

Submission  
No 488

## INQUIRY INTO COAL SEAM GAS

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Mr Tom Livanos

Dear Chairman Brown MLC and member of the General Purpose Standing Committee No. 5,

Please accept this document as a submission to the New South Wales Senate Inquiry Into Coal Seam Gas by the General Purpose Standing Committee No. 5.

My name is Tom Livanos. I am middle aged and have resided in New South Wales for my entire life excepting short term holidays. Before moving on, I wish to say thankyou. Thankyou for opening this inquiry. Thankyou for allowing members of the public such as myself to make submissions to it. Thankyou for taking the time to investigate the mining of coal seam gas. Thankyou especially for doing so given that the mining looks likely to occur in all of Australia's most fertile piece of land.

I will move on to address the points in the terms of reference momentarily. In the interim, I wish to provide one paragraph of background to this submission. Informally, I have been a student of sustainability for my entire life. The seriousness of this study has increased exponentially in recent years. It is largely due to *a series* of tragedies in my personal life which I experienced over the summer of 2004/2005. I am now enrolled to complete a Bachelor of Sustainability at the University of New England in Armidale, New South Wales. It is an honour to be given such an opportunity. A considerable amount of what I will write to you in this submission has been taken from my formal studies at the university. Whilst this Senate Inquiry is a blessing of unmeasurable proportions, it is also rather unfortunate that only 33 days have been provided to members of the public to make submissions. Taking my own personal experience, I first heard of the Inquiry - along with the 7 September 2011 closing date for submissions - on 26 August 2011. The ultimate decisions made by the Parliament on this issue will have significant ramifications for us and our descendants over the decades and centuries to come. If at all possible, I invite you, all members of the Standing Committee - and indeed all Parliamentarians - to look as much and as closely as possible at the processes involved in mining coal seam gas and the effects this has on the health of the environment (and by direct consequence the health of the human population i.e. us). **Thankyou for your time in reading this interlude. I now turn my attention to the terms of reference.**

#### 1. The environmental and health impact of coal seam gas activities.

A key environmental impact of the proposed mining activities is the fragmentation of the habitat for flora and fauna in New South Wales. This concept, habitat fragmentation, describes a situation where an ecosystem is splintered in a sort of criss-cross fashion. Plants are killed/taken out so that pipelines can be laid in their place for the transportation of the gas resources. This has a number of implications:

- First and foremost, there is a reduction in the existence of plants throughout a particular area. The plants that have been excavated and removed have, plain and simply, been excavated and removed. That area is then kept bare for the entire time that the pipes are used. If the pipes are not removed at the end of the mine's life, the ability of flora to regrow is reduced. While the pipes remain in place, the flora will never have the same capacity it

did to flourish. A diminished flora leads to diminished fauna in the area. One has to keep in mind that, when it comes to food chains and food webs, plants are the foundation of everything. They obtain their food from sunlight via a process known as photosynthesis. If you take out flora from an area, you are effectively ripping the guts out of the ecosystem which has been built around those plants. The ecosystem becomes less stable. Nature is always changing, especially here in Australia. One of many examples is that we go through periods of drought and periods of flood. If you reduce the number of plants of a species as well as the number of species in any given area, then 'shocks' to the system (eg. drought and flood) cannot be absorbed as easily as before. This makes it easier for micro-organisms (bacteria, viruses etc.) to escape. Their predators are lower in number so, what is the result? The micro-organisms can escape across the landscape more easily. If/when it does happen, there are implications for us as our food sources are affected.

