



Lower Murray Groundwater Source Summary Report 2006-2014

Water sharing plan

The Lower Murray Groundwater Source is managed under the *Water Management Act 2000* (WMA2000). The Water Sharing Plan for Lower Murray commenced on 1 November 2006. It sets the legal framework for managing the groundwater resource until July 1, 2017.

A copy of the Plan can be viewed and downloaded from the NSW legislation website or from the following link:

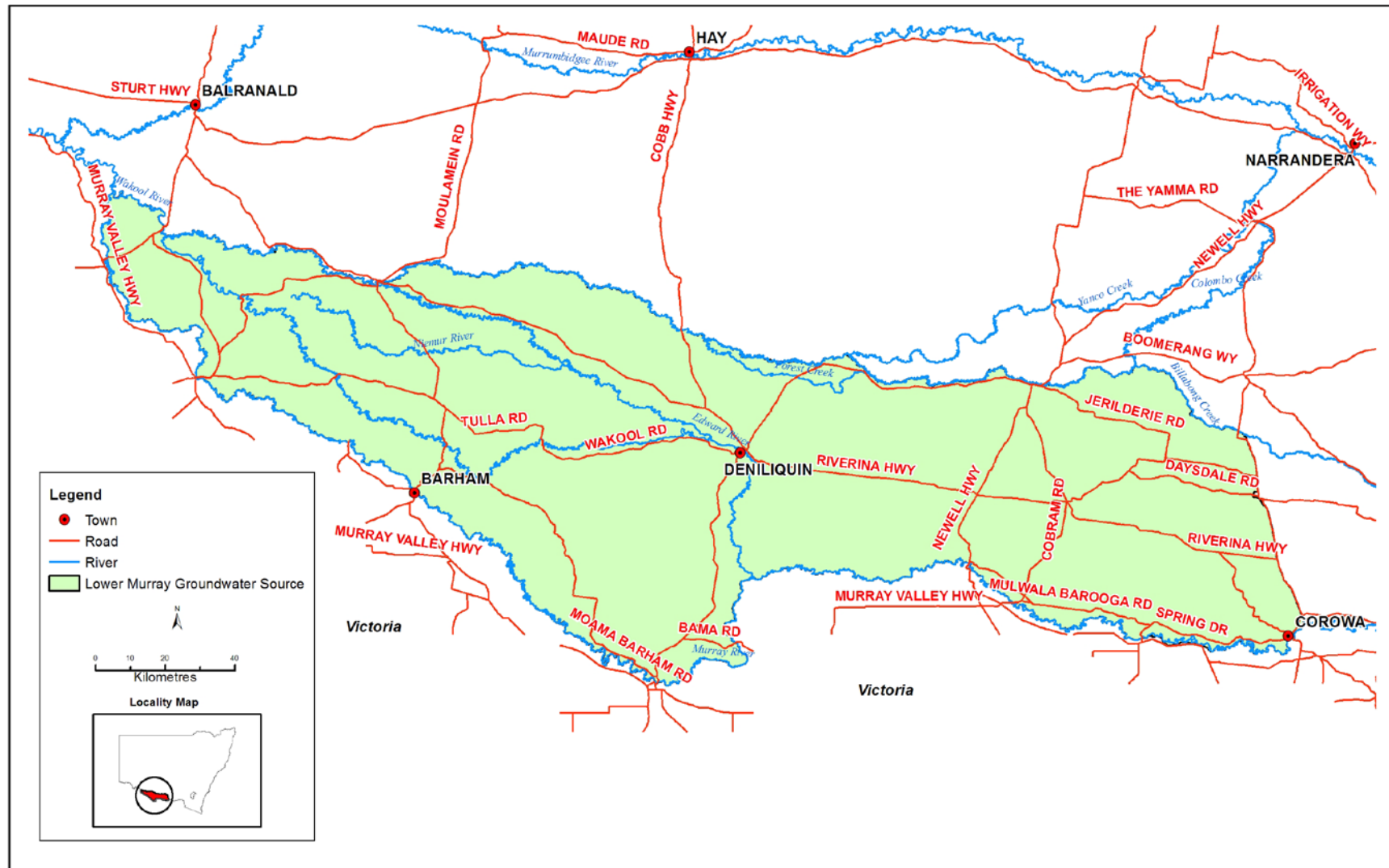
www.water.nsw.gov.au/Water-management/Water-sharing-plans/Plans-commenced/Water-source/Lower-Murray-Groundwater-Source

Location and description of the water source

The Lower Murray Groundwater Source (hereafter this groundwater source) includes all water contained in the unconsolidated alluvial aquifers deeper than 12 metres below the ground surface within the area shown in **Figure 1**. These sediments are defined as the Shepparton Formation, the Calivil Formation and the Renmark Group.

The lower Shepparton Formation is generally yellow to brown poorly sorted sand and clay sediments that extend to a depth of 20 to 50 metres below the ground surface. The Calivil Formation and Renmark Group are composed of pale grey to white quartz sand layers, with lenses of grey to white clay, peat and coal extending from the bottom of the Shepparton Formation down to the bedrock, with a maximum depth of 350 metres.

Figure 1 Map of the Lower Murray Groundwater Source



Access licences

There are three main categories of access licences in this water source. These are:

- local water utility access licence,
- aquifer access licence, and
- supplementary access licence.

There is also an aquifer access licence sub category of town water supply for the purpose of supply to communities for domestic consumption and commercial activities.

