



for a living planet

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WWF Northern Ireland briefing on shale gas exploration and hydraulic fracturing

The natural gas contained within shale rocks (referred to as shale gas) is normally accessed by the drilling of vertical wells and subsequent horizontal wells, into which certain chemicals, sand and water under very high pressure, is pumped, hydraulically fracturing (or fracking) the rock and releasing the gas.

In 2011, an Australian company, Tamboran was granted a five petroleum exploration licence, which amongst other things, allows for desk top research, seismic and magnetic surveying, and the drilling of shallow (200-300 metres deep) cored boreholes and of exploration wells, though, as WWF Northern Ireland understands it, no drilling can take place without obtaining further planning permission.

The potential for shale gas exploration and exploitation in Northern Ireland has generated a lot of attention and in December 2011 the Northern Ireland Assembly passed a motion calling for a moratorium to be placed on the onshore and offshore exploration, development and production of shale gas at least until the publication of a detailed environmental impact assessment into the practice and noted that hydraulic fracturing can put local water sources at risk of contamination⁽¹⁾. A number of counties in Ireland, including Donegal and Sligo, have banned fracking, as has France and Bulgaria⁽²⁾ and **WWF Northern Ireland is opposed to the production of shale gas in Northern Ireland.**

There is evidence that there are a number of serious environmental and health risks associated with shale gas production, the most serious of which is the potential for contamination of groundwater sources, currently the subject of a US Environmental Protection Agency enquiry. The US EPA investigated ground water quality in Wyoming and the EPA's analysis indicates the detection of synthetic chemicals consistent with gas production and hydraulic fracturing fluids, as well as high methane levels in the aquifer⁽³⁾. Other notable environmental concerns include greenhouse gas emissions, air pollution, spillage of hazardous substances, treatment and disposal of waste water, water consumption, noise and traffic.

Greenhouse gas emissions

According to researchers at Cornell University, New York, over the lifetime of the wells, due to venting and leaks, the methane emissions of shale gas are at least 30% more than, and perhaps more than twice as great as, those from conventional gas and the greenhouse gas (GHG) footprint of shale gas is at least 20% greater than and perhaps more than twice as great as coal⁽⁴⁾. WWF Northern Ireland believes exploiting shale gas in Northern Ireland would be incompatible with the target in the draft 2011-15 Programme for Government to reduce GHG emissions by 35% by 2020.

Water demand

According to Tamboran, the proposed fracking process will require the consumption of over five and three quarter million (5,760,000) gallons of water per well, with six trucks each pumping 2,000 gallons per minute of high pressure water into a well for an eight hour period (120,000 gallons of water per hour x 8 hours x 6 trucks). While between 30% and 50% of the water used in fracking normally flows back up to the surface and is then available for reuse, this means up to two and three quarter million gallons of virgin water will be required for each well, and with an anticipated eight hundred wells in the Fermanagh and Leitrim area alone, the water demand for this process could be over four billion gallons of water. WWF Northern Ireland is concerned that Tamboran may turn to the Fermanagh lakes and/or groundwater to supply some of this demand for water.



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There is also the issue of the contamination of the water used in the fracking by salts, heavy metals and other substances that lie deep underground, and given that much of the water then comes back up to the surface, this is in effect bringing up contaminants from underground to the surface - and the question remains as to how will these be dealt with.

Water pollution

Researchers from Duke University, North Carolina ⁽⁵⁾ documented

“systematic evidence for methane contamination of drinking water associated with shale gas extraction”

and found

“average and maximum methane concentrations in drinking water wells increased with proximity to the nearest gas well”

In some cases the concentrations of methane found were *“a potential explosion hazard”*

A report by the Tyndall Centre⁽⁶⁾ concluded that

“Evidence from the US suggests shale gas extraction brings a significant risk of ground and surface water contamination”

Anthony Ingraffea, professor of civil and environmental engineering at Cornell University referring to the potential for the contamination of groundwater even when well above the level of fracking, said

“it is possible that the fracking process could open up a pathway upwards to freshwater...it is not right to say that thousands of feet of impermeable rock between where the shale formation is fracked and points higher up prevents such an occurrence”. ⁽⁷⁾

Protected areas

The risks posed by high levels of abstraction and of contamination of freshwater, even if it is well above the level of the fracking, are a concern for WWF Northern Ireland, given the limestone geology in the Fermanagh/Leitrim area, which has given rise to, amongst other things the transnational Marble Arch Caves geopark. Fracking could have potentially negative impacts on the Fermanagh lakelands and other sites such as Lough Melvin Special Area of Conservation (SAC), which is home to three unique (sub)species of trout - Sonaghan, Gillaroo and Ferox - as well as rare species such as Arctic Charr.

Other

The fracking operations in Lancashire were found to have caused small earthquakes⁽⁸⁾ and though the crust around North West Ireland is generally stable, a small earthquake was reported in Donegal in January 2012⁽⁹⁾, so the risk of ground movement caused by fracking should be considered.

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