- When you take out tracts of plant life within any given area, wind speeds and temperatures rise. Humidity within that area drops.
  - Lets take wind first. Think of the situation in Sydney where you have streets bounded by tall buildings on either side. There is this tunnelling effect of the wind and it blows stronger in the streets than it would if the buildings were not there. The same effect happens in a fragmented forest area – the wind is tunnelled between the tracts of land which have been deforested and it therefore increases its force.
  - Moving on the temperature. Plants and trees regulate the temperature of an ecosystem as well. They absorb more light and heat during the hot days and release more heat during the cold nights. This smooths out the diurnal temperature of the area. If you remove the plants in a consistent manner over large areas, the temperatures will rise and fall more dramatically. This leads onto a subsequent effect to be described momentarily.
  - It is similarly the case with humidity.
- What does all this mean? The probability that a fire will break out increases. By mathematical definition, this means that over any length of time, more fires will break out. It is then not only the original vegetation which will be destroyed, but all other vegetation caught up in a fire. This will be good for some plant species like eucalyptus trees but poor for most plant species. The ecosystem is thrown out of balance causing a threat to our food security. How? The food chain is disturbed. Plants die causing animals to die.... Picture us at the top of that food chain and having our foundation for health wobbled from underneath us. The wobbling could be amplified by the escape of a micro-organism which is harmful to human health.
- Taking out tracts of vegetation has implications for how sub-surface and surface water flows are regulated. Plants and water have a symbiotic relationship. In other words, water affects where plants grow and plants affect where water flows/doesn't flow. Geologically speaking, Australia has been an island continent for tens of millions of years. As a result, it has developed its own system of co-operation between plant life and water flows. Australia is also the driest inhabited continent on the planet (this includes Africa). When it does rain, we have the highest variability of rainfall – a classic case of “it never rains but always pours”. Either that or we are in a drought. You cannot possibly imagine how sensitive this makes our plants to the climate. The exact implications of this are not really known. They cannot be known because the situation is so unique. What we do know is that to mess with it is to mess with a system - which has very, very, **very** slowly evolved over tens of millions of years. We would be messing with it within the metaphorical blink of an eye. You tell me what the implications of that are. All I know is that, whatever they are, they make me nervous.
- Moving on to fauna. Whatever the effects are on the flora, you can multiply this by a factor of 10? 20? 100? for the effects it will have on the fauna. It starts with the herbivores or the plant eating animals. They have less food and a lower variety of food so their populations and health are decreased respectively. It then impacts on the omnivores (animals which eat

plants and other animals) and it impacts on the carnivores (animals which eat other animals). As omnivores, we are obviously caught up in this mix. If we want to keep eating the same amount of vegetables, fruits, meats, dairy products etc. and want the same energy and nutritional value from our foods, we need to take up more and more land to satiate that need/want. How much extra land? That depends on the extent to which we have destroyed the plants. Keep in mind that this is not only a question of quantity but a question of quality. The plants and animals we do eat won't be as vital in terms of vitamins and nutrients.

I understand that the terms of reference list energy impacts as item number three. I beg the committee's indulgence to provide a little summary table at this point to counter-balance my "doom and gloom" bullet points above (all of which I can assure you are 100% valid and you can ask any environmental scientist for verification).

Our present day sources of energy are dwindling. The key question is all of this then is where do we obtain our extra energy from? Here is the table I just referred to:

**SOLAR ENERGY VS FOSSIL FUELS**  
**A CONTRAST**

	<u>Solar energy</u>	<u>Fossil fuels</u>
<b>Time remaining before exhaustion</b>	Billions of years	Decades
<b>Nature's production rate</b>	Daily	Every 250-325 million years
<b>Ease of access</b>	Easy and constant	Difficult and getting more difficult
<b>Pollution</b>	Zero	Very high
<b>Storage</b>	Getting better exponentially	Coal, oil and gas just sits there.
<b>Potential Potential Potential</b>	Enough sunlight reaches the surface of the Earth in a matter of hours, to meet the world's present day energy needs for one entire year!	Astonishing amounts need to be burned to meet our daily energy requirements. Once burned, it is gone forever.