The entitlement held for each access licence category in the water source is summarised in **Table 2**.

Table 1 Existing access licences

| Category | Volume (ML/year) | Unit shares |
|---|------------------|-------------|
| Local water utility access licence | 12 | |
| Aquifer access licence (sub category town water supply) | | 67 |
| Aquifer access licence | | 84,388 |
| Supplementary water access licence | | 47,782 |

Annual extraction limits and available water determination

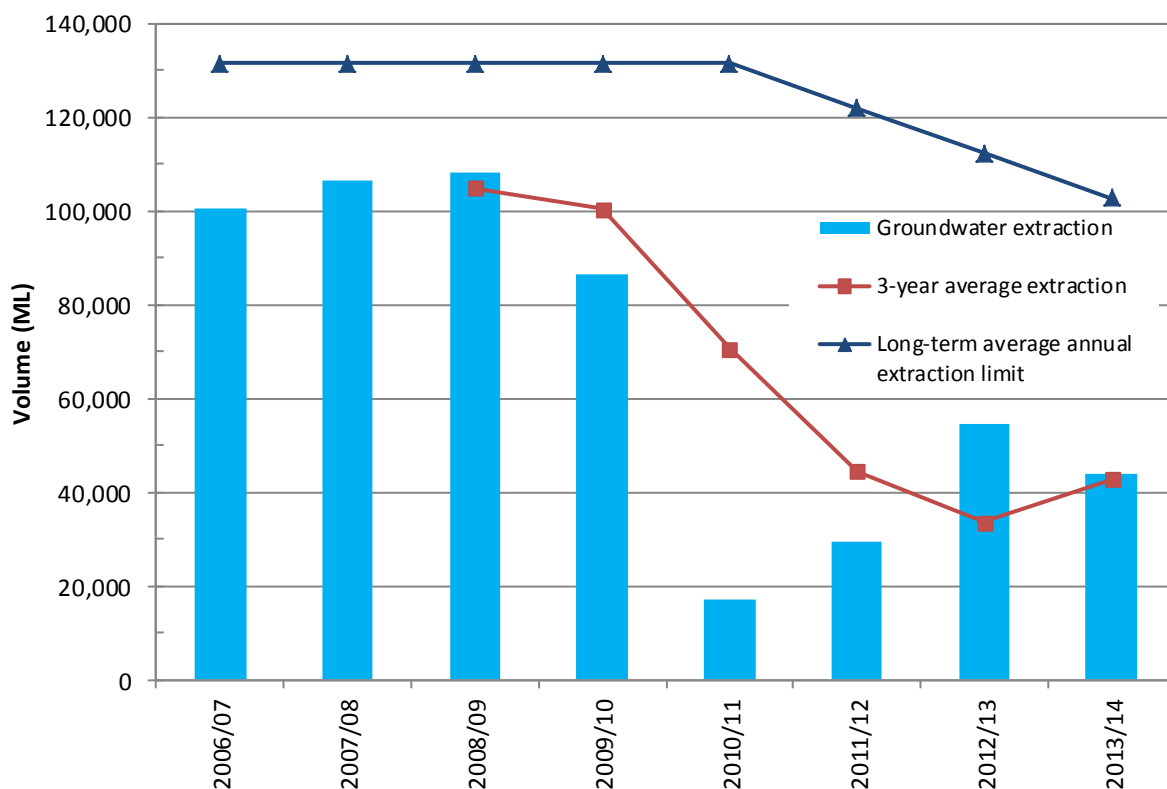
The long-term average annual extraction limit for this Groundwater Source is 83,700 ML/year plus water made available under supplementary access licence plus the total requirements for basic landholder rights at the commencement of the Plan.

The long-term average extraction limit remained the same for the first five years of the Plan. Since year 6, that is the 2011-2012 water year, supplementary water access licence allocations are being reduced by 20% each year resulting in a corresponding reduction in the extraction limit as shown in **Figure 2**. There will be zero allocation supplementary water access licences in year 10 of the Plan.

At the start of each water year an available water determination is made which sets the allocation of groundwater for the different categories of access licences. The Plan requires that if the average annual extraction volume over any 3 year period exceeds the long-term average annual extraction limit by 5% or greater, then an available water determination for aquifer access licences for the following water year, should be reduced by an amount that is assessed necessary by the Minister to return subsequent total water extraction to the extraction limit for that groundwater source.

To date the available water determinations for all the access licences, other than supplementary access licences, have remained at 1 ML per unit share or 100%.

Figure 2 Annual groundwater extractions



Access licence account management rules

The water sharing plan allows for accrual of unused allocation in aquifer access licence accounts. This includes the yearly allocations for the aquifer access licences made through available water determinations plus any carryover of unused allocation up to a maximum of 2 ML per unit of share component.

Local water utility and domestic and stock access licences do not have any provisions for carryover.

Groundwater dealings (trades)

Under the WMA 2000 dealings are permitted in access licences, shares, account water and the nomination of supply works.

All trades in this groundwater source require a hydrogeological assessment of the potential impact to neighbouring water supply works (bores) and the water source prior to being approved.

The most common dealings are assignment of allocation (sale or purchase of account water – s71T), and assignment of rights (sale or purchase of share component – s71Q). A summary of these dealings since the commencement of the Plan are provided in **Table 2**. This information may also be obtained from <http://registers.water.nsw.gov.au> (go to the Register of water allocation assignments or transfer and share assignment statistics).

