

Mid Murrumbidgee Alluvial Groundwater Sources

Groundwater annual report 2023.

Introduction

This report is a summary of water accounts, volume pumped and groundwater levels for the Mid Murrumbidgee Alluvial groundwater sources to 2023 including the start of year water account volumes for the 2023/2024 water year (1 July to 30 June).

For detailed information of the hydrogeology, management and past long-term water level behaviour of this water source refer to the Groundwater Resource Description Report for the Murrumbidgee Alluvium Water Sources:

www.industry.nsw.gov.au/___data/assets/pdf_file/0017/313127/appendix-a-murrumbidgee-alluvium-wrp-groundwater-resource-description.pdf

Description

The Mid Murrumbidgee alluvial groundwater sources are located within the Murrumbidgee catchment between Jugiong and Narrandera (Figure 1). The water sources extend from Narrandera in the west to the eastern boundary in Jugiong.

There are four separate groundwater sources:

- Kyeamba Alluvial Groundwater Source,
- Mid Murrumbidgee Zone 3 Alluvial Groundwater Source,
- Wagga Wagga Alluvial Groundwater Source, and
- Gundagai Alluvial Groundwater Source.

The Mid Murrumbidgee alluvial groundwater sources (Figure 1) are made up of alluvial sediments. These sediments are divided into two main aquifers, the shallow Cowra formation and the deeper Lachlan formation, comprised of clay, silt, sand and gravel.

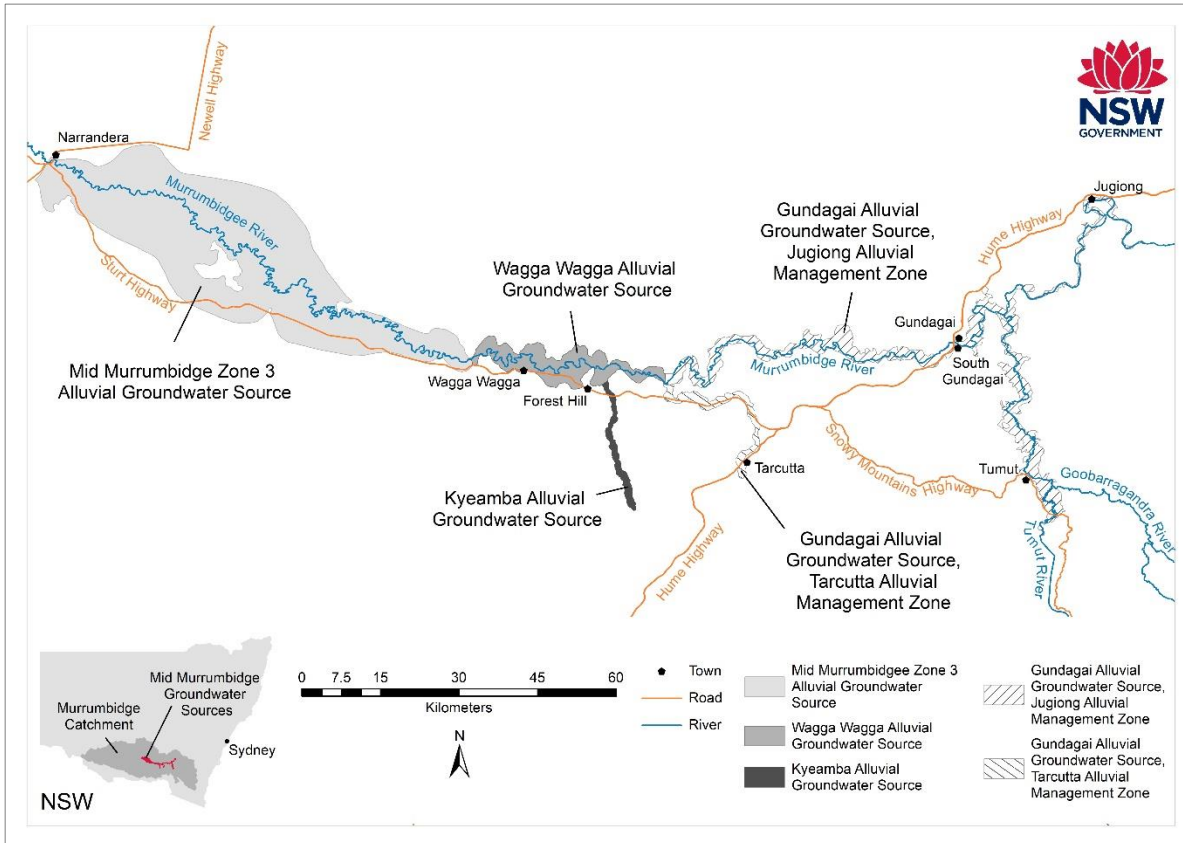
Water resource management

Water sharing plan

The Mid Murrumbidgee groundwater sources is managed by the rules defined in the Water Sharing Plan for the Murrumbidgee Alluvial Groundwater Sources 2020.

This water sharing plan is available for viewing on the Department of Planning and Environment Water website at: www.dpie.nsw.gov.au/water/plans-and-programs/water-sharing-plans/status/murrumbidgee-region

Figure 1: Location map



Basic rights

Basic landholder rights are available in this groundwater source for domestic and stock watering requirements. While landholders don't need an access licence to take water for domestic and stock purposes from groundwater below their property, the bore must be authorised by WaterNSW.

The volumes of water set aside in the water sharing plan for basic landholder rights for the alluvial groundwater Murrumbidgee sources are:

- 156 megalitres (ML) in the Gundagai Alluvial Groundwater Source,
- 12 ML in the Kyeamba Alluvial Groundwater Source,
- 496 ML in the Mid Murrumbidgee Zone 3 Alluvial Groundwater Source,
- 135 ML in the Wagga Wagga Alluvial Groundwater Source.

An approval holder is responsible for monitoring water quality from the bore to ensure it is suitable for its intended purpose for the duration of the approval. Inherent water quality and land use activities may make the water in some areas unsuitable for use. Water from the groundwater sources should not be used without first being tested and, if necessary, appropriately treated to ensure it is fit for purpose. Such testing and treatment are the responsibility of the water user.

Groundwater access licences

Groundwater access licence share components to 30 June 2023 are presented in Table 1.

Table 1: Mid Murrumbidgee groundwater sources share component 30 June 2023

Access Licence Category	Gundagai Alluvial Groundwater Source		Kyeamba Alluvial Groundwater Source		Mid Murrumbidgee Zone 3 Alluvial Groundwater Source		Wagga Wagga Alluvial Groundwater Source	
	No of Licences	Total Volume	No of Licences	Total Volume	No of Licences	Total Volume	No of Licences	Total Volume
Local Water Utility ¹	1	100	N/A	N/A	4	4,912	3	20,200
Aquifer ²	16	2,292	14	2,070	93	42,871	68	7,939
Aquifer (High Security) ²	30	1,913	N/A	N/A	N/A	N/A	N/A	N/A
Domestic and Stock ¹	N/A	N/A	N/A	N/A	3	189	1	22

¹Megalitres/year (ML)

² Megalitres per unit share

Extraction limit

All groundwater sharing plans have rules to manage extraction in a water source to the long-term average annual extraction limit.

The extraction limits for these groundwater sources are defined in the water sharing plan and listed in Table 2.

