

BCUK Fact Sheet | Fracking

What is Fracking?

“Hydraulic fracturing” or “fracking”, for short, is the term given to the technique used to access gas held within shale beds.

During this process, a borehole is drilled and a steel pipe is inserted. The pipe is perforated in target zones that contain oil or gas (1). A mixture of water, chemicals and sand, is pumped into the borehole at pressures high enough to cause a fracture in the target zone. The sand or other materials called “proppants”, prop open the fractures and allow the gas to flow out into the borehole (2).

Where does it take place?

Significant volumes of shale gas have been extracted via fracking in the USA, but exploration of the technique in the UK and Europe is relatively recent. The British Geological Survey (BGS) suggests that the UK has ‘abundant’ shales at depth. However, it is not yet known how much shale gas or oil may be extracted or whether the process in this country is commercially viable (3). Studies suggest that areas in which existing conventional gas has been found in the UK have the most potential for fracking (4). The BGS has identified potential areas in northern England around the Pennine Basin, in the Kimmeridge Clay of the Weald Basin in Surrey and Sussex, the Oil-Shale Group of the Midland Valley and the central belt of Scotland (5, 6, 7).

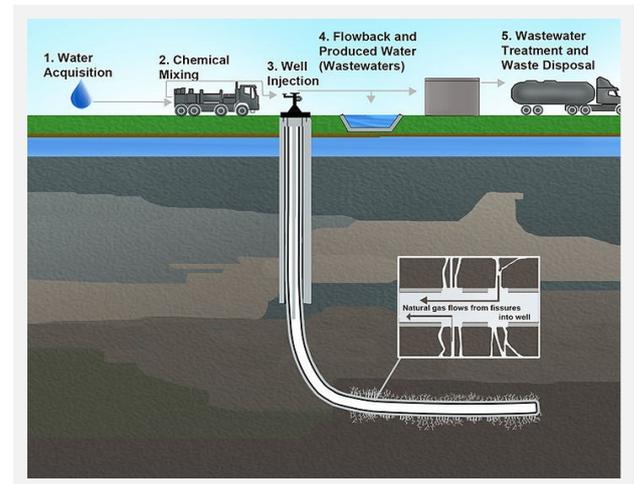


Illustration of Hydraulic Fracturing and its related activities
US Environmental Protection Agency (EPA)

Why should we be concerned?

Chemicals are used in the fracking process in an attempt to improve the efficiency and effectiveness of extraction. They are added to the water to facilitate boring, reduce friction, shorten drilling time and to prevent accidents (8). Biocides are used to prevent bacterial growth (9), stabilisers are used to prevent corrosion of metal pipes and acids are used to remove mud damage caused by drilling within the area (10). The number and combination of chemicals used is site dependent. However dozens to hundreds of chemicals are often used at any one time (11). Millions of gallons of fluid are injected into boreholes during the fracking process (12,13). Chemicals are said to account for between 0.5-1% of the mixture which equates to approximately 20-40,000 gallons of chemicals being used in each well (14).

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Reports differ as to how much of the fluid stays in the ground. The International Association of Oil and Gas Producers indicate that between 10% and 70% of it is recovered, suggesting that anything between 30% and 90% can remain underground (15). “Flowback”, or those fluids which return to the surface, are stored in open pits or tanks prior to disposal (16). Flowback can carry the toxic gasses, liquids and solid material that naturally occur in underground oil to the surface (17). Studies carried out in the USA reveal that chemicals used in fracking have contaminated groundwater and have led to drinking water contamination (18, 19, 20). In addition, towards the end of the fracking process, waste gas is set alight to dispose of it, which emits harmful gases (21).

How is fracking linked to breast cancer?

There is no conclusive evidence that fracking causes breast cancer. However, many of the chemicals used in fracking (22) are known chemicals of concern and have been linked to an increased risk of breast cancer. For example, benzene, acrylamide, formaldehyde and ethylene oxide are all used in fracking and are all listed by the International Agency for Research on Cancer (IARC) as human carcinogens (23) and have been linked to breast cancer tumours in other studies (24). Other chemicals used, such

as toluene (25), bisphenol A (26) and di (2-ethylhexyl) phthalate (DEHP) (27) are known endocrine disrupting chemicals with strong links to breast cancer risk.

One study, which gathered health data on a small percentage of the chemicals used in fracking, found that more than 25% of them can cause cancer and mutations and 37% can affect the endocrine system (28). This study worked under the assumption that their results “underestimated the consequences of the health impacts to the labor (sic) force, residents living in close proximity to the wells and those depending upon potable and agricultural water that could be affected by natural gas operations”. Of additional concern is that a large proportion of the chemicals used in fracking have not been tested for adverse health effects in humans (29).



A hydraulic fracturing operation at a Marcellus Shale well in the USA (US Geological Survey)

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Links to other diseases

Fracking is also linked to a host of other diseases and disorders from the relatively minor, such as rashes, nosebleeds, joint pain and headaches, to more serious disorders such as, breathing difficulties, memory loss, and intestinal problems (30). One study found that 75% of chemicals used can affect the skin, eyes and other sensory organs, respiratory system and gastrointestinal system and more than half can affect the brain and nervous system (31). One study also linked fracking to congenital heart defects and neural tube defects in new born babies (32).

What is the current regulatory position on fracking?

Shale gas drilling is only in the exploratory phase in the UK. However, the UK Government has stated that it believes that fracking could provide the UK with a more effective and efficient energy source and are, therefore, encouraging exploration to determine its potential (33).

Public Health England carried out a review of the risks to public health from exposure to emissions from fracking and concluded that: “the risks to public health from exposure to emissions from shale gas extractions are low if operations are properly run and regulated” (34). However, other agencies have expressed concern about the sketchiness of the available information and the inability to rule out adverse

environmental impacts and have, therefore, advised against further exploration until more data becomes available (35, 36, 37). Moreover, there are doubts that the fracking process can be “well run and well regulated” (38) and there can be no guarantee that human exposure to carcinogenic and hormone disrupting chemicals will not increase as a result of fracking.

Breast Cancer UK position:

- Breast Cancer UK has strong concerns about the potentially adverse health effects of increased exposure to harmful chemicals as a result of fracking.
- We support our European partners’ calls for a “moratorium on all exploration and exploitation licensing in all EU countries [including the UK] and a comprehensive review of EU policies which pertain to fracking” (39).

Further Resources:

[Health and Environment Alliance \(HEAL\) on Fracking](#)

[Heal Position paper on fracking](#)

[Chartered Institute of Environmental Health Briefing note on Hydraulic Fracking](#)

[Theo Colborn et al: Natural Gas Operations from a Public Health Perspective](#)

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For further information and more web resources please visit our website www.breastcanceruk.org.uk