FRACKING IN NORTH LEITRIM, WHAT'S THE STORY?

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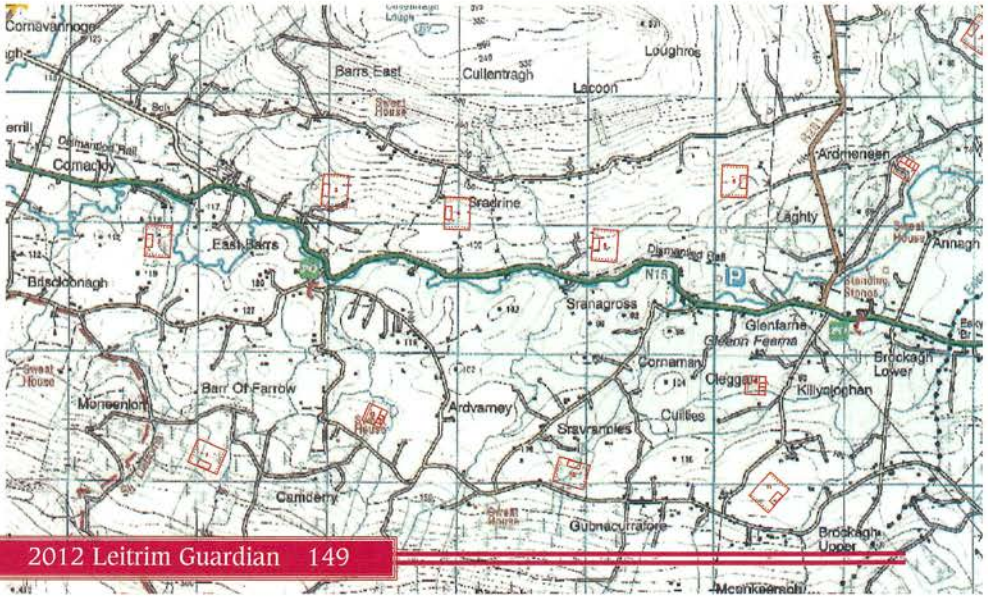
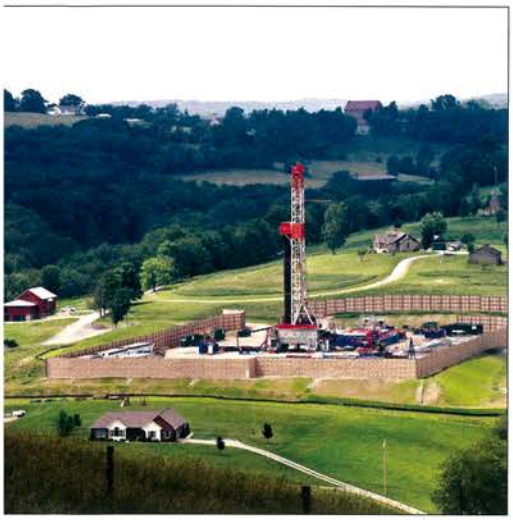
DEEP UNDER the soils of Leitrim, West Cavan, Fermanagh, and extending into parts of Monaghan, Sligo, Donegal and Roscommon lies the Northwest Carboniferous Basin. Layers of shale rock formed from clay and organic material, millions of years ago are now the focus of exploration companies seeking to extract gas from the rock. The presence of gas in this area has long been known with sporadic well drilling over the last fifty years. All the wells drilled produced some gas but the quantities produced were deemed to be too little for commercial extraction. The reason for this is simple, as the gas in this area is known in the industry as 'unconventional gas' or as a 'tight gas play'. The gas itself is conventional methane but how it is trapped in the rock is unconventional. Instead of a reservoir of gas under an impermeable layer of rock, the gas is held in tiny bubbles in the shale itself. Thus, when a well was drilled it released the gas where the rock was broken by the drill. However, this gas was soon exhausted and the prospectors went home empty-handed.

What has changed?

How come there is a new focus on this area? There have been several major changes over the last decade. Probably the most significant change is horizontal drilling, the ability to turn the drill head through 90 degrees and drill up to a kilometre horizontally through the shale layer, this has allowed exposure to much greater areas of shale rock from one well. The second development has been the use of hydraulic fracturing or fracking in these wells. The combination of these two techniques has only been around for about 10 years, so the long term effects of large scale fracking has yet to be properly assessed. Exempted from clean air and water legislation by the Bush administration, there has been an explosion of this type of drilling activity in the USA. Closer to home, in the





dying days of the last Fianna Fail government, options licenses were issued to two companies for the Northwest Carboniferous Basin.