Table 2: Extraction Limit for Mid Murrumbidgee alluvial groundwater sources

Water Source	Extraction Limit (ML/year)	Extraction limit for local water utility access licences (ML/year)
Gundagai Alluvial Groundwater Source	1,926	N/A
Kyeamba Alluvial Groundwater Source	723	N/A
Mid Murrumbidgee Zone 3 Alluvial Groundwater Source	30,176	N/A
Wagga Wagga Alluvial (Aquifer) Groundwater source	3,650*	16,998

* Extraction limit for basic landholder rights and access licences other than local water utility access licences.

Extraction in the Mid Murrumbidgee groundwater sources is not compliant if the 5 years average annual extraction is more than 110% of the extraction limit (known as the compliance trigger). If average extraction exceeds the compliance trigger, then the available water determination made for aquifer access licences for the following water year, may be reduced by an amount that would return subsequent total water extraction to the extraction limit.

Information on tracking groundwater extraction against extraction limit for the groundwater source including the likelihood of compliance being triggered in the current water year can be found at: water.dpie.nsw.gov.au/allocations-availability/extraction-limits/tracking-groundwater

For each inland groundwater source, the dashboard shows for the current water year:

- volume that if extracted will reach the compliance trigger (in ML, calculated annually)
- volume remaining to be extracted before reaching the compliance trigger (in ML, calculated throughout the year)
- likelihood that access to groundwater may be reduced in the next water year.

Note: the information on the dashboard is limited by the extraction data available at the time.

Available water

Total water availability in a water year is controlled by the available water determination (AWD) credited to an access licence account, and the carryover rules that dictate the allowable volume to be brought forward from one year to the next.

Total available water for use is controlled by the annual account usage limits, which define the maximum volume of allocated water that can be taken in that water year. The rules and limits that are applicable to the Mid Murrumbidgee alluvial groundwater sources are provided in Table 3.

Table 3: Mid Murrumbidgee groundwater sources access licence account rules

Water Source	Access Licence Category	Carryover Limit	Annual Use Limit	Maximum AWD
Gundagai Alluvial Groundwater Source	Local Water Utility	0%	100%	100%
	Aquifer	0.3 ML/share	1.3 ML/share	1 ML/share
	Aquifer (High Security)	0.3 ML/share	1.3 ML/share	1 ML/share
Kyeamba Alluvial Groundwater Source	Aquifer	0.4 ML/share	1.4 ML/share	1 ML/share
Mid Murrumbidgee Zone 3 Alluvial Groundwater Source	Aquifer	0.3 ML/share	1.3 ML/share	1 ML/share
	Domestic and Stock	0%	100%	100%
	Local Water Utility	0%	100%	100%
Wagga Wagga Groundwater Source	Aquifer	0.4 ML/share	1.4 ML/share	1 ML/share
	Domestic and Stock	0%	100%	100%
	Local Water Utility	0%	100%	100%

The maximum amount of water that can be debited from an aquifer access licence account in a water year can't exceed the annual use limit shown in Table 3 plus any allocation transferred in (temporary trade), and minus any allocation transferred out.

Total account water is displayed in Figure 2 and Figure 3 showing the proportion available for use and what is not available for use in a year. Total yearly extraction is also displayed. Note: all access licence categories have been combined in Figure 2 and Figure 3.

The Gundagai Alluvial Groundwater Source is divided into the following management zones (Figure 1):

- Tarcutta Alluvial Management Zone
- Jugiong Alluvial Management Zone

The alluvium within the Jugiong Alluvial Management Zone is highly connected to the Murrumbidgee and Tumut rivers. The available water determination for the aquifer (high security) access licences in the Jugiong Alluvial Management Zone are linked to those of the Murrumbidgee River high security access licences. The allocations for these licences are based on:

- 68% of the available water determination of aquifer access licences, plus
- 32% of the AWD made for regulated river (high security) access licences in the Murrumbidgee Regulated River Water Source.

The 2022-2023 allocations made available the full entitlement for each category and subcategory of access licence, except for aquifer (high security) access licences, which received 0.98 ML per share.

The access licence account information for the Mid Murrumbidgee alluvial groundwater sources on 1 July 2023 is summarised in Table 4.

Table 4: Access licence account information

	Gundagai Alluvial Groundwater Source	Kyeamba Alluvial Groundwater Source	Mid Murrumbidgee Zone 3 Alluvial Groundwater Source	Wagga Wagga Alluvial Groundwater Source
Carryover In (ML)	1,262	828	12,380	2,656
Available water determination (ML)	4,274	2,070	47,972	28,161

	Gundagai Alluvial Groundwater Source	Kyeamba Alluvial Groundwater Source	Mid Murrumbidgee Zone 3 Alluvial Groundwater Source	Wagga Wagga Alluvial Groundwater Source
Total water in account (ML)	5,536	2,898	60,352	30,817
Water available for use (ML)	5,536	2,898	60,352	30,817

Figure 2: Account water availability and usage summary for Gundagai Alluvial Groundwater Source

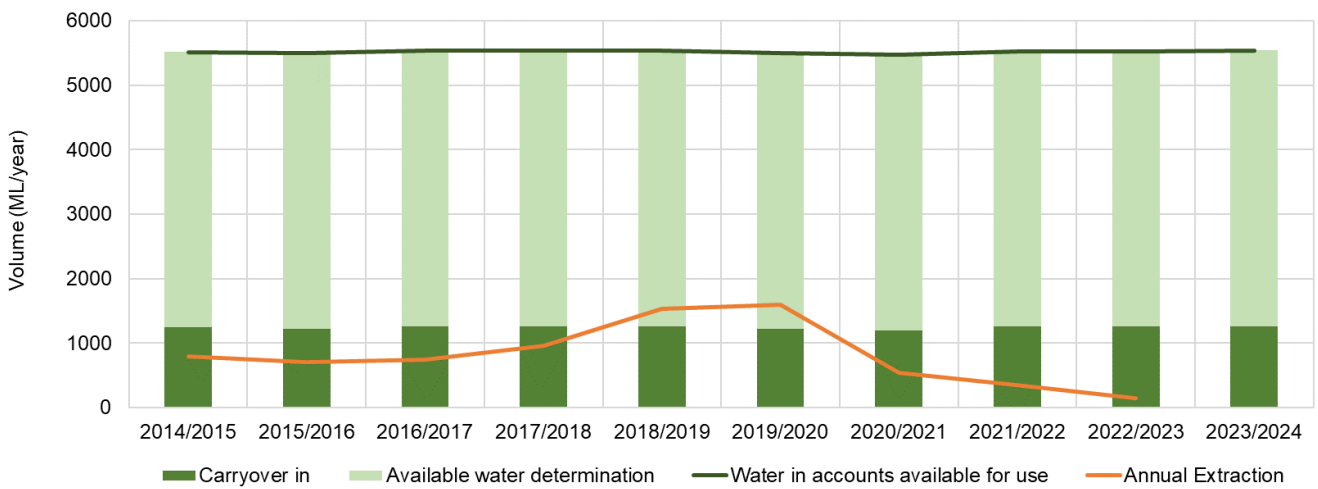


Figure 3: Account water availability and usage summary for Kyeamba Alluvial Groundwater Source

