

# Fracking and BTEX

Fracking is the process of creating cracks in underground coal seams 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.

In the case of coal seam gas (CSG), fracking involves pumping a fluid comprised largely of water and sand (99%) under pressure, into a coal seam. This action fractures the coal seam which increases the flow of gas from the seam.

Due to the varying geology of coal seams, fracking is not carried out in all CSG operations. Currently approximately 8% of Queensland's domestic CSG wells have been fracked. It is estimated that as the industry expands, between 10% and 40% of wells may be fracked.

## What chemicals are used?

The fracking process is made up of three components:

- proppant (sand or another man-made equivalent) (approx 9%). This keeps the crevices and 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 for example make the mixture more gel-like and hold the sand as it is pumped into the coal seam.

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)
- acetic acid (the basis of vinegar).

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

## Why are chemicals used in the process?

Chemicals are used in fracking to:

- form a gel to suspend the sand as it moves through the small cracks and crevices created under hydraulic pressure in the coal seams
- assist other chemicals to biodegrade once the fracc is complete
- stabilise clays to ensure the formation stays intact
- keep pH (acid balance) neutral
- eliminate bacteria
- ensure the fluid moves easily into the fractures.

## Regulating BTEX

The government has introduced new laws which strictly regulate the adding of BTEX chemicals to fluids used in petroleum and gas fracking processes (including coal seam gas activities).

Under the new laws, the BTEX chemicals, benzene, toluene, ethylbenzene and xylene are not allowed to be added to fracking fluids. As BTEX chemicals commonly occur in natural water sources, the government has **restricted the use of BTEX** in the fracking process to maintain nationally set environmental and human health standards.

The BTEX standards are measured in parts per billion (ppb). As guidance, 1 ppb is equivalent to 20 drops of liquid in a 25m swimming pool:

- 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.

More information on BTEX regulation is available from [http://www.derm.qld.gov.au/environmental\\_management/coal-seam-gas/regulation-btex-chemicals.html](http://www.derm.qld.gov.au/environmental_management/coal-seam-gas/regulation-btex-chemicals.html).

## Is fracking safe?

Before any fracking activities are authorised by the Department of Environment and Resource Management, the company must submit a risk assessment. This document assesses the risks of fracking activities over the life of the project for all wells.

The risk assessment 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.

The activity is only allowed to go ahead if the government determines that the risk of groundwater or environmental contamination is minimal. If fracking is authorised companies must meet a number of strict environmental approval conditions, including adherence with the risk assessment and comprehensive monitoring requirements.

After the seam has been fraced, flowback water (water that was used in the fracing fluid) must be monitored until one and a half times (150%) the amount of the fluid used in the fracc has been returned to the surface. This water is stored in appropriately designed, constructed and lined dams or storage containers where it is then either treated or disposed of at a regulated waste disposal facility.

## How do I know when fracing is happening on my land?

By law, CSG operators must notify landholders in writing at least 10 business days before undertaking fracing activities on a property and again within 10 business days of completing those activities.

These written notices must list the anticipated and actual composition of fracing fluids used, including chemicals and volumes. This ensures landholders are fully informed about the type and extent of fracing activities being undertaken on their land.

## How does the government monitor fracing activities?

Prior to obtaining an authorisation to undertake fracing activities, the government requires operators to:

- provide details of their proposed fracing operations including the location of wells
- detail the chemicals to be used and the toxicity of ingredients and mixtures
- develop a risk assessment that must be carried out for any well prior to it being fraced to ensure that the fracing activity is managed to prevent environmental harm.

This information is used by the government to impose strict environmental conditions on approvals. This may include requirements for CSG operators to:

- drain and rehabilitate any ponds that were designed to evaporate CSG water and fracing 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
- monitor groundwater and landholders bores prior to and following fracing activities.

CSG operators are legally required to notify any environmental incident or if a breach of condition occurs.

In addition to this, the government closely monitors fracing activities through a proactive compliance program including:

- attendance at fracing activities
- auditing fracing operations
- desktop audits of the information submitted by CSG operators
- independent monitoring of water bores in proximity to CSG operations.

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

If fracing is thought to have caused an impact on the quality of water in an aquifer, DERM may require an environmental evaluation on the incident and investigate. Then, depending on the outcome of the evaluation, further action can be taken under Queensland's strict environmental laws.

This may include ordering the CSG operator to cease the fracing activity and clean up and remediate any environmental harm caused.

In the event that serious environmental harm is caused as a result of fracing activities, the maximum penalty for an individual under the Environmental Protection Act is \$416,500 or five years imprisonment. A corporation may be fined a maximum penalty in excess of \$2 million.

## More information

- Call the CSG/LNG Hotline 13 25 23
- Visit [www.lng.industry.qld.gov.au](http://www.lng.industry.qld.gov.au)