Back in the USA things in the gas producing areas were far from rosy, with reports of serious environmental degradation, air and water pollution, earthquakes and stories of peoples' water becoming flammable, surely this couldn't be true? Along came Josh Fox and the film Gasland, and the bad news began to spread. 'It wasn't us' said Big Gas,'it was like this before we arrived here'.

So when the news spread to rural Leitrim that the gas companies were on the way there was a mixed reaction. Obviously the hope of employment and maybe some economic rejuvenation in an area that had suffered more than most from the ravages of the Celtic Tiger but also deep concern about the possible detrimental effects of hydraulic fracturing on one of the last unspoiled areas in western Europe.

So what is 'fracking'?

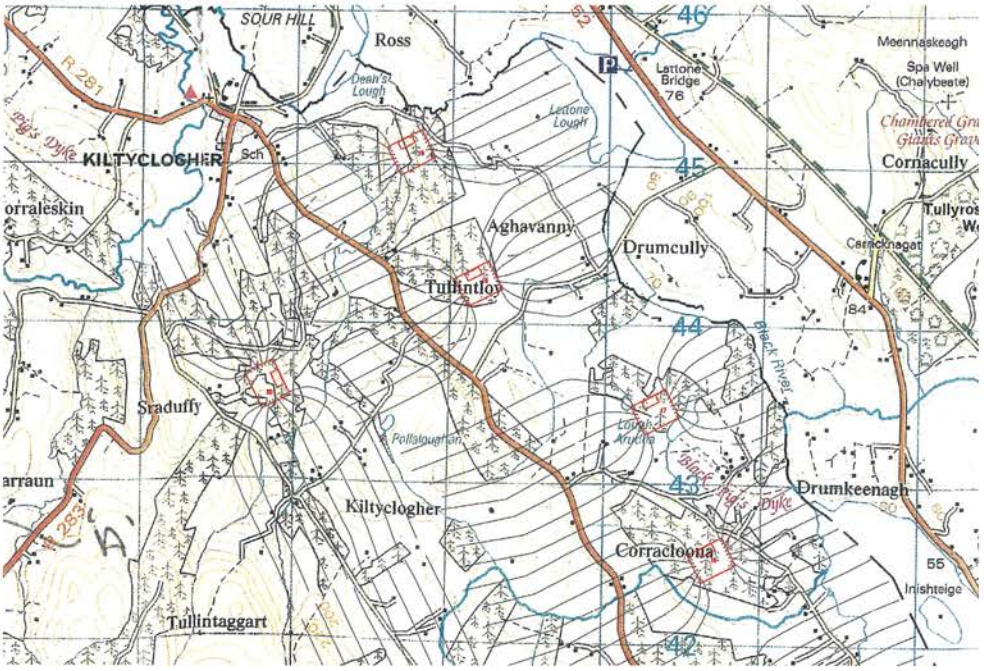
Fracking is technique to extract the tight gas from the shale rock. After the horizontal well has been drilled it is lined with steel and cement. An explosive gun, called a perforating gun, is put down the well, when detonated it makes small holes in the well casing and caused minor cracks in the surrounding rock. The next process is the actual hydraulic fracturing or fracking. A cocktail of water sand and chemicals is pumped into the well under enough pressure to cause fractures to spread through the layer of shale rock. The cocktail consists of about 95% water approximately 4.5% sand or proppant and somewhere between 0.2% and 0.5% chemicals. The water does all the work, the sand is there to prop the fractures open, (hence proppant), and allow the gas to escape from the shale layer and flow back up the well.The chemical mix is specific to each well and can consist of thing like gelling agents, friction reducers, biocides, anti-corrosives, the list goes on, in the USA over 500 different chemicals have been used in fracking fluid. Between 0.2% to 0.5% of chemicals doesn't sound too bad, less than 1%, can't do too much harm can it? However when you consider that it takes millions of gallons of water to frack a single well, that small percentage looks a lot more significant, for example a well

using 3 million gallons of water and 0.3% chemicals to frack it would have over 40 tonnes of chemicals involved which equates to two articulated truck-loads of chemicals travelling the roads of Leitrim for each well.

