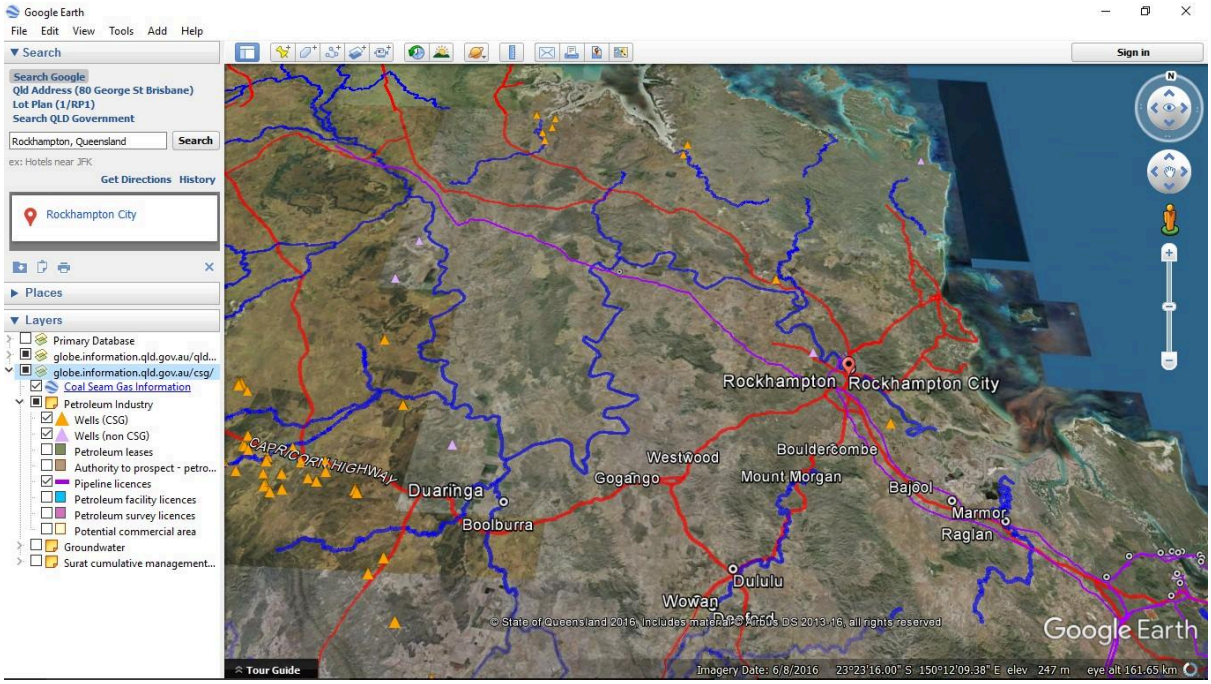
Amended Submission: Northern Territory Fracking Inquiry

7.1 WATER SUPPLY AND DISTRIBUTION

In the Background and Issues paper, water use estimates were 20 to 30 Megalitres per well (pg 8). If these estimates are correct, with an estimated 60,000 wells planned for the Northern Territory as commercially viable, that is a massive amount of fresh water needed for well stimulation. It is anticipated that the bulk of the water that the companies will be using is groundwater.

Placement of wells per global maps, are near rivers and creeks. Notice how close the wells and infrastructure are to rivers and creeks per this map of gas infrastructure near Rockhampton, Queensland



NT Pastoralists have said we have already over-allocated our groundwater use with the approval of Sandalwood Plantations in the Northern Territory so how are we going to spare thousands of megalitres of water for use in Shale gas fracking? If you have ever used a domestic bore, you will know that a person down the hill from you or with a bore that is deeper than yours will cause depressurisation in your bore. During the dry season bores are needed for stock watering and household use. Is it possible to turn up to a well pad and ask them to turn off their water so that you can fill your stock troughs? Use of bores can be worked out between neighbors undertaking similar activities but what happens when pastoralists and gas companies are drawing from the same aquifer?

WATER QUALITY

Also, although there is less flowback than for coal seam gas, there is still a considerable amount of frack waste water that needs to be treated and disposed of safely. There is some contention as to whether this is even possible. I witnessed very few safeguards for workers and the public or the environment in actual practice in Queensland and NSW. I was even sprayed with produced water by

a water truck driver who was annoyed that I was protesting the Santos development in the Pilliga. The evaporation ponds are a death trap for wildlife and the uncontrolled and unmonitored emissions from them as the evaporation process takes place are toxic. My evidence for this toxicity is empirical from witnessing the large number of dead animals in and around these "ponds" and reported health problems of residents that live near them. It is commonsense that if you put a toxic stew into lined dams about a km square that the evaporative process will cause emissions of toxic elements. I put in a huge request to this Inquiry Panel that all existing "holding ponds" in Australia be tested for the emissions that are coming off them so we at least know what compounds are causing these problems.

Evaporation Pond in Surat Basin Queensland – 13 December 2016

https://www.facebook.com/john.jenkyn/videos/1864118063821457/

Depleted uranium "pellets" are used to increase the weight of the material propelled through the casing into the shale by a shaped charge are used to do the fracks, and in the shale formations, as well as methane, radioactive elements and other toxic gases such as Formaldehyde, Nitrous Oxides and Sulphur Dioxide are also released when fracking occurs. For a more complete account of the toxic gases released refer to National Pollutants Inventory http://www.npi.gov.au/ for gas companies declared emissions from gas industry infrastructure.

Water is needed for sustainable industries such as agriculture and tourism, water is needed for the population that lives here. Water for the town of Alice Springs. Is it really acceptable to risk sacrificing whole towns for the profit of a few? (Apparently so, as it has happened in Queensland. Chinchilla was in an exclusion zone but because of the gas companies' use and dumping into the weir, you can no longer drink the town water.)

Is it really possible to regulate these industries into not needing the massive volumes of water they need to conduct their business, to not contaminate land and water with the waste that is part of their business and to regulate geology so that the fracks can be controlled? Are the biocides used by the fracking industry really so toxic that one molecule can kill?
http://www.ravenseyemedia.com/eah/403.asp

DISPOSAL OF FRACK WASTE

The USA has had enormous problems with radioactive waste from shale gas fracking – much dumped illegally into town sewage treatment and into local waterways.
http://www.smithsonianmag.com/science-nature/radioactive-wastewater-from-fracking-is-found-in-a-pennsylvania-stream-351641/ https://thinkprogress.org/ny-times-on-natural-gas-fracking-the-dangers-to-the-environment-and-health-are-greater-than-fd5f59b0c090 The latest plan by the Trump Administration is to approve the dumping of frack waste into the Mexican Gulf.
http://anonhq.com/unlimited-dumping-of-fracking-wastewater-into-gulf-of-mexico-okay-says-epa/
Evaporation ponds in Australia have caused problems with a concentration of vapors affecting residents in the area. These ponds also decimate local wildlife. Changing the name to "holding ponds" and changing the regulatory requirements has had absolutely no effect on the toxicity and dangers of these ponds and has not stopped any of the plastic liners from perishing and leaking. It

has only stopped the gas companies receiving fines or being required to take responsibility. So what exactly is the plan for this highly toxic waste? The AGL “beneficial use” of treated water on salt tolerant Lucerne cropping where diluted treated water was tested was abandoned as a failure due to salt and toxic chemical buildup in the soil. Results for “beneficial use” trials in Queensland on cotton haven’t fared much better. Nugrow has used some of the waste in fertilizer production due to high nitrogen content, however this has also failed due to the inability to remove other toxic elements. If reverse osmosis is used as it has been in Queensland , there is still the problem of millions of tonnes of toxic, radioactive salts. What is the plan to dispose of these? What is the financial commitment of the gas companies towards this end? Santos plan for its Pilliga gasfield in NSW is to bury the salt waste – a dangerous practice as it has the potential to seep into water sources and contaminate the Great Artesian Basin further. Also as soon as tree roots hit this waste layer they will die, along with associated eco-systems. This has been shown quite clearly from the “dead zones” in the Pilliga caused by spills that occurred 15 years ago. These areas are still unable to be cleaned up and rehabilitated despite efforts by Santos and are in fact growing in size each year as the toxic salts permeate through the landscape as they are diluted by rain and tonnes of water poured on the area by Santos in an attempt to fix the problem.

Photo (David Paull) 2017 of a produced water spill 2011 in Pilliga : Bimblewindi - Does this look rehabilitated to you?

