GEELONG SUSTAINABILITY

10 July 2015

Keir Delaney, Secretary, Environment & Planning Committee Parliament House, Spring Street, Melbourne VIC 3002 – email: epc@parliament.vic.gov.au

Submission for the Parliamentary inquiry into unconventional gas

Dear Keir Delaney,

Geelong Sustainability calls for the State Government to impose a permanent ban on all forms of unconventional gas extraction including tight gas, shale gas, coal seam gas, fracking and underground coal gasification. In the following, the various types of onshore gas mining methods are referred to simply as 'coal seam gas' or CSG'.

Geelong Sustainability believes the following submission address the key criteria of the requirements of the inquire:

1. The prospectivity of Victoria's geology for commercial sources of onshore unconventional gas.

Our perspective: The Geelong region

Any new industrial activity proposed for the Geelong region needs to be considered in the light of current visions and goals. Geelong Sustainability submits that Geelong and surrounds should be known for its clean green economy, and that there is no place for fracking within that.

Various vision statements have been created for the Geelong region, and many centre around creating a clean green future. Underpinning this is our region's natural environment – our beaches and parks are generating a thriving tourist economy. The region's wine and fine food industries have built upon the image of the Surf Coast and

Bellarine as beautiful natural areas. There is strong demand for real estate in the region because of the open spaces and relaxed lifestyle.

As organisations such a Cleantech Innovation Geelong and Future Proofing Geelong indicate, Geelong city does not sit apart from this image. Geelong Sustainability has long advocated that while climate change presents a global crisis, Geelong is uniquely positioned to be part of the solution – by manufacturing *clean and green* technology.

Climate change

Climate change is an undeniable reality. The levels of greenhouse gases in the atmosphere are now higher than they have been at any time for hundreds of thousands of years. Scientists believe that the Earth is reaching the point beyond which we no longer have a safe climate.

The effects for our region alone will be significant – higher sea levels, more frequent bushfires, more severe heatwaves, more droughts – with threats to general health and to food security. A drastic reduction in the production of greenhouse gases (particularly carbon dioxide and methane) is required. This will require a transformation of our electricity generation and transport industries, among other things.

Jobs

Recent job losses notwithstanding, Geelong still boasts a manufacturing sector. We have technical skills and expertise, coupled with the presence of a world class university that is focussed on local partnerships. Geelong could and should be manufacturing components for wind turbines, solar panels and components for solar thermal power stations. The basic ingredients for all of these are steel and glass, which are mainstays of our current production. In addition Geelong is one of few cities to have hosted an automotive industry. Geelong has made its name as a manufacturer of passenger vehicles, but it could be producing electric vehicles.

A state government must view fracking within this context. Fracking has a number of physical effects, both on the surface environment and the water table down below. The Geelong region's clean green image has been painstakingly build up through a

number of marketing campaigns – but perceptions can change quickly. Damage to Geelong's water table, on the other hand, will be with us for many decades, if not centuries.

Subsidence

The dewatering of coal seams could potentially lead to subsidence of the ground surface. The Williams Report states that: "Subsidence within a landscape is generally expected when groundwater aquifers are dewatered. It is a well-understood process in over-exploited groundwater systems around the world. Land subsidence over large areas can effect surface-water systems, ecosystems, irrigation and grazing lands".
It is also possible that hydraulic fracturing can lead to subsidence. The potential for subsidence depends on the geology and hydrogeological conditions of the region. Estimates of predicted subsidence of gas fields vary.

Induced seismicity

One way of dealing with produced water is to reinject it into underground water systems. This reinjection can, however, potentially induce seismicity (cause earthquakes). The O'Kane Report explains that earthquakes can be triggered or 'induced' by human activities such as "filling of large water reservoirs, mining and activities involving pumping fluids into and out of the crust, such as required in hydrocarbon extraction, geothermal activity and some water resource activities".
www.parliament.vic.gov.au/publications/research-papers/8927-unconventional-gas-coal-seam-gas-shale-gas-and-tight-gas

