017-18	80,431	6,342	2,180	5,123	3,038	2,391	0	(1,002)
2018-19	12,464	20,127	0	25,250	1,285	7,158	0	(6,875)
2019-20	49,243	15,073	1,116	39,207	2,092	4,049	0	(8,832)
2020-21	20,553	28	13,015	26,220	46,604	40,043	0	(2,271)
2021-22 ⁴⁶	68,701	0	23,900	2,320	67,972	65,830	0	(129)
2022-23	80,555	0	2,320	0	13,788	15,060	0	(1,401)

⁴⁴ Under Release is that water that was not delivered under the Translucent/transparent release rules in the Plan that will be paid back at a later date. The Under Release balance was zeroed once water sharing plan suspended.

⁴⁵ DRB balance was zeroed on 4 August 2012 to balance the borrowed volume accumulated since 1 July 2004. The figure used to zero accounts was 87,886 and was calculated based on corrected historical calculations of under release. These historical corrections have been retrospectively applied in the table.

⁴⁶ Figures reported in the 2021-22 report have been updated in line with adjustments made by WaterNSW to the accounting of above and below target releases.

Note 8—Snowy required annual release

Snowy Hydro Limited operates under a May to April accounting year, which is different to the water accounting period being considered in this report. Hence, this note will cover both the Snowy RAR and those adjusted to represent the reporting period.

Snowy Hydro Limited provides an annual fixed minimal accountable release, known as the Required Annual Release (RAR) to the Murrumbidgee (1,026,000 megalitres per year). However, in years of severe drought when the current inflow sequence is worse (drier) than the historical dry sequence, Snowy Hydro delivery of the RAR could put the Snowy Scheme at risk of running out of water. In those years the RAR may be reduced by the Dry Inflow Sequence Volume (DISV) being the measure of the cumulative difference between the historic dry sequence and the current inflow sequence. Any shortfall in the delivery of the DISV will be repaid in the future when annual inflows improve.

Further adjustments to the RAR can also be made each year as a result of pre-releases made in the previous year or for water savings in the Murrumbidgee that have been dedicated to Snowy River environmental flows. The RAR and those items that adjust it are monitored continually and updated whenever changes in the catchment dictate it.

The RAR delivered is assessed as Accountable Net Jounama Releases being the sum of:

- actual releases from Tumut 1 Power Station
- total montane release
- increase in storages at Talbingo and Jounama.

Montane release is environmental water to support the high-altitude streams that have been impacted by the Snowy Mountains Scheme. It is diverted to Burrinjuck Dam catchment with the majority lost before reaching the dam (hence, it is not separated out in statements for the Burrinjuck Dam inflows). The figure used for the accountable portion of Blowering Dam inflows in the accounting statements excludes Montane releases.

Policy

Snowy Water Licence 2010

Data type

Derived from measured data

Data accuracy

A1—Nil inaccuracy +/- 0%

Providing agency

Department of Climate Change, Energy, the Environment and Water

Data sources

Snowy Mountains Authority Water Operations Report

Methodology

Snowy Hydro inflow to Blowering Dam

Inflow delivered to Blowering Dam from Snowy Hydro infrastructure for reporting period (July–June) is assessed as:

- Delivered RAR (Sum accountable Net Jounama releases) less Montane release

Snowy RAR Accounting (May–April)

RAR Deliverable for Snowy–Tumut Development is calculated as being:

- Annual fixed RAR
- **plus** DISV as at 1 March (previous water year)
- **less** water savings allocated to Snowy Tumut
- **less** pre-release (previous water year)

Adjusted RAR for Snowy–Tumut Development is calculated as being:

- RAR Deliverable
- **less** DISV on 1 March (water year)
- **less** Murrumbidgee water deal paybacks
- **less** RAR permitted shortfalls and relaxations
- **less** Snowy-Tumut intervalley transfer settlement

Total RAR Delivered = Adjusted RAR plus Pre-release (next water year) plus Above Target Release

Additional Information

Table 28 provides a breakdown of the total estimated inflow to Blowering storage to the volume delivered from Snowy Hydro infrastructure, and the additional natural inflow component. The information is presented for the reporting period and historical (July to June). Table 29 provides a summary of the RAR accounting which is implemented on a May to April water year.

Table 28: Blowering Dam inflow sources

Water year	Total Blowering inflow estimate	Delivered from Snowy Hydro infrastructure	Additional inflow/natural
2008–09	618,281	409,713	208,567
2009–10	938,366	692,793	245,573
2010–11	1,786,517	784,296	1,002,221
2011–12	1,441,550	675,123	766,427
2012–13	1,658,915	1,276,277	382,638
2013–14	1,407,293	982,508	424,786
2014–15	814,012	498,476	315,535

Water year	Total Blowering inflow estimate	Delivered from Snowy Hydro infrastructure	Additional inflow/natural
2015–16	1,546,200	1,277,696	268,504
2016–17	1,828,767	1,110,070	718,696
2017–18	1,328,630	1,079,263	249,367
2018–19	858,795	682,177	176,617
2019–20	1,115,080	773,153	341,927
2020–21	1,762,581	1,164,421	598,160
2021–22	1,841,707	899,554	942,153
2022–23	2,011,539	1,113,935	897,604

Table 29: Snowy hydro required annual release summary (May to April water year)

Water Year	Total RAR delivered ⁴⁷	Pre-released RAR (for following water year)	Above target discretionary releases
2011–12	601,000	55,000	0
2012–13	983,000	200,000	51,000
2013–14	689,000	200,000	233,000
2014–15	623,000	0	0
2015–16	914,000	130,000	100,000
2016–17	900,000	200,000	34,000
2017–18	687,000	200,000	134,000
2018–19	730,000	63,000	0
2019–20	880,000	117,000	0
2020–21	612,000	200,000	112,000
2021–22	485,000	200,000	248,000
2022–23	888,000	200,000	343,000

⁴⁷ Includes RAR deliveries to snowy montane rivers and to Blowering storage

Note 9—Prior year account adjustment

This is a line item that is used to correct balances in the accounts. The double entry accounting being applied is a continuous process whereby the closing balance of one year is the opening balance for the following year. Occasionally corrections will be required for a variety of reasons including when an error is identified in prior year reporting or when a process that had previously been reported is unable to be supplied and the associated asset or liability must be removed 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.

Data type

Calculated

Accuracy

A1—Nil inaccuracy +/- 0%

Providing agency

Department of Climate Change, Energy, the Environment and Water

Data source

Not applicable

Methodology

A journal transaction is placed at the closing of the previous water year to either increase or decrease and account balance to align with the correct opening balances of the reporting year.

Additional Information

No prior year adjustment was 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 date of reporting. The volumes provided represent the total volume of water in the storage, including dead storage which is the volume of water which can't be accessed under normal operating conditions e.g. volume below low-level outlet. It is assumed that the dead storage can be accessed if required via alternative access methods e.g. siphons.

Data type

Derived from measured data

Policy

Not applicable

Data accuracy

A—Estimated in the range +/- 10%

Providing agency

Department of Climate Change, Energy, the Environment and Water

Data source

Department of 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.

Additional Information

The following table provides a breakdown of the storage capacities and dead storages.

Table 30: Capacity and dead storage summary table

Name	Capacity (ML)	Dead storage (ML)
Burrinjuck Dam	1,026,330	3,250
Blowering Dam	1,631,410	23,990
Berembed Weir	3,380	120
Gogeldrie Weir	7,400	200
Hay Weir	14,300	1,000
Maude Weir	8,028	300
Redbank Weir	5,580	400
Tombullen Storage	11,230	372
Total	2,704,470	29,632

Note 11—River channel storage

The 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

Department of Climate Change, Energy, the Environment and Water

Data sources

Department of Climate Change, Energy, the Environment and Water: HYDSTRA, CARM

Methodology

For each river section $S(n)$:

$$V = Q \times T$$

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

$$\text{River channel storage} = \sum S(n) V$$

Table 31: Summary of river volume 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.	HYDSTRA	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

Assumptions and approximations:

- Travel times are estimated to the nearest day.
- Daily flow change between gauging sites assumed to be linear.

Note 12—Storage inflow

Storage inflow refers to the volume of water flowing into the major headwater storages—Burrinjuck and Blowering Dams or the off-river, reregulating storage of Tombullen. The storage inflow for Blowering Dam has been sub-categorised Snowy Accountable, Snowy Pre-release and Other/Natural.

Snowy accountable is inflow accredited against the Required Annual Release (RAR) from Snowy Hydro and pre-release is water that has been released on top of those requirements and will be accredited to the required annual release in the next season. Other/Natural includes natural runoff from the surrounding Blowering catchment, and any water released from Snowy that was not allowed to be accredited as RAR water. Further information on RAR is available in Note 8.

Policy

Not applicable

Data type

Derived from measured data

Data accuracy

A—Estimated in the range +/- 10%

Providing agency

Department of Climate Change, Energy, the Environment and Water

Data sources

Department of Climate Change, Energy, the Environment and Water: HYDSTRA, SILO (Queensland government climatic information)

Methodology

For Blowering and Burrinjuck storages 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. This is referred to a back-calculation of inflows. The back-calculation figures were derived using a one-day time step with the inflow calculated according to the equation below. The daily inflows are then summed to provide an annual inflow figure.

$$I = \Delta S + O + Se + ((E - R) * A) / 100$$

Table 32: Components for back-calculation of inflow

Symbol	Variable	Unit
I	Inflow	ML/day

Symbol	Variable	Unit
ΔS	Change in storage volume	ML
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

Assumptions and approximations:

- Seepage was assumed to be zero.
- For Tombullen storage, where inflows are regulated by diverting flow from the main river inflow is measured. 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. Inflow reported in this GPWAR was obtained directly from the river operations spreadsheet (CARM).

Note 13—Storage evaporation and storage rainfall

For the major storages of Burrinjuck and Blowering, this refers to the water that is either lost as a result of evaporation or gained as a result of rainfall. For Tombullen storage, only a net evaporation is presented which is an estimate of the combined effects of rainfall and evaporation on the storage.

Data type

Derived from measured data

Policy

Not applicable

Data accuracy

B—Estimated in the range +/- 25%

Providing agency

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

Data source

Department of Climate Change, Energy, the Environment and Water—SILO (Queensland government climatic information), HYDSTRA, CARM

Methodology

Burrinjuck and Blowering storages

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:

$$\text{Volume (ML)} = \text{Rainfall (mm)} \times \text{Area (m}^2\text{)} \times 10^{-6}$$

Evaporation:

$$\text{Volume (ML)} = \text{Mortons shallow lake evaporation (mm)} \times \text{Area (m}^2\text{)} \times 10^{-6}$$

Tombullen storage

For Tombullen a simple, annual mass balance was calculated for the storage, whereby the known components are inflow, volume, and outflow (measured data obtained from CARM). The volume required to achieve mass balance is therefore assumed to be the volume of net evaporation from the storage.

$$\text{Net Evaporation} = \text{storage change (ML)} + \text{storage release (ML)} - \text{storage inflow (ML)}$$

Note 14—Gauged tributary inflow, other inflow

The inflow into the regulated river that occurs downstream of the headwater storages that is measured at known gauging stations.

Policy

Not applicable

Data type

Measured data

Data accuracy

A—Estimated in the range +/- 10%

Providing agency

Department of Climate Change, Energy, the Environment and Water

Data sources

Department of Climate Change, Energy, the Environment and Water: HYDSTRA, WaterNSW: Murray Irrigation operational accounting

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 the sum of the inflows for the gauged tributaries defined in the table below.

Charts showing the daily flow for each of the gauged tributaries can be seen in Figure 55, Figure 56 and Figure 57.

