



NT GREENS PO BOX 421 NIGHTCLIFF NT 0814
nt.greens.org.au

Submission to the Inquiry into Hydraulic Fracturing in the Northern Territory

The Greens recommend that the NT Government enacts a moratorium on unconventional gas extraction in the Northern Territory, based on the growing body of evidence that fracking and unconventional gas extraction is not compatible with human settlement and existing industries.

While there are remaining uncertainties as to the effect of fracking: on human health, water resources, the spread of poisons, degradation of natural resources;; the precautionary approach of suspending development is the only appropriate response.

Leakage of methane and other hydrocarbons is likely to negate the claimed advantage over other fossil fuels. The enthusiasm for ramping up exploitation of unconventional gas in the NT makes a mockery of government's commitment to emissions reductions, and offloads the burdens for wise management of our carbon budget to future generations.

There is strong community opposition to unconventional gas extraction across Australia. This comes from rural communities' lived experience of these industries, and their effects on health, on the water table and on land use. Because of the speed of development of this new industry, community experience of living over an altered hydrological profile has happened ahead of scientific consensus on its effects. While research continues to consolidate the sources and mechanisms of contamination and resource depletion.

In the NT the prospect of an unconventional gas industry represents the added threats of degrading our invaluable natural heritage, and destroying our agriculture and tourism industries. The groundwater resources which support life in our arid regions are replenished over such a long timescale that they are effectively non-renewable. Allocating large amounts for industrial use in the near term gain reduces the viability of future occupation.

Unconventional gas development in the sparsely populated NT would stretch the existing capacity for administration. Current environmental and water regulations do not adequately protect resources and the environment. Monitoring and compliance will be expensive and difficult across the remote extremes of our arid and tropical regions. State emergency services will be encumbered with a rapidly expanding burden.

Australia's opposition to fracking is characterised by proponents as being unfounded and out of line with a selective presentation of ongoing research. The NT Greens reject this suggestion. Unconventional extraction, as it is currently practiced, is a new phenomenon, and fundamental research on its regional effects is still being undertaken. While the industry is able to show some studies that don't find a link between fracking and pollution, many other publically available studies clearly do – of which a small number are cited below.

The appropriate response to this lack of consensus on the science is precaution. A full moratorium should be imposed while research continues in regions that have adopted these technologies early.

The NT Greens have argued this in detail in reference to the Terms of Reference below.

In addition, the NT Greens also recommend the following important considerations that are not explicitly included in the Terms of Reference

- The full economic lifecycle implications on development of an unconventional gas industry. This should consider the impacts of the industry on the Territory's economy beyond the 10-15 year lifecycle of a well.
It should consider future gas prices, and the potential for these to fall in response to rapid industry expansion, as has been experienced in the US.
Conversely, it should consider the risks of committing a local energy industry to global gas price fluctuations, with unexpected price rises, as has been experienced on the East coast.
It should consider the impact on other industries, such as agriculture, tourism and renewable energy.
The potential for natural gas to replace diesel generation across the Territory should be considered in comparison to well-developed alternative plans for a transition to solar – and long term lifecycle comparisons should be applied.
The uncertain cost of ongoing post productive environmental reparation should be considered.
- A review should be undertaken of the adequacy of existing regulatory instruments to protect the interests of Territorians – applying to water use, monitoring and reporting, penalties for accidents and non compliance, and environmental reparation.
- A review should be undertaken of the capacity of the NT public services to address incidents and emergencies, and the additional strain of interstate workers on services.
- The industry's environmental impact and water use should be assessed in a contextual sense – that is the effect that the whole industry could have for existing activities – the industry's total potential extraction from finite reserves, and the cumulative impact of contamination. The uncertainty that applies to these projections warrants a precautionary approach.
- The absence of base level data across the territory, relating to indicators such as airborne methane levels.
This is essential to enable monitoring, enable contamination to be identified, and to facilitate compensation from industry.
The NT Greens note that drilling has progressed through exploration to exploratory hydraulic fracturing, without adequate baseline data being collected.

Response to the Terms of Reference:

Hydraulic fracturing for hydrocarbon deposits in the Territory, including the assessment of the environmental risks and actual environmental impacts of hydraulic fracturing and the

effectiveness of mitigation measures, and more particularly the matters mentioned in the following clauses:

1. *Historical and proposed use of hydraulic fracturing (exploration, appraisal and production) of hydrocarbon deposits in the Northern Territory (number of wells, locations, timeline).*

Industry proponents often point to a 60-year history of fracking and horizontal drilling to counter the evidence for uncertainties and unknowns associated with fracking. Santos has legacy wells including horizontal wells in the NT.

