

Upper Macquarie Alluvial Groundwater Source

Groundwater annual report 2023.

Introduction

This report is a summary of water accounts, volume pumped and groundwater levels for the Upper Macquarie Alluvial Groundwater Source for the period 1 July 2021 to 30 June 2023 including the start of year water account volumes for the 2023/2024 water year.

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 Macquarie Alluvium Water Sources:

www.industry.nsw.gov.au/___data/assets/pdf_file/0017/192221/macquarie-castlereagh-alluvium-appendix-a-water-resource-description.pdf

Description

The Upper Macquarie Alluvial Groundwater Source occupies a narrow valley which extends northwest from Wellington to approximately 10 km beyond Dubbo and then west-southwest until it reaches the Lower Macquarie Alluvial Groundwater Source at 10 km east of Narromine (Figure 1).

The Upper Macquarie Alluvial Groundwater Source comprises unconsolidated clay, silt, sand and gravel deposited within a narrow valley by the Macquarie River.

Water resource management

Water sharing plan

The Upper Macquarie Alluvial Groundwater Source is managed by the rules defined in the Water Sharing Plan for the Macquarie-Castlereagh Alluvial Groundwater Sources 2020.

These water sharing plans are available for viewing on the Department of Planning and Environment Water website at: water.dpie.nsw.gov.au/plans-and-programs/water-sharing-plans/status/macquariecastlereagh-region

