HYDRAULIC FRACTURING **AT A GLANCE**

HYDRAULIC FRACTURING IS IMPORTANT

Application of hydraulic fracturing techniques, to increase oil and gas recovery, is estimated to account for 30 percent of U.S. recoverable oil and gas reserves and has been responsible for the addition of more than 7 billion barrels of oil and 600 trillion cubic feet of natural gas to meet the nation's energy needs.

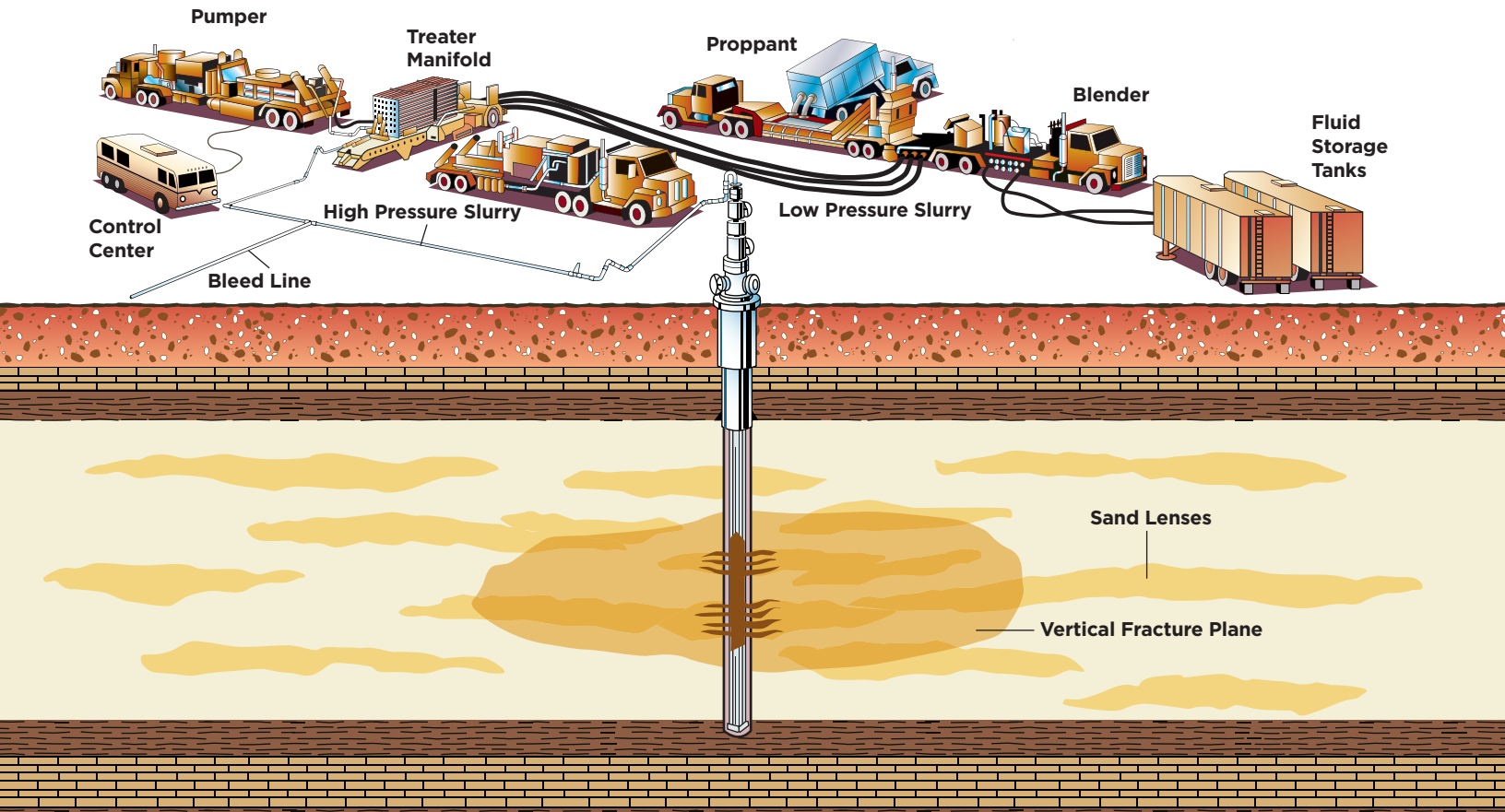
AMERICA'S NATURAL GAS AND HYDRAULIC FRACTURING

America needs its natural gas, and hydraulic fracturing is essential to produce it. In many regions, clean burning natural gas is critical to American manufacturing jobs, to farmers for fertilizer and energy, and to help address climate change concerns because of its low carbon-content.

