

# Great Artesian Basin groundwater sources

## Introduction

This report is a summary of water accounts, volume pumped and groundwater levels for the Great Artesian Basin groundwater sources (GAB groundwater sources) for the period 1 July 2020 to 30 June 2021. It will be updated regularly.

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 NSW Great Artesian Basin: [www.industry.nsw.gov.au/\\_\\_data/assets/pdf\\_file/0007/291175/nsw-gab-resource-description-report.pdf](http://www.industry.nsw.gov.au/__data/assets/pdf_file/0007/291175/nsw-gab-resource-description-report.pdf)

## Description

The Great Artesian Basin (GAB) is Australia's largest groundwater basin, spreading across 1.7 million square kilometres of New South Wales (NSW), Queensland, South Australia and Northern Territory, which is approximately 22% of Australia.

The NSW GAB occurs across north western NSW and includes the following groundwater sources (Error! Reference source not found.):

- Eastern Recharge Groundwater Source
- Southern Recharge Groundwater Source
- Surat Groundwater Source
- Warrego Groundwater Source
- Central Groundwater Source

The GAB groundwater sources (Error! Reference source not found.) are comprised of sedimentary rock layers that form aquifers and aquitards containing groundwater that is mostly under artesian conditions.

## Water resource management

### Water sharing plan

The GAB groundwater sources are managed by the rules defined in the Water Sharing Plan for the NSW Great Artesian Basin Groundwater Sources 2020.

These water sharing plans are available for viewing on the Department of Planning, Industry and Environment website at: [www.industry.nsw.gov.au/water/plans-programs/water-sharing-plans/status/barwon-darling-west-region](http://www.industry.nsw.gov.au/water/plans-programs/water-sharing-plans/status/barwon-darling-west-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 volumes of water set aside in the water sharing plan for basic landholder rights are:

- 3,200 megalitres (ML) in the Eastern Recharge Groundwater Source.

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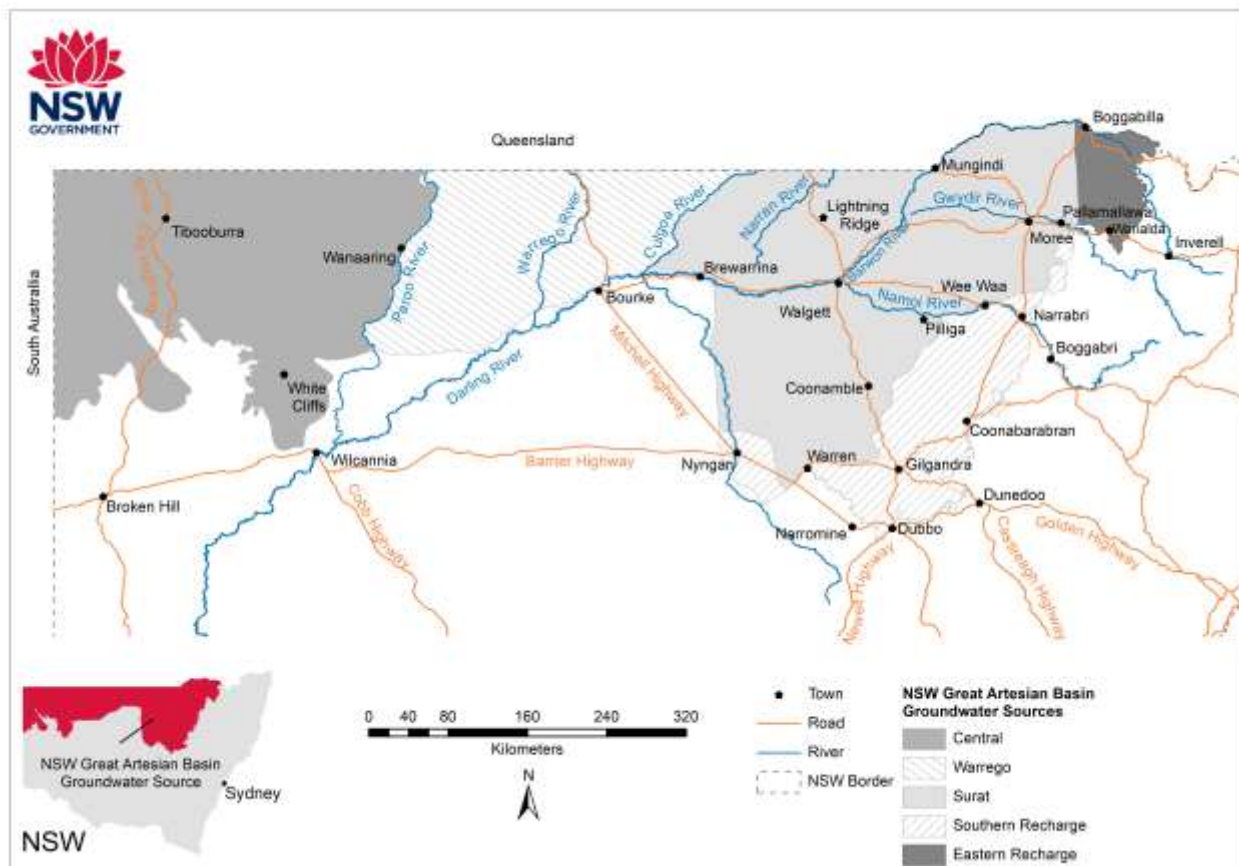


- 13,500 ML in the Southern Recharge Groundwater Source.
- 20,400 ML in the Surat Groundwater Source.
- 14,300 ML in the Warrego Groundwater Source.
- 3,600 ML in the Central Groundwater Source.

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.

Figure 1: Location map



### Groundwater access licences

Groundwater access licence share components for 2020 - 2021 are presented in **Table 1**.

**Table 1: GAB groundwater sources share component at 30 June 2021**

Eastern Recharge Groundwater Source		
Access Licence Category	Number of Licences	Total Volume
Domestic and Stock (Town Water Supply) <sup>1</sup>	1	32
Aquifer <sup>2</sup>	83	34,974
Southern Recharge Groundwater Source		
Access Licence Category	Number of Licences	Total Volume
Local Water Utility <sup>1</sup>	10	3,266
Aquifer <sup>2</sup>	161	25,023
Surat Groundwater Source		
Access Licence Category	Number of Licences	Total Volume
Local Water Utility <sup>1</sup>	12	3,793
Aquifer <sup>2</sup>	50	5,277
Aquifer (Town Water Supply)	1	25
Warrego Groundwater Source		
Access Licence Category	Number of Licences	Total Volume
Local Water Utility <sup>1</sup>	3	252
Aquifer <sup>2</sup>	6	406
Central Groundwater Source		
Access Licence Category	Number of Licences	Total Volume
Local Water Utility <sup>1</sup>	1	25
Aquifer <sup>2</sup>	10	43

<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 limits for the GAB groundwater sources are defined in the water sharing plan and listed in Error! Not a valid bookmark self-reference..

**Table 2: Extraction Limit for GAB groundwater sources**

Water Source	Extraction limit (ML/year)
Eastern Recharge Groundwater Source	16,200
Southern Recharge Groundwater Source	38,700
Surat Groundwater Source	*43,446

Water Source	Extraction limit (ML/year)
Warrego Groundwater Source	*8,816
Central Groundwater Source	*5,193

\*The extraction limits for Surat, Warrego and Central groundwater sources will vary over the term of the water sharing plan depending on the water savings made under the cap and pipe projects undertaken after 1 July 2020.

Extraction in the GAB groundwater sources is not compliant if the **5 years** average annual extraction (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 total 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: [www.industry.nsw.gov.au/water/allocations-availability/tracking-groundwater](http://www.industry.nsw.gov.au/water/allocations-availability/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

Total water credited to an access licence account in a water year is controlled by the available water determinations 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 GAB groundwater sources are provided in **Table 3**.

**Table 3: GAB groundwater sources access licence account rules**

Access Licence Category	Carryover Limit	Annual Use Limit	Maximum AWD
Local Water Utility	0 ML/share	1 ML/share	1 ML/share
Domestic and Stock Access Licences	0 ML/share	1 ML/share	1 ML/share
Aquifer	0.6 ML/share	1.3 ML/share	1 ML/share
Aquifer (Town Water Supply)	0.6 ML/share	1.3 ML/share	1 ML/share

The maximum amount of water that can be debited from an aquifer access licence account in any one water year cannot exceed 1.3 ML per unit share component (annual use limit), plus any allocation transferred in (temporary trade), minus any allocation transferred out.

This means that metered extraction plus transfers out cannot exceed 130% of the of share component, unless water is transferred in.