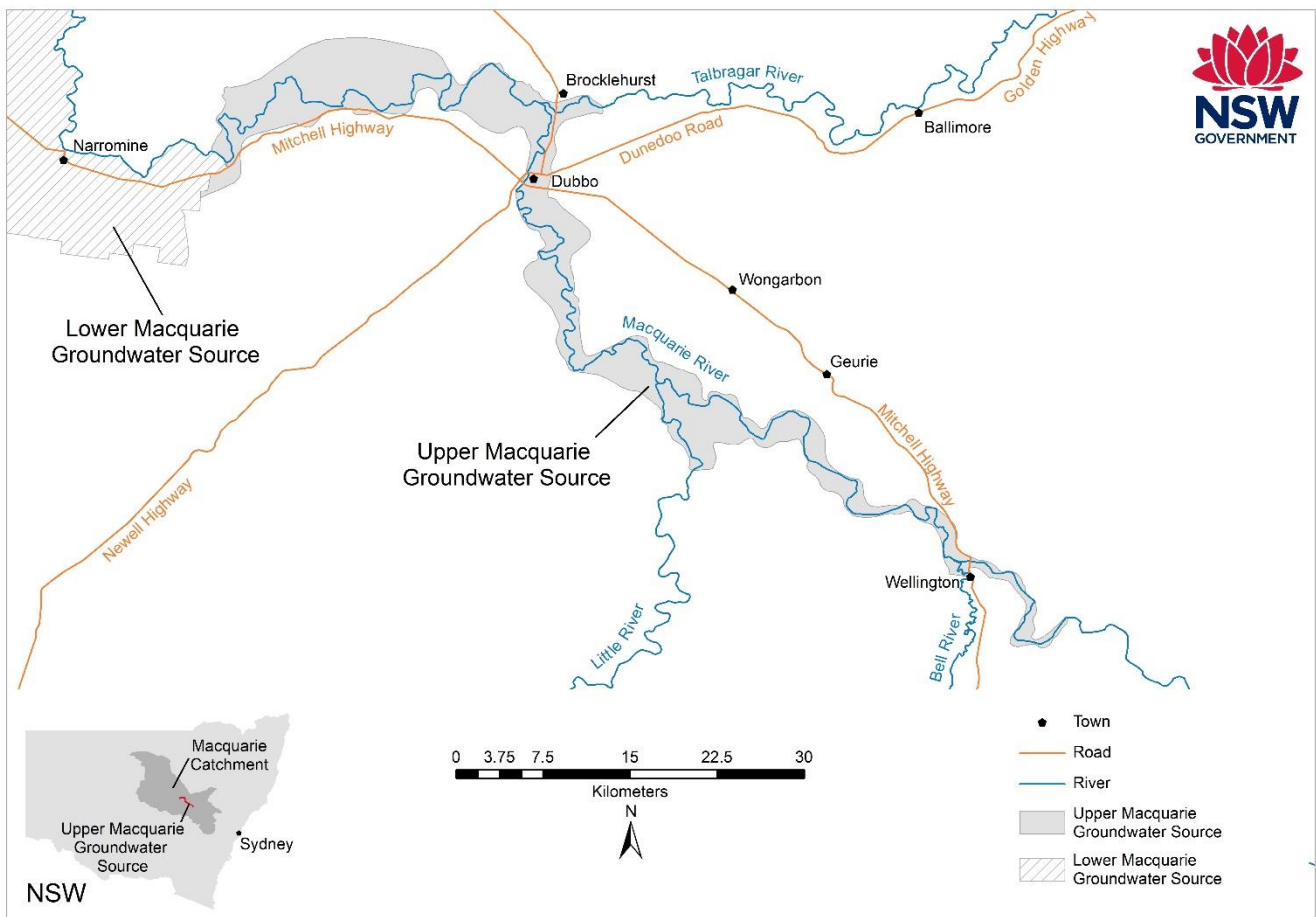
Basic rights

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 volume of water set aside in the water sharing plan for basic landholder rights is 304 megalitres (ML).

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.

Figure 1: Location map



Groundwater access licences

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

Table 1: Upper Macquarie Alluvial Groundwater Source share component 30 June 2023

Access Licence Category	Number of Licences	Total Volume
Local Water Utility ¹	4	4,470

Access Licence Category	Number of Licences	Total Volume
Domestic and Stock ¹	2	4
Aquifer ²	140	27,775

¹ Megalitres/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 limit for Upper Macquarie Alluvial Groundwater Source is 17,935 ML/year. Extraction in the groundwater source 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)
- the 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

Carryover of unused account water from one water year to the next is not available in the Upper Macquarie Groundwater Source. Total water availability in a water year is controlled by the available water determinations credited to an access licence account.

The maximum amount of water that can be debited from an aquifer access licence account in a water year can't exceed the available water determination (AWD) plus any allocation transferred in (temporary trade), and minus any allocation transferred out. This means that metered extraction plus transfers out can't exceed the AWD, unless water is transferred in.

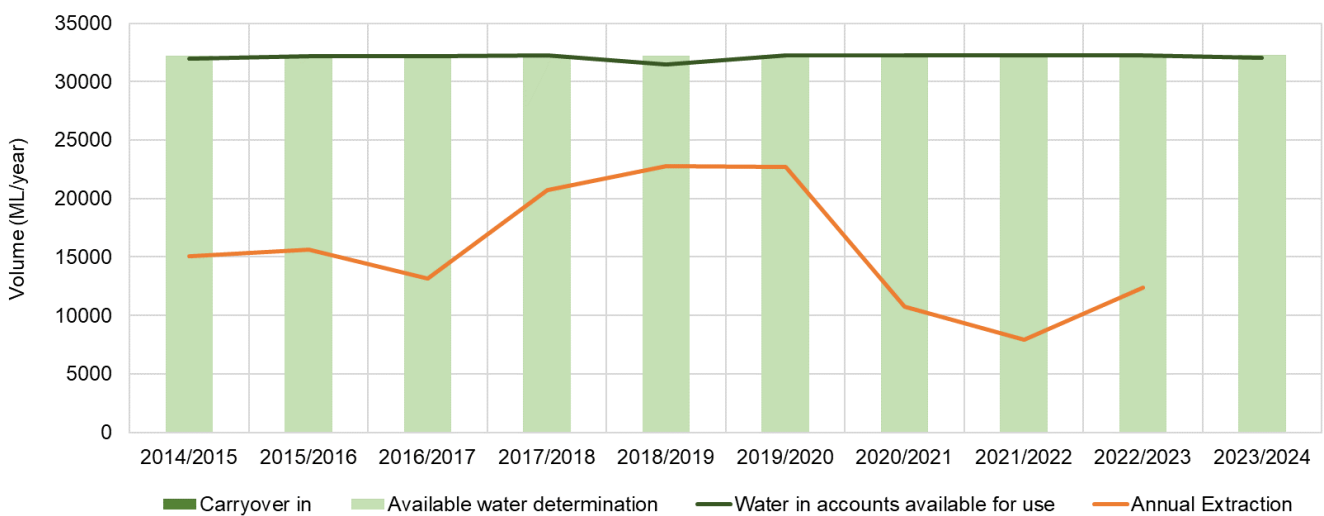
Total account water for period 2013/2014 to 2023/2024 is displayed in Figure 2 showing the proportion available for use and what is not available for use in a year. Total yearly extraction is also displayed. Note: all access licence categories have been combined in Figure 2.