HYDRAULIC FRACTURING TECHNIQUES

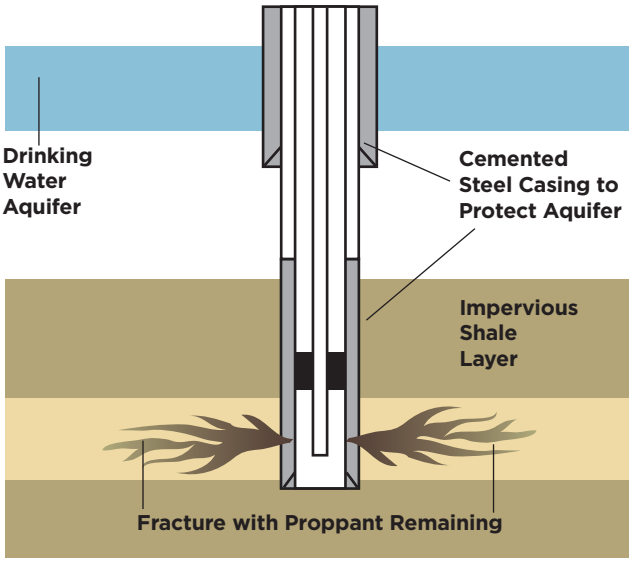
The vast majority of the nation's newly drilled natural gas wells do not produce gas at sufficient rates to make the well economical. Hydraulic fracturing is a technique used to allow natural gas and crude oil to move more freely from the rock pores where it is trapped to a producing well so it can be brought to the surface at higher rates. Hydraulic fracturing technology was developed in the late 1940s and has been continuously improved upon since that time.

In a hydraulic fracturing job, "fracturing fluids"or "pumping fluids" consisting primarily of water and sand are injected under high pressure into the producing formation. Water typically makes up 99 percent of the liquid phase of fracturing fluids. Some fracturing fluid also contains a "gelling agent" to make the fluid more viscous and better able to carry the sand (or "proppant") that is necessary to hold the fractures open and allow the oil or gas to make its way to the well. Fracturing fluids may also contain very limited amounts of other materials depending on the nature of the formation being fractured. The fluid is pumped into a well bore at pressures sufficient to create fractures in the producing formation. It is important to note that the substantial majority of the fracturing fluids are recovered as the well is brought into production and do not remain in the ground.



Source: Department of Energy

PROTECTIVE MEASURES ARE IN PLACE



NOT TO SCALE

State regulation of hydraulic fracturing began over 50 years ago. These regulations created a control system that has effectively protected ground water and drinking water sources. Existing well construction practices that are standard in the industry and that are required, again, by virtually all states, effectively protect underground sources of drinking water from impacts related to oil and gas exploration and production activities, including hydraulic fracturing. Casing and cementing is a critical part of the well construction that protects not only any water zones but also the integrity of the production zone(s). Current industry well design practices ensure multiple levels of protection between any sources of drinking water and the production zone of an oil and gas well.[1]

When the Ground Water Protection Council (GWPC), an association of state regulators and stakeholders, studied the environmental risk of hydraulic fracturing, they found one complaint in the over 10,000 coalbed methane wells reviewed—an Alabama well that the Environmental Protection Agency (EPA) had already concluded was not a fracturing problem. Subsequently, EPA initiated its own study of coalbed methane hydraulic fracturing environmental risks.

EPA released its completed study in June 2004. Again, no significant environmental risks as a result of proper hydraulic fracturing were identified.

1 Industry has developed equipment specific and operating practices for use in drilling and production activities. Examples include: API 5 Series Publications: Tubular Goods; API 7 Series Publications: Drilling Equipment; API 10 Series Publications: Oil Well Cements; API 11 Series Publications: Production Equipment; API 13 Series Publications: Drilling Fluid Material.

2 Prior to enactment of the Energy Policy Act, primary providers of hydraulic fracturing had agreed not to use diesel in coalbed fracturing.