Table 2 Dealings completed since Plan commencement

| Lower Murray Groundwater Source | | | | |
|---------------------------------|---------------------------------------|-------------|--------------------------------------|-------------|
| Year | allocation assignment dealings (s71T) | | assignment of rights dealings (s71Q) | |
| | number | volume (ML) | number | unit shares |
| 2006-2007 | 36 | 7,418 | 0 | 0 |
| 2007-2008 | 159 | 27,765 | 7 | 1,211 |
| 2008-2009 | 222 | 33,065 | 8 | 1,349 |
| 2009-2010 | 212 | 31,616 | 9 | 1,131 |
| 2010-2011 | 34 | 4,105 | 2 | 669 |
| 2011-2012 | 32 | 4,143 | 1 | 106 |
| 2012-2013 | 58 | 11,171 | 6 | 526 |
| 2013-2014 | 60 | 13,187 | 7 | 1,250 |

Groundwater extraction

There are 378 production bores within this groundwater source. These bores are pumping from the deep aquifers within the Calivil Formation and Renmark Group. Some bores are pumping from individual aquifers and some from both aquifers depending on spatial and vertical distribution of productive horizons at the bore site. All bores are metered and the extraction is recorded by State Water Corporation at regular intervals ranging from 2 to 4 readings per year.

Annual extractions plotted against long-term average annual extraction limits since the commencement of the Plan are provided in Figure 2. The three year average extractions have remained well below the long-term average annual extraction limit since introduction of the Plan.

Groundwater levels

There are 189 monitoring pipes (bores) at 81 sites within this groundwater source that are monitored for groundwater levels (**Figure 3**). At most monitoring sites there are two or more pipes monitoring different depths. The pipes at each site are identified by a common work number with each pipe numbered from shallowest to deepest (e.g. GW036742/1 is the shallow and GW036742/2 is the deeper pipe). The depth monitored by each pipe corresponds to the depth at which the casing is slotted to allow groundwater entry into the pipe. The hydrographs (**Figures 4 to 13**) illustrate the water level variations (natural or induced by pumping) over time from the depth indicated by the pipe's slots. The water levels (or pressures) are expressed as metres below ground level. The locations of the monitoring sites for which the graphs have been constructed are also shown in **Figure 3**.

The monitoring network includes 46 bores equipped with data loggers that record water levels continuously. Thirty three of these are telemetered so continuous real time data is available at www.water.nsw.gov.au/Real-time-data/hydro_index

The hydrographs (**Figures 4 to 13**) show that groundwater levels were impacted by the increased groundwater extractions during the decade long drought with low surface water allocations. The overall trend in groundwater levels was a steady decline until 2010. Since 2010 there was some significant recovery in the levels over a period of above average rainfall conditions, maximum surface water availability and reduced pumping.