However fracking as it is practiced today has advanced so significantly in speed and extent that its effects across a region should be considered untested. [1] Incremental technological advances made through the 90s – such as faster drilling, continual monitoring, the refinement of “slickwater” chemicals, and inhole motors – have created the current boom. So while some wells may have been fracked and drilled horizontally for a significant period the cumulative long term effects of fracking are still being realised.

Regions that have developed this industry early – in the US, and eastern Australia - have had to progress without applicable data.

Studies on the impacts in these developed areas, such as the long-awaited US EPA’s epidemiological study of the health implications of fracking on drinking water (due in 2014 but now scheduled for delivery in 2016) are still being researched. [2]

The NT Greens urge that the decision to allow these technologies is delayed pending the outcome of these fundamental independent studies.

Gas proponents such as APPEA are sometimes able to take advantage of the continuing status of research by presenting incomplete and growing evidence for risk, as inconclusive evidence. For example, APPEA’s website dismisses an Australian medical researcher’s concerns that cite a 2011 US EPA study into a groundwater contamination event on the basis that the study is a draft. [3]

Scientific consensus on fracking’s multiple risks is far from conclusive. The NT Greens urge that the appropriate response in these circumstances is a moratorium.

2. *Environmental outcomes of each hydraulic fracturing activity for hydrocarbon resources in the Northern Territory (number of wells; frequency of types of known environmental impacts).*

The wording of this Term of Reference suggests a statistical approach to risk appraisal, based on comparable developments elsewhere in the world.

The NT Greens recommend that this is not an appropriate precautionary approach, given:

- Fundamental region-level impacts are still in the process of being established, through studies such as the EPA’s drinking water review cited above, due in 2016. To base an assessment on “proven” incidents will drastically underestimate impacts.
- In addition, the longer term impacts of this new industry are an even greater unknown.
- Effects depend on local geological factors, not easily accommodated by a statistical approach.

- Human settlements and industry across the Territory depend solely on local underground water sources. Water resource depletion or contamination in a single region will prohibit future use of this land. Therefore there is no statistical level of “impacts” that can be deemed acceptable.

In reference to specific impacts:

Water Use

Gas industry representatives, in public presentations in Alice Springs, have claimed that it is possible to use less water per frack than the immense amount used in current east coast fracking. However, the water use in Amadeus Basin gasfields has been immense, and industry claims of what is potentially possible should be considered with respect to whether there is a regulatory framework in place that will limit use.

The Federal Government’s National Water Commission has found that the water required by a single well varied based on the geology and the techniques used. [3] (While this is in reference to CSG, it remains applicable to the unconventional methods proposed for the territory.)

However, water use in existing Australian gasfields has been immense. Even if some wells achieve a reduction on national averages, the consumption can still be expected to be too high. From the National Water Commission’s submission to the NSW Inquiry:

“Current projections indicate the Australian [East Coast] CSG industry could extract in the order of 7,500 gegalitres of co-produced water from groundwater systems over the next 25 years, equivalent to -300 gegalitres per year. In comparison, the current total extraction from the Great Artesian Basin is approximately 540 gegalitres per year.

“Potential impacts of CSG developments, particularly the cumulative effects of multiple projects, are not well understood.”

Extracting large volumes of low-quality water will impact on connected surface and groundwater systems, some of which may already be fully or over-allocated, including the Great Artesian Basin and Murray-Darling Basin. [3]

The Enquiry is urged to consider what water consumption at this level would mean for: the arid-zone pastoral industry, for remote communities, and for NT towns - in terms of the reduced number of years that we will be able to access water.

In addition to using a lot of water, unconventional gas extraction can lower the water table by reducing the pressure in adjacent aquifers. [3] The NT Greens recommends that in the uncharted hydrology of the vast NT, this effect could have drastic implications for future viability of human settlements. (Again, while the cited National Water Commission’s report relates to CSG, the point is transferrable.)

Water Contamination, Environmental Impacts and Human Health

Fracking has the potential to introduce contaminants in groundwater by increasing movement between formerly separated geological stratas, and by the introduction of additional chemicals in the fracking process.

The APPEA website dismisses the possibility of contamination, based on the “way wells are constructed.” [4]

This response is reductive and misleading for the following reasons:

- a. fracking changes the permeability between stratas. This can allow naturally occurring toxins to move between strata, poisoning drinking water reserves or escaping into the environment. [3]

From the National Water Commission:

The practice of hydraulic fracturing, or fracking, to increase gas output, has the potential to induce connection and cross-contamination between aquifers, with impacts on groundwater quality.

- b. a recent review of the world’s legacy of gas wells show that well failures allow contamination. More significantly, the existence of aging legacy wells that corrode and fail over time represents an ongoing risk, with costs unable to be recovered from well owners. [5]
- c. contaminated wastewater is stored above ground, and can leak or spill, such as in a recent incident from Santos operations in the Pillaga. (not fracking, but relevant in this case.)