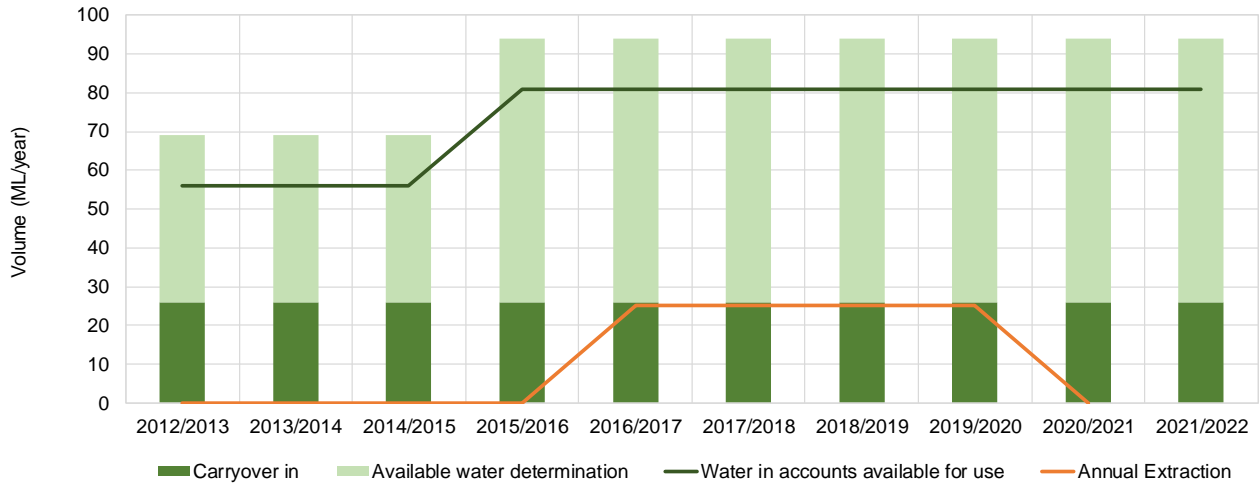
Total account water is displayed in Error! Reference source not found. to 6 showing the proportion available for use and what is not available for use in a year. Total yearly extraction is also displayed.

Note: all access licence categories have been combined in **Figures 2 to 6**.

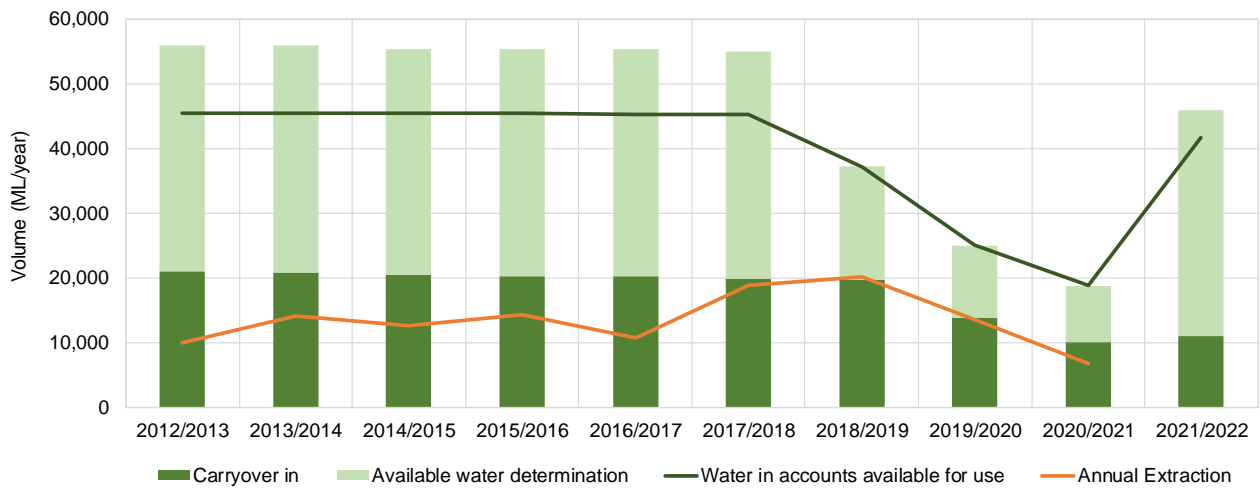
**Table 4: Access licence account information**

<b>Eastern Recharge Groundwater Source</b>	
Carryover In (ML)	10,956
Available water determination (ML)	35,006
Total water in account (ML)	45,962
Water available for use (ML)	41,679
<b>Southern Recharge Groundwater Source</b>	
Carryover In (ML)	27,753
Available water determination (ML)	27,753
Total water in account (ML)	42,186
Water available for use (ML)	34,901
<b>Surat Groundwater Source</b>	
Carryover In (ML)	2,829
Available water determination (ML)	9,095
Total water in account (ML)	11,924
Water available for use (ML)	10,515
<b>Warrego Groundwater Source</b>	
Carryover In (ML)	237
Available water determination (ML)	658
Total water in account (ML)	895
Water available for use (ML)	773
<b>Central Groundwater Source</b>	
Carryover In (ML)	26
Available water determination (ML)	68
Total water in account (ML)	94
Water available for use (ML)	81

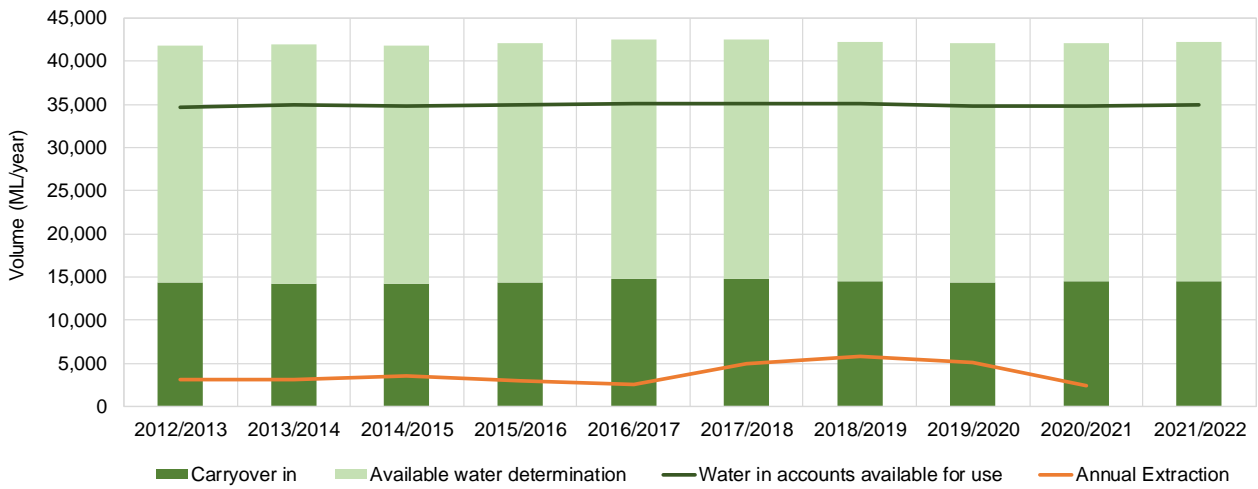
**Figure 2: Account water availability and usage summary Central Groundwater Source**



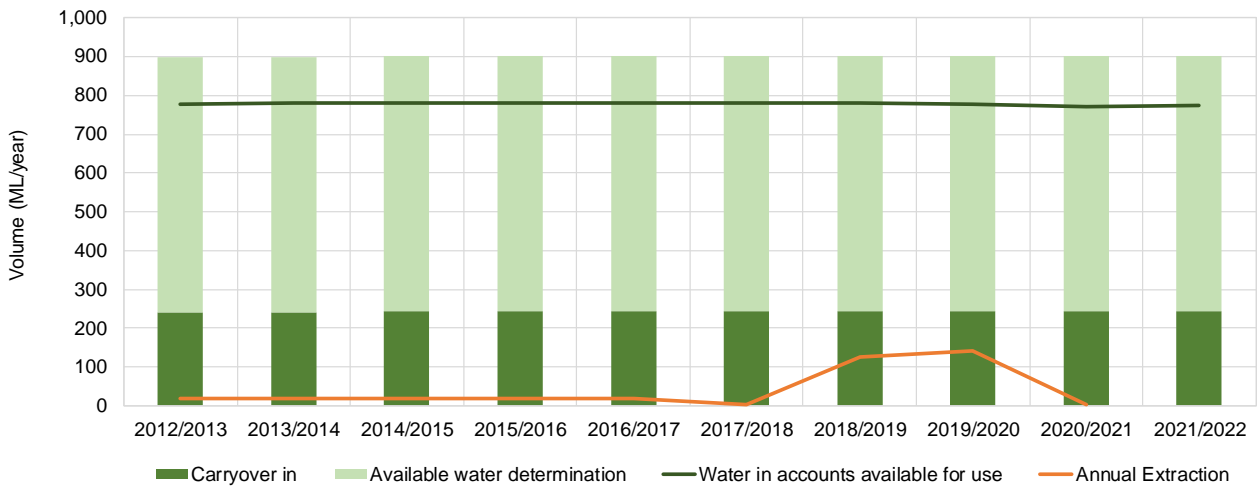
**Figure 3: Account water availability and usage summary for Eastern Recharge Groundwater Source**



