# Submission to NT Public Inquiry into Hydraulic Fracturing

## Overview

The points below are my personal views on the overall management of the shale gas boom in the NT which I believe indicates a lack of knowledge, transparency and community engagement from the Northern Territory Government regarding this boom in 'fracking'. Given this, I believe the Northern Territory; it's Government, people and environment is not adequately prepared for a boom in shale gas exploration. I also do not believe there is adequate legislation in place to safeguard our rights as citizens and landowners and/or protect our precious environment against damage.

- While community meetings took place in 2013, presentations lacked detailed information on the process of hydraulic fracturing. Fracking may have occurred in the Territory for a number of decades however I believe this has been vertical fracking, not horizontal which is currently emerging in remote regions and involves a different process of drilling and extraction. Community meetings conducted in 2013 did not provide a lot of information regarding the types and processes of different fracking operations nor has the Minister for Mines & Energy attempted to clarify this in media or correspondence. An absence of serious incident in the past is no argument to state that there will never be one in fact my research suggests that it can be corrosion and lack of proper maintenance to older gas field infrastructure which can lead to disasters. I cite the WA gas explosion on Varanus Island which cut 30 per cent of WA's supply and cost the WA economy an estimated $3 billion. (Source Perth Now May 24, 2012 *http://www.perthnow.com.au/business/varanus-gas-explosion-report-slams-apache/story-e6frg2r3-1226365866625* )
- Questions remain over the types of chemicals used, water usage & waste management procedures, rehabilitation of gas fields post extraction and the degree of risk associated with contaminating aquifers.

- Lack of substantial assessments on the effect of fracking in the NT means the true impacts on our unique Territory environment are not clear and have not been specifically studied or documented.
- A culture of silence from the Department of Mines & Energy creates an impression within the community that there is no transparency in regards to how this gas boom is being managed and monitored by the NT Government and relevant agencies.
- Concerns have been raised by the community regarding the transparency of investigating serious incidents. I cite the gas explosion at Santos' Mount Kitty oil field some months ago for which no Media Release was issued by the Minister for Mines & Energy and no updates to the community have been provided.

- I have serious questions regarding the ability of the EPA to properly regulate and monitor the industry and believe laws in the NT do not support the rights of individuals, landowners, traditional owners or the community to protest gas fields in their regions. With negotiations conducted solely with small groups of officially identified Traditional Owners, community sentiment or the views of surrounding landowners is not considered nor does the current process ensure that all descendants of Traditional Owners are recognized and included during the negotiation process.

## Environmental Impacts

***Differences in regional geology***

Hydraulic Fracturing has occurred in Central Australia for a number of decades but the shale gas industry is currently booming in the Top End of the Northern Territory for the first time. While the Minister for Mines & Energy' view is that decades of exploration in Central Australia prove that fracking is safe, I don't think this can be accurately determined without targeted studies and long term intensive monitoring which has not been done. There are also vast differences in the geology of the Central desert region and the tropical north. Any venture into fracking in the Top End should only be allowed once there has been some investigation on how fracking operates within the different regions and its likely effects on Top End geology vs Central Australian geology. For example, Central Australia does not have as many permanent river systems as the Top End but does rely heavily on underground aquifers. Any contamination of these aquifers would spell disaster for our Central region. Likewise, any contamination of vital Top End river systems would have detrimental effects on our Industry and lifestyle. A moratorium on fracking should be put in place until there is clearer evidence that fracking in either environment does not risk contamination of water resources whether a river system or an underground aquifer.

***Water use & contamination risks***

It has been stated that hydraulic fracturing can use millions of litres of water for each well. With mining companies exempt from the Water Act, I have serious concerns regarding monitoring and regulating the amount of water needed for the fracturing process and greatly concerned that a mining company can use whatever it needs without any water license application or public scrutiny. As it is, the public have no idea how much water is currently being consumed by gas exploration nor has the water taken out of the system by mining companies been included in Water Management plans or factored into the current NT Government's rush to issue more than 50 water licenses. If water used by companies for hydraulic fracturing is not included then the model currently relied on to issue Water Licenses is inadequate and could mean that more water is allocated than can be sustained by our environment. This could mean that in dryer years, a Territory farmer could have their water entitlement reduced while the gas companies continue to consume as much water as they like. This could lead to the demise of local agriculture industries at the expense of gas exploration and severely impact the Territory's ability to grow and prosper.

The issue of water contamination has already arisen in the Northern Territory, at the Mereenie oil field in Central Australia.