The American fracking industry's debt

At an international level, new figures from the United States shows that the fracking economy is getting progressively worse, and fracking companies have had to increase their net debt by US$106 billion to fill the hole.
"In 2013, only 60% of operational costs could be covered with production… What happens to this industry when borrowing costs double or triple? It's a scary thing to ponder. How does 'get out while you can' sound?"
~ Raúl Ilargi Meijer in *The Automatic Earth*

2. The environmental, land productivity and public health risks, risk mitigations and residual risks of onshore unconventional gas activities

Depletion of groundwater and inter-aquifer connectivity

The concern is that the removal of large quantities of water may deplete groundwater and drawdown the water table, which could impact on other water users such as farmers (for example by affecting the levels of nearby bore water) and the environment in general. The SCER explain that "If there are inter-aquifer connections with coal seams, surrounding groundwater is likely to be affected through pressure reductions or falling underground water levels".

The O'Kane Report similarly states that, "Worry about how groundwater extraction during CSG activities will affect the water table is one of the most often raised concerns due to the possible impacts on the availability of groundwater for regional communities, farmers and the environment. Groundwater is accessed for stock, irrigation and other bore water use for regional areas, and is also critical for providing base flow to some rivers, streams and lakes as well as ecosystems dependent on groundwater-fed springs."

Water production from a coal seam gas well can last for approximately 15 years depending on the actual geological formation.

Impact of Surface Infrastructure on Environment

In addition to impacting agricultural land, it is also identified that CSG production can impact on native vegetation, biodiversity and threatened species.

www.parliament.vic.gov.au/publications/research-papers/8927-unconventional-gas-coal-seam-gas-shale-gas-and-tight-gas – ftn160

The Williams Report states that potential impacts of the infrastructure footprint of CSG wells, roads, pipes and compressor stations, include the clearing of bushland, fragmentation of important remnant native vegetation, the spread of invasive species and the increased risk of bushfires. CSG operations in the Pilliga state forest in NSW have been used as an example of the industry's impact on native habitat, in regard to

clearing and fragmentation, and in regard to the poor management of spills of contaminated water and lack of regulatory oversight

