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Inquiry into Unconventional Gas in Victoria

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Introduction

The Australian Nursing and Midwifery Federation (ANMF) was established in 1924. The ANMF is the largest industrial and professional organisation in Australia for nurses and midwives, with branches in each state and territory of Australia, representing in excess of 243,000 members.

The Australian Nursing and Midwifery Federation (Victorian Branch) [ANMF (Vic Branch)] represents more than 73,000 nurses, midwives and personal care workers (the latter predominantly in the private residential aged care sector). Our members are employed in a wide range of enterprises in urban, rural and community care locations in both the public and private health and aged care sectors and in all specialty areas of nursing and midwifery. Registered and enrolled nurses comprise the largest component of the health care workforce and provide care to people throughout their lifespan and across all geographical localities nationally.

The ANMF participates in the development of policy relating to nursing and midwifery practice, professionalism, regulation, education, training, workforce, and socio-economic welfare; health and aged care, community services, veterans' affairs, occupational health and safety, industrial relations, social justice, health and environment, human rights, immigration, foreign affairs and law reform.

The core business for the ANMF is the representation of the professional and industrial interests of our members and the professions of nursing and midwifery. The ANMF (Vic Branch) has an interest in policy development as policy influences the direction given and commitment to the health and well-being of the community and the management of demands placed on the health system.

The ANMF's position statement on *Climate Change*¹ and policy on *Health and Environment*² guides the ANMF (Vic Branch) in representing our membership and acting on the link between a healthy environment and the health of the population. We recognise the burden placed on the health workforce as a result of the increased demand on health services when human health is harmed.

In 2012 at the ANMF (Vic Branch) delegates' conference a resolution was passed directing ANMF to become more involved in policy debate on climate change and environmental issues.

The ANMF (Vic Branch) welcomes the opportunity to contribute to the Parliamentary Inquiry into Unconventional Gas Exploration. The ANMF (Vic Branch) sees value in expanding the terms of reference to the inquiry from the previous 2013 inquiry chaired by Peter Reith, former federal minister. The Reith report recommended the moratorium on coal seam gas exploration and fracking be lifted in Victoria. The ANMF (Vic Branch) disagrees with the Reith recommendation. We support this Inquiry's emphasis on community consultation and inclusion of the health impacts of the unconventional gas industry.

¹ http://anmf.org.au/documents/policies/PS_Climate_Change.pdf

² http://anmf.org.au/documents/policies/P_Health_Environment.pdf

Executive summary

The ANMF (Vic Branch) submission focuses on the public health and environmental risks that are a feature of the unconventional gas industry. We also comment on the misguided approach of failing to factor in the economic costs associated with the consequences of ill health and environmental damage when considering the benefits of unconventional gas production.

The ANMF (Vic Branch) sees expansion of a fossil fuel industry as an energy source, when the industry has the capacity to contaminate air and water supplies, as well as contribute to the effects of climate change, as shortsighted. In circumstances when robust regulation is not a feature of the industry, with it deemed as not yet proven to be safe to co-exist with the population, then authorising development and expansion of the industry is irresponsible.

The ANMF (Vic Branch) does not support the exploration, extraction and production of onshore unconventional gas. This industry's practices generate pollution contaminating air and water supplies and damaging agricultural industry. The unconventional gas industry is not sufficiently regulated and monitored to satisfy community concerns and has not been proven to be scientifically safe.

In circumstances when public health is put at risk the ANMF supports invoking the "precautionary principle", a principle commonly adopted by environmental scientists and health professionals in circumstances when there are perceived risks to human health and the environment. The principle imposes a responsibility on the initiators of an activity to prove the activity is safe. The American Nurses Association (ANA) is a proponent of this principle and advocates for banning hydraulic fracturing, known as fracking, based on the health threats to communities when exposed to the industry³.

Put simply, the operation and rights of corporations must not override the safety of the community and impose health risks. Unconventional gas exploration directly impacts the health and well-being of people because it is an industry that generates and relies on the use of chemicals. The naturally occurring radioactive materials from coal seams along with the chemical additives used for fracking pollute the air, the water systems and damage the environment, threatening the safety of people, livestock and food production.