Figure 3 Monitoring bore locations

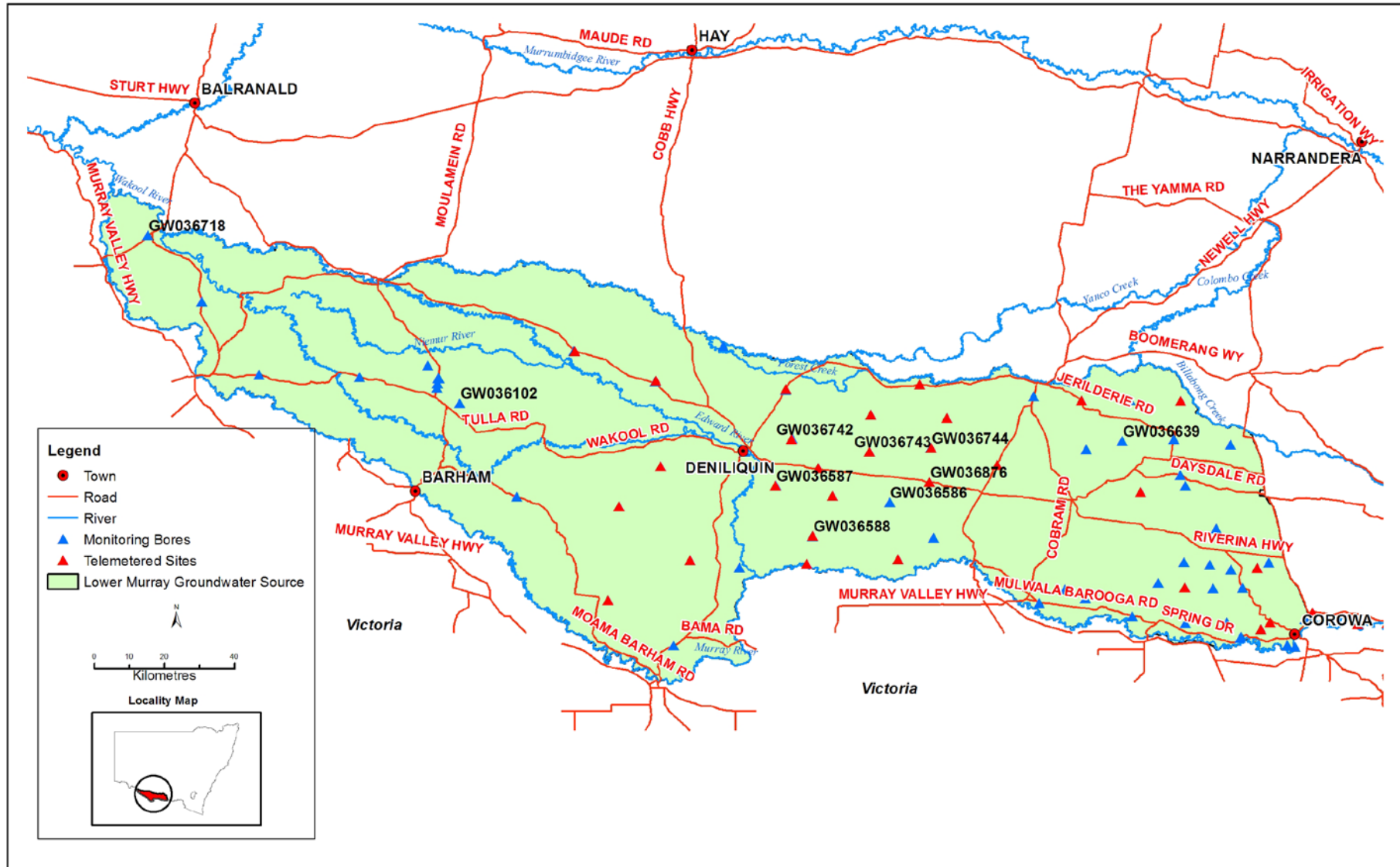


Figure 4 Hydrograph for groundwater monitoring site GW036742 (Mooney Swamp Road, Deniliquin)

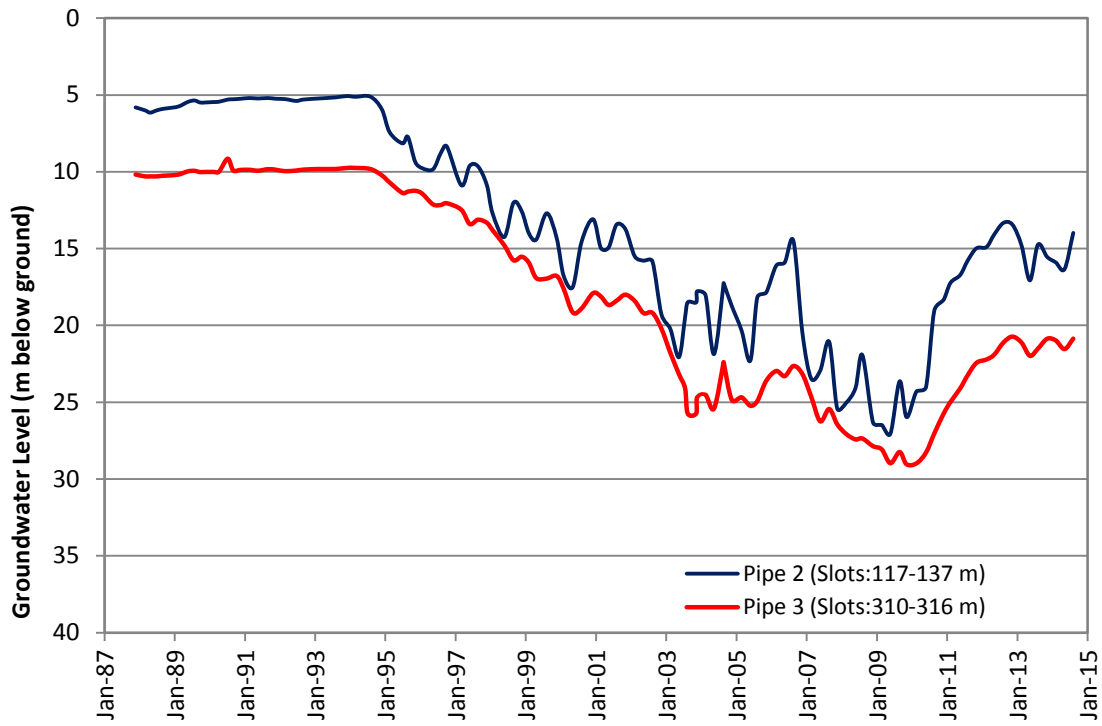


Figure 5 Hydrographs for groundwater monitoring site GW036743 (Hazeldene, Deniliquin)

