

# Alcoa Groundwater Pumping Test

## COMMUNITY UPDATE NOVEMBER/DECEMBER 2021

**This update provides a status of groundwater levels and water quality for key monitoring bores, including total extraction rates, as part of the Alcoa 12-month groundwater pumping test of the Upper Eastern View Formation (UEVF) aquifer.**

### In summary:

- This report covers the period of 22 October to 8 December 2021.
- The test continues to progress well, with all activities conducted in accordance with the licence conditions.
- The daily pumping rate remained at 3.45ML per day.
- 127.8ML was extracted and placed into the mine void waterbody during the period, with a total of 671.9ML extracted since the pumping test commenced on 13 May 2021.
- The water level increased to RL -17.62m (an increase of 3m since 13 May 2021) which represents 15.4% of the proposed full volume of the waterbody. (Relative level, or RL, is the water level in metres below sea level.)
- There is no significant change to groundwater levels in the upper part of the UEVF aquifer which is gradually increasing, or the unconfined shallow Demons Bluff Group (DBG) and Perched Water Table (PWT) aquifers which are responding to natural climate variations.
- As expected, groundwater levels have declined within modelled expectations at the pumping bore in the lower part of the UEVF aquifer.
- An investigation trigger (SOB 116459 - refer Figure 1 below for location) was briefly reached for one out of the 12 nominated trigger bores. Triggers are set at conservative levels and this occurrence does not represent any risk to groundwater dependent ecosystems or any other users.
- **On 8 December, stage one of the pumping test (the first six-month period) was successfully completed.** We are pleased with the progress to date, and specialist consultants are now collating, analysing and validating the collected data to determine a sustainable pumping rate. Some initial analysis of stage one of the test is provided on page 5 and 6 of this report.
- Further information about the 12-month groundwater pumping test can be found in this [fact sheet](#).

### Water Monitoring Plan

The 12-month groundwater pumping test commenced on 13 May 2021 and is underpinned by a comprehensive water monitoring plan approved by Southern Rural Water. The plan will ensure the groundwater extraction is not threatening groundwater dependent ecosystems that may connect to the aquifer underlying and surrounding the mine, or adversely impact any other users.

Water extraction rates, groundwater levels and quality, and the waterbody level are closely monitored by a specialist consultant. Results are reported monthly to the co-regulator technical working group (inclusive of Alcoa, Southern Rural Water, Department Environment Land Water and

Planning, EPA Victoria, Earth Resources Regulation, Barwon Water and CCMA) for review, and an update is published for the community.

A total of 1,500ML is permitted to be extracted during the pumping test, with a maximum daily extraction limit of 5.18ML.

To monitor groundwater levels and quality during the pumping test, 28 bores have been selected with 12 of those also nominated as trigger bores. The location of the trigger and other monitoring bores are shown in Figure 1 below.

