

December 2021

## HOT TOPIC ALERT

### Hydraulic Fracturing



Real estate professionals today face an unprecedented number of highly divisive challenges and concerns, such as the practice of hydraulic fracturing. Also referred to as fracking, the term hydraulic fracturing refers to a technique used in oil and natural gas extraction where the injection of water and other substances at a high pressure causes the underlying rock to fracture, allowing natural gas to escape. In practice, hydraulic fracturing raises complex questions among consumers and professionals alike involving mineral rights, royalties, zoning, environmental impact, public health, disclosure requirements, and [more](#). The real estate industry must be prepared to navigate the bipartisan, controversial waters surrounding the topic. Professionals must understand the process; the potential advantages and disadvantages; and the federal, state, and local rules and regulations regarding hydraulic fracturing as further set forth in this Hot Topic Alert.

## What is Hydraulic Fracturing?

Hydraulic fracturing is considered an unconventional method of natural gas production. In the United States, most natural gas is extracted from wells or in conjunction with crude oil production. In [conventional production](#), the oil or natural gas is in porous, permeable reservoir rock, which allows the oil or natural gas to travel freely from the reservoir rock to the well bore. By contrast, hydraulic fracturing allows the driller to reach oil or gas trapped under otherwise impermeable rock, such as tight sandstone, shale, and some coal beds. In addition, it can also be used to speed up or improve the flow of oil or gas trapped under porous, permeable reservoir rock.

Hydraulic fracturing begins with the drilling of a well. Wells vary drastically in depth and directionality and may tunnel [hundreds to thousands of feet](#) below the surface. They also may include non-vertical sections that extend thousands of feet. Once a well is drilled down to the target rock formation, steel pipes, also known as *casings*, are inserted into the well to help stabilize it and prevent soil and water contamination. The casings are then further supported with cement and perforated. Thereafter, water, proppant (typically sand), and chemical additives, such as [acid or gellant](#), are injected at extremely high pressures into the well. The injected liquid travels into the surrounding formation, opening cracks, and sand — called slurry — is poured into the cracks to hold them open. The injection process may occur upwards of twenty to thirty times over several days before the fracking liquid, also known as [flowback or produced water](#), is recovered for treatment and disposal. Oil or natural gas is then extracted as it flows up from the well bore.

Fracturing was first introduced in the 1860s through what is referred to as *oil shooting*, a dangerous, but often successful, method of lowering the explosive [nitroglycerin](#) into a vertical well and then exploding it as near as possible to the reservoir rock, increasing the initial flow and recovery of oil reserves. Over the next seven decades, oil shooting was refined, eventually culminating in non-explosive substances being injected into wells in attempts to enhance safety, lower cost, and increase oil production. Commercial hydraulic fracturing first began in 1947 in the [Hugoton gas field](#) in Grant County, Kansas, where it was used to unclog a well obstructed by drilling mud. In 1949, a patent was issued to the Halliburton Oil Well Cementing Company, which then performed the first two commercial fracturing treatments in vertical wells located in Oklahoma and Texas. The practice of horizontal fracturing began in the late 1980s, and it is now estimated that up to [95% of new wells](#) in the United States use hydraulic fracturing.

## Where is hydraulic fracturing practiced?

Today an estimated [1.3 million](#) oil and gas facilities are operational in the United States. Due to a lack of voluntarily reported data, it is unknown how many wells are conventionally drilled versus hydraulically fractured. However, at [least twenty-four states](#) have active natural gas operations.<sup>1</sup> In addition, [thirty-two states](#) have active crude oil operations.<sup>2</sup> To date, [California](#), Delaware, [Maryland](#), New York, New Jersey, Pennsylvania, and [Vermont](#) have taken measures to [ban hydraulic](#)

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<sup>1</sup> States with active natural gas operations include the following: Alabama, Alaska, Arkansas, California, Colorado, Illinois, Indiana, Kansas, Kentucky, Louisiana, Michigan, Mississippi, Montana, New Mexico, North Dakota, Ohio, Oklahoma, Pennsylvania, Tennessee, Texas, Utah, Virginia, West Virginia, and Wyoming.