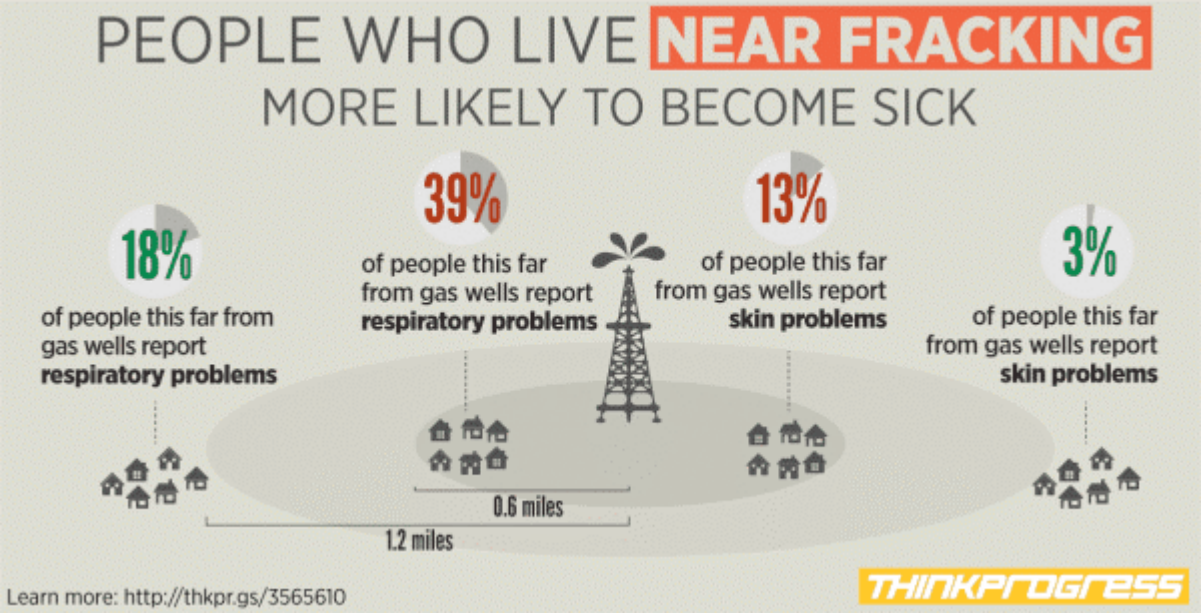
Fugitive emissions

The purpose of fracking is to extract methane gas which can be burned to provide power or heating. But this is not clean green technology. Methane is non renewable, and produces greenhouse gas when burned. Methane is sometimes marketed as being more “environmentally friendly” than coal due to its lower greenhouse emissions when burned. What is often discounted is the amount of “fugitive emissions” caused by fracking – i.e. methane that escapes directly into the atmosphere. When methane escapes directly it has a high global warming potential, negating the so called “environmentally friendly” effects.

The so-called environmental benefits of producing methane gas through fracking are questionable, and represent the wrong approach. Any new infrastructure related to power generation should be based around zero emission sources – particularly solar and wind.

The power production of the future will not reduce greenhouse gases, it will avoid producing them. Groups such as Beyond Zero Emissions have shown that a power grid comprising largely solar thermal, solar PV and wind could provide Australia’s electricity needs with zero greenhouse emissions. Geelong should play a central part in this.

We believe the following graphic give a clear indication of the potential of the impact on individuals and their health.



www.thinkprogress.org

Health risks

Research by the National Toxics Network found that there are serious risks associated with BTEX chemicals which can be naturally occurring and mobilised by the process of hydraulic fracturing. The National Toxics Network outlines the health hazards associated with exposure to BTEX chemicals as follows: "…in the short term causing skin irritation, central nervous system problems (tiredness, dizziness, headache, loss of coordination) and effects on the respiratory system (eye and nose irritation).

Prolonged exposure to these compounds can also negatively affect the functioning of the kidneys, liver and blood system. Long-term exposure to high levels of benzene in the air can lead to leukaemia and cancers of the blood".

3. The coexistence of onshore unconventional gas activities with existing land and water uses

> *"Wastewater poses a risk to the environment and health through leaks and spills. These happen with frightening regularity – they do not just pose a threat to*

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people's health and the environment but also present a serious risk to farmland and livestock.

CSG extraction has the potential to cause harm to the environment, farming land, water resources and human health. August survey respondents raised all these concerns and the available evidence suggests they have good reason to be worried. The lack of research that has been done into the environmental and health impacts of CSG is alarming. If the gas industry is keen to expand and the government wants it to, then it should commit far more funding to quality research in this area."

~ Australian Institute, Matt Grudnoff, March 2014

What about the infrastructure required for gas wells (all weather access roads, cleared well pads, compression stations, evaporation dams). Who will pay for the maintenance of roads that were not designed for 24 hour use by heavy duty industrial machinery associated with gas wells and fields? This is to say nothing of the risk to livestock from potential chemical spills and leaching from waste water retention dams.

(a) Agricultural production and domestic and export market requirements

Secondary / follow on effects

Note: these effects arise from several primary effects synergistically

• Compromise of agricultural land

• Adverse effects on livestock

• Adverse effects on ecosystems and the biosphere

• No reduction in GHG emissions and continued global warming

Source: Public Health Association Australia, 26 April 2013

This extract clearly shows the complexity of risk factors and the diversity of areas this impacts on. If you consider this in the light of overseas investment in the dairy industry (as demonstrated by the extract below) then why would the state risk this potentially expanding market. And while would the state risk its own investment in this industry.

Plans under way to build a milk powder plant at Warrnambool

"…The west Victorian dairy industry has been buoyed by an injection of more than $500 million recently when Canadian giant Saputo acquired a majority stake in Warrnambool Cheese and Butter.
The news of the dairy processing facility followed the announcement of a $20 million investment in the Midfield Meats site for a cold store and rendering plant.
This investment, which includes $1.5 million from the Victorian Government, would create more than 200 jobs with plans for expansion of the business, which presently employs 1,100 people."
Simone Smith, The Weekly Times, March 13, 2014

The surface footprint of CSG infrastructure is also of concern to landholders. The CSIRO explains that wells are generally laid out in a grid pattern about 750 metres apart and connected by a network of roads, pipelines and compressor stations. The development phase when the wells are drilled can involve substantial intrusion onto the property (e.g. trucks, light, erosion, noise and dust) and interruption of farming operations and domestic life.