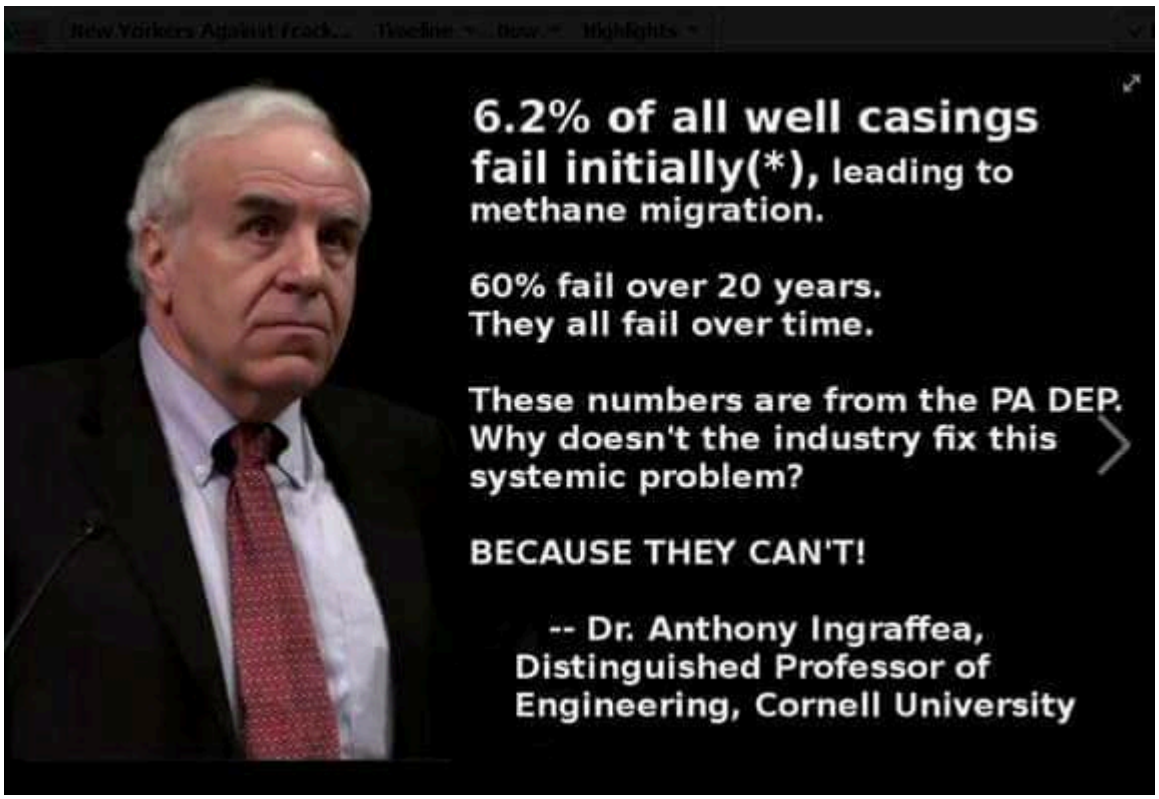
https://www.facebook.com/photo.php?fbid=10212715978192411&set=gm.1456499621081379&type=3

Photo (David Paull) 2017 Bimblewindi Spill Site caused when walls of Santos holding pond collapsed

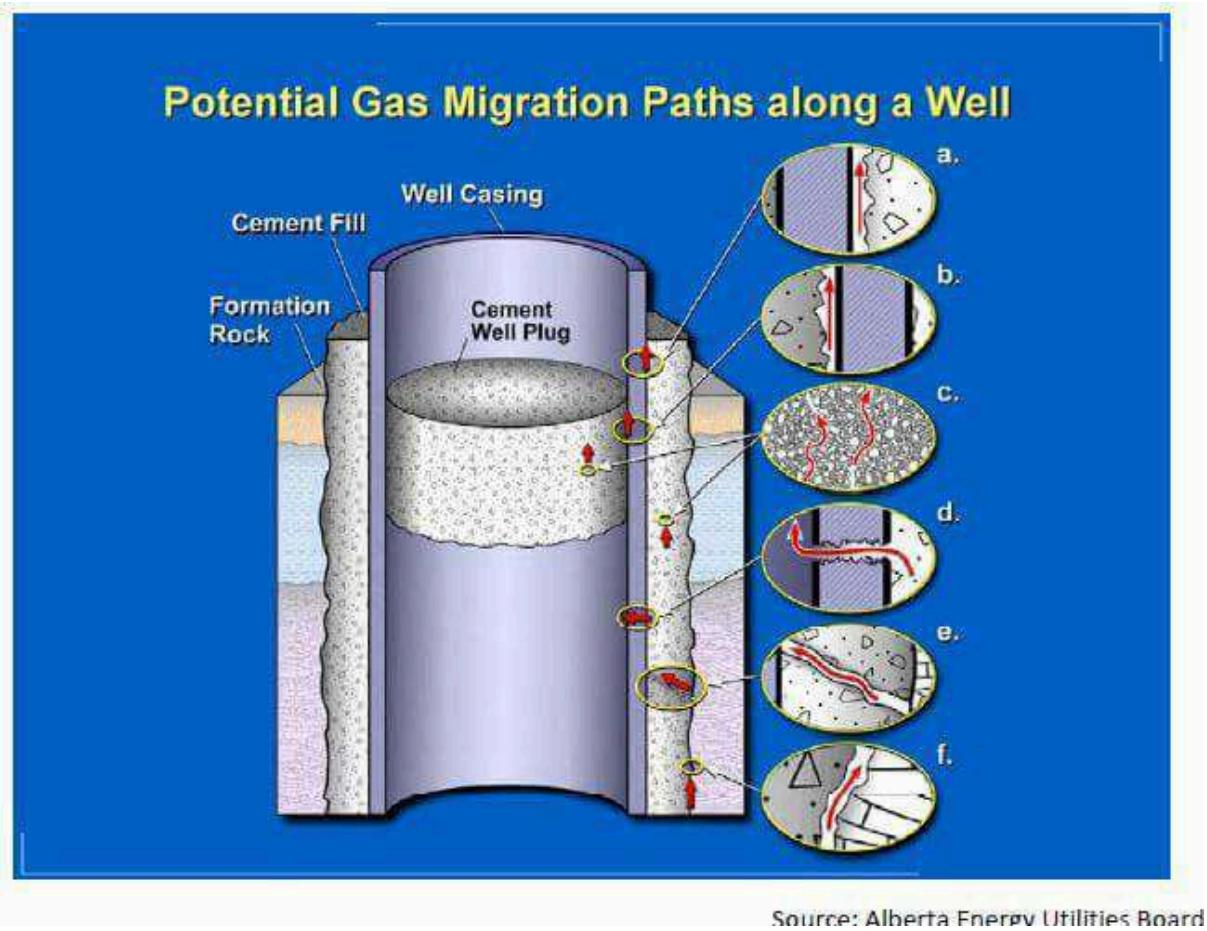
Photo (David Paull) 2017 Bohena Spill Site occurred 2000. Santos says they have spent $17 million on rehabilitation of this area. However it is still a “dead zone” in the Pilliga Forest

GEOLOGY

The world's leading expert into rock mechanics Dr Anthony Ingraffea, professor at Cornell University has worked for the oil and gas industry for some 30 years.



No matter how many cement casings used in an effort to protect the aquifer, it is the final cement layer against the rock that can never provide a guaranteed seal. Industry's own figures show that 6%-8% of wells fail immediately upon completion. There is movement when the fracks are done. Then there is the natural geological movement and rust which mean that by 30 years most wells fail. These are frightening figures as we need our aquifers protected indefinitely not just for the next 30 years. And when the gas is gone and the companies are sold on, who is responsible for the decommissioning of these wells? Who is responsible for ensuring integrity for millennia?



Source: Alberta Energy Utilities Board

The fracking process is very much dependent on geology, and real rock formations do not follow the neat patty cake layers shown in the fracking diagrams, but look like more of a crossword puzzle to quote a geologist that spoke at the Glen Lazarus led fracking enquiry in 2016. There is no guarantee of where and how a frack will end up. According to Anthony Ingraffea this has been a problem and an area of research in the industry for decades. In the limestone formations of the Daly and Roper river regions there are fissures and sinkholes all over the place that go through to the surface. It is geologically impossible to control a frack in these areas so why are there licenses over these regions? The risk of water contamination is almost a certainty. So how much risk is acceptable risk? It is certainly not something that can be legislated away with regulations as it is a risk associated with the land and frack process itself.

ECONOMICS

What is an unconventional gas industry worth to us? Under review is the Petroleum Rent Resources Tax in Australia as gas companies are offered very generous tax credits and uplift for capital expenditure. Tax credits for gas companies in Australia amounted to $238 billion for the 2015/1016 financial year meaning that they are unlikely to pay PRRT on their profits anytime soon if ever for the gas they export and intend to export. http://www.smh.com.au/federal-politics/political-news/tax-sink-hole-gas-multinationals-claim-50-billion-more-in-relief-credits-in-a-year-20170213-gubmfv.html

World renowned Economist Deborah Rogers has analysed data in the United States for states that have shale gas fracking and shows that these states are worse off since the shale gas industry started up in indicators such as state revenues, employment and health of residents. She describes the Shale gas industry as a Ponzi Scheme. http://www.nytimes.com/2011/06/26/us/26gas.html https://www.youtube.com/watch?v=JYaC7L2svoQ

A similar study was conducted in Queensland by economist Mark Ogge with the Discussion Paper: Be careful of what you wish for The economic impacts of Queensland's unconventional gas experiment and the implications for Northern Territory Policy makers https://www.google.com.au/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&ved=0ahUKEwjIzJy7rpTTAhXGqJQKHT6WC8QQFggfMAA&url=http%3A%2F%2Fwww.aph.gov.au%2FDocumentStore.ashx%3Fid%3Dae959a04-21c7-44b9-bbf5-3d79411cdf94&usg=AFQjCNEjmsAtciwxmbt5KTJbZYRDMH9cxQ&sig2=xFhuwp6uffS9DRiOlQ_PPg showing that post-construction phase, Queenslanders are actually worse off than they were before the gas boom with displacement of other industries and destruction of land playing a large part in this.