An indirect and additional harmful consequence of the industry is the air pollution that comes from the industry's reliance on vehicles maneuvering to and from sites, continually transferring product and waste.

The economic advantages for developing an energy industry do not sufficiently offset the overall disadvantages when considering the costs to health for members of the community needing health service delivery. The restoration of the environment or the loss of its value for human activity such as food production, is an additional factor when considering the debate about industry value at the expense of environmental degradation.

The ANMF (Vic Branch) opposes a short term energy solution at the expense of significant environmental damage. These adverse effects to health and the environment with the accumulation of toxins in the air and water supplies has the potential to impact negatively

³ Fracking, the environment and health - New energy practices may threaten public health. By Ruth McDermott-Levy, PhD, RN; Nina Kaktins, MSN, RN; and Barbara Sattler, DrPH, RN. AJN June 2013 Vol 113

on the environment for the long term⁴. Decisions made now will impact the environmental viability and health of future generations.

Victoria has a choice when considering and planning for the energy needs of the state. The transition to renewable energy solutions that are clean, safe for human health and the environment is a responsible and preferred response to the energy needs for the State of Victoria.

Unconventional gas – the risk to public health

Coal seam gas mining and fracking, involves drilling and pumping large amounts of water, sand and chemical additives at high pressure to fracture the underground coal seams to extract gas. Naturally occurring chemicals are a by-product of the process along with the introduction of chemicals such as methane, benzene, xylenes, hydrocarbons.

It is the exposure to chemicals that lead to poor health outcomes with toxins causing symptoms including fatigue, nose bleeds, headaches, burning eyes, dermatological irritation, respiratory problems, abdominal pain and endocrine and urological problems. These symptoms are known to be reported by people living in proximity to hydraulic fracking sites⁵.

Industry representatives such as the Australian Petroleum Production and Exploration Association (APPEA) underplay the health risks associated with unconventional gas exploration:

*.....risks associated with hydraulic fracturing are no greater than those posed by other industries and can be safely managed through regulation and industry best practice.*⁶

The views of proponents of the unconventional gas industry lack credibility because the industry they benefit from is not well regulated, and monitored, both nationally and internationally, nor are there sufficient legislative protections in place. Comprehensive research and longitudinal health studies of people exposed to contaminated air and water have not been undertaken. However the anecdotal reporting of symptoms of ill health, including increased blood level readings of chemicals, and the anecdotal experiences of adults and children exposed to fracking practices are compelling⁷.

The fact that unconventional gas exploration, including the practice of fracking involves the generation and use of hazardous chemicals is an obvious warning and not unexpectedly health risks result. The mining process uses and exposes the environment to the BTEX group of chemicals that are volatile organic compounds (VOC)⁸. These chemicals are known to cause toxicity, with health effects ranging from localised symptoms such as headaches, nose bleeds, eye, nose and throat irritation, damage and disruption to kidney, liver and central

⁴ http://dea.org.au/images/general/viewpoint_issue_8_CSG.pdf

Viewed 5 July 2015

⁵ Fracking, the environment and health - New energy practices may threaten public health. By Ruth McDermott-Levy, PhD, RN; Nina Kaktins, MSN, RN; and Barbara Sattler, DrPH, RN. AJN June 2013 Vol 113

⁶ http://www.appea.com.au/media_release/hydraulic-fracturing-poses-minimal-risk-to-water-us-epa/
APPEA - Viewed 5 June 2015

⁷ Fracking, the environment and health - New energy practices may threaten public health. By Ruth McDermott-Levy, PhD, RN; Nina Kaktins, MSN, RN; and Barbara Sattler, DrPH, RN. AJN June 2013 Vol 113

⁸ http://dea.org.au/images/general/viewpoint_issue_8_CSG.pdf

Viewed 5 July 2015

nervous system disorders, as well as irreversible health effects such as cancer and birth defects⁹.