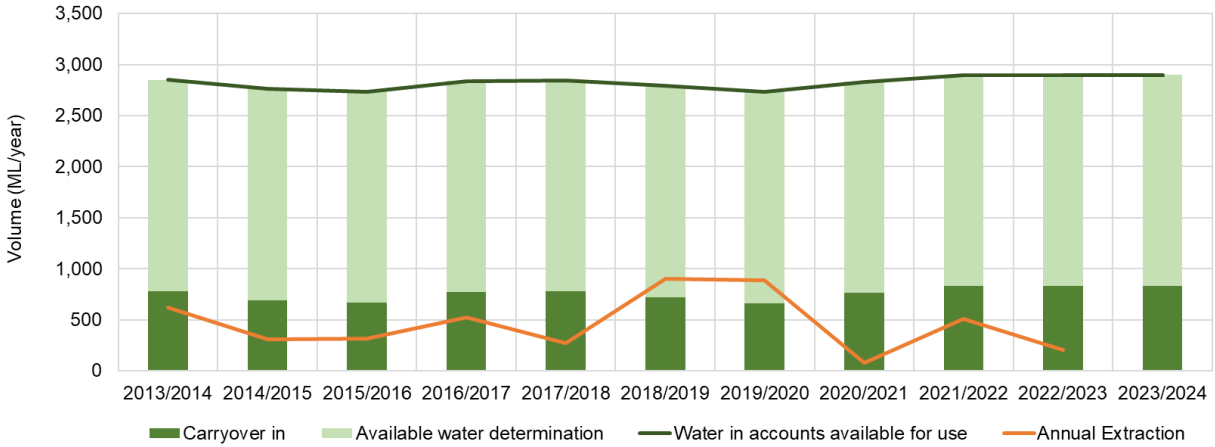


Figure 4: Account water availability and usage summary for Mid Murrumbidgee Zone 3 Alluvial Groundwater Source

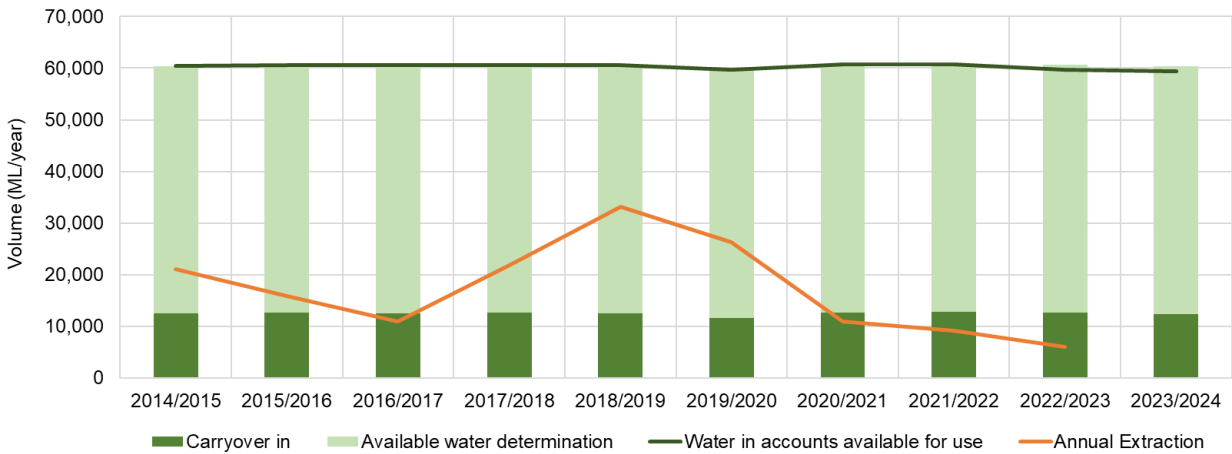
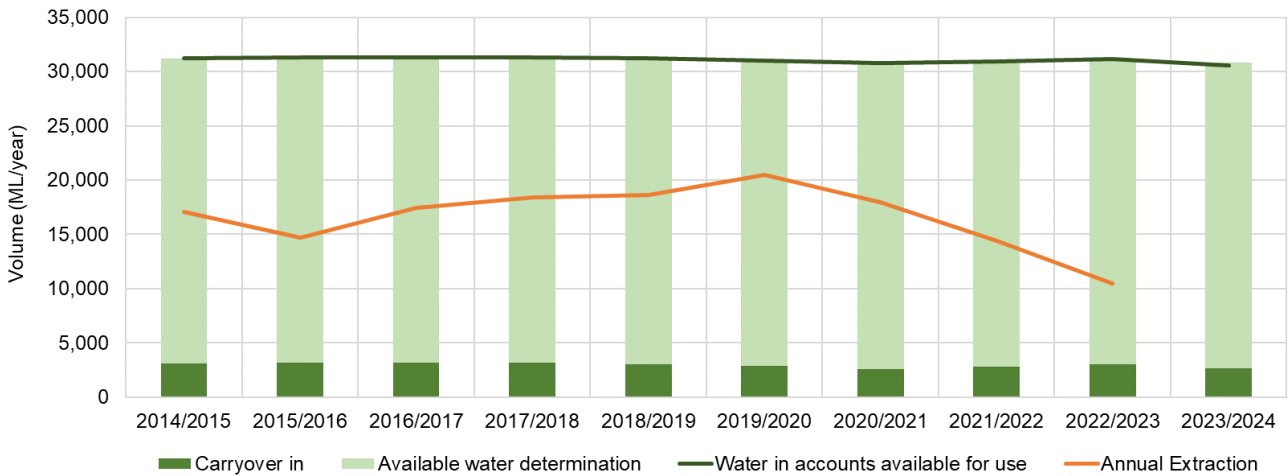


Figure 5: Account water availability and usage summary for Wagga Wagga Alluvial Groundwater Source



Groundwater trading

Trades are permitted within, but not between Mid Murrumbidgee groundwater sources and any other groundwater sources.

In addition, trades between the two management zones within the Gundagai Alluvial Groundwater Source are not permitted.

Allocation assignments (temporary trade)

Trading statistics for the Mid Murrumbidgee Zone 3 Alluvial Groundwater Source and Wagga Wagga Alluvial Groundwater Source are illustrated in Figure 6 and Figure 7. It excludes all trades for less than \$1 per megalitre. There is limited temporary trading data available for Gundagai Alluvial and Kyeamba alluvial groundwater sources.

For the Mid Murrumbidgee Zone 3 Alluvial Groundwater Source, the average value paid per megalitre in 2020-21 was \$30, while the maximum value was also \$30 per megalitre. There were no trades in 2021/22 and 2022/23.

For the Wagga Wagga Alluvial Groundwater Source, the average value paid per megalitre in 2022- 23 was \$50, while the maximum value was also \$50 per megalitre.

Further information on water licences, approvals, water trade and water dealings and other matters related to water entitlements in NSW can be found on the NSW Water Register at:

waterregister.waternsw.com.au/water-register-frame

Figure 6: Mid Murrumbidgee Zone 3 Alluvial Groundwater Source temporary trade statistics

