



HYDRAULIC FRACTURING

by Lauren Ris

Hydraulic fracturing, or "fracking," is a method used by oil and gas operators to increase or open up production on wells that would otherwise be inaccessible. Oil and gas operators now use fracturing on most wells in Colorado. Critics, however, express concerns about the safety of this practice and its potential impacts on groundwater and air quality. This issue brief explains the fracturing process, federal and state regulations, and an Environmental Protection Agency (EPA) study of its risks.

Background

Fracturing process. Hydraulic fracturing involves pumping a mixture of water, sand, and chemicals into wells under high pressure to crack open tight formations, thereby facilitating the flow of gas and oil to the surface. The chemicals maximize the water pressure, opening up cracks in the geologic formation. Sand in the water keeps these cracks from collapsing and allows the gas to flow to the surface.

When the process is finished, most of the fluid is removed from the well lines, but some remains. The remaining fluid is either dumped into a lined, open pit to evaporate, is reinjected underground, or is trucked to a disposal site.

Fracturing materials. Fracturing fluids are primarily a mix of water and sand (99.5 percent). The remaining 0.5 percent is comprised of chemicals and lubricants, the exact recipes of which are proprietary information held by the oil and gas companies and are not made public.

According to the Ground Water Protection Council, a nonprofit comprised of state regulatory agencies, a typical fracture treatment will use low concentrations of 3 to 12 additive chemicals,

depending on the formation being fractured. Each component serves a specific purpose. For example, water-based fracturing fluids mixed with friction-reducing additives, called *slickwater*, allow fracturing fluids and sand to be pumped to the target zone at a higher rate than if water alone were used. Biocides prevent microorganism growth, while oxygen scavengers, and other stabilizers prevent corrosion of metal pipes, and acids remove drilling and mud damage within the near-wellbore area. The website www.fracfocus.org is a joint project of the Ground Water Protection Council and the Interstate Oil and Gas Compact Commission that encourages oil and gas companies to disclose the chemicals they use, and provides additional information about the fracturing process.

Regulations and Laws

Colorado. The Colorado Oil and Gas Conservation Commission (COGCC) regulates oil and gas development on most privately owned lands in the state, as well as land owned by state and local governments. The COGCC is also charged with protecting public health and preventing significant environmental impacts to air, water, soil, or biological resources caused by oil and gas operations. The COGCC issues permits for drilling and operating oil and gas wells, and enforces rules and regulations for the spacing of wells, well construction, and well site reclamation. Rules are also enforced for the abandonment of wells and for the treatment and disposal of oil and gas exploration and production waste. The federal Bureau of Land Management is responsible for oil and gas leasing on federal lands in the state, and for leasing minerals on private lands where mineral rights have been retained by the federal government.

Chemical inventories. COGCC regulations require operators to inventory chemicals that they use in drilling and producing oil and gas wells, including fracturing fluids. Operators must provide this information upon request to the COGCC and certain health care professionals in order to properly respond to spills, or in cases where the COGCC has received complaints from landowners who believe their health, safety, welfare, or environment has been adversely affected. However, companies are not required to provide the chemical amounts or exact recipes of the fracturing fluids if the fluid is considered a Trade Secret by the operator. Once disclosed, the information is confidential, and neither the COGCC nor health departments may make the information publicly available.

Public health and safety rules. In 2007, the General Assembly enacted a law declaring it in the public interest to foster the responsible, balanced development of oil and gas resources that is consistent with the protection of the environment and wildlife resources. The law also required the COGCC to promulgate rules to protect the health, safety, and welfare of the general public in the conduct of oil and gas operations, in consultation with the Department of Public Health and Environment. The COGCC rules took effect April 1, 2009. The new rules are available on the COGCC's website at:

www.cogcc.state.co.us.

Drinking water protection rules. COGCC regulations establish casing and cementing standards to ensure that gas being produced does not leak into aquifers. These regulations require wells to be cased with steel pipe and the casing to be surrounded by cement to create a hydraulic seal within the space between the wall of the well bore and the steel pipe. Additionally, rules:

- impose mandatory setbacks and other restrictions on development occurring near public drinking water sources;
- require well pressures to be monitored during fracturing; and
- require pit permitting, lining, monitoring, and secondary containment to ensure that pit fluids do not leak.

Review of COGCC rules. In 2011, the COGCC requested a review of its rules on hydraulic fracturing by an outside panel of experts, called the State Review of Oil and Natural Gas Environmental Regulations (STRONGER), funded by the EPA, the U.S. Department of Energy, and the American Petroleum Institute. STRONGER will report its findings on the adequacy of COGCC's hydraulic fracturing rules later in 2011. The COGCC will then determine whether to make any recommended changes.

Federal Law

Safe Drinking Water Act. In 2001, a special task force on energy policy, led by Vice President Dick Cheney, recommended that Congress exempt hydraulic fracturing from the Safe Drinking Water Act. Following this recommendation, in 2005, a national energy bill included the exemption. The bill passed, but left the door open for the EPA to regulate the use of diesel in hydraulic fracturing operations. There have been subsequent attempts to pass legislation repealing the exemption and to require companies to publicly disclose chemicals used in hydraulic fracturing; however, all have failed.

EPA study. In its FY 2010-11 budget report, the U.S. House of Representatives Appropriations Conference Committee identified a need for a focused study on the health and environmental impacts of hydraulic fracturing. As a result, the EPA is in the process of conducting a scientific study to investigate the possible relationships between hydraulic fracturing and drinking water. The EPA plans to use information obtained from the study to identify potential risks associated with fracturing. The agency also plans to consult with experts in the field through peer review and to engage to stakeholders in technical workshops. The EPA anticipates that study results will be available by late 2012.