<sup>2</sup> States with active crude oil operations include all states referenced in Footnote 1 as well as Arizona, Florida, Idaho, Missouri, Nebraska, Nevada, New York, and South Dakota.

[fracturing](#).

## Controversies Around Fracturing

Americans remain divided over hydraulic fracturing. Supporters point to the [1.7 trillion dollars](#) in annual revenue generated by the natural gas and oil industry, the estimated [11.3 million](#) domestic workers currently employed in the field, and the demand for domestic energy resources. Opponents cite [public health](#) concerns, [environmental impacts](#), and the need for renewable energy sources. Arguments in favor and against fracturing persist in state, local, and national politics, feeding the often harsh political discourse around the topic.

Pundits in favor of hydraulic fracturing present evidence of fracturing significantly extending the life of otherwise [unproductive wells](#) and thereby saving [millions of dollars](#) in expected cost to find, lease, and drill new well sites. On average, a new well costs \$9 million or more. The oil or gas company must gain the necessary mineral rights, prepare the site, and complete drilling of the well bore. The costs of the new well, it is argued, are passed on to the consumer, raising the price of oil and natural gas across the country. Advocates of hydraulic fracturing also provide figures illustrating how hydraulic fracturing has lowered natural gas prices by [47 percent since 2013](#), leaving money in the wallets of American families. Hydraulic fracturing, they contend, allows oil and gas companies to extract nonrenewable energy from otherwise inaccessible reservoir rock such as [tight shale formations](#). Estimates forecast at least 60 percent of all wells drilled in the United States will require hydraulic fracturing [to remain operational](#) within the next ten years, and supporters of fracturing argue that fracturing is necessary for continued domestic oil and gas production.

Advocates of hydraulic fracturing further support their position with evidence of domestic oil and gas production saving the American people [203 billion dollars](#) every year and keeping [trillions of dollars in tax revenue](#) domestic, rather than sending those dollars overseas. They contend the benefits to previously marginalized communities are clear and that the oil and gas industry has brought [immense wealth](#) and quality of life improvements to [rural areas](#), such as Williston and Watford City, North Dakota. They provide examples of economic benefits in states such as North Dakota, which received over [\\$22 billion](#) in tax revenue from oil and gas companies over the past 12 years and allowed the state to make [improvements](#) to the public school system and infrastructure. Opponents, on the other hand, argue the economic benefits are temporary, but the harm will be permanent.

One of the most highly publicized arguments against hydraulic fracturing is the impact on health, to both [unborn children](#) and [adults](#). Opponents of the practice argue that fracturing leads to air and ground water pollution linked to congenital heart and neural tube defects, respiratory diseases, migraine headaches, and [more](#). While health impairments continue to be vigorously debated throughout [the media](#), opponents of hydraulic fracturing also cite non-renewable energy dependence and environmental concerns in support of their position. Opponents allege that the production of renewable energy is [cheaper](#) than hydraulic fracturing and that wind and solar energy are viable elements of the energy supply in America. They estimate that wind power alone would be able to generate [10 times](#) the existing power needs of the United States.

Hydraulic fracturing of a single well may use [3 to 6 million gallons](#) of water each year, and opponents claim the amount of water needed leads to [depletion of aquifers](#) and local water supplies.

They also claim that due to the high pressure involved — up to [twenty thousand PSI](#) — casings are not enough to protect the ground water reserves, leading to contamination. Furthermore, fracturing creates, as a necessary byproduct, wastewater — also known as [produced water](#) — that may contain oil residue, chemicals used in fracturing, and naturally occurring radioactive elements. Wastewater is often disposed of by injecting it [deep underground](#) and is believed to contribute to soil and [drinking water contamination](#). It is thought that for every half gallon of crude oil extracted from a well, [one gallon](#) of wastewater is created.

