Shale Gas Extraction in WA

A guide for Traditional Owners

Yamatji Marlpa
ABORIGINAL CORPORATION
Country is our mother, our provider and keeper of our cultural belongings
Introduction

Western Australia potentially has huge resources of shale gas in the Kimberley, East Pilbara and Midwest regions. Right now these resources are in the prospective, or exploration stages. The Department of Mines and Petroleum (DMP) estimates that significant commercial production of shale gas may start around 2020 or 2025. It is important that Traditional Owners have an understanding of what this will mean for their country, and have some knowledge about the potential risks and safeguards available so they can enter into negotiations with shale gas companies with confidence.

Western Australia is estimated to contain 280 trillion cubic feet (tcf) of potential shale and tight gas resources, or around 550 times the amount of gas the State uses every year. The amount of shale gas in WA is estimated to be double the amount of gas held in the WA’s offshore conventional gas fields.

Why has YMAC produced this booklet?

Yamatji Marlpa Aboriginal Corporation (YMAC) represents native title groups in the Pilbara, Murchison and Gascoyne regions of Western Australia. There are currently some exploration projects for shale gas in these regions and are likely to be more in the future, possibly leading to full-scale production.

YMAC is not for or against shale gas extraction. Our role is to make sure Traditional Owners are professionally represented, that native title rights are protected, and that communities are able to make fully informed decisions on matters affecting their native title rights.

Shale gas extraction and its methods have gained a lot of attention in the community and in the media, and have already generated a lot of controversy. This booklet gives some basic information to use as a starting point to become fully informed about shale gas extraction and hydraulic fracture stimulation, also commonly known as fracking (also spelled “fraccing”).

1 US Energy Information Administration and Department of Mines and Petroleum (WA)
What is Shale Gas?

Shale gas is a form of natural gas trapped deep underground in shale rock formations. Natural gas that is trapped in complex, non-porous rock formations is called “unconventional gas”. Other types of unconventional gas are coal seam gas and tight gas.

Shale formations are fine-grained sedimentary rocks found onshore that are rich in petroleum and natural gas, and usually occur at depths of 1.5km or more underground.

How is Shale Gas extracted? What is hydraulic fracturing?

Shale gas is usually found at depths of 1.5km to 5km below the surface, and is trapped inside the rock. Usually the well is drilled down vertically until it reaches the shale formation, and then it turns and goes out horizontally to access more of the shale.

In order to free the gas from the rock, a process called hydraulic fracture stimulation, or fracking (also spelled fraccing), is used. Hydraulic fracture stimulation involves sending water mixed with chemicals down a pipe at high pressure to create cracks in the rock. These cracks allow the gas to flow out of the rock, to the well and back up to the surface.
Where is Shale Gas found in WA?

Shale gas reserves in WA can potentially be found in three main basins: the Canning Basin, the Southern Carnarvon Basin, and the Perth Basin.
What chemicals are used in fracking?

Water and sand make up about 99% of the fracking fluid. Sand is used in the water mixture to hold the cracks open. Other chemicals, which make up about 1% of the fracking fluid, are used to reduce friction, prevent corrosion, prevent bacteria and other purposes.

All of the chemicals used must be approved by the Department of Mines and Petroleum as part of the environment plan which, once approved, are listed on the Department’s website. Some of the most dangerous and highly publicised chemicals used in fracking in the United States are not allowed to be used in Australia.

The chemicals used in fracking fluid are used in very small amounts when mixed with the sand and water. They pose a bigger threat in a concentrated form, before they are mixed with the water, when they are transported and stored onsite. Spills of these chemicals in their concentrated form could be very damaging to the environment, so it is very important that companies are very careful with how they transport and store chemicals and have a plan in place in the event of a spill.

How is Shale Gas different to Coal Seam Gas?

Coal seam gas has gathered a lot of media attention in recent years, due to community concern and campaigns. Coal seam gas is found much closer to the surface than shale gas (see diagram on page 2), and because of that, can present greater risks to groundwater. There is a risk when fracking coal seams that a fracture may cause gas and fracking fluids to contaminate the water. There is almost no risk of this happening with shale gas because the shale formations are so far below the surface, between 1.5km and 5km.

Coal seam gas production sometimes uses fracking and sometimes does not, while shale gas extraction almost always uses fracking.

There is also a big difference in the role of water in the two different processes. Coal seam gas production requires a technique called ‘dewatering’, where water is pumped out of the ground as part of the process of accessing the gas, and then processed at the surface. To access shale gas, water is pumped into the well but existing groundwater is not removed. In fact, where a well is constructed properly, according to approved plans and standards, the fracking water and ground water are not in contact with each other.

There is current production of coal seam gas in Queensland and New South Wales, but none so far in WA. There are currently no commercial coal seam gas reserves in WA but some companies are looking to drill in prospective areas.
What effect does Shale Gas extraction have on Country?
What is the footprint?

The average amount of land that needs to be cleared for each well site is about 1.5-2 hectares (a hectare is about the size of a rugby field). Multiple wells can be drilled from one well site, so they can be spread out, with approximately one drill site per 225 hectares. Each well site also needs an access track.

Once the fracking is finished, most of the equipment is removed from the site. Usually sealed valves about 2 metres high will remain, connected to pipelines running beside access tracks (which may or may not be buried).


