

## Considerations for the panel

Dear Sirs,

I am an independent consultant with 30 years' experience in the conventional and unconventional energy industry, including geothermal, carbon sequestration and coal seam gas. I am not employed or receiving any remuneration for my comments, nor am I aligned with any specific argument for or against hydraulic stimulation. I am, however, concerned that a truthful outcome is achieved in this scientific study, as there are very emotional and quite uninformed opinions relating to this issue being aired in public that I feel are counter-productive to Australia and its reputation as a rational thinking society based on facts and evidence.

I am particularly concerned about the position of incumbents regarding the accusations aimed at the industry as a whole that are unfounded speculation worthy only of conspiracy theorists. These include that the industry:

- Is a major source of pollution – especially methane fugitive emissions
- Is unregulated, when the opposite is true
- Has a link with other extractive industries, such as mining, in terms of operation and environmental impact

In fact, these are areas where the existing agricultural businesses fall short in polluting the environment. In particular, the Northern Territories have 2 million head of cattle spread over 220 leases. Each produces about 70 Kgs of methane emissions per year<sup>1</sup>, or a total of 140,000 tonnes of methane annually. In comparison, this is the **total annual production** of a small coal seam gas field (about 17 million cubic feet per day). This also does not take into account the massive amount of water consumed by animals and feedstock, nor the faecal waste and run off that is a danger to both land and surface waters.

Worse than this is the fact that 50% of the animal produce is exported, producing an even higher carbon footprint due to transport, and means another country takes the benefit, while Australia retains the waste and loss of fresh water.

I also noted the incorrect statement that no independent studies into fugitive emissions have been carried out. The CSIRO have a published study on Coal Seam Gas (CSG) fields in Queensland and New South Wales<sup>2</sup>, and I find it disturbing that even the most basic search for such a report has not been done by the groups calling for a moratorium. This highlights the confirmation bias being applied by pressure groups whose only motivation must be to retain a status quo to protect their own financial position, without regard for the environment or economic development of the country.

In conclusion on the issue of emissions, I suggest to the board that there is no basis for farming communities to consider their position as being “environmentally responsible” or to have any scientific basis for a concern about fugitive emissions from the oil and gas industry, being miniscule compared to those produced by cattle farming alone.

I turn now to the misconceptions and rhetoric used by such groups which indicates a lack of basic technical knowledge about the process of hydraulic fracturing and the possible impacts on water sources. While acknowledging the groups and individuals involved have little education in this area,

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<sup>1</sup> <http://www.publish.csiro.au/an/pdf/AN15365>

<sup>2</sup> <http://www.environment.gov.au/system/files/resources/57e4a9fd-56ea-428b-b995-f27c25822643/files/csg-fugitive-emissions-2014.pdf>

though it is not hard to obtain, the words used to describe the process are both inflammatory and inaccurate. In particular, talking about “exploding” the rock is in no way descriptive of the rather slow process of hydraulically producing a crack in a shale strata and propping it open.

The comments about “all wells fail” crops up also – really - where this comes from is unclear and also completely false. This should be obvious from the fact there are so many old water wells around! These are subject to much higher wear and tear than oil and gas wells, due to the poor construction materials and methods, effects of iron and sulphate reducing bacteria, hydrogen sulphide, erosion and galvanic corrosion. Older exploration or drained oil and gas wells have a useful production lifetime measured in a few decades at most, though designed to last hundreds of years. They have to be abandoned by multiple cement plugs and are usually in perfectly workable conditions at that time. In addition, the well production takes place through replaceable tubing strings, while the casings are cemented externally into the strata. It is quite disturbing to see the misconceptions and unfounded rhetoric being given any credence in a public forum without questioning their source.

There is also the claim that large quantities of water are required for hydraulic fracturing. In fact, in cases where the strata are compatible, brackish water is used, as this may be sourced from a nearby saline aquifer well to avoid costly transport. Even if fresh water is required, much of it is recycled and, again, the amount used pales in comparison to that used for farming, which raises the issue, again, of why the community sees their use of this resource as more environmentally worthy when much of it is permanently lost in export of produce.

The final issue is the “scare campaign” regarding contamination of drinking water supplies. It is not clear what the thinking is here and what contamination is envisioned. I assume there to be two claims – one that the very small amount of chemicals used during the fracturing process can “somehow” get into the aquifer, or that the fractures propagate through the overlying strata to reach the aquifer. Unimaginable as that may be based on the physics of fracture propagation and mechanical properties, even if it was possible, exactly how much contamination could feasibly occur? Considering a fracture width at the tip is about the thickness of a human hair, the leak off rate would be tiny, so the chemical dispersion in a massive aquifer completely negligible.

So I assume then, that the pollution would then be methane gas migration into the aquifer. Putting aside the presence of methane is a natural phenomenon in many aquifers, one has only to consider the solubility of methane (0.023g/Kg at 20 degC) and its lack of toxicity<sup>3</sup> to realise this is not a material that can cause any harmful effect, either to humans or the water environment. In addition, as the producing well represents a low pressure point, it is more likely that gas would flow to the well and the aquifer water “invade” down the fracture, not the other way around.

In conclusion, while I applaud the aims and reach of the investigation, I find it concerning that the board continues to allow unfettered falsehoods from pressure groups with an agenda, when the oil industry is restrained to tell the truth and provide sources and supporting evidence. By not holding up the same standards to both parties, there is a real possibility that the process will reflect poorly on the veracity of the board and its members.

Yours faithfully,

Barry Nicholson  


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<sup>3</sup> <http://www.praxair.com/-/media/documents/sds/methane-ch4-safety-data-sheet-sds-p4618.pdf>