

Fracking and B-TEX fact sheet

What is fracking?

Fracking is the process of creating cracks in underground rock formations to increase the flow and recovery of gas or oil out of a well. Fracking is also known as fracture stimulation, hydraulic fracturing, fraking, fracking, hydrofracking or fracturing.

Due to the varying geology of coal seams, fracking is not carried out in all coal seam gas (CSG) operations. For deep gas and oil activities (such as production of shale gas and oil, tight gas and basin-centred gas) fracking is undertaken in almost every well.

How is it done?

Fracking takes place in the well (hundreds of metres below the ground within the coal seam or thousands of metres below the ground for shale) and involves pumping fracking fluid under pressure into the target formation. The pressure from the fluid entering the space causes cracks in the rocks that allow gas to flow up the well and be captured.

Fracking can take place horizontally and vertically. The extent of a fracture depends on the frac design and underground geology. These days there are a number of technologies used by the onshore oil and gas industry to ensure fractures only travel as far as needed to obtain the gas or oil. If a fracture travels too far the resource is then harder to extract.

After the target formation has been fraced some or most of the fracking fluid is returned to the surface by underground pressure. This fracking fluid is stored in appropriately designed, constructed and lined dams or storage containers. It is then either treated or disposed of at an appropriate facility.

Typically, the fracking process only takes a few days but testing of the well may be carried out for many months afterwards to ensure the frac was successful and no environmental harm was caused.

Why is fracking undertaken?

Fracking is used to increase gas production from low permeability rocks, such as those from which deep gas and oil are obtained. The use of fracking can reduce the total number of wells required to be drilled, increasing the distance between wells, and reducing the level of land disturbance and the visual impact of wells on the landscape.

Frac fluids

Fracking fluid is made up of three components:

- proppant (sand or another man-made equivalent) (approx 9%). This keeps the cracks open, allowing gas to reach the well and rise to the surface.
- water (approx 90%) to carry the sand/proppant under pressure into the well.
- chemicals (approx 1%) that make the mixture more gel-like and hold the sand as it is pumped into the target formation.

What chemicals are used?

The chemicals used in the fracking process typically include common household compounds including:

- sodium hypochlorite (used in swimming pools)
- hydrochloric acid (used in swimming pools)
- surfactants (used in soaps)
- cellulose (the cell wall of green plants) and
- acetic acid (the basis of vinegar)

The exact nature of the fracking mixtures used by companies in Queensland will vary due to the different geological environments.

Regulating BTEX

Queensland laws restrict the use of BTEX chemicals in fracking to help ensure BTEX levels don't exceed the Australian environmental and human health standards. Because the standard is so stringent and the levels of allowed BTEX chemicals are so low, this means that in practice BTEX chemicals cannot be added to fracking fluids.

The BTEX standards are measured in parts per billion (ppb). As general guidance, 1 ppb is equivalent to 20 drops of liquid in a 25m swimming pool. The Australian environmental and human health standards used by Queensland laws require the amount of BTEX chemicals in any frac to be below these levels:

- Benzene – 1 ppb*
- Toluene – 180 ppb#
- Ethylbenzene – 80 ppb#
- m-Xylene – 75 ppb#
- o-Xylene – 350 ppb#
- p-Xylene – 200 ppb#

*Australian Drinking Water Guidelines #Australia and New Zealand Environment Conservation Council (ANZECC) Guidelines for Fresh and Marine Water Quality.

BTEX chemicals often occur in natural water sources, so in some instances trace levels of these chemicals may be detected at a fraced site.

More information on BTEX regulation is available from

www.ehp.qld.gov.au/management/non-mining/regulating-fracking.html

Why are chemicals used in the process?

Chemicals are used in fracking to:

- assist other chemicals to biodegrade once the frac is complete
- stabilise clays to ensure the formation stays intact
- keep pH (acid balance) neutral
- eliminate bacteria and;
- ensure the fluid moves easily into the fractures.

Is fracking safe?

Like any commercial or resource activity there are risks but when these risks are managed appropriately then fracking is a safe activity for the environment and surrounding communities. The fracking process occurs underground and is designed to only impact on the targeted resource formation.

How does the government monitor fracking activities?

Prior to undertaking fracking activities operators must:

- provide details of their proposed fracking operations, including the location of wells;
- detail the chemicals to be used and the toxicity of ingredients and mixtures; and
- develop a stimulation management plan that must be complied with during fracking. The management plan ensures that all the relevant matters for each well are considered prior to fracking activities taking place, and that any identified risks will be mitigated or managed to prevent environmental harm occurring.

In addition the government imposes strict environmental conditions on environmental authorities. This may include requirements for petroleum and gas companies to:

- drain and rehabilitate any ponds that were designed to evaporate fracking fluid over the long term;
- undertake long-term monitoring of water produced from wells that have been fraced;
- have comprehensive contingency and emergency response planning for water-quality related incidents; and
- monitor groundwater and landholders bores prior to and following fracking activities.

These conditions are legally enforceable and heavy

penalties apply for non-compliance. Petroleum and gas companies are legally required to notify of any environmental incident or breach of a condition. In addition to this, the government closely monitors fracking activities through a proactive compliance program including:

- attendance at fracking activities;
- auditing fracking operations;
- desktop audits of the information submitted by petroleum and gas companies; and
- independent monitoring of water bores in proximity to petroleum and gas operations.

How do I know when fracking is happening on my land?

Landholders must be notified in writing at least 10 days before a company undertakes any fracking activities and 10 days after the activities have been completed. The first notice contains information about planned activities and the second notice details what actually occurred, including provision of information about actual chemicals and volumes used.

What action will the government take if environmental impacts are identified?

If fracking is thought to have affected water quality in an aquifer, the Department of Environment and Heritage Protection may require an environmental evaluation on the incident, and undertake an investigation. Then, depending on the outcome of the evaluation, further action can be taken under Queensland's strict environmental laws. This may include ordering the petroleum and gas company to cease the fracking activity and to clean up and remediate any environmental harm caused.

In the event that serious environmental harm is caused as a result of fracking activities, the maximum penalty for an individual under the *Environmental Protection Act 1994* is a fine in excess of \$400,000 or five years imprisonment. A corporation may be fined a maximum penalty in excess of two million dollars.