

**Submission
No 610**

INQUIRY INTO COAL SEAM GAS

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The environmental and health impact of CSG activities

Water Impacts: Quantity

Coal Seam Gas is trapped within the coal seam by water pressure. In order to access the gas water must be extracted from the coal seam to allow the gas to flow. This can be a large amount of water.

- In Gloucester where AGL are approved to drill 110 gas wells, the company expects the equivalent of one Olympic swimming pool per day of this wastewater to be extracted across the field[i].
- The National Water Commissioner raised concerns about the volume of water that would be extracted by CSG development in a position paper in December 2010 stating that *“Current projections indicate the Australian CSG industry could extract in the order of 7,500 gigalitres of co-produced water from groundwater systems over the next 25 years, equivalent to ~300 gigalitres per year.”*[ii] This volume is more than half of existing total extraction from the Great Artesian Basin.
- In media statements in July 2011 the National Water Commissioner reaffirmed the concerns of the authority publically stating that the coal seam gas industry presents *“significant potential risks to water and our water management as a result of the scale of the development of the sector.”*[iii]

Water Impacts: Quality

The water that comes up from the coal seam is often saline and contains naturally occurring chemicals from within the coal seam.

- The National Toxics Network released a report in June 2011 indicating that the BTEX chemicals (Benzene, benzene, Toluene, Ethylbenzene and Xylene) are found naturally in the coal gas seams and that the fracking process can release BTEX from the natural-gas reservoirs, which may allow them to disperse into the groundwater aquifers or to volatilise into air.[iv]
- The National Water Commissioner released a position paper in December 2010 in relation to the developing coal seam gas industry which warned that *“The production of large volumes of treated waste water, if released to surface water systems, could alter natural flow patterns and have significant impacts on water quality, and river and wetland health.”*[v]
- On 4 August 2011 the NSW Environment Minister issued a formal warning to AGL in relation to an uncontrolled gas and water release at a CSG well near Campbelltown. AGL was found to have been in breach of its environmental protection licence.[vi]

Health Impacts

- Doctors for the Environment Australia made a detailed submission to the Federal Parliamentary Inquiry relating to coal seam gas impacts in the Murray Darling Basin. The submission covers a range of health concerns relating to coal seam gas development.[\[vii\]](#)

Fracking Impacts

Hydraulic fracturing or 'fracking' risks contamination of fresh water aquifers. Fracking forces a mix of water, sand and chemical into the CSG well at high pressure to fracture the surrounding coal in order to improve gas flow rates. It also has the potential to create fractures outside of the seam and can link the well with fresh water aquifers. This potentially exposes fresh water aquifers to fracking chemicals and other contamination existing within the coal seam.

- Fracking has been banned in France[\[viii\]](#), is currently suspended in areas of the UK[\[ix\]](#), is suspended pending review in Quebec, Canada[\[x\]](#) and has strict conditions in the New York state in the US including a ban within primary aquifers and within the drinking water catchment[\[xi\]](#).
- A recent report showed fracking near water bores increased methane levels in those bores to potentially explosive levels.[\[xii\]](#)

Surface Impacts

The surface impact from CSG relate primarily to the quantity of infrastructure required to connect wells with pipelines and roads, water management facilities, processing facilities, compressor stations, and transmission pipelines to power stations and export terminals. Depending on the environment, the impact on the surface can undermine the agricultural potential of an area or significantly disrupt the environmental values of bushland.

- A report in June 2011 led to the exploration activities of Eastern Star Gas being investigated by the Federal Environment Minister for potential breaches of Federal Environment laws due to the extent of clearing within the Pilliga Forest.[\[xiii\]](#)

Greenhouse Gas Emissions

Claims by industry of CSG being a clean, low emission technology are not supported by science. Very little research has been done, but what has points to CSG as having little if any greenhouse gas benefit over coal fired power.

- A Cornell University study suggests that the fugitive emissions (methane that escapes into the atmosphere during the production of gas) created in Shale Gas production in the US was so significant as to potentially make the carbon footprint of shale gas larger than coal when used for electricity generation. The processes for Shale Gas extraction are similar to those used for coal seam gas[\[xiv\]](#)
- Methane is 20 times more greenhouse potent than Co2 over a 100 year timescale[\[xv\]](#) which pushes up its carbon equivalent footprint. It is even worse if it is turned to LNG for export because a significant portion, estimated at around 10% of the gas is used in the refrigeration process to liquefy the gas.[\[xvi\]](#)

The economic and social implications of CSG activities

Royalties

- The coal seam gas industry currently enjoy a 5 year royalty holiday. The royalty arrangement in NSW are 0% for the first five years, 6% in year 6, 7% in year 7, 8% in year 8, 9% in year 9 and 10% in year 10 and for remaining years.
- In 2010 royalties from coal seam gas was only \$462,000[xvii]
- Industry experience in NSW has shown that peak production of wells often occurs in the first few years of the life of a well with production dropping off significantly after that. This means that NSW under the current arrangements will miss out on the bulk of royalties that would be payable if a fixed 10% rate was in place.
- Coal Seam Gas royalties in Qld are a flat 10%.

