

Submission
No 20

**INQUIRY INTO THE IMPLEMENTATION OF THE
RECOMMENDATIONS CONTAINED IN THE NSW CHIEF
SCIENTIST'S INDEPENDENT REVIEW OF COAL SEAM
GAS ACTIVITIES IN NEW SOUTH WALES**

Organisation: University of Queensland Centre for Natural Gas

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28 October 2019

Centre for Natural Gas

Mr Mark Banasiak
Chair
Portfolio Committee No. 4 - Industry
Parliament of New South Wales
Parliament House
6 Macquarie Street
Sydney, NSW 2000.

Dear Mr Banasiak,

Please accept this submission to the Inquiry regarding the implementation of the recommendations contained in the NSW Chief Scientist's Independent Review of Coal Seam Gas Activities in New South Wales. With submission to the Committee's ToR, this letter relates to the availability of more recent inquiry findings or major reports that are relevant to the Australian unconventional gas industry, and also to the Chief Scientist's recommendation regarding the establishment of a Standing Expert Body.

The UQ Centre for Natural Gas was established in December 2011 as the Centre for Coal Seam Gas. The purpose of the Centre is to conduct and support research and education relating to onshore gas development, coordinating a multi-disciplinary research program to address the range of community, government and industry challenges associated with the industry. The Centre conducts research and supports education in key discipline areas including economics, business, petroleum engineering, geosciences, water and social performance. The Centre also provides independent advice to stakeholders on policy or business-relevant matters, leadership on scientific and technical issues as well as strategic planning. Our research leaders have considerable expertise in reservoir modelling, groundwater flow modelling and hydraulic stimulation.

The Australian inquiries that are relevant to this review are outlined in the following table.

Inquiry	Report year	Outcome
Inquiry into onshore unconventional gas in Victoria	2015	Recommendations made to improve management of the industry. Subsequent Government decision to ban hydraulic fracturing and prevent the exploration for and mining of coal seam gas
Inquiry into unconventional gas (fracking) in the South East of South Australia	2016	Natural gas industry should not proceed in the South East of South Australia until it gains social licence to operate
Independent Scientific Panel Inquiry into Hydraulic Fracture Stimulation in Western Australia	2018	44 recommendations provided to improve the management of the WA unconventional oil and gas industry. Government has accepted in-principle the Inquiry's recommendations and introduced regulatory changes. State-wide fracking ban lifted on existing petroleum titles, but prohibited in specific areas
The Scientific Inquiry into Hydraulic Fracturing in the Northern Territory	2018	135 recommendations provided to improve the management of the NT onshore shale gas industry. Government accepted all recommendations and lifted the Moratorium.

Each of the above inquiries have undertaken reviews of available scientific literature and considered submissions from the public, government agencies, industry and academia.

There are several key reports and scientific publications that have been produced by research institutions and government agencies that are recommended for review:

- UQ research has compared the actual associated water production of the Queensland coal seam gas industry with the estimates developed by industry, government, consultants and academics in the pre and early-development phases of the industry. Actual volumes of associated water production are significantly lower than all pre and early development estimates (~25% of government and academia estimates and ~70% of 2010-11 industry estimates). The research proposes five factors that contributed to this over-estimation i.e. gas industry conservatism to reduce project risk; government desire for prudent forecasting; assessment of worse case scenarios; modelling software capability; and underestimation of the cumulative effects on depressurisation. Full details are available in the article: Unterschultz, J.R., Vink, S., Garnett, A. 2018. Coal seam gas associated water production in Queensland: Actual vs predicted. *Journal of Natural Gas Science and Engineering*. <https://doi.org/10.1016/j.jngse.2018.02.010>
- UQ research into the recharge of the Surat Basin has found that recharge is complex and rates vary across the basin due to geological factors. The Centre gathered data at three sites to compare recharge under different physical conditions. While it is not possible to extrapolate these findings across the basin, the report provided recommendations aimed to improve the modelling of recharge inputs to groundwater flow models. The Centre is able to provide a briefing on the main findings of this report upon request.
- The Centre is currently coordinating a Special Issue edition of the *Hydrogeology Journal*: *Advanced in hydrogeologic understanding of Australia's Great Artesian Basin*. This is expected to be published in early 2020 and is a collection of articles documenting the latest research undertaken within academia, government agencies and industry. It includes several articles that report outcomes of coal seam gas related research.
- The GasFields Commission has recently released [*Shared Landscapes*](#), a report containing a comprehensive range of data government agencies, the gas industry, and other public information sources regarding the Queensland gas and agricultural industries. It has been designed to report on industry development and regulatory activities. It focuses on matters of key concern to the community e.g. socioeconomic change, groundwater and hydraulic stimulation. This publication is consistent with the aims of the Chief Scientist's Recommendation 2, although it should only form one part of a package of open reporting mechanisms.
- CSIRO has completed a number of studies relating to methane emissions from coal seam gas and shale gas basins, and from wells and gasfield infrastructure. Ongoing research is gathering data in Queensland, New South Wales, Western Australia and Northern Territory. This research is providing Australia specific data that should guide government policy. The full range of reports can be downloaded at: <https://gisera.csiro.au/research/greenhouse-gas-and-air-quality/>
- National Energy Resources Australia (NERA) published [*Preparing Australia's future oil and gas workforce*](#) in 2018. This report provides information regarding current industry employment levels and explores future employment needs in 2030 against three industry development scenarios. The study concludes that "each oil and gas worker in Australia currently sustains another 10 jobs across the supply chain and wider economy – generating five times more indirect employment than an average worker in other industries."

The Chief Scientist Recommendation 12 proposed the establishment of a standing expert advisory body on CSG and we understand that the NSW Government has chosen to work closely with the existing Commonwealth Independent Expert Scientific Committee on Coal Seam Gas and Large Coal Mining Development (IESC) to avoid duplication. The Centre notes that while the members of the IESC have excellent scientific backgrounds, none have specific expertise in the petroleum and gas sector. The Centre suggests that if the NSW Government subsequently decides to create a state-based advisory panel it would be appropriate to include representatives with expertise in fields such as petroleum engineering, reservoir engineering, reservoir modelling and hydraulic stimulation to augment advice from the IESC, rather than replicate a similar expertise base.

I am happy to provide a briefing on any Centre research that may be of interest to the Inquiry. Prior to joining UQ I worked in the gas industry in many nations and would also be willing to meet with the Inquiry Committee to discuss management of the unconventional gas industry in other jurisdictions.

Yours sincerely

Prof Andrew Garnett
Director, Centre for Natural Gas