In an article posted in April 2013, Alice Online reported:

*Corroded well pipes in the Mereenie oil field leaked oil below ground into the Amadeus aquifer which provides the water for Alice Springs, so did a leaking pipeline, and highly saline water – a usual by-product of gas production – was kept in an unlined evaporation pond.*

The article also raises questions regarding the transparency of the Department of Mines & Energy and a lack of updated information regarding how this incident was managed.

(Source: Alice Online website: http://www.alicespringsnews.com.au/2013/04/05/questions-about-mereenie-oil-polluting-alice-water-still-linger)

If the community has not received full disclosure about this issue from the NT Government, how are we to trust that future incidents and issues will be properly addressed and managed? How are we to have peace of mind that mining companies are made to address these issues and how are we to know what steps have been taken to ensure that it does not continue or re-occur?

Risk of water contamination has become a serious issue for parts of the USA which have been experiencing a similar boom in shale gas in recent years.

Analysis by Independent academic group Researching Fracking in Europe (ReFINE) found that more than six per cent of wells in a major shale exploration region in Pennsylvania have reported some kind of leak and m*ore* than 100 cases of pollution have been confirmed over the past five years. (Source: The Telegraph online)

This seems to indicate that there is still much research to be done regarding the potential risks for water contamination from various sources whether related to leaks in the well barriers or pollution during the reinjection process. Experts have also suggested that greater monitoring of abandoned wells is needed with lead author of the ReFINE report Professor Richard Davies stating *"The findings confirm that well barrier failure and well integrity failure is an issue and that publicly available data in Europe on this seems to be sparse.*

*"Data from the monitoring of active wells and periodic surveys of abandoned wells would help assess the impact of shale exploitation."*

It seems obvious to me that there is a distinct lack of knowledge regarding the potential risks of water contamination and that hydraulic fracturing should be halted in the Northern Territory until comprehensive studies specific to our geological environment have been completed. Contamination of any of our water resources and/or river systems would have a detrimental effect on the NT and could prove fatal to our remote areas which rely on water resources for both consumption and industry. Contamination is permanent and this risk should not be minimized for the sake of a quick boom in gas.

***Number of wells***

A recent story on ABC 730 NT on March 28, 2014 included an interview with Dr Bill Freeland from the NT EPA who stated that the Northern Territory's hydraulic fracturing inquiry would be looking at the possibility of allowing multiple wells without individual Environmental Impact Assessments. Given the lack of detailed information about the true impacts of hydraulic fracturing, I believe any plan to allow multiple wells without Environmental Assessment would be dangerous and irresponsible. I believe this aspect requires a lot more investigation and community engagement so clarify whether there will be any regulation regarding the proximity of wells to each other, how multiple wells will be monitored and

potential risks of multiple wells in one location. Dr Freeland also commented that if world best practices and technology is applied, then there is very little to be concerned about. This may be true but I would question whether the NT Government has either the ability or motivation to ensure this given that the boom appears to be based on pushing through as many applications in a short time frame which does not allow for further investigation, research or adjustments to legislation. Ie If the NTG seriously believes that world's best practice would alleviate public concern or minimize the risk, why has nothing been done to pursue this and introduce legislation to ensure mining companies meet these standards?

***Rehabilitation Plans***

As stated in my Overview, there has been very little information provided to the public regarding hydraulic fracturing in the Northern Territory. I have not been able to find any information which details the process for rehabilitation of abandoned or completed wells. From my research into the Central Australian gas industry, there appears to be a degree of hit and miss when it comes to drilling new wells with some wells being suspended after the discovery of hydrogen sulfide. (Source NT Drilling and well testing activities, Department of Mines & Energy website)

I have not been able to find any information on how these suspended wells are rehabilitated once abandoned nor have I found any substantial information regarding the regulations mining companies will need to comply with post exploration. With a disgraceful history of legacy mines in the NT which continue to cause environmental and social issues long after the mining is complete (ie Mt Todd) I feel this is an area which definitely needs more focus and greater regulation by an independent regulator to avoid long term environmental impacts.

