Submission No 98

INQUIRY INTO COAL SEAM GAS

Name: Dr Steve Robinson

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The Director

General Purpose standing Committee No5

Parliament House

Macquarie St

Sydney NSW 2000

Dear Sir

Re Submission to Inquiry into coal seam gas

I attach a paper I have prepared summarising the Mental Health Impacts of Coal Seam Gas Mining.

I am a psychiatrist living in the Gloucester area where they have been exploring for CSG for 5 years+ and were given a license to produce 6 months ago in a very extensive area of 210sq km. Production has not commenced yet.

Mining is totally inappropriate for the Gloucester Valley for the combination of factors namely:-

It is a comparatively well populated rural area with 3500 people living within 5km of the projected gas field. It is a heritage area with a heritage landscape. It is a high rainfall area with good farming land. It has an established tourism industry and is a magnet for retirees, both of which form a long term economic base for Gloucester that will be demolished by extensive mining.

I call for a 12 month moratorium during which this project and the many other factors relevant to the advisability of CSG Mining can be reviewed. It is not too late to recommend shelving of the Gloucester Gas Project.

Dr Steve Robinson

Mental Health Impacts of Coal Seam Gas Mining (A personal view)

Introduction

Mining has extensive health impacts at each stage from exploration to rehabilitation. The mental health impacts arise from both the **psychosocial stressors** (including the **visual impact**) and also the **toxic impacts of chemicals** on the brain. In addition **Noise** has a range of adverse effects on brain functioning that is cumulative with the above effects. Complaints overwhelmingly arise from what we see and hear and smell though the most critical damage may be being caused by 'silent factors'.Gas mining follows the same principles as coal mining, just the details vary.

In a survey into mining problems of 350 residencies in the Gloucester valley in the vicinity of two open cut coal mines the most frequently reported problem was noise. This is poorly acknowledged by authorities. Noise travels further than visible dust and was perceived as a problem up to 10km from a mine at night. Air pollution around coal mines consists of visible dust particles which are complained of up to about 3km and a general haze from fine particles which can spread much further. The worst health impacts come from the invisible fine particles with increased asthma rates having been measured up to 5km from a mine. The distance that brain damage is occurring is not yet determined. Coal seam gas mining produces noise and annoying coarse dust from all the disturbance of the paddocks and unsealed roads but the multiple emission points of fine dust particles from pumps, machinery and vehicles occurring close to houses is the bigger worry. The visual impact to visitors is reduced according to how well the mine is screened but this doesn't fool residents who grieve the damaged landscape. Water pollution involves contamination of rivers, bores, pastures and domestic rainwater tanks and is a great worry to farmers with reduced capacity and sick animals. Poisons enter the food chain and drinking water. Increased heavy vehicle traffic is a safety worry as is gas explosions.

Coal seam gas mining involves multiple gas wells about 600 metres apart, a network of gas, power and water pipelines crossing paddocks, water collecting and evaporation ponds, a central processing unit, liquefied gas storage units and either a local power station or a pipeline to export facilities. Gas wells may be drilled and operated to within 200metres of private homes. Large projects will be divided into stages. Stage 1 of the Gloucester Gas Project has been approved for 110 wells spread over 50sq km. The total project will be at least 350 wells over 210sq km of high rainfall good farming land in a heritage valley comparatively densely populated.

Coal Seam Gas Mining by definition occurs in areas where there is coal and by implication coal mining may well be occurring nearby. Coal within 150metres of the surface will be mined by open cut mining and the gas is likely to have escaped into the atmosphere. Deeper seams in the same vicinity will be the primary interest of CSG mining and may not be suitable for underground coal mining. In such an area there are cumulative health impacts of CSG Mining and Coal Mining.

Coal Seam Gas Mining is new and so there are no extensive surveys of impacted populations whose health damage statistics can be quoted. The Gasland film was a dramatic record of social and health impacts of gas mining but it had a drawback. It showed mostly shale gas mining and a little CSG mining but the distinction was not made between the two processes. (Shale gas mining involves more fracking and can include the injection of BTEX chemicals). In NSW the small Camden Project is the only operational CSG mine. The Gloucester Gas Project has been approved but has not yet commenced operation.

