

Introduction

This is a summary guide to the water allocation method for the Murrumbidgee regulated river water source. It is a concise document that aims to provide public information on the water sharing framework and how water is allocated according to entitlement priority.

The *Water Management Act 2000* provides for the preparation of statutory water sharing plans. The rules and processes described in this guide implement the legislative requirements of the *Water Sharing Plan for the Murrumbidgee Regulated River Water Source 2016*.

The Department of Planning and Environment periodically assesses available water resources. The resource assessment identifies the total volume of water available within the regulated river system and how much can be allocated to rights and entitlement holders, particularly to the different categories of water access licence (WAL) held by water users, as required by the water sharing plan.

The process of formally allocating water to WAL holders is known as an Available Water Determination (AWD)¹. The results of the resource assessment and allocation process are publicly advised through Water Allocation Statements published on the department's website to meet transparency and water market obligations. Water accounts are credited accordingly.

The water allocation statement sets out the sharing of available water across all commitments and entitlements in each category of WAL. The announced allocation reflects the proportion of entitlement that is available for use and becomes the volume credited to water users' accounts.

The water allocation statements are normally published fortnightly until full allocation is made to all WAL categories. This summary guide describes key components of the resource assessment and allocation process followed by an example of a past allocation, that of 15 July 2021, at page 10.

Water users

There are different water users including the environment, basic land holder rights and licence (WAL) holders. The principles and hierarchy of allocating available water to the different water users and categories of licences are prescribed in the Act and reflected in the water sharing plan.

The Act states² that sharing of water from a water source must protect the water source, its dependent ecosystems and basic landholder rights. The department is tasked with implementing the water sharing requirements of these statutory instruments.



Murrumbidgee River
Lorraine Hardwicke – DPI

¹ *Water Management Act (2000)*, Clause 59

² *Water Management Act (2000)*, Clause 60(3)

The volumes equivalent to full (100%) allocation to basic landholder rights (BLR) and licence categories in megalitres (ML) per water year are listed below:

• BLR (Domestic and stock rights) ³	1,690 ML (estimated)
• Domestic and stock ⁴ WAL	35,041 ML
• Local water utility ⁵ WAL	23,816 ML
• High security ⁶ WAL	395,412 ML
• High security [subcategory] WAL	22,219 ML
• General security ⁷ WAL	1,891,815 ML
• Regulated river ⁸ (conveyance) WAL	2,968 ML
• Murrumbidgee ⁹ Irrigation (conveyance) WAL	243,000 ML
• Coleambally ¹⁰ Irrigation (conveyance) WAL	130,000 ML

There are also Supplementary WALs with a maximum¹¹ entitlement of 945,700 ML. Supplementary WAL holders usually receive full (100%) allocation¹² at the start of the water year, however; supplementary water users can only access water in periods of announced supplementary flow.

These unregulated or surplus flow conditions can occur from strong inflows from tributaries downstream of storages that cannot be re-regulated and/or spillage from upstream storages. Supplementary water is not supplied from storages (regulated water), therefore does not compete for allocations with regulated licence categories.

There is also another water use type called planned environmental water (PEW), discussed next.

Planned environmental water

PEW is set aside under the water sharing plans for ecosystem health and environmental purposes.

Minimum flow requirements¹³: There are two minimum flow requirements. These are 50 ML/d at Darlot (410134), at the end of the Yanco/Billabong system and monthly variable targets at Balranald (410130), at the end of the Murrumbidgee River. These targets equate to a total annual budget of 218 gigalitres (GL).

Transparent releases¹⁴ from Blowering Dam: Releases from Blowering Dam are transparent when natural inflows into Blowering are less than 560 ML/day. That is, if natural inflows into Blowering are less than 560 ML/day, they are allowed to pass through without being captured in

³ Water sharing plan, Clause 18

⁴ Water sharing plan, Clause 21

⁵ Water sharing plan, Clause 22

⁶ Water sharing plan, Clause 23 HS[Aboriginal]: 2,150 ML; HS [Town Water]: 19,769 ML; HS [Research]: 300 ML

⁷ Water sharing plan, Clause 24

⁸ Water sharing plan, Clause 25

⁹ Water sharing plan, Clause 26

¹⁰ Water sharing plan, Clause 27

¹¹ Water sharing plan, Clause 28, 29. Includes supplementary (Lowbidgee) WAL.

¹² Water sharing plan, Clause 65(2)

¹³ Water sharing plan, Clause 30 Monthly targets vary from 180 ML/d in February to 1330 ML/d in October.

¹⁴ Water sharing plan, Clause 31

storage, flowing down the Tumut River. The water can be reused once it enters Murrumbidgee River – hence no additional volume is reserved for this in the resource assessment.