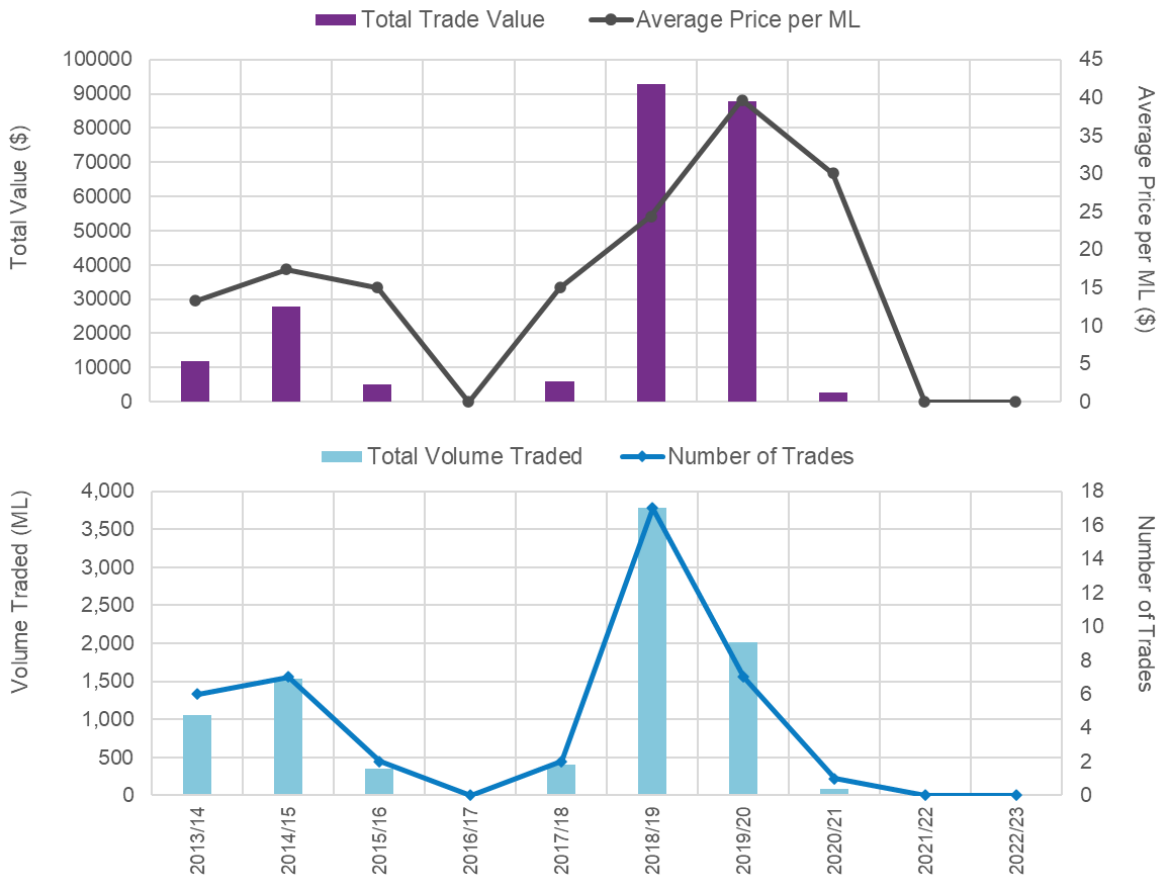
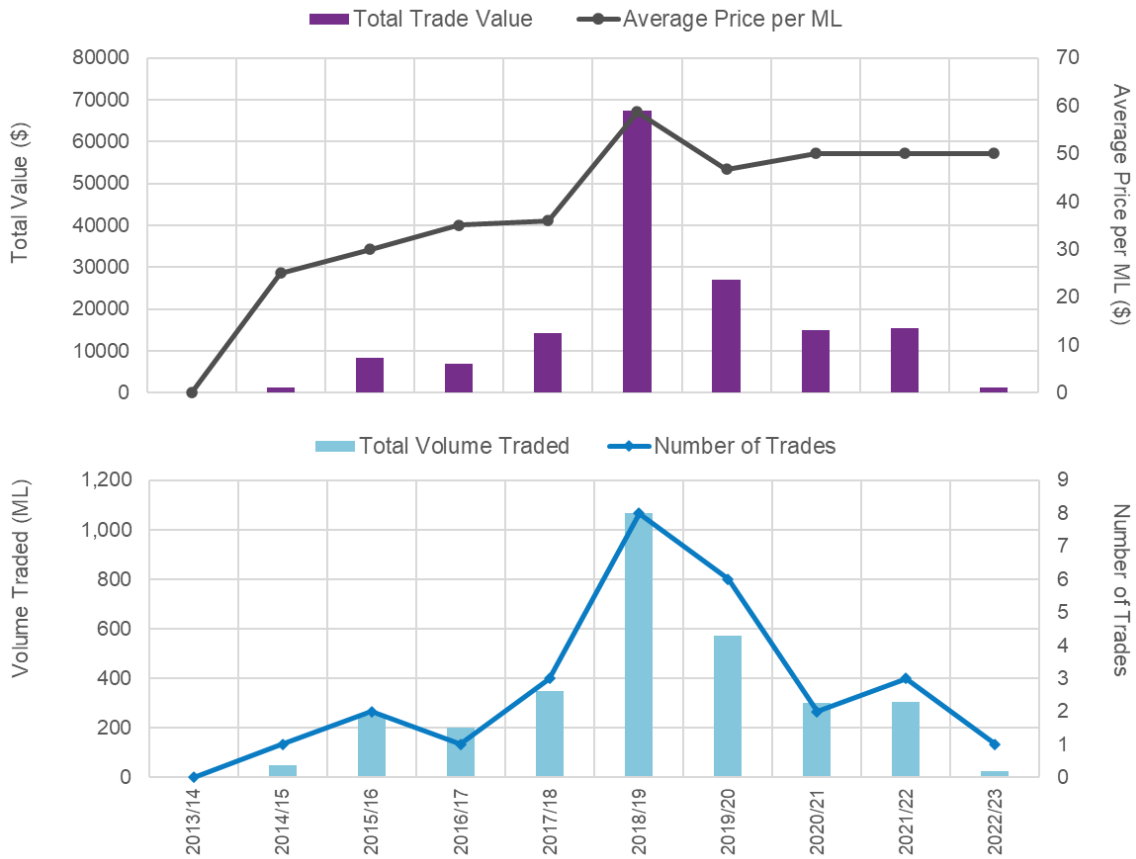


Figure 7: Wagga Wagga Alluvial Groundwater Source temporary trade statistics



Bores

There are approximately 780 registered bores across the entire Mid Murrumbidgee alluvial groundwater sources (Figure 8). The majority of these bores are used for stock and domestic purposes (Basic Landholder Rights). There is also significant use of groundwater for irrigation (Table 5).

Bores constructed in the deeper more productive aquifer systems can yield up to 3,300 ML/year, while most production bores supply up to 1,000 ML/year (Figure 9). This is based on average extraction from 2017/2018 to 2021/2022 and unlikely to have changed significantly.

Table 5: Approximate number of licensed bores in Mid Murrumbidgee alluvial groundwater sources (2023)

Groundwater Source	Registered Bore Purpose		
	Basic Landholder Rights	Production	Local Water Utility
Gundagai Alluvial Groundwater Source	129	54	2
Kyeamba Alluvial Groundwater Source	34	18	0
Mid Murrumbidgee Zone 3 Alluvial Groundwater Source	198	117	14
Wagga Wagga Alluvial Groundwater Source	108	90	16

Water level monitoring

WaterNSW monitors groundwater levels at 204 monitoring bores at 95 sites in the Mid Murrumbidgee alluvial groundwater sources (Figure 10). At most monitoring sites there are two or more pipes monitoring different depths. The depth monitored by each pipe reflects the depth where the casing is slotted to allow groundwater entry into the pipe.

A hydrograph is a plot of groundwater level or pressure from a monitoring bore over time. A representative sample of hydrographs from monitoring bores have been selected and are presented in Figure 11 to Figure 20.

