

Dear Inquiry Panel,

I oppose fracking in Western Australia.

I am in my third year of Sustainable Development and Community Development studies at Murdoch University. I am a mother of three girls aged 16, 12 and 10.

We, the people who live in Western Australia, deserve to have a government who decides to value our ability to provide food and water for ourselves and protect our environment now and for future generations by saying no to unconventional gas mining and fracking in Western Australia.

The oil and gas industry is boom and bust; our water and our food agricultural systems are needed for the long term and should be protected at all costs and as the most valuable of our resources.

I believe that the impacts of hydraulic fracture stimulation pose such a risk to our food and water that it cannot be guaranteed to be safe nor can this risk be managed or mitigated by the government or mining companies.

Within the terms of reference for this enquiry I will state the point and give some references to support the potential impacts and why I do not believe that the risk can be managed or mitigated to warrant the approval of unconventional gas mining and fracking in Western Australia.

- Fracking leads to large deliberate and fugitive emissions of methane, adding to climate change. It prevents and delays innovation and development of sustainable, alternative energy sources.

Professor Anthony Ingraffea from Cornell University:

“Shale gas is no bridge to a green, sustainable future. It is a barrier to deployment of green renewable energy. Keep it in the ground, Western Australia.”

“There is no longer any excuse for ignorance or personal opinion concerning potential impacts from shale gas extraction. There are over 50,000 shale gas wells drilled in the U.S. in the last 20 years, and, as a result, there are now over 1,400 peer-reviewed scientific publications on such impacts. The vast majority of these find undesirable impacts on air, water, and human health. I am assigning the reading of all of these publications to the Independent Scientific Panel and requesting their judgement on them.”

Source: https://www.zotero.org/groups/248773/pse_study_citation_database/items

“The Background and Issues Paper for the Scientific Inquiry notes, ‘A horizontal well, as shown on Figure 1 (with a horizontal length of one kilometre) with ten fracture stages is likely to require 21 million litres of water per well. This is the same as approximately 8.5 Olympic size swimming pools.’

I hope the Independent Panel moves forward a decade in its research to acknowledge that state-of-the-art shale gas wells in the U.S. have lateral lengths longer than 3 kilometres, more than 100 fracture stages, use 3 tons of proppant per meter, inject over 100 million litres of water, and use over 400 tons of steel, per well. And each of those wells will cost over \$A10 million to complete. The time for comparison to swimming pools is long past.”

Source: <https://www.swn.com/investors/LIP/latestinvestorpresentation.pdf>

Climate Analytics new research shows that the pollution produced by fracking in Western Australia would exceed Australia's entire pollution budget for energy production three times over, under the Paris Climate Agreement.

This means a Western Australian fracking industry would have a profound impact on our climate, and make it impossible for Australia to meet its international obligations on climate change.

Source: <file:///C:/Users/user/AppData/Local/Temp/climateanalytics-report-westernaustraliasgasmble-2018.pdf>

- Unconventional gas mining and fracking is harmful to health.

Communities living near gasfields in Queensland and the USA have reported serious health effects following the commencement of unconventional gas operations. These conditions include respiratory ailments, nose throat and eye irritations and neurological illnesses.

The industry claims that unconventional gas activities are safe. To justify this, it quotes a report from Queensland Health which concluded no clear link could be drawn between the health complaints of some residents and the local CSG industry (2.1) . ‘ This report found that the nature of complaints meant there were multiple possible causes and explanations including faecal contamination in the water supply, the use of wood- fired heaters or open fires, and rainwater contaminated with bacteria, viruses or other organisms. These causes are not related to gas operations. The report noted the most prevalent reported symptoms are headache, transient (reversible) eye irritation, nosebleeds and skin rashes. These are common medical complaints.’

There is a rapidly growing body of research that demonstrates that unconventional gas operations can have serious consequences for human and animal health.

Adgate, Goldstein and McKenzie (2014) (9.1) present a clear argument that unconventional gas mining poses risks to health, both directly and indirectly, and at the local, regional and global level. Thus, decisions on unconventional gas mining made by all Australian states and territories, and by other nations, affect us all.

There are numerous independent reviews involving many hundreds of peer-reviewed papers demonstrating the impacts of unconventional gas on human health.

Source:

9.1 Adgate, Goldstein and McKenzie (2014) Potential public health hazards, exposures and health effects from unconventional gas developments. Environmental Science and Technology 48: 8307-8320. <http://pubs.acs.org/doi/abs/10.1021/es404621d>

- Contamination of aquifers and surface water

Water and chemical use and wastewater production from fracking places WA's vital water resources at risk from contamination and depletion. Our state is one of the driest places on earth and climate change is already leading to decreased rainfall in southern WA. Our land and environment are under growing pressure from a lack of fresh water. We cannot afford to put our precious groundwater at risk for a short term and unnecessary fracking industry.