Transparent and translucent releases¹⁵ from Burrinjuck Dam: A proportion of inflows are required to be released under transparent and translucent flow rules. This is calculated daily based on a function of (a) the time of year, (b) inflows, (c) general security carryover and (c) Burrinjuck volume. The water can be reused downstream in the Murrumbidgee system – hence no additional volume is reserved for this in the resource assessment.

Environmental Water Allowance (EWA)¹⁶ and Provisional Storage Volume (PSV)¹⁷: There are three EWA accounts, namely EWA1, EWA2 and EWA3. The rules ensure that more water is made available to the environment when there are higher allocations to general security users. Also, there are 2 provisional storage volume accounts namely PSV1 and PSV2. These storage accounts retain prescribed volumes of water (depending on allocations and EWA accounts) to increase the probability of spill events and water availability in the following season. There are explicit line items in the assessment to account for EWA and PSV.

Opening allocation

Opening allocations are made at the beginning of each water year (1 July) for domestic and stock, local water utility and high security entitlements, as these entitlements forfeit any unused account balance at the end of each year and cannot carryover water. The opening allocations, as required by the water sharing plan¹⁸, for higher priority users at the beginning of each water year are as follows:

- Maximum (100%) allocation for domestic and stock, and local water utilities.
- An opening (95%) allocation to high security users and the maximum (100%) allocation for subcategories of high security users.
- 80 GL (33%) to Murrumbidgee Irrigation (conveyance entitlement).
- 111 GL (85%) to Coleambally Irrigation (conveyance entitlement).

If a year starts with insufficient water to make these high priority allocations in full, then they are met with the next available water. Only when these opening allocations have been made, can allocations begin to accrue to general security entitlements. High security and conveyance allocations can increment to the maximum 100% of entitlement as water is allocated to general security entitlements, in accordance with the rules of the water sharing plan.

Major steps in water allocation process

The major steps in the resource assessment and resulting water allocation include:

- 1) Identifying the accessible water in storages.
- 2) Adding budgeted future inflows.
- 3) Deducting all existing commitments, inclusive of reserves for the following year's higher priority needs.

¹⁵ Water sharing plan, Clause 32

¹⁶ Water sharing plan, Clause 33-40

¹⁷ Water sharing plan, Clause 41

¹⁸ Water sharing plan, Clauses 59,60,61

- 4) Setting aside water for system overheads and minimum releases.
- 5) Distributing remaining water for allocation as directed by the water sharing plan.

This can be further illustrated using Equation (1) below.

$$\text{Available Water} = \text{Current Resource} + \text{Future Inflow} - \text{Commitments} - \text{Overheads} \quad (1)$$

Water allocation is based on a very conservative estimate of future (minimum) inflow. As the year progresses, regular assessments of water availability are undertaken. Resource improvement, from greater than minimum inflows and less than forecast transmission losses, can therefore provide for modest allocation increases even without significant rainfall and inflow.

Additional available water in Equation (1) first goes to meet any shortfall for higher priority users in opening allocations. Once general security allocations commence, commensurate incremental allocations to regulated river (conveyance) entitlements are also made. Murrumbidgee Irrigation (conveyance) and Coleambally Irrigation (conveyance) licences will receive incremental allocations as a function of the general security allocation as defined in the water sharing plan¹⁹.

When the general security allocation meets certain triggers, then additional volumes are reserved for EWA/PSV accounts, before the general security allocations are incremented. When general security allocations reach 95% of entitlement, then allocation to both high and general security licences can proceed to their maximum 100% concurrently. The high security allocation is always greater than general security allocations until they both reach 100% of entitlement.

Every river system has its own way of arranging the line items of its balance sheet (see Table 4). However, in broad term the balance sheet conforms Equation (1). Accordingly, the four items shown in Equation (1) are explained next.

Current resource



Figure 1. Murrumbidgee River System

¹⁹ Water sharing plan, Clauses 63(2), 64(2)

The Murrumbidgee River catchment has two headwater reservoirs, in parallel, with a combined capacity of 2,659 gigalitres (GL). The Murrumbidgee River is regulated by Burrinjuck Dam, which has storage capacity of 1,028 GL. The dam is located near Yass at the junction of the Yass and Goodradigbee Rivers. Blowering Dam on the Tumut River has a capacity of 1,631 GL. In addition to natural unregulated inflow, Blowering Dam also receives water from the Snowy hydroelectric scheme.

There are also some minor sources of resource from receding inflows, water in the channel systems and small re-regulation storages (weirs), which are also included in the available resources. For example, the resource assessment of 15/7/21 at page 10, budgeted for 40 GL from channel and weirs storage, plus 57 GL from receding inflows.

Future inflow

Resource assessment considers future inflow which has yet to accrue in storage. Incorporating future assured inflows boosts early water allocations to entitlement holders, but involves some (small) risk.



There are several components of future inflows; natural inflows into storages, regulated releases into Blowering Dam from the Snowy hydroelectric scheme, unregulated tributary inflows downstream of storages and receding inflows from substantial rainfall events, which typically temporarily elevate river levels.

