

## Bell Alluvial Groundwater Source

### Introduction

This report is a summary of water accounts, volume pumped and groundwater levels for the Bell Alluvial Groundwater Source. The report is for the period 1 July 2019 to 30 June 2020 based on the water sharing plan that applied over the period and will be updated on an annual basis.

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-Castlereagh Groundwater Sources:

[www.industry.nsw.gov.au/\\_\\_data/assets/pdf\\_file/0017/192221/macquarie-castlereagh-alluvium-appendix-a-water-resource-description.pdf](http://www.industry.nsw.gov.au/__data/assets/pdf_file/0017/192221/macquarie-castlereagh-alluvium-appendix-a-water-resource-description.pdf)

### Description

The Bell Alluvial Groundwater Source is located within the Macquarie-Castlereagh River catchment. The water source extends approximately 24 km upstream from Wellington (**Figure 1**).

The Bell Alluvial Groundwater Source (**Figure 1**) is made up of the alluvial sediments. These sediments form an extensive alluvial fan deposited by the Bell River, comprised of clay, silt, sand and coarse gravel.

### Water resource management

#### Water sharing plan

For the period of reporting, the Bell Alluvial Groundwater Source was managed by the rules defined in the Water Sharing Plan for the Macquarie Bogan Unregulated and Alluvial Water Sources 2012. It was replaced on 1 July 2020 by Water Sharing Plan for the Macquarie-Castlereagh Groundwater Sources 2020.

This water sharing plan is available for viewing on the Department of Planning Industry and Environment - Water website at: [www.industry.nsw.gov.au/water/plans-programs/water-sharing-plans/status/macquarie-castlereagh-region](http://www.industry.nsw.gov.au/water/plans-programs/water-sharing-plans/status/macquarie-castlereagh-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 6 megalitres/year (ML/year).

The bore owner is responsible for monitoring water quality from the water supply work 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.

## Bell Alluvial Groundwater Source

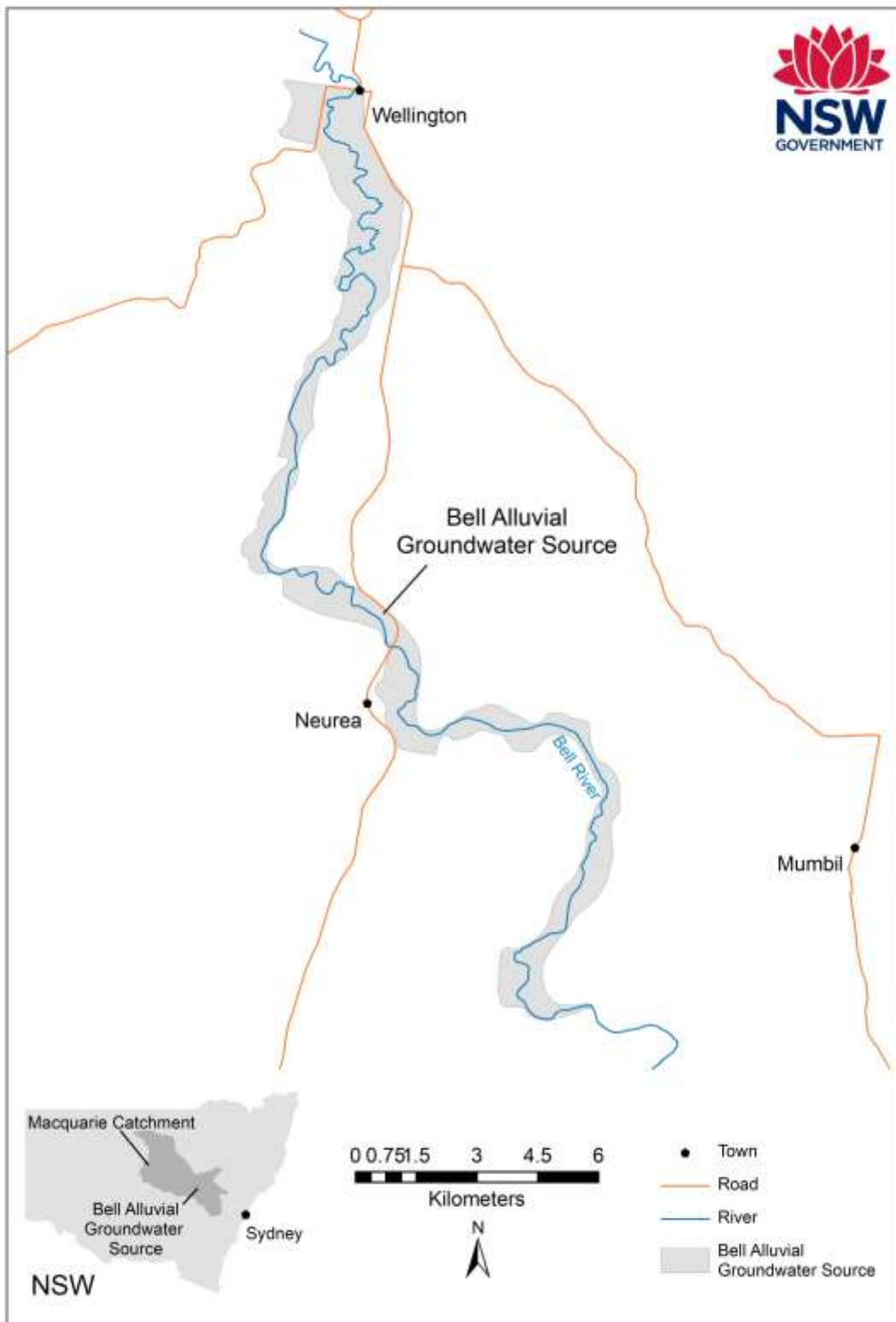


Figure 1: Location Map

## Bell Alluvial Groundwater Source

### Groundwater access licences

Groundwater access licence share components for 2019/2020 are presented in **Table 1**.