For farms that grow crops, there is concern that the large machinery farmers invest in for cropping will not have the space needed to operate if it is impeded by CSG infrastructure.

The Senate Committee Inquiry found that agriculture should not be placed at risk by poorly regulated gas extraction and lists some further concerns additional to the ones identified above. It states that:

"The coal seam gas industry is a relatively short lived industry. It may have a life of only 25 to 30 years in most regions. However, if it is not properly regulated, that period of time is sufficient to do serious damage to agricultural productivity on some of the best farmland in Australia. Landholders are legitimately concerned about water supply, disturbance to livestock, erosion caused by access roads and pipelines, interruption to

natural drainage flows, damage to soil, particularly from salt, and the spread of noxious weeds."

Governments and the CSG industry state that agriculture and CSG production can successfully co-exist, with the land being used for multiple functions, when industry best-practice standards are adhered to.
www.parliament.vic.gov.au/publications/research-papers/8927-unconventional-gas-coal-seam-gas-shale-gas-and-tight-gas
This is a total contradiction of the previous statement. To suggests that because the industry is short lived that the impact that it will have is minimal is disputed by existing evidence of the impact of CSG in other countries. The federal governments'
The *National Harmonised Regulatory Framework for Natural Gas from Coal Seams* supports and advocates for co-existence of CSG and agriculture. You can't eat or drink CSG.

(b)The legal rights of property owners and the impact on property values; and

Coal seam gas deposits are often under prime agricultural land, such as the Darling Downs in Queensland, the Liverpool Plains in NSW, and potentially Gippsland in Victoria, the Crown owns the mineral and petroleum resources under privately owned land and the state government (on behalf of the Crown) licenses companies to explore for and extract gas. The gas companies negotiate access agreements with individual landholders and provide compensation for the disruption to and impact on the property. Ultimately, the landowners have no legal right to refuse the gas company access to their land. www.parliament.vic.gov.au/publications/research-papers/8927-unconventional-gas-coal-seam-gas-shale-gas-and-tight-gas

This is a movement of very diverse stake holders. Who all share a common view which is "to protect Australia's natural, environmental, cultural and agricultural resources from

inappropriate mining and to educate and empower all Australians to demand sustainable solutions to food and energy production."
"Lock the Gate encourages landholders to 'lock the gate' to coal seam gas and mining companies as a form of non-cooperation. The law is strongly in favour of coal seam gas and mining companies but locking the gate to them is an effective means of preventing access."

"Resources are owned by the Crown, not the property owner. The Crown provides gas companies access to these resources and gives landholders only a minor right to 'negotiate' an access agreement and compensation deal with those companies."
www.lockthegate.org.au/about

If a drilling site is established on or near your property, expect the value of your house to diminish. Ray White Real Estate Mt Gambier reports of disastrous long-term effects: *"There is a short-term economic boost. Corporations bring in highly paid engineers. They spend some of their money in the small towns. But the industry activity can also cause real estate markets to collapse."*

The following is a quote from the Ray White Real Estate Mt Gambier website:
"While the project may bring large piles of money to Australia's government and large corporations, the long-term effects may be disastrous for our region and local farmers … This makes it even more important for everyone in our community to be educated in fracking and join forces to make their opinion heard, because we are the ones whose livelihoods will be directly impacted."
The website includes alerts for residents and customers."
~ Ross Mueller in *Geelong Advertiser*

Our concern is that the position of property owners is being undervalued. And that the short term gains of a very specific industry are being given priority over the needs of the majority of not just Victorians but Australians. Who elects the government? Not the mining companies but the vast majority of the community who don't want onshore unconventional gas extract in Victoria.

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(c) Any implications for local and regional development, investment and jobs

Geelong is currently experiencing the trauma caused by the moving on of a number of large corporations (e.g. Ford and Alcoa). According to the best wisdom of the day, Geelong actively recruited and attracted these companies. These companies brought economic benefits over many decades and helped establish Geelong as an industrial city, but now they are departing. We could choose to attract a new industry – fracking – to our region. No doubt the industry will spruik that they bring jobs and investment. Perhaps they will – for ten years or so, while each well is operating. Electric vehicles, wind and solar, cleantech products and energy efficiency work on the other hand will be needed in perpetuity, as will the jobs they create.