Researchers in the United States have reviewed the health effects of these chemical compounds and concluded that exposure to endocrine disruptors may affect "... fertility, exacerbate low birth weight and increase rates of miscarriage, pre-term birth and birth defects."¹⁰

The gas from the coal seams contains methane as well as naturally occurring radioactive materials (NORMS). Examples of these radioactive materials are identified in the report by the National Toxics Network in April 2013: http://www.ntn.org.au/wp/wp-content/uploads/2013/04/UCgas_report-April-2013.pdf

- Uranium – with the associated health risks of kidney toxicity¹¹
- Radium – a known carcinogen, exposure associated with increased incidence of bone, liver, and breast cancer
- Radon – can cause lung cancer

Unconventional gas production impacts the quality of the environment which is a fundamental infringement on the safety and health of communities.

The risks to health extend to the contamination of water supplies. This risk became a reality in NSW March 2014, an excerpt from the article report in the Sydney Morning Herald reads:

*A coal seam gas project operated by energy company Santos in north-western NSW has contaminated a nearby aquifer, with uranium at levels 20 times higher than safe drinking water guidelines, an official investigation has found. It is the first confirmation of aquifer contamination associated with coal seam gas activity in Australia - a blow to an industry pushing state and federal governments for permission to expand. Santos was fined \$1500 by the NSW Environment Protection Authority, which posted a media release on its website on February 18, without identifying the nature of the contamination.*¹²

This incident highlights the level of risk to communities when mining practice deficiencies result in spills and contamination, a disturbing combination with a poorly regulated industry that does not demand the identification of the type and quantity of chemicals. The paltry fine for the company is hardly an incentive for a best practice approach.

The disconnect between proponents of an industry that is not subject to rigorous disclosure requirements about chemicals used and people's anecdotal evidence of suffering ill-health requires careful consideration and attention before proceeding with approving unconventional gas mining. Until the question of whether the industry's practices are safe and whether human health is properly protected is resolved, then Government must err on the side of caution and not proceed.

⁹ <http://www.ntn.org.au/wp/wp-content/uploads/2013/12/CSG-Health-Impacts-Dr-W-Somerville.pdf>
Viewed 5 July 2015

¹⁰ Chemical pollution from fracking, PJ Lightowers for CHEM Trust – April 2015

¹¹ <http://web.ead.anl.gov/uranium/guide/compound/health/index.cfm>

Viewed 5 July 2015

¹² <http://www.smh.com.au/environment/santos-coal-seam-gas-project-contaminates-aquifer-20140307-34csb.html>

Viewed 6 July 2015

Unconventional gas – the risk to the environment

The unconventional gas industry involves creating wells and waste sites and injecting large amounts of water to enable the release of gas. Fracking contaminates water that becomes waste due to the volume of chemicals used in the process.

The combination of managing the migration of methane, found in the coal seams, and the chemical leaks into groundwater causing contamination from toxic substances puts at risk human health. Methane contributes to greenhouse gas emissions and in an enclosed environment can cause explosions. Private drinking sources have been affected by chemicals as well as livestock that may drink or suffer exposure to contaminated water supplies on properties.

Food sources and supplies are put at risk with an industry whose effects impact on soil quality, contaminated water supply, reduced access to water due to the high volume required for unconventional gas mining as well as the loss of valuable land due to the industry's demand for waste dumps.

The contribution to air pollutants from fleets of trucks required to transport product and waste to and from the mining sites to enable these projects, is an additional factor that is harmful to human health¹³.

Children in particular are vulnerable to compromised air quality with immature lung development, particularly for newborns at risk of respiratory compromise. Symptoms of asthma and respiratory problems can be long lasting when there is an increase in air pollutants and particulate matter.¹⁴

The industry often operates throughout the night, with the activities associated with vehicle movements and industry noise from its operation, interfering with people's ability to properly rest and enjoy recreational time. People often complain of the high voltage lighting that can be present throughout the night. These mines are set in communities often on private land which makes the ability to escape the light, noise and odours generated from chemicals impossible.

The potential benefits of onshore unconventional gas as an energy source

Proposals to explore and expand on energy sources that are derived from non-renewable fossil fuels are increasingly regarded with concern. Scientists, health professionals and the community generally, knowing the dangers of exacerbating greenhouse gas emissions, the major contributor to global warming, favour transitioning to renewable energy solutions.

- **The fossil fuel industry - health and climate change**

Human activity is the primary contributing factor to climate change, the effects of which are impacting adversely in a variety of ways on human health.