Social Implications

Under NSW law the Government owns and controls mineral and gas resources under the ground. There are laws pertaining to the granting of rights to explore for and exploit those resources that give mining companies the right to force access to private land. These rights are creating tremendous anxiety and frustration in many communities, particularly in agricultural land. The issues include:

- Creating division within communities with individual landholders being able to grant access without reference to the neighbors or communities wishes. This has created some conflict between members of communities
- Impacting on land values
- Creating uncertainty where land is covered by exploration licenses which can remain under licence for years without any idea of what the plans are for exploration or development.

Food Security

Large areas of productive agricultural land in NSW are covered by existing petroleum exploration licence. There are growing arguments that these areas should be protected for growing food and because of the water and surface impacts of coal seam gas development it is a risk to the future agricultural potential of these areas to allow CSG.

The areas at risk include more than just the most productive agricultural land like the Liverpool and Moree Plains. The Sydney Basin and Hawkesbury areas also produce large amounts of food for local consumption and there are important horticultural areas in the Southern Highlands, Central West and Mid North Coast and North Coast of NSW. This all need to be protected to ensure future food security

The role of CSG in meeting the future energy needs of NSW

There are a number of future energy options for NSW including existing coal fired, potential future gas and also renewable energy and any mix in between. How these options are managed is a political question. What is known however is the intention of companies currently engaged in CSG development.

Some of the projects flagged at the moment will provide gas for domestic power generation such as at Wellington Power Station (660 MW no yet under construction and able to be supplied by existing conventional gas[xviii]), Wilga Park Power Station (16MW currently in operation)[xix] and a new power station planned at Casino (Metgasco – 30MW not yet under construction[xx]). These are relatively small power plants compared to current NSW electricity supply.

While 6% of Sydney's domestic gas is supplied by coal seam gas from AGL Camden Gas field[xxi], the bulk of projects currently being developed in Australia and NSW are targeted to the export market. Options include export from a Liquefied Natural Gas plant at Newcastle as being proposed by Eastern Star Gas[xxii]. Metgasco in Queensland are proposing an offshore processing and export facility off the coast of Ballina[xxiii] and a pipeline to Queensland would see the major deposits currently under exploration in the Gunnedah Basin and north to the Queensland border transported to Gladstone in Queensland where four major export terminals are planned[xxiv].

The argument made by government and industry is that coal seam gas is a cleaner burning fuel that should be used in a transition to renewable energy. The fact that the greenhouse gas emissions profile for CSG is subject to significant uncertainty undermines this argument. Further to this, the focus on export and the lack of discussion by the industry about retiring coal power stations to be replaced by gas suggests that this is not a serious consideration by industry.

It also needs to be noted that there is growing evidence that renewable technologies have matured to the point that there is no need for a transition fuel to fill any gap in energy demands. NSW currently has over 2,200 MW of wind energy installed, approved or proposed[xxv]. Recently in Spain a solar thermal power station with molten salt storage was commissioned demonstrating the ability for 24hour electricity from solar power[xxvi].

Beyond Zero Emission have provided a roadmap for Australia to move rapidly to zero emission energy generation within a decade with a focus on solar thermal, wind and biomass power generation.[xxvii] This could be done within a time frame as to not require a gas transition fuel.

Safeguard Guarantee.

- Due to the size and scale of this industry it has the potential to cause very significant harm to human, animal health, and economy of areas where mining takes place.
- The mining industry should be made to guarantee that the extraction of Coal seam Gas will not adversely impact water quality, food production and human health.
- Until they can do this all mining should be stopped in NSW.
- If any mining is to proceed the Companies, it's directors, and employees should be held responsible for any damage caused and make good any losses caused by the mining.
- Heavy fines, and imprisonment should be applicable to individuals (Employees) as well as company directors when significant environmental damage is caused either knowingly or unknowingly by the extraction of Coal Seam Gas, This will act as a deterrent to taking a chance because the profit is just to good mentality and help to safeguard mining operations and methods.
- This inquiry is of great importance to my family and the Australia people wether they are aware of the issues or not.
- Health and safety must come before money and jobs.

Yours Sincerely

Mark & Paula Cave