As mentioned previously, the investment in a milk powder plant at Warrnambool, which includes $1.5 million from the Victorian Government, would create more than 200 jobs with plans for expansion of the business, which presently employs 1,100 people.

This is from a previous extract however it is worth repeating to emphasis the connections between the different focuses of the enquire and the importance of seeing these connections. This is without looking at the growing area of organic foods and the potential its market.

“Figures show that the domestic organic market is experiencing a boom, with domestic retail sales growing by 50% in the past two years, from $623 million to a healthy $947 million. And in 2010, retail sales are expected to pass the $1 billion mark.
The figures, from a newly released report, reveal that 91% of Australians say chemical-free produce is important to them, while more than six out of every 10 households now buy organic on occasion, up from 40% in 2008.”
www.smartcompany.com.au

And while this information is a bit dated it gives an indication of the growth of this market sector. An area of growth that id highly incompatible with on shore unconventional gas extract.

"It is well known that Australia has a clean environment, and this is important for us to ensure our products are fresh and of the best quality."
Mr Jay Jeong, Managing Director, CJ NutraCon1, Investment opportunities in Australian agribusiness and food | WHY AUSTRALIA 05
www.austrade.gov.au

This quote from a federal government trade paper demonstrates how Australian Agri business is promoted overseas. How does on shore unconventional gas extract fit with this promotion?

4. The ability of potential onshore unconventional gas resources contributing to the State's overall energy sources

Unconventional gas is a fossil fuel. By definition, unconventional gases are harder to extract than conventional gas.The Gas Market Taskforce, chaired by the former Commonwealth Government Minister the Hon. Peter Reith The Gas Market Taskforce states that Victoria's supplies of conventional gas will last about another 30 years. Surely in this period of time we could move to clean renewable energy sources.

(a) an ability to provide a competitive source of energy and non energy inputs for Victorian industries

It may be that Victoria's brown coal (lignite) deposits yield less coal seam gas than black coal deposits. It may also be the case that if there is coal seam gas in Victoria's brown coal deposits it may be harder to extract and hence more costly to produce than CSG from black coal deposits.

It is challenging at this early stage to estimate the costs of production of potential unconventional gas resources in Victoria. A 2012 Core Energy Group paper prepared for the Australian Energy Market Operator provides modelling of the costs of production in current and prospective gas fields in eastern Australia.

www.parliament.vic.gov.au/publications/research-papers/8927-unconventional-gas-coal-seam-gas-shale-gas-and-tight-gas – ftn66

According to its modelling, the prospective costs of supply of unconventional gas from Victoria's onshore basins would be high relative to other conventional and unconventional fields or basins in eastern Australia.

The Core Energy Group paper states that the sources with high projected costs of supply 'are typified by fields/basins of lower geographical quality, resulting in lower well productivity and increased cost of extraction.' The paper argues that the primary factors influencing the higher cost of CSG extraction from the onshore Otway basin are that the CSG is relatively deep underground (deep wells are significantly more costly) and has a higher CO_2 content that would require additional facilities to process. The paper argues that low permeability in the onshore Gippsland basin would require deep horizontal drilling and fracking in order to develop the target sections, resulting in expensive well costs. www.parliament.vic.gov.au/publications/research-papers/8927-unconventional-gas-coal-seam-gas-shale-gas-and-tight-gas

(b) An affordable energy source for domestic consumers

The Gas Taskforce Report and a recent report by the Grattan Institute titled *Getting Gas Right* (2013) address this issue in detail. These reports state that increasing the supply of gas, by allowing unconventional gas production in Victoria and increasing production in the other states, will help to combat the price rise. On the other hand, the New South Wales Parliamentary Inquiry into coal seam gas in 2012 www.parliament.vic.gov.au/publications/research-papers/8927-unconventional-gas-coal-seam-gas-shale-gas-and-tight-gas – ftn62 found that evidence on the matter was 'highly conflicting' and the price rise will not be influenced by the development of coal seam gas in NSW. The Inquiry received highly conflicting evidence in regard to the potential impact of the coal seam gas industry on energy security and the price of gas in New South Wales.