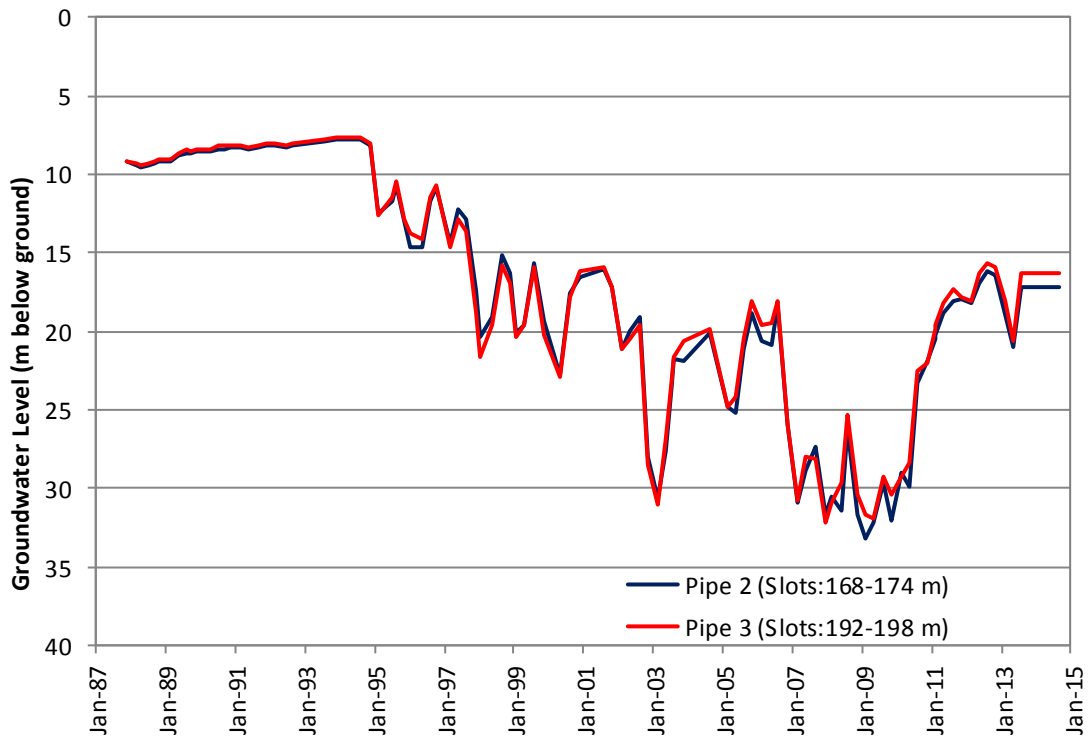


Figure 6 Hydrographs for monitoring site GW036744 at McAllister, McAllister Road

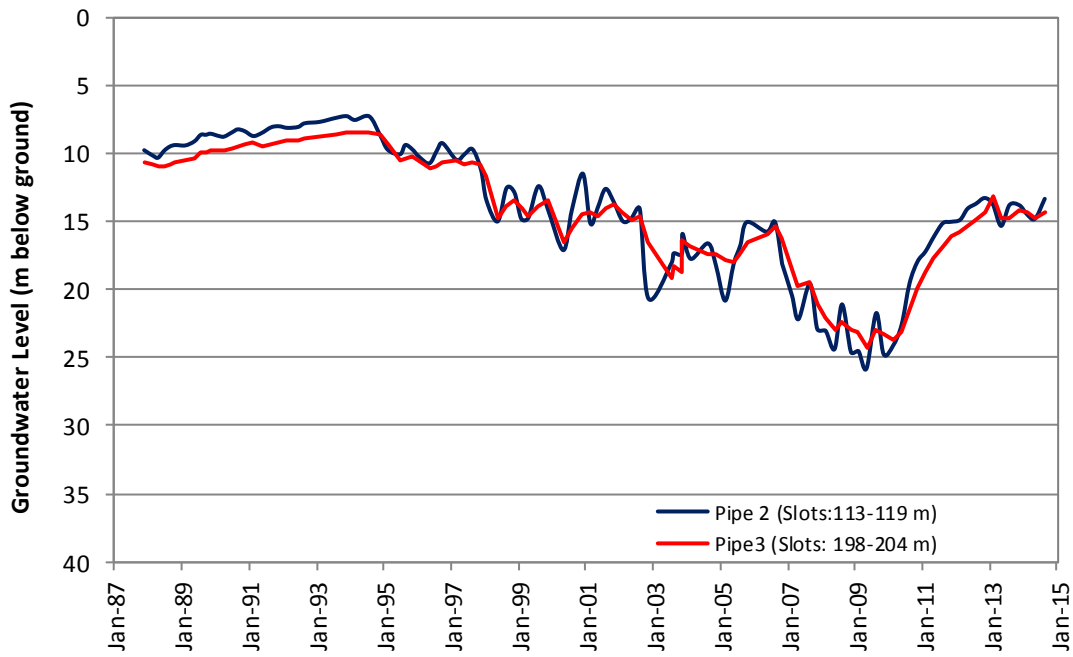


Figure 7 Hydrographs for monitoring site GW036876 at Retreat, Riverina Highway

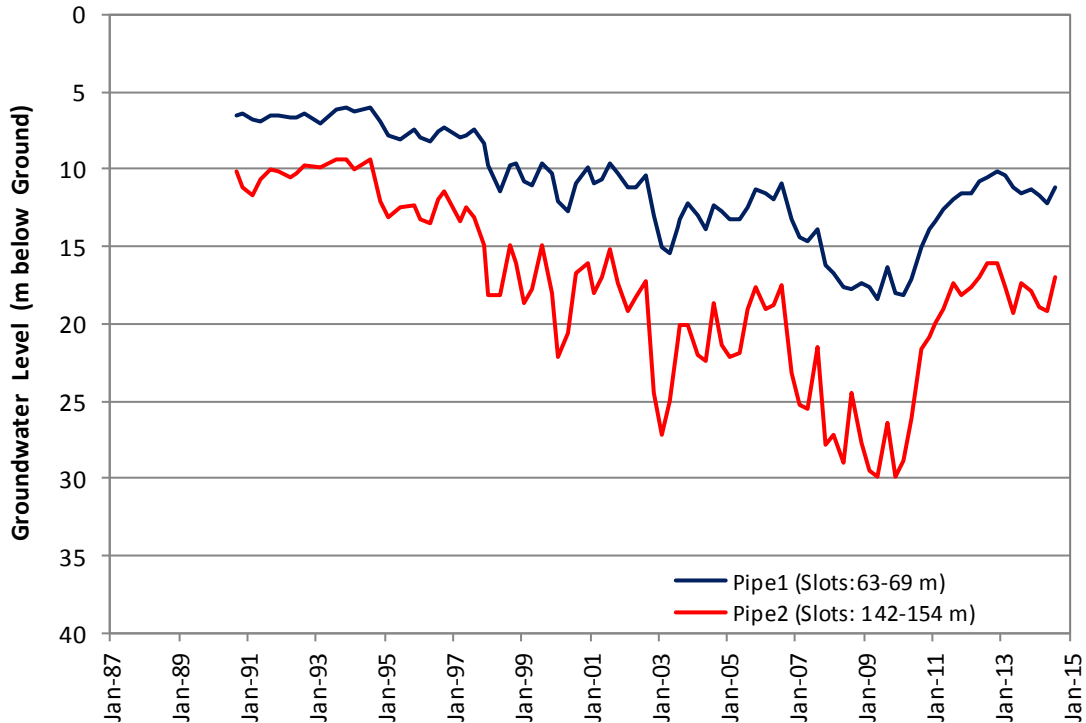


Figure 8 Hydrographs for monitoring site GW036586 at Coleman, Upper Tocumwal Road