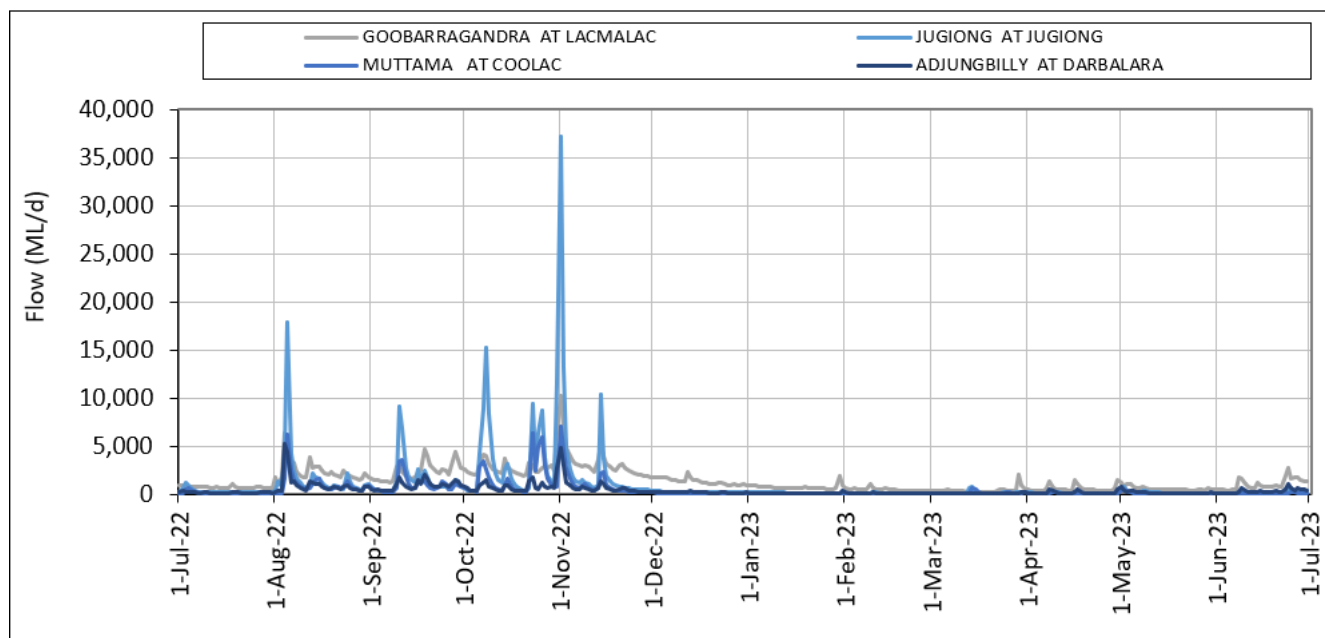
Table 33: Summary of gauged tributary inflow

Station	Station Name	Area (km ²)	Flow (ML)
410057	Goobarragandra River at	673	517,964
410025	Jugiong Creek at Jugiong	2,120	352,465
410044	Muttama Creek at Coolac	1,025	163,498
410038	Adjungbilly Creek at	391	149,629
410061	Adelong Creek at Batlow	144	66,312
410047	Tarcutta Creek at Old	1,660	426,026
410048	Kyeamba Creek at Ladysmith	530	77,683
410043	Hillas Creek at Mount Adrah	568	163,728
410103	Houlaghans Creek at	1,130	18,977
410114	Killimcat Creek at Wyangle	23	8,083
410012	Billabong Creek at	4,660	198,800
Total			2,143,163

Table 34: Summary of other gauged river inflow

Station	Station name	Area (km ²)	Volume (ML)
-	Finley Escape ⁴⁸	N/A	10,080
-	Coleambally Irrigation returns (for details note 17)	NA	14,726
-	Murrumbidgee Irrigation returns (for details note 17)	NA	5,930
Total	-	N/A	31,476

Figure 55: Gauged tributary inflows for the reporting period (Plot 1)



⁴⁸ Source MDBA.

Figure 56: Gauged tributary inflows for the reporting period (Plot 2)

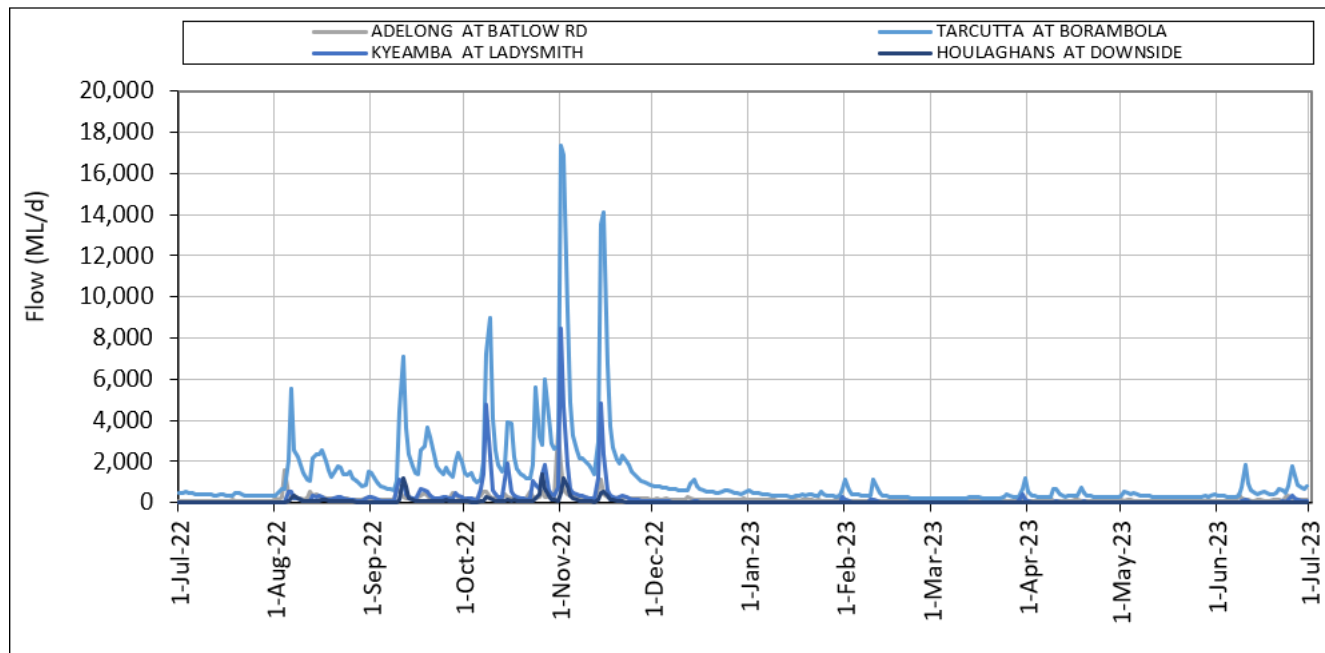
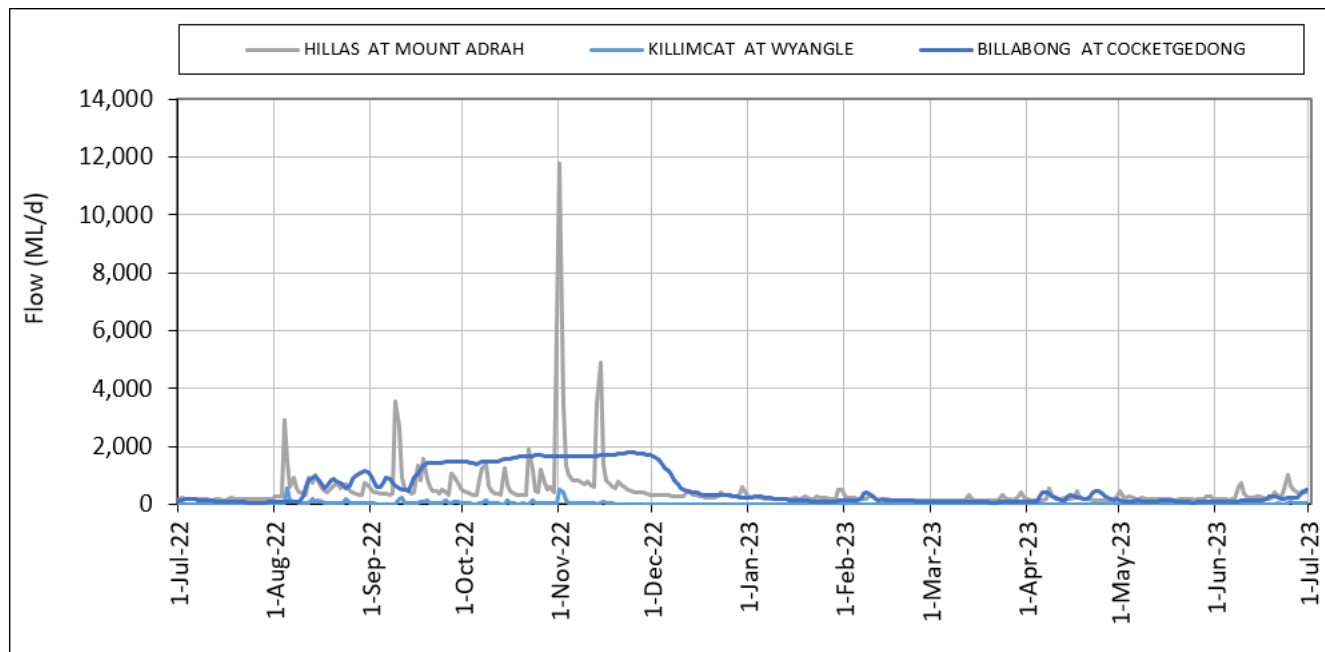


Figure 57: Gauged tributary inflows for the reporting period (Plot 3)



Note 15—Ungauged runoff estimate

The 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

Department of Climate Change, Energy, the Environment and Water

Data sources

Department of Climate Change, Energy, the Environment and Water, WaterNSW: CARM

Methodology

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 area below Narrandera or the Yanco Creek system and aquifer interaction has been excluded from the calculation.

$$U_{\text{Inflow}} = G_{\text{Narrandera}} - R_{\text{Burrinjuck}} - R_{\text{Blowering}} - G_{\text{Inflow}} + U_{\text{Narrandera}} + L_{\text{estimate}}$$

Where:

- U_{Inflow} = Ungauged Inflow to Narrandera (excluding Yanco Creek system)
- $G_{\text{Narrandera}}$ = Gauged flow at Murrumbidgee River at Narrandera
- $R_{\text{Burrinjuck}}$ = Total release from Burrinjuck Storage
- $R_{\text{Blowering}}$ = Total release from Blowering Storage
- G_{Inflow} = Total gauged inflow to Narrandera (excluding Yanco system)
- $U_{\text{Narrandera}}$ = Total extractions to Narrandera (excluding Yanco system extractions)
- L_{estimate} = Estimate of losses in target reach. Assumed to be 10% of all water entering.

Additional information

Table 35 summarises ungauged inflow estimates for the reporting period and prior years.

Table 35: Summary of Murrumbidgee ungauged inflow estimates

Catchment	Total volume estimated (ML)
2013-14	450,000
2014-15	370,000
2015-16	370,000
2016-17	1,830,000
2017-18	360,000
2018-19	170,000
2019-20	80,000
2020-21	210,000
2021-22	1,770,000
2022-23	1,180,000

Note 16—River evaporation and river rainfall

This refers to the volume of water effective on the accounted river reach that is either lost as a result of evaporation or gained as a result of rainfall.

Data type

Derived from measured data

Policy

NA

Data accuracy

B—Estimated in the range +/- 25%

Providing agency

Department of Climate Change, Energy, the Environment and Water

Data source

- Department of Climate Change, Energy, the Environment and Water: HYDSTRA, ARCGIS
- QLD 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 two gauging locations using ARCGIS and as such an area for each reach can be defined.

$$\text{Area (m}^2\text{)} = \text{Average W (m)} \times \text{L (m)}$$

Where 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 are 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:

$$\text{Volume (ML)} = \text{Rainfall (mm)} \times \text{Area (m}^2\text{)} \times 10^{-6}$$

Evaporation:

$$\text{Volume (ML)} = \text{ET}_0 \text{ (mm)} \times \text{K}_c \times \text{Area (m}^2\text{)} \times 10^{-6}$$

Where:

- ET_0 = reference evapotranspiration from SILO
- K_c = crop factor for open water (1.05)

Note 17—Return flows (including re-credit)

Return flow is that flow that has left the river and returns further downstream. The returning flow is less than what leaves the river. It can also include return flows from catchment drains within the irrigation corporation areas.