**Table 1: Bell Alluvial Groundwater Source share component 30 June 2020**

Access Licence Category	No. of Licences	Total Volume
Local Water Utility <sup>1</sup>	1	70
Aquifer <sup>2</sup>	51	4,693

<sup>1</sup> Megalitres/year (ML)

<sup>2</sup> Megalitres per unit share

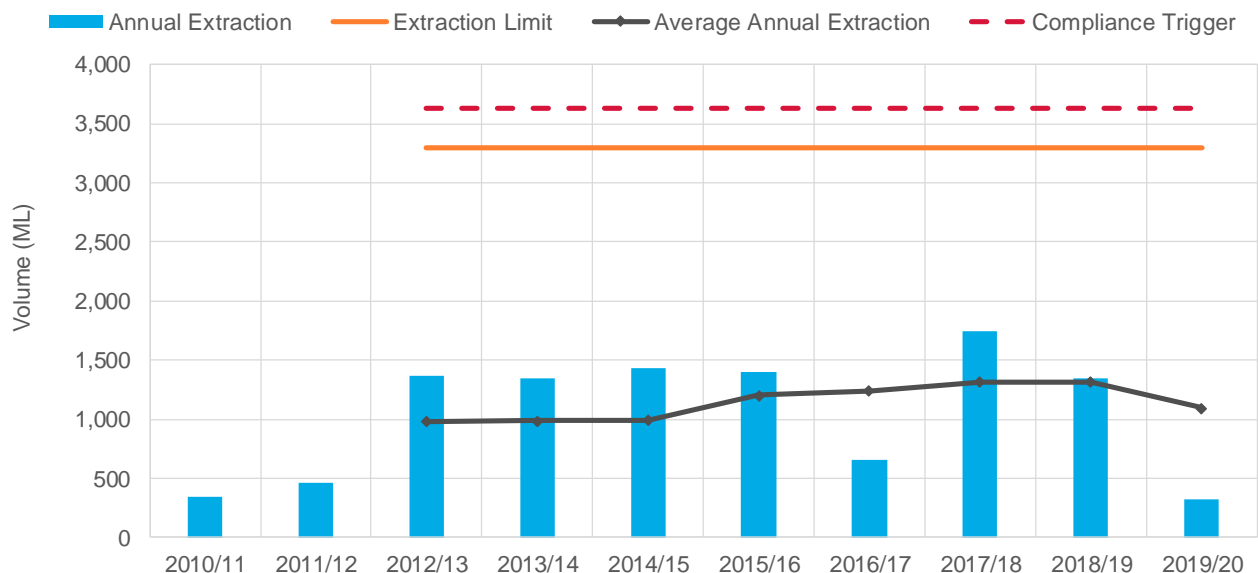
### Extraction limit

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 this water source is 3,299 ML/year.

Extraction in the Bell Alluvial Groundwater Source is not compliant if the **5 years** average annual extraction (known as the assessment period) 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.

Compliance against the extraction limit for the Bell Alluvial Groundwater Source is illustrated in **Figure 2**.



**Figure 2: Bell Alluvial extraction compared to the extraction limit compliance trigger**

## Bell Alluvial Groundwater Source

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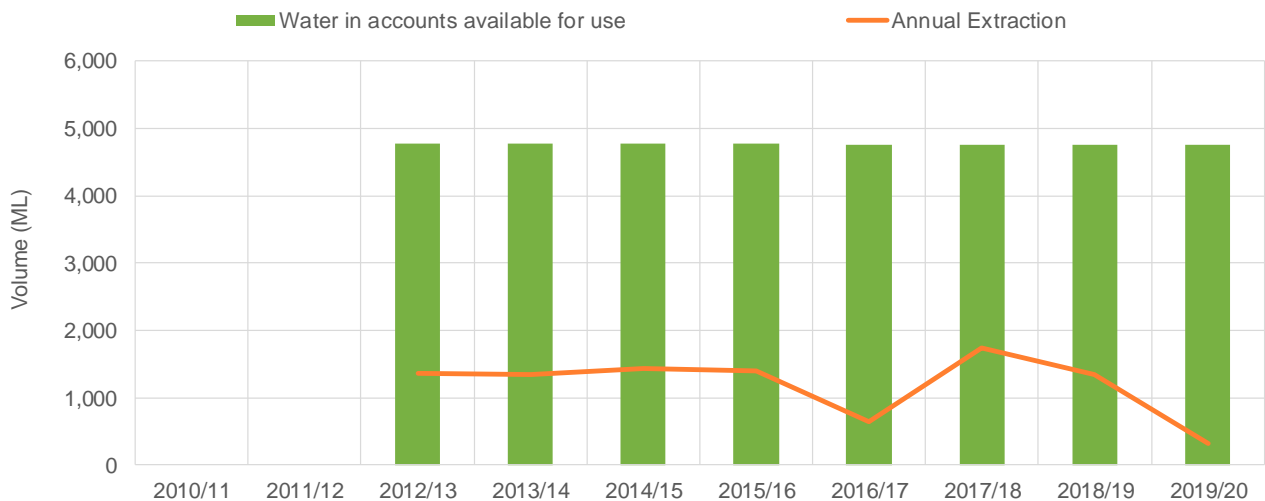
### Available water

Carryover of unused account water from one water year to the next is not available in this 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 account in any one 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 cannot exceed the AWD, unless water is transferred in.