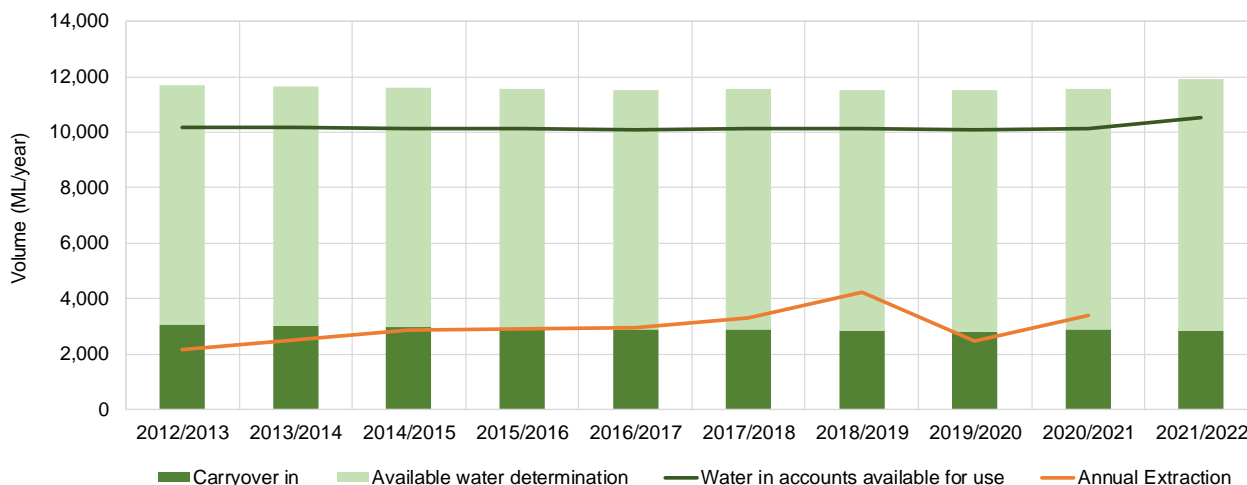
**Figure 4: Account water availability and usage summary for Southern Recharge Groundwater Source**



**Figure 5: Account water availability and usage summary for Warrego Groundwater Source**



**Figure 6: Account water availability and usage summary for Surat Groundwater Source**



## Groundwater trading

Trades are allowed within the Eastern Recharge and Southern Recharge groundwater sources. You can't trade between these groundwater sources or with any other groundwater source.

Trades are allowed between the Surat, Warrego and Central groundwater sources, but not between them and any other groundwater source.

No trading is currently allowed between states.

### Allocation assignments (temporary trade)

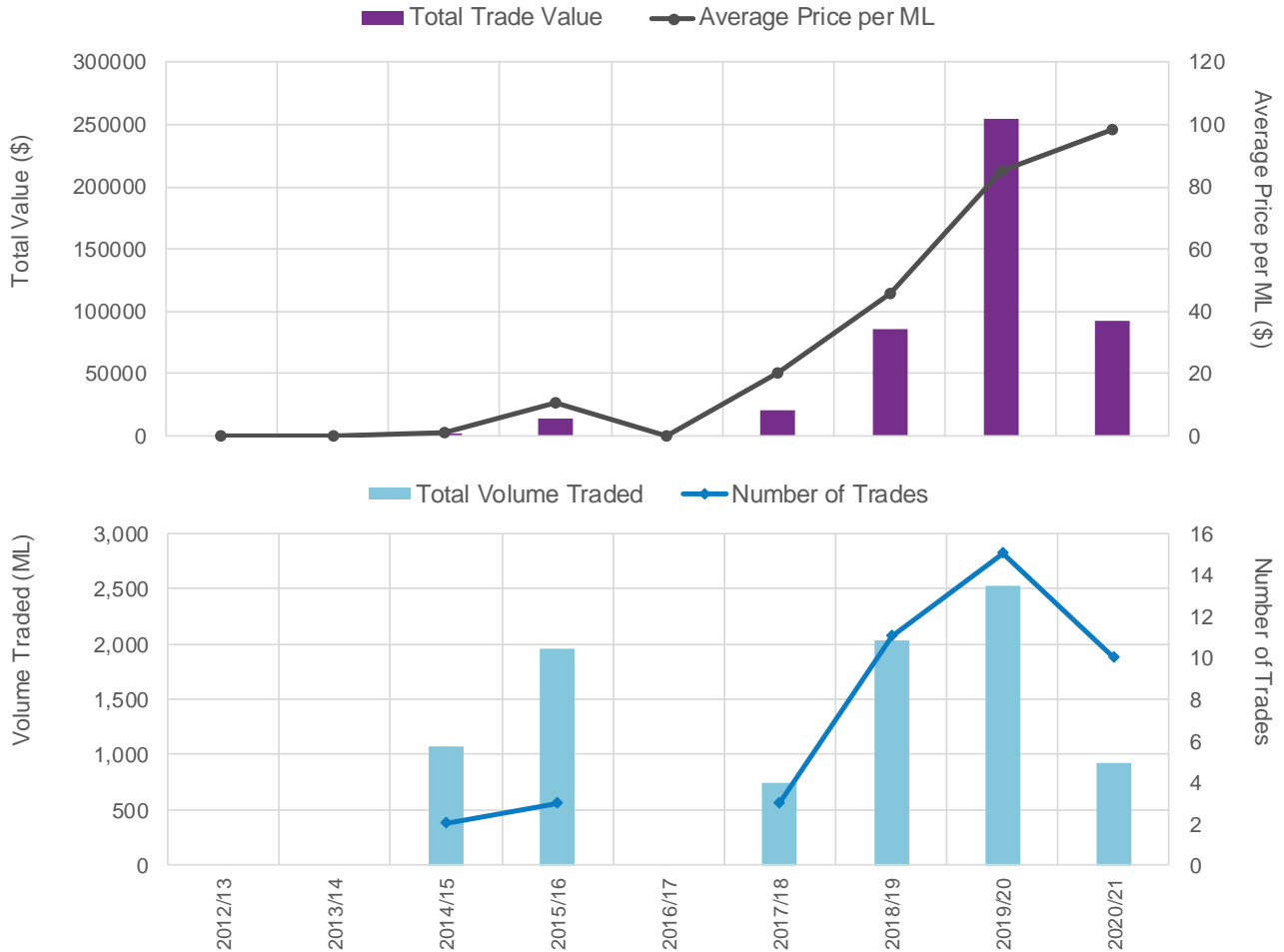
Trading statistics for the Eastern Recharge Groundwater Source and Southern Recharge groundwater sources are illustrated in **Figures 7** and **8**, these graphs exclude temporary trades for less than \$1 per megalitre. There has been no temporary trading in the Central and Surat groundwater sources and limited trades in the Warrego Groundwater Source (**Table 5**).

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

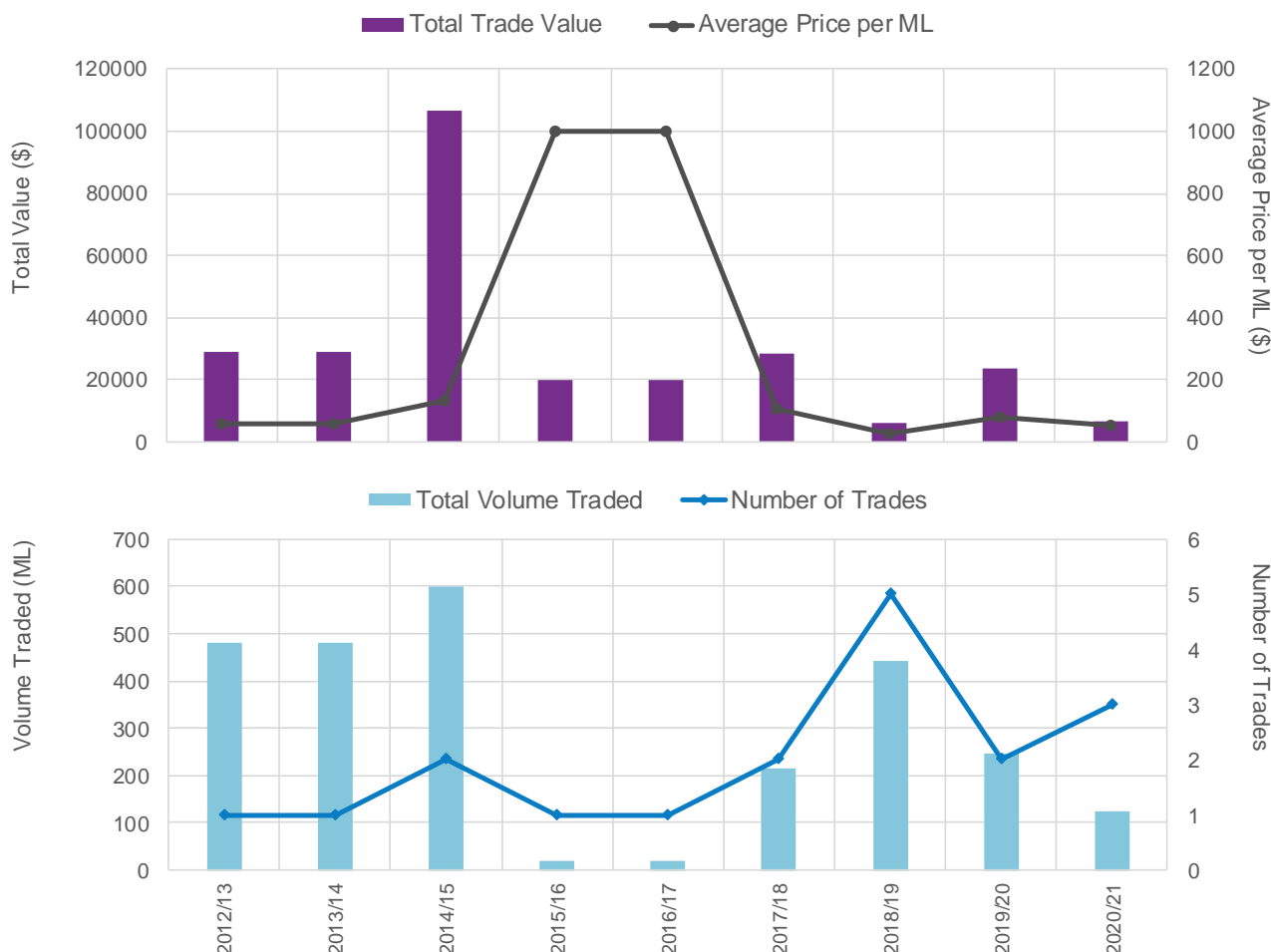
[waterregister.watersw.com.au/water-register-frame](http://waterregister.watersw.com.au/water-register-frame)