¹³ Fracking, the environment and health - New energy practices may threaten public health. By Ruth McDermott-Levy, PhD, RN; Nina Kaktins, MSN, RN; and Barbara Sattler, DrPH, RN. AJN June 2013 Vol 113

¹⁴ Outdoor air pollution and asthma in children, Lillian Tzivian, Journal of Asthma 48; pp470-481, 2011

In 2009 the Lancet Commission on health and climate change warned “Climate change is the biggest global threat of the 21st century”.¹⁵

The effects on human health includes more frequent and intense natural disasters such as fire and floods, spread of infectious diseases and chronic illness, food insecurity, displacement of communities. In 2013 the World Health Organisation calculated there were over 150,000 deaths each year attributable to climate change factors ranging from extreme weather events to increase in diseases¹⁶.

The most damaging contributor to global warming and climate change is atmospheric emissions that are primarily generated by fossil fuels. Whilst coal production is the commonly accepted dominant culprit for the escalation of carbon emissions, the generation of methane from unconventional gas exploration is a less well known but equally and potentially a more harmful gas. Methane is a potent greenhouse gas with each tonne of methane that is emitted equaling 25 tonnes of carbon dioxide emissions¹⁷.

Whilst methane is the main greenhouse gas emission from unconventional gas production, it is one of a number of gases known as “fugitive emissions”. These emissions are not able to be measured and without research the industry should halt its activities to better enable abatement of global warming.

The pathway to acting on the challenge of reducing greenhouse gas emissions and the effects of climate change is to transition to clean energy technologies.

- **Renewable energy options**

The argument to transition from fossil fuel and highly polluting energy industries such as unconventional gas is only possible because alternate low carbon technologies are not only available but already in production in Victoria. The progress of the transition program depends on the attitude of the political decision-makers.

The recently elected Victorian Government (November 2014) has acted quickly to support the renewable industry by:

- Announcing changes to windfarm planning laws to remove restrictions on industry development
- Development of a Victorian Renewable Energy action Plan
- Establishment of a \$20m New Energy Jobs Fund

In June 2015 the Ararat wind farm announced its expansion of turbines to enable it to be the third largest windfarm in Australia and provide energy to the ACT¹⁸.

The Lancet health and climate change report, June 2015 states “Tackling climate change could be the greatest global health opportunity of the 21st century”¹⁹. Embedded in the Lancet commission report is the view that there are opportunities to resolve health problems by embracing available technologies, developing innovations, challenging behaviors and transitioning to a new low carbon energy economy.

¹⁵ The Lancet – Health and climate change, June 2015

¹⁶ Nursing and climate change: and emerging connection, William Adlong, Elaine Dietsch Elsevier, 2013, collegian (2015) 22 pp19-24

¹⁷ Fracking the future – busting industry myths about coal seam gas, The Australian Institute – Matt Grundoff, March 2014

¹⁸ <http://www.abc.net.au/news/2015-06-26/act-backed-wind-farm-project-to-go-ahead-in-victoria/6574618>

¹⁹ The Lancet – Health and climate change, June 2015

- **Economic risks of unconventional gas**

1. Employment

The mining industry boasts the industry boosts economic success with the creation of jobs.

According to the Australian Institute it is hard to estimate the number employed because it is so small it is not separately identified by the bureau of statistics. The institute estimates the gas industry employed 0.2% in 2012²⁰.

Matt Grudnoff in the Australia Institute Research Paper *Fracking the future*, March 2014, argues the gas industry is not only a small employer but the industry inflates the number of jobs that are created.

He challenges the modelling by Santos and instead states in reference to gas industry development in NSW, that those most advantaged are the owners of Santos.

2. Health costs

The consequences of harmful exposure to unconventional gas and fracking means more members of the community are accessing health services including public health services, for hospitalisation – eg, for respiratory problems, general practice clinics for symptoms such as headaches, sore eyes and requiring pharmaceutical solutions to health problems.

3. Environmental damage

The expansion of the unconventional gas industry in Victoria puts at risk the agricultural production and protections for species and flourishing biodiversity of the environment.

