Hydraulic fracturing is a well completion process that releases natural gas from shale rock formations that are found thousands of feet below the surface of the Earth. This fossil fuel is formed from the remains of prehistoric plant and animal life that has been subjected to high temperatures and pressure for millions of years. A large portion of this thermogenic natural gas, which is trapped in shale formations, had been inaccessible until hydraulic fracturing was developed in the late 1940s. Technological advances, including the use of horizontal drilling, allows the modern driller to more economically develop this resource.

To release natural gas trapped in a formation, a hole is drilled into the ground vertically to the needed depth and then as much as two miles horizontally. This “bore hole” is lined with steel casing and cemented in to a depth adequate to protect freshwater aquifers, coal seams, etc. A mixture of water, sand, and chemicals (to improve flow) is then injected under high pressure to break apart the shale. The fracturing fluid flows away and the sand (called proppant) stays behind – holding the fractures apart so gas can escape. The released natural gas then flows up the casing to the surface.

Fracturing fluid that is not left underground, having returned to the surface with the gas, is called flowback. Flowback is treated and reused in other wells. Its ultimate disposal is currently through a Class II disposal well.

Water is used for fracking because it will not compress.

For more information, contact:
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Shale is a fine-grained sedimentary rock formed in thin layers. Shale is composed of more abundant organic material than most other rock types, making it a rich hydrocarbon source in many areas.

Natural gas is a hydrocarbon gas mixture composed primarily of methane and used for heating, cooking, and electricity generation.

The West Virginia Department of Environmental Protection (DEP) is committed to ensuring drillers engaging in hydraulic fracturing are compliant with current safety and environmental requirements.