

Technical File Note – Assessment of Groundwater Levels across the Northern Boundary

1. Introduction and background

The purpose of this technical file note is to discuss the outcomes of an investigation into the potential for using existing bores to monitor groundwater levels along the Birregurra-Colac Fault. The Fault lies along the central northern boundary of the Barwon Downs aquifer and is used to define one of the limits in the numerical groundwater model. This boundary controls flow of water into and out of the Barwon Downs aquifer in this area and influences the extent of impact from pumping and the groundwater behaviour predicted in the model. There are very few monitoring bores along the central northern boundary and the existing monitoring bores are located on the southern side (the borefield side) of the fault. There are no monitoring bores on the northern side.

In order to improve the understanding of how much drawdown from the borefield propagates across this boundary, an investigation into whether there are existing bores was undertaken. The risk this data gaps poses is low, given the boundary is located at some distance from the borefield and an analysis of the connectivity across this fault boundary was completed by MDGroundwater (2014), which showed that the connectivity was low. Consequently a new monitoring bore was not recommended. However, if an existing bore could be used to monitor groundwater levels (for a fraction of the cost), this would provide useful information.

The intention of this technical note is to document the outcomes of this discrete study as part of the Technical Works Monitoring Program for 2015/16. The findings presented in this document will be incorporated into the Integration Report.

2. Objective

The purpose of this task is to determine if there are existing bores around Birregurra that could be used to confirm the water levels north of the Birregurra-Colac Fault. The Visualising Victoria's Groundwater website (2016) indicates that two private bores exist in the area of interest - 50057 and 50061. Bore 50061 is ~350 m in depth and was monitored approximately 15 years ago, but is no longer active. Bore 50057 is ~330 m in depth and has no known monitoring data.

3. Investigation

The investigation involved two stages of work:

- Engaging with the landowners to get permission to access the bores
- Site inspection to confirm the condition of the bore and monitoring the water level if available.

These are described in more detail below.

3.1 Landowner engagement

In January 2016, Barwon Water contacted the landowners for bores 50057 and 50061.

It was determined that bore 50057 no longer existed and has not for many years, while bore 50061 remained beside a track bordering the Forest Timber Products property. The location and access route to the bore is indicated in Figure 1 as indicated by the landowner.

The bore was described by the owner as in fair condition and had been used to run 4 sprinklers for 2 hrs duration twice a week for the month of February (2016).



Figure 1 Location of bore 50061

3.2 Site inspection

The bore condition was assessed by Jacobs on the 17th of March 2016. Bore 50061 was found beside a track bordering the Forest Timber Products as indicated by the landowner. The approximate co-ordinates of the bore are -38.327078 Latitude and 143.787837 Longitude, estimated using google maps.

The bore head works consisted of a galvanised pipe approximately 50 mm in diameter held by a concrete filled 40 gallon steel drum (Figure 2). The pipe is connected to a network of 3 outlets controlled by 3 taps.

Full release of one outlet generated an unrestricted flow of ~0.5 L/s from one of the hoses. This indicates artesian conditions (i.e. groundwater levels are above the surface) at a depth of ~350 m at this location.



Figure 2 Headwork of bore 50061



Figure 3 Flow from bore 50061

4. Conclusions and Recommendations

Landowner engagement and site investigations have confirmed the presence of bore 50061 as indicated by online databases (VVG, 2016). The ~350 m deep bore was confirmed to be operational and generating artesian flow at a rate of ~0.5 L/s.

Given the bore is artesian and currently in use, the bore cannot be used as a monitoring bore. However we now know that the groundwater levels are artesian at this location and this information will be used during the calibration of the numerical model.

While there are limited monitoring bores in this area, the data gap is not considered to be significant enough to warrant additional bores being drilled.

5. References

MDGroundwater (2014) Barwon Downs Hydrogeological Conceptual Model - Analysis of drawdown to refine conceptual model at the SW and NE Barwon Downs numerical model boundaries. 11 December 2014.

Visualising Victoria's Groundwater – VVG, 2016. Online data available at < <http://www.vvg.org.au/>>