

*Fracking and directional drilling have led to lower energy prices without increasing pollution.*

## Introduction

Hydraulic fracturing, aka “fracking,” is a method for recovering oil and gas from unconventional fossil fuel reservoirs. It involves creating fissures in underground rock formations to stimulate oil or gas movement through a reservoir that is otherwise too difficult to extract oil and gas from. Revolutionary advances in directional drilling, including horizontal drilling, during the past 30 years have made fracking extremely efficient and safe.

Shale formations have good porosity, which are void spaces between the grains of a rock that can hold fluid, but poor permeability, which are pathways connecting those voids. As a result, it has been difficult to produce significant amounts of oil and gas from shale. Overcoming this difficulty, oil companies and researchers developed ways to steer the drill bit so that it can drill deep horizontal (lateral) wells. Then, they use improved fracking technology to create artificial permeability in tight shales by pumping liquid solutions and fine particles of sand at high pressure down to the target formation.

## Economics

Fracking has allowed natural gas and oil to be produced from formations where it was not previously technologically or commercially viable. Natural gas is now produced in 34 states.<sup>1</sup> Fracking, combined with horizontal drilling technologies, allowed gas production to increase approximately 84 percent since 2005.<sup>2</sup> This reversed a decline in production that had begun in the 1970s. This “Shale Revolution” also led to a 137 percent increase in oil production, allowing the United States to become a net-exporter of natural gas by 2017, and to substantially reduce the amount of oil imported.<sup>3,4,5</sup>

## Quick Bullets

- Fracking is a method of increasing the amount of oil and gas that can be extracted from a reservoir.
- Fracking, combined with directional drilling—including horizontal drilling—allowed U.S. natural gas production to climb 84 percent, and oil production to grow 137 percent since 2005.
- Prodigious amounts of new gas recently unlocked by fracking reduced the price of natural gas by \$6.83/MCF, a 77 percent decrease, from 2008 to 2020.
- Research indicates fracking is not causing water or air pollution, or damaging earthquakes.

The production increase caused spot prices of natural gas to decline from \$8.86 per thousand cubic feet (MCF) in 2008 to \$2.03/MCF in 2020, though prices have risen since the Biden administration began pushing anti-U.S. oil and gas production policies.<sup>6,7</sup>

Through a process called “refracking,” fracking combined with horizontal drilling has increased production of existing wells from which production had been in decline, saving the costs associated with drilling a new well.<sup>8</sup>

## Environmental Analysis

Multiple studies show fracking is not a significant risk for water pollution. One study, conducted by

the U.S. Environmental Protection Agency (EPA), examined 110,000 fracked oil and gas wells over a six-year period, finding no pollution. The EPA concluded fracking operations are also unlikely to drive any oil or gas into drinking water zones.<sup>9</sup>

This should not be surprising because fracked formations are usually located 6,000 to 10,000 feet underground—far deeper than water wells, which are usually no more than 500 feet deep.<sup>10</sup> Thousands of feet of relatively impervious rock separate fracked wells from water wells, making pollution exceedingly unlikely.

Moreover, multiple studies from universities and local governments have also found that modern well sites do not emit dangerous levels of air pollution.<sup>11</sup>

Fracking can cause minor tremors underground, but they are not strong enough to be felt or to cause damage. Most reported “induced” earthquakes associated with fracking operations come from wastewater injection wells. However, such incidents declined after reinjection pressure was reduced and recycling of wastewater increased.<sup>12</sup>

The low price of natural gas has also allowed it to partially replace coal for electricity production, which has resulted in lower sulfur, nitrogen, mercury, particulates, and carbon dioxide emissions.<sup>13</sup>