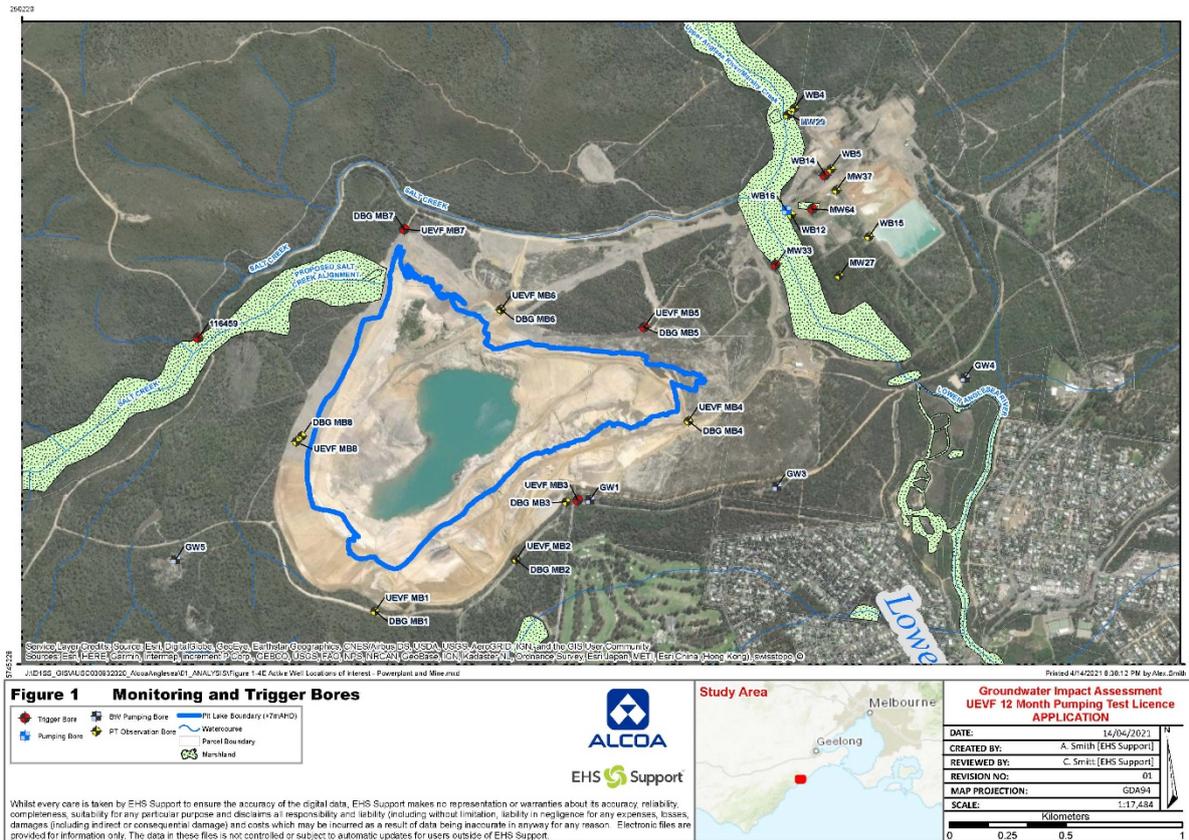


Figure 1: Trigger and other monitoring bore locations.

Each of the trigger bores has defined water level and/or water quality thresholds, known as triggers, and defined response actions if a trigger is met. The triggers and responses, known as trigger rules, were developed in consultation with a specialist consultant and Southern Rural Water.

Each trigger has been set at a conservatively low level to ensure we are alerted early, and, if necessary, able to act quickly during the pumping test to prevent damage to groundwater dependent ecosystems. In total there are five separate trigger rules, with these applying in various combinations to the 12 trigger bores. Each trigger rule has different responses ranging from additional monitoring to reducing the pumping rate.

Data from key Barwon Water monitoring bores in the vicinity is also included in the water monitoring plan for analysis. This data is provided by Barwon Water.

## Extraction rates

Month	Volume extracted (ML)	Maximum daily volume extracted (ML)	Total volume extracted to date (ML)
<b>May 2021 (from 13/5)</b>	53.6 ML	3.45ML	53.6 ML
<b>June 2021</b>	118.3ML	4.32ML	171.9ML
<b>July 2021</b>	132.6ML	4.32ML	304.5ML
<b>August 2021</b>	105.1ML	4.32ML	409.6ML
<b>September 2021</b>	61.5ML*	3.45ML	471.1ML
<b>October 2021</b>	74.0ML*	3.45ML	569.0ML
<b>November 2021</b>	101.1ML	3.45ML	645.2ML
<b>December 2021</b>	26.7ML	3.45ML	671.9ML

Note: SRW License allows a maximum daily limit of 5.18ML, and total extracted volume limit of 1500ML.

\*Due to equipment reliability issue, a lower volume was extracted.