So what are the concerns relating to fracking?

For a while, the main concern seemed to be the chemical use in the fracking fluid mentioned above.However, a closer examination of this process reveals a host of concerns, and it is possible that every stage of this process has significant risks associated with it. One of the companies that holds a license for North Leitrim has promised to carry out chemical-free fracking but chemical-free fracking has never been carried out anywhere in the world. Professor Anthony Ingraffea from Cornell University (a world expert on fracking) says fracking cannot be carried out without a cocktail of chemicals. The same company promised to make a submission to the

Commission for Energy Regulation in Ireland, asking them to put a regulation in place to ban chemicals for fracking. yet when the deadline for the submission passed they admitted that they had changed their mind and that they had confidence in the Irish Regulator to do the right thing.



Scale of the Project

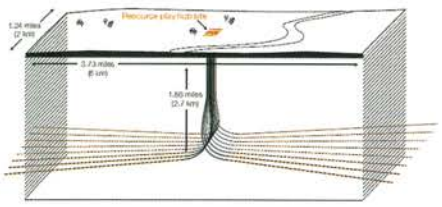
Firstly look at the scale of the project: the gas companies are planning a drilling pad every two kilometres, and each drilling pad will consume five to twelve acres and will have between 8 and 16 wells drilled on it. There will also be water collection tanks, ponds for storing produced water (more about this later), as well as an area to contain drilling tailings. Each pad will have to have road access for heavy truck traffic. These areas will be cleared of topsoil and will be covered in crushed stone to create a work area. Burying 5 acres to the depth of 1 metre in crushed stone would require approximately 2500 truck journeys alone. Additional truck journeys would be needed to construct roads, create concrete bunds etc., so construction of a small pad would probably entail close to 3000 truck journeys before a single hole could be drilled yet. The gas companies are talking about 100 pads in North Leitrim, with construction of 10 to 12 pads per year at peak times.

Potential Risks

Potential risks from this activity include air pollution from all the diesel burned during truck journeys, and high levels of diesel fumes in the presence of sunlight are known to cause ozone production. The water contamination from pad construction too, (remember the landslides during wind farm construction?), alongside huge traffic, wrecking local roads combine to raise the human health and safety risk from accidents.

Secondly, the drilling process itself. Drilling requires drilling muds to lubricate and cool the drill bit and to remove the rock chips from the well. Drilling muds contain a variety of chemicals and, depending on the nature of the rock layers that the drill bit passes through, more substances can contaminate the drilling muds. Some of these substances include naturally occurring radioactive compounds that cause radon gas, and the gas bearing shale rock can have high levels of salts and toxic compounds such as aliphatic hydrocarbons, and benzene, toluene. A small pad could easily produce 7000 tonnes of drilling tailings that need to be safely disposed of. Potential risks of drilling are risks of water and soil contamination with long term exposure to these compounds associated with significant human health risks. There is also a risks of drilling mud contaminating the aquifers, (aquifers are underground water sources that supply springs and domestic wells) as the well is drilled through the water bearing area. There are also reports of aquifers becoming contaminated with methane prior to the well being lined. Methane dissolved in water can be ignited as the water comes out of the tap and has caused serious problems in some areas in the USA.

Thirdly the fracking process. Fracking a single well can take up to three days, with arrays of high powered diesel pumps running continuously, so a sixteen well pad could take up to



50 days to frack. After the well has been fracked the pressure of released gas will force some of the fracking fluid back up the well, up to 50% of this fluid can be regurgitated,and the gas industry call this fluid 'produced water'. Produced water contains the original fracking chemicals but will also pick up the same substances discussed in the drilling section above. Produced water is regularly stored in open ponds, leading to possibility of water and soil pollution should there be any leakage from these ponds.

Fourthly the gas production phase. The gas will need to be scrubbed and have water condensed from it on site, yet another batch of contaminated water to be dealt with.

Finally the well, having reached the end of its productive life, will have to be decommissioned. Bringing these industrial sites back to where they are now will be a major challenge. The mining tailings ponds in Silvermines in Tipperary are still causing major problems thirty years after the mines have ceased production. There is a risk of the well casing deteriorating over time allowing methane to leak into aquifers. Once the lease has expired who will carry the long term responsibility for the drilling site? Should the well cause pollution after the lease has expired will the owner of the land be responsible for pollution caused,and for rehabilitation of the site?