Economist Ross Gittens describes the gas shortage as a con http://www.smh.com.au/comment/industrys-coal-seam-gas-campaign-is-a-con-20131008-2v63m.html and

Economist Bruce Robertson did a study of the Northern Pipeline which shows that due to the world gas glut and current and projected prices, that the Northern Territory will be worse off as we will be forced to pay China to take our gas. http://ieefa.org/wp-content/uploads/2016/05/Pipe-Dream-A-Financial-Analysis-of-the-NEGI-MAY-2016.pdf

The Northern Territory has currently invested $23.8 million (Per NT Oil and Gas Development Strategy) of our tax dollars and counting (Both Adam Giles and Michael Gunner have made announcements on Darwin TV of more funding for the onshore gas industry since this report was signed off, however I have found it difficult to source exact amounts) into developing an onshore gas industry in the Northern Territory. I would like to know exactly how much of our tax dollars have gone to supporting an onshore gas industry in the Northern Territory up to the present time and what is the estimated return on that investment?

Our entire Economic Development Plan revolves around the development and support of an onshore unconventional gas industry. This puts all our eggs into one basket – when long standing basic investment advice is to diversify your investment portfolio to reduce your exposure to risk. What if the 685 plus peer reviewed studies outlining unacceptable water, health, air quality and financial risks of unconventional gas development are correct and the glossy media releases from APPEA and others who have heavily invested in the unconventional gas industry are wrong? Should the Northern Territory still go ahead because taxpayers have already put in $23.8 million? Or should we pull out of this industry before we lose a billion dollars? Can the risks of global market forces be mitigated by local regulation?

I fail to see how our energy security would be adversely affected if we don't push ahead with developing our unconventional gas reserves in the immediate future. PAWA is already paying for gas it is not using from current NT gas extraction. (Bruce Robertson – Pipe Dreams report) This tells

me that we have enough gas should local manufacturing industries or local demand increases. If the gas is for Territorians then why build pipelines to export markets? Why build a massive processing plant so that gas can be exported? Australia has no domestic reservation policy. Our export contracts for gas are 20 times the amount the whole of Australia uses domestically. Tax incentives are better for companies that export. Because of these factors, wouldn't the gas just get sucked up and sent overseas? How does that help NT energy security? Without a gas reservation policy in place wouldn't the price of gas for local use be subject to upward pressure as locals compete with overseas buyers for available gas?

As for risks to property values, banks such as Commonwealth have already completed this risk assessment when they refused to lend against a property that had four coal seam gas wells on it citing this as the reason for their refusal to the applicants. Landholders are also unable to insure their property against possible damage from gas infrastructure on their property. This effectively makes properties worthless if you cannot borrow to buy a property or insure it. https://www.theguardian.com/environment/2016/sep/30/commonwealth-bank-coal-seam-gas-makes-property-unacceptable-as-loan-security http://www.farmonline.com.au/story/3365648/csg-too-risky-for-insurers/

https://scontent-sit4-1.xx.fbcdn.net/v/t1.0-9/15420794_10211448651510036_4168005942283840091_n.jpg?oh=21fe5b2d301d20f907587f74fc2acc15&oe=5995807F

My main worry with this enquiry is that it is purely a tick a box exercise so that residents can vent some of their frustration and feel like they are having a say. The already signed off Northern Territory Economic Development Plan, and Developing the North have as the only plan for the Northern Territory, the development of an onshore gas industry, all eggs in one basket with all development revolving around a gas boom and some rubbery economics. Plenty of us in the community have quite a few ideas as to how we can develop the Northern Territory economically. My plans would involve a lot of smaller businesses all paying tax, all owned by people that live here, Employing locals. Low or no interest startups. Infrastructure that supports our fastest growing industry – tourism. Improvements in education and training. Spread our tax base and employment across a number of businesses and industries.

I don't think the onshore gas industry can be regulated into safety. From my experience in NSW and QLD compliance issues have always been bought to the fore by residents not by regulators and the fines these companies get are laughable – Santos got fined $1500 for permanently contaminating an aquifer. http://www.northerndailyleader.com.au/story/2137939/santos-fined-1500-uranium-at-20-times-safe-levels-found-in-aquifer-at-the-pilliga/

It is way cheaper for these companies to break the regulations than obey them. In the United States, when regulations have impeded the Shale gas industry, they have simply removed them altogether.

Amended Submission now includes, formal presentation made

10 March 2016 NT Fracking Inquiry Formal Hearing

(A summary of my questions and concerns raised within this presentation are included as an attachment at the end)

The terms of reference of this Inquiry refer to assessing scientific evidence.

When researching scientific evidence, I notice that there is a plethora of scientific evidence with regard to onshore gas resources in the Northern Territory. How much gas there is, where it is found, the mapping of the quality and quantity of our gas resources in different areas, processes of extraction. well placement, and volumes of water needed to frack the wells.

Unfortunately, I have been unable to reference the same quality and quantity of scientific evidence with regard to water resources both surface and groundwater in the Northern Territory. This is despite the fact that both the Petroleum Act and the Petroleum (Environment) Regulations make a large number of references to water resources.

For example, How much of our water resources are potable resources? Where is the full mapping of our surface and groundwater resources? What is the quality of our different resources in different areas? Given the shale gas fracking uses large quantities of water – How much water do we have available for this process in the areas they wish to frack? What would be the impact of this drawdown on other users and the environment in the same areas? How likely is there to be contamination issues as there has been multiple reports of with this industry around the world including USAhttp://www.ecowatch.com/pennsylvania-fracking-water-contamination-much-higher-than-reported-1882166816.html**,** http://www.ecowatch.com/duke-study-rivers-contaminated-with-radium-and-lead-from-thousands-of--1891128813.html **Queensland**http://www.smh.com.au/environment/toxins-found-at-third-site-as-fracking-fears-build-20101118-17zfv.html **and NSW** http://www.smh.com.au/environment/santos-coal-seam-gas-project-contaminates-aquifer-20140307-34csb.htm**– given that the same extraction processes are used. Given that there are issues with the disposal of frack waste in all of these areas. What is the current health of our water resources?**

In particular my presentation concentrates on baseline testing with the current knowledge gaps, additional work and a suggested program or how that work or research should be prioritised and implemented.

I expand on Baseline Testing of Water, Fugitive emissions, geological mapping, and Social Baselines and Health.

Included in my discussion are personal observations from my own experience visiting the Darling Downs and the South Burnett districts in Queensland on numerous occasions prior to there being a gas industry, during the construction phase and post construction/production phase of this industry in these areas. I have a relative with a 5000 acre property at Durong in the South Burnett

about an hour drive north of Chinchilla. I have also been involved in actions in the Pilliga with regard to Santos' Narrabri Project as I have a close friend who is a farmer in the area. Her property is in the Coonamble district and is bordered on 2 sides by the Pilliga Forest. Her farm is highly likely to be directly impacted if Santos Narrabri Project goes ahead.

To begin with, I question how it is possible to assess scientific evidence as regards the nature and extent of environmental impacts and risks per Terms of Reference point 1 if baseline scientific data per Terms of Reference Point 2 a), b) c)and d) is not collected and analysed? In the Northern Territory the Onshore gas activities are subject to the Petroleum (Environment) Regulations 2016 (NT) with the Department of Primary Industry and Resources being the regulatory body responsible for the implementation of these regulations

(Please Note: Regulatons per Water Resources was copied first from the NTG Department of Primary Industries and Resources (DPIR) website then updated 15 April 2017 from the NTG Minerals Council website after moved from DPIR. I then looked up Auslii 24 April 2017 to find the regulation numbers for these statements but in the Auslii Regulations there is no reference to water at all except one brief mention that water sampling is an unregulated activity – excerpt below was accurate as at 10 March 2017 copied from the DPIR website)

Petroleum (Environment) Regulations 2016 NT direct copy from DPIR website 10 March 2017 -

> **"Water Resources**
>
> **If you are making a petroleum activity application you must show how you will protect water resources in your application for approval.**
>
> **Your petroleum activity application is also assessed on how your activity would impact on other water users and environmental sustainability.**
>
> **This includes:**
>
> **baseline water quality assessments**
>
> **sustainable water use and allocation planning**
>
> **protecting aquifers through well integrity standards**
>
> **decommissioning standards**
>
> **management of wastewater.**
>
> **This is a rigorous assessment done by the Department of Primary Industry and Resources in consultation with Department of Environment and Natural Resources and the NTEPA.**
>
> **If your activity has the potential to cause harm to water resources, you are required to submit water quality data and water monitoring plans and reports for assessment by the Department of Primary Industry and Resources."**

In order for Baseline Testing to be to be valid in an Australian Court of law, the baseline testing must be traceable to an accredited testing Authority. In the Northern Territory the only accredited Testing Authorities are the Department of Primary Industry and Resources Laboratory (DPIRL) and Intertek's Northern Territory Environmental Laboratory (NTEL). NTEL is the only laboratory listed which tests for heavy metals and chemicals commonly found where fracking occurs. They are the main service provider for the mining industry in the NT.