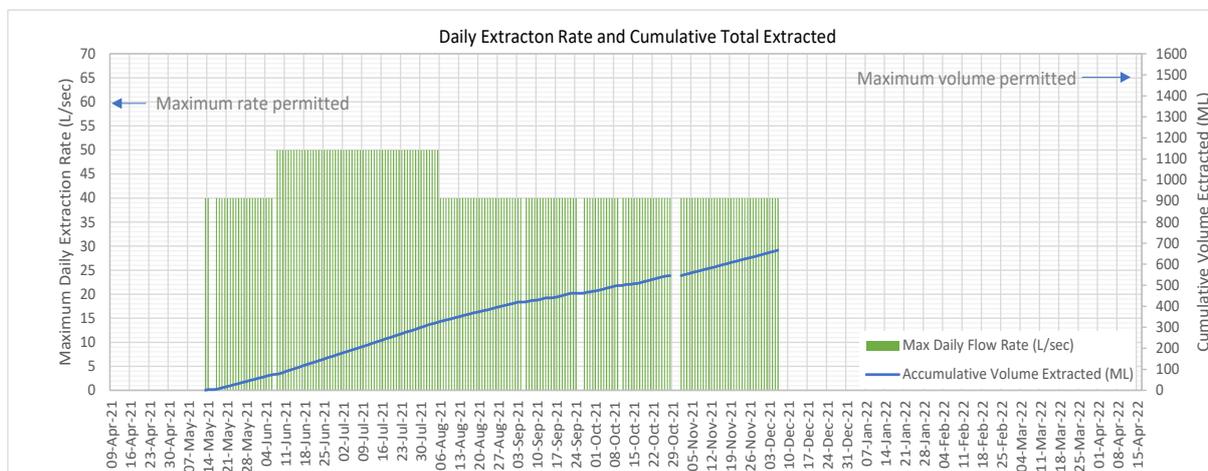


Figure 2: Daily extraction rate and cumulative total extracted

## Waterbody level

Date	Waterbody level RL (m)	Monthly Rainfall (mm)	Waterbody % Full
<b>26 April 2021</b>	-20.93m	N/A	10.3%
<b>24 May 2021</b>	-20.42m	163.2mm	11.1%
<b>21 June 2021</b>	-19.93m	65.8mm	11.8%
<b>19 July 2021</b>	-19.41m	84.6mm	12.5%
<b>30 Aug 2021</b>	-18.64m	29.6mm	13.7%
<b>27 Sept 2021</b>	-18.46m	57.4mm	14.0%
<b>25 Oct 2021</b>	-18.06m	103mm	14.6%
<b>22 Nov 2021</b>	-17.72m	39.6mm	15.2%
<b>8 Dec 2021</b>	-17.62m	1.8mm	15.4%

Note: Total estimated volume of the water body is 17,200ML (17.2GL) at RL 5.5m (subject to future bathymetry surveys).

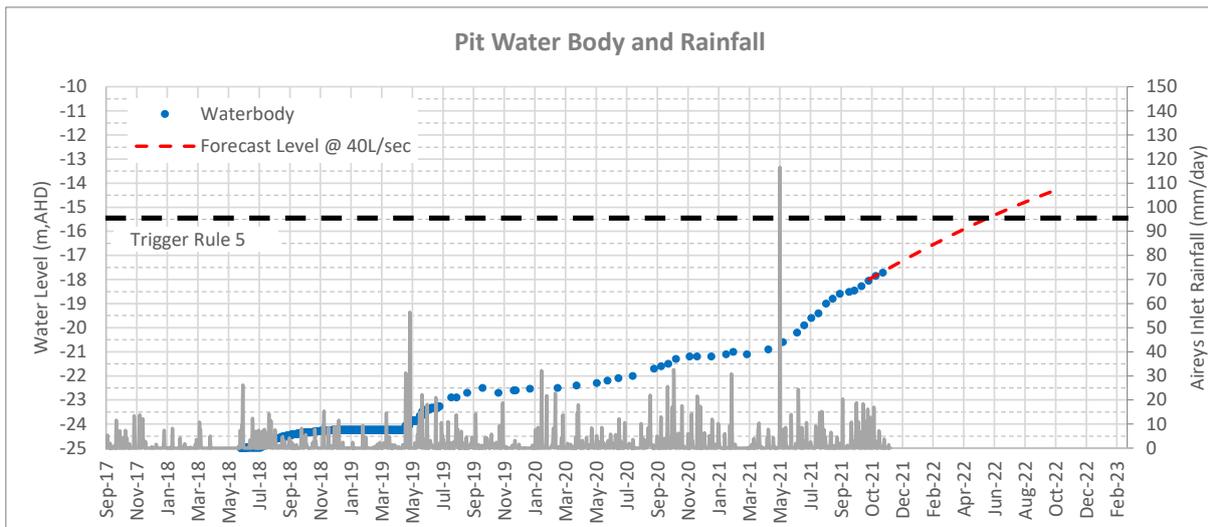


Figure 3: Pit waterbody level and rainfall (forecast water level based on average rainfall and 3.45ML/day inflow)