**Figure 7: Eastern Recharge Groundwater Source temporary trade statistics**



**Figure 8: Southern Recharge Groundwater Source temporary trade statistics**



**Table 5: Warrego Groundwater Source temporary trade statistics**

Year	Number of Trades	Total Volume Traded (ML)	Total Trade Value (\$)	Average Price per ML (\$)
2018/19	1	60	10,000	166.66
2019/20	1	225	22,500	100

## Bores

There are approximately 8,190 registered bores across the GAB groundwater sources (Error! Reference source not found.9). The majority of these bores are used for stock and domestic purposes. There is also use of groundwater for irrigation (Error! Not a valid bookmark self-reference.6).

Production bores in the GAB Groundwater Sources are concentrated in the Eastern Recharge Groundwater Source and Southern Recharge Groundwater Source, with lesser amounts in the other three groundwater sources diminishing further to the west (Error! Reference source not found.10).

**Table 6: Number of licensed water supply bores in the GAB groundwater sources (at June 2021)**

Groundwater Source	Registered Bore Type		
	Basic Landholder Rights	Production	Local Water Utility
Eastern Recharge	783	118	0
Southern Recharge	4294	193	31
Surat	1305	47	16
Warrego	668	6	8
Central	725	8	1

## Water level monitoring

WaterNSW monitors groundwater levels in 90 pipes at 57 sites in the Eastern and Southern Recharge groundwater sources, as well as artesian pressure. While flow and temperature are monitored in 66 private bores in the Central, Warrego and Surat groundwater sources (**Figure 11**).

At some 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 **Figures 12 to 28**.

Data for the monitored bores, as well as private bore information, can be obtained from the WaterNSW real time data portal ([realtimedata.waternsw.com.au/](http://realtimedata.waternsw.com.au/)). It includes data for 33 groundwater monitoring sites in real-time via telemetry.

You can also request information via: [Customer.Helpdesk@waternsw.com.au](mailto:Customer.Helpdesk@waternsw.com.au)

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Figure 9: GAB groundwater sources registered bores

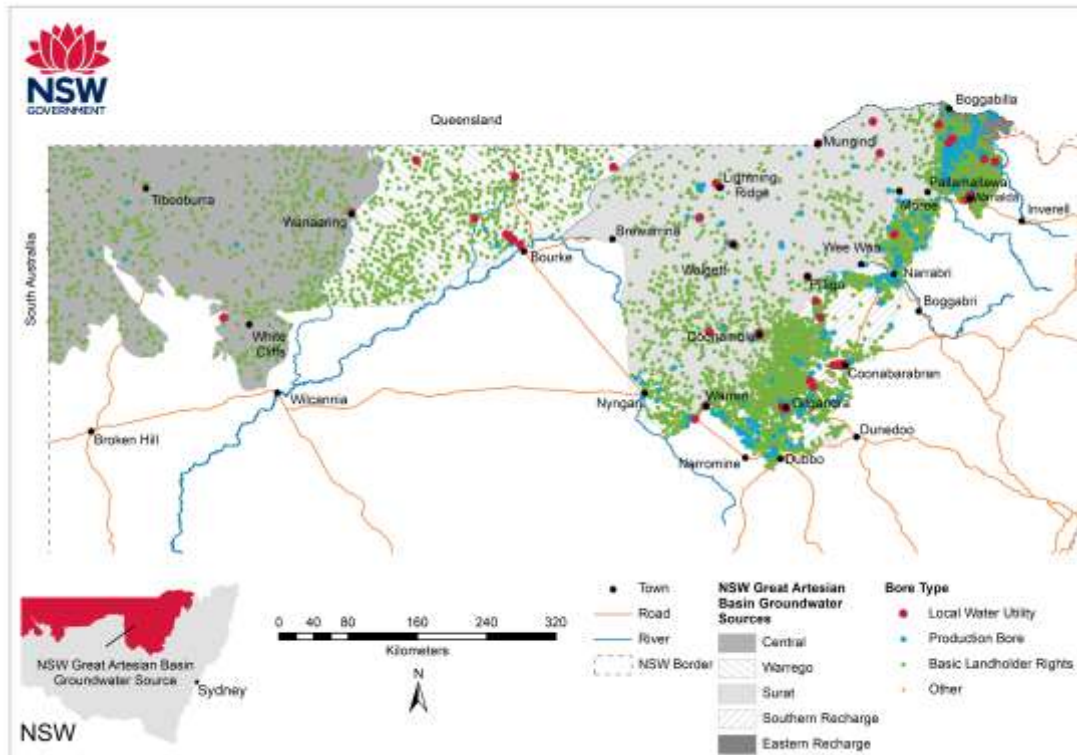


Figure 10: GAB groundwater sources water supply bores and distribution of extraction