With regards to the potential field, I first became aware of this for solar energy whilst reading the January-March 2010 issue of *ReNew* magazine. This is a quarterly publication released to members of the Alternative Technology Association. It is also sold through newsagents The Alternative Technology Association is based in Melbourne, have been operating continuously since 1980 and are funded entirely by member subscriptions, sale of magazines at newsagents and sale of equipment via their online shop. Their website is <http://www.ata.org.au>. The January-March 2010 issue of *ReNew* magazine was the first one I read and, I must confess, I was rather sceptical about the figures provided within one article explaining the potential of solar energy. I decided to do the calculations myself and, to my astonishment, I found that the figures were accurate. Enough sunlight reaches the surface of the Earth in a matter of hours to theoretically meet the entire world's 2008 energy needs. It is astonishing but think for a moment. The sun is a ball of energy with 330,000 times the volume of the Earth. It is not surprising then that it sends so much energy our way. In short, there is no need to mine coal seam gas or any other fossil fuel to meet our energy needs. It is a far wiser approach to invest the same money in harnessing the power of solar light. This will meet all consumer needs, all industry needs, all business needs, all government needs, all not-for-profit organisation needs.... just all energy needs full stop.

Returning now to the first point in the terms of reference regarding the environment and human health. In the mining of coal seam gas, the committee would be aware that it is often necessary to employ hydraulic fracturing to access and release the gas. Chemicals, some of them known

carcinogens, are used in the process. At this point in my submission, I wish to draw the committee's attention to the report done by Matt Carney of the ABC's *4 Corners* program. It went to air on Monday night 21 February 2011. Please follow this link to view the report, extended interviews, related *4 Corners* programs from the past and a section showing additional resources.

[http://www.abc.net.au/4corners/special\\_ed/20110221/gas/default.htm](http://www.abc.net.au/4corners/special_ed/20110221/gas/default.htm)

Specifically, in an interview with Dr. Mariann Lloyd-Smith of the National Toxics Network (<http://www.ntn.org.au>), she clearly and unequivocally states that none of the 23 known chemicals used in the hydraulic fracturing process have been independently reviewed in connection with their use for hydraulic fracturing. Only two have been reviewed in *any* context. Mr chairman and committee members, I am not a toxicologist. As a person who values his own health, I find this situation rather disturbing – especially considering how much of these chemicals are going to be pumped into the groundwater as a result of the process. Lets leave out all the technical terms and all the jargon – on this one I have as much of an idea as what you do. Is this something which you would bet your health on? Your children's health? The health of others in the community and their children? I can only answer for myself and my answer is no. Simple. No exaggerations, no extremes, nothing of the sort along those lines. I am simply saying that I would not bet people's health – including my own – on the outcome of hydraulic fracturing and pumping thousands of chemicals into the groundwater. One fact which I am aware of is that it takes centuries if not millennia for that groundwater and the Great Artesian Basin to be replenished.

The fact that it takes hundreds of millions of years for coal seam gas to form within the crust of the Earth is established. Decades, no, centuries of scientific inquiry has amassed an astonishing volume of evidence to say so. Of course, the resource can only be used for meeting our energy needs once. Once it is burned, that is it. Finished for another period of hundreds of millions of years. What is less well known is that billions of years ago, the atmosphere of Earth was different. It comprised of far more carbon dioxide and other gases than what it does today. The oceans were anoxic (devoid of oxygen). The oceans were like a thick, gluey acid. The water must have smelled awful. It took the best part of a couple of billion years for the atmosphere to change to what it is today (78% nitrogen, 21% oxygen and some much tinier proportions of other gases – including argon, carbon dioxide, methane, sulfur dioxide, nitrous oxides). That happened via the photosynthetic processes of algae and other basic plant forms. They took in carbon dioxide as an input and released oxygen as an output of photosynthesis. Over billions of years, this changed the atmosphere and the oceans to contain more oxygen. In turn, that enabled more complex forms of life to develop. The process ultimately led to the diversity of life which we see around the planet today (including ourselves). Note: co-operation – even at the very beginning – was what drove life forward. The algae co-operated with the atmosphere. The atmosphere then co-operated with the algae and other life forms. This feedback back-and-forth created variety around the planet – in plant life as well as animal life. That variety made everything stronger and more resilient to shocks.

