

Introduction

Coal Seam Gas (CSG) companies have a statutory right to extract groundwater that is unavoidably taken during production. This lowers the water tables in these formations. Lowering of more than 5m is called 'impact'. The formations containing CSG are also sources of water for domestic and stock use, intensive stock use (piggeries, feedlots, poultry etc), town water, industrial, and agriculture and irrigation. Those users do NOT have a statutory right to underground water.

There are about 22,500 registered water bores in the Surat Cumulative Management Area (CMA) ⁽¹⁾. Under the Queensland Water Act (2010), CSG companies must negotiate 'make good' agreements with owners of affected water bores. (See *website* for relevant factsheets.)

Identifying bores at risk of becoming 'affected'.

The 'Office of Groundwater Impact Assessment' (OGIA) publishes three-yearly 'Underground Water Impact Reports' (UWIR) ⁽²⁾ to assess the cumulative impacts of all water users. It uses a still evolving computer model to identify water bores potentially affected by CSG. It recognises:

- 'Immediately Affected Areas' (IAAs), where CSG wells are likely to impact water levels by 5m or more within 3 years, and
- 'Long-term Affected Areas' (LAAs) where that can happen at any time in the future.

UWIR 2019 in table 4-1 lists 8,086 water bores in the group of formations (layers of rock) which are the target for CSG extraction in the Surat CMA.

Before starting to develop a gas field, CSG companies have to conduct base-line assessments of water bores in the relevant IAAs to identify those bores that may require 'make good' agreements. In addition, the Department of Environment and Science can issue a notice to assess a bore that has not been identified as an IAA bore. So far 16 such notices have been issued.

Bores are recorded as: 'existing, abandoned and destroyed,' or 'abandoned and useful'. Bores not recorded as decommissioned are recorded as existing and usable, **regardless if they are currently in use or not.** They are considered when identifying impacted bores under the UWIR 2019.

Findings to date

More than 3,500 base-line assessments have been completed. The majority of assessed bores are less than 200m deep. They are mainly used (84%) for Stock and Domestic purposes. These require smaller volumes and lower yields, implying that they will not become 'affected bores'.

IAA bores. UWIR 2016 initially identified 127 IAA bores. That figure has since been adjusted down to 122 as more data became available. Of these 122 bores, 'make good' agreements have been executed for 99. Of these 71 have been decommissioned. 23 were still undecided. In addition to those bores where obligations exist, CSG companies have advised that 'make good' agreements have been negotiated with owners of 98 bores. 38 of these have been decommissioned.

As new CSG wells are developed, pressure declines occur in new areas and thus additional water bores are being identified as IAA bores. UWIR 2019 added 100 new IAA bores, for a total of 222.

LAA bores. Impacts of up to 350 m have been recorded in the Walloon Coal Measures which have been depressured the longest, since 2005. This depth affects the time taken for groundwater levels to recover. As a result of more data and revised mapping, the predicted LAA for the Walloon Coal Measure is spreading further than previously predicted. In the Springbok formation the drawdown has been amplified by more wells and higher leakage into the Walloon Coal Measures.

As a result, UWIR 2019 shows that 571 LAA bores have been recognised as being at risk, an increase of 53 since UWIR 2016. In total, it appears that 109 water bores have been decommissioned and 197 'make good' agreements have been executed up to early 2019.

¹ The Water management System and Groundwater Database of the Department of Natural Resources, Minerals and Energy.

