

From: Jason trevers
To: [fracking inquiry](#)
Subject: Presentation from Jason Trevers
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Good afternoon your Honor, and the rest of the panel, my name is Jason.
I am here representing the general Alice Springs community my friends and family.

I presented here during the first round and had a good optimistic feeling that this inquiry had the right approach and the ability to meet and hear the public, and is truly independent.

After I read your inter-term report I was shocked to see how misguided the inquiry has gone. I lost many hours sleep over it.

Page 7 states Rather The work of the Inquiry is to, based on the most current and best available relevant scientific data and literature assess the environmental Social cultural and economic risks associated with Hydraulic fracturing for shale gas in the territory.

Lets Start with section 5.2.3 *Well Integrity*.

Acknowledging that there is considerable evidence to indicate that well integrity is an issue for the shale gas industry. I'm with you there.

Then you go to say "the performance of modern wells is much improved when compared to earlier wells and legacy wells."

<http://www.pnas.org/content/111/30/10955.full>

You then quote, (ref 13 - from the *Proceedings of National Academy of Sciences* - a scientific publication). The article was written by 4 renowned and highly regarded scientists. The article states that their findings of analyzing *Scientific DATA of Casing and Cement Impairment in Oil and Gas Wells* can lead to methane migration into the atmosphere and/or into underground sources of drinking water. An analysis of 75,505 compliance reports for 41,381 conventional and unconventional oil and gas wells in Pennsylvania drilled from January 1, 2000–December 31, 2012

You quoted "Their findings indicated a 6 fold higher incidence of cement and / or casing issues for shale gas wells compared to conventional wells."

Their data showed that wells drilled spudded before 2009 had similar failure rates as wells drilled after.

Unconventional wells spudded in the NE region since 2009 (2,714 wells) show a similarly high rate of occurrence (9.18% casing cement failure)

APPEA seem to have huge pressure to convince you otherwise, to give you skewed or misleading data, that is not close to reality or world wide data documented by peer reviewed scientific articles.

Well integrity failure has been a continual problem for the industry and a couple of extra layers of cement and steel in the upper most section of the well, scientifically had made no difference at all to well failure rates. The rest of the world is averaging between 5-7% at best (1.9% where there is insufficient data) well integrity issues. But some how APPEA convince the *Scientific Enquiry into Fracking* to believe their delusional statistics (0.004% 1 in 25,000 well integrity failure compared to 5% 1 in 20) that are coming from an industry that is well known to be unregulated or under regulated.

After giving you these rubbish figures APPEA say "and is most commonly attributed to slow leakage of methane around the external casing and can be re-mediated by additional cementing and pressure testing." This is also complete rubbish and by you printing it in your report is demonstrates that you have no idea of the reality of the issues or problems. Gas and other contaminates are migrating from the shale beds through water the aquifer(s) to the surface. The only place cement can be placed is on the surface of the well head. A band aid approach to make the well appear not to be failing. The well may be failing from superficial layers of shale deposits and may not fail a pressure test.

The the reality is failing well will continue to get worse loosened cement particles sand blast the path way making it bigger exposing the corroding steel. The gas will then follow the path of least resistance through the water aquifer and find another path to the surface possibly the next water bore. To the best of my knowledge a leaking well can not be fixed and eventually every well will fail.

<http://www.refine.org.uk/media/sites/researchwebsites/1refine/papers/Davies%20et%20al.,%20Well%20integrity,%202014.pdf>

Marine and Petroleum Geology - ReFINE

www.refine.org.uk

Review article Oil and gas wells and their integrity: Implications for shale and unconventional resource exploitation Richard J. Davies*, Sam Almonda, Robert S ...

Refine.Org.uk published an article titled "Oil and Gas Wells and their Integrity Implications for Shale and Unconventional Resource Exploration."

This peer reviewed article written by 9 scientists from 5 different university's or institutes, compiled from 25 reliable data sets from around the world including Australia.

The Data sets of more than 4 million on shore hydro carbon wells varied considerably from 1.9% to 75% instances of well integrity failure.