What has all this got to do with mining coal seam gas? Extracting this gas and burning it effectively reverses the chemical processes which put the gas in the ground in the first place. It is released back into the atmosphere and we start reverting back to the atmosphere of billions of years ago – hostile to about 99.99999% of all life alive on the planet today (including, most certainly, ourselves). The faster we extract and burn it, the faster the reversal will occur. The mining companies may make arguments about wanting to recover the investment they made to extract the gas and then add a return on that investment. It is in their interests to do so. I could even go so far to say that, in one very small way, they make a legitimate point. Collectively – and mining company shareholders, executives, managers, employees and customers are just as human as you and I – we will be destroying ourselves. We will be altering conditions up in the sky such that we will no longer be able to live in the atmosphere which we will have created. I have often heard that the development

of the steam engine for industrial use occurred in 1723. Since then, we have been burning fossil fuels, of which coal seam gas is one. In those early days of the 1700s, it was miniscule compared to what we burn today. Slowly but surely, we have been increasing the rate at which we burn – month after month, year after year, decade after decade etc. A reckoning time will come. I don't know when. I don't know the exact path which we/the environment will take. What I do know is that business as usual will, one day, destroy us.

I am a humble student of sustainability. For me, that means having a world which is healthy and peaceful. You have those two things and you have sustainability. What happens if you do not have sustainability? By definition, societies – and all people within them – die. I ask the question then: what is the value of anything else which we have done, are doing or will do? What is the value of the advancements in science, technology, literature, knowledge, communications, transport etc.? If we reach a point where we ourselves are no longer around, what value do these things or anything else have? It is at this point that I move on to item two in the terms of reference.

## 2. The economic and social implications of coal seam gas activities.

I will deal with the economic implications first. An economy – any economy – exists so that the needs and wants of individuals within society can be met. The resources we use to meet those needs and wants come from the environment. Too often, policy is framed within the context of “the environment vs. the economy”. I am pleased to have an official channel by which to communicate just how misleading this framework actually is. If you show me a severely degraded environment, I will show you a severely degraded economy – perhaps even a non-existent economy. I will also show you a human population which is too ill to work, to attend school, to be with family and friends or to perform any of life's other necessary and pleasurable activities. Are we finally - after centuries of thinking “economy vs. environment” - are we finally ready to see that the two are intertwined as much as what air quality is connected with the health of our lungs? The environment is how the resources behave and self-organise. The economy is how we, as humans, interact with those resources. In a very real, very pragmatic and very accurate way, we are a part of the environment. The impacts on the economy are therefore derived – and pretty much the same – as the impacts highlighted in what I have written for terms of reference point one.

I move on to the social impacts of mining for coal seam gas. I base this assessment on the experiences I have heard from farmers – both through the media and via direct, face to face communication with them. To sum it up in one word: they are being treated with complete and utter contempt by the mining companies. It is to the point where the behaviour can only be described as 100% apathetic. This then raises the question: is this behaviour going to be allowed to continue? If the answer is yes then the outcome can only be one: a culture of apathy is what will seep its way insidiously deep within the consciousness of the community and everyone within it. The result of that can only be one: each individual will act entirely within their own, short-term, survivalist self-interest. This term of reference to the Inquiry asks for the social implications of coal seam gas mining. I can only go by the actions thus far on the part of the mining companies. The analysis I have just provided flows on from those actions.

Here is an example. The Carroona Coal Action Group within the community of Carroona established a blockade in front of agricultural land which the mining companies wished to access. To have any effect, any effect whatsoever, it had to be manned (along with at least one mobile phone) 24 hours a day, 7 days a week – for two years. The moral force of the blockade can be seen by the fact that people started coming in from other communities, from other parts of New South Wales, from other parts of Australia, from New Zealand, from Northern Europe, from Canada, from the United States of America... You and I have places to live. When this Senate Inquiry has come to its conclusions,