Total account water and yearly extractions are displayed in **Figure 3**, showing the proportion available with yearly extraction. Note, all access licence categories have been combined in this figure.

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



**Figure 3: Account water availability and usage summary for the Bell Alluvial Water Source**

### Access licence account summary for the 2019/2020 water year

The following section summarises the water accounting information applicable to the access licences in the Bell Alluvial Groundwater Source for the period 1 July 2019 to 30 June 2020.

The data is presented in **Table 2**. Account summary components have been rounded to the nearest megalitre.

## Bell Alluvial Groundwater Source

**Table 2: Bell Alluvial Groundwater Source access licence account summary 2019-20, volumes in ML or shares**

Access licence category	Share 30 June 2019	Opening balance	AWD	Assignments (Temporary Trades)		Account usage	End of year balance		End of year forfeit	Carry forward
				In	Out		Available	Unavailable		
Local Water Utility	70	0	70	0	0	78	(8)	0	0	(8)
Aquifer	4,693	0	4,693	136	136	242	4,451	0	4,451	0

### Explanatory information for Table 2

Heading		Description
Share		This is the total share component (entitlement) in the specific licence category and the end of the relevant water year
Opening balance		The volume of water that has been carried forward from previous years access licence accounts for the relevant licence category.
AWD		Increase to total account water as a result of available water determinations (a process which distributes a volume of water to access licence accounts at the commencement of each water year)
Assignments	In	Increase in account water as a result of allocation assignments (temporary trade) in.
	Out	Decrease in account water as a result of allocation assignments (temporary trade) out.
Account usage		Decrease in account water due to account usage
End of year balance	Available	The available (accessible for use) account balance reported and the end of the relevant water year. The total account balance is equal to the available plus unavailable volumes. The volume stated is prior to any end of year forfeits.
	Unavailable	The amount in accounts that is unavailable for use at the time of reporting due to account usage limits defined in the relevant water sharing plan. The volume is reported at the end of the relevant water year. The total account balance is equal to the available plus unavailable volumes. The volume stated is prior to any end of year forfeits.
End of Year Forfeit		Account water that is forfeited at the end of the water year as a result of carryover rules defined in the relevant water sharing plan that may restrict the volumes allowed to be carried forward.
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.
(123)		Denotes a negative value

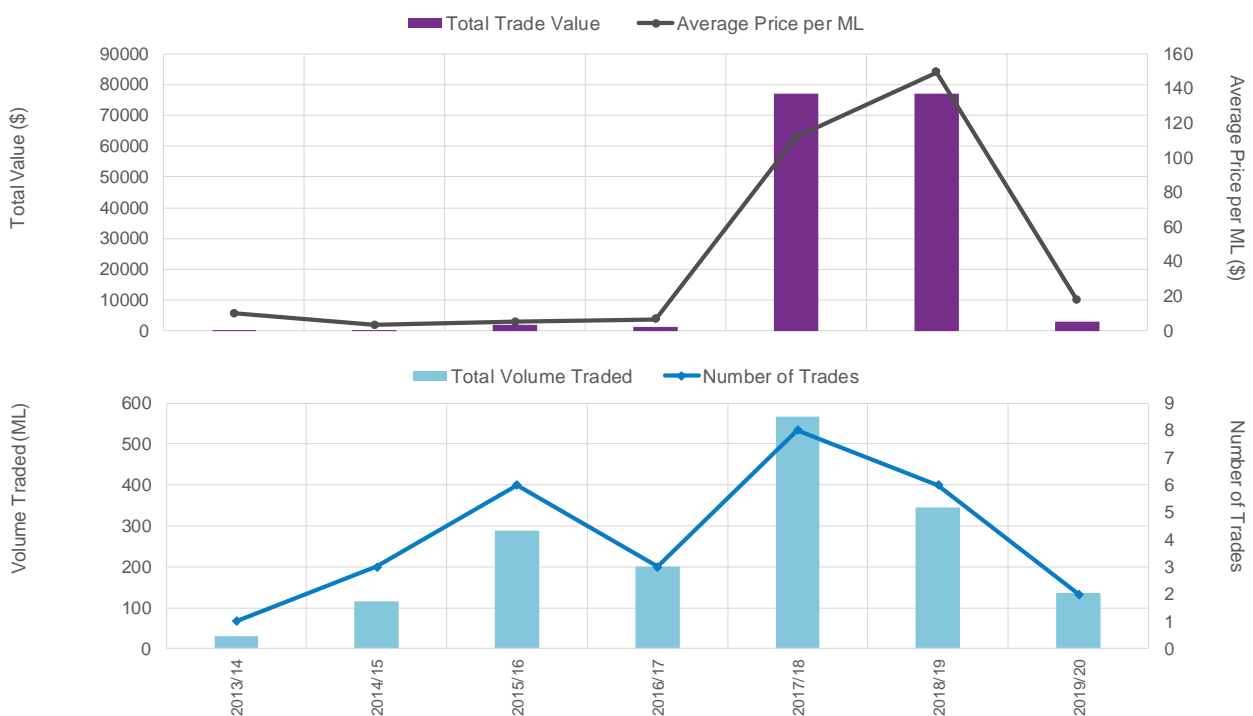
## Bell Alluvial Groundwater Source

### Groundwater trading

Trades are permitted within the Bell Alluvial Groundwater Source, but not between Bell Alluvial Groundwater Source and any other groundwater source.