There has been no reduction in the available water determination (AWD) for aquifer access licences in the Upper Macquarie Alluvial Groundwater Source since the water sharing plan first started in 2012.

The access licence account information for the Upper Macquarie Alluvial Groundwater Source on 1 July 2023 is summarised below:

- Carryover In: 0 ML
- Available water determination: 32,249 ML
- Total water in account: 32,054 ML
- Total water available for use: 32,054 ML

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



Groundwater trading

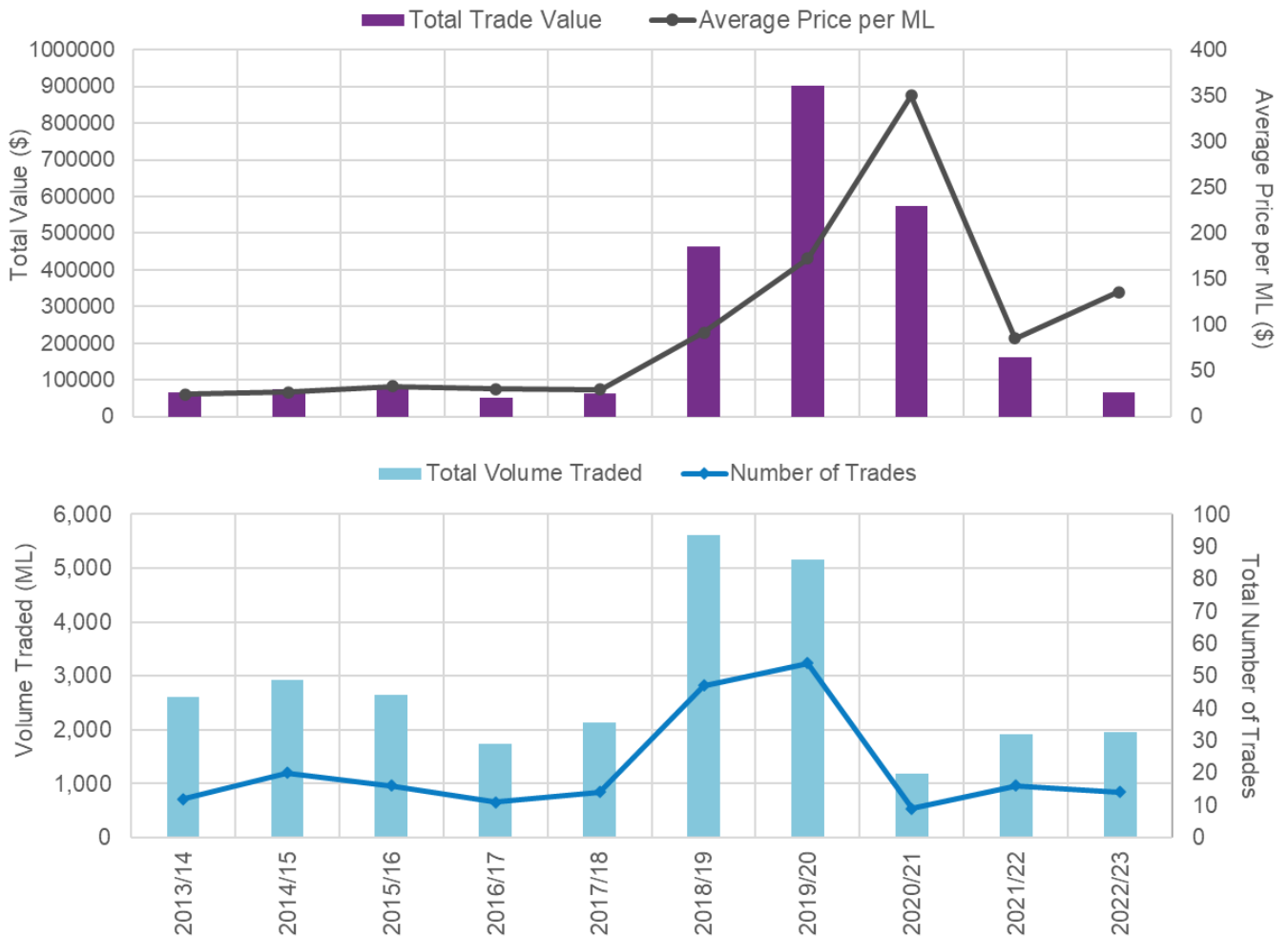
Trades are permitted within but not between Upper Macquarie Alluvial Groundwater Source and any other groundwater source.