Department of Mines and Petroleum
A shale gas project can affect the local habitat and wildlife and make it difficult or impossible for Traditional Owners to access parts of Country for camping, fishing, hunting, or ceremonies. Increased traffic, people and noise can also affect Traditional Owners’ use of the land. Depending on where a project is, and how big it is, fly-in, fly-out or temporary workers may be employed, which has social impacts on an area.
How much water does a Shale Gas project use?

Shale gas extraction projects use a lot of water. CSIRO estimates that between 5 and 25 million litres of water are used per well, and a project may have many wells.

The water used does not necessarily need to be fresh water. There is a potential for seawater or brackish water to be used, and it is possible to reuse 'produced' water (water that has been pumped down the well and come back up).

It is important for Traditional Owners to discuss a company’s plans for water use, including where the water will come from and how much will be used, and where the recycled water will be stored and processed early in the negotiation stages.

What happens when the project is finished?

A shale gas well may produce gas for a few years or for decades. Once it is finished, the company must seal the well and rehabilitate the site. By law the company is responsible for the rehabilitated site for 20 years. However, Traditional Owners may want to include in any land access agreements a requirement for the company to take responsibility for much longer than that.
How safe is it? What are the risks?

Some of the biggest risks around shale gas extraction have to do with storage and transport of chemicals and waste water. The chemicals used in the fracking fluid that is pumped underground are mixed with large amounts of water so they become diluted. However before the chemicals are mixed they need to be transported and stored at the well site in a concentrated form. This can pose a risk if the company does not store them securely enough or does not have an adequate plan in place in the event of a spill.

There are several different ways that waste water can be stored after it has been pumped into the well. Some types of storage systems like containment ponds pose a risk if they overflow, for example if there is heavy rain or flooding. The risk of contamination from waste water spills can be reduced if the company uses a storage system that is closed on top.

Other risks can arise if the wells are poorly constructed. If a well leaks it can cause damage to the environment and contaminate ground water. It is essential that companies use best practice and follow all safety and quality guidelines in constructing the wells to make sure they are safe.

There is also a low risk that projects using fracking can lead to small earthquakes. There have been some documented cases of this happening overseas, although most of these are too small to be felt by humans. This risk is also present with dams and reservoirs, geothermal energy projects, and some mining operations.
How can the risks be reduced?

The risks involved in shale gas extraction can all be reduced if a company uses ‘world’s best practice’ standards at all times. ‘World’s best practice’ means the highest standards of quality and safety at the time, and this is constantly changing and improving.

Some of the ways a company can reduce risks and potential harm to country are:

• Using a closed storage tank or bladder to store contaminated water, instead of an open storage pond
• Having a comprehensive plan in case of a surface chemical spill
• Recycling used water
• Well tests by an independent party

Traditional Owners can ask for an independent assessment and monitoring of the well as part of the native title land access agreement. This will make sure that the company has followed its own plans and has built the well to the highest standards.

Who is responsible for making sure shale gas projects are conducted properly and safely?

The WA Department of Mines and Petroleum is the lead agency that regulates shale gas extraction. It is responsible for assessing work programs, well management plans, safety management systems, environmental plans, and issuing permits, among other things.

Other state government departments are also involved in different aspects and approvals processes, including the Department of Environment Regulation, Department of Water, Environmental Protection Authority, Department of Aboriginal Affairs, and others.

If a native title group signs an agreement with a company, the company is also responsible to the native title group for whatever is detailed in the agreement.
What Traditional Owners can do to protect their Country

As with other forms of resource extraction, native title holders do not have a right to stop shale gas projects going ahead on their Country. However, like other mining projects, if it is on land subject to native title, the native title party has the Right to Negotiate. This guarantees Traditional Owners a seat at the negotiating table, but if an agreement cannot be reached after six months, the company may apply to have the lease granted without an agreement.

The Right to Negotiate gives Traditional Owners a chance to voice their concerns and priorities for a project. It gives the opportunity to ask that certain safety, water-use and monitoring standards are included in the agreement, as well as things like heritage site protection, financial benefits and training and employment opportunities.

Traditional Owners can ask that the agreement include an independent qualified party to assess and monitor the safety of the wells and water storage system. This is strongly recommended.

What is YMAC doing about prospective shale gas projects?

In 2014 YMAC legal staff met with some of Australia’s leading experts on unconventional gas extraction and the legal framework around it. Claim lawyers are continuing to educate themselves about the issues discussed here in order to give the best possible representation to native title groups facing negotiations with shale gas companies.

If you would like more information about the issues discussed in this booklet, or to speak to your YMAC claim lawyer, contact your nearest YMAC office on 1 300 7 12345.
For more information

The Commonwealth Scientific and Industrial Research Organisation (CSIRO):  

The Department of Mines and Petroleum:  

Gas Industry Social and Environmental Research Alliance (GISERA):  

YMAC particularly recommends CSIRO’s short video to give a basic understanding of how shale gas extraction works:  

Shale Gas Resources in Western Australia: An Assessment of the Legal Framework for the Extraction of Onshore Shale Gas, by Dr Tina Hunter:  


Disclaimer: YMAC does not advocate for or against shale gas exploration or the use of hydraulic fracturing. The information in this booklet is correct at the time of printing in 2015. The information contained in this document is not legal advice.

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