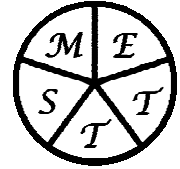


# M.E.T.T.S. Pty. Ltd.

ABN 66 050 710 015

## Consulting Engineers, Resource & Infrastructure Development

Dr. Michael C. Clarke, CPEng., F.I.E.Aust., F.Aus.I.M.M., RPEQ. Managing Director



PO Box 843  
Helensvale, Qld. 4212  
Telephone: (+617) 5502 8093  
<http://www.metts.com.au>  
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Dr Allan Hawke AC  
Commissioner  
Northern Territory Hydraulic Fracturing Inquiry

Dear Dr Hawke,

Fracking with associated drilling and production technologies has heralded in a new petroleum era, with the gas and oil shortages that were considered as inevitable certainties as late as the middle of the last decade, being replaced by surpluses. Since the mid 2000's the world's recoverable gas inventory has been very significantly increased both in terms of total volume and distribution. Oil likewise has had a major increase in recoverable reserves, again with an increase in the distribution of countries that have potentially significant recoverable resources.

### Australia, the Northern Territory and unconventional petroleum resources

Australia has great potential for petroleum production enhanced by fracking and associated technologies. Recently fracking has been approved for the highly prospective Canning Basin, northern Western Australia, petroleum explorers have had success with fracking in the Cooper Basin (South Australia) and a number of petroleum explorers are exploring for potential gas/oil resources in the Territory where fracking will be an essential production technology.

For the Territory, fracking has the potential to make many existing gas and oil plays more productive and thus economically more viable. As to reworking such plays as the central Australian oil and gas fields, conventional field-life extension with fracking of associated strata with non-conventional potential, may bring those fields back into substantial production, and could make the Amadeus Basin, for instance, one of Australia's premier petroleum provinces.

Although the Territory has considerable coal resources, so far that coal has not been associated with recoverable coal seam gas (CSG). There are however many prospective sedimentary basins that have high potential for unconventional gas and oil discoveries and recovery. In short, the NT could become a major world petroleum resource. The question now must be asked, 'does the Territory want involvement in this potential energy resource'? The first environmental question thus becomes, 'does the Territory want the development of a relatively low carbon fuel resource'? If the answer is Yes to both questions, then the question of allowing fracking must be answered in the positive, and a set of 'fracking rules and regulations' created.

### Defining fracking and its applications

1. Fracking can and is used to increase the permeability of shale, tight rocks (such as sandstone and limestone) and coal, and is classified as an UNCONVENTIONAL petroleum recovery method.
2. Fracking is not a new technology, it has been regularly employed since the late 1940s for increasing petroleum flows from oil and gas wells,

3. Fracking is now used in 50 – 60% of CSG boreholes, where the coal structure is opened up to allow for the migration of gas out of the coal (however CSG production is presently likely in the NT),
4. Fracking can be used on ‘tight’ petroleum strata, such as sandstones and limestones with low permeability,
5. Fracking can be used to liberate gas and oil from shale with high Total Organic Content (TOC), say >2% TOC, and
6. Fracking is a lead technology in this **new second petroleum era**.

#### Putting a Greenfields and Brownfields context to the application of fracking and complementary technologies

A greenfields site is taken to be one that at most has only received basic petroleum exploration interest and has not undergone any production activities. It may have some tracks where seismic teams and drillers have entered and carried out exploration activities, but all infrastructure that has been on the site is temporary and portable. Here explorers may have delineated potential resources that were not economically exploitable without fracking and associated technologies.

A brownfields site includes those sites where production has occurred and where exploration for additional resources has been undertaken. These sites will have varying amounts of existing infrastructure (either operational or non-operational) still in place. The ongoing exploration activities may have indicated the potential for the delineation and exploitation of unconventional gas/oil resources. Some of the existing infrastructure such as well-pads, pipelines and gas cleaning plant may have direct use functions for future unconventional petroleum production.