Data for the monitored bores as well as private bore information can be obtained from the WaterNSW real time data portal at: realtimedata.waternsw.com.au/

Data is also available for 2 of the groundwater monitoring sites in real-time via telemetry. You can also request information via: Customer.Helpdesk@waternsw.com.au

Figure 8: Mid Murrumbidgee alluvial groundwater sources registered bores

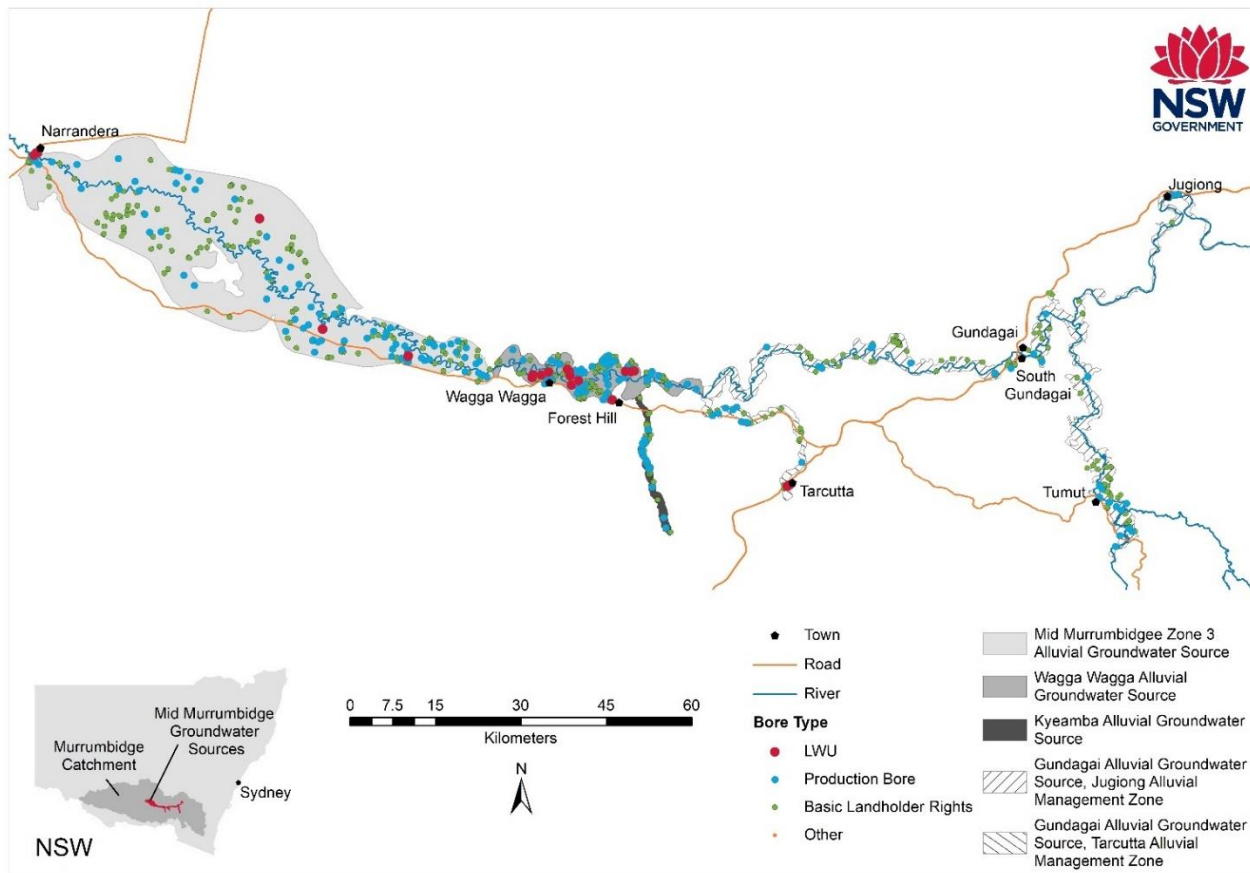


Figure 9: Mid Murrumbidgee Groundwater Source water supply bores and distribution of extraction (for period 2017/2018 to 2021/2022)

