From: John Geary
To: fracking inquiry
Subject: The role of hydraulic fracturing in relation to the current gas shortage in Eastern Australia
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My name is John Geary and I am a retired petroleum geologist who has worked for 35 years in petroleum exploration in Australia and Canada. I only became aware of the closing date for the NT inquiry into
hydraulic fracturing yesterday when I received an email from the Petroleum Exploration Society of Australia, of which I have been a member since its inception. PESA has made its own submission and has invited individual members to make theirs if they so desire. In view of the short deadline this submission will be brief and confined to the importance of hydraulic fracturing to the country as a whole particularly in view of the recent emergence of a critical shortage of natural gas for industry in Eastern Australia and proposed Federal Government action to address this situation.

The pros and cons of the practice of hydraulic fracturing have been canvassed in multiple inquiries both in Australia and overseas. Perhaps one of the most relevant to this inquiry is "Report 42 Implications for Western Australia of Hydraulic Fracturing for Unconventional Gas". The Committee which produced the report comprised five Members of the WA Legislative Council, two Liberal, two Labor and one National. . The report is available on the parliamentary website http://www.parliament.wa.gov.au./ The Committee made a number of findings and recommendations after consulting widely with local and overseas experts and visiting various operational sites. Key findings included that community concerns about the impact of hydraulic fracturing can be addressed by regulation and ongoing monitoring and that the risk of hydraulic fractures intersecting underground aquifers or causing induced seismicity is negligible. A report on shale oil-gas opportunities in the Northern Territory has been compiled by Dr Dennis Gee a former Director of the Northern Territory Geological Survey.

The United States Energy Information Administration (EIA) in 2011 made an estimate of the technically available shale gas resources in a number of countries over six continents. Australia had the sixth largest resources behind China, USA, Argentina, Mexico and South Africa. Australia's resources were estimated at 385 trillion cubic feet, there are probably more up to date figures available but they would be of a similar order of magnitude. This figure is almost three times Australia's present proved and probable gas reserves, about 30% of which are coal seam gas. Hydraulic fracturing is essential to unlocking these resources.

The principal sources of gas supply for Eastern Australia are the offshore fields of the Bass Strait and the onshore fields of the Cooper Basin in north eastern South Australia and south western Queensland. After more than half a century of production the Bass Strait fields are depleting. While the Cooper Basin enjoys a relatively high drilling success rate, discoveries tend to be on the smallish side. However the Cooper Basin has significant resources of unconventional gas estimated by the EIA to be 85 trillion cubic feet. Putting this figure into perspective it would represent about 60 years of supply at Australia's present rate of consumption. While the Cooper Basin ranks second in Australia to the Canning Basin in Western Australia in terms of estimated recoverable unconventional gas resources, it has significant advantages. Firstly it has a thick section of gas bearing shales of Permian age and secondly it has a network of connecting pipelines which enable delivery to each of the eastern capitals as well as to the LNG export facilities at Gladstone, Queensland. Unsurprisingly for these reasons exploration for shale gas is more advanced in the Cooper Basin than anywhere else in Australia with Beach Energy being one of the pioneers.

Hydraulic fracturing has been practised in vertical wells in the Cooper Basin (and elsewhere in Australia eg Barrow Island) since the late 1960s, generally for enhancing the deliverability of low permeability sandstones but not on the scale of modern practice in horizontally drilled shale wells as in the US. Beach drilled the first shale test well in 2010 in the geological entity in the Cooper Basin known as the Nappamerri Trough where the greatest potential for unconventional gas is believed to exist. It encountered 363 metres of gas bearing shale. More recently, in partnership with US major Chevron, it drilled six vertical wells in the Queensland section of the Nappamerri Trough to depths of between 3800 and 4300 metres All were gas wells with one flowing gas at 4.5 million cubic feet per day which is an excellent rate for a vertical shale well. Chevron subsequently withdrew from the joint venture possibly because of low oil prices, a significant blowout in cost of the Gorgon LNG project in WA and a retreat to more lucrative prospects in the US. Beach recently also withdrew from the project perhaps for some of the same reasons.