There are numerous examples of peer-reviewed literature showing serious unconventional gas impacts on groundwater in the USA, regardless of the industry's insistence that there are no impacts. This should provide a warning to Western Australia that impacts do occur and are usually found by third parties (5.2) .

The gas industry claims that because shale and tight gas extraction involves deeper rock layers, they are safer than gas extraction from shallow coal seams. But according to a European Commission Report (6.1) there is an overall high risk of ground and surface water contamination resulting from fracking.

Aquifers can be contaminated by fracking: • through water seeping from leaking wells • from faults induced by fracking • from surface spills of produced water involved in the fracking process • contaminated water from the gas source per se. (1. 6 , 6.2 , 6.3 , 6.4)

After fracking at each well, the large volumes of hazardous flow back fluid must be stored and disposed of. Surface water pollution can occur: • when there are accidental spills of fluids or solids at the surface • when well blow outs occur • through discharge of waste water onto land surfaces or into waterways (1. 6 , 6.2 , 6.3 , 6.4) .

Flowback fluids contain hazardous fracking chemicals as well as naturally occurring toxic substances released from target geological zones such as: • methane • BTEX (benzene, toluene, ethylbenzene, xylene) • polycyclic aromatic hydrocarbons (PAHs) • naturally occurring radioactive materials (NORMs) • heavy metals and other volatile organic compounds (VOCs) (6.5 , 6.6 , 6.7 , 6.8) .

Sources:

Impacts on water – Ground water and surface water

5.2 Vogwill R., 2017. Western Australia's Tight Gas Industry – A review of groundwater and environmental risks. Conservation Council of Western Australia.

6.1 Broomfield Mark, Support to the identification of potential risks for the environment and human health arising from hydrocarbons operations involving hydraulic fracturing in Europe. AEA Technology, 2012.

<http://ec.europa.eu/environment/integration/energy/pdf/fracking%20study.pdf>

6.2 EPA United States (2016): Hydraulic Fracturing for oil and Gas: Impacts from the Hydraulic Fracturing Water Cycle on Drinking Water Resources in the United States. December 2016 <https://www.epa.gov/hfstudy>

6.3 Fracking: The evidence,

<https://docs.google.com/file/d/0B1cEvov1OlyHdzRBRjk4dElfbVE/edit?pli=1>

6.4 Vengosh et al. 2014

https://hero.epa.gov/hero/index.cfm/reference/details/reference_id/2253172

6.5 Dart (Univ Qld): Submission to Inquiry into Hydraulic Fracturing in NT April 2017 <https://frackinginquiry.nt.gov.au/?a=424261>

6.6 National Toxics Network, 2013, Toxic Chemicals in the Exploration and Production of Gas from Unconventional Sources http://www.ntn.org.au/wp/wp-content/uploads/2013/04/UCgas_report-April2013.pdf

6.7 NTN: Toxic Chemicals in the Exploration and Production of Gas from Unconventional Sources; http://www.karooplaces.com/wp-content/uploads/2011/06/coop_shale_gas_report_final_200111.pdf

6.8 Fracking: a serious concern for surface water as well as groundwater:

<http://ec.europa.eu/environment/integration/research/newsalert/pdf/275na3.pdf>

6.9 Hildenbrand, Z. L., Carlton, D. D., Fontenot, B. E., Meik, J. M., Walton, J.L., Taylor, J. T., . . . Schug, K.A. (2015) A comprehensive analysis of groundwater quality in the Barnett Shale region. Environmental Science & Technology, 49(13), 8254-62. doi: 10.1021/acs.est.5b01526

- Landholders and Traditional Owners don't have the right to refuse access to oil and gas companies in WA.

This creates stress and leaves individuals and communities worried about their financial security, their ability to farm their land and continue to live in their homes maintaining their sense of place. The cards are stacked unfairly in favor of the gas industry and human rights are being ignored for a resource that is no longer strategically vital as it can be replaced by renewable forms of energy generation.

Community cohesion and wellbeing:

The Queensland and NSW experience has shown that when an unconventional gas industry is forced upon communities against their wishes, there is potential for significant conflict and social upheaval and disruption as a result (1.6). Lock the Gate members and local community groups report a range of impacts on their mental and emotional wellbeing, including:

- A sense of injustice that they do not have the right to refuse access to companies for UG activities and that this industry is being forced on an unwilling population.
- Fear and anxiety about the impacts of the unconventional gas industry on their family's health and the quality of the air and water they rely upon.
- Concern about the impact of unconventional gas development on the economic viability of their farms and property values.
- A sense of anger and betrayal that governments are supporting industry rather than communities in the development of the unconventional industry.
- A sense of anger that the industry is being pushed ahead rapidly without proper consideration of the impacts and before proper scientific studies have been done and baseline data collected.