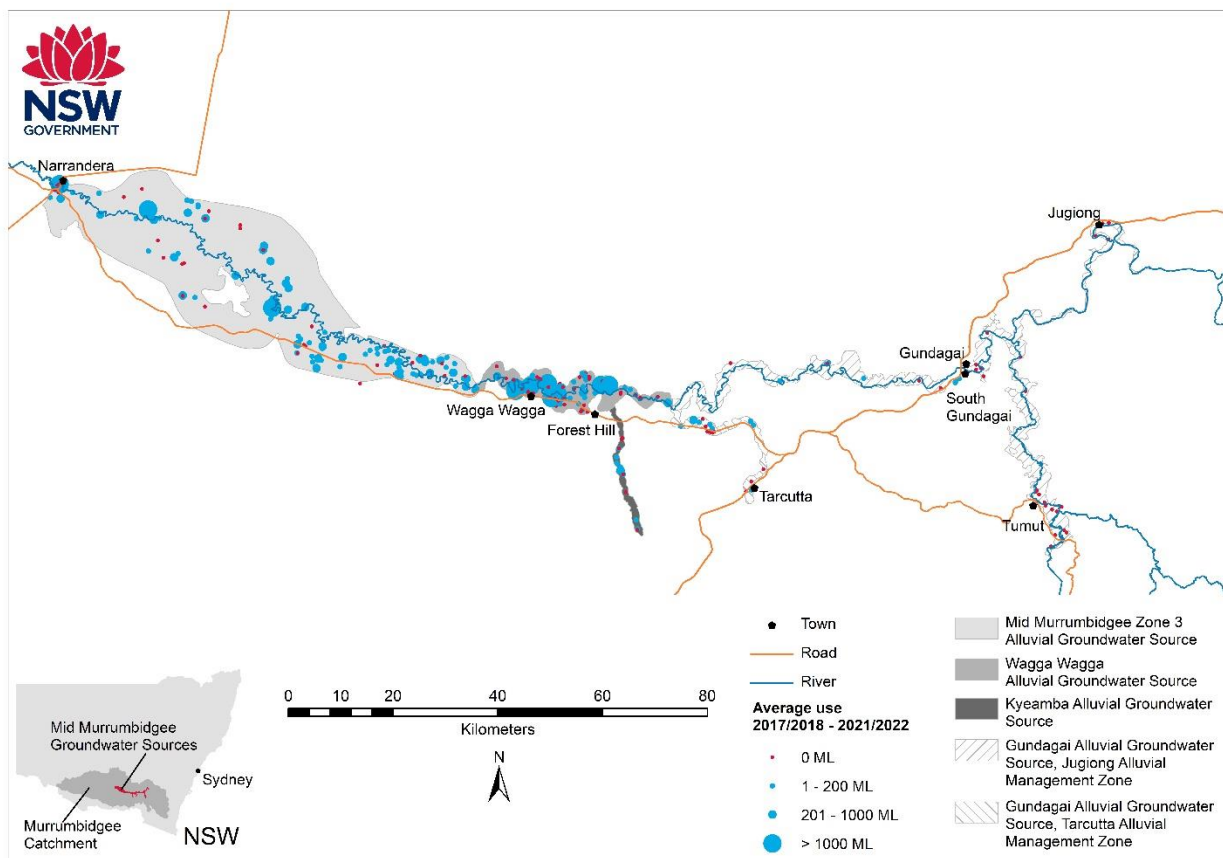


Figure 10: Mid Murrumbidgee alluvial groundwater sources monitoring bore sites

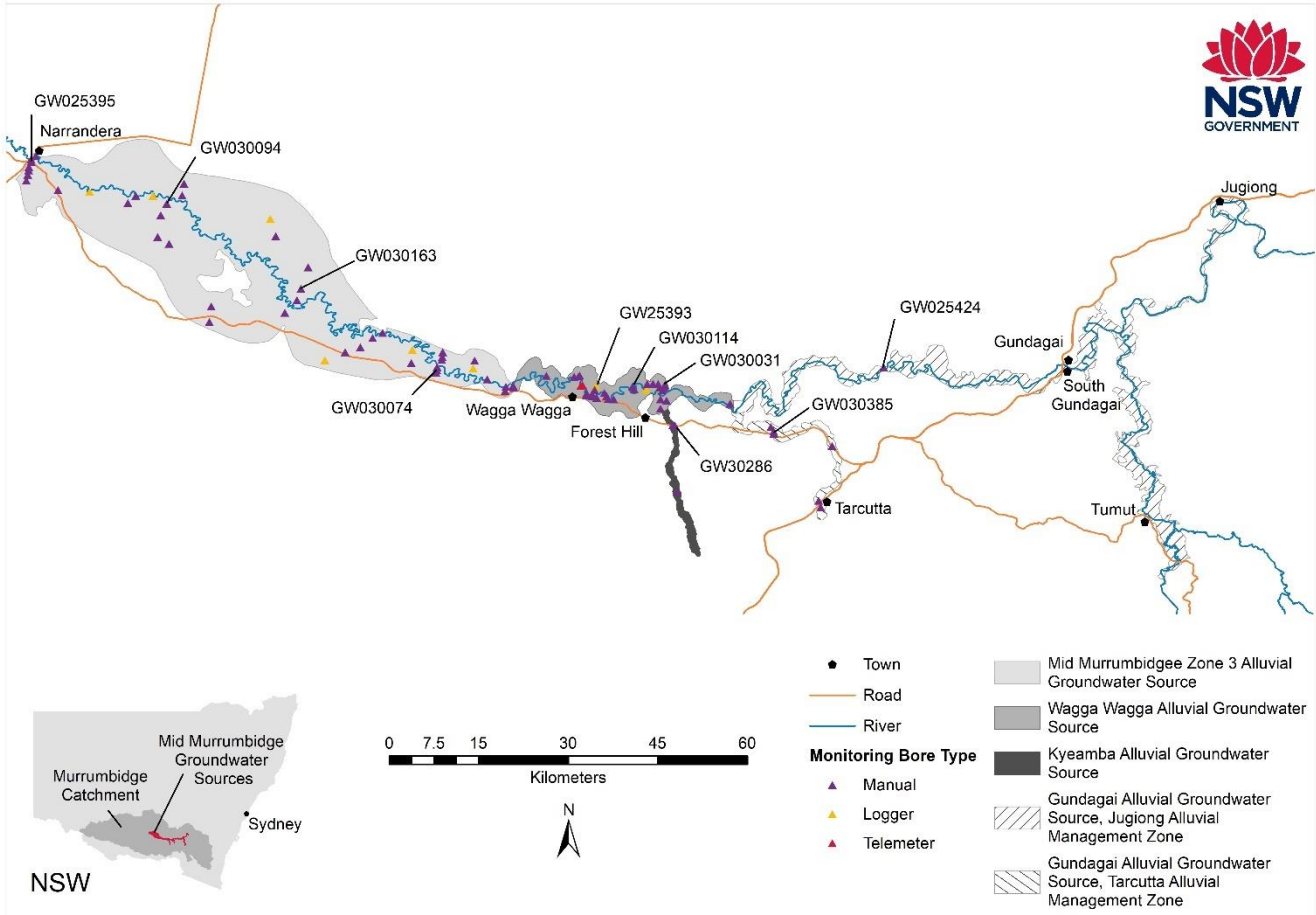


Figure 11: Hydrograph for monitoring bore GW025424 (Gundagai Alluvial)

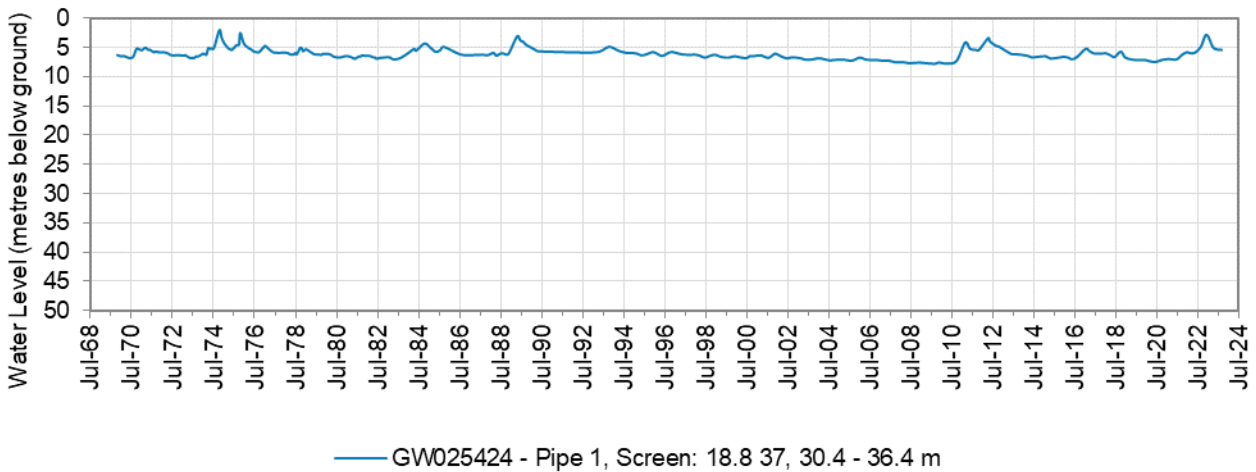


Figure 12: Hydrograph of monitoring bore GW030385 (Gundagai Alluvial)

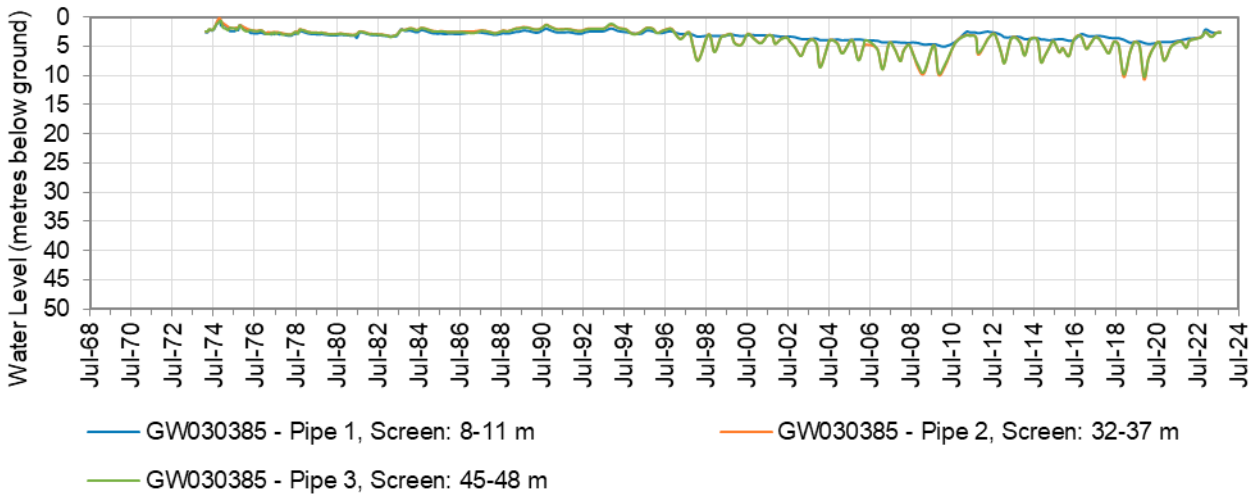


Figure 13: Hydrograph of monitoring bore GW030286 (Kyeamba Alluvial)