APPEA's data must have missed this extensive study. Another well documented fact is that the rate of well failures increases with age steel and cement degradation is an unsolved problem. 30 -50% of wells are failing at the end of their life. When a well is capped or plugged it will continue to leak on the outside layer where degradation continues rapidly eventually the steel and cement will decay completely leaving a large open path way from the shale to our water and our air. One could use a corrosion resistant resin polymer that would be flexible instead of cement but it might not be economically viable.

https://www.youtube.com/watch?v=Dxis-vYGM_M



Lethal gas/oil wells: Anthony Ingraffea at TEDxAlbany 2013

www.youtube.com

Various industry sources estimate that 30% or more of all gas/oil wells are leaking because of faulty cement/casing. Can this problem be predicted in future wells ...

This talk shows a lot of data proving that in Pennsylvania where the worlds toughest regulations are being used, and the most modern well construction methods are being used, Wells are leaking more not less than the older wells. Also that hundreds of peoples water wells have been polluted, and a prediction of thousands of wells likely to be polluted. This relevant scientific data contradicts your statement on Page 6 "These issues have been addressed overseas by implementing strict regulatory controls and technological improvements to reduce the risk of detrimental impacts form shale gas development."

In my last presentation I was in, I quoted Dr Anthony Ingraffea's statistics of well failure and submitted a couple of his u tube presentation links here is what I sent you. It appears that you did not see it or failed to see that it is current and relevant scientific data and highly regarded literature.

https://ecommons.cornell.edu/bitstream/handle/1813/38108/Ingraffea_CV_Full_Oct_2014.pdf?sequence=2

Ingraffea's CV

https://www.youtube.com/watch?v=Dxis-vYGM_M

<https://www.ecowatch.com/meet-anthony-ingraffea-from-industry-insider-to-implacable-fracking-op-1881680606.html>

Written interview with Anthony Ingraffea

<https://www.youtube.com/watch?v=WJ0cBZxpghg>

Refers to Australian regulations and risks

Water Requirements:

Department of Environment & Natural Resources Submission to enquiry
page 6. 2 - 2.5 mega liters per stage.

Page 30 Panel notes that since 1 - 2 ML of water is required for each stage of fracking and "at least" 20 stages of fracking are likely, based on developing industry practice, this means that "at least" 40 ML of storage will be required.

Being a business man it is my experience that it is always better to slightly overestimate a quote than greatly under estimate. Given we are working with water and the survival of life in the entire region lets use the 2.5 mega litres per stage, considering that we are looking AT LEAST 20 stages. 2.5ML x 20 stages

50 ML per frack + 1 ML drilling.

408 ML per 8 well pad.

510 ML per 10 well pad. 204 Olympic sized swimming pools of water

If we get 30% flow back we will have 153 ML 61.2 Olympic swimming pools of contaminated waste water then a daily flow of product water potentially as high as 4,500 litres per day per well. For ten wells 45,000 litres a day 315,000 litres per week and 1,350,000litres product water flowing per month.

Flow back rates can be in excess of 50% which would increase astronomical this by more than 50%. Regulations and planning need to allow for worst case scenario.

Refracking is common practice after a wells productivity has dropped off which can usually occur within the first year or two. In North Dakota I have heard of wells being fracked 20 to 30 times, and in other US areas claiming 18 refracks, but more commonly 10. Lets be conservative and say that on average the wells will be fracked 3 times in their lives,

50ML X 3 = 150 + 1 ML for drilling = 151 ML

151 ML x 1,200 wells unlikely 181, 200 ML (or 72,480 Olympic Swimming Pools)

Which could produce 54,360ML (21744 Olympic Swimming pools) of Flow back. Then product water 4,500ltrs x 1,200wells 5.4 ML per day (2.16 OS) 37ml per week 14.8(OS) 162ML (64.8OS) of product water per month.

151 ML x 50,000 wells more likely = 7,550,000 ML 7,550,000,000,000Ltrs or (3,020,000 Olympic Swimming Pools) About 1.5 times the volume of the Sydney Harbor.

Which could produce 2,265,000ML 2,265,000,000,000,ltrs (906,000 Olympic sized swimming pools, of flow back.

Then product water flow of 255ML (102 OS) per day 1,785ML (714OS)per week and 7,650ML (3,060 OS) per month.

These volumes are huge and accumulative

The industry to date has found no viable way to properly treat the water back to safe drinking levels.

Storage is problematic and short term (with no long term solutions) with high risks to land and water pollution.

As stated in the

In your report you mentioned that areas in The States has moved to banning lined pits and using storage tanks. This is Industry best practice.

Something that has been spoken about a lot, but, Why are you still looking at use of lined pits and not recommending industry best practice?