From Source Watch Report:

"In April 2011, Democratic members of the House Committeee on Energy and Commerce released a report detailing the range of chemicals used in fracking. According to the report, the most widely used chemical in fracking fluids, methanol is a hazardous air pollutant and is on the candidate list for potential regulation under the Safe Drinking Water Act. Isopropyl alcohol, 2-butoxyethanol and ethylene glycol were the other most widely used chemicals. The study noted that in some cases benzene (a known carcinogen), toluene, xylene and ethylbenzene are used (BTEX is banned in Australia but occurs naturally in coal seams /produced water as a petroleum product) Many of the hydraulic fracturing fluids contain chemical components theat are listed as "proprietary" or "trade secret"

Of the 300-odd compounds that private researchers and the Bureau of Land Management suspect are being used in fracking, 65 are listed as hazardous by the federal government. The New York State Department of Environmental Conservation was tasked with going through a public review of its new rules on hydraulic fracturing, and looked into reports that "gas companies use at least 260 types of chemicals, many of them toxic, like benzene." The chemicals tend to remain in the ground once the fracturing has been completed, raising fears about long-term contamination."

http://www.sourcewatch.org/index.php/Fracking_and_water_pollution#cite_note-21

Frac Focus Chemical Disclosure Registry https://fracfocus.org/chemical-use/what-chemicals-are-used

The Actual House Committee on Energy and Commerce Report detailing the range of chemicals used in fracking fluids is listed in my browser as "Forbidden"

According to the Regulations, Gas companies operating in the NT are to provide a full list of chemicals they use in fracking fluids, which is then Published on the DPIR website. According to the Website, the link is "still to be applied" at the time of my presentation 10 March 2017

(Note this was correct at the time of the presentation 10 March 2017 but has now disappeared altogether off the DPIR Website checked 24 April 2017**),**

At the present time No companies with fracking licenses in the NT have provided a public list of the chemicals they are using in their frack fluids. This causes me concern as these chemicals may only make up half percent of frack fluids but their addition causes 100% of the water used for fracking to be contaminated. I am particularly concerned about the toxicity of the biocides used. http://www.ravenseyemedia.com/eah/403.asp

Radium and other radioactive components have tested 100 to 1000 times safe drinking water levels in shale gas fracking waste. In Queensland where radon gas is released into the atmosphere

where fracking occurshttps://link.springer.com/article/10.1007/s11270-014-2216-2 **(SCU study Dr Isaac Santos)** https://www.echo.net.au/2014/11/scu-researchers-trace-methane-emissions-csg-mines/ **radioactive Lead 210 is in drinking rainwater tanks of residents in Tara Qld. Article shows levels of lead found in rainwater tanks:** http://informed-integrity.org/index.php/csg-mysterious-serious-lead-contamination/

Residents along with pets and livestock are no longer able to drink the water in Tara Qld. The onus has been entirely on the landholder or concerned citizen to prove impacts. Baseline studies have not been done with regard to the Unconventional gas industry either in Australia or the United States.

Just as well we have regulations requiring baseline testing in the Northern Territory Right? Wrong, The Regulations also state "Plans approved prior to the commencement of the regulations will be DEEMED **to be approved plans until the 1st December 2017". That would be all areas currently under license in the Northern Territory. The regulations came into effect July 2016 and as far as I know there have been no applications for new exploration licenses registered since that time.**

Petroleum activities are also exempt from the application of the Water Act 1992 (NT) and the Federal Water Trigger http://www.environment.gov.au/epbc/publications/factsheet4-oss-epbc-act-amendments-water-trigger **does not apply. This alarms me given the volumes of water these companies need to operate their business. What exactly is the scientific evidence available to determine impacts and risks to water in the Territory if under current legislation gas companies operating under license across huge expanses of the Northern Territory are not required to provide it? I also have concerns because with the current Regulations, Onshore gas companies have no requirements to study the cumulative impacts of their operations over time. Under Australian Law the onus in on the landholder or resident to prove impacts from the gas industry. This has not been possible so far because baseline testing has not been done.**

My advice therefore on additional work or research required per Item 2 is that Baseline Data per item 2 is collected prior to the completion of this inquiry so that levels of risk acceptable for the NT per item 3 and per item 1 can be determined. To assess the scientific evidence in the NT it is self-evident that we need scientific evidence in the NT to make that assessment.

We need relevant scientific data collected in the NT such as baseline testing outlined in the Regulations. Currently, I can find no baseline data provided by gas operators or government for the Northern Territory and suggest that if such data exists that it be made public and published on the DPIR website as per regulations for frack fluids or the NTG website. I can find plenty of data from gas companies and government on how big our gas reservoir s are in the NT as well as how profitable it is likely to make us so commercial confidentiality is obviously not a problem but nothing publicly published by the NTG or Gas companies concerning any environmental or risk assessment studies in their tenements. As per Item 2 baseline data is needed to determine impacts and cumulative impacts. Until we have that information how can the environmental and other risks associated with fracking in the Northern Territory be determined? How can a level of risk be determined if current baselines are unknown as without baseline there is no way of determining deviations from what is normal for a particular area. I know that large pastoralists

such as CDC operating in the Northern Territory have done some studies on water across their holdings. Would it be possible for them to release this information also?

From looking at the other presentations to the NT Fracking Inquiry, I noticed that Pangea claims they have done baseline testing on two bores within their license area. Would either of those bores been drinking water bores used by residents? If not why not as these are the bores that are of most interest to residents? How often was the testing conducted and over what period of time to prove a baseline? Why hasn't the baseline testing results been release to those living within their tenements? Was any historical data used?

A strong argument for the implementation of baseline data collection as mandatory for companies which currently hold exploration and production licenses in the Northern Territory before they frack, is the lived, impacted experience of landholders in Queensland and NSW. Even for areas where wells have been fracked, it would be wise to collect baseline data to see whether impacts get worse over time. Impacted landholders are trying to prove these companies responsible for the impacts they have been experiencing since the development of a gas industry in their area. This is relevant to this Inquiry as many of the same companies such as Santos and Origin Energy now want to frack the Territory. If their work practices have been unacceptable to residents living in fracking areas in other states, I have a great deal of concern that they will conduct their business practices in the same way in the NT.

I find it of great concern that every member of the public I have spoken to in the NT has no idea of what Baseline Testing actually is including those with Petroleum Licences over their land. I have had to explain to them individually the basics of collecting data samples of an area over a period of time and that each of those data tests form a point which when joined together over time forms a baseline of the test results for that area. There is a total lack of education and information about baseline testing in the NT and elsewhere which has just made it easier for the gas companies to dodge their baseline testing obligations. Given that the onus of proof is on landholders to prove impact from gas companies, there needs to be education of residents in license areas about baseline testing and how it is used in cases of proving harm. This is a knowledge gap that needs to be addressed for those living in environments where shale gas companies intend to operate. Potential harms from this industry are not just restricted to fracking shale gas wells but from every aspect of their operations introduced to the landscape and towns.

Companies such as QGC, Arrow, BG Santos and Origin have had a huge number of complaints and allegations made against them including: bullying of landholders, intimidation of locals by gas workers, excessive rubbish thrown on road verges by gas workers, dangerous driving by gas workers frightening and endangering locals including local school bus driver with school kids on board, ripping down of boundary fences without permission, weed contamination, illegal dumping of frack water onto roads and into creeks, contamination of ground and surface water and rainwater tanks, contamination of the town water supplies for Tara and Chinchilla, noise pollution particularly from compressor stations and vents Please watch following from Sandra Bamberry regarding noisehttps://www.facebook.com/sandi.bams.3/videos/897471710394501/ **, light pollution, health impacts from flaring and venting, health impacts from the vapours emitted from evaporation ponds, excessive numbers of dead wildlife around ponds and Kenya Processing plant particularly birds, air pollution causing sickness and death of stock, Fugitive emissions**

causing sickness from industry infrastructure such as wells, vents, pipelines and compressor stations, contamination of soil.

In this video landowner Wayne Walker shows impacts from the unconventional gas industry on his farm. He invites people to come to his property and see for themselves.
https://www.facebook.com/100015336371626/videos/166438060544072/

Without accredited baseline testing, the residents have been unable to prove their case against the gas companies regarding most of these complaints and allegations. Under current laws the onus is on the landowner to prove the gas companies are at fault for the problems they have been experiencing since these companies started operating in their area.

Testimony From Kylie – Impacted Tara Resident
https://www.facebook.com/People4thePeople/videos/822123904618006/

A vivid example of this is that stretches of the Condamine River can be set alight. The problems in the Condamine River were first bought to the attention of the public when a farmer with land adjacent to the river rang ABC radio in distress describing the river as "bubbling like a spa". He also went on to say that he had never seen anything like it in his lifetime and that as far as he knew it wasn't something that had ever occurred before. The bubbling in the river started after QGC fracked wells in the area. However due to lack of baseline studies, QGC used the "it was like that when we got here" defence calling the excessive methane in the river a "natural occurrence" or "natural fugitive emissions". It has then become an extremely expensive and protracted legal and environmental exercise for the landholder and a reluctant government department (DERM) to prove QGC (Now BG) responsible. Five years later, no compensation has been forthcoming, no remediation has been attempted and QGC has not been required to shut down its gas operations in that area. Professor Damian Barrett, the CSIRO's lead researcher into unconventional gas, has been monitoring the Condamine gas seeps. He has confirmed the bubbling has intensified over time. The Queensland Government told the ABC in 2016 that it "doesn't have sufficient information to identify the cause of the leaks". The Condamine is an essential water source for dryland farmers in Queensland and flows directly in to our main river system the Murray Darling Basin. It is an environmental disaster of epic proportions and nothing is being done.
http://www.abc.net.au/news/2016-02-14/condamine-river-mysterious-bubbling-intensifying-landholders-say/7139676 http://www.abc.net.au/news/2016-04-23/condamine-river-bubbling-methane-gas-set-alight-greens-mp/7352578

Even worse is the contamination of hundreds of acres of agricultural land in the Hopeland District due to the failure of an Underground Coal Gasification experiment conducted by Linc Energy which has since gone into receivership. The land has become completely unusable for its former agricultural purposes. http://www.abc.net.au/news/2017-02-09/flammable-levels-hydrogen-found-near-queensland-gas-plant/8256808

From articlehttp://www.queenslandcountrylife.com.au/story/3434983/bender-family-statement/ **In 2011, George (Bender) raised concerns about the impacts of UCG (Underground Coal Gasification) arising from the operations of Linc Energy in the Hopeland area. The response from Peter Bond, CEO and Managing Director of Linc Energy, was to deny all such claims and a direct threat to have George Bender declared "a vexatious complainant and/or commence legal action for damages for**

injurious falsehood" It is notable that the property on which George was raised and lived until his untimely death is now within and exclusion zone imposed by the Department of Environment and Heritage Protection as a result of investigations into Linc activities.