Exploration Phase and Psychological stress

Gas wells are noisy, potentially poisonous and unsightly. No-one would chose them for a neighbour.
Exploration is when the psychological stresses are first noticed in the community. Exploration maps are placed in the local newspaper but they are difficult to decipher and individual landholders are not notified. This uncertainty starts to generate community anxiety. Some individual landholders are approached and offers are made mostly for access but with agreements that include confidentiality clauses. Individuals don't know if they are being treated fairly. The community starts to divide between the few who see it as an opportunity for an additional income and the larger number who hear the risks and see little in the way of benefits. Seismic surveys come and go with some damage to paddocks, heavy vehicle traffic ruining country roads and noise. Drilling occurs with the same complications. A few properties are purchased for good prices, other houses close-by can not be sold and their value drops. Life time plans are put on hold or cancelled. Property development in the area declines as a result of the general uncertainty. Rental property is more expensive. The town takes on a different look with mining vehicles being prominent and drilling teams from interstate coming and going. The visual impact is slowly increasing.

In order to prove a project is viable the exploration company need to demonstrate a good flow of gas for many months. Exploration wells are fracked to optimize the flow and the wells are flared for months. There is no explanation of the risks and precautions taken in these fracking and flaring operations. There is no publicity given to any air or water testing, which is even lower in the exploration phase than the production phase. Community alarm is generated by Gasland and the seeming inevitability of large areas of land being permanently poisoned ruining the area for food production for generations to come.
There have been at least two separate unpredicted explosions locally due to gas migration known to the community from just a dozen exploration wells and even more dramatic events elsewhere from gas mining. This results in understandable anxiety about safety risks.
In Gloucester this first phase has taken 5 years so far and production has yet to commence. Wells may have a life of say 10 years. Then Stage 2 and 3.

The local council reflects the community. It has a sharp pro-mining v anti-mining divide leading to a spill of one mayor and the letters page in the local newspaper has amply echoed this divide for the past 5 years. The tourism industry is threatened and wealthy prospective city retirees look to other beautiful areas not impacted by mining. Very few locals are employed by the gas miners. The average wage in Gloucester is $32,000 compared with a NSW average of $46,000 despite mining being in the Gloucester valley for 15 years.
The wells closest to town will be adjacent to a new housing development still being promoted and only 3km from the hospital and schools.

Visual Impact

Glen Albrecht and co investigators described a type of grieving for a lost, loved landscape. He labeled this **Solastalgia**. He described it in the scenic and now devastated Upper Hunter. The Gloucester Valley is a heritage and very beautiful landscape which has drawn tourists and retirees to the valley in large numbers and features in landscapes of classic Australian artists such as Arthur Streeton. The long time residents have a particularly strong attachment to the landscape and the potential devastation caused by 350 closely sited gas wells over 210 sq km sows the seeds for depressive illnesses for many of the 1000 residents of the valley and the 2500 residents of Gloucester town. This is just one gas project.

What are the effects on the individual of this general stress on residents of a town and valley?

Reactivation of existing mental disorders:- Stress is cumulative and will highlight the weak link in those already at risk. Those with illnesses of depression, anxiety, paranoia etc that are currently under control run the risk of having those illnesses reactivated. These were the most numerous group of the disorders I saw in psychiatric practice in this newly mining affected community.

New illnesses:- It usually takes a more intense, life threatening stress to cause PTSD (Post Traumatic Stress Disorder) but stresses that continue for a very long time, involving a powerful opponent and having no apparent solution promote feelings of helplessness and hopelessness. These are hallmarks of depressive illness and I saw several such cases in individuals with no prior history of mental disorder.

Other Behaviours:- Angry Outbursts, single episodes of antisocial behavior, interpersonal disharmony, 'locking the gate' and the drive which has led to 200+ activists spending more time fighting mining than is spent by AGL running the mining project!