With the idea the amount of hydrolic fracturing should be minimized during the wet season. This is naive concept to assist the industry in getting a green light. What if the pits are full (60+ Olympic sized swimming pools worth for 1 pad fracked) and continue to receive daily product water, and if the wet season in the north was to deliver more than 2000mm (provision for a 1 in 100 year rain fall). In the current climate we are experiencing constant record breaking events. Injection is not permitted and treatment not possible or economically viable.

Palm Valley in their environmental impact statement where required to "A sump will be constructed of adequate size to contain any waste liquids." The sump they built was not close to being adequate so the company Magellan

Petroleum hired a local company to truck untested untreated product water to Lake Lewis where it was illegally dumped.

Millions of litres of road train carting 60 -90 thousand litres made the trip once or twice a week. In the Mereenie 30 wells have been fracked which could produce about 450ML Flow back 180 Olympic sized swimming pools. Richard Cottee mentioned that there was a "swimming pool worth of flow back at Mereenie as I looked into the Mereenie fields on Google maps it seems that the pits are unlined.

Recycling of Flow back water is environment dependent specific to the water quality and types of salts and minerals in the area there for can not be factored in at this stage as there is no guarantee it will work.

Section 7411 (within the report) states risk to surface water flows is likely to be low Arid areas of the Northern Territory. Many permanent / semi permanent are spring or ground water fed. The enquiry need to know of these facts before it can make a judgement as to whether ground water is likely to be affected. Parks and wildlife aboriginal elders pastoralists with local knowledge should be consulted. If Aboriginals and animals survived in the arid regions then there must be permanent sources of water and it is highly likely that the water supply is ground water. Dropping pressure and /or water levels will affect these water sources.

Depressurizing large scale on the aquifers will result spring fed water sources drying up. There are many spring fed water supplies that sustain fragile eco systems in arid areas.

Example of Temple Downs
Palm Valley product water.

7.4.1.2. Guide lining principles doc from DPIR Palm Valley

Token terms - "Industry Best Practice."
Tanks - not open pits.

Volumes 1 pad could use 510 MI of water (204 Olympic sized swimming pools).

Recycling could marginally reduce this amount but is geology dependent and can't be relied upon. Water reduction via recycling does not reduce chemical toxicity but increases it.

The estimates of 1000 - 1200 wells is extremely low & unlikely compared with previous forecasts & industry data. In Australia we have the ability to drill a lot more than 1200 well in 25 years. In 2013 -2014 in Queensland 1634 wells were drilled. By the middle of 2013 the east coast had 5,072 wells drilled by the end of 2015 we had 7331 wells. Not to mention that big international drilling companies have many idle rigs and crews after the 2012 fracking bust. N.T. Government web sites have shown maps predicting 28,331 wells in the Geogina Basin. All other basins were predicted to have potential for more than 10,000 wells.

The EIA estimates that the Beetaloo Sub Basin contains 194 T cf of recoverable shale gas. The Beetaloo Basin is considered by some within the industry to be one of the most promising shale plays in the country.

Page 36, (of the summary) says "almost 70% of the estimated shale gas of the N.T. is estimated to occur in the Beetaloo Sub Basin - 178,200 P.J. which is 169 T cf.

Estimates of Ultimate Reserves (EUR)