Gogeldrie Weir – Peter Simpson DPI

Natural inflows into Blowering and Burrinjuck dams

The natural inflows into Burrinjuck Dam and Blowering Dam are inflows which occur due to rainfall, runoff and baseflow from the catchment upstream of these major storages.

The resource assessment assumes natural inflows in any given year are highly unlikely to be drier than the driest observed drought prior to 1 July 2004 (the commencement of the inaugural water sharing plan). This is the agreed level of allocation risk, specified in the water sharing plan, balancing water allocation for productive use, versus water needed for security against drought.

The department uses the 114 years of available hydrological record (1890 to 2004) to plan for the rest of this water year and to secure higher priority commitments for next year. Based on the

hydrological records, the inflows from a third winter would be sufficient to provide recovery and meet all high security needs.

At the start of every water year in July, future minimum monthly inflows totalling 273 GL (from Burrinjuck and Blowering dams) are assumed will occur until the end of June. The future inflow budget reduces as the number of months remaining in the assessment shortens (as the water year progresses), as shown in Table below. The inflow time series is constructed by the hydrologic model Murrumbidgee Integrated Quality Quantity Model (IQQM) version C106. The department uses the same model for reporting diversions against the 1993/94 level of development for the sustainable diversion limit.

During the mid-month's assessments these monthly inflows are adjusted. The example of 15/7/21 assessment in page 10 budgeted 254 GL inflow, reflecting halfway between July budget of 273 GL and August budget of 234 GL.

Table 1. Minimum headwater natural inflow volume over 1890 to 2004 record period

Planning horizon	Months Remaining	Burrinjuck Inflow (GL)	Equivalent Burrinjuck Drought	Blowering Inflow (GL)	Equivalent Blowering Drought
July to June	12	176	07/1902 - 06/1903	97	07/1944 - 06/1945
August to June	11	151	08/1911-06/1912	83	08/2002 - 06/2003
September to June	10	99	09/1911-06/1912	62	09/2002 - 06/2003
October to June	09	83	10/1911-06/1912	25	10/2002 - 06/2003
November to June	08	73	11/1911-06/1912	14	11/2002 - 06/2003
December to June	07	55	12/1946-06/1947	12	12/2002 - 06/2003
January to June	06	32	01/1902-06/1902	10	01/2003 - 06/2003
February to June	05	20	02/1902-06/1902	8	02/2003 - 06/2003
March to June	04	17	03/1902-06/1902	8	03/2003 - 06/2003
April to June	03	13	04/1902-06/1902	6	04/1963 - 06/1963
May to June	02	8	05/1902-06/1902	5	05/1963 - 06/1963
June to June	01	0	06/1902-06/1902	2	06/1963 - 06/1963

Inflows from tributaries

Significant downstream tributary flows generally cannot be regulated. The potential usefulness of tributary inflows is dependent on their timing and magnitude, compared with system demands at the time. If tributary inflows can be used to meet system demands (such as customer orders, system losses or flow targets) then this demand no longer is required to be met from the major storages, thus boosting regulated water availability.

Given operational complexities, it is difficult to predict useful tributary contributions in the system for the length of assessment period. However, during fortnightly assessments, the department incorporates contributions from unregulated flows where possible to maximise water availability.

Inflow from Snowy hydroelectric releases

Blowering Dam receives a significant volume of water from the Snowy hydroelectric scheme, being the proceeds of power generation and natural inflows from the local Tumut catchment. The capture and release of water by Snowy Hydro Limited is regulated under the Snowy Water Licence.

Snowy Hydro Limited contributes a guaranteed volume to the Murrumbidgee system through the Snowy water-year (May to April), known as Required Annual Releases (RAR), whilst operating the scheme to maximise the economic return from electricity markets. The RAR is delivered by Snowy Hydro Limited mostly in the timing of its choosing, in response to fluctuating energy markets.

There are adjustments to the base RAR volume of 1,026 GL per year, with releases potentially affected by:

- Dry Inflow Sequence Volume
- Pre-Release
- Relaxation Volume
- Discretionary Above Target Release
- Snowy Savings Volumes

The details of these complex adjustments are beyond the scope of this summary guide. However, all water expected from Snowy Hydro Limited in a year is included in the resource assessment and allocated as soon as it is known, often on 1 July, regardless of when it is actually delivered.

For example, from May 2020 to April 2021, the regulated discharge from the scheme was 924 GL, of which 612 GL was 2020/21 RAR²⁰. Each resource assessment budgets for the full forecast adjusted RAR volume regardless of when the water is physically released from the Snowy scheme.

Commitments

Every resource assessment budgets for all commitments for the rest of the current water year and any necessary reserve, to ensure the required opening allocation for the next water year can also be met. Current year commitments include water for basic landholder rights, outstanding WAL account balances, operational requirements (e.g. transmission losses), planned environmental water and account water that has been traded out of the valley and is owed to the Murray. This latter volume is tracked through the Inter Valley Trade account balance.