Meanwhile Peter Bond, CEO of Linc Energy is living in his mansion on the Gold Coast bragging that he is still financially well off and looking to start other enterprises. For the harm he has caused hundreds of people and the permanent destruction of what was once prime agricultural land and key food bowl for Australia – he faces a maximum of 5 years jail. His victims are either dead or set to suffer for the rest of their lives. The contamination zone stretches for hundreds of kilometres (300km radius) and is spreading which locals are attributing to continued coal seam gas operations in the area.

There appears to be a pattern in the onshore unconventional gas industry of landholders making complaints and gas companies denying responsibility until it is too late.

As another example: In Queensland as the Unconventional gas industry rolled out, landholders were advised that Baseline testing was unnecessary because baseline testing couldn't stop the effects of contamination if it occurred and that it was "too expensive". What they were not told was that without baseline testing, it was almost impossible to prove corporate liability, difficult to get operations suspected to be causing problems shut down, difficult to isolate contamination to one source and that if impacts did occur, it was prohibitively expensive for landholders to fight for compensation. The Precautionary Principle has not been applied.

For residents of Tara Estates experiencing health problems which they attribute to a gasfield being built across residential estates where they lived, they are also having problems proving that the gas companies are at fault for the health problems they are experiencing. Dr Geralyn McCarron did a study of these residents published as a paper called Symptomatology of a Gas Field file:///C:/Users/Public.TH-D2DL-PARTPC0/Downloads/Sub_12_attach2.pdf **The residents symptoms were consistent with reported effects of the toxins declared by the gas companies as emissions to the National Pollutants Inventory. There appears to be a strong causal link between gas company operations and the health problems, however without baseline testing of health, or baseline air testing the gas companies have again been able to use the "it was like that when we got here" defence and thus avoid their responsibility toward people that have been impacted. The health problems have been severe and frightening: such as bleeding from the nose and ears, fits neurological problems, migraines, blackouts and severe rashes akin to chemical burns. Some of the most vocal like Debbi Orr have had their blocks purchased by the Gas companies and were forced to sign confidentiality agreements in order to move their kids to safety. Others have simply given up and walked away. Some like John Jenkyn are trapped where they are and can only gather video and written evidence of their own suffering and the environmental devastation happening around them. In Queensland and Federal Parliaments these people have been referred to as "Collateral Damage". They have simply been abandoned to their own devices, left to die. They live in a sacrifice zone for an industry that they didn't ask for and which they don't benefit from. I wrote an article about this in 2013:** http://nofibs.com.au/data-problem-katherine-marchment-reports/#.WMNE2DV6o_g.facebook **Please note the tables showing the correlation between residents symptoms and known health effects of reported emissions. Also please watch**

this short video by David Monk on the issue of air pollution where he lives at Kogan Qld in the Surat Basin. https://www.facebook.com/100015336371626/videos/179774325877112/

Which leads me to another question - What benefits from a shale gas industry in the NT accrue to those who bear the most risk of suffering impacts from shale gas fracking? Are any of those that gain the most financial benefit from a shale gas industry in the NT subject to these risks? What risks? Do they live here and are they going to spend their money in the Northern Territory? Should external investors in onshore gas in the Northern Territory have more of a say about what we are to do with our gas reserves than Territorians themselves?

Baseline health testing for health can be done through Medicare. Hair tests are done for analysis of heavy metal exposure, blood tests are done to detect the presence of other common chemicals used in or emitted by fracking and urine tests are done to determine exposure to BTEX However, when I was in Queensland, I was a live in carer for a woman who had worked in the Petro industry and was now experiencing health problems. One of her doctors was denied the right to bulk bill his patients for hair testing for heavy metals and blood and urine testing for other indicators of petrochemical exposure. The reason given by Queensland Health was that he was "ordering too many tests". Thus gas workers and residents of gas fields no longer able to work because of their health are often unable to pay the full price for the tests they need to attempt to obtain diagnosis and workers comp. Given the nature of petrochemical illnesses, often they feel too sick to want to stress themselves with legal action, they just want their health to improve.

Another knowledge gap per Item one how the gas companies use of water will impact those living within these licence areas as well as the environment within those areas. Has testing and recording made of the average pressures found in water bores in their license area over a few previous yearly cycles as one of the baselines for impacts on groundwater? Loss of pressure, bores drying up and bores becoming gassy have been the experiences of landholders in Queensland since the gas industry. According to regulations, the gas companies need to provide DPIR with sustainable water use and allocation planning. I think that a copy of this plan needs to be provided also to residents within their license zone as these are the people directly impacted by the water use of these companies.

According to the: Underground Water Impact Report for the Surat Cumulative Management Area 2016 https://www.dnrm.qld.gov.au/__data/assets/pdf_file/0007/345616/uwir-surat-basin-2016.pdf

459 existing bores are predicted to be affected by CSG water extraction in the long term. This is in addition to the 59 bores that have been recorded as decommissioned since 2012.

91 of the 459 bores are predicted to be affected within three years. This comprises 34 bores which were previously identified as IAA bores but have not yet been decommissioned and 57 newly identified bores. Of the previously identified bores, 36 have been decommissioned since 2012.

The net loss of water from the Condamine Alluvium to the underlying coal measures is predicted to be 1,160 megalitres per year, which is in line with the 2012 predictions.

Table E-1 provides details of authorised bores that as a result of UWIR 2016 are predicted to experience an impact of more than the trigger threshold of 5 metres within 3 years

There also needs to be baseline studies per Issue 2 c). If geological and fault-line mapping is not completed how can the industry be sure that they can frack safely? Given that the horizontal fracking occurs over kilometres, How can they be sure where the fracks will go? How can they be sure that their operations will not affect interconnectivity of aquifers? How can they be sure they won't have well blowouts caused by unmapped fault lines?

Per Items 4 & 5 The exploration and production licenses in the Northern Territory cover 90% of the landmass. It would be impossible for the current number of employees of the only accredited authorities in NT, DPIR or NTEL to conduct significant baseline testing over this area in the short time that this Inquiry is conducted, or within a timeframe that would be acceptable for either gas companies or residents.

Apart from going to the expense of bringing accredited specialists to the Northern Territory from other states or overseas - One solution to this dilemma is to train and employ residents living in and around license areas in the application and use of baseline testing kits and contract them to the DPIR or other accredited agency to do the testing so that they are accredited. It would be simple to have an acceptable methodology for the testing to be signed off by a qualified expert. I personally have a pretty good idea of methodologies I would use simply from my experience of living on the land and my practical and pragmatic approach to things particularly for water testing and water baseline testing. For a start my immediate drinking water would be tested most often and I would prefer my baselines for my water to extend over the longest time period possible.

Note that DPIR and NTEL already have significant contracts with the Unconventional Gas Industry in the Northern Territory. (Therefore, these Laboratories are unlikely to compromise a $500,000 job with a gas company for a $1000 job for a pastoralist or Aboriginal Community)

A water testing kit purchased over the internet costs only about $320 to test for heavy metals such as lead, mercury and cadmium, which are commonly found in high concentrations in water near fracking operations in the United States and Australia. It is very similar to using a home pool testing kit. It is a kit that does not need a high level of literacy or training to use which would make it ideal for use in areas under license where literacy levels are low. We already have some of the Rangers (Sea Rangers) in remote areas that are already familiar with water testing. - Particularly in the MacArthur River Region due to contamination by the MacArthur River Mine. Locals have told me about catching diseased and deformed fish and fish without scales in that region.
https://www.theguardian.com/environment/2016/aug/21/calls-to-halt-mcarthur-river-mine-operations-over-safety-and-remediation-concerns

A basic baseline testing kit for water and air would only cost approximately $1000 per kit and would consist of: A GPS(Free phone app), a water testing kit, A gas detector calibrated in parts per million for methane, radon and other flammable gases commonly found near fracking operations and a Geiger counter.

Those who live in license areas would easily be able to do the baseline testing themselves and they have a much more compelling motivation to do so than any other stakeholder given that the onus of proof is on them to prove impacts. I have spoken to residents from Borroloola about this and once they understood what baseline testing was and why it was needed, they indicated that they are very keen to begin a baseline testing program and gave me assurances that they would

be willing to commit to the process. They just need the training and accreditation. This would save on expensive fly in fly out consultants and enable the baseline testing to cover a much larger area. Results would be sent to an independent database. The Environment Centre NT is independent, employs a database manager and has offered to take on this role. I am also willing to take on this role myself as I am also in possession of the skills, just not the equipment. The Environment Centre NT also has the database capacity track and work with a large number of residents. A process like this would facilitate independence and trust and save the DPIR and thus the taxpayer a lot of money as DPIR would be able to pay a lower award based on the fact that the testers would have less formal qualifications in this particular field.

When it comes to cost, the NTG has spent $23.8 million dollars on gathering scientific data on our gas reserves for the benefit of gas industry proponents.

"The Northern Territory Government has committed nearly $8 million over four years to specifically target improved knowledge about the Territory's shale gas resources. The CORE program, totalling $23.8 million, is the largest investment to support the exploration industry made by a Territory Government" (page 17 of the NTG's, 'Oil and Gas Industry Development Strategy').