It appears likely that when coal seam gas produced in Queensland begins to be exported to Asia, gas prices will increase, as Australia's East Coast gas market will be influenced by the higher gas prices paid internationally. Price rises are likely regardless of whether we develop coal seam gas reserves in New South Wales

Because they need to be fracked to release the gas from the coal seam or rock, the energy cost of the gas is high compared with conventional LNG. Additionally, with the government plans to export massive volumes of gas through ports in QLD, Victorian consumers will be competing with international energy prices in coming year. So UCG is unlikely to be an affordable energy source for consumers. A much better option is to look at ways we can reduce our need to use gas (for instance through ensuring better energy efficiency standards in new homes and a government funded energy efficiency retrofit program for existing houses etc

The Gas Market Taskforce, chaired by the former Commonwealth Government Minister the Hon. Peter Reith The Gas Market Taskforce states that Victoria's supplies of conventional gas will last about another 30 years.
If this is the case then why aren't we moving to renewable energy sources? Unconventional gas is another fossil fuel with all the environmental negatives associated with it. In particular climate change

According to Anthony Ingraffea, rejecting onshore gas extraction is about moving renewables faster to relay climate change. He explains what could be an alternative to shale gas for New York State:

“Renewables will stabilize energy prices and improve energy security. We own the wind, the sun, the water. Their fuel cost is zero. It is cost effective. The $486 billion price tag is paid off entirely in health-cost and climate-cost savings of $36 billion per year over 14 years. Emission decreases would reduce 2050 climate costs by billions of dollars per year.”
~ Dr Anthony Ingraffea, NYS Green Building Conference march 2014.

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(c) Carbon dioxide emissions from these sources;

Natural gas is often presented as a transitional fuel in the move to a lower carbon economy because it produces less carbon dioxide than burning coal for comparable electricity generation. Fugitive emissions – could mean that CSG has a greater greenhouse gas impact than was previously thought. Methane is a powerful greenhouse gas. One of our issues with this is that it is also a fossil fuel. A shift to renewables is urgent.

The NSW Parliamentary Inquiry found that, *"while it is impossible to reach a definitive conclusion as to the greenhouse gas emissions of Australian coal seam gas, the Committee considers it likely that at worst the greenhouse gas emissions produced from coal seam gas would be equal to those produced by coal."*

Fugitive methane emissions result in lost product and revenue for the CSG industry, so it is in the industry's interest to minimise the emissions.

As the O'Kane Report explains, methane has a global warming potential, defined by the Intergovernmental Panel on Climate Change as 21 times that of carbon dioxide. The O'Kane Report also states that fugitive emissions are created by various industries and that industry emissions are measured or estimated annually and reported under the National Greenhouse Gas Emissions Reporting Scheme (NGERS). It further states that the relevant Commonwealth departments are working to address 'numerous criticisms' related to the application of NGERS measurement methods to the CSG industry so as to make the methods more effective.

The O'Kane Report explains that it is important to note that methane leaks also occur naturally in the environment and through existing groundwater bores and this makes measuring fugitive emissions directly from CSG activities more complex, It also underlines the importance of gathering baseline data prior to beginning CSG production.

5. The resource knowledge requirements and policy and regulatory safeguards that would be necessary to enable exploration and development of onshore unconventional gas resources

Commonwealth and COAG Regulatory Developments

National Partnership Agreement In March 2012,

Establishment of the Independent Expert Scientific Committee November 2012,

Environment Protection and Biodiversity Conservation Act 1999

Environment Protection and Biodiversity Conservation Act June 2013

EPBC Act Water Trigger Amendment June 2013,

National Harmonised Regulatory Framework for Natural Gas from Coal Seams June 2013

COAG Standing Council on Energy and Resources (SCER produced

National Harmonised Regulatory Framework for Natural Gas from Coal Seams June 2013,

Victorian Regulatory Developments

Inquiry into Greenfields Mineral Exploration and Project Development in Victoria May 2012,