In certain circumstances in the Murrumbidgee water is delivered through Coleambally Irrigation catchment drains in order to meet demand in Yanco Creek system during peak flow periods. In these circumstances the return flow provided through Coleambally Irrigation will be accountable and is credited back to the appropriate allocation account. All other return from drainage is non accountable.

Re-credits are also given to Coleambally Irrigation for any flow diverted to Tombullen storage, a re-regulating storage beside the Murrumbidgee River, whereby water is diverted to the storage via the Coleambally main canal. Accounted usage in this GPWAR, detailed in Note 3, provides the net usage after any recredits have been applied.

Data type

Measured

Policy

NA

Data accuracy

- Return flow—A - Estimated in the range +/- 10%
- Recredit—A1 – Nil accuracy

Providing agency

Department of Climate Change, Energy, the Environment and Water

Data sources

- Murrumbidgee Irrigation Licence Compliance Report
- Coleambally Irrigation Annual Compliance Report
- WaterNSW irrigation corporation operational accounting

Methodology

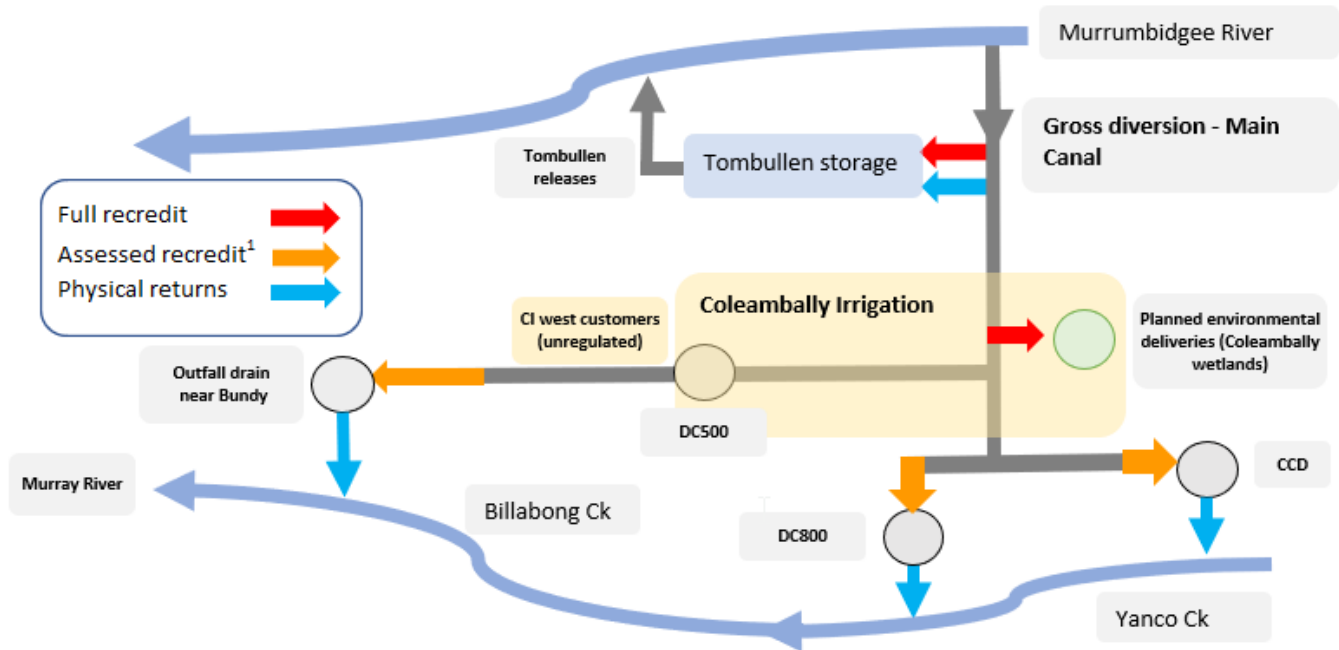
The return flows are measured in the same way as the gauged inflows, that is by measuring river heights at gauging stations along the river, passing these heights through a rating table that converts them to a flow or alternatively using a flume gate installed in the open channel. The total return flow is the sum of the flows for all the return flow gauges.

Additional information

Table 36: Return flow summary table (includes flow passed to Tombullen storage)

Year	Coleambally Irrigation Main Canal diversion	Coleambally Irrigation Total recredits ⁴⁹	Coleambally Irrigation Physical returns ⁵⁰	Murrumbidgee Irrigation Physical return
2021–22	324,935	63,019	70,645	1,708
2022-23	314,881	62,059	65,020	5,930

Figure 58: Conceptual diagram for Coleambally Irrigation re-credits



1. Assessment is determined based on requests to pass flow for downstream use (by the river operator to Coleambally Irrigation)
Conveyance losses are also considered in determining the allocation recredit

⁴⁹ Recredits for water moved to Tombullen, planned e-water deliveries, or ordered water passed through drains including allowance for conveyance loss

⁵⁰ Inflows to Tombullen storage plus flows at outfall drain near Bundy, DC800, CCD

Note 18—Dam releases, river inflow from dam releases

The volume of water released from Burrinjuck and Blowering Dams, and Tombullen (off river storage) to meet downstream requirements. Releases for Burrinjuck have been sub-classified into Translucent, Transparent or other (the remaining) releases. In the accounting process releases have been represented as both a decrease in asset (of the dams) and an equal increase in asset (the river).

Policy

Not applicable

Data type

Measured data

Data accuracy

A—Estimated in the range +/- 10%

Providing agency

Department of Climate Change, Energy, the Environment and Water

Data sources

- Department of Climate Change, Energy, the Environment and Water—HYDSTRA
- WaterNSW—Daily Environmental Operational Spreadsheet

Methodology

The flows are obtained by measuring river heights at a gauging station downstream of the dam wall, and then passing these heights through a rating table that converts them to a daily flow volume. The gauges used were 410102 (Tumut River at Blowering Dam) and 410008 Murrumbidgee River at D/S Burrinjuck Dam. The total Burrinjuck release was disaggregated using daily operational spreadsheet tags of transparent and translucent releases.

Additional information

Table 37 provides a breakdown by component of the accounted storage releases for the reporting period. Charts showing the daily release for the reporting period from Burrinjuck, Blowering and Tombullen storages can be seen in Figure 59 and Figure 60.

Table 37: Summary of releases for the reporting period (ML)

Storage	Translucent Release (ML)	Transparent Release (ML)	Other Release (ML)	Total release (ML)
Burrinjuck Dam	273,475	90,277	2,914,226	3,277,978
Blowering Dam	-	203,241	1,889,185	2,092,426
Tombullen	-	44,799	-	44,799
Total increase to river (ML)	-	-	-	5,415,203

Figure 59: Daily releases from Burrinjuck and Blowering storages (reporting period)

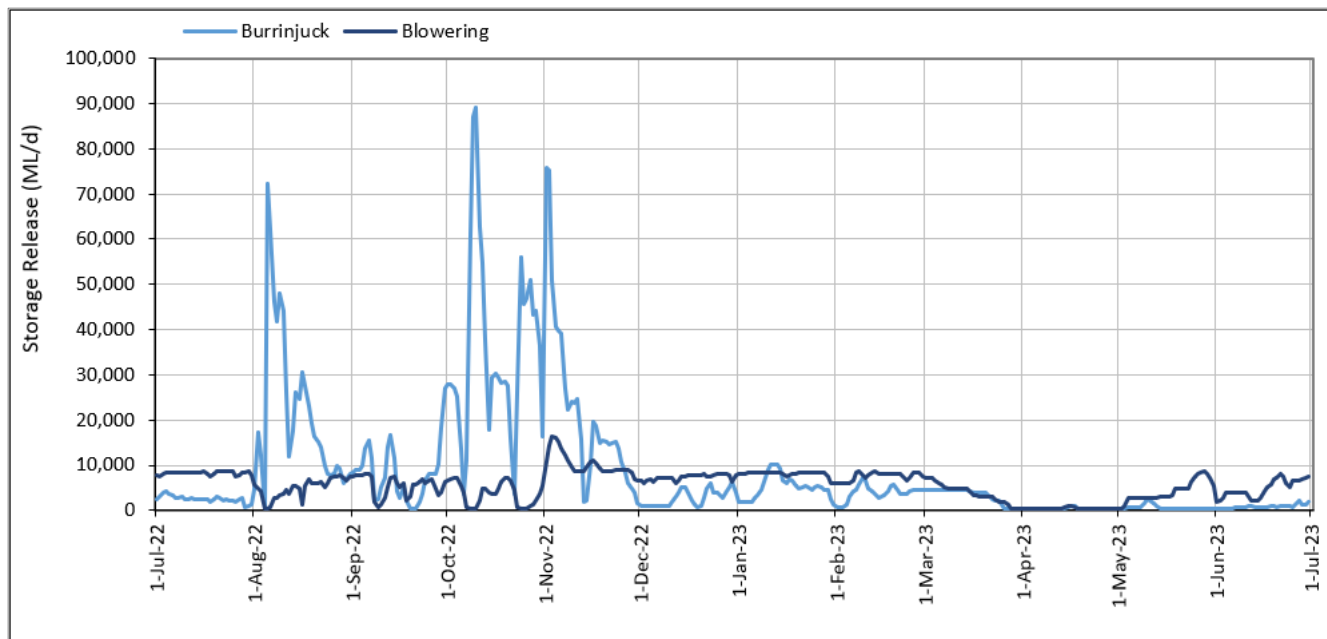
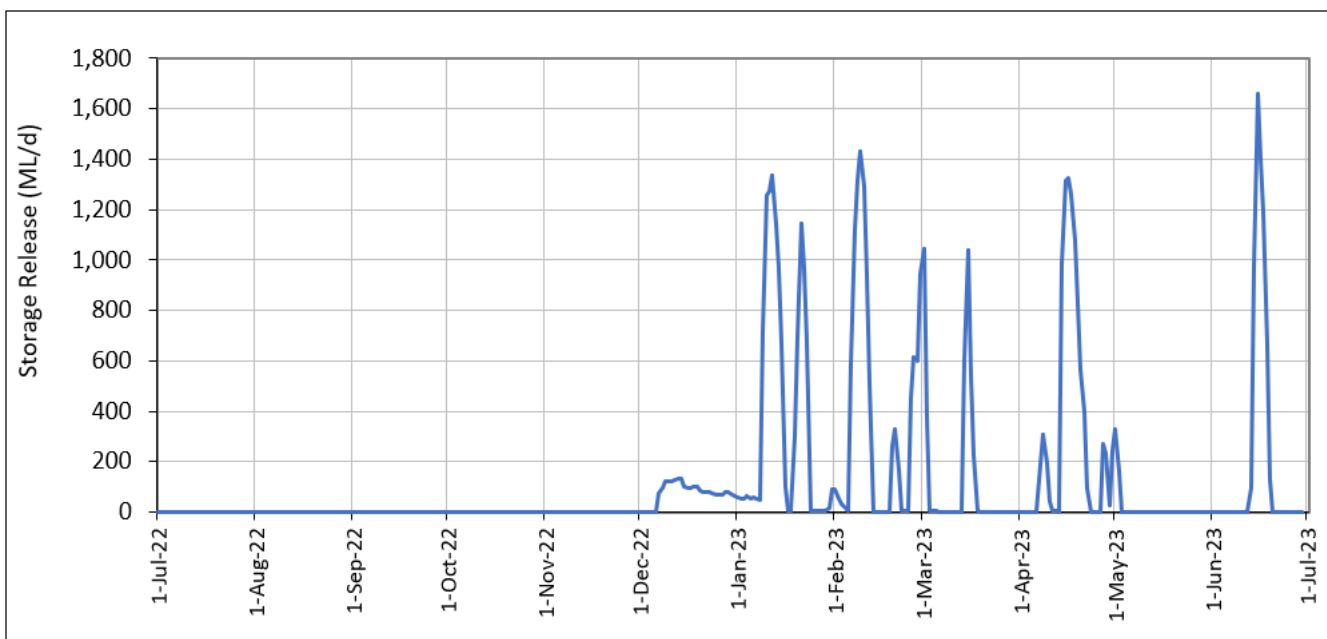


Figure 60: Daily releases from Tombullen storage (reporting period)



Note 19—End of system flow

This refers to flow that leaves the entity and does not return.