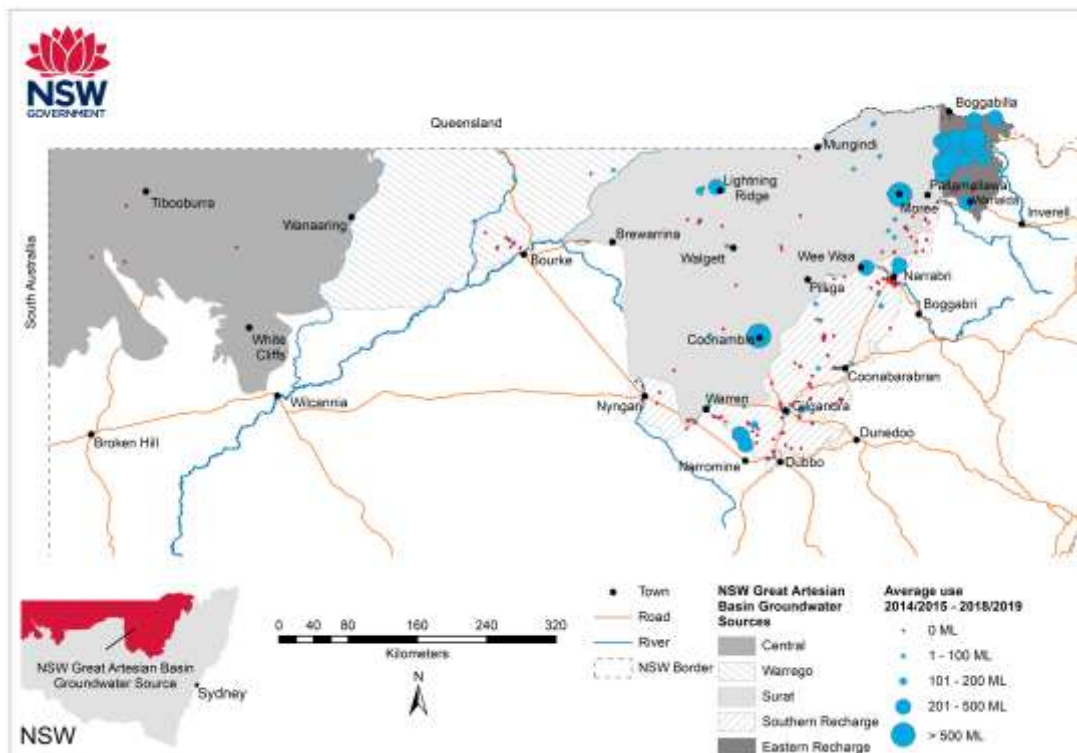
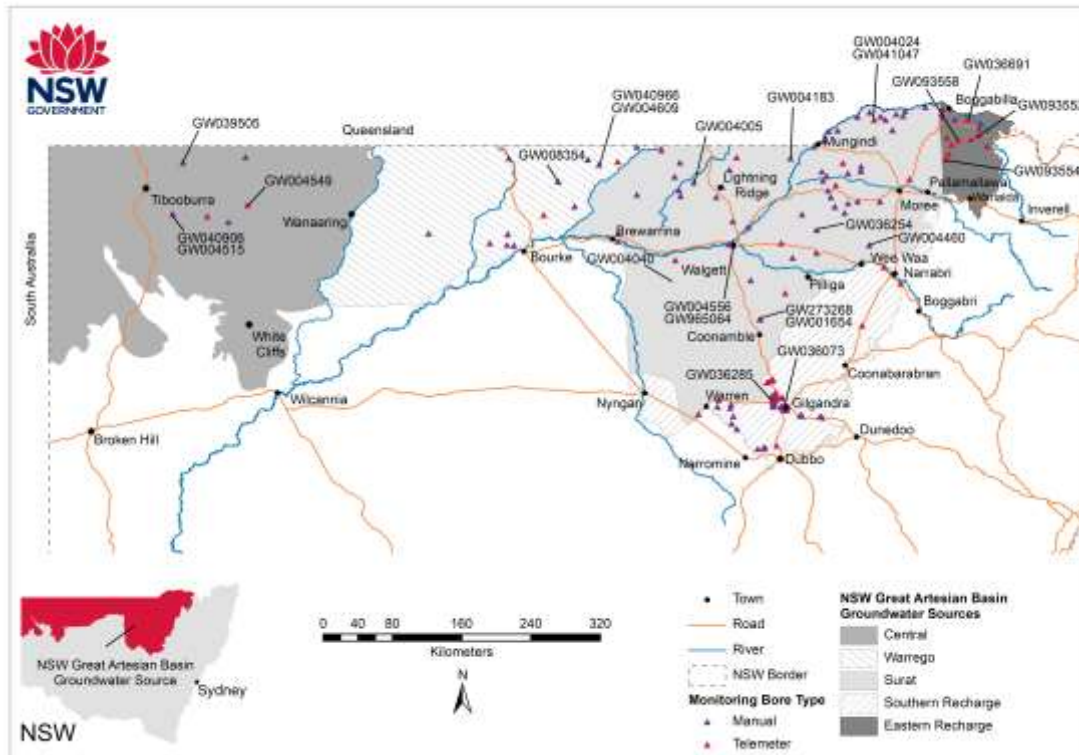
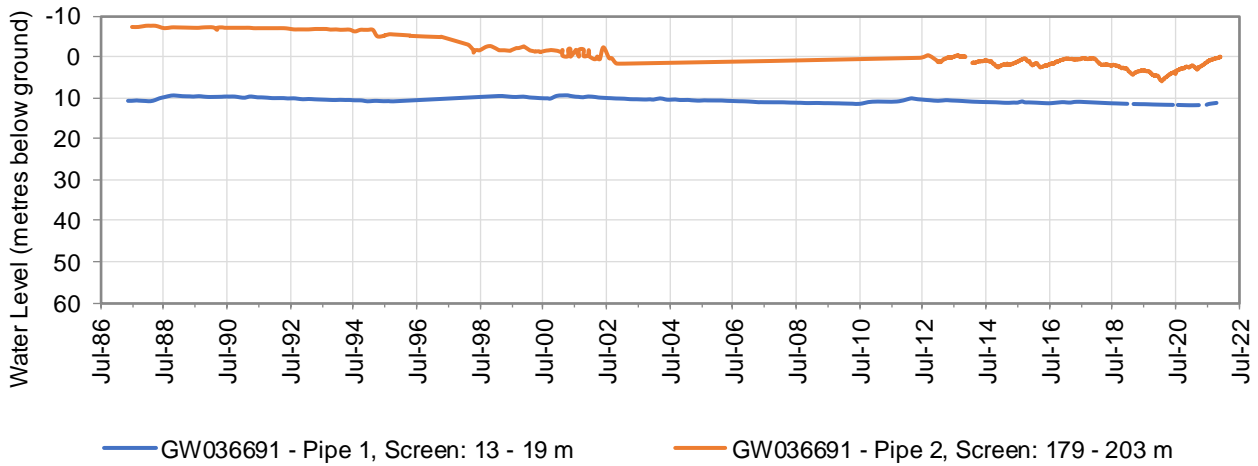


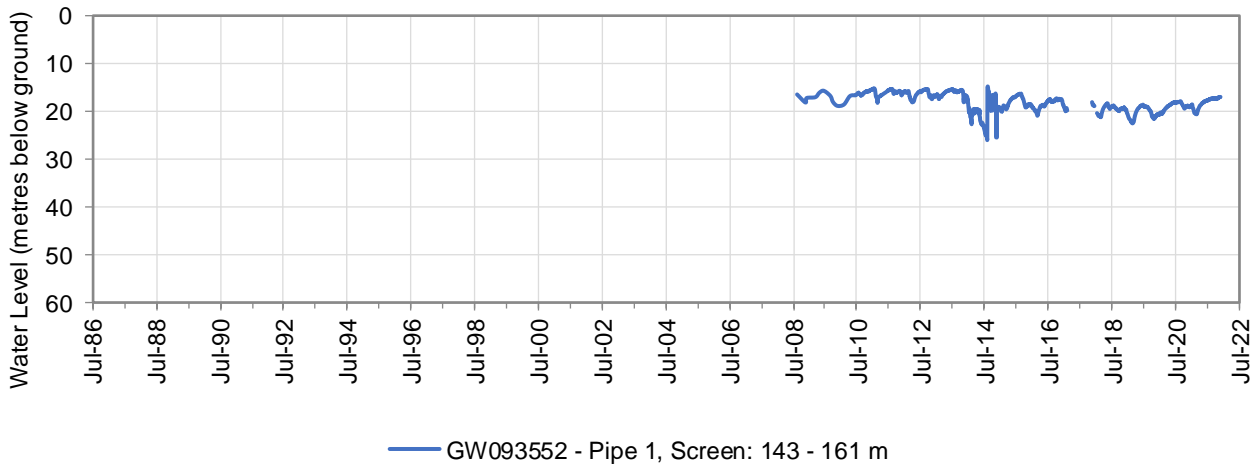
Figure 11: GAB groundwater source monitoring bore sites



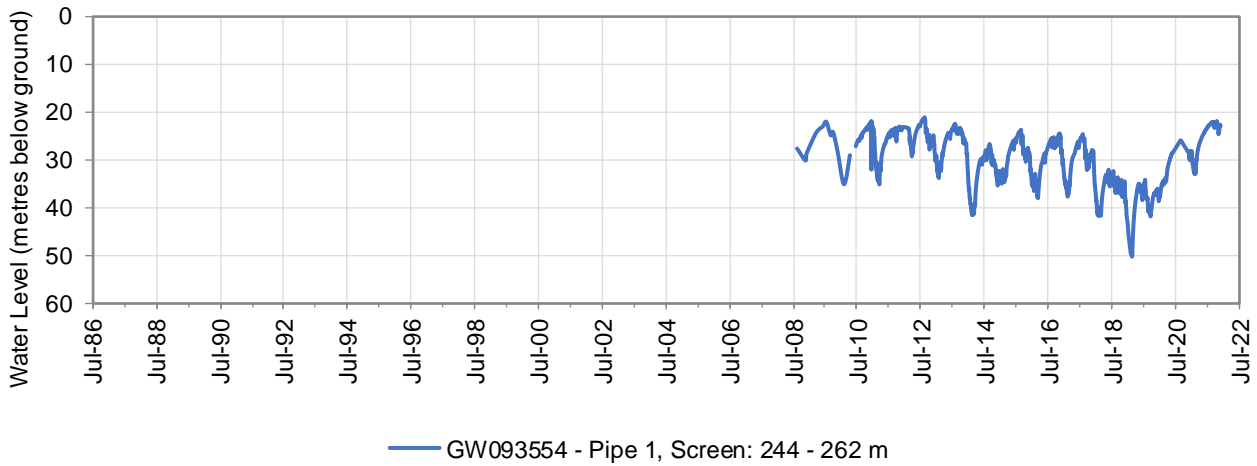
**Figure 12: Hydrograph for monitoring bore GW036691 – Eastern Recharge Groundwater Source**



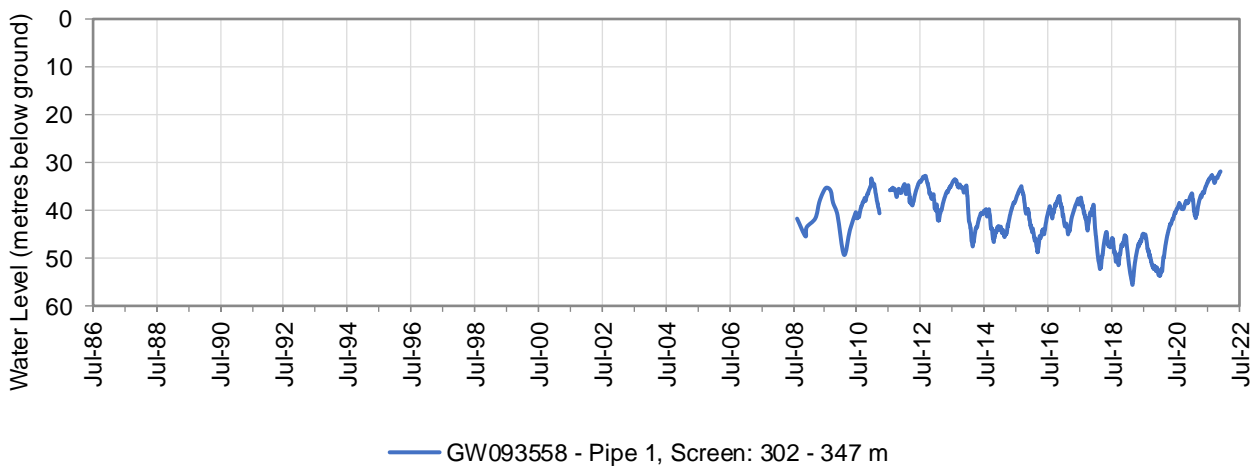
**Figure 13: Hydrograph for monitoring bore GW093552 – Eastern Recharge Groundwater Source**