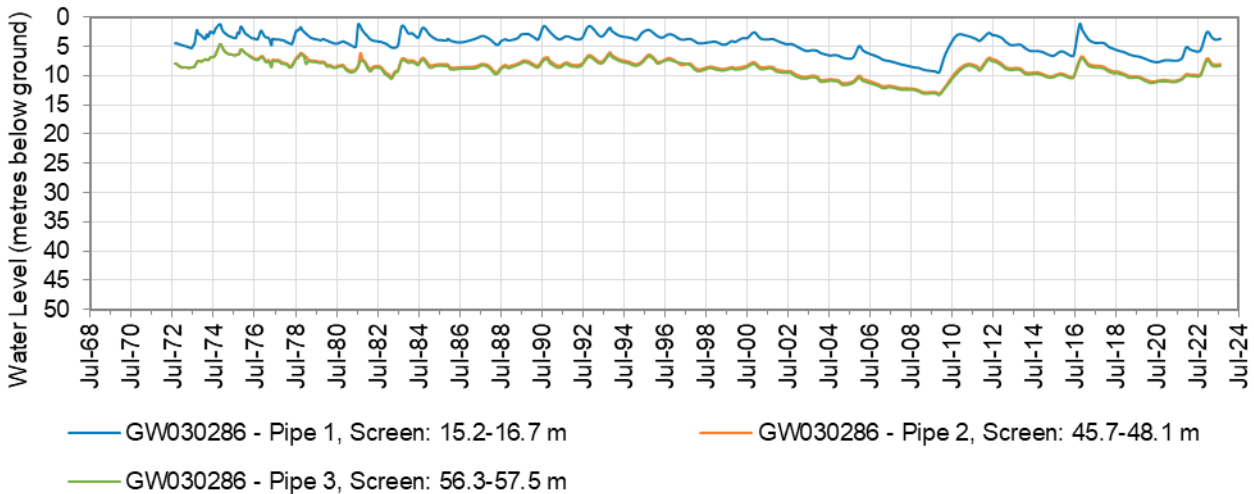


Figure 14: Hydrograph of monitoring bore GW025395 (Mid Murrumbidgee Zone 3 Alluvial)

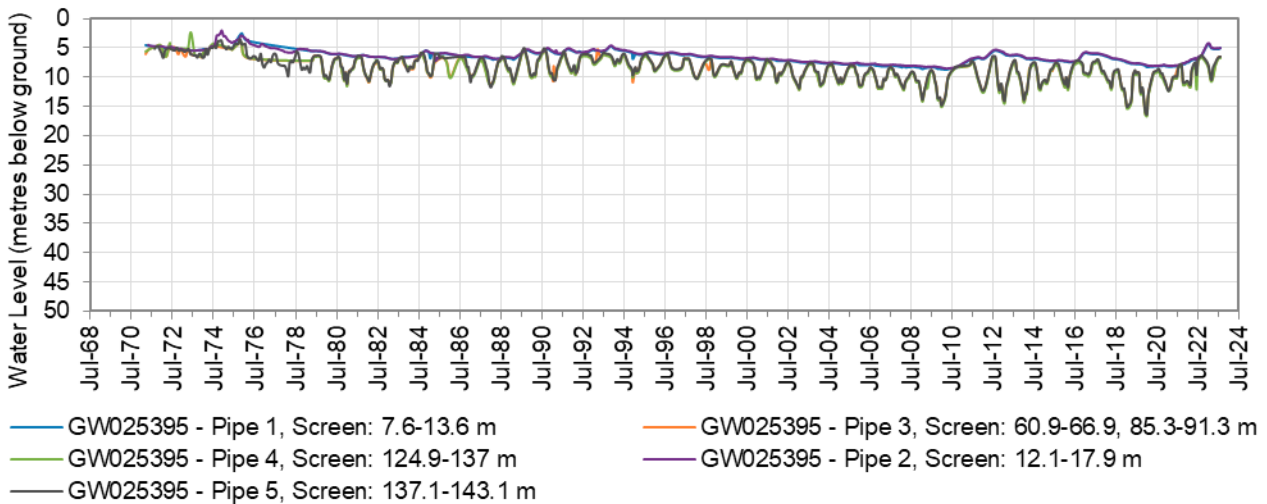


Figure 15: Hydrograph of monitoring bore GW030074 (Mid Murrumbidgee Zone 3 Alluvial)

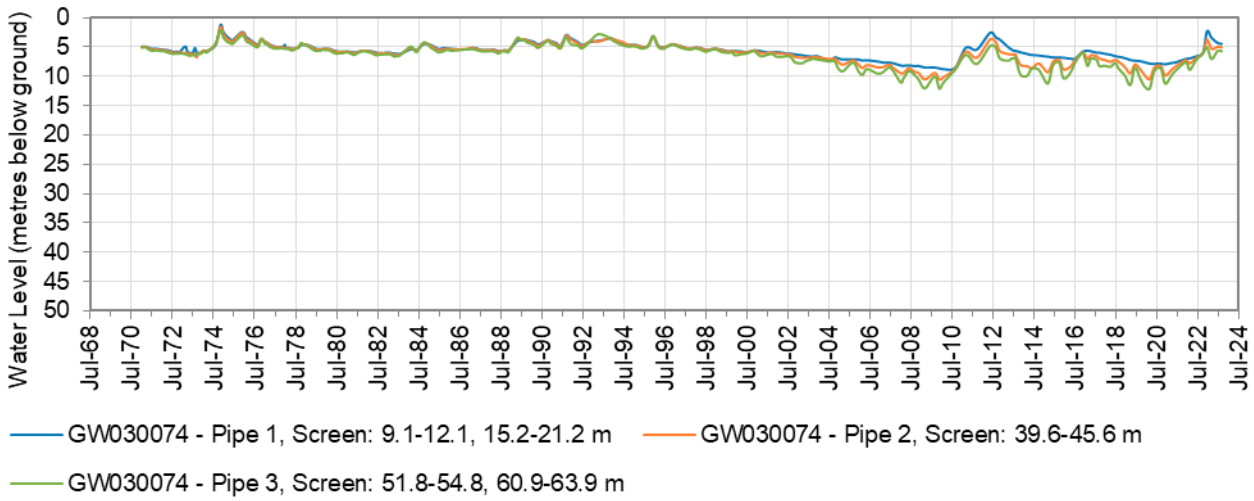


Figure 16: Hydrograph of monitoring bore GW030094 (Mid Murrumbidgee Zone 3 Alluvial)