Data type

Derived from measured data

Policy

Not applicable

Data accuracy

A—Estimated in the range +/- 10%

Providing agency

Department of Climate Change, Energy, the Environment and Water

Data source

Department of Climate Change, Energy, the Environment and Water—HYDSTRA

Methodology

Summation of flows at gauging station/s measuring the volume of water that leaves the entity. For the Murrumbidgee reporting entity this is represented by the following gauges:

- 410134 Billabong Creek at Darlot
- 410003 Murrumbidgee River at Balranald

These gauges record the time series of heights which are converted to a volume of water based on a derived 'height to flow' relationship (rating table).

Under the water sharing plan minimum flow targets also exist at these end of system gauges.

Additional Information

Figure 61 and Figure 62 provide details of the daily flows in comparisons to both the minimum flow targets and the required flow targets. The required flow targets are made up of the minimum targets plus any other downstream requirements such as demand, environmental water requirements or inter-valley trade delivery requirements. A truncated plot is provided at Figure 51 and Figure 52 earlier in this report for each site to provide a clearer view the minimum flow target.

Figure 61: Murrumbidgee River at Balranald flow and target

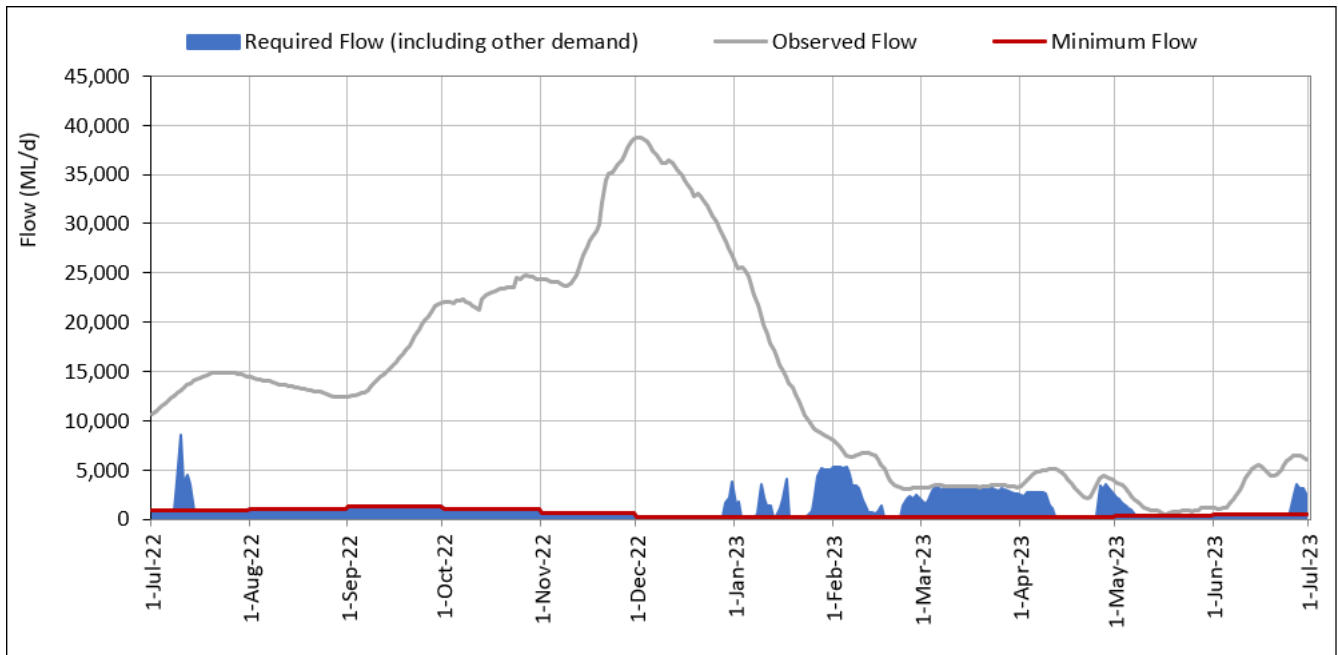
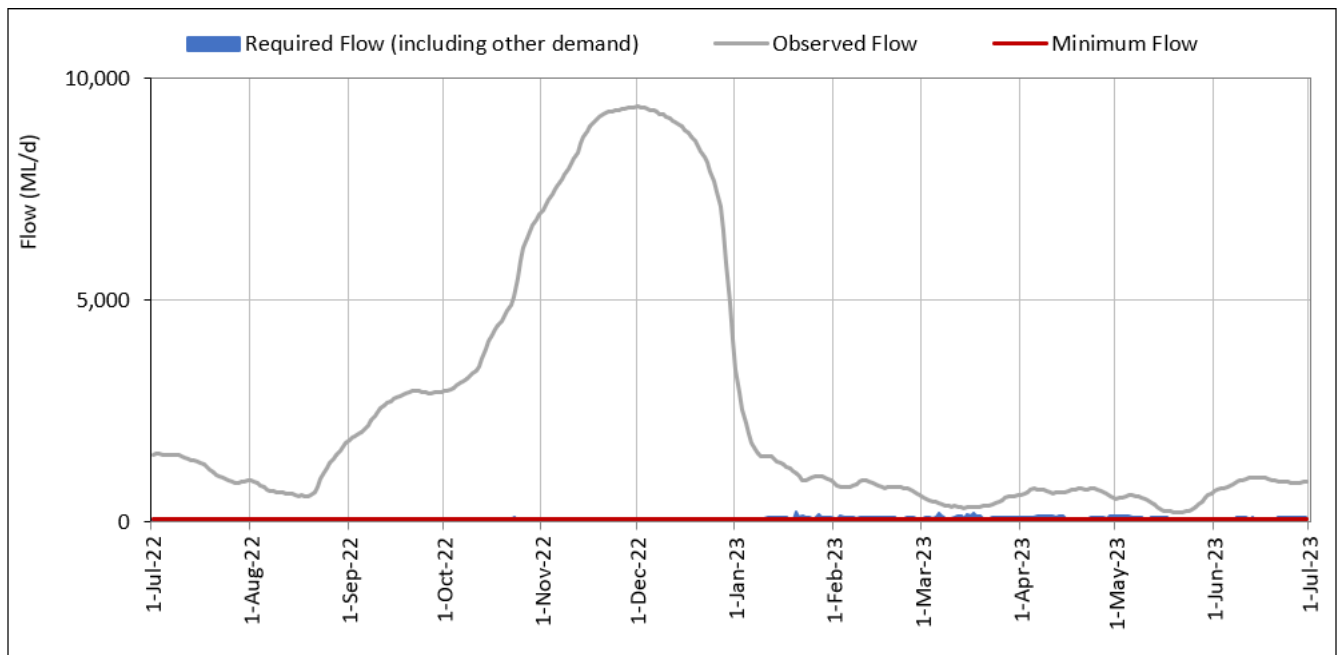


Figure 62: Billabong Creek at Darlot flow and target



Note 20—Diversions to Lowbidgee

The Lowbidgee is the largest area of floodplain wetland remaining in the Murrumbidgee catchment. It is located between Maude and Balranald and covers an area over 2,000 square kilometres. The Lowbidgee includes the second largest red gum forest in Australia and significant black box, lignum and reed-bed communities. The lower Murrumbidgee floodplain wetlands have a strategic role in the health of the Murray–Darling river system and are significant at a national and international level.

Data type

Measured

Policy

Water Sharing Plan for the Murrumbidgee Regulated River Water Source 2016

- Part 9 Rules for managing access licences
 - Division 2 Access to supplementary water and taking water without debit rules
 - Clause 69 Taking of water under supplementary water access licences and supplementary (Lowbidgee) access licences
 - Clause 70 Distribution rules for the Lowbidgee area

Available from Department of Climate Change, Energy, the Environment and Water website at [DCCEEW Website](#)

Data accuracy

A—Estimated in the range +/- 10%

Providing agency

Department of Climate Change, Energy, the Environment and Water

Data source

- Department of Climate Change, Energy, the Environment and Water—HYDSTRA
- WaterNSW—annual compliance report

Methodology

The total diversion to Lowbidgee is calculated by summing the flows diverted down three canals off Maude Weir and four Regulators off Redbank Weir.

Note 21—Extractions from river

For surface water, this refers to the actual volume of water directly pumped or diverted from the regulated river by licence holders. 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. The volume physically extracted from the river will not always be equal to the amount of water debited to accounts for usage, which has been reported in detail in Note 3. The figure also excludes basic rights extractions, which is reported as a separate line item and detailed in Note 22.

Data type

Measured data

Policy

Not applicable

Data accuracy

A—Estimated in the range +/- 10%

Providing agency

Department of Climate Change, Energy, the Environment and Water

Data source

- WaterNSW/ Department of Climate Change, Energy, the Environment and Water—Water Accounting System (Joint ownership of system).
- Department of Climate Change, Energy, the Environment and Water—Water Ordering and Usage database

Methodology

For the purposes of this GPWAR extraction from the river is considered to be the total volume metered and debited to the allocation accounts minus any water that can be identified as being used within the system or ordered to be passed through the system. These volumes are generally associated with environmental water orders and have already been accounted for in other line items. Extractions from river included that diverted to an irrigation corporation for distribution.

Additional information

Table 38 provides a reconciliation of the accounted usage against access licences compared to the extraction from river volume presented in the water accounting statements.

Table 38: Reconciliation of account usage to physical extractions from the accounting extent

Item	Volume (ML)
Total account usage (A)	1,582,921
Volume account usage to Lowbidgee (disclosed in another item) (B)	96,110
Total CI account usage (C)	252,823
Volume of usage leaving accounted extent (account usage downstream Balranald or Darlot, already accounted in flow leaving) (D)	165,488
Extraction Coleambally Main Canal (F)	314,881
Total extractions (A-B-C-D+F)	1,383,383

Note 22—Basic rights extractions

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 Murrumbidgee Regulated River Water Source 2016

- Part 5 Requirements for water
 - Division 2 Requirements for water for basic landholder rights
 - Clause 18 Domestic and stock rights

Available on the Department of Climate Change, Energy, the Environment and Water website at [DCCEEW Website](#)

Data accuracy

C—Estimated in the range +/- 50%

Providing agency

Department of Climate Change, Energy, the Environment and Water

Data source

Water Sharing Plan for the Murrumbidgee Regulated River Water Source 2016

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 Murrumbidgee Regulated River Water Source 2016 (1,690 megalitres).

Note 23—Supplementary/Uncontrolled Flow extractions

This is the volume of water extracted, diverted or delivered under supplementary access licences and uncontrolled flow rules during announced periods of supplementary water. Supplementary flow events are announced periodically during the season when high flow events occur with the period of extraction and volume of water to be extracted determined based on the rules as set out in the water sharing plans. It is important to note that supplementary access licences differ from other categories of access licence in that the volume of water announced in the available water determination account refers to an annual upper limit for extractions and its provision is totally reliant on the occurrence of high flow events. In addition to supplementary water access being available during the supplementary flow events uncontrolled flow (if available) is also accessible against general security licences (see Note 23 for more detail on uncontrolled flows).

In 2012-13 a new category of licence, Supplementary (Lowbidgee), was introduced under WMA2000 to convert land (area) based rights to a volumetric entitlement.

For this GPWAR the actual amount of Supplementary water taken during the year has been displayed as both an increase in water liability (demand to take from an announced event) and an equal decrease in water liability (reduction in supplementary holders account for physical extractions), the net effect is zero system on the system liability and a decrease in the systems total water assets. No other processes for supplementary water (available water determinations, trading etc) were considered in the accounting process.