**It is important to differentiate between greenfield and brownfield sites when it comes to understanding Environmental Impacts and Threats, Environmental Mitigation, Water Management and Clean-up Requirements, Monitoring Requirements, and Rehabilitation and Well Closure Requirements.**

M.E.T.T.S. would like to continue this submission to your inquiry under the following broad headings from the ToR:

#### Environmental Impacts and Threats (including Water Use, Management and Clean-up),

The major concern that has been put forward as an immediate environmental factor is spent fracking water management. This has been overplayed, since fracking is not an ongoing activity during gas and oil production, but is limited to the well development phase.

The Inquiry lists ‘sound’ as a factor, however sound is unlikely to be an issue in remote Australia. Seismic activity is however possible from fracking as has been noted by the UK and French governments. The seismic activity from fracking is generally very weak and does not increase the natural seismic activity – note, the NT has significant intra-plate seismic activity with quakes being recorded over 7 on the Richter Scale. These quakes originate at much greater depths than ‘fracking depths’ and thus the two causes of seismic activity are rarely related.

#### Environmental Mitigation,

The water question has been largely resolved with mitigation measures including:

- The increasing use of only non-harmful fracking chemicals and the recovery of those chemicals on fluid that flows back to the surface,
- The ability to utilise saline water in fracking, and where recovered produce a potable or agricultural water from the spent fluids,
- The recovery of residuals from spent fluids including propants and chemicals, and the recycling of those materials,
- The use of appropriate well liners to form a lasting seal with upper aquifers, and
- Good housekeeping of all fluids.

Seismic activity mitigation is achieved by not fracking under populated area and in the regions, informing communities when fracking is about to occur.

#### The use of Single or Multiple Well Pads, and

Multiple well pads are very useful where horizontal fracking is being planned. The technique can access very large volumes of highly prospective strata with high TOCs, especially where the target strata are extensive in area but not thick. Where very thick gas bearing strata is encountered, then vertical multi-stage fracking is more appropriate; this has been successfully practiced in South Australia by SANTOS and its JV partners on the Moomba 191 and 194 shale-gas wells.

The total time involved in drilling a vertical well, vertical fracking that well and moving onto the next well can be considerably less than undertaking horizontal drilling and fracking the those horizontal sections. Since the disturbance to a well site is mainly during the relatively short term drilling and fracking activities, in some cases there will be an environmental advantage in vertical drilling and thence stimulation.

#### Site Rehabilitation.

The exploration and fracking phases of well developments are periods of frantic effort with large amounts of temporary infrastructure being installed around a drilling pad. Once the fracking is complete, spent fracking fluids removed and processed, and the well goes into production, then very little infrastructure remains in, on and around the site. The site can be rehabilitated during the production period, with only a small amount of plant removal and rehabilitation being required on the final well shut-down, in say five to fifteen years.

In areas of conventional exploitation that are being reworked as unconventional plays, the reworking offers the chance to have rehabilitation brought up to the latest standards, this being very useful in brownfield site management. It is suggested that future regulations reflect on whether a site is brownfield or greenfield, take into account the existing state of the site, and that appropriate regulations and operating rules be created by the petroleum authorities (the petroleum inspectorate) for each gas/oilfield.

#### Other

The development of fracking is democratising the World's energy supply (essentially spreading the sources of gas supply) and increasing international energy security and thus promoting environmental well-being, and industrial and future human development. Promoting the regional utilisation of discovered gas (and oil), for example the re-birthing of a Sweetwater type gas-to-liquids (GTL) project in Darwin or elsewhere in the NT, could see the Territory become a source of energy (and fuels) security for Australia. The rapidly changing world gas supply situation, with looming over-supply could see Australia with a surplus, a surplus that does not have a market as LNG. GTL for both domestic and export could be the answer.

To be able to become a world class resource in gas and associated natural gas liquids (NGLs) the NT must allow fracking. Those practicing fracking must have access to industry-best-practice technology (both onshore and offshore) and must quickly become a source of knowledge and expertise on indigenous fracking technologies, practices and applications.

With regards,

Dr. Mike Clarke

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