

Hydraulic Fracturing in Australia's Northern Territory

The past 5 years has seen a massive increase in the number of on-shore companies applying to produce oil and/or gas in Australia's Northern Territory. All of these applications consider the use of hydraulic fracturing during exploration and production phases. Many of these are on land subject to the Aboriginal Land Rights Act, where Aboriginal people hold inalienable title and the right to veto development. Others are on land where Agreements are required to compensate for impingement on traditional and cultural rights. Although the financial benefits from on-shore oil and gas production will be high, Aboriginal people are concerned about serious environmental and cultural impacts that must also be addressed if projects proceed.

This paper primarily describes the concerns that Aboriginal people have with respect to exploration and production of oil and gas from land over which they hold cultural rights. It also describes the measures that are recommended for inclusion in Agreements to ensure maximum environmental and cultural protection can be applied. Although the main focus is on recovery of oil and/or gas from shale, the same principles can be applied to oil and/or gas recovery from coal.

Introduction

The Northern Land Council is one of four statutory bodies (the others being the Central, Tiwi and Anindilyaka Councils) created under the Aboriginal Land Rights (Northern Territory) Act 1976, to administer and manage land held in trust for Aboriginal people in the northern half of Australia's Northern Territory. This Act provides for communal freehold ownership of land in parts of the Territory and carries with it the right to veto industrial development there. Where communal freehold does not exist, the Native Title Act 1993 (which does not carry a veto provision) often applies. Under both Acts, the Northern Land Council is required to ensure free, prior and informed consent is obtained before any agreement is reached with a developer (Smith, 2012).

Funding is derived from the resource industry and a significant part of the Land Council's work requires negotiation of exploration and oil and/or gas production agreements where required. A recent high level of activity by companies seeking to exploit on-shore oil and gas fields has resulted in the need to negotiate a large number of these agreements – nearly all of which consider the use of hydraulic fracturing to recover hydrocarbons from deep-seated shale deposits. These negotiations have taken place against a backdrop of adverse international and national media information has heightened concern about environmental impacts.

Hydraulic fracturing may be defined as a process of creating fissures or fractures in underground formations to allow oil and/or gas to flow. Water, sand and chemical additives are pumped under high pressure (often as high as 8500 psi) to split the rock. Sand acts a 'proppant', keeping the fractures open and allowing the oil and/or gas to flow into the bore and escape to the surface.

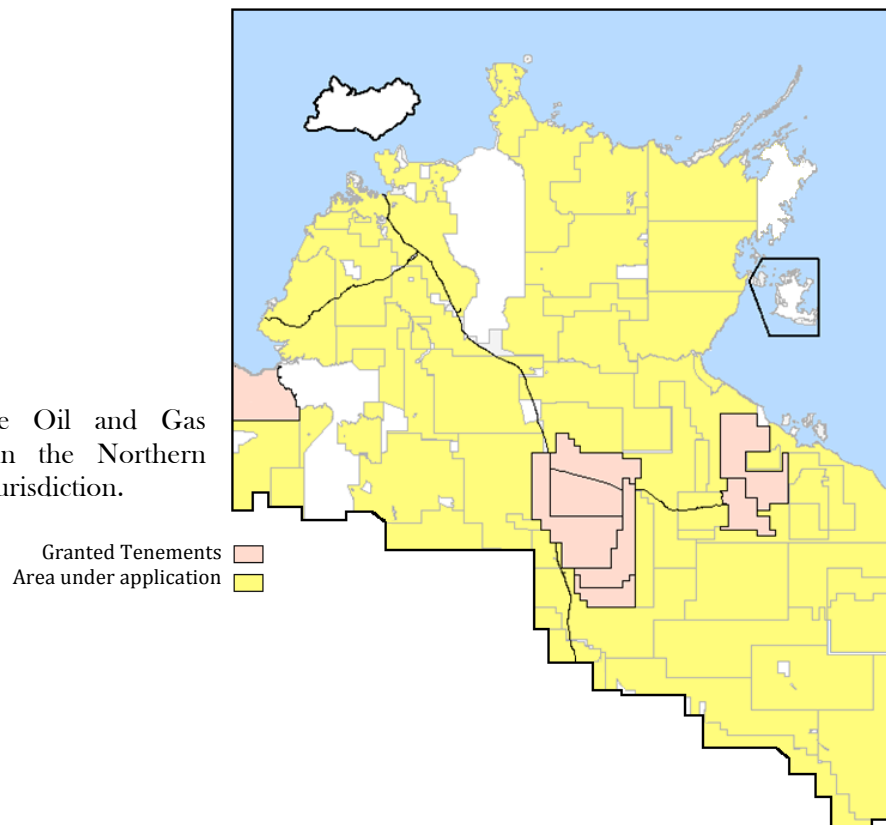
Hydraulic fracturing has been applied to coal seams, shale and other tight sands deposits around the world, but is relatively new and unknown to Aboriginal people in Australia's Northern Territory.