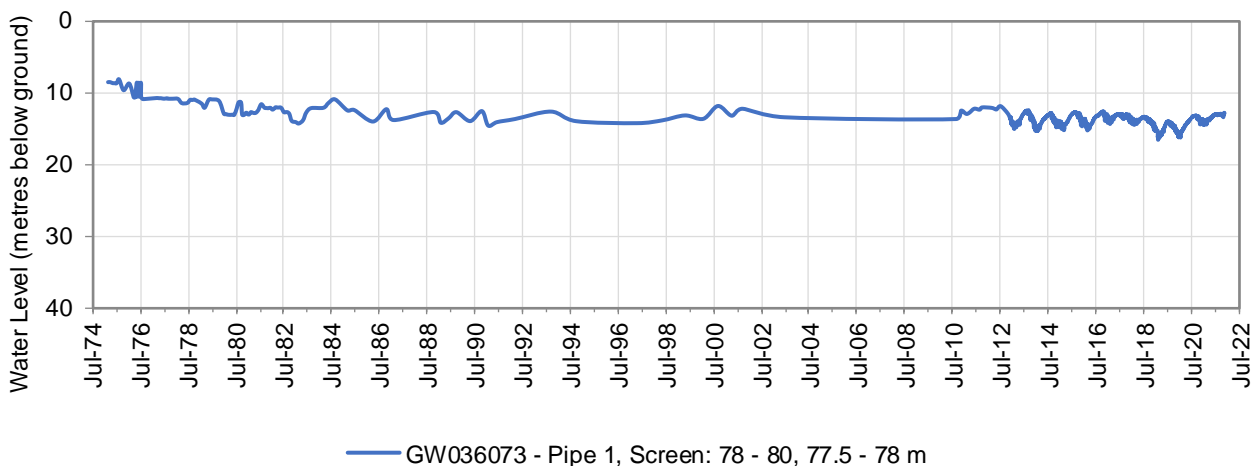
**Figure 14: Hydrograph for monitoring bore GW093554 – Eastern Recharge Groundwater Source**



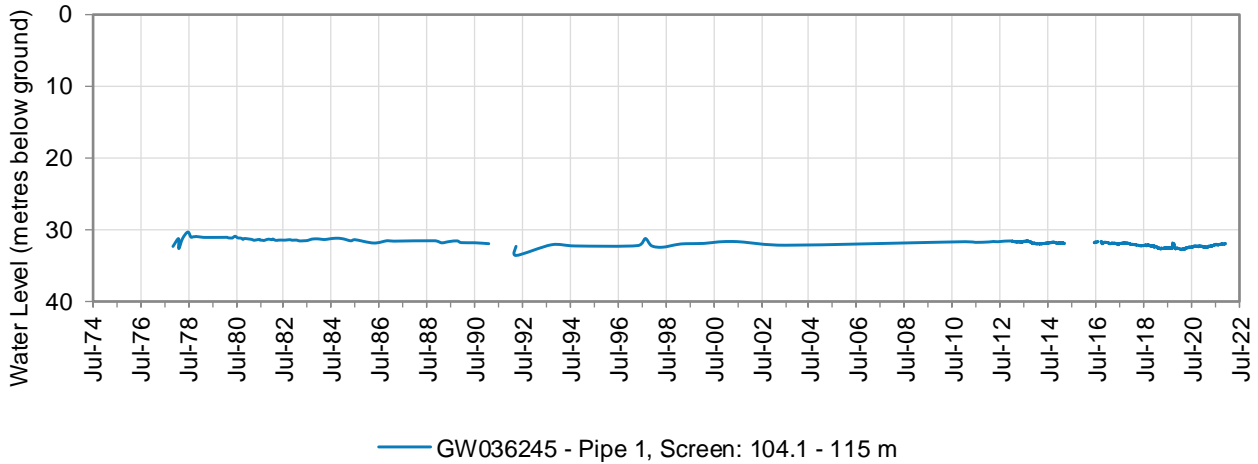
**Figure 15: Hydrograph for monitoring bore GW093558 – Eastern Recharge Groundwater Source**



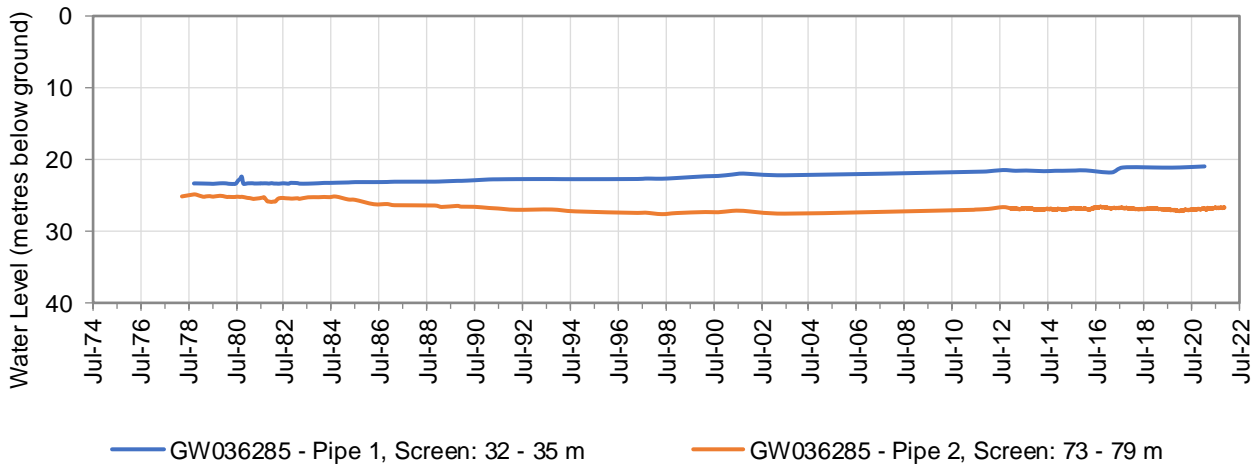
**Figure 16: Hydrograph for monitoring bore GW036073 – Southern Recharge Groundwater Source**



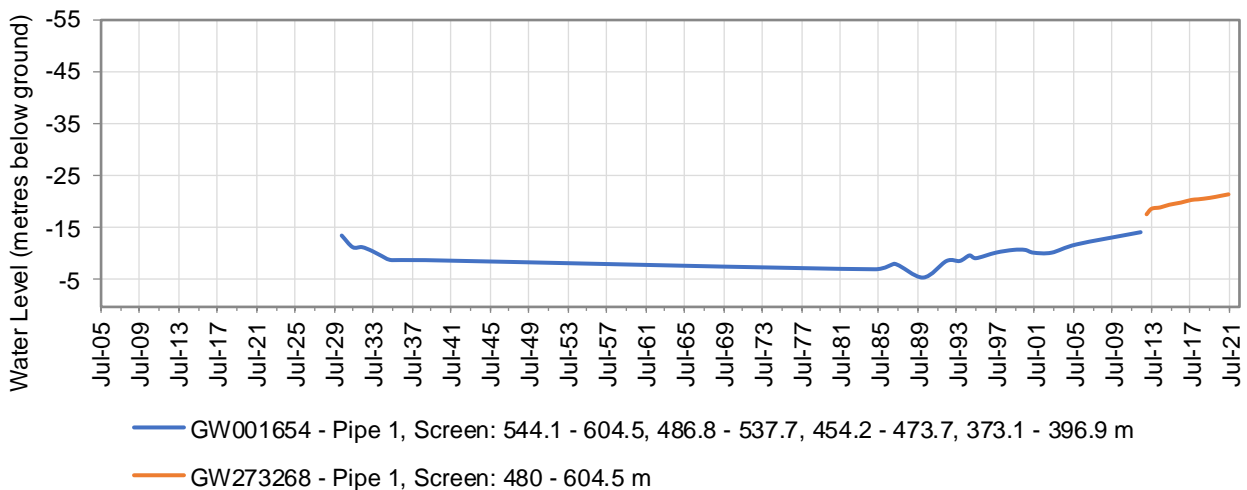
**Figure 17: Hydrograph for monitoring bore GW036245 – Southern Recharge Groundwater Source**