Allocation assignments (temporary trade)

Trading statistics for the Upper Macquarie Groundwater Sources are illustrated in Figure 3, excludes trades for less than \$1 per megalitre. The average value paid per megalitre in 2022-23 was \$135.80, while the maximum value was \$1,500 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 3: Upper Macquarie Alluvial Groundwater Source temporary trade statistics



Bores

There are approximately 704 registered bores across the Upper Macquarie Alluvial Groundwater Source (Figure 4). 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 2).

Production bores are scattered throughout the Upper Macquarie Alluvial Groundwater Source with a notably higher density of bore locations near Dubbo. The majority of production bores in the Upper Macquarie Alluvial Groundwater Source can supply up to 500 ML/year (Figure 5). This is based on average extraction from 2017/2018 to 2021/2022 and unlikely to have changed significantly.

Table 2: Approximate number of licensed bores in Upper Macquarie Alluvial Groundwater Source (2023)

Groundwater Source	Registered Bore Purpose		
	Basic Landholder Rights	Production	Local Water Utility
Upper Macquarie Alluvial	486	202	16

Water level monitoring

WaterNSW monitors groundwater levels at 55 monitoring bores at 45 sites in the Upper Macquarie Alluvial Groundwater Source (Figure 6). 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 7 to Figure 11.

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 4: Upper Macquarie Alluvial Groundwater Source registered bores

