Public Health Association
AUSTRALIA

The independent review of coal seam gas activities in NSW (human health and environment effects)

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26 April 2013

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Contents

Introduction

The Public Health Association of Australia Incorporated (PHAA) is recognised as the principal non-government organisation for public health in Australia and works to promote the health and well-being of all Australians. The Association seeks better population health outcomes based on prevention, the social determinants of health and equity principles.

Public Health

Public health includes, but goes beyond the treatment of individuals to encompass health promotion, prevention of disease and disability, recovery and rehabilitation, and disability support. This framework, together with attention to the social, economic and environmental determinants of health, provides particular relevance to, and expertly informs the Association's role.

The Public Health Association of Australia

PHAA is a national organisation comprising around 1900 individual members and representing over 40 professional groups concerned with the promotion of health at a population level.

Key roles of the organisation include capacity building, advocacy and the development of policy. Core to our work is an evidence base drawn from a wide range of members working in public health practice, research, administration and related fields who volunteer their time to inform policy, support advocacy and assist in capacity building within the sector. PHAA has been a key proponent of a preventive approach for better population health outcomes championing such policies and providing strong support for the Australian Government and for the Preventative Health Taskforce and National Health and Medical Research Council (NHMRC) in their efforts to develop and strengthen research and actions in this area across Australia.

PHAA has Branches in every State and Territory and a wide range of Special Interest Groups. The Branches work with the National Office in providing policy advice, in organising seminars and public events and in mentoring public health professionals. This work is based on the agreed policies of the PHAA. Our Special Interest Groups provide specific expertise, peer review and professionalism in assisting the National Organisation to respond to issues and challenges as well as a close involvement in the development of policies. In addition to these groups the Australian and New Zealand Journal of Public Health (ANZJPH) draws on individuals from within PHAA who provide editorial advice, and review and edit the Journal.

Advocacy and capacity building

In recent years PHAA has further developed its role in advocacy to achieve the best possible health outcomes for the community, both through working with all levels of Government and agencies, and promoting key policies and advocacy goals through the media, public events and other means.

Terms of Reference

The terms of reference that PHAA will be addressing are:

> *2. identify and assess any gaps in the identification and management of risk arising from coal seam gas exploration, assessment and production, particularly as they relate to human health, the environment and water catchments*
>
> *3. identify best practice in relation to the management of CSG or similar unconventional gas projects in close proximity to residential properties and urban areas and consider appropriate ways to manage the interface between residences and CSG activity*

This Submission

Our submission covers these topics:

1. The National Harmonised Framework on CSG
2. Overview of health effects – a framework and summary
3. Importance of protecting agricultural land and water supply
4. Delaying transition from fossil fuel energy
5. Other issues

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National Harmonised Framework on CSG

In making this submission, PHAA would like it noted that we were involved on the Coal Seam Gas Stakeholder Reference Group (CSGSRG) of the Standing Council on Energy and Resources (SCER) of COAG. Our role in that process was to ensure that a public health viewpoint was included in the development of the National Harmonised Framework on Coal Seam Gas and in the Multiple Land Use Framework. The purpose of these processes was to develop leading practice, trustworthy regulation of the CSG industry in order to ensure Australia's vast deposits of unconventional gas are able to be exploited with minimal damage to social, economic and natural environments. PHAA commends the outcomes of this process to the current review.

However PHAA would like to emphasise that from the public health view, the focus of development of the National Harmonised Framework was extremely limited and was not able to address the complete range of public health concerns which exist in relation to the extraction and use of CSG specifically and coal and gas fuels more broadly. We address these concerns in this submission.

Further, PHAA is concerned that while the Harmonised Framework sets standards in relation to CSG development and extraction activities, it is only as good as the actual practice by companies and contractors in implementation of the standards. We know from experience that the confluence of any combination of deliberate malfeasance by contractors, poor workmanship, mistakes and bad luck can overwhelm the best laid risk minimisation plans. We are also concerned that for standards to be effective they need to be implemented, monitored and breaches followed up and adequate and realistic action taken in response. We also wish to emphasise that because risks to health (outlined below) carry a high personal, social, economic and environmental cost, safety standards need to be extremely robust. PHAA is not confident that in the current rush to develop CSG government will carry out the monitoring and response sufficiently to prevent or rectify problems. We are also concerned about the emerging problem of long term post production well integrity as the concrete and steel well shafts age – this issue has not been adequately factored into the assessment and risk profiling process.

Overview of health effects – a framework and summary

The health consequences of unconventional gas extraction might be framed in a classical medical primary, secondary and tertiary effects manner. Primary are the direct, secondary the indirect, systemic effects and tertiary the flow on effects. These are summarised in Tables 1 and 2.

Table 1 Health effects of Unconventional Gas extraction

Primary / Direct		Secondary/ follow on
Effect on	Cause	Effects
Air quality [3]	Methane, volatile hydrocarbons	Note: these effects arise from several primary effects synergistically Compromise of agricultural land [2,3] Adverse effects on livestock[3] Adverse effects on ecosystems and the biosphere No reduction in GHG emissions and continued global warming
Water Quality (surface and underground) [1,2,3]	Drilling and fracking chemicals Volatile hydrocarbons and methane from coal Salts Heavy / radioactive metals from coal and rock	
Water availability[2]	Use of water in production Inadvertent linkage of aquifers and water loss	
Soil quality	Chemical leakage / spillage from production or waste water	
Seismic activity	From fracking and pressure changes below ground	
Erosion	Increased travel over roads and country	
Spread of weeds	From increased vehicle access	

(1,2,3 1, 2, 3)

No level of hazard has been assigned to these threats in this overview; the research to make such an assessment is not available.