Currently Senex Energy is drilling an exploration well in another geological entity in the northern Cooper Basin in South Australia known as the Patchawarra Trough. The target is another form of unconventional gas, tight gas or basin centred gas. This well is scheduled to be drilled initially to a vertical depth of about 3600 metres and depending on the results of this, a horizontal leg of up to 1500 metres will be drilled. The target formation is low permeability sandstone of Permian age and if the second stage proceeds it is believed that it will be the first horizontal well for unconventional gas drilled in Australia. Hydraulic fracturing will be necessary to achieve commercial production.

Currently bans or moratoriums on hydraulic fracturing are in effect in Victoria, NSW, Tasmania and the Northern Territory. In Victoria there is also a moratorium on exploration for onshore conventional gas. NSW has a moratorium on coal seam gas production. South Australia allows hydraulic fracturing but the present Opposition Leader has stated that if the Opposition wins the next election he will impose a ten year moratorium on unconventional gas. WA has allowed hydraulic fracturing but the policy of the newly elected Government is presently unclear.

There is a looming crisis in gas availability in eastern Australia. There are several reasons for this:-
a) The closing of some coal fired power stations as a result of actions by some State Governments has created a demand for gas to fill the energy gap.
b) Unrealistic alternative energy targets set by some States which not only create power outages when the alternative sources fail, as seen recently in South Australia, but discourage private capital from investment in gas production if there is a fear of being phased out in favour of alternative energy, as has happened to some degree in the case of coal.
c) The demand for gas created by the construction of three LNG export facilities in Queensland. One of the consortiums lead by Santos has contracted to sell more gas than it has available which has required the purchase of third party gas. The shortfall is largely due to the moratorium placed by the NSW government on development of the large coal seam gas resource at Narrabri.
d) The present low oil price to which the price of gas, especially export gas, is largely tied, has discouraged exploration.
e) the policies of some Governments in regard to hydraulic fracturing as outlined in the previous paragraph.

The Federal Government has reacted to the crisis in two ways, firstly by proposing to enact legislation requiring gas producers to make gas available to local customers at an acceptable price, which presumably would be the price that producers would receive through export, and secondly pressuring State Governments to abandon their restrictive policies on gas exploration and production. The first action is not unreasonable but could force gas exporters to declare force majeure on export contracts with adverse implications for sovereign risk and future overseas investment in Australia. On the other hand it is unacceptable for local industry to face new contract prices of four to five times the cost of gas in the US. Suggestions of a connecting pipeline to the north west of WA have been raised but this would make the cost of gas in the eastern States prohibitive and the pipeline could become a stranded asset if and when the eastern gas producing basins were developed to their full capacity. The quickest and least costly solution to the problem is to produce more gas in the area where existing infrastructure can deliver it to the localities where it is required. This can be done by encouraging conventional and unconventional gas exploration in the Cooper Basin and also by the NSW Government immediately lifting the moratorium on coal seam gas development. We should learn from the US where the shale revolution has provided that country with the lowest cost energy on the planet, which has done wonders for the competitiveness of its industry.

Finally the question might be asked what all this has to do with the Northern Territory. It gets its gas supplies from fields in central Australia (where hydraulic fracturing has been used) and from offshore. Like WA it has no shortage. However the Territory will benefit from the exploitation of its resources. Origin Energy's exploration in the Beetaloo Sub Basin has identified a shale gas resource. Also within the Territory there are oil rich shales which could produce oil with the techniques of horizontal drilling and hydraulic fracturing. It is important for the country as a whole that the Federal Government persuades or forces the States and the Territory to abandon the restrictive and often changing policies that currently exist on resource development and adopt a uniform and less restrictive policy for the entire country.

Submitted respectfully,
John Geary