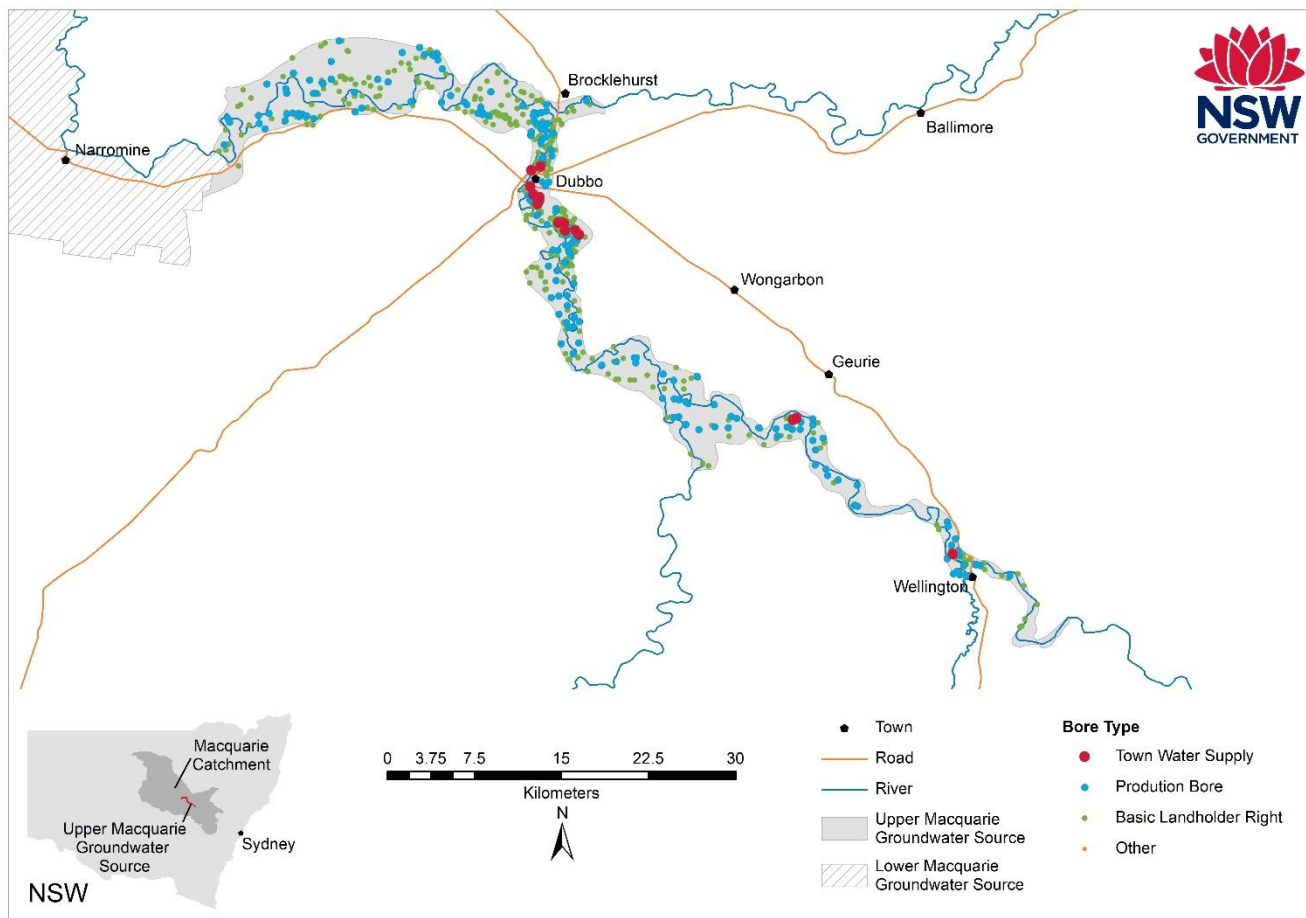


Figure 5: Upper Macquarie Alluvial Groundwater Source water supply bores and distribution of extraction for period 2017/2018 to 2021/2022

