

Submission to the Review of Hydraulic Fracturing (Fracking) in Tasmania

December 2014



67 Payneham Road
College Park SA 5069
P 0422 974 857
E admin@dea.org.au
W www.dea.org.au

Healthy planet, **healthy people.**

DEA Scientific Committee

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Introduction

Doctors for the Environment Australia (DEA) is an independent, self-funded, non-government organisation of medical doctors and students in all Australian States and Territories. Our members work across all specialities in community, hospital and private practices. We work to prevent and address the diseases - local, national and global - caused by damage to our natural environment. We are a public health voice in the sphere of environmental health with a primary focus on the health harms from pollution and climate change.

DEA welcomes the opportunity to comment on the possibility of the introduction of hydraulic fracturing - and potentially other risky methods of gas extraction - to Tasmania. DEA notes that this review process came about through the expression of significant concern about the potential for exploration and mining for unconventional gas deposits (including coal seam gas) by landholders, communities, businesses and health bodies in the lead-up to the 2014 Tasmanian state election.

Terms of reference 1-3

In recent years Australia has seen exponential growth in interest and development of exploration and mining for gas reserves previously inaccessible using standard techniques. Newer processes for extraction of these deposits, including the current and proposed use of hydraulic fracturing, have emerged only within the past decade (1). DEA is concerned that the rush to exploit these new methods has greatly outstripped the ability of assessment and regulatory bodies to ensure that public health is adequately protected.

Doctors for the Environment Australia reminds governments and proponents that health impact assessment is an integral part of the EIA process. In Australia, the states operate the EIA process under Health Impact Assessment (HIA) Guidelines September 2001
[http://www.health.gov.au/internet/main/publishing.nsf/Content/9BA012184863E206CA257BF0001C1B0E/\\$File/env_impact.pdf](http://www.health.gov.au/internet/main/publishing.nsf/Content/9BA012184863E206CA257BF0001C1B0E/$File/env_impact.pdf)

In these guidelines it is recognised that health is determined by many factors including genes, age, and a person's social and economic circumstances, lifestyle and access to services, as well as environmental health factors such as air and water quality, housing, etc. HIA seeks to ensure both the positive and negative impacts on health (as viewed from a wider perspective than just physical illness or injury) are effectively considered during impact assessment.

In the view of DEA, a number of states have preceded Tasmania in the assessment of unconventional gas and fracking and have largely ignored health issues. The consequences have been a failure to obtain base line scientific data before commencement and widespread community concern and protest over procedures. Tasmania therefore has the opportunity to learn from others and provide a thorough assessment which would protect both its people and its clean green image for agriculture which is in keeping with the key determinants of public health, clean air, clean water and a safe food supply (2).

This submission will therefore explore the potential human health implications of hydraulic fracturing and the processes that implicitly accompany it. However, whilst the focus of this review is on hydraulic fracturing, DEA notes that this process is just one of a number of recent innovations and new technologies that have enabled the development of previously inaccessible petrochemical reserves. In addition to the hydraulic fracturing stage, the combined methods and associated technologies used during each phase of unconventional gas extraction may present further risks to public health and warrant substantive review.

This submission draws on the work of DEA in previous submissions to state government and related authorities in Western Australia, New South Wales and Western Australia and the Northern Territory; but also takes in to account recently published scientific research into human and environmental impacts of hydraulic fracturing.

DEA notes that key determinants of public health include clean air, clean water and a safe food supply (2). In general, the recommendations of this submission are in keeping with those of a number of other peak scientific and health bodies in Australia and around the world, in calling for the application of the precautionary principle with regards to hydraulic fracturing and other related processes.

This sentiment has recently been echoed by the United Kingdom's Chief Scientific Adviser Mark Walport, whose annual report drew a direct comparison between hydraulic fracturing technology and past health issues including thalidomide, asbestos and tobacco (3).

DEA strongly recommends that the exploration and extraction of unconventional gas in Tasmania, including the use of hydraulic fracturing, be subject to an indefinite moratorium until there is clear safety data that key determinants of human health are not compromised.

Water resources

The extraction of unconventional hydrocarbons poses threats to both water quality and water quantity. Estimates of quantity used vary widely in Australia, but are reported to be at an average of 30, 000 litres per well per day in Queensland (4). Many key urban and agricultural regions of Tasmania are already affected by significant droughts on a regular basis - a problem which is forecast to be exacerbated by climate change (5).

Hydraulic fracturing involves pumping fluids with added chemicals into coal seams or shale to cause gas to be driven towards extraction points. Whilst the fluid produced by this process will contain some naturally occurring chemicals found in the coal seam, some of the chemicals added by the extraction process have not been adequately assessed for human or environmental toxicity (6), and some are known to be associated with the potential for health risks. For example, ethoxylated 4-nonylphenol, which has been used in Australian unconventional gas operations (7), can affect the human endocrine system at extremely low concentrations (8). Naturally occurring contaminants dislodged by hydraulic fracturing, such as benzenes, heavy metals and radioactive materials, pose a significant human and environmental health risk (9). Alarmingly, some chemicals used in the process have not even been disclosed by industry (10).

A spill or other accident involving these chemicals would carry risks that such chemical cocktails may leak out in to ground water which may later be consumed by humans or livestock (11).

