

THE IMPLICATIONS FOR HUMAN HEALTH AND WELLBEING OF EXPANDING GAS MINING IN AUSTRALIA

Onshore Oil and Gas Policy
Background paper
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The evidence is clear that gas mining harms the necessary supports for human health and indeed life: stable climate, air and water quality and security, food security, community cohesion and, in some locations, geological stability. The cumulative impacts of this industry on the wider requirements for good health and wellbeing are extremely concerning.

In particular, gas mining is responsible for an increasing proportion of Australia's global fossil fuel carbon footprint. Climate Analytics¹ indicates that our domestic and export fossil fuel emissions are now 5% of global emissions and current developments could increase this to 12-17% by 2030.

Accordingly, Doctors for the Environment Australia (DEA) urges the Australian government to commit to a national energy plan that prioritises the urgency of climate change and urges a ban on new gas and oil developments, and stringent regulation of existing gas developments, while vigorously promoting a coordinated transition to renewable energy.

The evidence

Over the past six years, health and environmental researchers, have published over 1,500 research papers on the impacts of gas mining. This research comes mainly from the United States where rapid and expansive development of gas and oil fields has occurred in close proximity to residential areas.

We have reviewed this research and recognise that the exploration and extraction of natural gas (methane) and oil from conventional and unconventional sources pose many risks to human health and wellbeing.

1. Greenhouse gas emissions

The substantial and rising greenhouse gas footprint of the expanding gas and oil industry threatens global efforts to urgently reduce emissions.

Emissions caused by gas are often underestimated through:

- ❖ Failure to consider the footprint of the entire lifecycle of gas production, processing, transport and use which makes it little different from the footprint of coal;
- ❖ Underestimation of the quantity and duration of fugitive methane emissions;
- ❖ Inappropriate application of climate-forcing potency of methane over a 100-year time timeframe (20 times more than CO₂), rather than the more appropriate 20-year timeframe (86 times higher potency) given the already measurable health impacts of current rapid warming;
- ❖ Failure to consider the potential significance of large-scale methane-emitting accidents (e.g. Aliso Canyon storage facility in California) and leakages that are difficult to stop quickly;

- ❖ Failure to recognise the economic competition between abundant gas from large expansions and low emission renewable energies in the energy market.

The rapid increase in global warming has many health impacts in Australia and throughout the world.

2. Chemicals used in drilling and released from coal seams and shale

The second major concern to health from gas mining is the wide array of chemicals used in drilling and hydraulic fracturing, and released into the environment through airborne emissions and wastewater, and also emitted from the high level of industrial activity (e.g. compressor stations, gas processing plants, on-site diesel-powered machinery and heavy vehicles) surrounding the production process.

Furthermore, potentially toxic chemicals within shale and coal seams are released into the air and wastewater. They include volatile organic compounds notably benzene, phenols, polycyclic aromatic hydrocarbons (PAHs), heavy metals, salt and technologically enhanced naturally occurring radioactive materials that may become concentrated through treatment processes.

Studies examining the potential toxicities of chemicals found in shale gas wastewater have reported that while many have not been evaluated, some are known carcinogens and/or have the potential for endocrine disruption and/or are associated with neurological, reproductive and developmental harm.

There are many ways by which ground and surface water is impacted by gas well activity, through spillage, injection procedures, spills or deliberate discharge of inadequately treated water and leakage from wastewater pits and ponds.

Potentially harmful substances are emitted into the atmosphere during dewatering, gas production and processing, wastewater handling and transport. They include PM_{2.5} and PM₁₀, volatile organic compounds, hydrogen sulphide, formaldehyde, diesel exhaust and ground level ozone.

3. Health effects in gas field communities

The evidence of the health impacts of gas mining is in its infancy, due to limited resourcing to date. However, concerning aspects have already emerged in the scientific literature.

Associations have been reported between residences close to gas mining activities and asthma exacerbations, sinus conditions and migraines, skin rashes, fatigue and headaches as well as hospitalisations for heart, neurological, respiratory, immune system diseases and some cancers. Most of these studies have been from

the US, but similar reports have occurred with coal seam gas mining in Queensland.

In addition, there have been reports of negative birth outcomes, such as low birth weight, pre-term delivery, higher risk births and some birth defects in pregnancies spent closer to gas mining activities, compared to pregnancies spent further away, or in the same area before commencement of gas mining activities.

Increased levels of stress, depression, criminal activity and traffic accidents have also been reported among those living near gas mining. These changes likely reflect psychological and social disturbance among individuals and whole communities. Australian researchers have found that stress about coal seam gas mining may contribute significantly to mental health risks among directly affected farmers.

Of particular concern to Australian agriculture and remote communities is research showing an unpredicted but consistent rise in water footprint—up to 7.7- and 14-fold increases in water usage and waste used per well in semi-arid regions across the United States.

Demonstrated health impacts either directly or indirectly through water, air, and soil, require that the precautionary principle is applied to protect the Australian community.

Further reading and references

1. Climate Analytics

https://www.acf.org.au/australia_on_track_to_become_one_of_the_worlds_major_climate_polluters

The full document - "The implications for human health and wellbeing of expanding gas mining in Australia" can be accessed here:

<https://www.dea.org.au/wp-content/uploads/2018/12/DEA-Oil-and-Gas-final-28-11-18.pdf>

Evaluating the significance of Australia's global fossil fuel carbon footprint Report prepared by Climate Analytics for the Australian Conservation Foundation (ACF)

https://d3n8a8pro7vhmx.cloudfront.net/auscon/pages/16166/attachments/original/1562469729/FINAL_Carbon_footprint_report_Formatted.pdf?1562469729

DEA Fact Sheet: Climate Change and health in Australia

https://www.dea.org.au/wp-content/uploads/2017/02/DEA_Climate_Change_Health_Fact_Sheet_final.pdf

DEA Fact Sheet: Oil Spills & Health Don't Mix

<https://www.dea.org.au/wp-content/uploads/2019/06/DEA-Fact-Sheet-Oil-Spills.pdf>

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