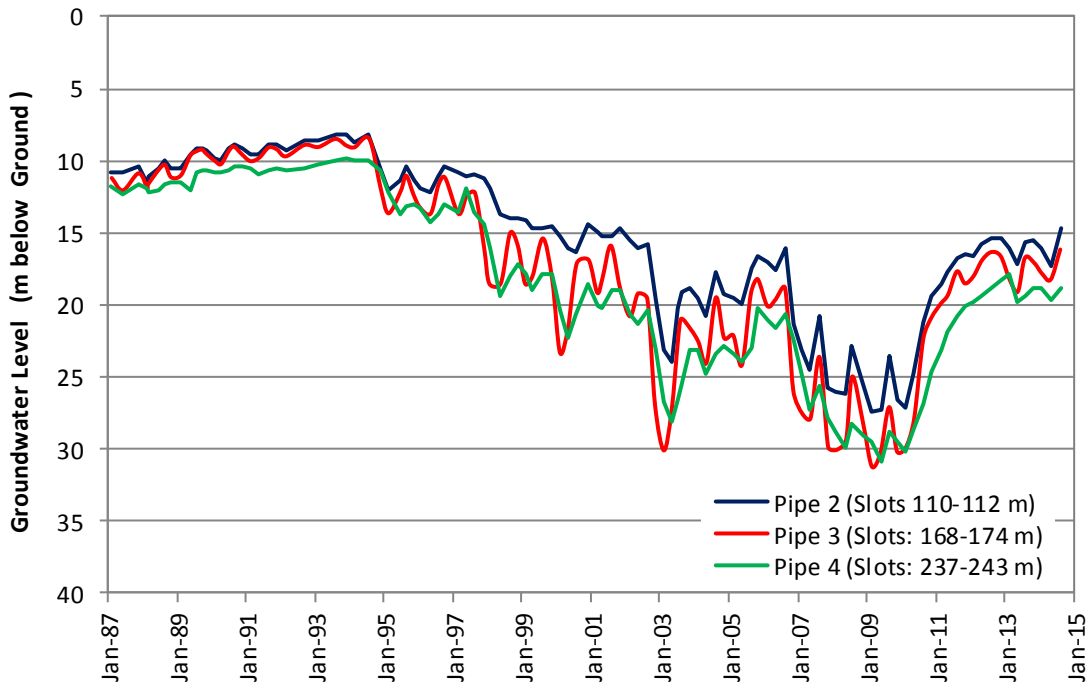


Figure 9 Hydrographs for monitoring site GW036587 at Tuppal Creek

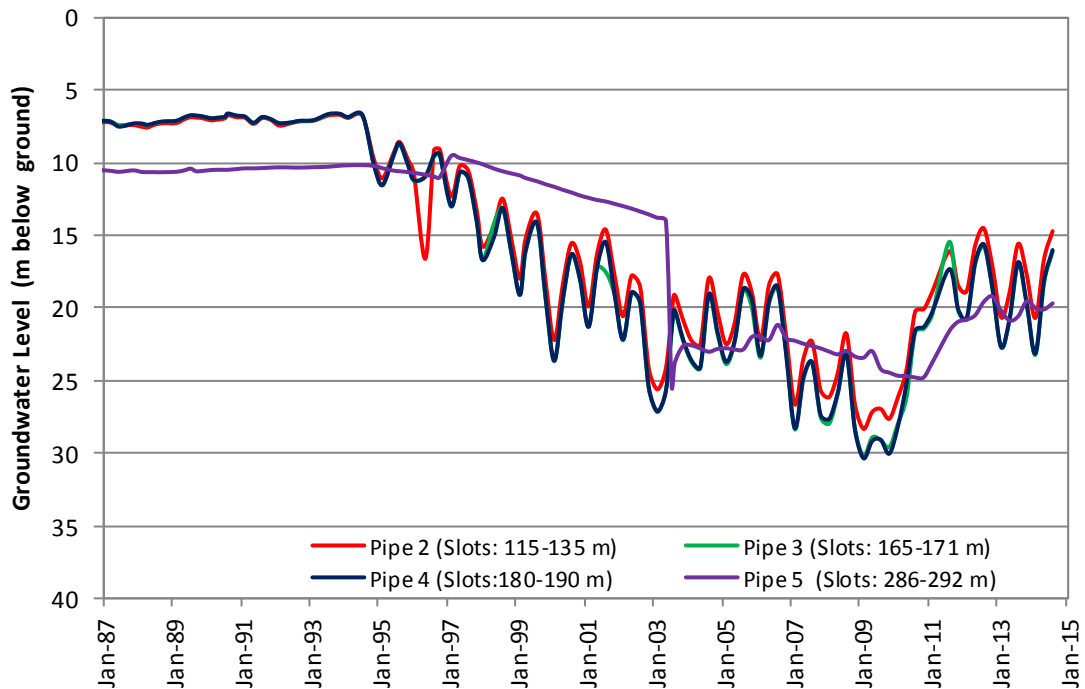


Figure 10 Hydrographs for monitoring site GW036588 at Millewa Road

