



Producing Natural Gas From Shale

Voiceover

Natural gas is a clean-burning fossil fuel found deep below ground. Some natural gas is trapped within shale, a dense rock once thought beyond our reach for energy production. By combining two well-established technologies, horizontal drilling and hydraulic fracturing, we can now unlock this valuable resource.

Before any drilling begins, our geologists examine rock characteristics to see if gas is likely to be present. If gas is confirmed, we determine the best location for drilling. The natural gas will be located in shale layers. These may be as deep as 2 miles, or 3.5 kilometers, below the surface. That's 10 times the height of the Eiffel Tower.

To ensure that the subterranean area is sealed off and groundwater is protected for the life of the well, we line our wells with several layers of protective steel casing and cement. Once at the target depth, we drill horizontally about 5,000 feet, or 1,500 meters. This provides more access to the gas along the shale layer. When drilling is complete, steel production casing is inserted into the horizontal section of the well. Cement is then pumped down the length of the casing and back up around it. This permanently secures the well and prevents gas and liquids from seeping out as they are brought to the surface.

Next, we use an electrical perforating gun to make small holes in the steel casing and cement. Finally, to release the gas from the rock, we use hydraulic fracturing. This is a safe and proven technology that's been in use since the 1940s. A mixture of more than 99 percent water and sand and less than 1 percent additives is pumped into the well under high pressure. The mixture is pumped down the well and out through the perforations into the surrounding shale formation, creating fractures that allow gas to flow to the well. The fractures are contained within a few hundred yards or meters of the well bore and separated from the aquifer by about 1 to 3 miles, or 2 to 4 kilometers, of impermeable rock.

At the surface, Chevron manages the well site to strict environmental standards. When pumping is complete, flow-back water is retrieved from the well and captured in tanks or lined pits. Flow-back water is typically either treated and reused in future hydraulic fracturing jobs or injected into permitted water disposal wells. In some locations, flow-back water may be disposed of at a certified waste facility. Solids are cleaned and responsibly disposed of at a certified waste facility.

When each well is complete, the drilling and fracturing equipment is removed, and the pits are filled in. The reduced site now contains only the necessary equipment to ensure the natural gas continues to be produced safely—primarily a well head and related equipment. It's estimated that a typical well has a life of 30 years or more. This new generation of natural gas production can help secure a domestic energy supply and energy security for decades to come.