I would like to see them at least match this to gather scientific data particularly baseline data about our water resources for the benefit of current local industries such as agriculture, tourism and fishing as well as for the benefit of residents of the Northern Territory and so we can make informed decisions about the development and lifespan of an onshore gas industry in the Northern Territory.

My proposal is for regulation to be enacted retrospectively that the companies that hold a petroleum exploration or production license over an area provide baseline testing kits of this type to every resident living within the license area and pay for training and accreditation for the residents. Hydrologists and other scientific experts employed by DPIR or NTEL would simply have to sign off on acceptable equipment and methodology and check results. Some residents already have this training and these skills. – These residents as well as earning testing accreditation need to receive accreditation to be trainers as well so the program can be expanded. Members of the ECNT and others also need to be trained and accredited so that communities and pastoral leases conducting the testing can be supported on an ongoing basis. I have lived in remote areas and I have seen a lot of programs fail because of a lack of ongoing support.

As part of the Queensland experience, employees and contractors of the gas companies have been accredited, as well as DERM to do testing of water and air. This has not worked out too well for landholders. A few examples: Testing of a farmer's (Brian Monk) water bore by the Queensland Gas Compliance Unit , was found to have no flammable gas levels and to be safe for drinking even though it produced a chemical burn on his grandchildren, the cattle wouldn't touch it and the farmer was able to set the bore alight. https://www.youtube.com/watch?v=SMe59e9Lcco **Brian also had other videos of gas inspectors testing his bore, times and dates on video – much of this footage has been removed from public source. Some of the footage is still available in Voices from the Gasfields from 5min 30sec to 15 min 15 Sec** https://www.youtube.com/watch?v=1EIVkOEf6JQ

On the Tara Chinchilla road, an oily corrosive substance landing on roofs and vehicles that the landholders attributed to flaring by Origin Energy was said to be caused by lerps (insects). Subsequent testing by landowners found the substance to be petrochemical in origin and likely a result of faulty flaring. In both these instances there is video and photographic evidence of landowner claims. http://nofibs.com.au/black-rain-rob-rimmer-reports/ http://nofibs.com.au/response-from-origin-energy-not-enough-savlance75-comments-on-csg/

For residents of the Tara Estates, air testing was done on days when the wind was high and the flaring stopped, with the testers kindly informing the gas companies of the days they were arriving to do the testing.

Social Baseline and Social Licence for Fracking the Territory – current situation

There are many in the Northern Territory that have friends and family in Queensland and NSW and word of the latest outrageous incident gets around quick up here. With the information we have received from other States in Australia and visits from shale gasfield residents in the USA - We have no trust in the word of the gas companies or their employees or contractors. We have no trust in governments that have tied the Territory's financial future to gas companies or political parties that rely on political donations from the gas industry or politicians with close ties to the industry being wined and dined at closed to the public events by APPEA and Gina Reinhardt. What are the current personal investments in the shale gas industry by Northern Territory Politicians? Politicians like Adam Giles whose recent job with Gina Reinhardt serves only to make it official for Territorians who he was really working for while he was our Chief Minister. We simply know of too many instances where gas companies have abysmally failed in their duty of care toward the residents and landholders in the areas where they carry out their operations. We know about the lies and the bullying treatment of our own people right here in the Territory by Origin Energy such as Rod Dunbar at Nutwood Downs as well as the bullying by Origin Energy in Queensland that drove George Bender to suicide. We do not trust these people at all and that is another reason we would rather do baseline testing ourselves. If you live rural, on a station or in a remote community, you are used to having to do most things for yourself anyway. Most Territorians especially those in License Areas feel that the Onshore Gas Industry and Fracking is being forced on us against our will and I suggest the NT Fracking Inquiry survey residents to confirm this.

A huge concern for Territorians is that the onus of proof for impacts from the Onshore Gas Industry and Fracking is on the resident or landholder. Proof such as Baseline Testing that has to be government accredited to stand up in court. A government that has heavily funded the establishment of an Onshore gas Industry in the NT. Will the NT Government train and accredit those living in License Areas, those most at risk from fracking to do Baseline Testing?

Advantages of Baseline Testing

Baseline testing across the Territory by accredited residents is advantageous to the Northern Territory Government as it gives us a map of the current environmental health of the Northern Territory which helps with planning of other industries such as agriculture and tourism. If an incident does occur it can be identified and isolated much more quickly saving money and time. This type of monitoring would help the Northern Territory Government improve industry regulations and standards. It helps the Northern Territory Government assess our current

resources which would be invaluable to this and future governments in the NT for planning and development purposes and would also be of immense use at local government or council level in the NT.

It would be beneficial to commercial operations other than oil and gas in the Northern Territory. Pastoralists would acquire information which would help them in maximising the commercial benefits of their property. They would be able to identify areas for pastoral improvement. They would also have more chance of receiving compensation for fracking damage to their land and business should any incidents occur. Tourism operators would be able to locate "sweet spots" for fish and wildlife to maximise visitor enjoyment/spending and also which environmentally sensitive areas need to be avoided for certain activities.

Aboriginal People would benefit as it would increase their technical knowledge and better enable them to manage their land and resources and care for country. A side benefit is that baseline testing is a valuable avenue of employment that has potential for future development and study in a real capacity in industry. It is no "make work" scheme such as picking up rubbish but a real career path opportunity with the added benefit that it complies with cultural values of caring for country, so it is likely to have more appeal to young people.

It would benefit the gas industry as this is a way for them to finally be able to prove that their operations are as safe as they insist they are. If there is no significant deviation from the baselines over the life of their wells, they will have a case to argue that bans and moratoriums be lifted in other parts of Australia and the world, giving them new opportunities. Baselines would give them the opportunity to constantly monitor and improve safe industry practice which would give them a commercial edge over their competitors. They would be leading the way for their whole industry as there are no known baseline studies tailored to their industry completed anywhere else in the world.

APPENDIX – Requests from Panel after formal presentation

Justice Rachel Pepper

Request for a List of References and Video

References from amended original submission:

Evaporation Pond Surat Basin Queensland
https://www.facebook.com/john.jenkyn/videos/1864118063821457/

National Pollutants Inventory http://www.npi.gov.au/

Biocides used in Frack Fluids http://www.ravenseyemedia.com/eah/403.asp

Dumping of Radioactive frack waste http://www.smithsonianmag.com/science-nature/radioactive-wastewater-from-fracking-is-found-in-a-pennsylvania-stream-351641/ https://thinkprogress.org/ny-times-on-natural-gas-fracking-the-dangers-to-the-environment-and-health-are-greater-than-fd5f59b0c090

http://anonhq.com/unlimited-dumping-of-fracking-wastewater-into-gulf-of-mexico-okay-says-epa/

Dead Zones in the Pilliga NSW, Frack waste spills
https://www.facebook.com/photo.php?fbid=10212715978192411&set=gm.1456499621081379&type=3

Giving away our gas for free http://www.smh.com.au/federal-politics/political-news/tax-sink-hole-gas-multinationals-claim-50-billion-more-in-relief-credits-in-a-year-20170213-gubmfv.html

Deborah Rodgers – Economics of Shale Gas

http://www.nytimes.com/2011/06/26/us/26gas.html

https://www.youtube.com/watch?v=JYaC7L2svoQ

Mark Ogge – Economic Impacts of unconventional gas in Queensland and implications for NT
https://www.google.com.au/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&ved=0ahUKEwjIzJy7rpTTAhXGqJQKHT6WC8QQFggfMAA&url=http%3A%2F%2Fwww.aph.gov.au%2FDocumentStore.ashx%3Fid%3Dae959a04-21c7-44b9-bbf5-3d79411cdf94&usg=AFQjCNEjmsAtciwxmbt5KTJbZYRDMH9cxQ&sig2=xFhuwp6uffS9DRiOlQ_PPg

Ross Gittens – gas shortage is a con http://www.smh.com.au/comment/industrys-coal-seam-gas-campaign-is-a-con-20131008-2v63m.html

Economist Bruce Robertson – "Pipe Dreams" report on proposed Northern Pipe Line NEGI or NPL from Tennant Creek to Mt Isa http://ieefa.org/wp-content/uploads/2016/05/Pipe-Dream-A-Financial-Analysis-of-the-NEGI-MAY-2016.pdf

Wells make property unacceptable to banks as loan security
https://www.theguardian.com/environment/2016/sep/30/commonwealth-bank-coal-seam-gas-makes-property-unacceptable-as-loan-security

https://scontent-sit4-1.xx.fbcdn.net/v/t1.0-9/15420794_10211448651510036_4168005942283840091_n.jpg?oh=21fe5b2d301d20f907587f74fc2acc15&oe=5995807F

Unable to Insure property against damage by the gas industry
http://www.farmonline.com.au/story/3365648/csg-too-risky-for-insurers/

Santos receive $1500 fine for permanently contaminating an aquifer
http://www.northerndailyleader.com.au/story/2137939/santos-fined-1500-uranium-at-20-times-safe-levels-found-in-aquifer-at-the-pilliga/

References from Formal Presentation NT Fracking Inquiry:

Water contamination Pennsylvania http://www.ecowatch.com/pennsylvania-fracking-water-contamination-much-higher-than-reported-1882166816.html

Duke Study – Rivers contaminated with Radium and Lead http://www.ecowatch.com/duke-study-rivers-contaminated-with-radium-and-lead-from-thousands-of--1891128813.html