²⁰ Snowy Hydro, Annual Operating Plan 2021 | 2022, page 5

Second year reserve

The second-year reserve is necessary to ensure the required opening allocation to high priority commitments²¹, plus environmental needs for the future years can be made each year on 1 July. The new opening allocation, if it cannot be met from new resources, must be met from the reserves set-aside in the preceding year. Under dry conditions, experience has shown a reserve of up to 450 GL can be required, based on balancing new commitments and new resources as itemised in Table 2 below.

Table 2. Minimum essential commitment for second year

Key Items	Volume (GL)
Minimum opening allocation commitments	Approx. 1231
Domestic and stock rights and WAL (100%)	32
Local water utility (100%)	24
High security (95%)	346
High security [towns] (100%)	20
Murrumbidgee Irrigation (conveyance)	80
Coleambally Irrigation (conveyance)	111
Balranald and Darlot minimum flows	218
Unusable storage (25GL per dam)	50
System overhead (transmission, operation, evaporation)	350
Minimum future resources	Approx. 783
RAR from minimum Tumut inflow during drought	240
Snowy drought reserve	150
Snowy compensation (variable)	100
Blowering and Burrinjuck minimum inflow	273
System efficiency measures	20
Reserves	Approx. 450

In general, the second-year reserve is built gradually through the water year instead of storing the entire 450 GL at the onset of July (see Table 3). This allows early allocation to general security water users and utilisation of autumn inflows to fill the reserve.

Table 3. Target reserve built up in GL

Month	July	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May
Target	110	190	250	300	350	360	380	390	400	430	450

Should assured future resources be higher than those in Table 2, such as higher assured RAR, the required reserve volume of 450 GL will be adjusted down accordingly. In the 2020-21 water year,

²¹ Water sharing plan, Clauses 18, 21, 22, 23, 26, 27, 41

the reserve commenced at 150 GL in the 15/7/20 assessment, which then increased to 315 GL by the 15/01/21 assessment. The example of 15/7/21 assessment in page 10 reserved 100 GL.

Inter-valley trade

A special aspect of this valley is the facility for inter-valley trade (IVT). Water users can trade water from the Murrumbidgee into the Murray, including to South Australia and Victoria. The trade results in an exchange of commitment and resources. A trade out of the valley results in a reduction of volume required to supply users on Murrumbidgee, however; there is a commensurate increase in the IVT delivery to the Murray. While reverse trade from Murray into Murrumbidgee is allowed, with a commensurate reduction in required IVT delivery, the net trade volume must remain positive from the Murrumbidgee towards Murray to reflect the one-way river flow from Murrumbidgee. A negative balance implies an obligation for the Murray to deliver traded water uphill to the Murrumbidgee.

System overheads

System overheads are volumes that are required to operate the river. In the resource assessment, the following overheads are considered:

- evaporation loss
- transmission loss
- operational loss

Evaporation loss

Resource assessment needs to account for the likely evaporation loss over the assessment horizon from Burrinjuck and Blowering storages. The loss is based on assumed evaporation height from the respective storage surface area. The assumed evaporation is 909 mm per year which would be 90 GL from two storages if they remained full all year. For context, the maximum annual evaporation rate since 1890 has been 1150 mm recorded in 1982 and the maximum annual volume lost to evaporation in last 20 years was 80 GL in 2016/17.

Reservoir evaporation is calculated for each dam separately as per the equation (2) below,

$$E = (S_{\text{current}} / S_{\text{max}}) \times R \times E_{\text{max}} \quad (2)$$

E = Evaporation in GL over the rest of the water year.

S_{max} = Full supply level; 1028 GL for Burrinjuck Dam or 1631GL for Blowering Dam.

S_{current} = The volume at the assessment month.

E_{max} = Annual evaporation if the storage remained full whole year; Burrinjuck is 50 GL, Blowering is 40 GL.

R = A monthly pattern or ratio that adds up to unity over the year.

The pattern or ratio R closely resembles the monthly demand volume and evaporation heights which peak during summer. Equation (2) is a simple pro-rata estimate to determine an indicative future evaporation budget. Should actual evaporation losses be lower than this budget, the excess water is released for allocations.

Transmission loss

Transmission loss is water lost through seepage and evaporation in the river systems below the major storages and must be released from the storages in addition to orders and other requirements. It is often described as ‘water to run the river system’.

Total transmission losses for the Murrumbidgee Valley consist of losses from the Murrumbidgee River and the Yanco Creek system. At the beginning of the water year, a fixed volume of water is set aside for transmission losses. The current practices, based on the operator assessment, is to set aside at least 285 GL and 70 GL to run the main river and Yanco Creek respectively to meet higher priority deliveries. Hence, for years with limited general security delivery, the total transmission loss budget is around 350 GL, but greater for significant general security delivery.