**Figure 18: Hydrograph for monitoring bore GW036285 – Southern Recharge Groundwater Source**

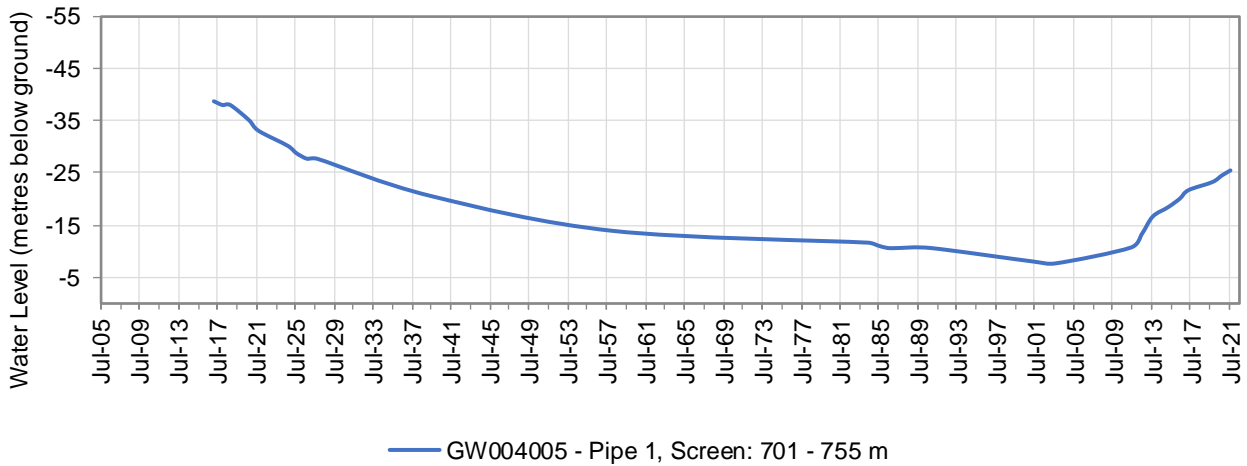


**Figure 19: Hydrograph for monitoring bore GW001654 (Whittonbri – Plugged) and GW273268 (Whittonbri No 2) – Surat Groundwater Source**

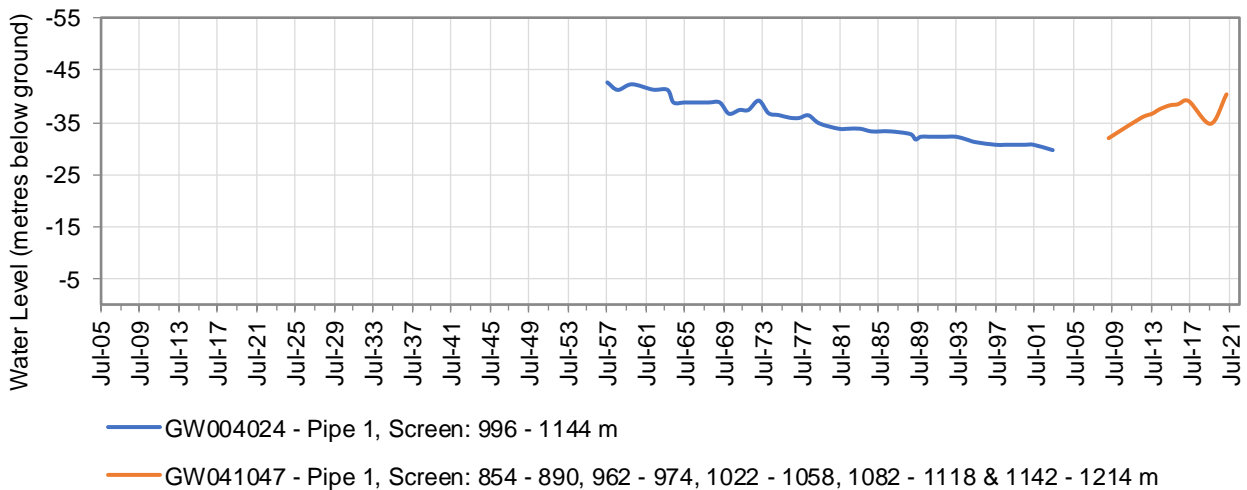




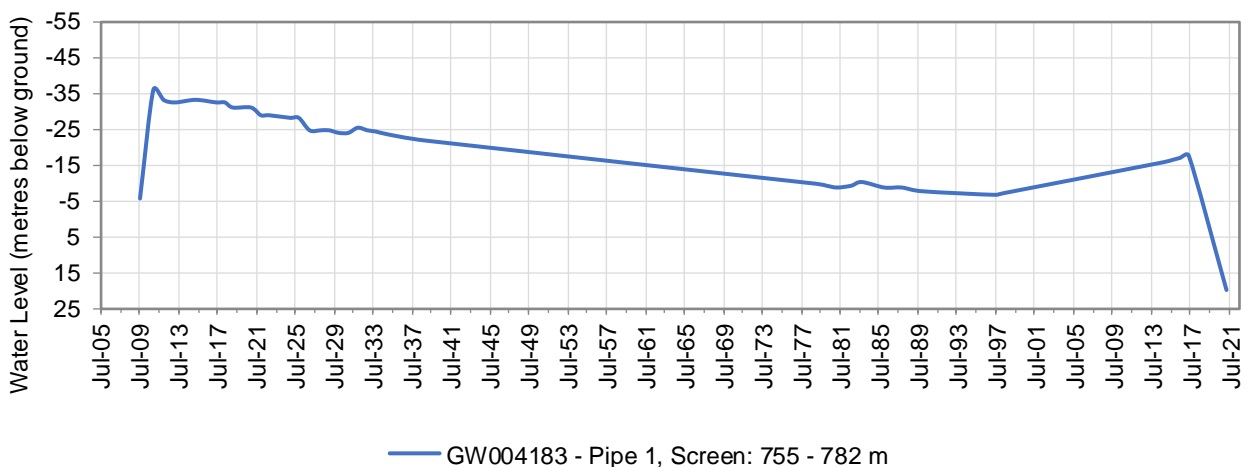
**Figure 20: Hydrograph for monitoring bore GW004005 (Bangate No 2) – Surat Groundwater Source**



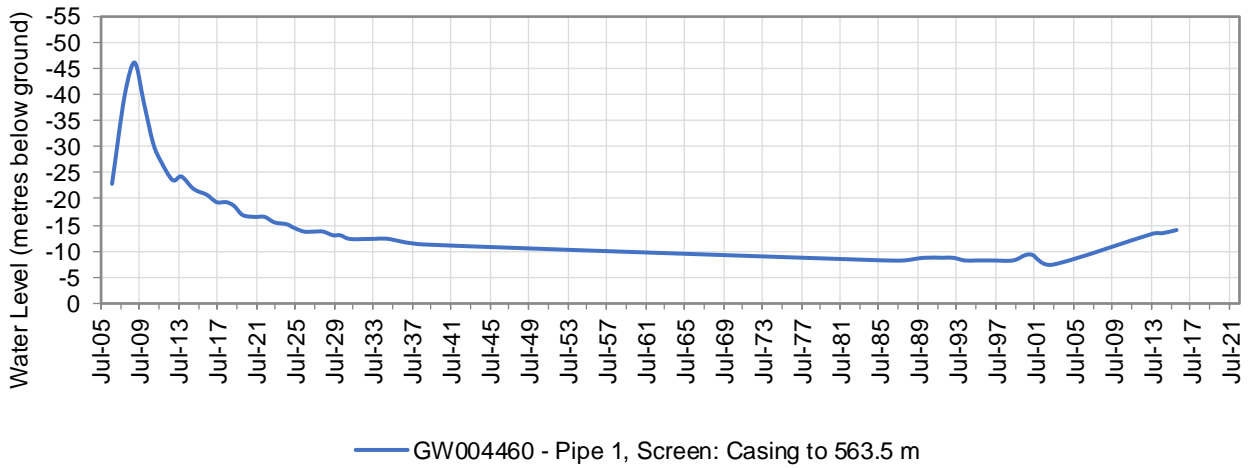
**Figure 21: Hydrograph for monitoring bore GW004024 (Boomi – Plugged) and GW041047 (Boomi East No 2) – Surat Groundwater Source**



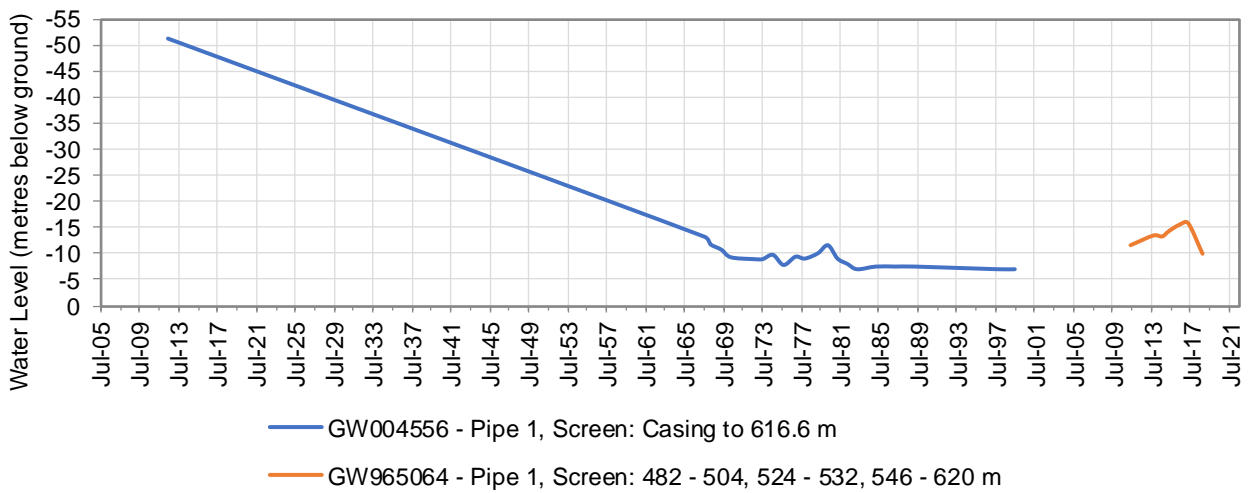
**Figure 22: Hydrograph for monitoring bore GW004183 (Eulalie) – Surat Groundwater Source**