Contamination in Queensland from fracking http://www.smh.com.au/environment/toxins-found-at-third-site-as-fracking-fears-build-20101118-17zfv.html

Contamination in NSW from fracking http://www.smh.com.au/environment/santos-coal-seam-gas-project-contaminates-aquifer-20140307-34csb.htm

Common Chemicals Found in Fracking Fluids
http://www.sourcewatch.org/index.php/Fracking_and_water_pollution#cite_note-21

https://fracfocus.org/chemical-use/what-chemicals-are-used

Methane Emissions Queensland Gas Fields, Dr Isaac Santos https://www.echo.net.au/2014/11/scu-researchers-trace-methane-emissions-csg-mines/

Radioactivity of Fracking http://www.resilience.org/stories/2014-05-05/how-fracking-is-exposing-people-to-radioactive-waste/

SCU Study – Methane and Radon Qld Gas fields https://link.springer.com/article/10.1007/s11270-014-2216-2

https://www.echo.net.au/2014/11/scu-researchers-trace-methane-emissions-csg-mines/

Lead 210 found in rainwater tanks http://informed-integrity.org/index.php/csg-mysterious-serious-lead-contamination/

Petroleum Activities Exempt NT Water Act 1992 and from Federal Water Trigger
http://www.environment.gov.au/epbc/publications/factsheet4-oss-epbc-act-amendments-water-trigger**. I question this exemption as large volumes of water will be used affecting all other users of the same land and there is also the problems dealing with waste water.**

Noise Pollution https://www.facebook.com/sandi.bams.3/videos/897471710394501/

Impacts on landowners and the myth of co-existence .
https://www.facebook.com/100015336371626/videos/166438060544072/

Testimony Impacted Resident
https://www.facebook.com/People4thePeople/videos/822123904618006/

Methane Seeps Condamine River http://www.abc.net.au/news/2016-02-14/condamine-river-mysterious-bubbling-intensifying-landholders-say/7139676 http://www.abc.net.au/news/2016-04-23/condamine-river-bubbling-methane-gas-set-alight-greens-mp/7352578

Flammable levels of Hydrogen in the Ground Hopeland District http://www.abc.net.au/news/2017-02-09/flammable-levels-hydrogen-found-near-queensland-gas-plant/8256808

Impacts on Bender Family of the Hopeland Disaster. Note, George Bender raised the alarm 2 years before DEHP investigated – shows how well compliance and regulation is working in Queensland. http://www.queenslandcountrylife.com.au/story/3434983/bender-family-statement/

Symptomatology of a Gasfield – Dr Gerralyn McCarron file:///C:/Users/Public.TH-D2DL-PARTPC0/Downloads/Sub_12_attach2.pdf

Link between emissions reported by gas companies and symptoms reported by residents:

Katherine Marchment http://nofibs.com.au/data-problem-katherine-marchment-reports/#.WMNE2DV6o_g.facebook

David Monkhttps://www.facebook.com/100015336371626/videos/179774325877112/

Impact on Bores Surat Basin
https://www.dnrm.qld.gov.au/__data/assets/pdf_file/0007/345616/uwir-surat-basin-2016.pdf

MacArthur River Mine – raises concerns about remediation of damage caused by mining and fracking in the NT https://www.theguardian.com/environment/2016/aug/21/calls-to-halt-mcarthur-river-mine-operations-over-safety-and-remediation-concerns

Monk Water bore able to be set alight https://www.youtube.com/watch?v=SMe59e9Lcco

Brian Monk, Kogan Farmer raising concerns about fracking (Segment of film at 5min to 15:15 min) https://www.youtube.com/watch?v=1EIVkOEf6JQ

Black Rain http://nofibs.com.au/black-rain-rob-rimmer-reports/ http://nofibs.com.au/response-from-origin-energy-not-enough-savlance75-comments-on-csg/

Northern Territory Government: Oil and Gas Industry Development Strategy 2015 (Unable to find a link)

Dr Barry Hart

List of Questions for him to "tick off"

Amended Original Submission

1. How are we going to spare thousands of megalitres of water for use in Shale gas fracking?
2. Is it possible to turn up to a well pad and ask them to turn off their water so that you can fill your stock troughs?
3. What happens when pastoralists and gas companies are drawing from the same aquifer?
4. I put in a huge request to this Inquiry Panel that all existing "holding ponds" in Australia be tested for the emissions that are coming off them so we at least know what compounds are causing these problems.
5. Is it really acceptable to risk sacrificing whole towns for the profit of a few?
6. Is it really possible to regulate these industries into not needing the massive volumes of water they need to conduct their business, to not contaminate land and water with the waste that is part of their business and to regulate geology so that the fracks can be controlled?
7. Are the biocides used by the fracking industry really so toxic that one molecule can kill?
8. So what exactly is the plan for this highly toxic (frack) waste?
9. Millions of tonnes of toxic, radioactive salts. What is the plan to dispose of these? What is the financial commitment of the gas companies towards this end?
10. Who is responsible for the decommissioning of these wells? Who is responsible for ensuring integrity for millennia?
11. In the limestone formations of the Daly and Roper river regions there are fissures and sinkholes all over the place that go through to the surface. It is geologically impossible to control a frack in these areas so why are there licenses over these regions?
12. So how much risk is acceptable risk?
13. What is an unconventional gas industry worth to us? What financial benefits to NT? At what cost? Short and Long term
14. I would like to know exactly how much of our tax dollars have gone to supporting an onshore gas industry in the Northern Territory up to the present time and what is the estimated return on that investment?
15. What if the 685 plus peer reviewed studies outlining unacceptable water, health, air quality and financial risks of unconventional gas development are correct and the glossy media releases from APPEA and others who have heavily invested in the unconventional gas industry are wrong? Should the Northern Territory still go ahead because taxpayers have already put in $23.8 million? Or should we pull out of this industry before we lose a billion dollars? Can the risks of global market forces be mitigated by local regulation?
16. If the gas is for Territorians then why build pipelines to export markets? Why build a massive processing plant so that gas can be exported? Australia has no domestic reservation policy. Our export contracts for gas are 20 times the amount the whole of Australia uses domestically. Tax incentives are better for companies that export. Because of these factors, wouldn't the gas just get sucked up and sent overseas? How does that help NT energy security? Without a gas reservation policy in place wouldn't the price of gas for local use be subject to upward pressure as locals compete with overseas buyers for available gas?

Dr Barry Hart
List of Questions from Formal Presentation 10 March

1. **How much of our water resources are potable resources?**
2. **Where is the full mapping of our surface and groundwater resources?**
3. **What is the quality of our different resources in different areas?**
4. **Given the shale gas fracking uses large quantities of water – How much water do we have available for this process in the areas they wish to frack?**
5. **What would be the impact of this drawdown on other users and the environment in the same areas?**
6. **How likely is there to be contamination issues?**
7. **What is the current health of our water resources?**
8. **I question how it is possible to assess scientific evidence as regards the nature and extent of environmental impacts and risks per Terms of Reference point 1 if baseline scientific data per Terms of Reference Point 2 a), b) c)and d) is not collected and analysed?**
9. **What exactly is the scientific evidence available to determine impacts and risks to water in the Territory if under current legislation gas companies operating under license across huge expanses of the Northern Territory are not required to provide it?**
10. **Until we have that information how can the environmental and other risks associated with fracking in the Northern Territory be determined?**
11. **How can a level of risk be determined if current baselines are unknown?**
12. **Would it be possible for gas companies and large cattle operations to publically release water studies or baseline studies that they have done?**
13. **Have gas companies done any baseline studies on drinking water or stock bores within their tenements?**
14. **What benefits from a shale gas industry in the NT accrue to those who bear the most risk of suffering impacts from shale gas fracking?**
15. **Are any of those that gain the most financial benefit from a shale gas industry in the NT subject to these risks? What risks? Do they live here and are they going to spend their money in the Northern Territory?**
16. **Should external investors in onshore gas in the Northern Territory have more of a say about what we are to do with our gas reserves than Territorians themselves?**
17. **Has testing and recording made of the average pressures found in water bores in their license area over a few previous yearly cycles as one of the baselines for impacts on groundwater?**
18. **Will the NT Government train and accredit those living in License Areas, those most at risk from fracking to do Baseline Testing?**
19. **If geological and fault-line mapping is not completed how can the industry be sure that they can frack safely?**
20. **Given that the horizontal fracking occurs over kilometres, How can they be sure where the fracks will go?**
21. **How can they be sure that their operations will not affect interconnectivity of aquifers?**
22. **How can they be sure they won't have well blowouts caused by unmapped fault lines?**
23. **What are the current personal investments in the shale gas industry by current and previous government Northern Territory Politicians?**

I have strong suspicions that this may be the cause of some bias amongst our politicians, especially when they want to argue with me about impacts in Queensland when I am actually trying to discuss Baseline Testing in the Northern Territory. They get visibly upset at anything that may be seen as criticism the gas industry

Gerry Wood got upset, refused to discuss NT Baseline Testing, claimed to have visited the Surat Basin once and to have read the CSIRO report on the Condamine Seeps and declares they are "natural", whereas I have also read this gas industry funded report and visited the Surat Basin many times before and after the gas industry and have friends and relatives there. I refused to be drawn into an argument simply stating the case for Baseline Testing in the NT which Gerry clearly did not want to talk about. Gerry is well known in the last CLP government for his pro fracking stance as evidenced in Hansard. The fact that he refuses to sight or listen to any evidence that doesn't support his pro fracking views is a worry and a compromise of his independence as a member.