Should actual transmission losses be lower than this budget, the unused budget is progressively released for allocations in each assessment. These annual volumes are pro-rata monthly based on R in Equation (2) explained earlier. In the example assessment of 15/7/21 at page 10, the loss budget was 322 GL for next 11½ months to the end of June.

Operational loss

In a hypothetical water delivery scenario with perfect control, the end of the river should exactly discharge the minimum flow rate or simply stop flowing if there were no end-of-system flow target.

In practice, water delivery efficiency is subject to variable weather patterns, losses and customer behaviour, and the timely ability of operators to respond to these changes. As a result, a volume greater than the minimum flow may be discharged from the bottom of the system. This unavoidable surplus delivery is considered an operational loss.

Operational loss is typically budgeted as 3.5% to 5% of all regulated deliveries. Between 2011/12 and 2021/22, average annual operational loss has been 60 GL. In the 15/7/21 assessment this was commenced at 97 GL, however; similar to transmission and evaporation loss budgets, should actual operational losses be lower than this budget, the excess water is released for allocations.

Water allocation example of 15 July 2021

An example of an Available Water Determination behind the statement published on 15 July 2021 is provided in Table 4. The assessment returned 20% allocation to general security users, taking the total for the water year to 50%. Surplus volume was allocated among user groups based on the distribution shown at the bottom of the table.

Table 4. Detailed allocation balance sheet as of 15 July 2021

Key Items	Volume (GL)	Balance (GL)
Annual 2021/22 resource budget (7/21 to 6/22)	3098	3098
Blowering and Burrinjuck active storage (12/7/21)	2492	
Recoverable channel storage (12/7/21 to 31/7/21)	20	
Recoverable weir storage (12/7/21 to 31/7/21)	20	
Inflow recession (12/7/21 to 31/7/21)	57	
Future unregulated inflow budget (8/21 to 6/22)	254	
Snowy regulated inflow budget (12/7/21 to 30/4/22)	255	

Water Allocation Methodology

Murrumbidgee Regulated River Water Source



Key Items	Volume (GL)	Balance (GL)
Planned environmental water	279	2819
Environmental water allowance, EWA	71	
End of system flow target	208	
Second year reserve	100	2719
Operational reserve (25GLx2), PSV1 (25GL)	75	
Savings towards next year's reserve target	25	
Commitments (15/7/21)	1857	862
Domestic and stock, local water utility	74	
High security (95%, 100% subcategory)	348	
Conveyance already allocated (all three)	290	
General security carried over on 1/7/21	485	
General security already allocated 2021/22 (30%)	568	
Inter valley trade to Murray	92	
<i>less</i> Usage in this water year (1/7/21 to 15/7/21)	- 0	
System overheads (7/21 to 6/22)	445	417
Evaporation	26	
Transmission	322	
Operation	97	
Available for Allocation	417	
General security Increment of 20% (1892 GL x 20%)	378	
Conveyance - CIA Increment (14%) as per clause 64(2)	33	
Conveyance – MIA Increment (5%) as per clauses 63(2)	6	
Conveyance – Regulated River (20% i.e., 3 GLx0.20)	0	
Additional loss to deliver allocation increment	0*	

* Implicit within system overhead of 444 GL.

Disclaimer

Allocations are based on a very conservative future inflow assumption. However, during extended dry periods, inflows may be less than budgeted and/or delivery losses may be higher, creating a shortfall in allocated resources. The management of allocation deficits during extreme drought is beyond the scope of this summary guide. Readers are referred to the [NSW Extreme Events Policy](#) for details.

For example, in the event of a shortfall where there is insufficient physical water to match all water in accounts, and if it is in the public interest to do so, a temporary water restriction can be imposed to prevent access to account water. This is one drought management tool, akin to a negative water allocation, used to protect dwindling supplies for critical needs.

Water Allocation Methodology

Murrumbidgee Regulated River Water Source



The routine water allocation computation, while broadly follows this guideline, is subject to wider hydrological considerations not covered in this summary document. This is a guide only and subject to improvements and changes over time. Water users should use this information with caution and are encouraged to seek their own expert advice as needed.

Version History

First edition	April 2021	P Jayakody, D Singh
This edition	March 2022	S Chowdhury, P Inamdar, P Jayakody

© State of New South Wales through Department of Planning and Environment 2022. The information contained in this publication is based on knowledge and understanding at the time of writing (May 2022). However, because of advances in knowledge, users should ensure that the information upon which they rely is up to date and to check the currency of the information with the appropriate departmental officer or the user's independent adviser.

Annexure

Example: Water allocation statement - 15 July 2021

15 July 2021

Murrumbidgee Valley

Water allocation update

Allocations to **general security licences have increased by 20%** in the Murrumbidgee regulated valley. Cumulative allocations for 2021-22 to general security now total 50% of entitlement.