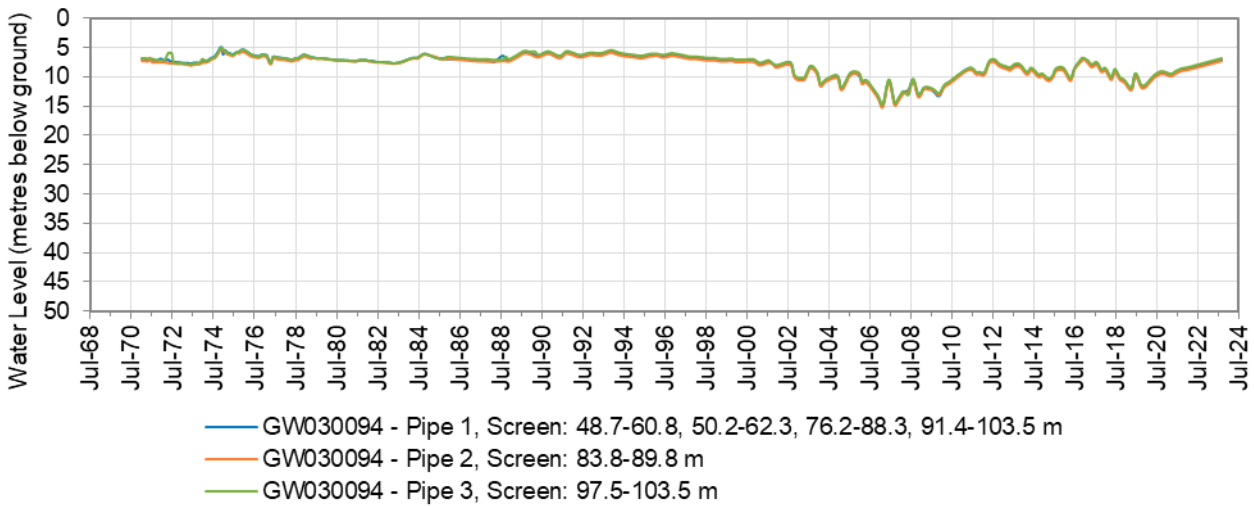


Figure 17: Hydrograph of monitoring bore GW030163 (Mid Murrumbidgee Zone 3 Alluvial)

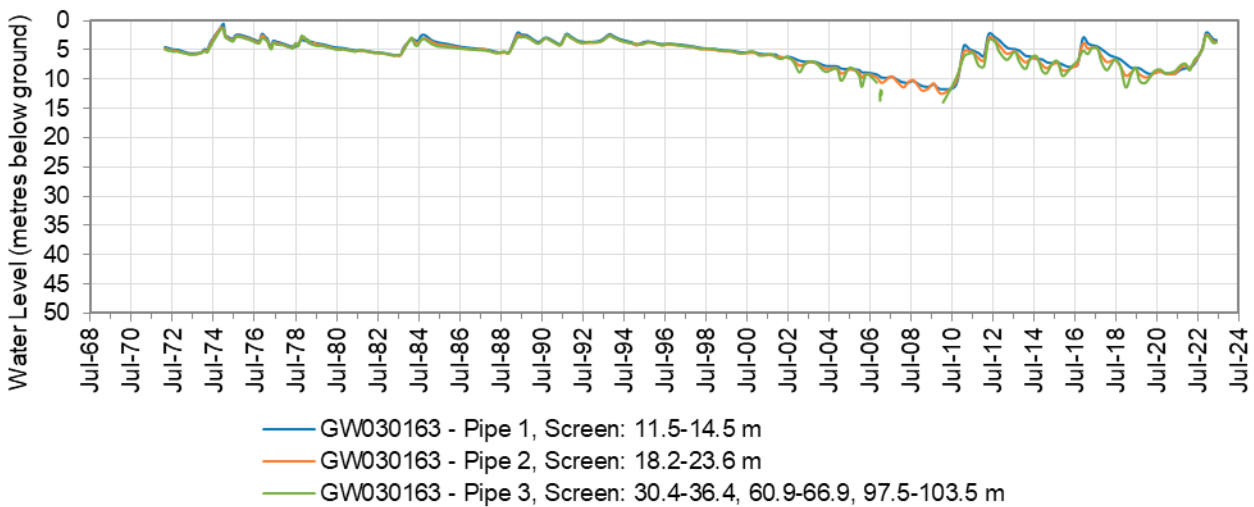


Figure 18: Hydrograph of monitoring bore GW025393 (Wagga Wagga Alluvial)

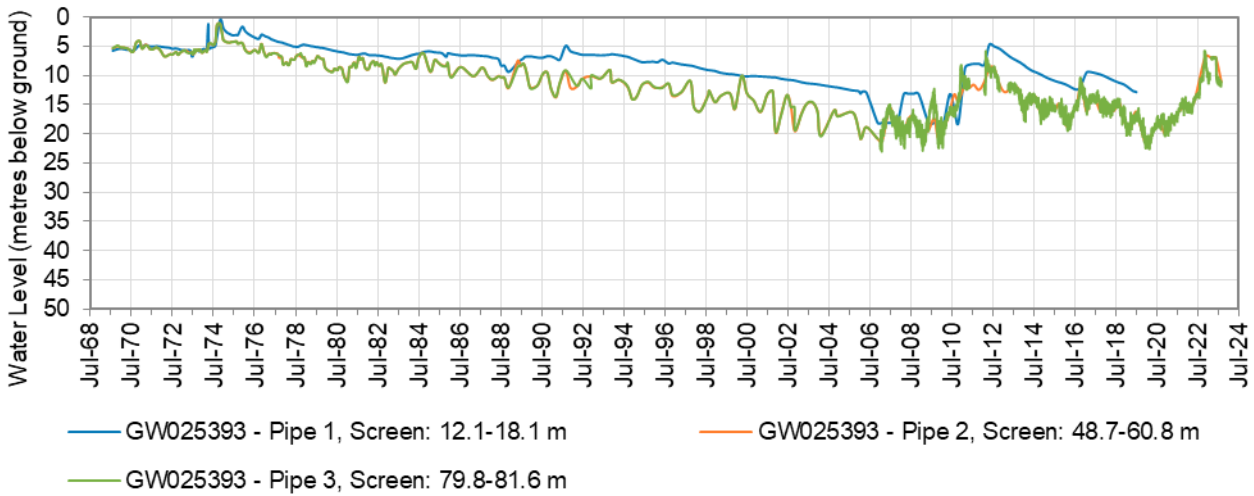


Figure 19: Hydrograph of monitoring bore GW030031 (Wagga Wagga Alluvial)

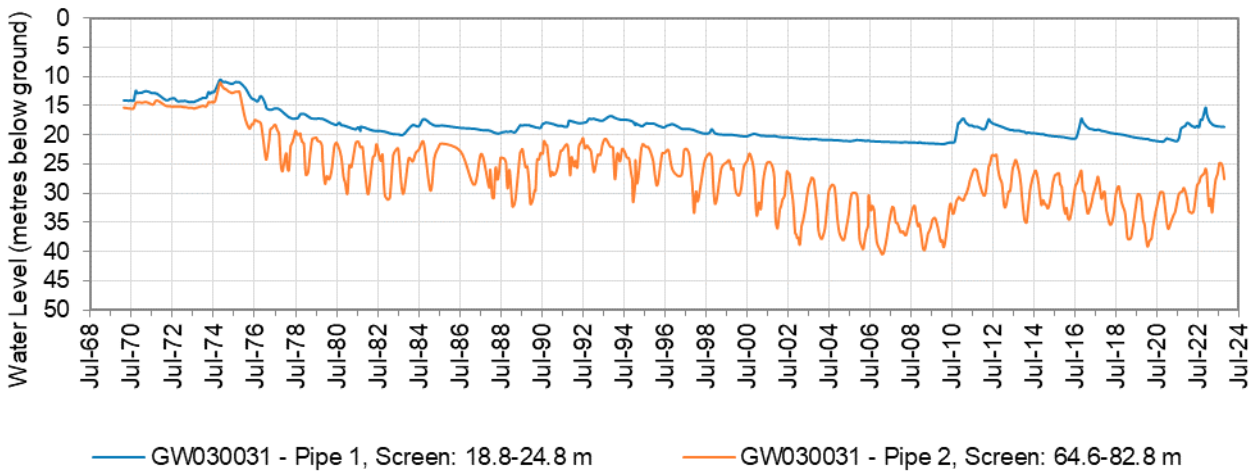


Figure 20: Hydrograph of monitoring bore GW030114 (Wagga Wagga Alluvial)