Lauren Moss maintained a poker face and was determined fob me off without answering any questions.

Natasha Fyles refused to discuss with me stating that it was not her portfolio.

My local member Jeff Collins has been having his office refurbished and I have been unable to make contact with him.

I have also been unable to make contact as yet with Michael Gunner or Ken Vowles

Dr David Jones

Request for Evidence of Lead Contamination in Rainwater Tanks

My deepest gratitude to John Jenkyn for providing the following evidence. I first met John and his family 1 July 2014 in Chinchilla Qld when John was defending a charge bought against him by QGC for a post he made on Facebook. The charges were struck out by the magistrate and the case against him dismissed due to lack of evidence. Prior to that I often drove past John's property on the Tara-Chinchilla Road on my way to Durong.

John describes himself as "having to become a scientist in his own home". He has lived with his family on his 155 acre property since 2005. Since moving there he has documented in photographs his local area. There is a stark contrast between the photographs taken before the gas industry moved into his neighbourhood and the photographs he has taken since. John's property is completely surrounded by gas wells and gasfield infrastructure with the QGC Kenya processing plant next door to him.

John is now an expert in water testing, air testing, radiation testing, gas testing and gas industry infrastructure and emissions as well as health and financial impacts. He has accredited test results for air, water, soil and medical.

John Jenkyn can be contacted [redacted] for more photographic and video evidence regarding impacts of gas field infrastructure including leaking wells and air, water and other pollution from the gas industry around his home on his acreage and on his family. He has test results other than those for his rainwater tanks shown available.

http://www.queenslandcountrylife.com.au/story/3581997/chinchilla-familys-csg-battle/?cs=4698

Article: Lead 210 found in rainwater tanks. Article shows levels of lead found in tanks of local resident Sandra Bamberry. http://informed-integrity.org/index.php/csg-mysterious-serious-lead-contamination/

Water Sampling Done by DEHP on John Jenkyn's RainwaterTanks

Page : 3 of 10
Work Order : EB1404148
Client : QUEENSLAND DEPARTMENT OF ENVIRONMENT AND HERITAGE PROTECTION
Project : Jenkyn Water Sampling

ALS

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Compound	CAS Number	LOR	Unit	Client sample ID	Tank 1	Tank 2	Tank 3	Tank 4	Tank 5
				Client sampling date / time	19-FEB-2014 11:30	19-FEB-2014 11:30	19-FEB-2014 11:30	19-FEB-2014 11:30	19-FEB-2014 11:30
					EB1404148-001	EB1404148-002	EB1404148-003	EB1404148-004	EB1404148-005
EA005P: pH by PC Titrator									
pH Value	----	0.01	pH Unit		4.36	7.97	4.37	5.87	7.81
EA010P: Conductivity by PC Titrator									
Electrical Conductivity @ 25°C	----	1	µS/cm		38	126	30	26	229
EA016: Non Marine - Estimated TDS Salinity									
Total Dissolved Solids (Calc.)	----	1	mg/L		25	82	20	17	149
EA065: Total Hardness as CaCO3									
Total Hardness as CaCO3	----	1	mg/L		<1	52	<1	2	20
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		<1	49	<1	4	48
Total Alkalinity as CaCO3	----	1	mg/L		<1	49	<1	4	48
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		2	2	2	2	14
ED045G: Chloride Discrete analyser									
Chloride	16887-00-6	1	mg/L		2	2	1	3	31
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		<1	21	<1	1	3
Magnesium	7439-95-4	1	mg/L		<1	<1	<1	<1	3
Sodium	7440-23-5	1	mg/L		1	1	<1	1	40
Potassium	7440-09-7	1	mg/L		<1	<1	<1	<1	3
EG020T: Total Metals by ICP-MS									
Arsenic	7440-38-2	0.001	mg/L		<0.001	<0.001	<0.001	----	----
Boron	7440-42-8	0.05	mg/L		<0.05	<0.05	<0.05	----	----
Barium	7440-39-3	0.001	mg/L		0.043	0.058	0.018	----	----
Beryllium	7440-41-7	0.001	mg/L		<0.001	<0.001	<0.001	----	----
Cadmium	7440-43-9	0.0001	mg/L		<0.0001	0.0002	<0.0001	----	----
Cobalt	7440-48-4	0.001	mg/L		<0.001	0.005	<0.001	----	----
Chromium	7440-47-3	0.001	mg/L		0.004	0.008	0.001	----	----
Copper	7440-50-8	0.001	mg/L		0.069	0.030	0.247	----	----
Manganese	7439-96-5	0.001	mg/L		0.039	0.147	0.024	----	----
Nickel	7440-02-0	0.001	mg/L		<0.001	0.002	<0.001	----	----
Lead	7439-92-1	0.001	mg/L		0.006	0.039	0.008	----	----

John Jenkyn - Sediment Sampling Tank 3

file:///C:/Users/Public.TH-D2DL-PARTPC0/Downloads/DirtTest-P3.pdf

Photo of Tank 3 John Jenkyn 14 Jan 2015

From a conversation with John 24 March 2016 "This is the side of our rain water tank looks kind of oily and that is what we found inside was a clear layer of oil on top of the water separated by a thin black layer of who knows what"

19/12/13 9:11 am Bonnet of Jenkyn Landrover

Colour wipes off tyre cover. 18 Feb 2014

https://scontent-sit4-1.xx.fbcdn.net/v/t1.0-9/1004963_10203172774830055_1730803415_n.jpg?oh=5deb165053f73dce7651ebbf4b3a2448&oe=59866327

White powdery substance on roof of car. Paint coming off when wiped with hand.18 Feb 2014

https://scontent-sit4-1.xx.fbcdn.net/v/t1.0-9/1456053_10203172771909982_1734537448_n.jpg?oh=2a6a64e2b77fcfc7142601f326a4dd5c&oe=597759F3

John Jenkyn - Black Rain Roof of Car.

DEHP said it was caused by lerps, but those working in the industry have since told John that it is more likely to be condensate from faulty flaring close to his property

What happens to green tree frogs caught in the rain at John Jenkyn's place photo 16/3/14

Impacts of gas industry on bores Surat Basin
https://www.dnrm.qld.gov.au/__data/assets/pdf_file/0007/345616/uwir-surat-basin-2016.pdf
measures drop in bores of 3 metres or more. Some bores have had a 95 metre drop.

Dead Trees Tara Chinchilla Road. Video John Jenkyn. Also my personal observation. The bush was not like this prior to the gas industry
https://www.facebook.com/john.jenkyn/videos/1930587427174520/

What caused this methane fire in a borehole near Dalby where the CSG industry has been drilling like crazy? Not linked to CSG according to the Qld Government so what did cause it?
https://www.facebook.com/vic.day.2/videos/1840501712842851/

Produced Water spill caught on camera by residents. How many of these incidents go unreported when a resident is not there to catch it on film? Glenugie CSG Spill
https://www.facebook.com/vic.day.2/videos/1839339646292391/

Pollution in Dam Queensland Gasfields

Photos – low point drain

John Jenkyn This is the (leaking) tap on a tank connected to a low point drain on a QGC pipeline, They can be found on low point drain close to creeks as well as random locations on csg pipelines all across the Surat Basin, They should always be pump out into trucks and taken away for treatment, Origin were trying to get approval to dump this straight into the environment, They did not get it

https://scontent-sit4-1 xx fbcdn net/v/t31.0-8/18121148_1929567180609878_4304696354526417611_o.jpg?oh=43f1f925a29ad6e6a5ae86d5c26d70eb&oe=5984C7DB

https://scontent-sit4-1 xx fbcdn net/v/t31.0-8/18056353_1929570427276220_8747134880819590560_o.jpg?oh=4511aa29e226c8da7e23bc351f327751&oe=59C1B83B

https://scontent-sit4-1 xx fbcdn net/v/t31.0-8/18077412_1929570610609535_6365886843708949930_o.jpg?oh=5969c29150168d536d9af61daa303c3d&oe=597B23AA

John Jenkyn (QLD GASFIELDS) Flares >Chinchilla area 2017
This is the sky between Brian and myself tonight, I had Aaron awake till 2:30 am with compression station noise, pipe line noise all afternoon, I do have faith in people power just not in any government departments or there ministerial bosses (NB Aaron is John's disabled son)

Flares on the horizon from Johns Place 9/10/16

Combustible Gases Coming out of the Ground – video John Jenkyn
https://www.facebook.com/john.jenkyn/videos/1829089203991010/

John Jenkyn Combustible gas being detected in the air as i walked around the garden, Either drifting in from leaking wells, high point vents or straight out of the ground https://www.facebook.com/john.jenkyn/videos/1830135667219697/

Radioactivity in Johns House : https://www.facebook.com/john.jenkyn/videos/1566556820244251/

Radioactive – Fell of the Back of a Truck
https://www.facebook.com/john.jenkyn/videos/1593631110870155/

Radioactive Produced Water being used for "dust suppression" on tarmac roads
https://www.facebook.com/john.jenkyn/videos/1600589470174319/

Noise and toxic elements released into the air. Gas Well near Johns house
https://www.facebook.com/john.jenkyn/videos/1579095422323724/

Toxins from a well sprayed into the air
https://www.facebook.com/john.jenkyn/videos/1466149370284997/

Drill Rig Noise Pollution https://www.facebook.com/john.jenkyn/videos/1770412966525301/

Condamine River – I don't remember it ever being like this prior to the gas industry
https://www.facebook.com/john.jenkyn/videos/1762743663958898/

https://www.facebook.com/john.jenkyn/videos/1724593451107253/