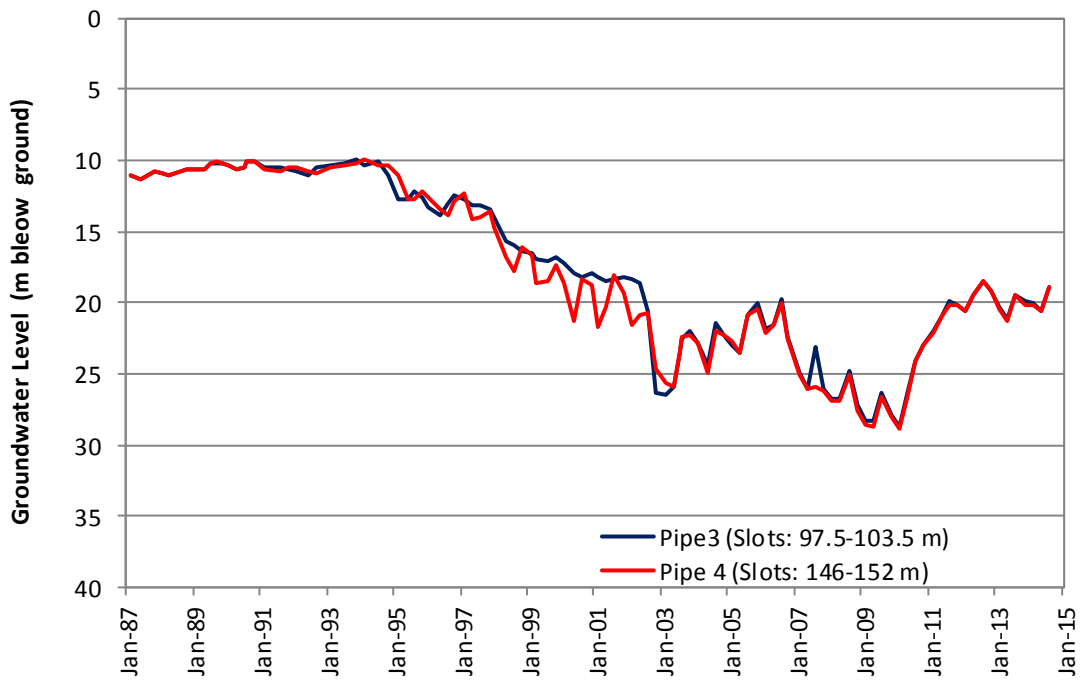


Figure 11 Hydrographs for monitoring site GW036718 at Kyalite-Tooleybuc Road

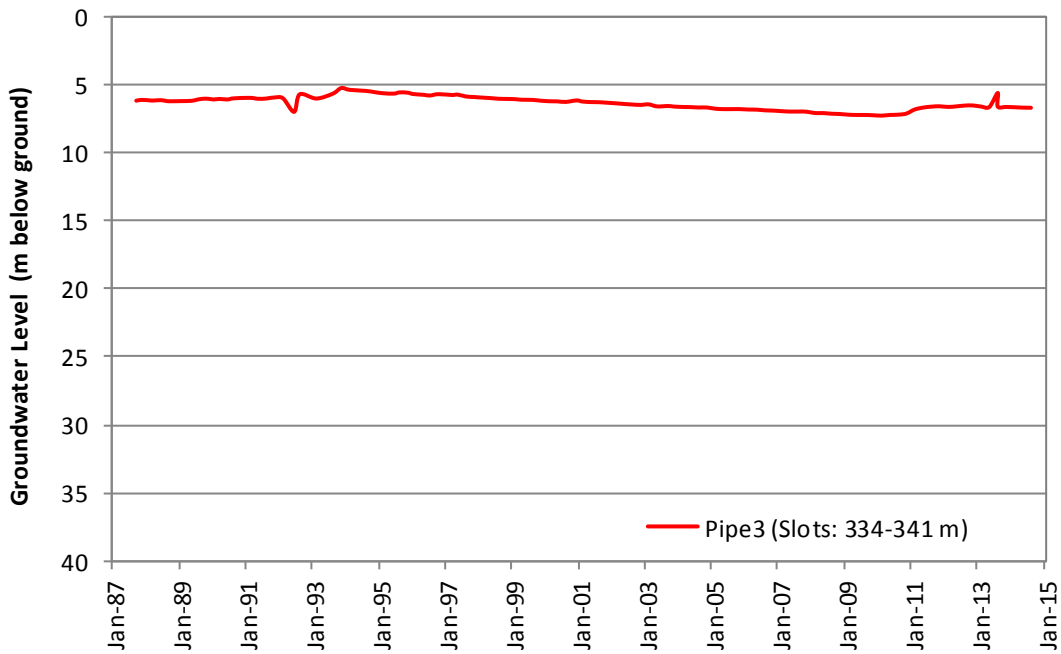


Figure 12 Hydrographs for monitoring site GW036639 at Corner Telephone Gate Road and Walkers Lane