The Victorian Government has demonstrated its commitment to protecting the states biodiversity and ecosystems when it recently released recommendations in response to the former Commissioner for the Environmental Sustainability, Professor Kate Auty's report, Victoria: *State of environment Report 2013*.

The tenet of the government's commitments is *...ensuring that our environment and biodiversity remain healthy and resilient for generations to come*. (Victorian Government response to the State of Environment Report 2013.)

The strong recommendations from government to manage, support and protect the health of the environment including water resources would be inconsistent with approving the development of a mining industry that disrupts the integrity of the environment.

How the unconventional gas industry is managed in other Australian and international jurisdictions

The features of the unconventional gas industry are essentially the same worldwide that is, it relies on harmful chemicals, large volumes of water and the management of waste and contaminated water. The concerning theme is that the industry causes air and water pollution, risk contamination from leaking wells.

²⁰ <http://theconversation.com/three-myths-the-coal-seam-gas-industry-wants-you-to-believe-24422>
Viewed 7 July 2015

Further the industry benefits from and the community suffers because of the consequences of inadequate regulation and monitoring.

The challenges of managing the contamination risks and pollution incidents in the United States, United Kingdom and European countries are discussed in the report; Chemical Pollution from Fracking authored by Philip Lightowers, Edinburgh.

In summary the conclusions are that:

- Fracking and unconventional gas exploration causes widespread air and water pollution
- Groundwater and drinking water contamination has been caused by faulty wells
- Legislation and regulation has not averted pollution
- Biodiversity of the environment should be protected. The impact of the industry both direct and indirectly puts at risk the environment including by the noise generated by the industry, vehicle impacts and landscape degradation
- It is the nature of the industry that environmental damage will occur irrespective of compliance with a regulatory framework
- Fossil fuel extraction will exacerbate greenhouse gas emissions and reduce the likelihood of meeting reduced emissions targets to combat climate change

In Australia, NSW and Queensland are the primary locations for the multibillion dollar coal seam gas industry. Dr Marion Carey in her peer reviewed paper *Coal Seam Gas: future bonanza or toxic legacy?* echoes the views of opponents of the unconventional gas industry in identifying shortfalls and consequences with industry oversight:

- Questions the Australian Petroleum Production and Exploration Association Ltd (APPEA) claim that despite some toxic characteristics, diluted chemicals only present minimal to no risk to human health and the environment.
- There is foundation for concerns that hazardous chemicals used in coal seam gas mining cause long term health effects including cancer, fertility and reproductive ill effects
- Without national regulation there is no requirement to disclose the chemical uses
- There is a need for more published scientific and health studies
- The quantity of water used in the industry could threaten sustainability of water supplies
- Spillage and contamination of water supplies are not properly monitored and managed

Conclusion

The topic of unconventional gas exploration is controversial, primarily because the nature of its extraction involves the release of chemicals into the environment with consequential health and environmental impacts that vary from mild irritations to significant endocrine disruptions and cancer. Despite community members in Australia and internationally reporting harmful health effects, the health risks are not given proper regard because of the lack of research.

The adoption of the “precautionary principle” is the right approach in circumstances when health and safety of the population is at risk and the activity of mining is not proven to be safe.

The pathway to restoring health to humans and the environment is to move away from expanding non-renewable fossil fuels as an energy source. The renewable energy industry, in producing low carbon solutions that tackles climate change, is the public health response for the 21st century to meet the challenge of our energy needs and ensure the environment is compatible with human existence.

Recommendations

1. A permanent ban on unconventional gas exploration, extraction and production in Victoria
2. Gas industry should commit to more funding for quality research in advance of any further expansion in other jurisdictions
3. The focus of research should be the risks to the environment, agriculture, water and human health
4. Victoria should promote its natural resources and develop tourism and agricultural industry in preference to the polluting mining industry
5. Unconventional gas exploration should be rigorously regulated which includes disclosure of type and quantities of chemicals used, construction specifications and proper risk management
6. Landholders should have right of veto when approached by industry to explore coal seam gas reserves
7. Victoria should expand its renewable energy industry
8. Victorian biodiversity and ecosystems must be protected from the harmful mining industry
9. Industry must be required to commit sufficient financial resources to manage the risks associated with environmental contamination

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