Average well EUR

Barnett 2.2 bcf

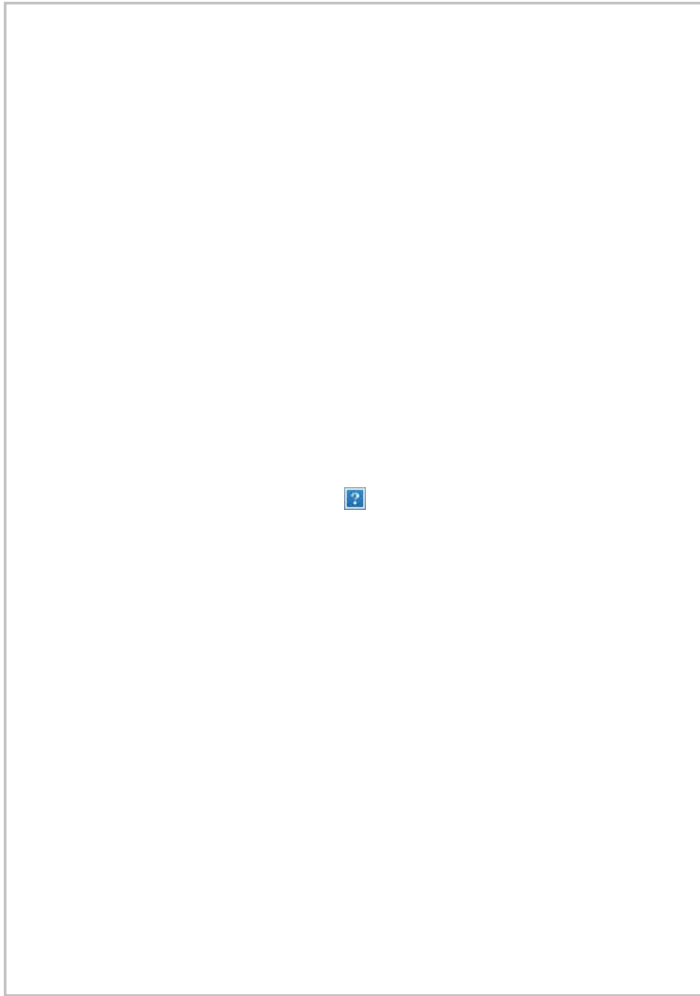
Fayetteville 3.0 bcf

Haynesville 3.5 bcf

Marcellus 3.6 bcf

Average with 60% between 6.6 and 1.8 bs cf

<http://www.gswindell.com/marcellus.htm>



Using EUR of 3.6 of Marcellus, if we divide estimates of the Beetaloo Sub Basin you would need between 53,889 - 46,916 wells to extract the potential gas. 50,000 - 1,200 2.4%

Page 10 (of the summary) Well pads are predicted at 1 every 10 to 20 klm squared. This is not in line with photos and data I have seen. However if there is 1,200 wells taking up 20 Klm squared, $1,200 \times 20 \text{ klm} = 24,000$ 0 of the 30,000 klm squared area of the basin which is 80%.

So the industry say they intend to use 80% of the surface area to extract 2.4% of the available gas over the next 25 years. Something does not add up?

1 TJ/d

The figure Origin gives in Table 6.2 (page 44) of gas production of 400 - 500 TJ/d over 20 -40 years, translates to a projected EUR of 10,4 B cf if the well operated for 30 years and EUR of 13.87 many times greater than the average of EUR 3.6 in the Marcellus.

<https://www.youtube.com/watch?v=JAEfxDjDqc4>

Examples of fracking in Marcellus effects on communities health environment.

<http://www.latimes.com/science/sciencenow/la-sci-sn-methane-emissions-natural-gas-fracking-20140414-story.html>

EPA methane emission estimates too low

<https://www.youtube.com/watch?v=T3lb5O-igds>

Scientists latest views on methane emissions from Shale fields

<https://jacksonlab.stanford.edu/sites/default/files/ep2013.pdf>

Methane leaks from pipe lines in Boston

If Methane leaks at 3.3% it is more harmful than coal as a green house gas. Most of the leaking is unable to be accurately measured everything leaks from the wells to the pipelines to the processing stations LNG plants to the pipes in our homes. 2% total methane emission loss is likely to be a grate under estimate. The fact that well degradation creates greater well failure rates up to 30 - 50 % at 30 - 50 years the amount a well leaks also increases with age. As with many factors in Fracking the problems keep compounding. A leaking decommissioned well that has failure of the outer layer of cement (the

most common failure) will leak for eternity. As the case in Boston shows aged infrastructure leaks more than new infrastructure. It was stated that best practice has reduced methane emissions but again that is not being applied in Australia as a metal pipeline has been approved and is being built now and is being referred to as a legacy infrastructure.

Conclusion Fracking is not safe it is an insane process that is driven by corporate greed. The long term risks far outweigh any short term gain for a minority. Fracking has polluted drinking water sources and air and soil and continues to do so and will continue into the future if allowed to continue. No shale gas field has been in operation long enough to see the full environmental, social, economic impacts when a play has come to its completion. Norway taxes the gas and oil industry at 78% Saudi Arabia gets 85% return on their investments our Governments are supporting and sponsoring the industry and selling our future resources at a time when there is over supply and demand is reducing. The industry has many problems and issues the wells leak and contaminate water and air. Soil contaminates from drilling huge volume of water consumption and waste. No ability to responsibly deal with or treat the waste. Once a well is drilled it needs to hold integrity for ever but the wells degrade steel rusts and cement turns to powder in a moist salty corrosive environment. Within decades wells lose their integrity and continue to degrade further.