**Figure 23: Hydrograph for monitoring bore GW004460 (Roma) – Surat Groundwater Source**



**Figure 24: Hydrograph for monitoring bore GW004556 (Walgett TWS – Plugged) and GW965064 (Ulumbie No 2) – Surat Groundwater Source**

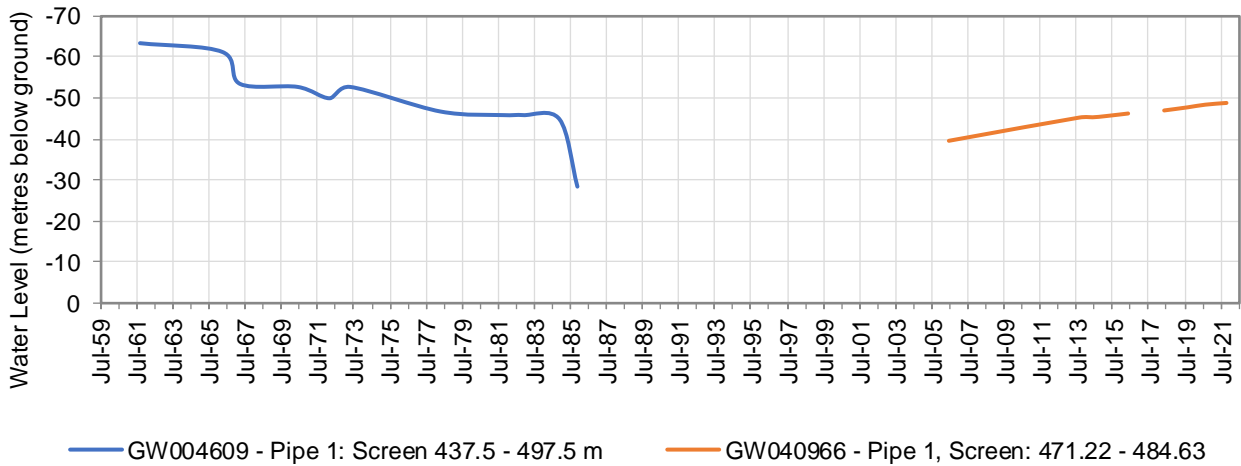


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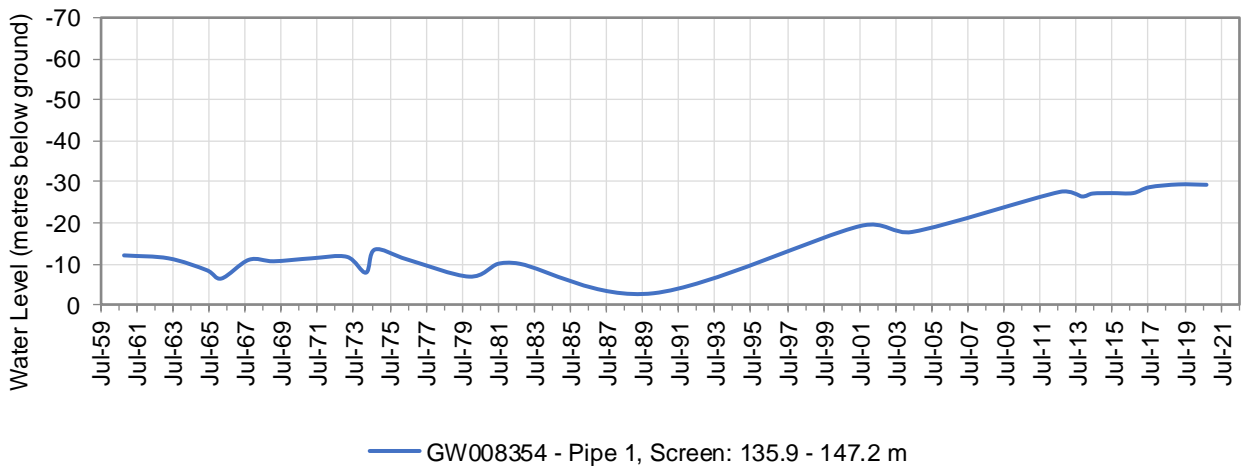
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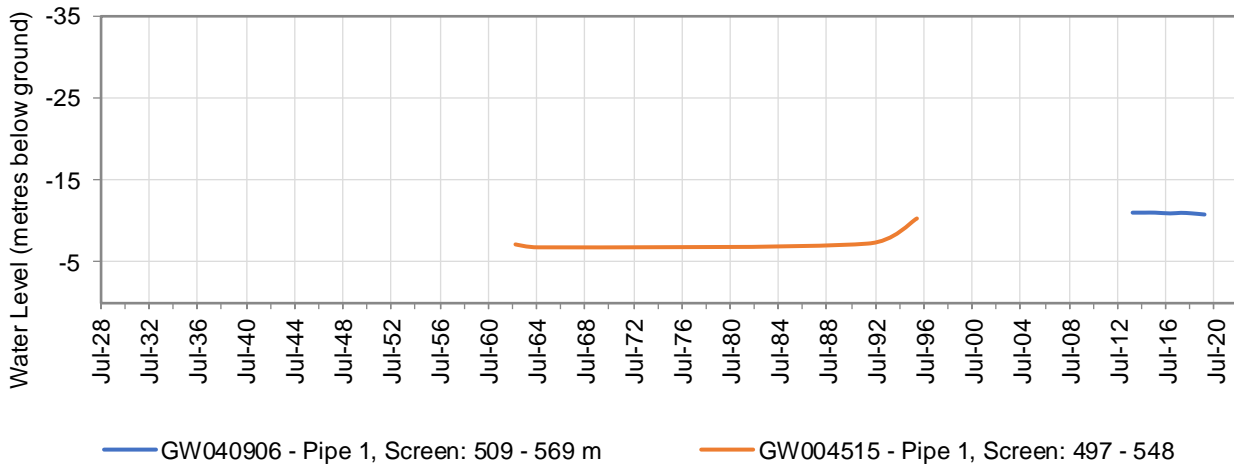
**Figure 25: Hydrograph for monitoring bore GW004609 (Weilmoringle No 2 – Plugged) and GW0040966 (Orana) – Warrego Groundwater Source**



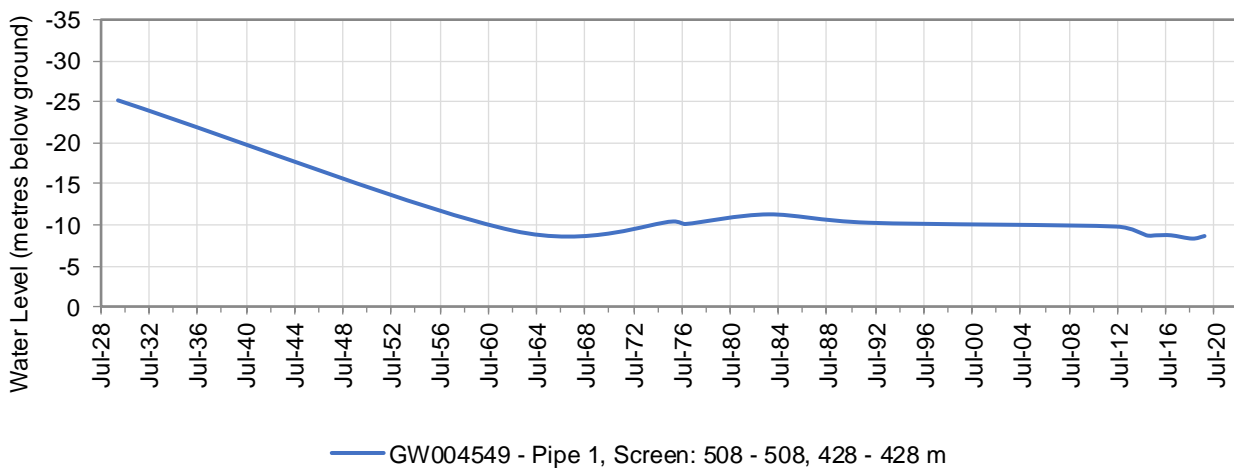
**Figure 26: Hydrograph for monitoring bore GW008354 (Oswald) – Warrego Groundwater Source**



**Figure 27: Hydrograph for monitoring bore GW040906 (Tineroo No 2) and GW004515 (Tineroo – Plugged) – Central Groundwater Source**



**Figure 28: Hydrograph for monitoring bore GW004549 (Urisino No 4) - Central Groundwater Source**



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