Of further concern is the management of wastewater produced by the mining of unconventional hydrocarbons. Wastewater generated by hydraulic fracturing may contain radioactive materials and heavy metals including uranium, which has been shown to be mobilised by such processes (12). There are a number of documented and anecdotal cases of wastewater spills, failures of holding dams and planned release of contaminated waste water in Australia and the United States.

Further health concerns

There is mounting evidence in the published scientific literature outlining threats posed to human health through unconventional gas exploration and mining.

An analysis published by the Colorado School of Public Health described potential routes for human exposure resulting from development of unconventional gas resources, and identified multiple potential health risks and impacts (13). One study found higher prevalence of self-reported

respiratory and skin conditions amongst people living within 1 kilometre of a shale gas well compared to those living more than 2 kilometres away from a well (14).

A large regional cohort study involving 124 832 infants found a positive association between congenital heart disease and increasing numbers of shale gas wells within 10 miles of residence in the year the infant was born (15).

The broad health impacts of gas mining on a rural community were explored by Queensland General practitioner Dr Geralyn McCarron in her 2013 report entitled "Symptomatology of a gas field: an independent health survey in the Tara rural residential estates and environs", and described a high rate of perceived negative health impacts amongst residents surveyed (16).

Term of reference 5

Social and economic impacts and health effects

DEA notes that the EIA and associated HIA should not consider economic benefits alone, rather the intent is to assess both positive and negative impacts. Thus detrimental social effects, illness and stress all have a negative economic effect on the balance sheet just as royalties and creation of jobs are positives. We recommend that proposals should not proceed without full cost benefit analyses. Some governments have disregarded this need in order to obtain short term economic gain and have left the losses that will accrue from ill health and loss of sustainability to be dealt with in subsequent decades.

It remains unclear as to why Tasmania needs to play host to unconventional gas developments. Tasmania has ample opportunity to be readily supplied by renewable energy, and the costs involved in exporting gas from these developments does not seem to be obviously economically expedient. If revenue generation from royalties and profits for developers is seen to be the imperative for unconventional gas mining in Tasmania, a full cost-benefit analysis including all potential health costs is mandatory.

The migratory, boom and bust nature of mining developments can carry with it significant social and psychological effects for those who live in communities near mining and gas operations and on those who may travel to work at these developments. A study of impacts of mining and unconventional gas operations on landholders in Queensland found that these operations placed rural communities "under sustained stress", with study participants describing significant impacts on the health, social fabric and economy of local communities (17).

Mining developments may contribute to light and noise pollution, creating the potential for increased stress and disturbed sleep patterns for those living in proximity of such operations and cause a variety of adverse

physiological effects.

The introduction of hydraulic fracturing, a highly controversial mining technique which is as yet unproven in terms of safety for human and environmental health, is also likely to put at risk Tasmania's reputation as a clean and green holiday destination and source of high quality food and wine products. A threat to this image could conceivably carry social and economic risks to those dependent on tourism and agriculture in Tasmania.

Additionally, there is generally an even greater potential for higher exposures in wildlife and farm animals than humans. A US study reported multiple accounts of adverse health effects in herd and domestic animals that live in proximity to unconventional gas developments (18) - an issue that is likely to be highly relevant to Tasmania's agricultural economy.

Greenhouse gas emissions

Whilst the terms of reference of this review do not explicitly state a time frame for which potential impacts should be examined, it is relevant to consider the potential contributions of hydraulic fracturing and associated processes to climate change. Climate change is the defining global health challenge of this century, and has the potential to reverse gains made in public health, for example through contributions to under-nutrition, extreme weather conditions and changing patterns of infectious disease (19).

Some in the industry have proposed unconventional gas as a chance to move away from the use of other fossil fuels for energy production. However, the amount of fugitive emissions - those emissions which are not captured for use - associated with the extraction and transport of this gas seriously mitigates, if not entirely negates, any proposed greenhouse benefits of using unconventional gas sources (9).

Unconventional gas: the public health message

A number of leading health and environmental bodies have now expressed concern about the expansion of unconventional gas exploration and mining, including hydraulic fracturing, in Australia. DEA is in line with other public health organisations such as the Public Health Association of Australia, the Climate and Health Alliance and the National Toxics Network in recommending a precautionary approach to this technology.

The Australian Medical Association similarly calls for the application of the precautionary principle in the absence of sufficient evidence to ensure safety, calling for a block to any coal seam gas development where there remains any doubt about their potential to cause serious harm to health (20).

Summary and recommendations

Given the risks to water resources, the risks of chemical spills and contamination, and the multitude of other risks to human health, society and the environment, it seems unlikely that there would be adequate safety data generated in the near future to allow the public health community to endorse hydraulic fracturing or unconventional gas extraction more broadly.

As such, DEA strongly recommends that the Tasmanian government continue its moratorium on exploration and mining for unconventional and coal seam gas in Tasmania indefinitely. Importantly, such a moratorium would be meaningless unless extended to cover pre-existing mining exploration leases granted in the state for these purposes.

DEA calls for any future proposals for unconventional gas exploration or mining in Tasmania to be subject to rigorous and independent health risk assessments, taking into account potential for exposure to pollutants through groundwater and other methods, as well as any possible health risks associated with the proposal. Furthermore, any current exploration projects must be regularly monitored for health impacts.

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