### Allocation assignments (temporary trade)

Trading statistics for the Bell Alluvial Groundwater Source are illustrated in **Figure 4**, this excludes trades for less than \$1 per megalitre.



**Figure 4: Bell Alluvial Groundwater Source temporary trade statistics**

### Assignment or transfer of rights (permanent trade)

A summary of the assignment or transfer of water access rights dealings in the Bell Alluvial Groundwater Source is provided in **Table 3**.

Other dealings that can result in increased extractions at existing locations or at new locations such as adding or removing approvals from an access licence, or subdivision and consolidation of access licences have not been included in **Table 3**.

Note that permanent dealings and/or new bore applications may not be approved or will be subject to an annual extraction limit in some parts of this water source. This is due to the high density of bores and/or share volumes in the local area impacting on the groundwater source, other users and/or the environment.

## Bell Alluvial Groundwater Source

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**Table 3: Summary of assignments or transfers of water access rights**

Dealing		2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20
<b>Bell Alluvial Groundwater Source</b>											
Transfer of WAL (excludes transfers for less than \$1 per share)	Number	0	0	0	0	1	0	2	0	0	1
	Total share transferred	0	0	0	0	37	0	310	0	0	88
Assignment of share component (excludes assignments for less than \$1 per share)	Number	0	0	0	0	0	0	0	0	0	0
	Total share assigned	0	0	0	0	0	0	0	0	0	0
	Average price per ML	0	0	0	0	0	0	0	0	0	0

## Bell Alluvial Groundwater Source

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### Bores

There are approximately 99 registered bores across the Bell Alluvial Groundwater Source (**Figure 5**). The majority of these bores are used for irrigation (**Table 4**).

Production bores in the Bell Alluvial Groundwater Source are located mostly between Neurea and Wellington. Some bores can yield up to 300 ML/year, while most production bores produce up to 70 ML/year (**Figure 6**).

**Table 4: Number of licensed water supply bores in the Bell Alluvial Groundwater Source (at June 2020).**

Water Source	Registered Bore Purpose		
	Basic Landholder Rights	Production	Local Water Utility
Bell Alluvial Groundwater Source	25	71	3

### Water level monitoring

WaterNSW monitors groundwater levels at 10 monitoring bores at 9 sites in the Bell Alluvial Groundwater Source (**Figure 7**). At some 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 **Figures 8 to 14**.

Data for the monitored bores as well as private bore information can be obtained from the WaterNSW real time data portal ([realtimedata.watarnsw.com.au/](https://realtimedata.watarnsw.com.au/)). You can also request information via: [Customer.Helpdesk@watarnsw.com.au](mailto:Customer.Helpdesk@watarnsw.com.au)

The manually monitored sites are read every four to eight weeks. Data is also available for 2 of the groundwater monitoring sites in real-time via telemetry.