Doctors for the Environment Australia note that the lack of a veto right for landholders in relation to unconventional gas development, the stress involved in dealing with companies (often against their will), the lack of full information and disclosure on the realities of unconventional gas development, and the often underhanded tactics employed by companies contributes to a sense of powerlessness, betrayal and frustration amongst landholders and affected communities. The injustice and powerlessness contribute to distress and poorer mental health outcomes. Unconventional gas development can 'divide previously close-knit rural communities, increasing tension and disharmony'.

According to DEA, in eastern Australia, the stress and disruption caused to farmers has already been shown to force some of them to leave a CSG drilling area, allowing once productive lands to lapse into disuse. In the USA long-time residents are moving, unable to bear the changes the gas industry has wrought on their landscape and community.

A study on landholders in Queensland found that unconventional gas operations placed rural communities under sustained stress, with study participants describing significant impacts on the health, social fabric and economy of local communities (10.4).

Source: (1.6) LTG Submission to NT Inquiry April 2017

<https://frackinginquiry.nt.gov.au/?a=424035> See also:

<https://www.youtube.com/watch?v=R8TKwEjU7sw&feature=youtu.be&list=PLHnnuC-2E7S6sW2215knMKqH0NRPIcgV>

Source: (10.4) Hossain D. et al. Impact of the mining industry on the mental health of landholders and rural communities in southwest Queensland (2013). *Psychiatry*, 21:32-37.

Emeritus Professor Bruce Armstrong, University of Sydney:

“Evidence of harmful effects on health due to fracking is increasing. We must not commit to likely uncontrollable health impacts from increased greenhouse gas emissions and other hazards associated with fracking without full consideration of this evidence, and be prepared to apply the precautionary principle where the evidence is insufficient to establish important risks to health.”

Note: Precautionary measures should be taken even if some cause and effect relationships are not fully established scientifically when an activity raises threats of harm to human health or the environment.

- Research into the economic and social impacts of the unconventional gas industry in Queensland has shown that the industry has led to a reduction in community well-being and social cohesion.

It also caused a deterioration in local skills and infrastructure; few additional local job opportunities; and limited economic benefit to the wider economy.

Former WA Premier Professor Carmen Lawrence, University of Western Australia:

“We now know that the mental health of people living in the areas where unconventional gas is exploited is being compromised. There is a growing body of evidence that the disruption of cultural values and place attachment through the transformation and degradation of the cherished places and the natural environment contribute to poorer community mental health and well being. These effects are often overlooked in project assessments when they should be front and centre of any evaluation.”

Conclusion

Scientists and academic researchers have demonstrated that pollution and health implications can be delayed by years or decades. There is a history of regulations not being adhered to and the risk of pollution is too great to guarantee no risk to the long term viability of our environment.

The growing evidence of actual harm, and the potential environmental and health risks from shale gas development, has now resulted in decisive action from governments across the globe to halt the expansion of this industry. Internationally, jurisdictions with some form of ban or moratorium in place include Scotland, Wales, Germany, Bulgaria, Romania, the Netherlands, Northern Ireland, Wales, the Czech Republic, Luxembourg and France as well as the US States of New York, Maryland, Florida and Vermont and the Canadian Provinces of New Brunswick, Newfoundland, Nova Scotia and Quebec

Source: LTG Submission to NT Inquiry April 2017
<https://frackinginquiry.nt.gov.au/?a=424035> See also:

<https://www.youtube.com/watch?v=R8TKwEjU7sw&feature=youtu.be&list=PLHnnuC-2E7S6sW2215knMKgH0NRPlcgV>

Source: Concerned Health Professionals of New York & Physicians for Social Responsibility. (2016, November 17). Compendium of scientific, medical, and media findings demonstrating risks and harms of fracking (unconventional gas and oil extraction) (4th ed.). <http://concernedhealthny.org/compendium/> Available at: <http://www.psr.org/assets/pdfs/fracking-compendium-4.pdf>

Source: Concerned Health Professionals of New York & Physicians for Social Responsibility. (2015, October 14). Compendium of scientific, medical, and media findings demonstrating risks and harms of fracking (unconventional gas and oil extraction) (3rd ed.). <http://concernedhealthny.org/compendium/> Available at: <http://www.psr.org/assets/pdfs/fracking-compendium-4.pdf>

Source: Places with fracking bans in place. <https://keptapwatersafe.org/global-bans-on-fracking/>

I urge the inquiry to make a recommendation to permanently ban fracking and all unconventional gas mining in Western Australia.

Kind Regards

Kristine Thomson

17 March 2018