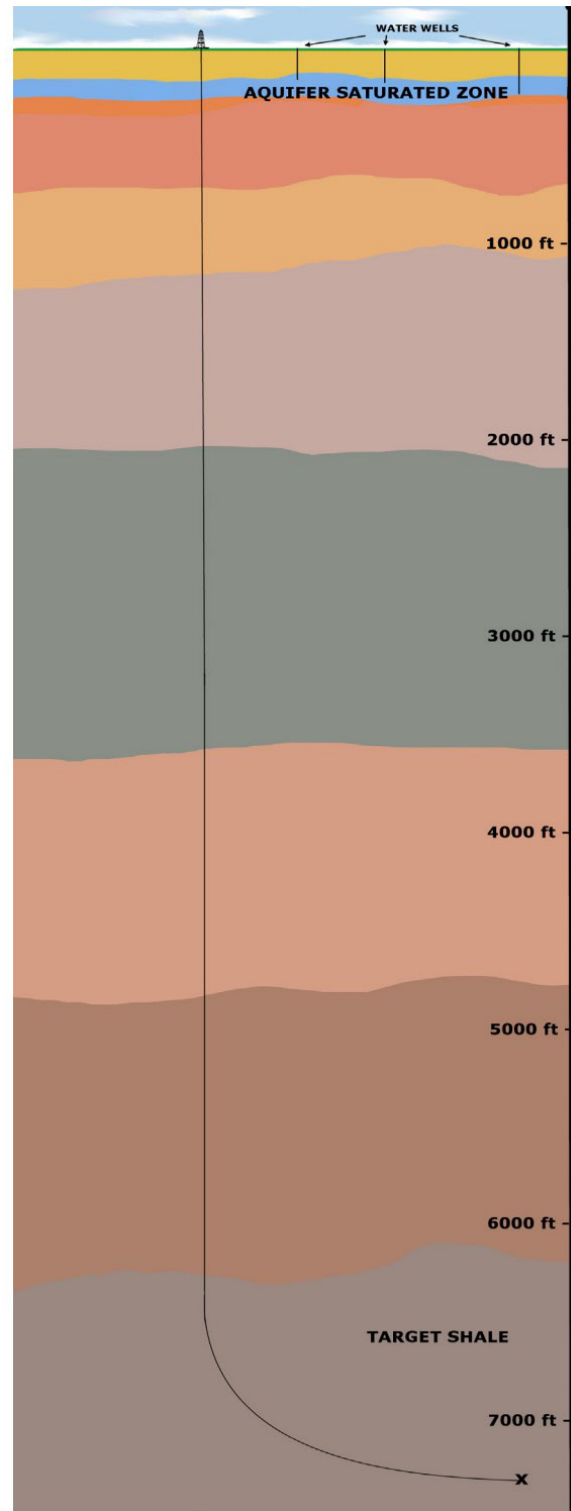


Figure 1: Rough scale graphic of the depth of a fracked well, with water wells plotted at average depth of 300ft.

## Endnotes

- 1 U.S. Energy Information Administration, “Monthly Crude Oil and Natural Gas Production,” Petroleum & Other Liquids Data, Accessed April 13, 2023. <https://www.eia.gov/petroleum/data.php>
- 2 U.S. Energy Information Administration, “Natural Gas – U.S. Natural Gas Gross Withdrawals.”
- 3 U.S. Energy Information Administration, “Monthly Crude Oil and Natural Gas Production.”
- 4 Lueken, L. 2022. “Energy at a Glance: U.S. Liquefied Natural Gas (LNG).” Heartland.org, May 25. Accessed April 18, 2023. <https://heartland.org/publications/the-history-and-importance-of-us-liquefied-natural-gas-lng/>
- 5 U.S. Energy Information Administration. n.d. “Weekly U.S. Imports of Crude Oil.” Petroleum & Other Liquids Data. Accessed April 25, 2023. <https://www.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=PET&s=WCRIMUS2&f=W>
- 6 U.S. Energy Information Administration, “Natural Gas Prices.”
- 7 Linnea Lueken, “Biden’s energy policies cost U.S. households more than \$2,300 since 2021,” Heartland Daily News, April 6, 2023, <https://heartlanddailynews.com/2023/03/bidens-energy-policies-cost-u-s-households-more-than-2300-since-2021/>
- 8 Anna Driver and Ernest Scheyder, “Refracking brings ‘vintage’ oil and gas wells to life,” Reuters, August 20, 2014, <https://www.reuters.com/article/us-energy-refracking-insight/refracking-brings-vintage-oil-and-gas-wells-to-life-idUSKBN0GK0CC20140820>
- 9 U.S. Environmental Protection Agency, “Hydraulic Fracturing for Oil and Gas: Impacts from the Hydraulic Fracturing Water Cycle on Drinking Water Resources in the United States (Final Report),” December 2016, Chapter 6, p. 52, <https://cfpub.epa.gov/ncea/hfstudy/recordisplay.cfm?deid=332990>
- 10 Tim Worstall, “Ten things to know about fracking,” Forbes, August 9, 2011, <https://www.forbes.com/sites/timworstall/2011/06/21/ten-things-to-know-about-fracking/?sh=4a78caa44898>
- 11 Tim Benson and Linnea Lueken, “Debunking Four Persistent Myths About Hydraulic Fracturing,” Policy Brief, The Heartland Institute, October 12, 2018, <https://heartland.org/publications/debunking-four-persistent-myths-about-hydraulic-fracturing/>
- 12 Justin Rubenstein, “Myths and Misconceptions about Induced Earthquakes,” U.S. Geological Survey – Earthquakes Hazards Program, Accessed April 13, 2023, <https://www.usgs.gov/programs/earthquake-hazards/myths-and-misconceptions-about-induced-earthquakes>
- 13 Robert B. Jackson et al., “The Environmental Costs and Benefits of Fracking,” Annual Review of Environment and Resources, Volume 39, Issue 1, 2014, pp. 327-362, <https://doi.org/10.1146/annurev-environ-031113-144051>