### Groundwater level monitoring and trigger status

Bore	Overall status	Action / Comment
<b>UEVF WB14</b>	No trigger reached	Continue to monitor
<b>UEVF SOB 116459</b>	Rule 3 Trigger	Rule 3 trigger was briefly exceeded during the period however the groundwater level appears to be stable in this bore.
<b>UEVF MB3</b>	No trigger reached	Continue to monitor
<b>UEVF MB5</b>	No trigger reached	Continue to monitor
<b>UEVF MB7</b>	No trigger reached	Continue to monitor
<b>UEVF MB8</b>	No trigger reached	Continue to monitor
<b>DBG MB3</b>	No trigger reached	Continue to monitor
<b>DBG MB5</b>	No trigger reached	Continue to monitor
<b>DBG MB7</b>	No trigger reached	Continue to monitor
<b>DBG MB8</b>	No trigger reached	Continue to monitor
<b>PWT MW33</b>	No trigger reached	Continue to monitor
<b>PWT MW64</b>	No trigger reached	Continue to monitor

### Barwon Water Anglesea borefield monitoring data

The Anglesea borefield is one of a number of water sources that can supplement the existing Greater Geelong water supply system for Barwon Water. Access to groundwater from the Lower Eastern View Formation (LEVF) is governed by a bulk entitlement, issued by the Victorian Government.

During operation, Barwon Water reports monthly on the status against the threshold level for two key bores. They have recommenced these monthly updates for the duration of the Alcoa pumping test. The Anglesea borefield groundwater level trigger components (P8 or P19) were not reached during November. For more information on the Anglesea borefield and the monthly updates please see the [Barwon Water website](#).

## Groundwater pumping test – Stage one complete

On 8 December the test reached a significant milestone as planned, with the first six-month period (stage one) successfully completed. The test has run in accordance with the licence, and we are pleased with the progress to date.

Throughout stage one, we have conducted monthly reviews with the co-regulator technical working group (inclusive of Alcoa, Southern Rural Water, Department Environment Land Water and Planning, EPA Victoria, Earth Resources Regulation, Barwon Water and CCMA).

The test is being undertaken in two stages:

- Stage one - an initial six-month period to establish various aquifer parameters, update the groundwater model and determine a sustainable extraction rate to support a further licence amendment.
- Stage two - an additional six-month period to provide additional confidence to the community, and further validation of the updated groundwater model and input to the associated risk assessment.

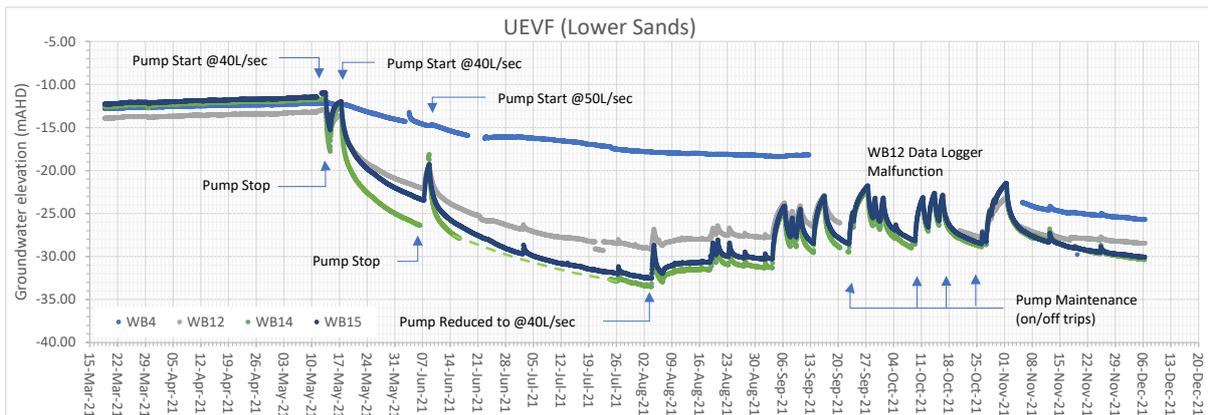
Specialist consultants are now collating, analysing and validating the data collected in the first six months of the test to determine a sustainable pumping rate.

The data will also facilitate the calibration of the updated 'Anglesea Groundwater Model' being developed in conjunction with Barwon Water. The model is being independently peer reviewed and will further inform any proposed long-term licence amendment.