## Bell Alluvial Groundwater Source

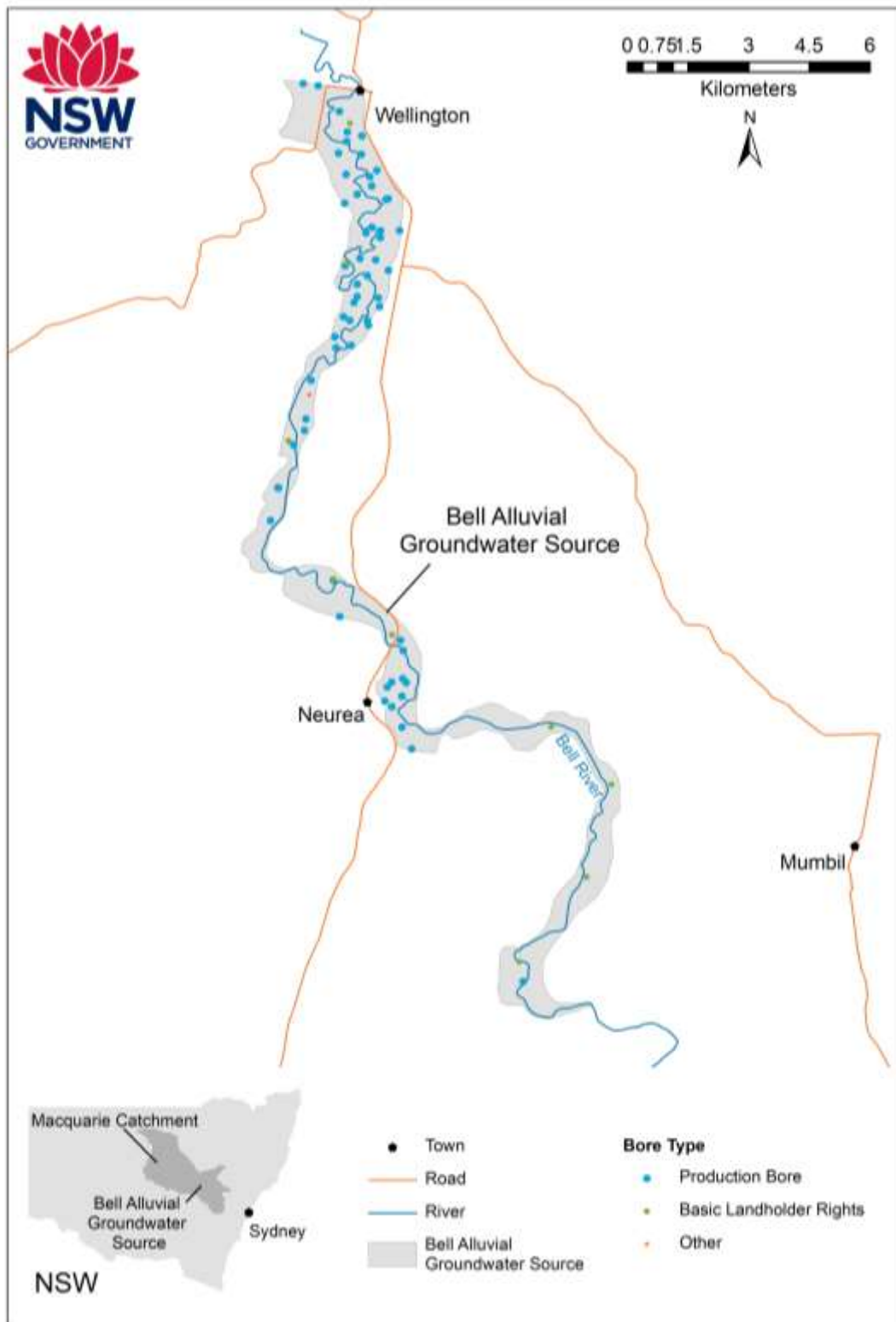


Figure 5: Bell Alluvial Groundwater Source water supply bores

## Bell Alluvial Groundwater Source

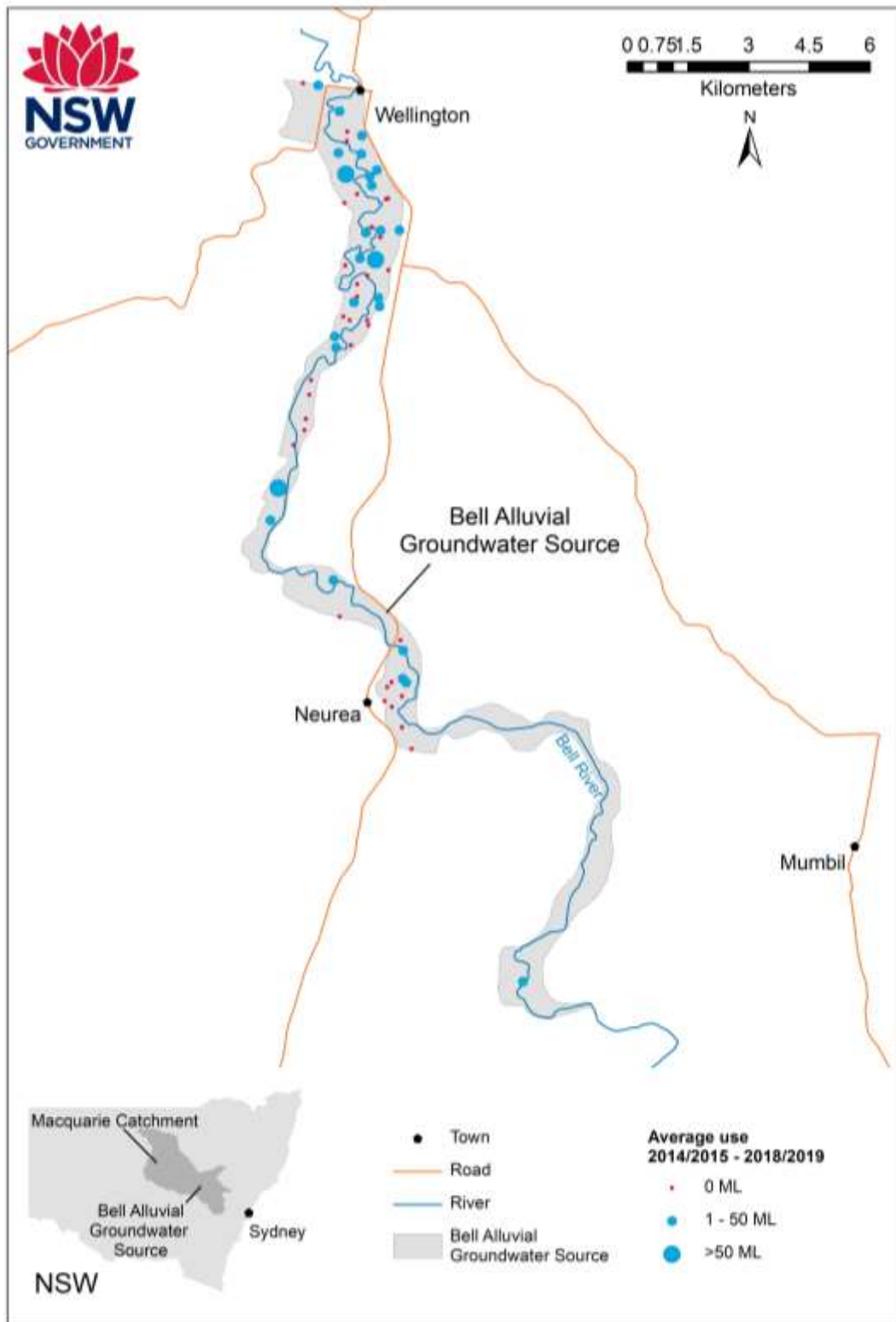