During the course of negotiations, it has become apparent that there are a number of complex issues that must be worked through before Aboriginal people can be comfortable with the horizontal hydraulic fracturing process. This paper briefly outlines those concerns and how they impact upon Aboriginal people under the Northern Land Council's jurisdiction.

Shale Gas in the Northern Land Council's jurisdiction.

Since 2008, there has been a massive upsurge in interest in on-shore oil and gas exploration in the Northern Territory of Australia. Almost all parts of the Northern Land Council's jurisdiction is now covered by applications to explore, however there have been few agreements negotiated and tenements granted (refer Figure 1). Active negotiations currently focus on the areas near Beetaloo Station and Borroloola where the subsurface shales are known to hold significant hydrocarbon potential (Ryder Scott, 2010). Except to the west and north where they rise towards the surface, these shales are also predominantly situated below the region's largest dolomitic/limestone aquifer (refer Figure 2), which supplies potable water to many remote towns and Aboriginal communities of the northern part of the Territory.

Figure 1: Shale Oil and Gas tenements within the Northern Land Council's jurisdiction.



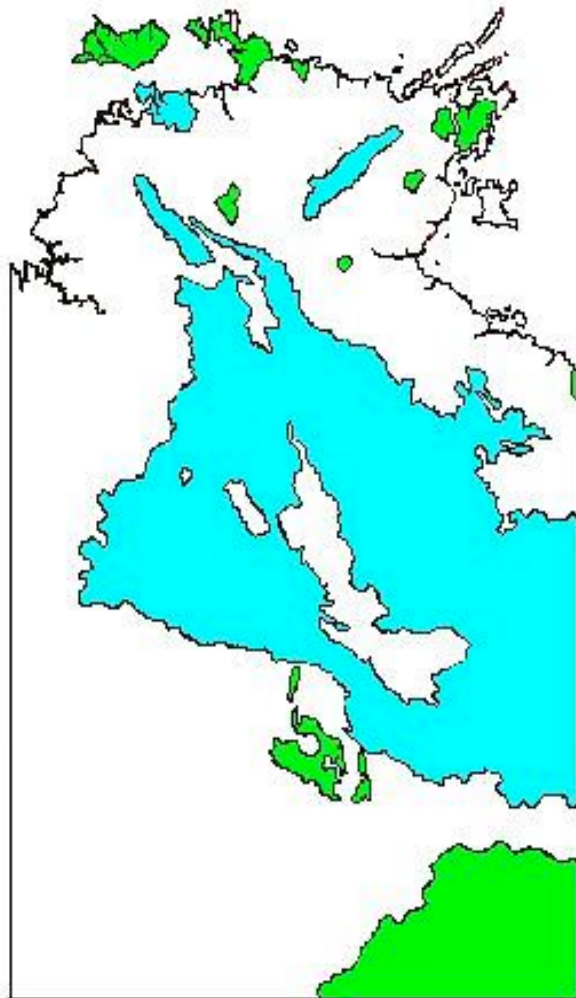


Figure 2: Major aquifers of the Northern Territory.

- Dolomite and Limestone
- Sandstone

Aboriginal concerns with hydraulic fracturing

Cultural and social concerns of Aboriginal people produce an additional layer of complexity with which the Northern Land Council must deal when obtaining free, prior and informed consent.