Uncontrolled Flow refers to a specific volume of non-debit water, as defined in the water sharing plan, pumped or diverted from the river for consumptive use by general security licence holders during periods when the extraction of supplementary water is permitted. It differs from supplementary water, which is a defined licence category that limits the volume pumped during high flow events, in that based on rules defined in the water sharing plan it can debit the licence holders general security account.

Data type

Measured data

Policy

Water Sharing Plan for the Murrumbidgee Regulated River Water Source 2016

- Part 7 Limits to the availability of water
 - Division 2—Available water determinations
 - Clause 65 Available water determinations for supplementary water access licences
 - Clause 66 Available water determinations for supplementary water (Lowbidgee) access licences
- Part 9 Rules for managing access licences
 - Division 2 - Access to supplementary water and taking water without debit rules
 - Clause 69 Taking of water under supplementary water access licences and supplementary (Lowbidgee) access licences
 - Clause 70 Distribution rules for the Lowbidgee area

- Clause 71 Taking of water without debit under regulated river (general security) access licence

Refer to applicable Water Sharing Plan on Department of Climate Change, Energy, the Environment and Water Website.

Data accuracy

A—Estimated in the range +/- 10%

Providing agency

Department of Climate Change, Energy, the Environment and Water

Data source

WaterNSW/ Department of Climate Change, Energy, the Environment and Water—Water Accounting System (Joint ownership of System).

Methodology (Supplementary water)

Supplementary and uncontrolled flow 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 and uncontrolled flow water being extracted through the same pumps as those extracting water under other categories of access licences additional information is required to separate out supplementary and uncontrolled flow extraction. Basically, licence holders provide notification of their intention to pump prior to pumping or diverting water during the declared supplementary event and provide meter readings both at the commencement and conclusion of pumping. This enables the supplementary flow extraction to be assessed independent of other categories of access licences.

The total volume of supplementary extractions is then calculated by summing the individual extractions and diversions that occurred during declared periods of supplementary flow for the water year.

Methodology (Uncontrolled flow usage)

Uncontrolled flow usage is measured in the same way as general security extractions but is tagged as uncontrolled flow in the accounting system. Under specific rules as outlined in the water sharing plan the uncontrolled usage will be debited against the general security account in a water year.

The summary of these rules is given below:

- Uncontrolled flow can be extracted, up to a limit of 0.85 megalitres per share of entitlement, without debit when the annual allocation plus carryover (effective allocation) is below 0.7 megalitres per share of entitlement.

- When uncontrolled extractions plus effective allocation exceed a volume equivalent to 0.85 megalitres per share of entitlement then the volume of exceedance less any previously debited exceedance water will be debited against the general security allocation account.
- When effective allocation exceeds 0.85 megalitres per share of entitlement then the uncontrolled usage less any previously debited exceedance will be debited against the general security allocation account.

As uncontrolled flow is extracted through the same pumps as those extracting water under other categories of access licences, additional information is required to identify periods and, therefore, volumes of uncontrolled flow extractions. This is achieved by holders providing notification of intent to pump prior to pumping or diverting water during a declared supplementary event and provide meter readings both at the commencement and conclusion of pumping. This enables the uncontrolled flow extraction to be assessed independent of the other categories of access licences.

Additional information

Total supplementary usage and uncontrolled flow usage for reporting period was 144,084 megalitres and 36,312 megalitres respectively. Total supplementary and uncontrolled usage by river section is presented in Figure 63. Total daily supplementary and uncontrolled usage is presented in Figure 64. Uncontrolled usage is presented as accessed as time of extraction. The accounting rules require accessed water to be reclassified as controlled and debited to accounts if allocation triggers are met during the year. Volumes of uncontrolled flow accounted to licences are provided in Table 40.

Table 39: Murrumbidgee Supplementary Event Announcements

Announce Date	Use limit (%)	Catchment	Section	Star Date	End Date	Supp Usage	UCF Usage
1-Jul-22	100	BEAVERS CREEK	Beavers Creek	1-Jul-22	21-Dec-22	-	-
1-May-23	100	BEAVERS CREEK	Beavers Creek	4-May-23	7-May-23	-	-
22-May-23	100	BEAVERS CREEK	Beavers Creek	26-May-23	4-Jun-23	-	-
8-Jun-23	100	BEAVERS CREEK	Beavers Creek	11-Jun-23	30-Jun-23	-	-
1-Jul-22	100	BILLABONG CREEK	Billabong Ck Algudgerie To Puckawidgee	1-Jul-22	10-Mar-23	1,288	709
1-May-23	100	BILLABONG CREEK	Billabong Ck Algudgerie To Puckawidgee	1-May-23	8-May-23	205	-
1-May-23	100	BILLABONG CREEK	Billabong Ck Algudgerie To Puckawidgee	18-May-23	21-May-23	-	-
22-May-23	100	BILLABONG CREEK	Billabong Ck Algudgerie To Puckawidgee	12-Jun-23	21-Jun-23	-	-
8-Jun-23	100	BILLABONG CREEK	Billabong Ck Algudgerie To Puckawidgee	26-Jun-23	30-Jun-23	-	-
1-Jul-22	100	BILLABONG CREEK	Billabong Ck Colombo Junction To Jerilderie	1-Jul-22	8-Mar-23	481	90
27-Apr-23	100	BILLABONG CREEK	Billabong Ck Colombo Junction To Jerilderie	30-Apr-23	1-May-23	-	-
1-May-23	100	BILLABONG CREEK	Billabong Ck Colombo Junction To Jerilderie	1-May-23	8-May-23	35	-
1-May-23	100	BILLABONG CREEK	Billabong Ck Colombo Junction To Jerilderie	16-May-23	19-May-23	58	-
22-May-23	100	BILLABONG CREEK	Billabong Ck Colombo Junction To Jerilderie	5-Jun-23	14-Jun-23	-	-
8-Jun-23	100	BILLABONG CREEK	Billabong Ck Colombo Junction To Jerilderie	22-Jun-23	30-Jun-23	-	-
1-Jul-22	100	BILLABONG CREEK	Billabong Ck D/S Of Darlot Gauge	1-Jul-22	19-Mar-23	2,897	13
1-May-23	100	BILLABONG CREEK	Billabong Ck D/S Of Darlot Gauge	1-May-23	8-May-23	-	-
1-May-23	100	BILLABONG CREEK	Billabong Ck D/S Of Darlot Gauge	26-May-23	29-May-23	-	-
22-May-23	100	BILLABONG CREEK	Billabong Ck D/S Of Darlot Gauge	16-Jun-23	25-Jun-23	-	-
1-Jul-22	100	BILLABONG CREEK	Billabong Ck Jerilderie to Algudgerie	1-Jul-22	10-Mar-23	160	369
1-May-23	100	BILLABONG CREEK	Billabong Ck Jerilderie to Algudgerie	1-May-23	8-May-23	-	-
1-May-23	100	BILLABONG CREEK	Billabong Ck Jerilderie to Algudgerie	18-May-23	21-May-23	50	-
22-May-23	100	BILLABONG CREEK	Billabong Ck Jerilderie to Algudgerie	10-Jun-23	19-Jun-23	-	-
8-Jun-23	100	BILLABONG CREEK	Billabong Ck Jerilderie to Algudgerie	26-Jun-23	30-Jun-23	-	-
1-Jul-22	100	BILLABONG CREEK	Billabong Ck Puckawidgee to Wangenella	1-Jul-22	15-Mar-23	1,745	72
1-May-23	100	BILLABONG CREEK	Billabong Ck Puckawidgee to Wangenella	1-May-23	8-May-23	-	-
1-May-23	100	BILLABONG CREEK	Billabong Ck Puckawidgee to Wangenella	23-May-23	26-May-23	-	-
22-May-23	100	BILLABONG CREEK	Billabong Ck Puckawidgee to Wangenella	13-Jun-23	22-Jun-23	-	-

Announce Date	Use limit (%)	Catchment	Section	Star Date	End Date	Supp Usage	UCF Usage
8-Jun-23	100	BILLABONG CREEK	Billabong Ck Puckawidgee to Wangenella	27-Jun-23	30-Jun-23	-	-
1-Jul-22	100	BILLABONG CREEK	Billabong Ck Wangenella to Darlot	1-Jul-22	19-Mar-23	121	339
1-May-23	100	BILLABONG CREEK	Billabong Ck Wangenella to Darlot	1-May-23	8-May-23	-	-
1-May-23	100	BILLABONG CREEK	Billabong Ck Wangenella to Darlot	26-May-23	29-May-23	-	-
22-May-23	100	BILLABONG CREEK	Billabong Ck Wangenella to Darlot	16-Jun-23	25-Jun-23	-	-
1-Jul-22	100	BUDGEE CREEK	Budgee Creek	1-Jul-22	21-Dec-22	-	-
1-May-23	100	BUDGEE CREEK	Budgee Creek	12-May-23	15-May-23	-	-
22-May-23	100	BUDGEE CREEK	Budgee Creek	3-Jun-23	12-Jun-23	-	-
8-Jun-23	100	BUDGEE CREEK	Budgee Creek	20-Jun-23	30-Jun-23	-	-
1-Jul-22	100	BUNDIDGERRY CREEK	Bundidgerry Creek	1-Jul-22	21-Dec-22	-	-
1-May-23	100	BUNDIDGERRY CREEK	Bundidgerry Creek	4-May-23	7-May-23	-	-
22-May-23	100	BUNDIDGERRY CREEK	Bundidgerry Creek	27-May-23	5-Jun-23	-	-
8-Jun-23	100	BUNDIDGERRY CREEK	Bundidgerry Creek	11-Jun-23	21-Jun-23	-	-
1-Jul-22	100	MURRUMBIDGEE RIVER	Burrinjuck Dam To Gundagai	1-Jul-22	21-Dec-22	-	-
1-May-23	100	MURRUMBIDGEE RIVER	Burrinjuck Dam To Gundagai	2-May-23	5-May-23	-	-
22-May-23	100	MURRUMBIDGEE RIVER	Burrinjuck Dam To Gundagai	23-May-23	1-Jun-23	-	-
8-Jun-23	100	MURRUMBIDGEE RIVER	Burrinjuck Dam To Gundagai	8-Jun-23	30-Jun-23	-	-
1-Jul-22	100	COLOMBO CREEK	Colombo Ck Coonong Weir To Billabong Junction	1-Jul-22	6-Mar-23	206	259
27-Apr-23	100	COLOMBO CREEK	Colombo Ck Coonong Weir To Billabong Junction	28-Apr-23	1-May-23	-	-
1-May-23	100	COLOMBO CREEK	Colombo Ck Coonong Weir To Billabong Junction	14-May-23	17-May-23	-	-
22-May-23	100	COLOMBO CREEK	Colombo Ck Coonong Weir To Billabong Junction	3-Jun-23	12-Jun-23	-	-
8-Jun-23	100	COLOMBO CREEK	Colombo Ck Coonong Weir To Billabong Junction	20-Jun-23	30-Jun-23	-	-
1-Jul-22	100	COLOMBO CREEK	Colombo Ck Morundah To Coonong Weir	1-Jul-22	26-Feb-23	-	1
1-May-23	100	COLOMBO CREEK	Colombo Ck Morundah To Coonong Weir	13-May-23	16-May-23	-	-
22-May-23	100	COLOMBO CREEK	Colombo Ck Morundah To Coonong Weir	2-Jun-23	11-Jun-23	-	-
8-Jun-23	100	COLOMBO CREEK	Colombo Ck Morundah To Coonong Weir	19-Jun-23	30-Jun-23	-	-
1-Jul-22	100	MURRUMBIDGEE RIVER	Coly Main Canal Offtake	1-Jul-22	21-Dec-22	10,000	11,698
1-May-23	100	MURRUMBIDGEE RIVER	Coly Main Canal Offtake	6-May-23	9-May-23	-	-
1-Jul-22	100	COWABBIE CREEK	Cowabbie Creek	1-Jul-22	21-Dec-22	-	-