***Chemicals used & waste storage/disposal***

One of the most concerning aspects to 'fracking' is the nature of chemicals used in the fracking process. Mining companies are required to submit their Chemical Disclosure Statements to the Department of Mines & Energy however upon viewing this page there are only four entries and no apparent consistency to the format or information they are required to provide. I submit the following links to demonstrate this inconsistency – the Mereenie statement contains a lot more detail than the Owen3H statement. I also found the lack of 'not known, not applicable' within the Mereenie statement.

http://www.nt.gov.au/d/Minerals_Energy/Content/File/Petroleum/ChemicalDisclosureLists/MereenieMADDFractureStimulationCompletionMSDS.pdf

http://www.nt.gov.au/d/Minerals_Energy/Content/File/Petroleum/ChemicalDisclosureLists/Owen3HWell.pdf

Alarmingly, I found very little information regarding the chemical M275 found in the first link provided. This is identified as a chemical which is:

*toxic to aquatic organisms and may cause long term adverse effects to the aquatic environment.*

Data on the following is either not available or not known:

Aquatic toxicity

Potential Chronic Health effects: Chronic Toxicity, Irritation/Corrosion, Carcinogenicity & Reproductive Toxicity among others

Persistence/Degradability

There seems to be a large amount of unknowns regarding this chemical and I feel that there should be a lot more scrutiny of the types of chemicals used and their potential effect on people and the environment. There is also no Exposure Standard allocated for Occupational Exposure Limits which may put mine workers at risk.

I also noted that the statement on this chemical advises that should a fire occur:

*Firefighters should wear appropriate protective clothing, and self contained breathing apparatus with a full face piece operated in positive pressure mode.*

Given the amount of risks associated with this and other chemicals used during the fracking process, there should be processes to ensure close scrutiny, frequent inspections and reporting of both storage, usage and training of staff dealing with these chemicals. A number of the chemical statements note they are combustible when stored near other chemicals, flammable in certain temperatures, require storage in a dry environment, require adequate ventilation and are handled safely and adequately. Incidents need to be responded to by fire fighters who have been adequately trained and I wonder how a remote area mining company would ensure they have trained fire fighters onsite at all times?

I would also like to mention that the Owen3H statement is unreadable and when I requested a pdf copy from the Dept of Mines and Energy I was information that there was not one readily available to send to me. All information on the Dept of Mines website should be legible and these issues need to be rectified as soon as possible.

The process of fracking creates a significant amount of waste which requires proper management and incidents have occurred in both Australia (Santos in Pilligra) and the USA (Pennsylvania, Colorado, Ohio & North Dakota) There is an increased risk of holding ponds overflowing in areas prone to high levels of rain and/or flooding – exactly what the Top End experiences. I would like to see the Northern Territory Government put in place strict controls and monitoring in regards to waste management and storage, particularly in terms of how it is transported as this puts at risk the environment along the whole of the transport corridor which will obviously take in townships and rural areas. I would ask the inquiry to consider recommending mining companies are made to invest in new technology which can process and minimize the amount of waste as mentioned in this article from Technology review:

http://www.technologyreview.com/news/519416/one-way-to-solve-frackings-dirty-problem/

***Location of Gas fields***

One of the most concerning aspects to the current gas boom in my opinion is the fact that more than 90% of the Territory has been earmarked for exploration. This means that nothing is protected and regions such as Tennant Creek which are prone to earthquakes have not been made exempt from exploration. I have serious concerns regarding fracking in our national parks, fracking close to townships and rural areas, fracking in regions prone to earthquakes, fracking in regions of Indigenous cultural significance and fracking in our precious off shore marine environments. If these areas are not protected, precious ecosystems, cultural sites, recreational areas and residents themselves may be left vulnerable to risk or damage. Locating gas fields & their waste disposal sites within close proximity to populated areas could expose residents to health risks as noted on the US EPA website:

*Risks analyzed for the general population within a 50 mile radius of the disposal site include exposures from the downwind transport of re-suspended particulates and radon, and exposures arising from*

*ingestion of river water contaminated via the groundwater pathway and surface runoff. Downwind exposures include inhalation of re-suspended particulates, ingestion of food contaminated by deposition of re-suspended particulates, and inhalation of radon gas.*

*(source: USA EPA website: http://www.epa.gov/radiation/tenorm/oilandgas.html#residentsoffice)*

***Potential for serious incidents and risks to community health & safety***

For every action there is a reaction and it would be foolish to think that drilling deep into our earth and extracting huge amounts of resources would not have some effect on the environment. I have already mentioned the Varanus Island explosion and concerns about the Mereenie oil field so it seems clear that the potential for serious incidents is very real and apparent. In April 2014 Santos suspended drilling at its Mount Kitty well after an incident. (source: http://www.abc.net.au/news/2014-04-16/santos-suspends-gas-drilling-at-mount-kitty-field-after-acciden/5395120) Despite an intensive search on Government websites as well as Santos & Central Petroleum websites, I cannot find any further information about this 'incident'; there is no page on the Department of Mines & Energy website which provides any news or updates on incidents nor has the Minister for Mines & Energy issued a Media Release or provided an update on the subsequent investigation. This demonstrates a distinct lack of information flowing to the community and contributes to the culture of silence I mentioned earlier.