Figure 6: Bell Alluvial Groundwater Source distribution of extraction

## Bell Alluvial Groundwater Source

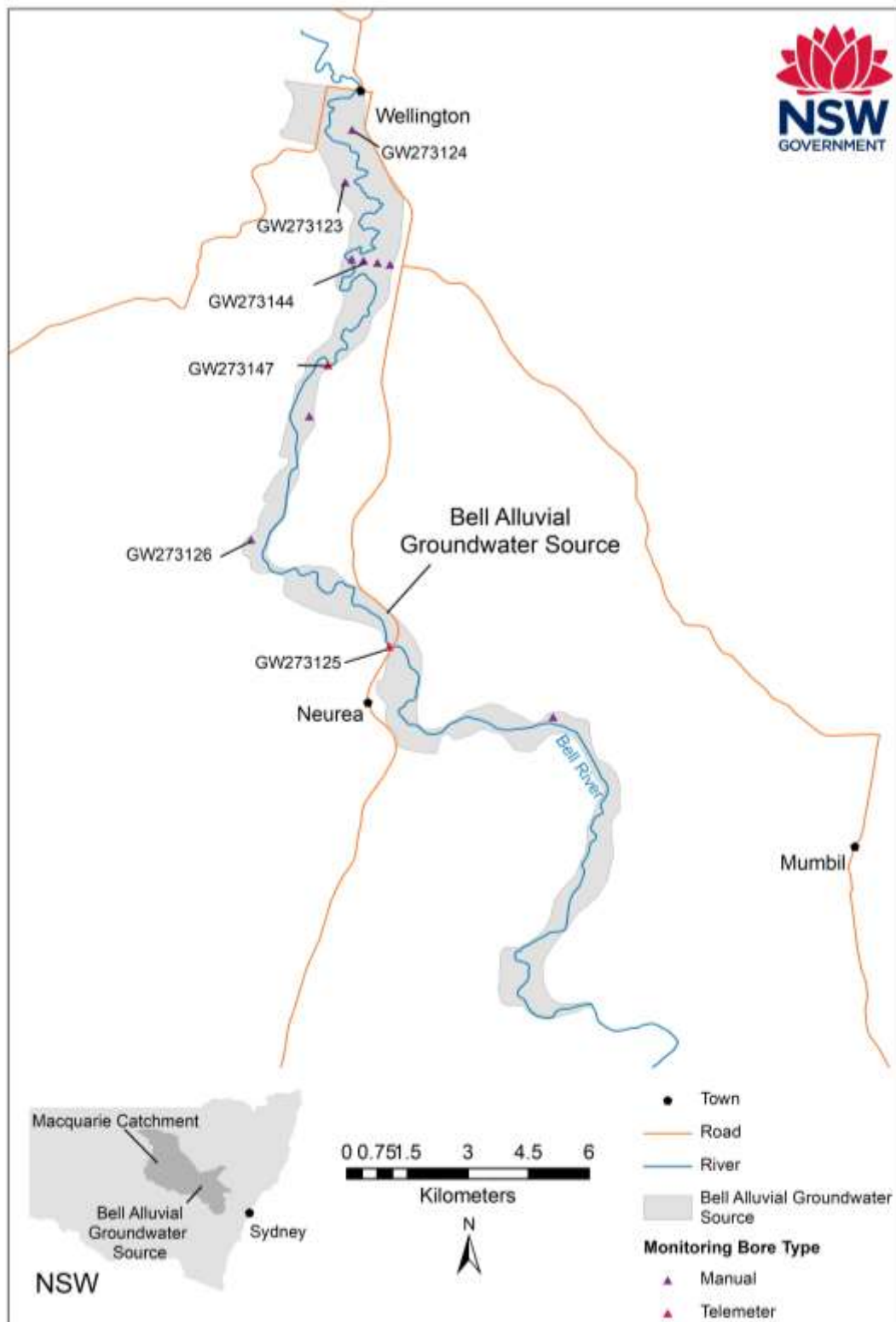
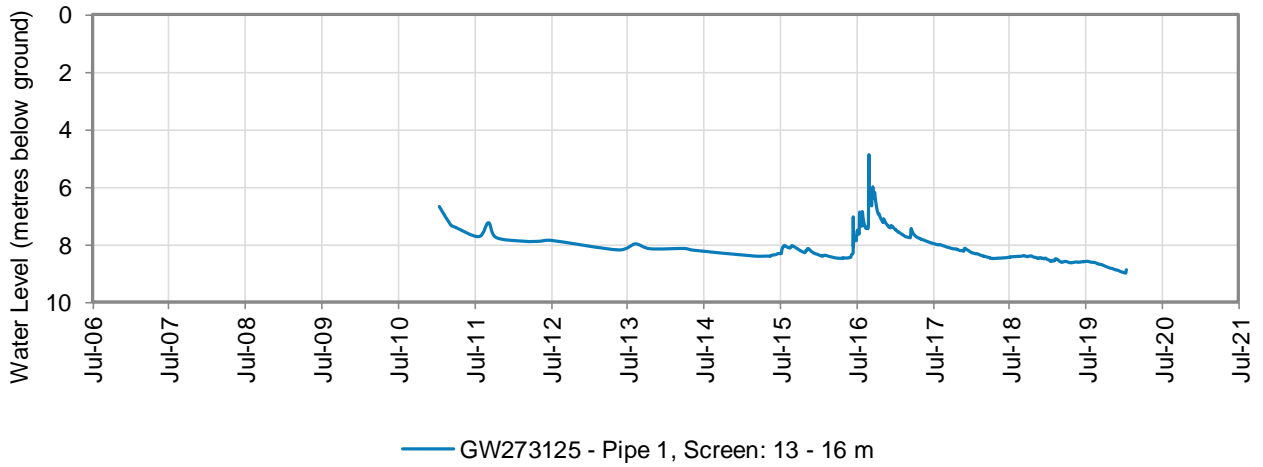