Announce Date	Use limit (%)	Catchment	Section	Star Date	End Date	Supp Usage	UCF Usage
1-May-23	100	COWABBIE CREEK	Cowabbie Creek	4-May-23	7-May-23	-	-
22-May-23	100	COWABBIE CREEK	Cowabbie Creek	27-May-23	5-Jun-23	-	-
8-Jun-23	100	COWABBIE CREEK	Cowabbie Creek	11-Jun-23	30-Jun-23	-	-
1-Jul-22	100	CUDELLE CREEK	Cuddell Creek (Off Yanco Ck)	1-Jul-22	9-Feb-23	550	223
1-May-23	100	CUDELLE CREEK	Cuddell Creek (Off Yanco Ck)	7-May-23	10-May-23	-	-
22-May-23	100	CUDELLE CREEK	Cuddell Creek (Off Yanco Ck)	27-May-23	5-Jun-23	-	-
8-Jun-23	100	CUDELLE CREEK	Cuddell Creek (Off Yanco Ck)	12-Jun-23	30-Jun-23	-	-
1-Jul-22	100	MURRUMBIDGEE RIVER	D/S Balranad Weir To Murray	1-Jul-22	20-Feb-23	176	13
1-May-23	100	MURRUMBIDGEE RIVER	D/S Balranad Weir To Murray	18-May-23	21-May-23	-	-
22-May-23	100	MURRUMBIDGEE RIVER	D/S Balranad Weir To Murray	8-Jun-23	17-Jun-23	-	-
8-Jun-23	100	MURRUMBIDGEE RIVER	D/S Balranad Weir To Murray	25-Jun-23	30-Jun-23	-	-
1-Jul-22	100	MURRUMBIDGEE RIVER	D/S Berembed Weir To Narrandera	1-Jul-22	21-Dec-22	-	-
1-May-23	100	MURRUMBIDGEE RIVER	D/S Berembed Weir To Narrandera	6-May-23	9-May-23	-	-
22-May-23	100	MURRUMBIDGEE RIVER	D/S Berembed Weir To Narrandera	27-May-23	5-Jun-23	-	-
8-Jun-23	100	MURRUMBIDGEE RIVER	D/S Berembed Weir To Narrandera	12-Jun-23	30-Jun-23	-	-
1-Jul-22	100	MURRUMBIDGEE RIVER	D/S Carrathhool To Hay Weir	1-Jul-22	21-Dec-22	6,930	1,901
1-May-23	100	MURRUMBIDGEE RIVER	D/S Carrathhool To Hay Weir	11-May-23	15-May-23	1,196	-
22-May-23	100	MURRUMBIDGEE RIVER	D/S Carrathhool To Hay Weir	2-Jun-23	11-Jun-23	267	-
8-Jun-23	100	MURRUMBIDGEE RIVER	D/S Carrathhool To Hay Weir	19-Jun-23	30-Jun-23	87	-
1-Jul-22	100	MURRUMBIDGEE RIVER	D/S Coly Main Offtake To Gogeldrie Weir	1-Jul-22	21-Dec-22	-	-
1-May-23	100	MURRUMBIDGEE RIVER	D/S Coly Main Offtake To Gogeldrie Weir	6-May-23	9-May-23	-	-
22-May-23	100	MURRUMBIDGEE RIVER	D/S Coly Main Offtake To Gogeldrie Weir	27-May-23	5-Jun-23	-	-
8-Jun-23	100	MURRUMBIDGEE RIVER	D/S Coly Main Offtake To Gogeldrie Weir	12-Jun-23	30-Jun-23	-	-
1-Jul-22	100	MURRUMBIDGEE RIVER	D/S Currawarna Bridge To Berembed Weir	1-Jul-22	21-Dec-22	-	-
1-May-23	100	MURRUMBIDGEE RIVER	D/S Currawarna Bridge To Berembed Weir	4-May-23	7-May-23	-	-
22-May-23	100	MURRUMBIDGEE RIVER	D/S Currawarna Bridge To Berembed Weir	26-May-23	4-Jun-23	-	-
8-Jun-23	100	MURRUMBIDGEE RIVER	D/S Currawarna Bridge To Berembed Weir	11-Jun-23	30-Jun-23	-	-
1-Jul-22	100	MURRUMBIDGEE RIVER	D/S Darlington Pt Gauge To Carrathool	1-Jul-22	21-Dec-22	11,838	253
1-May-23	100	MURRUMBIDGEE RIVER	D/S Darlington Pt Gauge To Carrathool	11-May-23	15-May-23	2,412	-

Announce Date	Use limit (%)	Catchment	Section	Star Date	End Date	Supp Usage	UCF Usage
22-May-23	100	MURRUMBIDGEE RIVER	D/S Darlington Pt Gauge To Carrathool	31-May-23	9-Jun-23	3,706	-
8-Jun-23	100	MURRUMBIDGEE RIVER	D/S Darlington Pt Gauge To Carrathool	17-Jun-23	30-Jun-23	2	-
1-Jul-22	100	MURRUMBIDGEE RIVER	D/S Gogeldrie Weir To Darlington Point	1-Jul-22	21-Dec-22	1,441	4
1-May-23	100	MURRUMBIDGEE RIVER	D/S Gogeldrie Weir To Darlington Point	7-May-23	10-May-23	1,900	-
22-May-23	100	MURRUMBIDGEE RIVER	D/S Gogeldrie Weir To Darlington Point	29-May-23	7-Jun-23	2,800	-
8-Jun-23	100	MURRUMBIDGEE RIVER	D/S Gogeldrie Weir To Darlington Point	14-Jun-23	30-Jun-23	-	-
1-Jul-22	100	MURRUMBIDGEE RIVER	D/S Hay Weir To Maude Weir	1-Jul-22	21-Dec-22	23,609	336
1-May-23	100	MURRUMBIDGEE RIVER	D/S Hay Weir To Maude Weir	12-May-23	15-May-23	2,410	-
22-May-23	100	MURRUMBIDGEE RIVER	D/S Hay Weir To Maude Weir	3-Jun-23	12-Jun-23	882	-
8-Jun-23	100	MURRUMBIDGEE RIVER	D/S Hay Weir To Maude Weir	20-Jun-23	30-Jun-23	795	-
1-Jul-22	100	MURRUMBIDGEE RIVER	D/S Maude Weir To Redbank Weir	1-Jul-22	21-Dec-22	4,672	646
1-May-23	100	MURRUMBIDGEE RIVER	D/S Maude Weir To Redbank Weir	16-May-23	19-May-23	822	-
17-May-23	100	MURRUMBIDGEE RIVER	D/S Maude Weir To Redbank Weir	17-May-23	20-May-23	283	-
22-May-23	100	MURRUMBIDGEE RIVER	D/S Maude Weir To Redbank Weir	5-Jun-23	14-Jun-23	2,622	-
8-Jun-23	100	MURRUMBIDGEE RIVER	D/S Maude Weir To Redbank Weir	22-Jun-23	30-Jun-23	1,770	-
1-Jul-22	100	MURRUMBIDGEE RIVER	D/S Narrandera Gauge To Coly Main Offtake	1-Jul-22	21-Dec-22	93	3
1-May-23	100	MURRUMBIDGEE RIVER	D/S Narrandera Gauge To Coly Main Offtake	6-May-23	9-May-23	-	-
22-May-23	100	MURRUMBIDGEE RIVER	D/S Narrandera Gauge To Coly Main Offtake	27-May-23	5-Jun-23	-	-
8-Jun-23	100	MURRUMBIDGEE RIVER	D/S Narrandera Gauge To Coly Main Offtake	12-Jun-23	30-Jun-23	-	-
1-Jul-22	100	UNNAMED WATERCOURSE	D/S Narrandera Gauge To Gogeldrie Weir	1-Jul-22	21-Dec-22	-	-
1-May-23	100	UNNAMED WATERCOURSE	D/S Narrandera Gauge To Gogeldrie Weir	6-May-23	9-May-23	-	-
22-May-23	100	UNNAMED WATERCOURSE	D/S Narrandera Gauge To Gogeldrie Weir	27-May-23	5-Jun-23	-	-
8-Jun-23	100	UNNAMED WATERCOURSE	D/S Narrandera Gauge To Gogeldrie Weir	12-Jun-23	30-Jun-23	-	-
1-Jul-22	100	MURRUMBIDGEE RIVER	D/S Redbank To Balranald Weir	1-Jul-22	20-Feb-23	283	52
1-May-23	100	MURRUMBIDGEE RIVER	D/S Redbank To Balranald Weir	18-May-23	21-May-23	-	-
22-May-23	100	MURRUMBIDGEE RIVER	D/S Redbank To Balranald Weir	8-Jun-23	17-Jun-23	-	-
8-Jun-23	100	MURRUMBIDGEE RIVER	D/S Redbank To Balranald Weir	25-Jun-23	30-Jun-23	-	-
1-Jul-22	100	FOREST CREEK	Forest Creek	1-Jul-22	10-Mar-23	2,610	361
1-May-23	100	FOREST CREEK	Forest Creek	18-May-23	21-May-23	210	-

Announce Date	Use limit (%)	Catchment	Section	Star Date	End Date	Supp Usage	UCF Usage
22-May-23	100	FOREST CREEK	Forest Creek	10-Jun-23	19-Jun-23	-	-
8-Jun-23	100	FOREST CREEK	Forest Creek	26-Jun-23	30-Jun-23	-	-
1-Jul-22	100	MURRUMBIDGEE RIVER	Gundagai To Wagga	1-Jul-22	21-Dec-22	-	-
1-May-23	100	MURRUMBIDGEE RIVER	Gundagai To Wagga	2-May-23	5-May-23	-	-
22-May-23	100	MURRUMBIDGEE RIVER	Gundagai To Wagga	23-May-23	1-Jun-23	-	-
8-Jun-23	100	MURRUMBIDGEE RIVER	Gundagai To Wagga	8-Jun-23	30-Jun-23	-	-
1-Jul-22	100	ISLAND CREEK	Island Creek (Via Nangus)	1-Jul-22	7-Feb-23	-	-
1-May-23	100	ISLAND CREEK	Island Creek (Via Nangus)	2-May-23	5-May-23	-	-
22-May-23	100	ISLAND CREEK	Island Creek (Via Nangus)	23-May-23	1-Jun-23	-	-
8-Jun-23	100	ISLAND CREEK	Island Creek (Via Nangus)	8-Jun-23	30-Jun-23	-	-
1-Jul-22	100	ISLAND LAGOON	Island Lagoon	1-Jul-22	21-Dec-22	-	-
1-May-23	100	ISLAND LAGOON	Island Lagoon	4-May-23	7-May-23	-	-
22-May-23	100	ISLAND LAGOON	Island Lagoon	26-May-23	4-Jun-23	-	-
8-Jun-23	100	ISLAND LAGOON	Island Lagoon	11-Jun-23	30-Jun-23	-	-
1-Jul-22	100	BUNDIDGERRY CREEK	MI Main Canal	1-Jul-22	21-Dec-22	27,273	11,098
1-May-23	100	BUNDIDGERRY CREEK	MI Main Canal	4-May-23	7-May-23	1,145	-
8-Jun-23	100	BUNDIDGERRY CREEK	MI Main Canal	12-Jun-23	21-Jun-23	-	-
1-Jul-22	100	COONONCOOCABIL LAGOON	MI Sturt Canal	1-Jul-22	21-Dec-22	7,238	7,230
1-May-23	100	COONONCOOCABIL LAGOON	MI Sturt Canal	6-May-23	9-May-23	355	-
22-May-23	100	COONONCOOCABIL LAGOON	MI Sturt Canal	27-May-23	5-Jun-23	-	-
8-Jun-23	100	COONONCOOCABIL LAGOON	MI Sturt Canal	12-Jun-23	16-Jun-23	-	-
1-Jul-22	100	MIRROOL CREEK	Mirrool Creek	1-Jul-22	21-Dec-22	-	-
1-May-23	100	MIRROOL CREEK	Mirrool Creek	4-May-23	7-May-23	-	-
22-May-23	100	MIRROOL CREEK	Mirrool Creek	27-May-23	5-Jun-23	-	-
8-Jun-23	100	MIRROOL CREEK	Mirrool Creek	11-Jun-23	30-Jun-23	-	-
1-Jul-22	100	NIMBO CREEK	Nimbo Creek	1-Jul-22	21-Dec-22	-	-
1-May-23	100	NIMBO CREEK	Nimbo Creek	2-May-23	5-May-23	-	-
22-May-23	100	NIMBO CREEK	Nimbo Creek	23-May-23	1-Jun-23	-	-
8-Jun-23	100	NIMBO CREEK	Nimbo Creek	8-Jun-23	30-Jun-23	-	-