A major European Commission study highlighted several other concerns, including the lack of a regulatory framework for this process and the fact that gas produced by this process is equivalent to coal in terms of carbon emissions. (Directorate General for Internal Policies. Economic and Scientific Policy. Impacts of shale gas and shale oil on the environment and on human health, 2011)

Who Benefits?

So much for the problems related to this process. What benefits will it bring to the country at large, and to North Leitrim in particular?

The main beneficiaries of this process will be the gas companies extracting the gas and selling into an energy hungry market. Other parties will profit from the leasing of land to the gas companies for extraction activities, Coillte, the major landowner in the Northwest, will

be an obvious target for the gas companies and could potentially be another big earner.

The government will benefit from a 25% tax on profits generated by the gas companies, but given the massive expense required to bring the gas into production, these taxes are unlikely to bring a swift end to our economic woes. There will also be some benefit to the national exchequer from tax revenues generated by economic activity during the construction phases. However, the loss of up to 7% of the methane, a very potent greenhouse gas, during drilling and extraction brings the possibility of billion euro carbon taxes further reducing any benefit to the State.

The gas companies argue that this gas will increase Ireland's energy security; however the gas will belong to the gas companies and will be sold on the open market to the highest bidder. There is no agreement between the Irish Government and the gas companies to sell gas to Ireland at favourable rates, or even to ensure that Ireland has first call on gas produced here. There is a gas inter-connector in place which allows transmission of gas to the UK and European market, so the gas will be transferred to the

country paying the highest price. Locally there would probably be some short term benefit with increased activity in the construction and quarrying areas but again this activity would be relatively short lived and would not be sustainable. Long term employment in the gas industry is likely to be insignificant with small numbers employed maintaining production facilities.

In the Northwest, especially in the current economic environment, the challenge of providing long term sustainable employment is a major issue. The two areas that show most promise in terms of employment, namely ecotourism and agriculture, are the most likely industries to be adversely affected by this industrial process. As a veterinary surgeon, with a deep connection to this area where I have settled down, and now call Home, I have serious concerns about the extraction of gas by fracking in this area. I see everyday, the devastation that the unregulated building boom caused in this area. I recognise the need

the need to find a way to sustain people here in the Northwest on the land, and in their local communities. However, I believe that the risks associated with fracking, which is still in its infancy, are too great to bear. In particular, one should measure these risks against the potential employment and economic viability of agriculture (farming incomes have actually grown in the wake of the death of the Celtic Tiger) and the huge potential that has been shown internationally in investing in eco-tourism. This issue has brought together communities across the area, both those who have lived here for generations and more recent settlers who have adopted the north west as their home, to oppose fracking. As well as the opposition to fracking there is a clear recognition among the groups involved, that there is a need to promote something positive. To further this, groups are looking at ways to identify and promote all the positives that this area has to offer e.g. the number of organic farmers, artists, and craftspeople that live here, the dramatic unspoiled environment, and to identify how these strengths can be developed to help provide sustainable employment.

Conclusion

To conclude, the Northwest now faces the possibility of hydraulic fracturing for gas. This process has been very controversial in other countries and has had significant negative environmental impact in some regions. As a wider community we need to ask ourselves the following questions. Are we happy to be subjected to another unregulated activity that has the the potential to cause long term environmental damage to this beautiful region? Do we believe the claims of the gas companies that this process, which is still in its infancy and has been proven to cause serious environmental damage and small earthquakes in other countries, will be safe here? Are we happy to believe the claims of our government that this process will be adequately supervised when the EU states that this process is so novel that it falls outside the scope of current legislation and the Commission for Energy Regulation have stated that they do not have the expertise to regulate it? Are we happy to accept the long term risks to our environment and health while the benefits are accrued elsewhere? With the high level of renewable energy harvested in Leitrim we are more than playing our part in the national energy picture so why should this area carry all of the risk while big energy companies benefit? This gas has been trapped in the shale rock for millions of years; why not let it remain there for future generations until a safe method of extraction has been developed?

For those who may want some further information I have found the following website useful: www.frackingfreeireland.org

There may also be a group operating in your local area on the issue of fracking and its impact, which will also provide a good source of information.