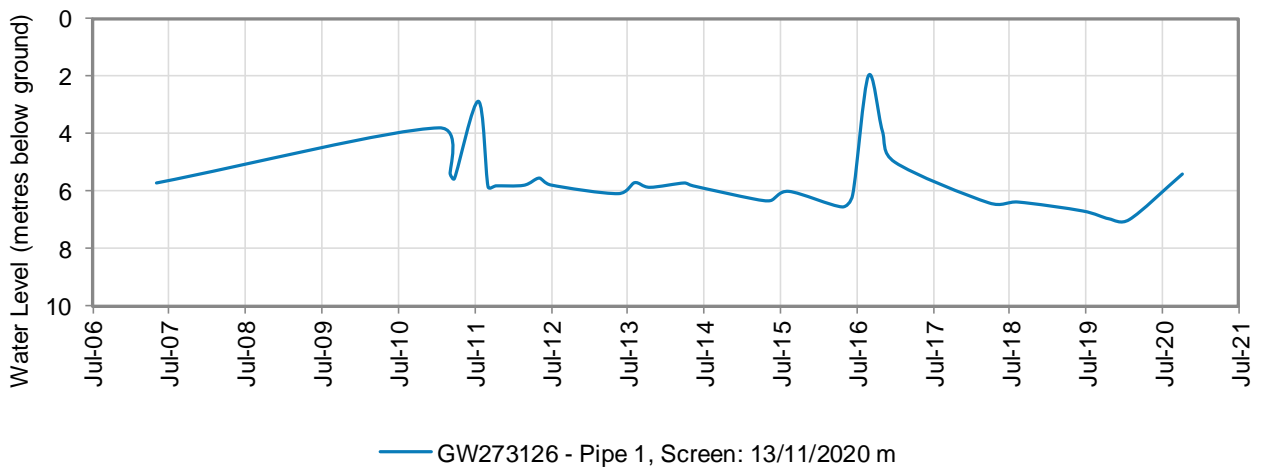
Figure 7: Bell Alluvial Groundwater Source monitoring bore sites

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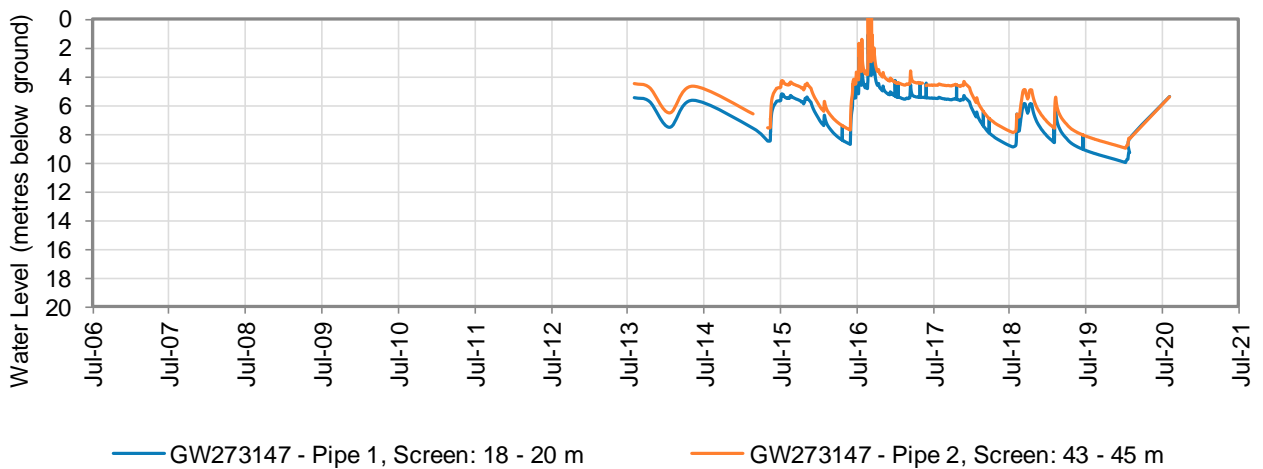
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**Figure 8: Hydrograph of monitoring bore GW273125**