Announce Date	Use limit (%)	Catchment	Section	Star Date	End Date	Supp Usage	UCF Usage
1-Jul-22	100	OLD MAN CREEK	Old Man Creek	1-Jul-22	21-Dec-22	-	6
1-May-23	100	OLD MAN CREEK	Old Man Creek	4-May-23	7-May-23	-	-
22-May-23	100	OLD MAN CREEK	Old Man Creek	26-May-23	4-Jun-23	-	-
8-Jun-23	100	OLD MAN CREEK	Old Man Creek	11-Jun-23	30-Jun-23	-	-
1-Jul-22	100	SHEEPWASH CREEK	Sheepwash Ck (Off Billabong Ck)	1-Jul-22	15-Mar-23	288	14
1-May-23	100	SHEEPWASH CREEK	Sheepwash Ck (Off Billabong Ck)	24-May-23	27-May-23	-	-
22-May-23	100	SHEEPWASH CREEK	Sheepwash Ck (Off Billabong Ck)	13-Jun-23	22-Jun-23	-	-
8-Jun-23	100	SHEEPWASH CREEK	Sheepwash Ck (Off Billabong Ck)	27-Jun-23	30-Jun-23	-	-
1-Jul-22	100	TUMUT RIVER	Tumut	1-Jul-22	21-Dec-22	-	207
1-May-23	100	TUMUT RIVER	Tumut	2-May-23	5-May-23	-	-
22-May-23	100	TUMUT RIVER	Tumut	23-May-23	1-Jun-23	-	-
8-Jun-23	100	TUMUT RIVER	Tumut	8-Jun-23	30-Jun-23	-	-
1-Jul-22	100	UNNAMED WATERCOURSE	Unnamed Water Course	1-Jul-22	21-Dec-22	-	-
1-May-23	100	UNNAMED WATERCOURSE	Unnamed Water Course	11-May-23	14-May-23	-	-
22-May-23	100	UNNAMED WATERCOURSE	Unnamed Water Course	2-Jun-23	11-Jun-23	-	-
8-Jun-23	100	UNNAMED WATERCOURSE	Unnamed Water Course	19-Jun-23	30-Jun-23	-	-
1-Jul-22	100	URI CREEK	Uri Creek	1-Jul-22	21-Dec-22	303	-
1-May-23	100	URI CREEK	Uri Creek	11-May-23	15-May-23	94	-
22-May-23	100	URI CREEK	Uri Creek	31-May-23	9-Jun-23	360	-
8-Jun-23	100	URI CREEK	Uri Creek	17-Jun-23	30-Jun-23	-	-
1-Jul-22	100	MURRUMBIDGEE RIVER	Wagga To Currawarna	1-Jul-22	21-Dec-22	6	5
1-May-23	100	MURRUMBIDGEE RIVER	Wagga To Currawarna	4-May-23	7-May-23	-	-
22-May-23	100	MURRUMBIDGEE RIVER	Wagga To Currawarna	26-May-23	4-Jun-23	-	-
8-Jun-23	100	MURRUMBIDGEE RIVER	Wagga To Currawarna	11-Jun-23	30-Jun-23	-	-
1-Jul-22	100	WASHPEN CREEK	Washpen Creek (Off Yanco Ck)	1-Jul-22	9-Feb-23	-	-
1-May-23	100	WASHPEN CREEK	Washpen Creek (Off Yanco Ck)	7-May-23	10-May-23	-	-
22-May-23	100	WASHPEN CREEK	Washpen Creek (Off Yanco Ck)	27-May-23	5-Jun-23	-	-
8-Jun-23	100	WASHPEN CREEK	Washpen Creek (Off Yanco Ck)	12-Jun-23	30-Jun-23	-	-
1-Jul-22	100	WILSON ANABRANCH	Wilson Anadranch (Off Yanco Ck)	1-Jul-22	6-Mar-23	-	-

Announce Date	Use limit (%)	Catchment	Section	Star Date	End Date	Supp Usage	UCF Usage
22-May-23	100	WILSON ANABRANCH	Wilson Anadranch (Off Yanco Ck)	7-Jun-23	16-Jun-23	-	-
8-Jun-23	100	WILSON ANABRANCH	Wilson Anadranch (Off Yanco Ck)	27-Jun-23	30-Jun-23	-	-
1-Jul-22	100	YANCO CREEK	Yanco Ck Morundah To Yanco Bridge	1-Jul-22	6-Mar-23	193	179
22-May-23	100	YANCO CREEK	Yanco Ck Morundah To Yanco Bridge	4-Jun-23	13-Jun-23	-	-
8-Jun-23	100	YANCO CREEK	Yanco Ck Morundah To Yanco Bridge	20-Jun-23	30-Jun-23	-	-
1-Jul-22	100	YANCO CREEK	Yanco Ck Offtake To Morundah	1-Jul-22	9-Feb-23	1,289	-
1-May-23	100	YANCO CREEK	Yanco Ck Offtake To Morundah	7-May-23	10-May-23	-	-
22-May-23	100	YANCO CREEK	Yanco Ck Offtake To Morundah	27-May-23	5-Jun-23	4,403	-
8-Jun-23	100	YANCO CREEK	Yanco Ck Offtake To Morundah	12-Jun-23	30-Jun-23	5,669	-
1-Jul-22	100	YANCO CREEK	Yanco Ck Wiraki To Puckawidgee	1-Jul-22	10-Mar-23	1,351	202
1-May-23	100	YANCO CREEK	Yanco Ck Wiraki To Puckawidgee	24-May-23	27-May-23	58	-
22-May-23	100	YANCO CREEK	Yanco Ck Wiraki To Puckawidgee	7-Jun-23	16-Jun-23	-	-
8-Jun-23	100	YANCO CREEK	Yanco Ck Wiraki To Puckawidgee	27-Jun-23	30-Jun-23	-	-
1-Jul-22	100	YANCO CREEK	Yanco Ck Yanco Bridge To Wiraki	1-Jul-22	9-Mar-23	2,401	31
1-May-23	100	YANCO CREEK	Yanco Ck Yanco Bridge To Wiraki	24-May-23	27-May-23	49	-
22-May-23	100	YANCO CREEK	Yanco Ck Yanco Bridge To Wiraki	5-Jun-23	15-Jun-23	-	-
8-Jun-23	100	YANCO CREEK	Yanco Ck Yanco Bridge To Wiraki	25-Jun-23	30-Jun-23	-	-

Figure 63: Supplementary and uncontrolled flow usage by river section

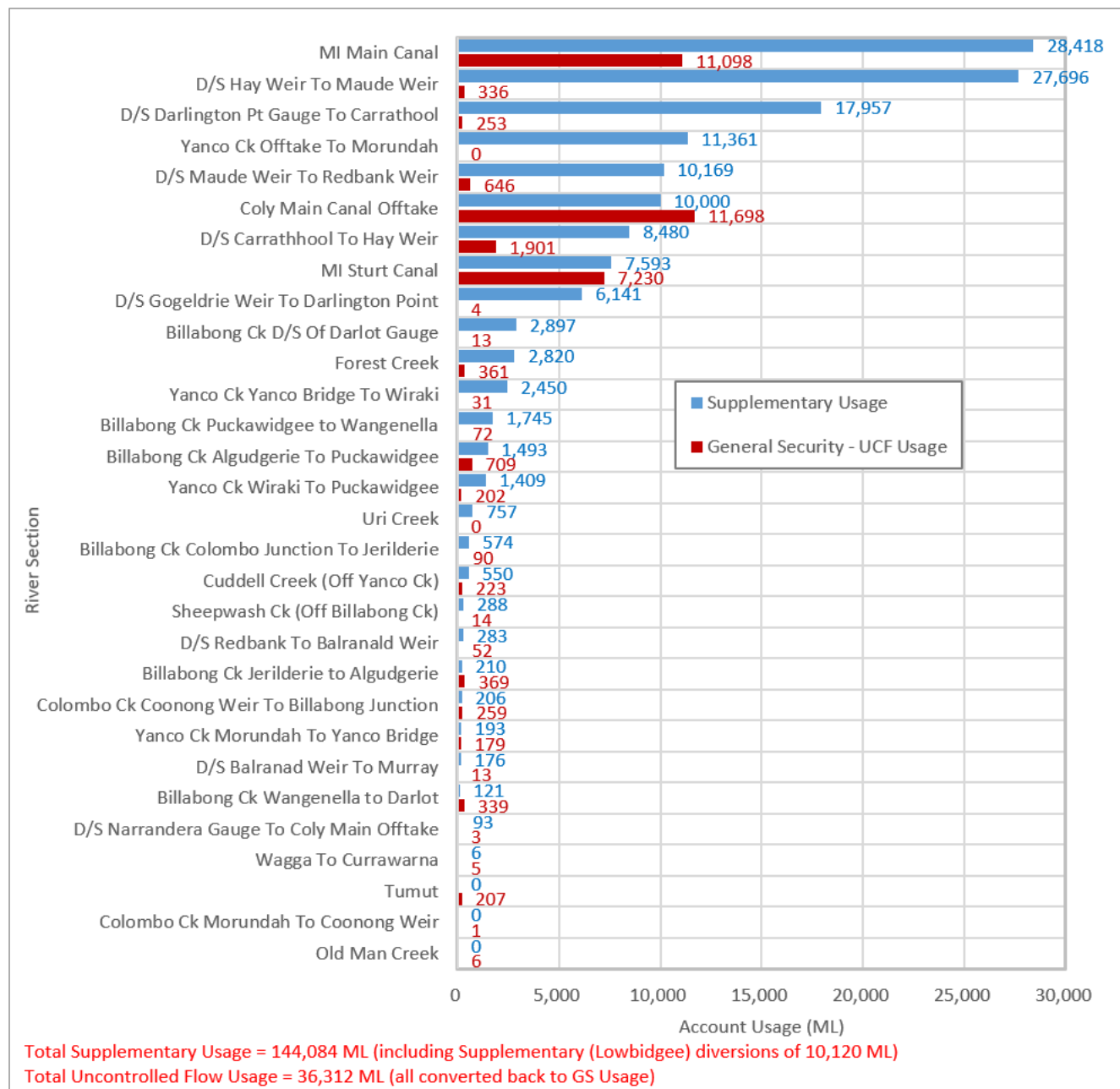
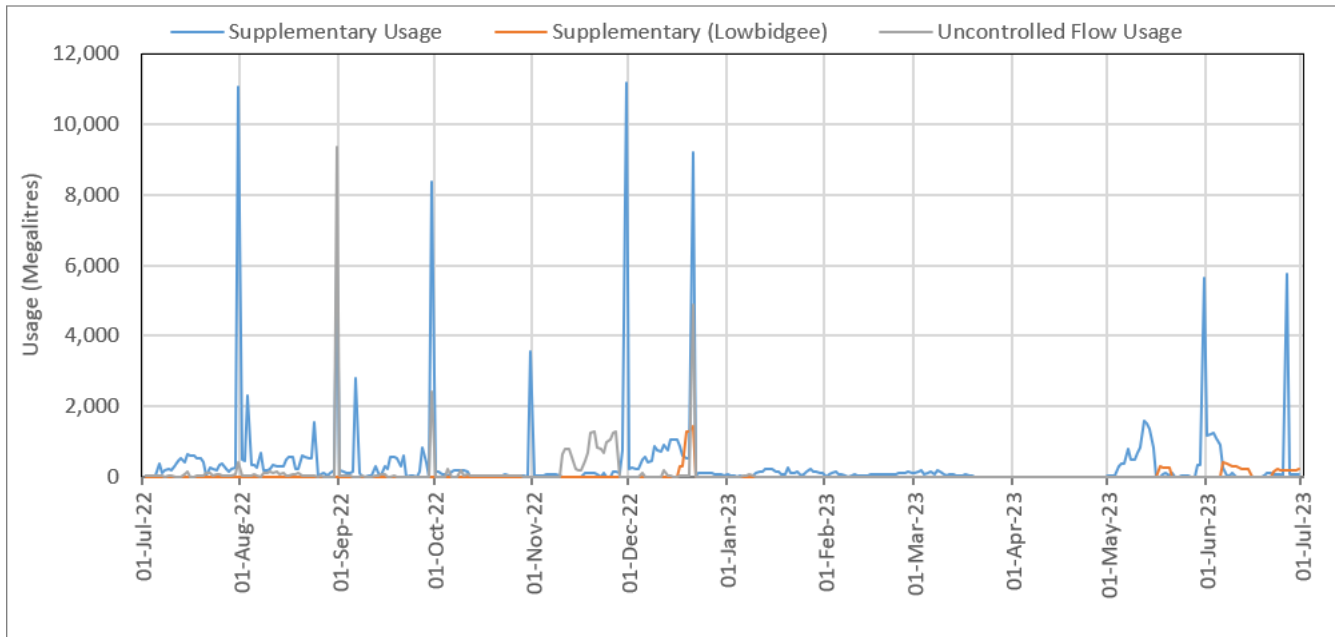