We have not been able to find much information on regulating the industry in Victoria. We were particular alarmed by The *National Harmonised Regulatory Framework for Natural Gas from Coal Seams* ('the Framework'). A Federal government frame work which takes the view that, “the CSG industry and agriculture can co-exist if the leading practice regulatory settings it details are implemented, and that this will ensure community confidence in the industry,” and, “The Framework recommends that regulatory and legislative settings **should be underpinned by the principle of co-existence where 'a shared' commitment exists between the resources industry, other land users, local communities and governments** to multiple, merit-based and sequential land use that provides certainty for industry and improved community confidence in land use decision-making" (our emphasis)

www.parliament.vic.gov.au/publications/research-papers/8927-unconventional-gas-coal-seam-gas-shale-gas-and-tight-gas

The frame work is set up to ‘guide’ best practices to regulators of the industry. The frame doesn't see the need to develop specific legislation as in various forms these currently exist. This smacks of deregulation. The 'precautionary principle' we would see as a key under pinning of the process of regulation rather than the principle of 'co-existance'. What is even more alarming is the Victorian State government's support of this frame work. All the evidence we came across including the Victorian state governments 'Unconventional Gas: Coal Seam Gas, Shale Gas and Tight Gas' paper would strongly state otherwise..

The Australian Medical Association has passed a resolution saying:
“All future proposals for coal seam gas mining are subject to rigorous and independent health risk assessments, which take into account the potential for exposure to pollutants through air and groundwater and any likely associated health risks. In circumstances where there is insufficient evidence to ensure safety, the precautionary principle should apply.”

Lloyd-Smith and Senjen (2011) found that even though they might be in low concentrations, the effect of the complex mixture of chemicals on the environment was not well understood and there were no water quality guidelines for many of the compounds. Many of the chemical compounds have demonstrated human health effects – for example, skin exposure to sodium persulfate can lead to sensitisation, ethylene glycol is a respiratory toxicant, naphthalene is a potential human carcinogen and isopropanol is a reproductive toxicant (Lloyd-Smith & Senjen 2011)

The Victorian Environmental Defenders Office (EDO) highlights that, under the MRSD Act Exploration and development projects are exempt from requiring approvals under the *Environmental Protection Act 1970* (Vic) to discharge waste or undertake an activity that potentially damages the environment; and from requiring planning permits to remove native vegetation. These exemptions are based on the premise that these matters will be dealt with through the work plans submitted to the Department.

(a) Further scientific work to inform the effective regulation of an onshore unconventional gas industry, including the role of industry and government, particularly in relation to rigorous monitoring and enforcement, and the effectiveness of impact mitigation responses; and

There is considerable scientific uncertainty over the long-term impact of unconventional gas production on the environment. Concerns centre on the lack of data – and a lack of sharing of known data – on groundwater systems, CSG activities and their potential impacts. The NSW Parliamentary Inquiry shared the view of the current literature that more work needs to be done to understand the operation of groundwater systems, particularly in regard to the interconnection of aquifers in areas where CSG production is planned or underway.

It is essential and urgent to do the research to obtain base line date prior to the commencement so if the CSG goes ahead regulators can access the cumulative impacts. The inquiry also found that there was a total lack of information on the potential long term cumulative impacts of multiple coal seam gas projects.

It also stated that Commonwealth and State governments must take concerted action as a matter of urgency to develop models of cumulative impacts. It believed that the lack of baseline data was interfering with effective monitoring and compliance reviews of the coal gas industry.

Data collected by members of the industry is seen as commercially sensitive and are unwilling to share it with government regulators. This 'commercially sensitive' data is seen as a critical aspect in assessing accumulative impacts. We wonder if this unwillingness to share this data is due to is negative implications for the industry. The O'Kane Report's view is that this sharing and collection of data between all agencies both public and private is critical to monitoring the potential impacts of the industry.

The CSIRO states that groundwater impacts may not become evident for years and ongoing research will be important: “Prediction of specific impacts of CSG

developments requires ongoing research because groundwater responses may take decades or centuries to move through aquifers, especially when groundwater flow velocities are slow."