Wet conditions in the past month have pushed storage levels in the Murrumbidgee valley to effectively full. Significant releases are being made for airspace operations and unregulated conditions have resulted in ongoing supplementary access. Water users should monitor the WaterNSW website (<https://waterinsights.waternsw.com.au/>) for publication of supplementary announcements.

Further improvements to resource is contingent on regulated usage creating airspace in the major storages to capture new inflows. As the year progresses, any improvements will be used to allocate to general security and ensure high priority needs for 2022-23 can be met on 1 July 2022.

2021-22	High Security	General Security	Average Carryover
Murrumbidgee	95%	50%	26%*

* Carryover is provided as an estimate only. Final carryover numbers will be provided once accounts have been reconciled for the 2020/21 water year.

Storage levels (as at 14 July 2021)

- Blowering Dam is 96% full – steady – holding 1,565,000 ML.
- Burrinjuck Dam is 95% full – steady – holding 975,000 ML.

Climatic outlook

The Bureau of Meteorology's seasonal outlook for August to October indicates that rainfall is highly likely to be above average across the catchment. Daytime and overnight temperatures are likely to be average to warmer than average.

The Bureau's El Niño-Southern Oscillation indicator remains inactive. Models indicate that negative Indian Ocean Dipole conditions may develop in the coming week, which may increase the chances of above average rainfall in winter-spring.

For further details: www.bom.gov.au/climate/outlooks/#/overview/summary

Trade

The normal operating range for the Murrumbidgee IVT account is between 0 GL and 100 GL. Trade **out** of the Murrumbidgee is **closed**, while trade **into** the Murrumbidgee valley is **open** (as of 14 July 2021). Water users should monitor the WaterNSW website

(www.waternsw.com.au) for daily information about the IVT account balance, the status of trade, and other information. The IVT account balance at the end of the previous water year has carried forward into this water year.

Next announcement

The next water allocation statement will be published on **Monday 2 August 2021**. It will be a short statement, updating any improvements in resource and allocations.

The next comprehensive statement, including the likely improvement in general security allocations under various inflow scenarios, will be published on Monday 16 August 2021.

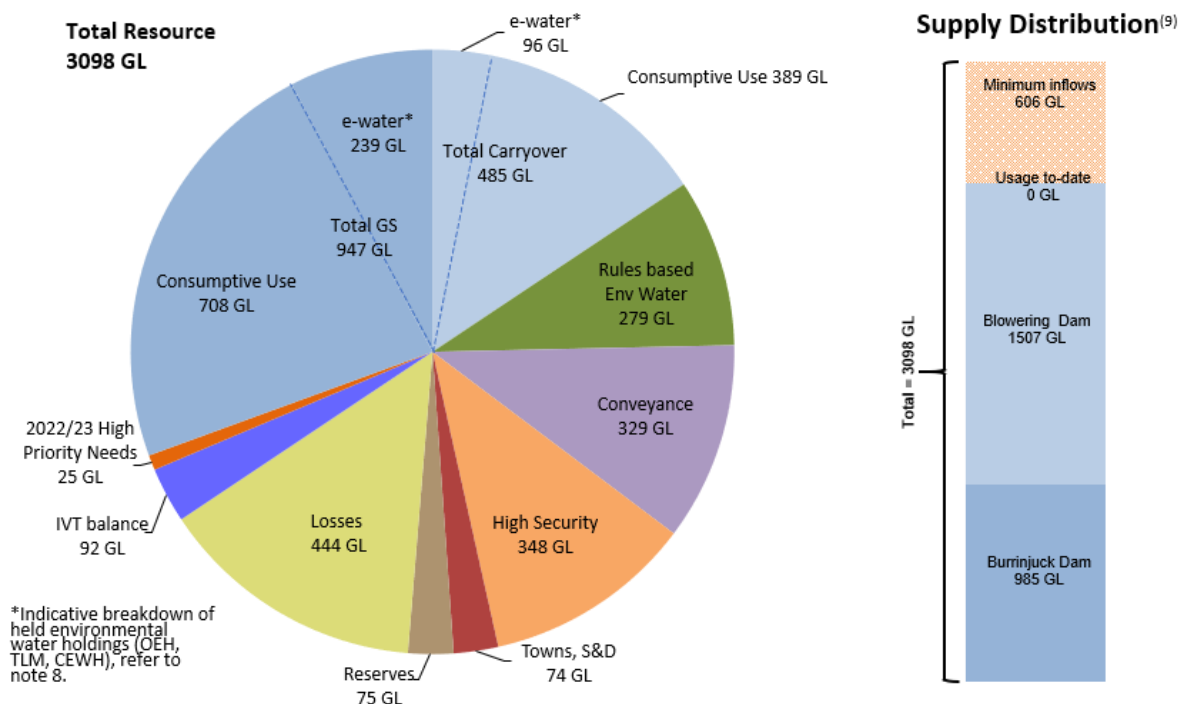
Murrumbidgee resource assessment data sheet