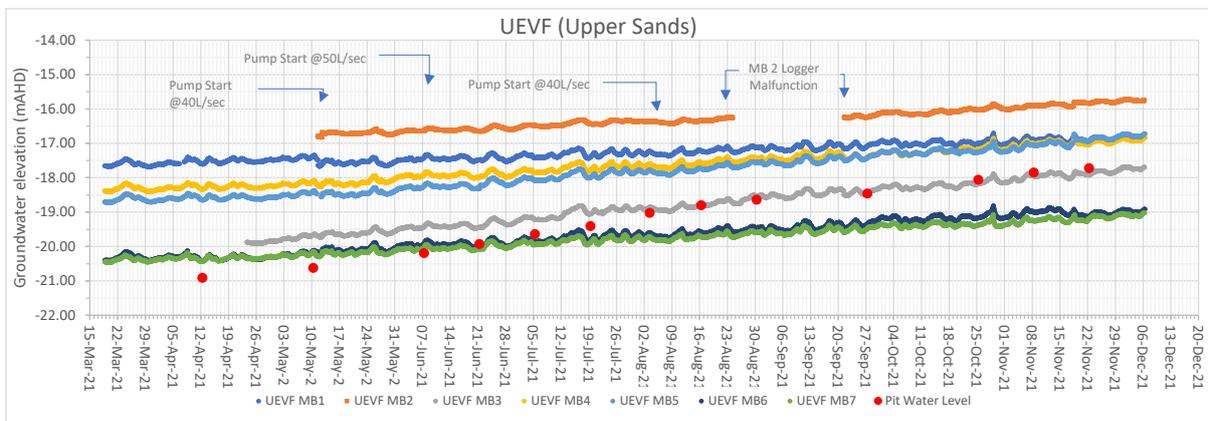
Below are graphical representations of some of the key data from stage one of the pumping test.

- Graph 1 shows that the groundwater levels have declined within modelled expectations at the pumping bore in the lower part of the UEVF aquifer, extracting water from a depth of approximately 200 metres below the surface.
- Graph 2 shows that despite this, and as expected, groundwater levels in the upper part of the UEVF aquifer, located at depths varying between 40 metres and 140 metres below the surface, show no impact of pumping and continue to gradually increase in pressure.
- Graph 3 importantly shows the shallowest aquifers, Demons Bluff Formation (DBF) and Perched Water Table (PWT), located 5 metres to 50 metres below the surface and closest to the Anglesea River system, are responding only to natural climate variations and have shown no impact as a result of the pumping test.

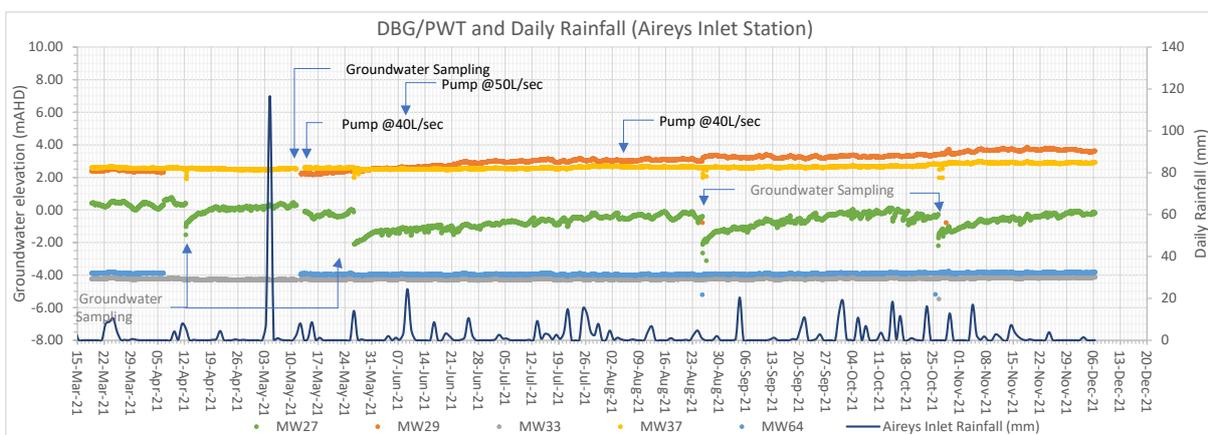
Stage two of the test will commence when the required analysis and regulatory assessments have been completed. Further information and updates are posted on [www.alcoa.com.au/anglesea](http://www.alcoa.com.au/anglesea).



Graph 1: Groundwater level (pressure) trends for the lower part of the UEVF aquifer (approximately 200m depth) show declines as modelled.



Graph 2: Groundwater level (pressure) trends for the upper part of the UEVF aquifer (approximately 40m to 140m depth) show no impact of pumping.



Graph 3: Groundwater level trends in the DBG / PWT aquifer (approximately 5m to 50m depth) shows response only to natural climate variations and no impact of pumping.