

The Fracking Controversy: Can Environmental Concerns be Resolved?

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Abstract

To satisfy long-term global demand for energy from fossil fuels, the energy industry continues to develop better and more efficient drilling techniques to enhance oil and gas production. Fracking, or hydraulic fracturing, involves a combination of technologies that are very effective at capturing oil and gas trapped in shale formations, not possible with traditional vertical drilling methods. Fracking has enjoyed a boom across the US and other energy-producing nations over the last decade, but has simultaneously created an emerging environmental controversy involving a wide range of issues such as ground water contamination, surface chemical spills, and the excessive use of scarce water supplies, as well as earthquakes and methane gas releases. This paper examines the public health and environmental science aspects of fracking, as well as potential solutions to the emerging problems.

Keywords: environment, pollution, fracking, fossil fuels

1. Introduction

To satisfy insatiable global demand for energy from fossil fuels, the energy industry continues to develop better and more efficient drilling techniques to enhance oil and gas production. Fracking, or hydraulic fracturing, involves a combination of new technologies that are very effective at capturing oil and gas trapped in shale formations, not possible with traditional vertical drilling methods. Fracking has enjoyed a boom across the US and other energy-producing nations over the last decade, however, this technique is at the center of an emerging controversy involving environmental science. While hydraulic fracturing is seen by some as an important part of a viable short-medium term solution to the world's energy needs, others see it as a significant environmental risk. Fracking necessitates pumping millions of gallons of water, sand, and toxic chemicals into holes drilled in the earth's surface, reinvigorating geological formations that were previously considered depleted or unreachable. Fracking is being used to open up reservoirs that scientists/geologists previously considered unusable. However, the technique necessitates use of 'fracking fluids' which in turn then leads to the necessity of disposal when it comes back to the surface. The disposal of these fluids is most often accomplished by re-injecting them back into the earth. (Carvalho 2007). Fracking has therefore led to ever-increasing environmental concerns on a wide range of issues including ground water contamination, surface chemical spills, and the excessive use of scarce water supplies, as well as earthquakes and methane gas releases. (Stanberry 2016).

2. Studies Find Evidence of Environmental Risks

The process of hydraulic fracturing injects known toxic chemicals, (including arsenic, barium, boric acid, chromium, hydrochloric acid, lead, and methanol) mixed with water and sand, into the ground both during the drilling process and in the waste disposal process. This results in increased risks of contaminating underground water supplies as well the surrounding surface land and ponds, thus creating potential hazards for humans and livestock. (Coman 2012).

Fracking also often emits significant quantities of toxins into the air, such as methane gas, which can be harmful to humans. (Compendium 2016). “Oil and gas hydraulic fracturing well sites have been found to allow releases of cancer-causing chemicals into the air, and this is a very significant public health risk,” says David Carpenter, director at the University at Albany-State University of New York’s Institute for Health and the Environment. Carpenter was the lead author of the study, in the *Journal of Environmental Health*. (Compendium 2016). In his study, Dr. Carpenter found a variety of toxic chemicals at or near drilling sites in multiple states, and the chemical levels significantly exceeded the recommended federal limits. The toxic chemicals which have been found include benzene, formaldehyde, and hydrogen sulfide, all of which can cause significant health problems. (Compendium 2016). The general adverse health effects of living close to an oil or gas well fracking site has also been documented by researchers at Yale and the University of Washington, which found residents within a mile of a well had twice the number of health problems as those living more than a mile from a well site. (Compendium 2016).

3. Non-Disclosure of Drilling Chemicals is a Concern

There is generally widespread agreement that drilling and oilfield service companies should be transparent and disclose what toxic chemicals are being used and disposed of in the fracking process. However, to date many companies often refuse to disclose everything, claiming protection of proprietary trade secrets. At least ten percent of the hundreds of different chemicals they use during fracturing or drilling are still a secret, according to a new analysis by the Environmental Protection Agency. (EPA Analysis 2017). Chemical transparency is an ethical responsibility that all oil and gas companies should embrace, and if they do not, government regulation should mandate such disclosure. The EPA’s assessment of approximately 50,000 company reports from the website FracFocus (<https://fracfocus.org/>) about the chemical composition of drilling fluids, indicates that in about $\frac{3}{4}$ of all reports, at least one chemical was identified as a secret or confidential business information so that consumers would not know what it is. (EPA Analysis 2017). FracFocus is the website where companies post information about the drilling fluids used during fracking, which uses a combination of water, chemicals, and sand. The EPA conducted an analysis of the reports that companies filed with FracFocus. The analysis included information about fracking chemical ingredients and found that the most common substances were methanol, hydrochloric acid, and benzene. (Compendium 2016).