Resource Distribution* (15 July) for 2021-22	Volume (GL)
Total Available Resource ⁽¹⁾	3,098
less	
Carryover ⁽⁸⁾	485 [#]
Rules based Environmental Water ⁽²⁾	279
Towns, Stock, Domestic (100%)	74
Reserves ⁽³⁾	75
Conveyance ⁽⁴⁾	329
Announced High Security (95%)	348
Losses (transmission, evaporation, operational) ⁽⁵⁾	444
Murrumbidgee IVT account (carryover on 1 July) ⁽⁶⁾	92
Announced General Security (50%) ⁽⁸⁾	947
Year 2 (2022-23) high priority needs ⁽⁷⁾	25

*See notes below

[#] Carryover volume estimated. Final carryover numbers will be provided once accounts are reconciled for the 2020/21 water year.

Murrumbidgee resource distribution 2021-22 – 15 July 2021



Data sheet notes

- 1) Total available resource – total active storage volume (Blowering & Burrinjuck Dams) at the day of assessment plus any usable flows in transit plus minimum inflows for rest of the year plus Snowy Hydro's assured Required Annual Release (RAR) (including any flex (pre-release) from the prior year), as well as estimated usage to date. Snowy Hydro's net Jounama Release for this year (2021-22) is estimated to be about 390 GL (includes montane release).
- 2) Rules-based environmental water – water required to be set aside under water sharing plans to provide for riverine environments. Includes end-of-system flow requirements (currently 208 GL) and environmental water allowances (EWA1 = 53 GL, EWA2 = 18 GL, EWA3 = 0 GL). Excludes 'licence-based' environmental water also known as held environmental water (HEW). This total volume typically reduces as water is used during the year.
- 3) Reserves – required primarily under statutory plans, and mainly used for emergency purposes and critical needs. Includes 25 GL per dam as an operational reserve, and Provisional Storage Volumes (PSV1 = 25 GL, PSV2 = nil).
- 4) Conveyance entitlement – a category of access licence originally issued to Irrigation Corporations to facilitate delivery of water through their channel systems. Allocation to this category is prescribed in the water sharing plans and is a function of high and general security allocations. Conveyance licences in the Murrumbidgee valley can also carryover 30% of their entitlement.
- 5) Losses – the best estimate of the volume required to run the river under dry conditions to meet demands for the remainder of the water year. This includes storage evaporation, transmission losses and operational loss. This estimate is updated monthly.
- 6) IVT account carryover value into 2021-22. Does not reflect the current IVT balance.
- 7) 2022-2023 high priority needs on 1 July 2022 - volume set aside to cover high priority needs on 1 July 2022, for 'Year 2', including potential carryover.
- 8) Held environmental water (HEW) – licenced water administered by environmental water holders is reported here, with the associated portions of general security allocation and carryover also identified in the above pie chart. This reporting of held environmental water is the total credited to accounts (not usage) and is estimated to be 239 GL of GS, 15 GL of HS, 10 GL of conveyance allocation and 96 GL of GS carryover. These entitlements are held and/or managed either singly or jointly by various environmental holder groups, including the NSW Department of Planning, Industry and Environment (DPIE), The Living Murray (TLM) and the Commonwealth Environmental Water Holder (CEWH). Details on environmental holdings can be found on individual agency websites.
- 9) Supply Distribution – the distribution of supply includes volumes at the time of the assessment for the following categories: active volumes in the dams, indicative usage to-date (may be estimates prior to reconciliation with hydrographic updates) and assumed minimum future inflows (includes Snowy Hydro's guaranteed inflows for the water year, and late season inflows).

Murrumbidgee Resource Assessment – Comparison with this time last year

Item		Mid Jul 2020 (GL)	Mid Jul 2021 (GL)	Comments
Storage Volume (GL)	Burrinjuck	448	985	
	Blowering	933	1507	
	Total	1381	2492	Significantly improved conditions in 2021/22
Losses (transmission, evaporation, operations)		552	444	Lower delivery losses due to wetter conditions
1 July IVT carryover balance		6	92	High trade balance
GS Available		14%	50%	Higher water availability in 21/22
Average GS Carryover		18%	26%	Higher water availability in 20/21

Chances of improvement

The chances of improved general security allocations, based on a repeat of historical inflows, are provided in the following table under a variety of conditions. The forecast is based on all available historical data, which is appropriate given the seasonal outlook, and gives a better outlook than using just the driest years on record (dry tercile).

It is important to note that these estimates are indicative improvements only and are not guaranteed allocations. Estimates may change based on weather conditions, water management decisions and river operations. This means water users should use this information with caution and at their own risk.