3 GWPC Letter to the House Oversight and Government Reform Committee Chair, Henry Waxman on October 30, 2007.

A HISTORICAL LOOK AT THE ISSUE

Years after state regulation of hydraulic fracturing was implemented, Congress enacted the Safe Drinking Water Act (SDWA) in 1974.

By then, hydraulic fracturing had been used for 25 years with no environmental problems. Under the SDWA, states developed extensive underground injection control (UIC) programs to manage liquid wastes and the reinjection of produced waters. These programs addressed liquids intended to be periodically injected, continuously injected, and those intended to remain in underground geologic formations. By 1980 Congress—recognizing the fact that many state-administered injection programs were in place and well established, creating a need for further state flexibility—modified the SDWA to give states the option of gaining federal "primacy" for existing injection programs based on the demonstrated effectiveness of state oil and gas UIC programs.

At no time during these debates was there any suggestion that hydraulic fracturing was considered covered under the UIC waste management requirements. Regardless, litigation in the 1990s and subsequent rulings left the federal statutory and regulatory arenas unsettled with regard to hydraulic fracturing.

The U.S. Department of Energy's (DOE's) Strategic Center for Natural Gas noted that more restrictive regulation of hydraulic fracturing, which may not increase the protection of underground drinking water, could have a deleterious effect on the supply of natural gas in the U.S.—especially now, when the country is counting on natural gas to meet its growing energy requirements in an environmentally responsible manner.

U.S. DOE National Energy Technology Laboratory Policy Facts—June 2001

Recognizing the need to provide legislative clarity, Congress addressed the issue of hydraulic fracturing under the SDWA in the Energy Policy Act of 2005 (EPAct) by preserving the state regulatory system that has worked so effectively for the past half century. EPAct clarified that the SDWA was not the appropriate law for regulating hydraulic fracturing with one exception. During the previous referenced analysis of environmental risk from hydraulic fracturing, EPA hypothesized that the use of diesel fuel as a solvent in the fracturing process of coalbeds might pose a risk.[2] While no incidents of actual damage were identified, Congress preserved the option for the application of the SDWA for regulation of hydraulic fracturing if diesel fuel was utilized.

The current balanced management approach serves the nation well. As reaffirmed by state regulators in October 2007,[3] the current approach retains the effective state regulatory programs that protect the environment. And, it provides for a structure that allows for the essential development of the nation's oil and natural gas.

FREQUENTLY ASKED QUESTIONS

HOW DOES OIL AND GAS GET PRODUCED?

There are many methods of "completing" or preparing a well to produce at higher rates. Generally, a well must be perforated, downhole equipment installed, and the well is fractured to enhance production capabilities. During these completion operations, it is typically necessary to stimulate the well to increase conductivity between the wellbore and the producing zones.

HOW ARE DRINKING WATER AQUIFERS PROTECTED?

Typically, steel pipe known as surface casing is cemented into place at the uppermost portion of a well for the explicit purpose of protecting groundwater. The depth of the surface casing is generally determined based on groundwater protection, among other factors. As the well is drilled deeper, additional casing is installed to isolate the formation(s) from which oil or gas is to be produced which further protects groundwater from the producing formations in the well.

DOES HYDRAULIC FRACTURING LEAD TO GROUND WATER CONTAMINATION?

Recent claims that hydraulic fracturing is a source of ground water contamination are unfounded. Current regulations covering well design requirements and hydraulic fracturing operations are specifically intended to protect ground water. Recent studies by the GWPC and the EPA have clearly demonstrated the effectiveness of these regulations. No instances of ground water contamination from hydraulic fracturing were identified in either of these thorough studies.

HOW IS THE FLUID MANAGED TO PROTECT THE ENVIRONMENT?

Fracturing fluids are primarily fresh or produced-water based fluids with additives for special purposes. There are several practices used for the management of the fluid depending on the constituents, the presence of usable groundwater or surface waters, geography, and local, state, and federal regulations:

- Spent or used fracturing fluids are normally recovered as part of the initial production after completion work is finished and processed with other production streams (handled as part of a closed system to be recycled for future use) or properly disposed of on site, either by surface discharge where authorized under the Clean Water Act or by injection into Class II wells as authorized under the SDWA.
- Recovered fracturing fluids are also disposed of at commercial facilities when operators do not have disposal facilities available on site.

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