4. Liability Issues Resulting from Environmental Exposure

Fracking is a controversial issue in the US, especially in states such as Texas, which accounts for one-third of the nation’s natural gas production. There are thousands of fracking sites in Texas alone, most of which are concentrated in the state’s shale formations. In addition, fracking is occurring on a grand scale throughout the US, including in approximately 20 states. (Anderson 2011). While the oil and natural gas industry claim that fracking is entirely harmless, many personal injury and toxic tort attorneys believe that the chemicals used for fracking can damage water supplies and potentially cause cancer, as well as a host of other public health problems. There have been multiple reports of water becoming non-potable due to fracking, as well as reported cases of contaminated water in home water supplies, causing skin damage and other health issues. Scores of people are now reporting respiratory problems, numbness of limbs, and neurological problems related to chemical spills and releases of methane gas (from venting). Furthermore, fracking can affect not only the land immediately around the drill site, it is thought that the chemicals from inadequately managed disposal wells can possibly leach into the surrounding areas including underground water aquifers, causing problems many miles away. (Watson 2017).

Since 2010, more than 100 tort lawsuits have been filed by property owners against oil and gas companies or contractors, claiming personal injury damage caused by drilling and fracking operations. (Anderson 2011). About half of the legal cases to date have been settled, with the other half going to trial. And the litigation trend is expected to continue as public attention, media stories, and the general level of awareness accelerates. Although prior and pending lawsuits have focused on relatively straightforward causes of action related to various forms of contamination, plaintiffs’ counsel may grow more creative in their claims. For example, given the unpredictable way in which contaminants can migrate through different geology, claims of contamination at sites farther and farther away from drilling operations may emerge. (Watson 2017). Additionally, plaintiffs may decide to focus on improper management or disposal of fracking wastewater. The fracking process can generate millions of gallons of wastewater per well. That wastewater contains many hazardous chemicals, salts, and radioactive materials, and disposal is becoming increasingly controversial. Leaks from storage and transport units are inevitable, and with the increase in drilling, will mount in numbers.

Moreover, water treatment facilities may bring claims if they are impacted in some way by treating the fracking wastewater. (Coman 2012). Most prior and pending lawsuits associated with natural gas extraction typically focus on individual sites, usually where a particular driller suffered a mishap, or a small group of adjacent homeowners are claiming injury. However, one way for plaintiffs' counsel to create a mass tort case is to file statewide class actions on behalf of all private citizens affected by drilling operations. Indeed, three such class actions have already been filed in various states. (Watson 2017). Other targets for litigation include chemical manufacturers who market specialized additives for fracking fluid. At most drilling sites, some of the toxic fracking fluid is left underground in disposal injection wells. New legal claims are very likely to accelerate as more people are exposed to environmental harm.

5. Fracking Regulation by Governments Varies around the Globe

Some countries have embraced fracking while others have gone in the opposite direction, with some states or nations passing complete fracking bans. The most common position to date is a middle-ground approach in which fracking is allowed but is strictly regulated. The following list is a brief summary of the regulatory position of various nations.

5.1 North America

The US is the nation where the most fracking has occurred to date. Most regulations related to the oil and gas industry are found at the state level, rather than the federal level, with the exception of drilling on federal lands. Some states ban fracking completely, such as New York, (Bishop 2016). Other states are much more lenient, such as Texas. Multiple states allow fracking but have varying degrees of administrative regulations on this type of drilling operations. Such regulations often focus on drilling techniques, handling of chemical materials, and waste water disposal. (Watson 2017). Canada is in the process of generally relaxing the fracking regulations in some provinces, however in at least two provinces there is in place a temporary halt to fracking.

5.2 Europe

Germany has a very level of demand for energy, but it is tightening the fracking regulations. German domestic gas production declined by up to 10% per year over the past several years since the crackdown on fracking. (Nelson 2016). France is the country is generally thought to have the largest natural gas shale deposits in Europe. However, most provincial local laws prevent exploration and production, often putting a complete stop to fracking. (Nelson 2016). Poland has been one of the front runners for allowing fracking in Europe, and it has some of the biggest reserves in Europe. Although Poland continues to be a pro-fracking country with easy regulations, other recent developments at the EU level may slow down the fracking boom in Poland. (Nelson 2016). The UK presents an interesting case, with a relatively high level of need, as well as available potential. The UK is debating whether to follow the example of the US, or France which has banned fracking completely. Recent news reports indicate that fracking will be allowed with the government inviting bids for oil and gas licenses. (Nelson 2016).

6. Diverse Interests Must Coalesce to Resolve Environmental Issues

It is clear the world will be dependent on fossil fuels for decades to come, and therefore there is a continuing economic incentive for US and multinational energy companies to continue use fracking as a method to extract as much oil and gas from the earth as possible. However, coupled with the economic benefits, fracking is accompanied by significant environmental concerns and risk. Increased regulation and/or more significant voluntary industry actions are needed in an attempt to find a balanced approach. Over-regulation may end up leaving potential benefits untapped. (Engelder 2011). Under-regulation may end up exposing humans, and our environment, to unnecessary risks. Environmentally concerned citizens, scientists, and politicians have been very active in making the risks associated with fracking known to the public. This awareness has led to public protests wherever companies are fracking for oil and gas; not only in the US but Europe and Latin America as well. The public relations hurdle for the fracking industry will be to convince the public as well as the appropriate government authorities that it can be done in a way addresses scientific and environmental concerns as well as public health issues.

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