Industry proponents often focus on the fact that some fracking chemicals also have familiar industrial applications – like hydrochloric acid, used in swimming pools.

However, the National Toxics Network, in their submission to the Queensland Inquiry, found that many fracking chemicals commonly used in practice in Australia, have not been assessed by the federal regulator – a typical indication that this industry is progressing too fast for effective regulation. [6]

Human Health

Epidemiological studies – to quantify the claims of communities living close to gas developments in different countries of severe health impacts – are still in progress where gas developments have already taken place, such as the EPA’s Epidemiological Study.

The NT Greens recommend that a precautionary moratorium is the only appropriate response to this remaining uncertainty, for the human settlements across the territory.

Greenhouse impact

As gas from unconventional sources offsets coal use in some energy markets, some proponents claim this has a net carbon benefit.

However, significant evidence, including a recent Harvard University study (cited) suggests that the extent of methane leakage from mining infrastructure, as well as methane release through increased mobility between strata, negates any benefit, and may mean that unconventional gas has an equivalent greenhouse footprint. [5]

Infrastructure leaks have historically been significant, partially due to the increased pressures involved in unconventional techniques, with much infrastructure being designed for conventional gas. These are the types of incidents that adequate monitoring has the potential to address.

However, it has been demonstrated that significant gas can potentially be released through geological changes between strata. This represents a huge uncertainty, and an unmanageable risk.

Therefore the NT Greens urge the NT Government to take Climate Change seriously, and reject an unconventional gas industry.

4. The potential for multiple well pads to reduce or enhance the risks of environmental impacts.

Multiple well pads are likely to multiply associated risks.

This Term of Reference may apply to the potential for horizontal drilling to reduce the number of injection points, which is sometimes claimed to minimise surface impacts.

Alternatively it may apply to the potential benefits of locating well pads close by across a region.

Either way, the NT Greens suggest these considerations of harm minimisation are secondary to the question as to whether fracking represents an acceptable risk for the Territory.

The Greens recommend that a moratorium is appropriate.

7. Effective methods for mitigating potential environmental impacts before, during and after hydraulic fracturing.

a the selection of sites for wells;

b well design, construction, standards, control and operational safety and well integrity rating;

c water use;

d chemical use;

e disposal and treatment of waste water and drilling muds;

f fugitive emissions;

g noise;

h monitoring requirements;

i the use of single or multiple well pads;

j rehabilitation and closure of wells (exploratory and production) including issues associated with corrosion and long term post closure;

k site rehabilitation for areas where hydraulic fracturing activities have occurred.

As stated above, unconventional extraction as it is currently being implemented, should be considered a new industry.

The impacts of fracking are still being established, through continuing research in areas where unconventional gas development has been pursued at a large scale – over the last 15 years.

Therefore, the risk that unconventional gas poses to NT industries, settlements and natural resources can't yet be effectively evaluated. Data emerging over the next five years will address many of these questions – with data on long-term effects continuing to emerge.

The listed questions relating to methods of mitigation, therefore, are secondary to the question of evaluating the overall risk and uncertainty that unconventional gas extraction represents for the Territory.

By email to: hydraulicfracturing.inquiry@nt.gov.au

30th May 2014

References

1. Richard J. Davies et al, *Marine and Petroleum Geology*, 1 March 2014.
2. EPA *Study of the Potential Impacts of Hydraulic Fracturing on Drinking Water Resources: Progress Report* http://www2.epa.gov/sites/production/files/2013-07/documents/webinar20130102_1.pdf, accessed 23 May 2014
3. Warning on purported health risks ignores key facts: APPEA website, 23 May 2014: <http://www.appea.com.au/2014/05/warning-on-purported-health-risks-ignores-key-facts/>
3. National Water Commission Submission to the NSW Inquiry into Coal Seam Gas: <http://www.parliament.nsw.gov.au/prod/parlment/committee.nsf/0/468E8545B4C1FBFDCA257957007CFF53> accessed 23 May 2014
4. Mythbusting APPEA website, . <http://www.appea.com.au/oil-gas-explained/mythbusting/> accessed 23 May 2014
5. Miller, S et al *Anthropogenic emissions of methane in the United States* PNAS 2013 110 (50) 20018-20022; published ahead of print November 25, 2013,
6. *National Toxics Network Submission to the NSW Inquiry into Coal Seam Gas*: <http://www.parliament.nsw.gov.au/prod/parlment/committee.nsf/0/9DC9313F1711608ACA25790D000EA5D1>, Accessed 23 May 2014.