Chemical Poisons and Particles

The Environmental Assessments of CSG projects say air quality will be impaired by significant emissions of nitrous oxides, formaldehyde, carbon monoxide, volatile organic compounds e.g benzene, and coarse PM10 particles. This list is markedly incomplete. It fails to mention the fugitive methane emissions and with them the other gases e.g.propane, butane etc which are part of coal seam gas. It fails to mention drilling fluids and fracking chemicals. Some of these chemicals are powerful endocrine disruptors which in turn disrupt the emotional stability. It fails to mention toxins in the coal which become released into the groundwater and are then either pumped out or pass directly into aquifers that replenish streams and enter the food chain.

The air particles which are primarily emitted by combustion processes such as flaring and diesel motors are not PM10 particles but are the much more harmful fine and ultrafine particles.

Each well needs to be drilled and then a pump installed to extract water and gas. These are permitted as close as 200meters from a private residence. Pipelines have to be installed and all of this maintained. This requires power. The diesel motors and generators emit particles which are very harmful due both to their size and chemical content. Fine (PM2.5) particles are inhaled and get into lung tissue and set up inflammatory foci spreading damage throughout the body including the brain, ultrafine particles(PM0.1) get inside cells causing change to the genetic material of cells i.e cancer and other new diseases all including adverse mental health impacts. This is seen in increased days lost from work typical of mining areas but not yet quantified for CSG mining.

The central processing unit will emit much higher concentrations and for the Gloucester Gas Project they have chosen a site only 1.5km from Stratford Primary School.

Diesel particles are carried to the brain where they are particularly damaging to young children.

Diesel particles have been demonstrated to lower the IQ by up to 5 points in infants and to result in an increase in autistic and antisocial behaviours. (Perera FP et al)

The chemical emissions of CSG mining are cumulative with nearby coal mining but presented separately.

Noise

Industrial noise legislation has primarily been focused on the avoidance of industrial deafness and has neglected the problems associated with noise of fewer decibels, lower frequency and also ignores the character of noise. (Noise can vary from pleasurable when musical to distressing when of a rough mechanical origin. Bird calls of 45 decibels have a very different impact to a diesel motor of the same intensity yet mining consent conditions fail to acknowledge this).

'WHO Guidelines for Community Noise' gives a detailed account of physical and psychological impacts. Noise impairs speech communication, it disturbs sleep and impairs concentration and learning. Infrasound and Low frequency noise damage (Vibroacoustic disease) is ignored in noise monitoring legislation but is particularly intrusive because it passes unaffected through insulation and can be of a frequency that will naturally resonate inside a living or bedroom or inside the skull (or chest). Machines may be at their maximum intensity at a low frequency that isn't being measured. It is believed by many that such low frequency energy inside the body will impact on the Autonomic Nervous System which controls many body systems including those involved with anxiety and also interfere with cardiac function. (Mariana Alves-Pereira et al)
Noise monitoring invariably is done outside where these resonance effects are avoided. This further generates frustration in noise affected neighbourhoods.
If you are sleeping you are likely to be awakened by an increase of 15decibels over the background noise. Mining consent legislation assumes the minimum night time noise level is 30decibels. This is probably true for a city. Quiet rural areas can have a normal night time sound level of 20 decibels so that a noise in the high 30's is likely to wake you. The legislators believe that since this is only slightly above their city minimum and it will not wake you and so is ignored. The more times you are wakened the more likely your REM sleep will be impacted. Sleep is when your memories are laid down and impaired sleep can also be a powerful trigger for manic and depressive illnesses. We have all experienced the irritability that results from just one night of lost sleep. Pity the person with a gas well 200 metres away.

Recent Australian Early Development Index school survey results of all 5 yr olds and also 'MySchool' results from the mining affected Upper Hunter suggest a community of developmentally damaged and educationally disadvantaged children is being allowed to occur with no interventions taking place. This is a combined impact of noise and air pollution. CSG Mining will just add to that damage.

Compensation is rarely paid for physical health damage and in my experience is totally unheard of for the more prevalent mental health damage.

Dr Steve Robinson
(The author is a psychiatrist, now retired, who uniquely practiced for ten years prior to retirement in this farming community newly affected by mining.)

References

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