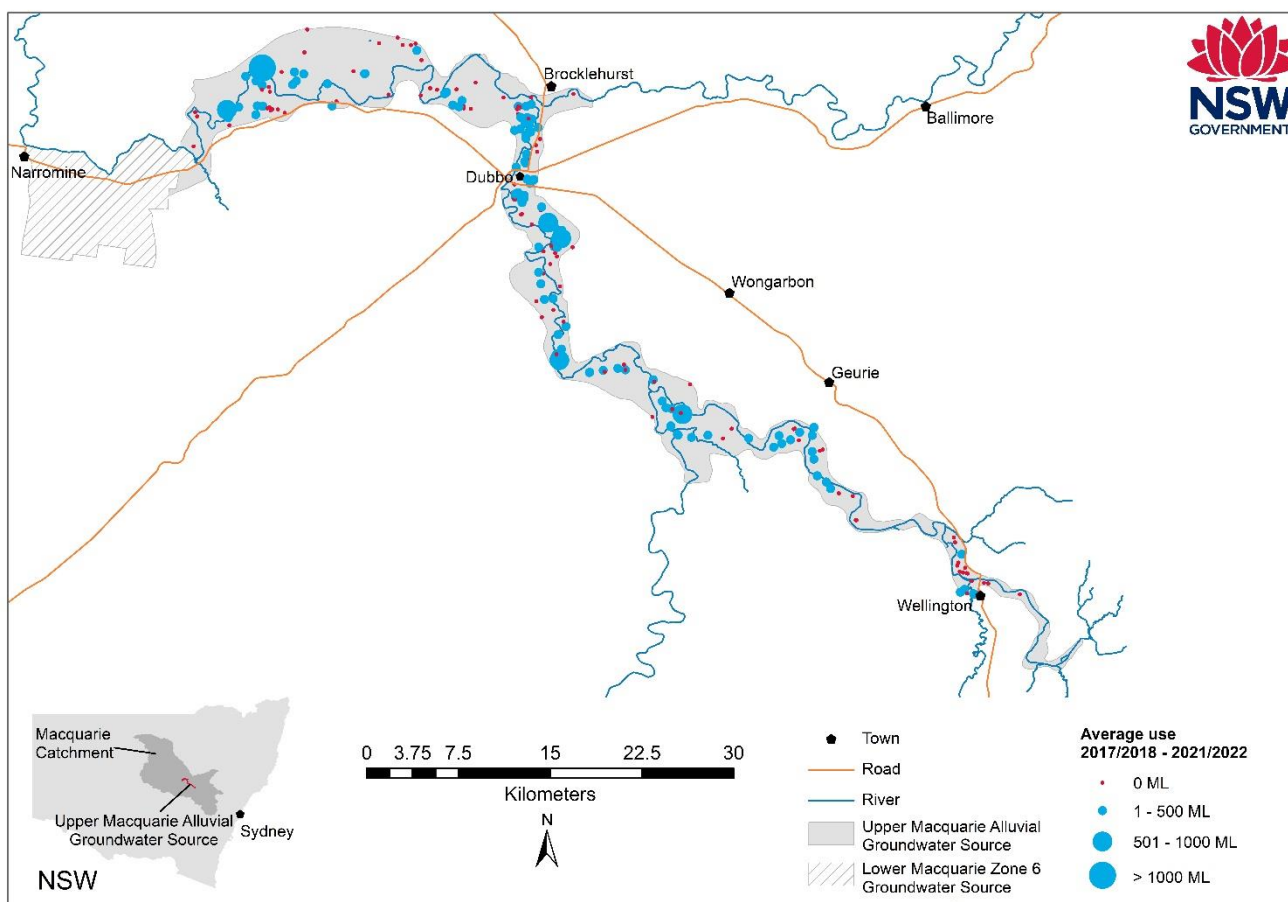


Figure 6: Upper Macquarie Alluvial Groundwater Source monitoring bore sites

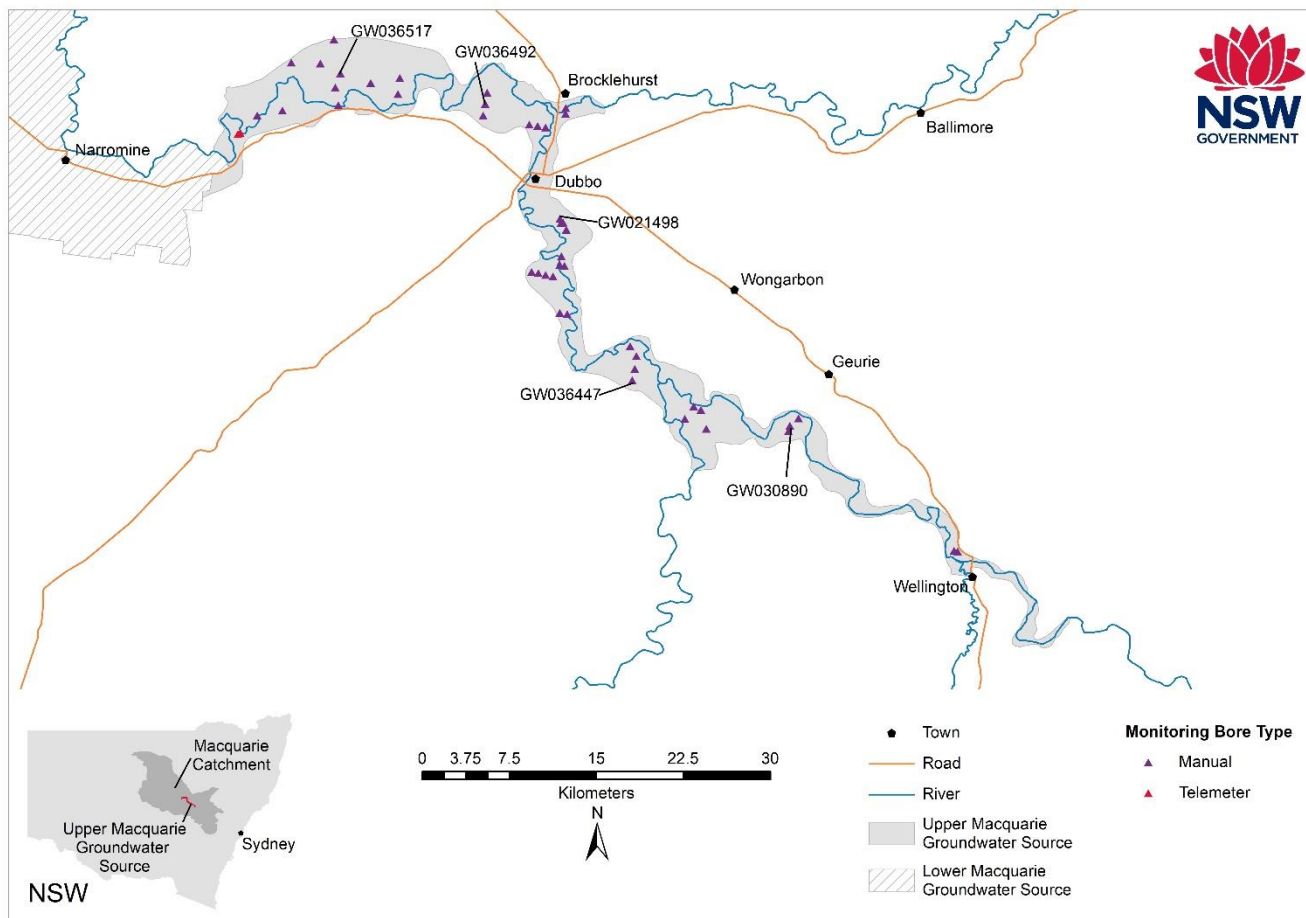


Figure 7: Hydrograph for monitoring bore GW021498