Frequent reports from the USA, Asia and Europe also demonstrate gas pipeline explosions, leaks and spills from well bores and well casing failures leading to increased risks of water contamination. There are numerous other safety risks associated with drilling sites including worker safety and adequate storage of waste products.

(Source: various; http://norj.ca/2014/01/a-terrible-year-for-spills-and-leaks-in-northern-alberta/, http://jonathandealblog.com/2013/09/10/shell-admits-shale-well-casing-failures-in-china/, http://www.sciencedirect.com/science/article/pii/S0264817214000609, http://www.pribanic.com/Articles/Fatal-Marcellus-Shale-Field-explosion.shtml)

The Australian Medical Association has also called on state and federal governments to ensure all CSG proposals are subject to rigorous and independent health risk assessments to help protect communities living near gas fields and the same should apply to shale gas exploration. (Source: http://www.abc.net.au/news/2014-05-26/renewed-call-for-csg-health-risk-assessments/5478634)

## Social Impacts

***Insurance & Property Values***

Insurance companies in the UK and USA have stated that they will not insure against damage caused by hydraulic fracturing causing issues for home owners who reside in areas now experiencing a gas boom. (source: Huffington Post online; http://www.huffingtonpost.com/2012/07/13/nationwide-insurance-fracking_n_1669775.html & Wells Journal online; http://www.wellsjournal.co.uk/Insurance-shock-Wells-home-owners/story-20659325-detail/story.html)

*What assurances can the Northern Territory Government provide to landowners and homeowners that they will not be financially disadvantaged from Insurance or falling property values in areas where fracking is occurring?*

***Territory lifestyle & recreation***

I note with interest that the Katherine region is currently being promoted as a pristine environment with plenty of opportunities for recreation such as fishing, bush walking and camping. There is mention of the vital river systems on which the Katherine region relies for both industry, agriculture, tourism, recreation and human consumption. I believe the potential risks of fracking in this region could jeopardize the future of the region; its economy and its lifestyle. As someone who was born and bred in the Katherine region, it would be devastating to see this country put at risk for the sake of extracting a resource for profit.

*What assurances will the Northern Territory Government and mining companies provide to the Territory community that our environment and lifestyle will not be put at risk in this way? Who will be responsible if irreparable environmental damage occurs? Who will be liable for compensation and ensure full rehabilitation of any damage and who will regulate this?*

***Rights of Landowners and Traditional Owners***

Current Legislation does little to protect the rights of landowners and does not promote an ongoing engagement with landowners or Traditional Owners. The consultation process should be continued throughout the duration of the operation and the rights of landowners to say no to fracking on their property need to be stronger and confirmed by appropriate legislation.

*What changes will be made to legislation to ensure that the rights of landowners and Traditional Owners are fully respected particularly in cases where they are no longer supportive of fracking and want it ceased on their property or land?*

## Conclusion

In conclusion I would like to state that I don't believe the NT is prepared for a boom in shale gas. I believe any continuation of this boom would be irresponsible of the Northern Territory Government and Department of Mines and Energy and could put our Territory environment and lifestyle at risk. We need to slow it down and do it properly.

It seems illogical to me that rather than pursuing renewable energies which are less invasive, the Northern Territory Government seems intent on ripping out our precious resources without full understanding of the risks in order to open the door to gas mining companies. I would doubt that this shale gas boom would lead to cheaper power prices for the residents of the Northern Territory given that fracking has occurred for decades in Central Australia and power prices have only increased in that time. In fact, it seems our gas is shipped offshore and then sold back to us at high prices. This, to me, is not an industry that provides a lot of benefit to the residents of the Northern Territory, nor is it environmentally friendly.

I would also like to say that while I welcome the NT Inquiry into Hydraulic Fracturing, I hope that this will not be used simply as an opportunity for the NT Government to push through its own agenda and the thoughts put forward by Territorians in their submissions are seriously considered and responded to. I also believe that public sessions inviting community members to engage directly with Dr Allan Hawke are essential and I hope that this will occur in all regional centres before the Inquiry is concluded.