**Figure 9: Hydrograph of monitoring bore GW273126**



**Figure 10: Hydrograph of monitoring bore GW273147**

## Bell Alluvial Groundwater Source

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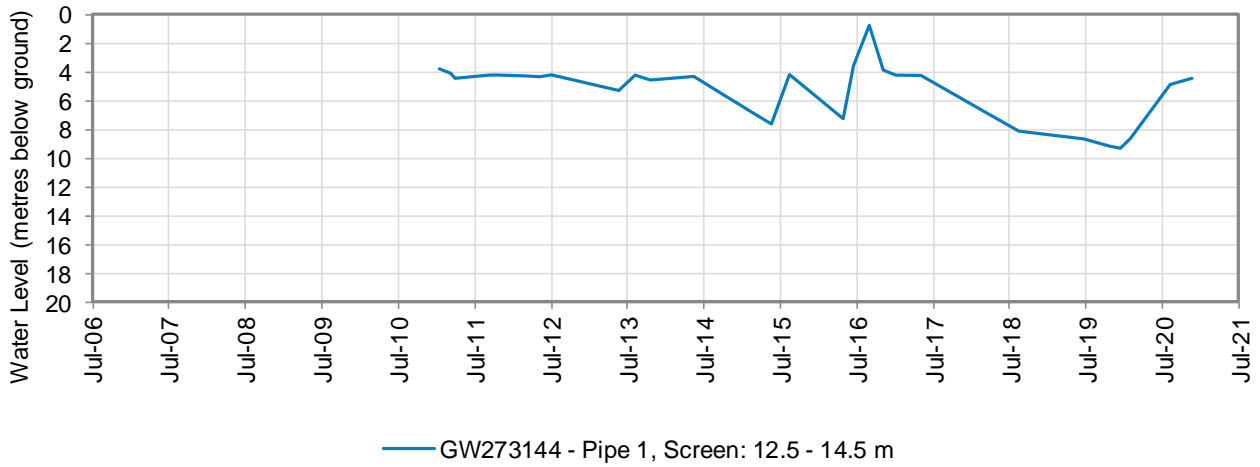


Figure 11: Hydrograph of monitoring bore GW273144

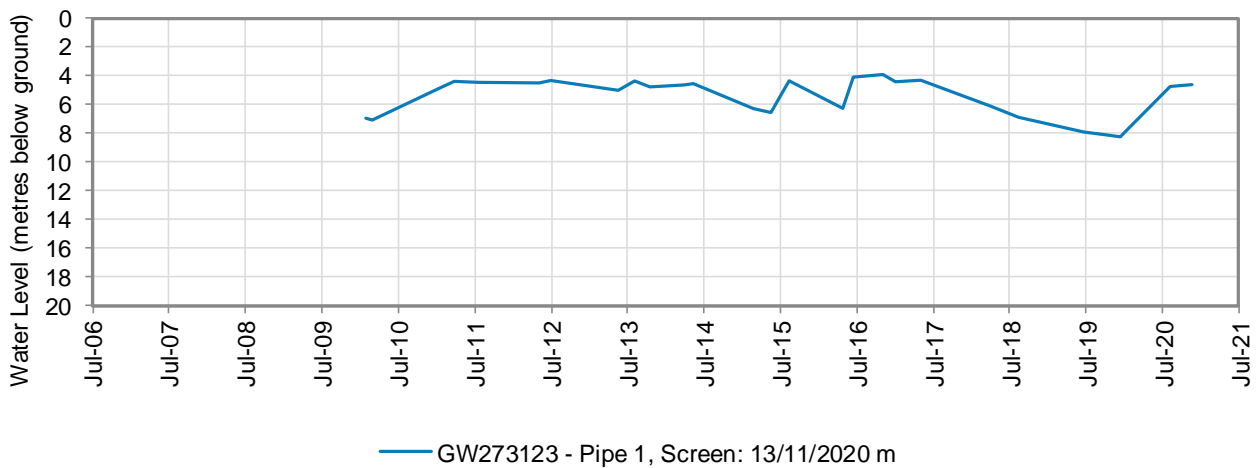


Figure 12: Hydrograph of monitoring bore GW273123

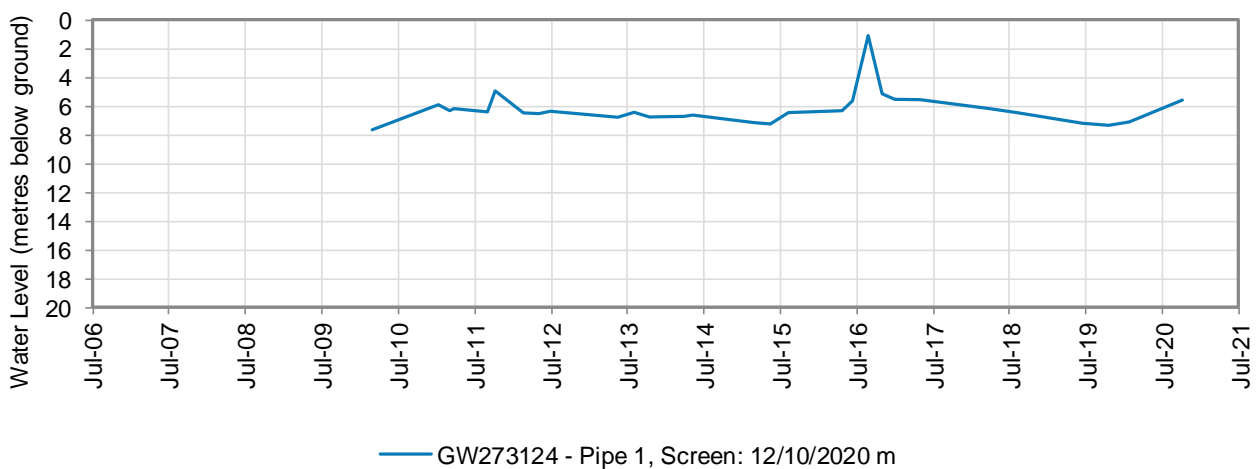


Figure 13: Hydrograph of monitoring bore GW273124

## Bell Alluvial Groundwater Source

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