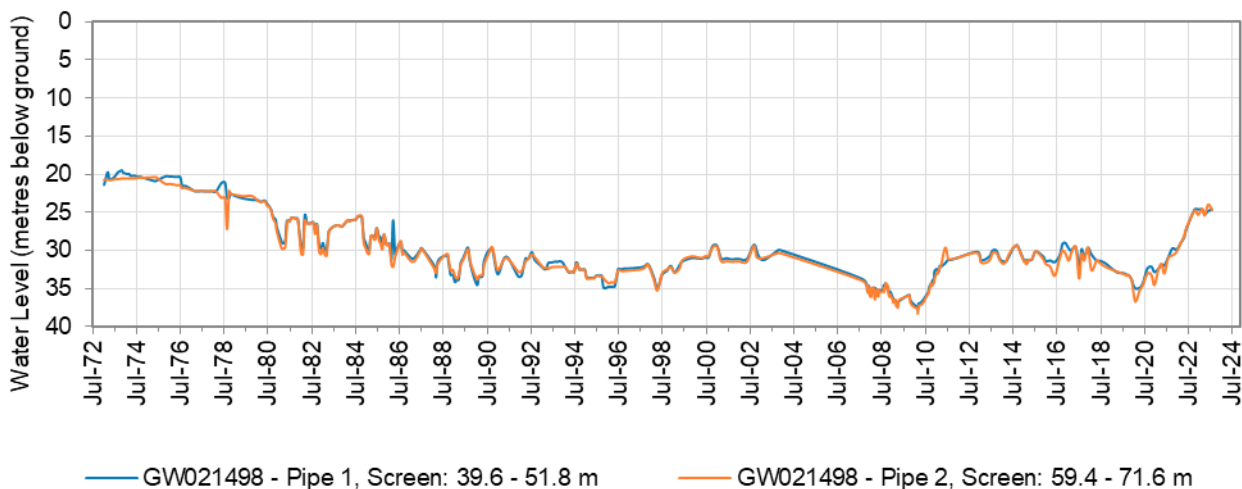


Figure 8: Hydrograph of monitoring bore GW030890

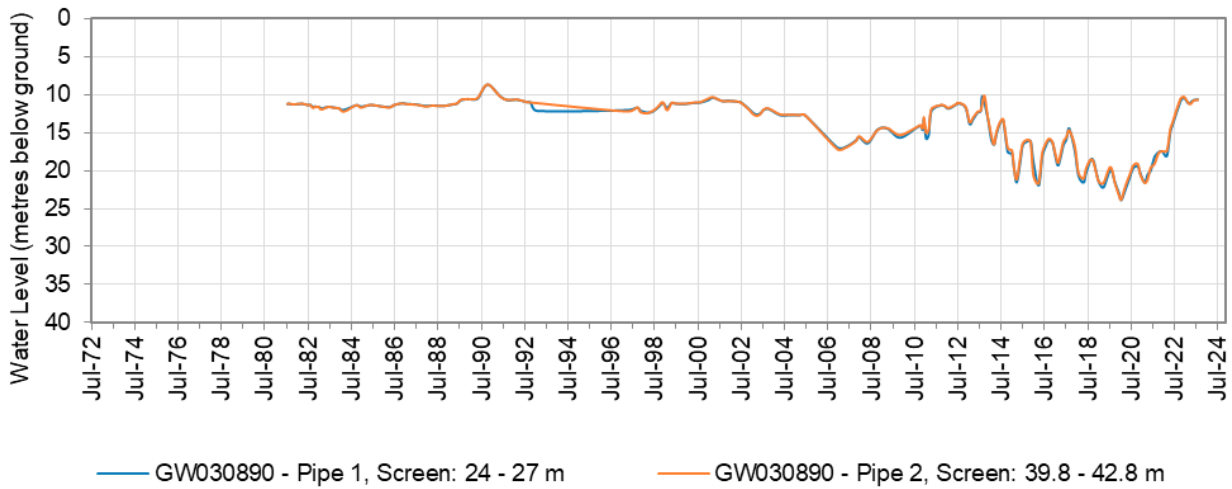


Figure 9: Hydrograph of monitoring bore GW036447