when the government has selected the recommendations to be implemented, when they have been implemented and while they are being managed, these farmers will continue trying to do what their families have done for generations: provide us with the food we eat. The trajectory which the mining companies are setting us on is to destroy the social fabric of these communities. Some farmers may ultimately – and quite possibly without even consciously realising it – turn to an apathetic approach themselves. It is only tragic consequences which could result from all of this. Suicides, perhaps even murders, a decline in social services, a view from policy-makers such as yourselves that “this is just too far gone; nothing can be done about it now”. Item 2b in the terms of reference asks for submissions of food security and agricultural activity. Do I need to type the words? I will anyway. Such social dislocation among farmers, between farmers and food consumers.. that is nothing short of self-destructive to food security and agricultural activity. It could not be otherwise. Item 2a asks for submissions on property rights and property values. Both will decline. It is akin to having any form of physical security removed from your own life. I, for one, am not able to describe this present trajectory in terms other than those which associate with tragedy, sadness, despair and a complete and utter loss of meaning in life. This is not only at the community level among farmers; it is also at the broader societal level among farmers, miners, consumers, voters, governments, businesses, users of social services (which includes all of us) etc.

I do not write a separate section for term of reference five regarding other jurisdictions. I simply say here that similar effects have been felt in the United States of America – the other jurisdiction which has taken the mining of coal seam gas so seriously in its operations. As backup for this claim, I refer to the documentary *Gasland* by Josh Fox (<http://www.gaslandthemovie.com/> and <http://www.imdb.com/title/tt1558250/>). A movie made specifically in the Australian context is also available by Jim O'Neill (<http://www.gasland.com.au/>). I specifically and deliberately include reference to both of these movies. I insist that each of you on the committee view them before making your Inquiry recommendations.

#### Terms of reference items three, four, five and my conclusion.

With regards to item three, I have nothing further to submit to the committee at this time. That which I have outlined above within term of reference one is once again brought to the committee's attention now. This is especially the table contrasting solar energy with fossil fuels.

I wish to make this historical point within the context of my own life. As a child and teenager, I was brought up to be responsible with money. This was a core value which my parents instilled in me and it continues to this day (for example, I have never been in trouble debt wise or in any other way with respect to money).

During my conversations and interactions with green groups back then, I found myself fearing that I was on a hiding to nothing if I were to follow their advice. I felt as though I would need to continue cutting back on what I consumed in my daily life. I felt a psychological pressure than no amount of cutting back was good enough – I would always need to cut back more. As a result of all this, I eventually rejected their arguments and did so most emphatically – about as emphatically as I have done anything in my life.

This all changed in January 2010. As I wrote above, I discovered just how vast the sun's energy was as a source of power. Why couldn't the greenies have told me about **this**? It was not a matter of perpetually cutting back, it was a matter of balancing the rate at which nature provides resources with the rate at which we consume those resources. It so happens (and I would say fortuitously) that we can continue living as we do today. It is not a question of cutting back as much as it is of re-organising how we have our needs and wants met. Going back to my discussion about the economy

and the environment, the energy question is a question of re-organising our economy. We need to move away from fossil fuels (with all their negative health effects) and towards renewables (which are perfectly compatible with human health – in fact, we have developed biologically to be compatible with energy sources like solar). The sooner we do it, the easier it will be. It is important – and there is one thing which I know about matters of importance: the longer you delay your attending to them, the harder they become to attend to. As we continue delaying this transition - which we will have to make at some point - the sacrifices which will be required continue to grow more and more significant. This has very real implications for you, for me and for all of us and our health.

I have no submission to make with respect to item four – I am simply not sufficiently versed in other legislation.

Apart from my specific and deliberate referral to the United States of America based movie *Gasland* by Josh Fox above, I have nothing to submit with regards to term of reference five.

I once again express my gratitude to you for taking on this monumental task, for your time in reading my submission and for your efforts. I am unaware if it is generally considered appropriate to leave contact details within the body of a submission. My apologies in advance if it is not. My email address is !

Thankyou and regards,  
Tom Livanos.

Lifetime citizen of the state of New South Wales.