(b) Performance standards for managing environmental and health risks, including water quality, air quality, chemical use, waste disposal, land contamination and geotechnical stability;

These are placed together because of research done by Barth (2013) would indicate that scientific research can be contaminated by the bias of the industry. Barth concludes that independent studies need to be done to remove this risk. We need to be vigilant on this issue because more and more funding in so called independent studies by university comes from the industry being researched. The following are extracts from a paper by Barth and demonstrate the context from an American perspective.

Studies funded by gas industry

Numerous studies have been prepared by and/or funded by the gas industry [1-6]. They generally conclude that there will be large, positive economic impacts to both states and local communities. These studies primarily highlight benefits such as employment, income, and tax revenue growth.

Kinnaman [7] has reviewed several of these industry-sponsored studies and observed that they are not peer-reviewed. He has raised a number of concerns about the industry-sponsored studies, and concluded that due to unrealistic assumptions regarding windfall gains to households, location of suppliers and property owners, and the methodology used, the estimates of economic benefits in the industry-sponsored studies are very likely overstated. Any economic activity, including shale gas development, will generate some level of state and local economic revenues and provide some number of state and local employment opportunities, but policymakers should recognize that the estimated gains in revenues and employment are probably exaggerated in the industry-funded studies and the long-term economic impact may

be far different than expected. In addition to the points made by Kinnaman [7], the estimates in these studies may be further overstated if overly optimistic gas reserve and production assumptions were used pp86.

From conclusion

Policymakers should insist on unbiased, comprehensive economic assessments of shale gas development for each state and community that may be impacted. Pp 96 JANNETTE M. BARTH NEW SOLUTIONS, Vol. 23(1) 85-101, 2013

(b) Performance standards for managing environmental and health risks, including water quality, air quality, chemical use, waste disposal, land contamination and geotechnical stability;

A report recently made by the Independent Expert Scientific Committee Bore integrity, June 2014, stated that:

> *"There are no specific standards or guidelines relating to coal seam gas well integrity in Victoria."*

This is very worrying. In the same report it discusses legacy bores. We would like to know what number of legacy bore exist in Victoria? And as you read below, the direct impact a legacy bore could have in our community. If we had a 'flare up' in the Otway ranges in summer, it would be a disaster.

Research by Doctors for the Environment found that the current level of assessment, monitoring and regulation of CSG exploration and mining activities in Australia is inadequate to protect the health of current and future generations of Australians. Doctors for the Environment have outlined three key areas where there is the potential for adverse human health impacts:

- through contamination of water, air and soil
- through diversion of water and land away from agricultural food production
- from mental health impacts on communities who have had environmental changes imposed upon them

www.parliament.nsw.gov.au/Prod/parlment/committee.nsf/0/F96D076732225603CA25791B00102098

6. Relevant domestic and international reviews and inquiries covering the management of risks for similar industries including, but not limited to, the Victorian Auditor-General Office's report Unconventional Gas: Managing Risks and Impacts (contingent upon this report being presented to Parliament) and other reports generated by the Victorian community and stakeholder engagement programs.

The NSW Chief Scientist and Engineer Professor Mary O'Kane's 2013 *Initial Report on the Independent Review of Coal Seam Gas Activities in NSW* (The "O'Kane Report")

The NSW Legislative Council General Purpose Standing Committee No. 5, 2012 *Inquiry into Coal Seam Gas* ('NSW Parliamentary Inquiry') www.parliament.vic.gov.au/publications/research-papers/8927-unconventional-gas-coal-seam-gas-shale-gas-and-tight-gas

Jannette M. Barth, The Economic Impact Of Shale Gas Development On State And Local Economies: Benefits, Costs, And Uncertainties, New Solutions, Vol. 23(1) 85-101, 2013

CSIRO (2012) 'Coal Seam Gas – Produced Water and Site Management', Factsheet, CSIRO website, viewed 17 October 2013, www.csiro.au/news/coal-seam-gas#FactSheets

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In conclusion: This is why Geelong Sustainability calls for the State Government to impose a permanent ban on all forms of unconventional gas extraction including tight gas, shale gas, coal seam gas, fracking and underground coal gasification.

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