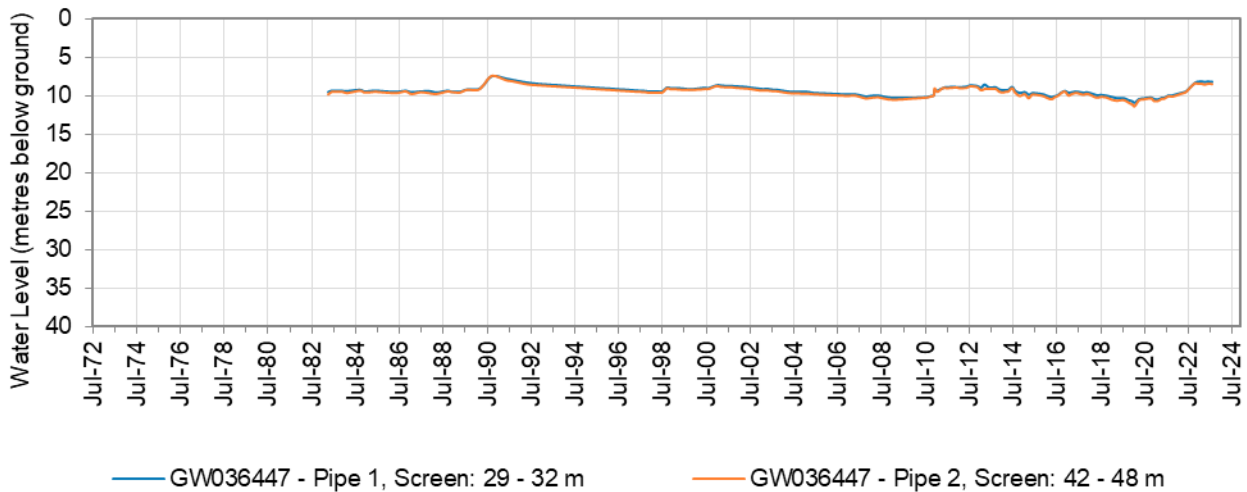


Figure 10: Hydrograph of monitoring bore GW036492

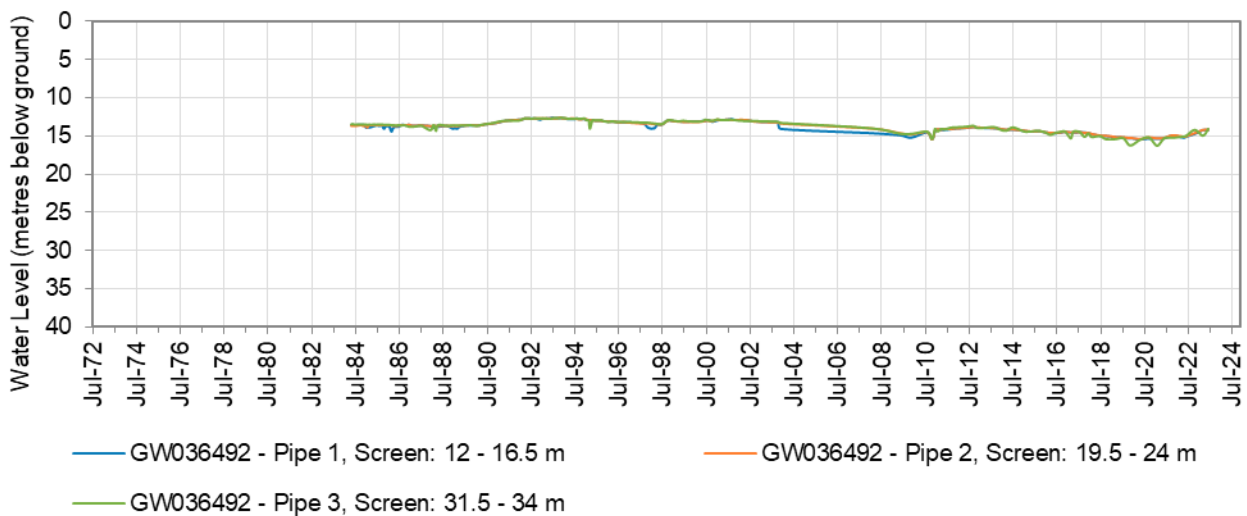


Figure 11: Hydrograph of monitoring bore GW036517