The most significant concern expressed by Aboriginal people relates to the security and integrity of potable water aquifers essential for survival of people in remote communities. The two most significant aspects relate to drawdown and contamination of aquifers; and in this respect Aboriginal concerns are no different to those of indigenous people around the world. Drawdown and/or contamination of large volumes of water have the potential not only to remove essential drinking supplies, but also lead to loss of species abundance and ultimately, biodiversity and socio-economics at subsistence level. It is recognized that a single well may have minimal environmental impact, but the lingering concerns are:

- that multiple wells will have a cumulative and widespread impact; and
- that once wells are drilled it may not be possible to properly close them forever and that contamination associated with thousands of wells in a single area may have catastrophic consequences that will persist for many generations.

Discussions to date indicate that perceived threats to the sanctity of sacred sites must be considered on a case-by-case basis. Some clan groups have indicated that deep horizontal drilling beneath a sacred site will not impinge upon a site or its value; while others have. The two principal factors to be considered are the depth at which drilling is to occur and the nature and purpose of the site. In general, drilling at depths less than 500-1000m would not be permitted under most sites, however there are a number of sites that hold such great value to Aboriginal spirituality that no subsurface drilling would be permitted at all.

Perceived ownership of oil and gas within the resource represents a distinct social concern. In locations where the right to veto projects apply, adjoining clan groups may disagree on whether horizontal hydraulic fracturing should be used. Extraction of oil and gas from deposits that cross clan boundaries, even well below the surface, could be considered 'theft' from a neighboring group; in a manner that damage to a shared water source could be considered to be an 'assault' or 'attack' (Garr, 2011).

The development of hydraulic fracturing has the potential to allow oil and gas to be recovered from large areas of land that were previously considered unproductive. Where successful, this will create widespread benefits and wealth. A key feature of agreements negotiated by the Northern Land Council is receipt of production royalties, which may amount to billions of dollars annually, on behalf of Aboriginal people. Previous experiences with the inflow of large amounts of cash have made Aboriginal people well aware of the opportunities it presents, but also of the social dysfunction it will cause.

Towards a resolution

The first step towards addressing these concerns was to obtain a better understanding of on-shore oil and gas operations, hydraulic fracturing and how producing fields have impacted upon society in the USA and Canada. The key outcomes of a visit in 2011 (Smith, 2011) suggest that principal environmental impacts were occurring mainly through:

- inconsistencies in the way regulations were being applied;
- inadequate well design;
- ineffective plugging of abandoned wells; and
- undertaking hydraulic fracturing events or disposing of wastewater under pressure close to historic abandoned wells that were not cemented or closed in accordance with modern procedures.

As part of a coordinated approach to addressing these issues, the Northern and Central Land Councils are currently engaged in negotiations with the Northern Territory Government with respect to improving regulation of the on-shore oil and gas industry.

There are two principal aspects to these negotiations. The first is a tightening of regulations that relate to well construction and integrity; while the second relates to performance of a regional impact assessment that focuses on all aspects of on-shore oil and gas exploration and production – but with the security and integrity of water at its core. Consideration is being given to developing a set of regulations modeled on those currently in use in North Dakota.

Environmental and Cultural protection are key aspects of exploration and production agreements between the Northern Land Council and Oil and Gas companies. A number of expectations related to well integrity and construction have been implemented in the more recent agreements. These seek to improve upon current best practice while remaining consistent with negotiations over legislation. They promote good operations and are acceptable to the major companies. Expectations include:

- Baseline water monitoring and assessment prior to construction;
- Third party (independent) assessment and certification of well construction;
- Construction and cementing of the well casing to a point well beyond the bottom reach of the aquifer; and
- Cement bond-logging during construction, periodically throughout operations and immediately prior to abandonment.

There are few historic oil and gas exploration holes within the Northern Land Council's jurisdiction, making this a matter of little present consequence.

Sacred sites are protected by application of Federal and Territory Legislation. However, problems associated with extraction of oil and gas from beneath neighbouring clan lands where the veto has been applied is a matter still to be resolved. It would be possible to resolve this by limiting the lengths of the horizontal drill lines to ensure they stay within the specified boundaries; but this may be difficult to negotiate with companies because it has the potential to sterilize part of the resource.

The Northern Land Council's own greatest concern is dealing with the benefits expected to flow into communities. Careful thought and consideration is being given to how to best utilize the cash for infrastructure development; and how to create systems of education and employment that guarantee long-term and meaningful employment within the industry for local Aboriginal people. However, there is still a long way to go.

References

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