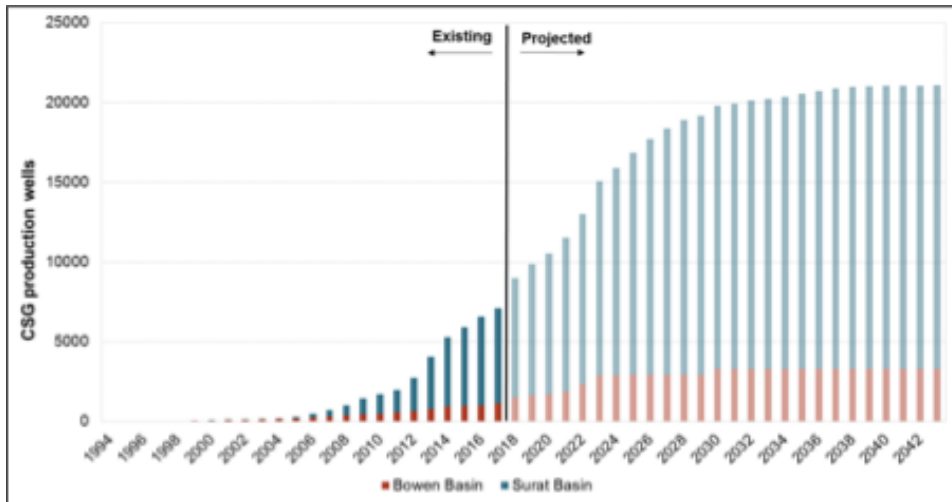
² The figures used in this factsheet are based on the **Underground Water Impact Report (UWIR 2019)**. It is the third report since the Surat Cumulative Management Area (CMA) was declared in 2011.

Once water extraction ceases, bores located close to the edge of the LAA are expected to recover within 5 years to less than 5 m. However, within the production areas in the Walloon Coal Measures predictions are that around 25% of impacted bores would recover in 250 years and around 75% of bores in 1,000 years or more.

Further CSG expansion

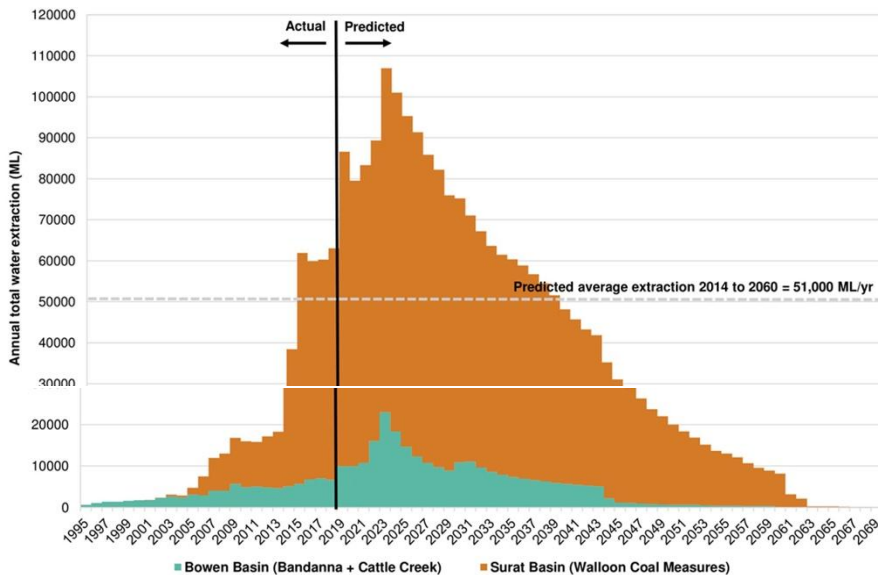
The production area to early 2019 covers about 14,000 ha, about half of what was proposed in 2013. Figure 2.8 in UWIR 2019, shows that an estimated 6,800 CSG wells in the Surat CMA are either producing gas or have been completed as production wells. OGIA estimates that if all production areas are developed as planned, some 21,000 CSG wells may be completed by 2042.

Figure 2-8 Existing and projected CSG wells in production areas



Current CSG water extraction from CSG formations is about 60,000 ML/year. Average CSG water extraction over the life of the industry till 2070 is predicted to be around 51,000 ML/year with a peak of about 100,000 ML/year in 2023- 2025.

Figure 7-3 Predicted CSG water extraction



Comments

The figures above show that the effects of CSG on water bores is only in its early stages. Many more may be lost forever if this industry runs its full course till 2070. This is not likely to happen.

Rapid development of renewable energy sources is making CSG uncompetitive. Commercial energy companies are reluctant to invest in new gas-fired power stations without subsidies.

The capital cost of building renewables of similar capacity is close to the same as that for gas. The time needed to construct them is shorter. Their 'fuel' is free, while CSG is expensive. The investments in high voltage connectors between states will provide the needed reliability.