Forecast general security allocations (%)

(Any carryover water can be added to these indicative allocations)

Repeat of historical inflow conditions	1 Sept 2021	1 Nov 2021
99 chances in 100 (extreme) (99%)	50%	50%
9 chances in 10 (very dry) (90%)	51%	51%
3 chances in 4 (dry) (75%)	55%	60%
1 chance in 2 (mean) (50%)	57%	61%

Note 1: Estimated values indicative only, not guaranteed and subject to change based on actual events unfolding.

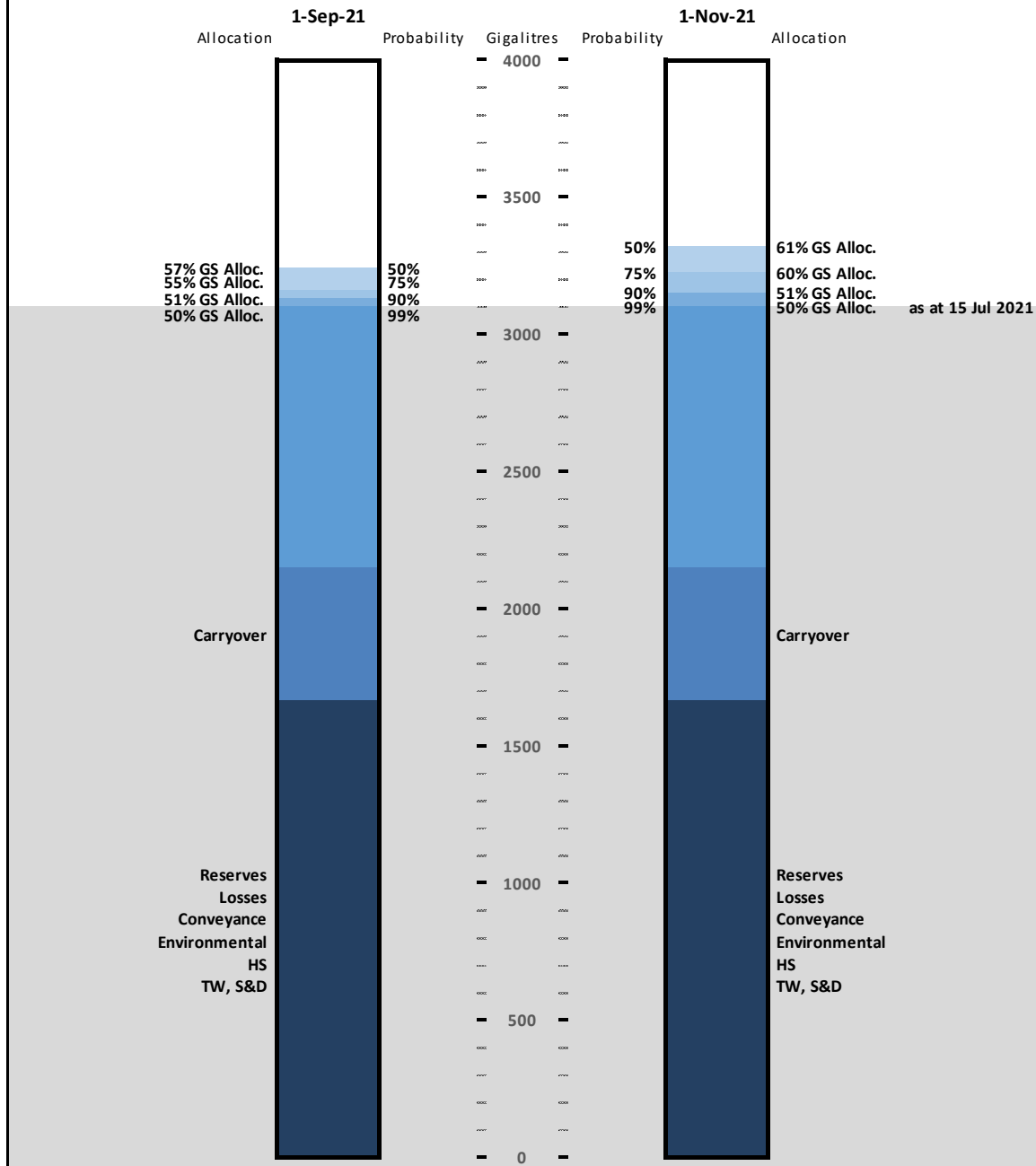
Note 2: Forecast assumes 26% carryover on average.

Note 3: A physical spill is likely under most inflow conditions. A physical spill limits resource improvements as inflows are unable to be captured.

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Murrumbidgee Valley Outlook

as at 15 July 2021



This figure provides indicative improvements in general security allocations for two forecast snapshots, 1 September 2021 and 1 November 2021. The allocation improvements are indicative only, and do not constitute guaranteed allocations. As of 15 July 2021, General Security allocation is at 50 per cent, and under 99% inflow conditions, will remain the same for the rest of the water year.