Figure 64: Supplementary water and uncontrolled flow daily usage⁵¹



⁵¹ This refers to the total uncontrolled flow usage at the time of extraction i.e. not adjusted for conversion back to general security as per the plan rules.

Table 40: Uncontrolled flow allocation accounted usage⁵²

Water year	Uncontrolled flow extractions
2004–05	145,197
2005–06	187,302
2006–07	0
2007–08	0
2008–09	0
2009–10	21,977
2010–11	0
2011–12	0
2012–13	0
2013–14	40,547
2014–15	28,014
2015–16	78,931
2016–17	839
2017–18	20,605
2018–19	0
2019–20	16,603
2020–21	7
2021–22	0
2022-23	0

⁵² This refers to the uncontrolled flow after adjustments for conversions back to general security usage as per the water sharing plan rules.

Note 24—Unaccounted volume

In theory, if all the processes of a water balance were accurately accounted for the unaccounted difference would be zero. Due to the large accuracy uncertainties in many of the volumes presented in the accounts, the various sources and methods from which the data has been obtained and the fact that not all processes of the water cycle have been accounted for in detail, 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 progresses and accuracy improves in the account estimates, it is anticipated that relatively, this figure should reduce in future accounts.

Data type

Not applicable

Policy

Not applicable

Data accuracy

D—Estimated in the range +/- 100% (this refers to the fact the unaccounted volume is a result of a range of processes estimated using different methodologies and accuracies. The accuracy around the number itself, that is required to achieve mass balances is A1—Nil accuracy).

Providing agency

Not applicable

Data source

Not applicable

Methodology

The unaccounted difference is equal to the amount required to obtain the correct physical volume in river at the end of the reporting period, after all the known physical inflows and outflows have been accounted. The accounting process of this GPWAR attempted 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.

The historical unaccounted difference and its percentage of total river inflow is provided in Table 41 below.

Surface water unaccounted difference:

$$UV_{sw} = R_s - R_c + R_i - R_o$$

Where:

- UV_{sw} = Unaccounted difference for surface water

- **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)

Table 41: Historical unaccounted difference including percent of total inflow

Water Year	Total River Inflow (ML)	Unaccounted Difference (UAD) (ML)	UAD % of total river inflow
2010-11	5,485,342	148,763	2.7%
2011-12	7,427,822	2,407,947	32.4%
2012-13	6,130,854	2,009,990	32.8%
2013-14	3,126,047	502,885	16.1%
2014-15	3,225,400	246,649	7.6%
2015-16	3,032,975	178,984	5.9%
2016-17	7,091,801	1,421,857	20.0%
2017-18	2,976,793	365,611	12.3%
2018-19	2,036,598	444,690	21.8%
2019-20	1,506,716	255,017	16.9%
2020-21	3,488,048	289,698	8.3%
2021-22	8,889,505	2,112,746	23.8%
2022-23	8,874,991	828,524	9.3%

Note 25—River and groundwater interaction

This note refers to the net effect of water that has been identified as either flowing from the connected alluvium to the accounted river extent (increase in water asset), and from the accounted river extent to the alluvium aquifer (decrease in water asset).

Data type

Modelled

Policy

Not applicable

Data accuracy

D—Estimated in the range +/- 100%

Providing agency

Department of Climate Change, Energy, the Environment and Water

Data source

Department of Climate Change, Energy, the Environment and Water MODFLOW (Mid Murrumbidgee), Water Table Fluctuation Model (Lower Murrumbidgee). Data inputs to the models are obtained from HYDSTRA, GDS

Methodology

For the Murrumbidgee Mid and Lower groundwater sources the method used to calculate either flow from the connected alluvium to the accounted river extent and the accounted river extent to the alluvium aquifer can be either of the following:

- If available use the estimated annual budget from the NSW Department of Climate Change, Energy, the Environment Water Modflow model (Method A) to assess the annual physical groundwater budget in both the Mid Murrumbidgee Groundwater Management Area and the Lower Murrumbidgee groundwater management area. The 2020–21 GPWAR includes results from the recently calibrated Lower Murrumbidgee model which allows separate quantification of both river inflows and river outflows in the accounting statements a limitation of the approach utilised in prior publications (method B) where only a net interaction is quantified. For a more detailed description of these methods used to produce estimates in this GPWAR refer to the report, General Purpose Water Accounting Reports: Groundwater methodologies available for download from the Department of Climate Change, Energy, the Environment and Water webpage.
- Alternatively, an estimation based on the relationships developed between the annual average river height at river gauging site '410021 Murrumbidgee River at Darlington Point' and historical MODFLOW

model results (Figure 65). The resulting equation used for estimating the accounting input are as follows:

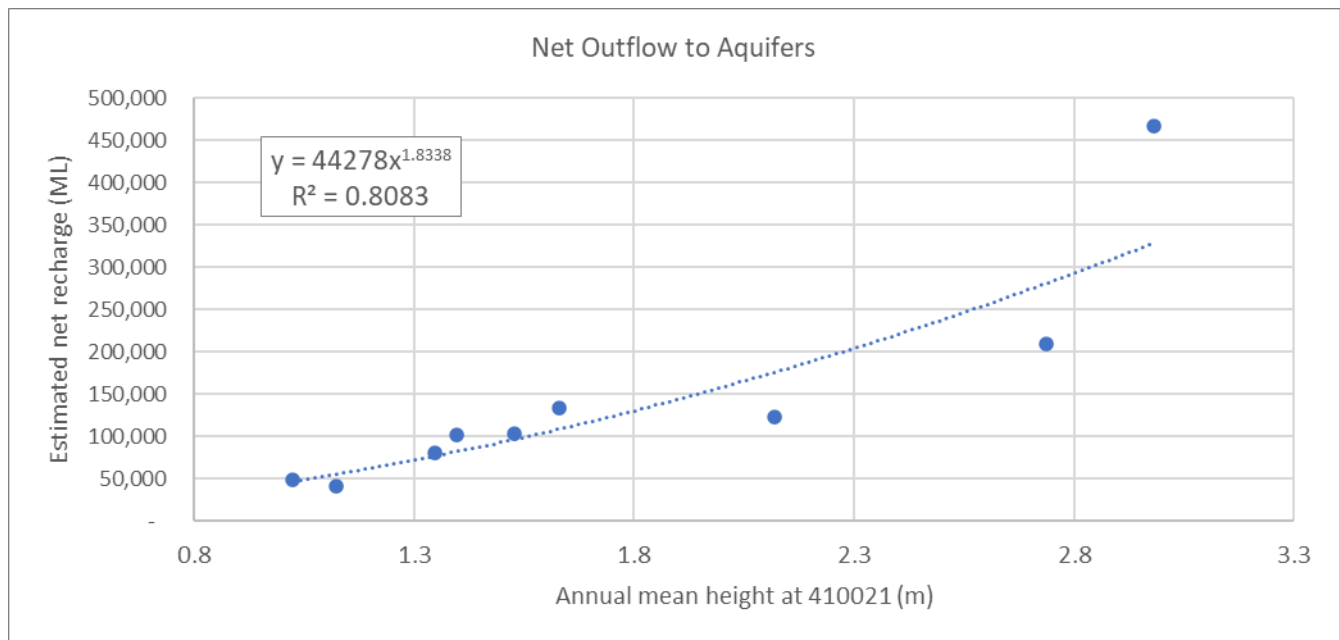
$$\text{Net Outflow to Aquifer} = 44,278 \times \text{Mean Annual Gauge Height (410021)}^{1.8338}$$

No estimate is included in the statements for any river interactions outside the areas covered by these methods.

Additional information

No annual groundwater budget from Method A is available for the reporting period at the time of reporting. Therefore, the alternative estimation method has been used until such time as the results from Method A are available.

Figure 65: Net outflow to groundwater relationship chart



Note 26—Snowy River allocation transfer

Through government funded intervention water entitlement is accumulated from the Murrumbidgee (and Murray) valleys, via water saving implementation, or entitlement purchases in order to return water to the Snowy River. The Snowy River has suffered increasing environment degradation, following implementation of the Snowy Mountains Scheme for electricity and irrigation. A significant portion of the rivers historical natural flows were harvested for use west of the Great Dividing Range, and the system no longer received critical high flow events for the ecosystem.

The Snowy Water Inquiry Outcomes Implementation Deed (2002) is a legally binding agreement between the New South Wales, Victoria and Commonwealth governments. The deed includes the water recovery targets for the Snowy, Murray and Snowy Montane Rivers increased flows programs.

Targets for the increased flow programs include returning the following average volumes annually:

- Snowy River (SRIF)—212,000 megalitres or 21% of the average natural flow
- Murray River (RMIF)—70,000 megalitres
- Snowy Montane Rivers—up to 117,800 megalitres

Data type

Derived from allocation data

Policy

Snowy Water Inquiry Outcomes Implementation Deed (2002)

Available on the Department of Climate Change, Energy, the Environment and Water website at [DCCEEW Website](#)

Data accuracy

A1—Nil inaccuracy +/- 0%

Providing agency

Department of Climate Change, Energy, the Environment and Water

Data source

WaterNSW/ Department of Climate Change, Energy, the Environment and Water—Water Accounting System (joint ownership)

Water savings accounting industry.nsw.gov.au/water/basins-catchments/snowy-river/initiative/water-recovery-savings-summary

Methodology

Each year, allocated water in licences acquired by the water for rivers recovery is determined on January 31 (the amount Snowy Hydro is instructed to withhold from upcoming environmental delivery requirements). A transaction of this amount removes the allocation from the Murrumbidgee licences (decreasing the liability on the Murrumbidgee water assets). Any available water determinations that occur after this date and prior to the closing of the water year, are added to the accounts, with the standard carryover rules of the relative licence category applied.

Additional information

Table 42: Summary of Murrumbidgee water for rivers environmental holdings and transfers in the reporting period

Category	Share	Allocation transferred
Coleambally Irrigation (Conveyance)	3,500	3,500
Murrumbidgee Irrigation (Conveyance)	20,000	20,000
Regulated River (Conveyance)	1,000	1,000
Regulated River (General Security)	75,489	75,489
Regulated River (High Security)	1,885	1,885
Non-licenced water recovery⁵³	N/A	58,464
Total allocation available for release in Snowy River and Murray (RMIF)	-	196,683

⁵³ Savings for Forrest Creek replenishment configuration and Computer Aided River Management (CARM) projects are yet to be converted to a registered access licence but are being allowed for in operation.

References

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