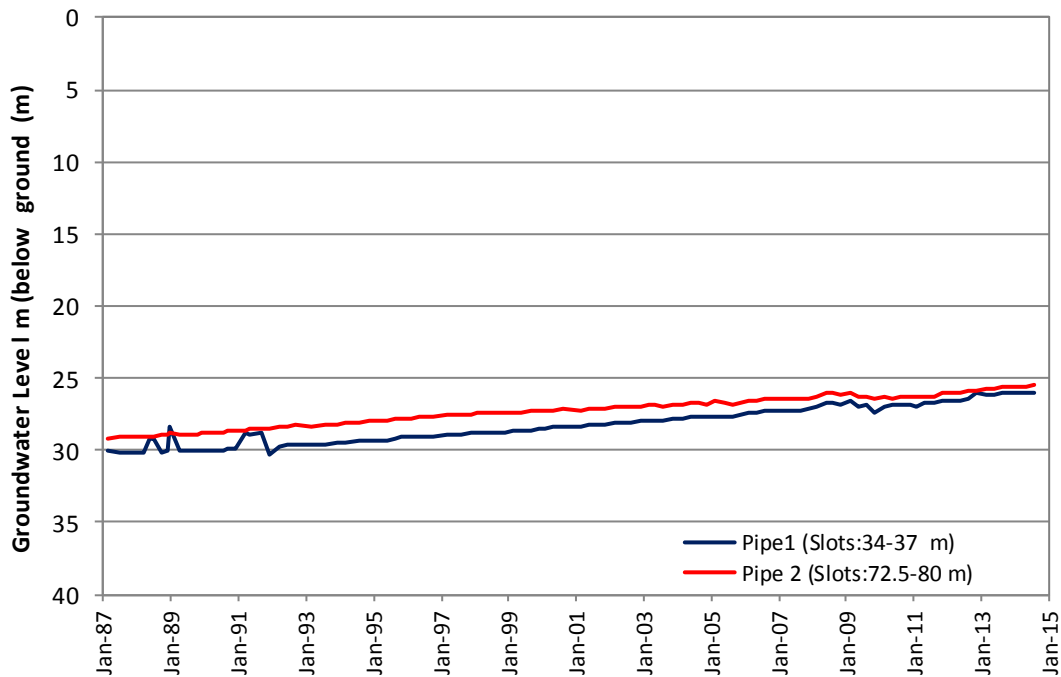
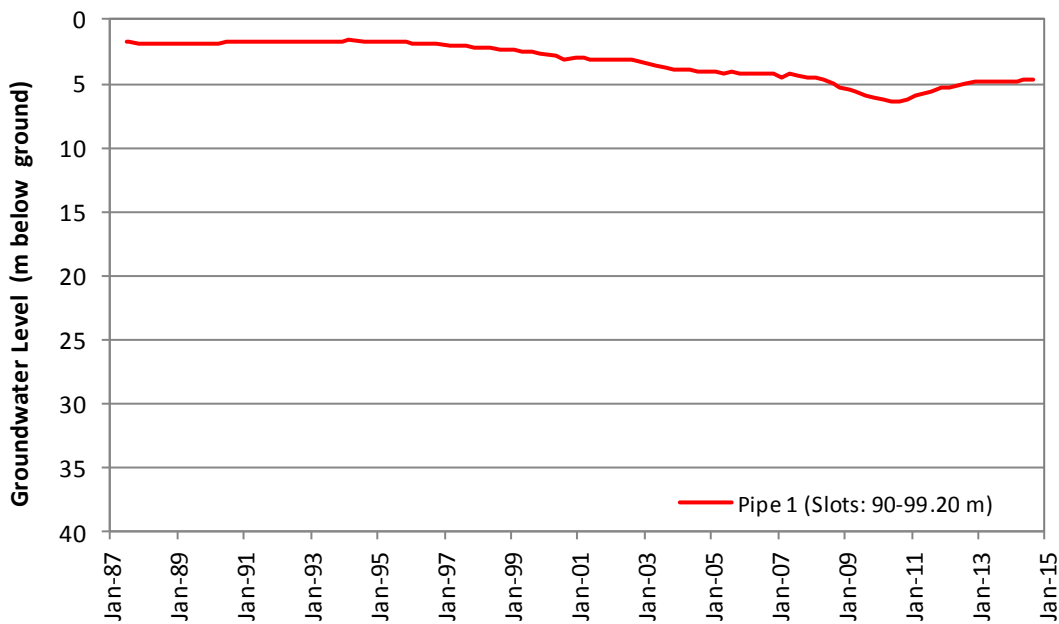


Figure 13 Hydrograph for monitoring site GW036102 at Wakool



More information

NSW Office of Water, 512 Dean Street, Albury. Phone 02 6024 8832. www.water.nsw.gov.au

© State of New South Wales through the Department of Trade and Investment, Regional Infrastructure and Services 2014. You may copy, distribute and otherwise freely deal with this publication for any purpose, provided that you attribute the NSW Department of Primary Industries as the owner.

Disclaimer: The information contained in this publication is based on knowledge and understanding at the time of writing (2014). However, because of advances in knowledge, users are reminded of the need to ensure that information upon which they rely is up to date and to check currency of the information with the appropriate officer of the Department of Primary Industries or the user's independent adviser.

Published by the Department of Primary Industries, a division of NSW Department of Trade and Investment, Regional Infrastructure and Services. Jobtrack 13374