Table 2: Tertiary / Flow-on effects on well-being and health

- Conflict in mining affected communities
- Loss of control over access to property
- Reduced water availability
- Fears of loss of land, livelihood and community
- Actual loss of agricultural productivity impacting food security for Australia
- Loss of wellbeing due to concerns about health
- Psychological effects from several of the above sources

Examples of such effects in Australia include:

- Benzene, xylene and toluene were found in monitoring water bores. Connectivity and cross contamination of the Springbok aquifer by the Walloons coal measure was demonstrated post fracking at Myrtle 3.
- There was widespread habitat destruction after a spill in the Pilliga forest.
- There are flammable water bores at Kogan and gas fuelled bush fires at Dalby.

- The Condamine River is bubbling methane along several kilometres of its length.
- There is a cluster of ill health amongst people living in the gas fields near Tara and Kogan. Their symptoms are similar to what have been reported in gas fields in the US. These include daily headaches, epistaxis, rashes after bathing, nausea, eye irritation, metallic taste and respiratory problems.

The three levels of effect reflect a broad concept of human well-being and health that considers direct toxic effects to be as, but no more, important than the effects on biological systems that underpin the ecosystem services that humanity relies on for fresh water, fertile soil and agricultural production. Similarly the psychological and socioeconomic effects from the primary and secondary effects are equally important for health and human survival. The secondary and tertiary effects will have a much larger impact on well-being and health overall than the direct effects and are therefore more serious. This suggests the public health approach is to prevent as much as possible rather than managing, or attempting restitution of any adverse health effects.

Given these existing issues, having CSG developments close to residential areas should require an approach that is highly risk adverse in relation to new CSG activity and to expanding existing activity. Existing CSG activity needs to have adequate monitoring for potential health effects as they emerge and to give the public confidence that government is concerned for the wellbeing of its citizens holistically and beyond the provision of energy. In addition, the definition of residential area should be broadly based and include rural residents in small towns and on properties, as well as in regional towns and cities.

Protecting agricultural land and water supply

Fresh clean water for drinking, agriculture and stock, over and above the needs of industry, needs a very long term prospective planning outlook. Australia is a dry continent. With the progression of global warming it is forecast that Australia will become drier and hotter (4). Simultaneously the population is projected to rise to between 30.9 and 42.5 million people by 2056 (5). Any sector within a multiple land use framework, including requirements for energy, has to be subordinate to the requirements to provide drinking water and food for the long term future.

Delaying transition from fossil fuel energy

With the world warming at a rapid rate and the likelihood of temperature increases of beyond the two degrees Celsius guardrail, taking rapid action to reduce fossil fuel emissions is critical (6, 7). Taking a 'big picture' approach must recognise the importance of not delaying transition from fossil fuel to renewable energy. Continued focus on fossil fuel sources locks in further decades of reliance on fossil fuel use and associated emissions because of the huge infrastructure and systems investments. As well, rapid action to promote energy efficiency and energy demand reduction is necessary to complement any continued fossil fuel use (7, 8). Further, recent studies by Southern Cross University suggests that because of methane leakage, unconventional gas sources may not be much better than coal from a life cycle emissions perspective (9).

Other issues

Amenity

The amenity provided to humans by access to unspoilt natural places is significant for wellbeing and conversely are detrimental to and damage local and natural environments (10-13). The Draft Multiple Land Use Framework recognised that the intrinsic importance national parks and unspoilt places may override requirements for energy.

Extreme Weather and Bush fire risk

With global warming and climate change there is an increased probability of extreme weather and of bush fires in bush areas around Australia. Experience of heat and fire events in Australia over the past few years raises, at this stage theoretical, concerns about having CSG wells in burnable country, as malfunction of well-flow controllers may occur and this might likely contribute to worsening fire damage to the environment, property and life.

Future liabilities

Government, that is tax payers, may be liable for a broad set of costs if fossil fuel infrastructure needs to be withdrawn in future, consequent to energy policy change resultant on emerging effects of global warming. Taxpayer financial liability can also arise from several factors including paying out contracts, as well as having to take 'additional' action on adaptation.

Conclusion

PHAA welcomes the independent review of CSG activity in NSW. We submit that a range of public health concerns arise from the focus on CSG developments at the expense of an energy transition to renewables supported by improving energy efficiency and promoting energy demand reductions.

There are direct effects on the health of nearby residents as well as on the environment near CSG developments.

There are secondary and flow on effects particularly on Australia's future capacity to provide drinking water and support agriculture / stock to grow food for ourselves and for export.

Continuing development of fossil fuel infrastructure ties us into decades of emissions at a time when scientists and bodies such as the World Bank and the International Energy Agency are warning that we need to rapidly de-carbonise our economies to prevent dangerous global warming.

In addition to any large scale effects, mental wellbeing, bush fire risks and future government liabilities are important extra issues that need to be included in accounting for the effects of CSG and fossil fuel use.

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