Background

This factsheet looks at wetlands and plant communities that rely on surface and sub-surface water in the Surat Basin. The Queensland Herbarium calls these ‘Groundwater Dependent Ecosystems’. It has described and mapped them. They are protected by the Environmental Protection Act (1994). Many are at risk from unconventional gas. The ‘Office of Groundwater Impact Assessment’ combined the Herbarium maps with its geological maps and identified the ones at risk from water extraction in Coal Seam Gas bores. See ‘Underground Water Impact Report 2019’ (UWIR).

Groundwater Dependent Ecosystems at risk (GDEs)

These plant communities can be very susceptible to permanent lowering of the water tables that they depend on. They occur around springs, in visible soaks and where water is only just below the surface. The Ecosystems differ considerably depending on soil types, surface or subsurface water, and on depth of the water below ground level.

In the Surat Basin GDEs occur on a range of geological formations. UWIR 2019 states that GDE’s at risk are primarily associated with the Walloon Coal Measures. Map 10.2 shows that most areas at risk are south east of Wandoan, with many more that are sprinkled in an arc from Cecil Plains past Wondoan, halfway to Injune. The report shows locations only. It provides no list of individual GDEs at risk, no details and no coordinates. (Such coordinates are available for springs and bores.) Field verification of individual GDEs is difficult when there are no coordinates. Without field verification it will not be known what has been lost.

Water extraction (Photo: UWIR 2019.)

Producing unconventional gas means drilling wells into the Walloon Coal Measures and pumping water out. This lowers the water tables above the gas which allows the gas to ‘escape’ to the surface. At the surface most but not all gas is captured and piped to Gladstone for export. It sounds simple.

In reality, it requires huge investments in infra-structure: export facilities in Gladstone; 1,000’s of kms of pipes to and across the whole area; wells; pump stations; roads etc. And it involves:

- drilling up to 21,000 wells in an 800m grid spacing across 10,000’s km², with each well covering an area of 65ha,
- pumping water from depths ranging from 150 to 750m [2],
- extracting an average of 51,000ML per year over 55 years,
- drawing-down water levels to up to 350 m near production areas.

The Walloon Coal Measures have very low rates of recharging. Recharging depends on water soaking into the soil at limited inlet areas and then slowly seeping sideways. The UWIR updates its estimates of recharging rates and of water movement through and between formations when more data becomes available. It estimates that, once unconventional gas projects finish around 2060, about 50% of groundwater levels will recover in 5 years to 5m, not to surface level. Of the remaining 50%, 1/4 will recover within 250 years and 3/4 will take more than 1,000 years, if ever.

Outlook for the future
Petroleum and gas tenures cover most of the Walloon Coal Measures. Due to the 800m grid spacing, the long-term outlook for high risk GDEs can be projected using current data about the lowering of water tables. That of course assumes that other things remain the same.

Once the production areas will have been fully expanded and 21,000 wells have been used to extract water, few if any GDEs on the Walloon Coal Measure are likely to survive. There is no strategy to prevent or ameliorate this. Given the very deep drop in water levels, ‘managing’ does not seem possible.

Effects on forests
One aspect of Environmental Value not mentioned in UWIR 2019 are the cumulative effects of a gasfield on forests. Easements through forests for a metre diameter pipeline can be up to hundreds of metres wide. They isolate small birds, reptiles and marsupials such as gliders. When these try to cross wide open spaces, they are subject to predation. This can lead to isolation of small populations, risking inbreeding and perhaps local extinction. The width and disturbance of easements creates erosion hazards. During droughts, networks of them covered in weeds and dry grasses add to fire risks. Traffic creates biosecurity risks from spreading of weeds and diseases.

A glimmer of hope
The report in Section 2.4.3 states that: “Other than in a small number of gas fields, there is a general shifting of planned production to later years, some by up to 10 years.” There are undoubtedly many reasons for this. Two may be financial: unexpected higher production costs and unforeseen strong competition from renewable energy.

Unconventional gas is a high cost business
The industry has misjudged the cost to build and operate the plants which are much higher than expected. They overestimated what the fields can produce. Operators are discovering the wells decline faster than expected. Fields produce less gas and more water, thus increasing costs. The industry expected costs between A$2.20 and A$2.70 a gigajoule. The actual costs are about A$3.65 and A$6.40 a gigajoule making it very expensive gas. (Courtesy Bruce Roberts, IEEFA).

Renewable power is now cheaper
Power from renewable energy is already much cheaper than that of coal. But is now also below that of gas. Renewables are making money without any subsidies. Their costs are coming down almost monthly. Technology is developing rapidly in every part of renewable energy. An enormous amount of capital is being invested in every sector of the industry because it makes money.

Domestically, gas is no longer a competitive fuel for electricity production in Queensland and its usage is falling. Commercially, businesses are adding to the transition from fossil to renewable energy. They can now deal directly with renewable companies and bypass the middleman, the energy retailers, and their obstructions. Overseas, developments are happening even faster.

Time may be the best friend of at-risk GDEs.
Competition will make the high cost Unconventional gas unprofitable long before 2070, the Project’s lifespan. The sooner that happens, the fewer areas of Environmental Value on the Darling Downs, in the Channel Country and anywhere in Australia will be destroyed forever.

Any non-violent effort to speed up the transition from fossil fuel to renewable fuels is worth making.

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3 https://ieefa.org/coal-seam-gas-is-high-cost-gas-for-queenslanders/

Western Downs Alliance: Safeguarding Food and Water Security for Future Generations