Advocates of banning hydraulic fracturing also argue that fracturing leads to increased methane emissions and the induction of frack quakes, earthquakes believed to be caused by fracturing. [Methane](#), a greenhouse gas, is released into the air as a byproduct of oil and gas production, and has prompted many to argue that fracturing is contributing to [global warming](#). As for earthquakes, a [M4.0 earthquake](#) that occurred in Texas in 2018 is the largest known earthquake to occur due to fracking, while Oklahoma remains plagued by [earthquakes](#) related to both conventional and unconventional oil and natural gas operations.

Finally, opponents also cite leasing and mineral rights issues faced by landowners across the United States. The leasing of mineral rights to oil and gas companies has created unprecedented [legal challenges](#). Deposits of oil and natural gas do not, of course, follow the neatly drawn property lines found on plat records. One landowner may lease his mineral rights to an oil and gas company, while his neighbor may choose to retain all of his property rights. The neighbor may be disappointed when he realizes his efforts do not stop the oil and gas company from operating and affecting his property. Indeed, his own oil and gas reserves may even be legally depleted. Under the [rule of capture](#), as long as an oil and gas company follows all applicable laws, there has been no legal trespass against the neighbor, even if he can prove his oil and gas reserves were affected. Furthermore, [thirty-eight states](#) also allow what is known as [forced pooling](#), a mechanism to force holdouts to lease their mineral rights if a significant number of the property owners in a certain area — the pool — have already agreed to allow oil and gas extraction on their property.

### **Federal, State, and Local Restrictions on Hydraulic Fracturing**

The regulations surrounding hydraulic fracturing are nearly as varied as the arguments in support and against the practice. Despite hydraulic fracturing occurring nationwide, much of the regulation regarding the practice is [left to the states](#). Fracturing is excluded, at least in part, from multiple federal environmental statutes<sup>3</sup> including, but not limited to, the [Safe Drinking Water Act](#), which protects drinking water from contaminants; the [Clean Water Act](#), which prohibits the discharge of pollutants into U.S. waters; the [Clean Air Act](#), which regulates emissions and establishes air quality standards; and the [National Environmental Policy Act](#), which conducts environmental impact reviews on federal lands.

Exemptions vary with each act. Some, such as the Clean Air Act and the [Solid Waste Disposal](#)

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<sup>3</sup> Hydraulic fracturing is excluded, in whole or in part, from the Safe Drinking Water Act; the Resource Conservation and Recovery Act; the Emergency Planning and Community Right-To-Know Act; the Clean Water Act; the Clean Air Act; the Comprehensive Environmental Response, Compensation, and Liability Act, and the National Environmental Policy Act.

[Act](#), exempt hydraulic fracturing entirely from regulation. Others, such as the [Energy Policy Act](#), only exempt hydraulic fracturing from regulation in specific instances. For example, under the Energy Policy Act, fracturing is exempt from federal law unless [diesel is used](#) in the process of managing wastewater. Petroleum products other than diesel, however, are not regulated, creating what is known by some as the [Halliburton loophole](#) in the Act.

Bills have been introduced at a federal level in an attempt to establish nationwide regulations over unconventional drilling. In 2011, a bill known as the [Fracturing Responsibility and Awareness of Chemicals Act](#) (the FRAC Act), which would have regulated unconventional drilling and required the chemical components used in drilling to be disclosed, died in the [House](#). It was, however, reintroduced [in March of 2021](#). A competing act was thereafter introduced as well, known as the [Fracturing Regulations are Effective in State Hands Act](#), which would have provided states with the sole regulatory authority over hydraulic fracturing on federal land within their boundaries. To date, the Biden administration has [ordered a moratorium](#) on new oil and gas leases on federal land and water areas.

Conflict persists at a federal, state, and local level regarding the regulation of unconventional drilling, creating what has been referred to as [The Fracking Wars](#) and raising the question of what law prevails when federal, state, and local regulations conflict. The preemption doctrine holds that if [two laws conflict](#), the law coming from the highest level of government will supersede the law coming from the government with less authority. However, federal oversight of unconventional drilling remains significantly limited, causing much of the oversight to fall to the states and local governments.

In 2012, [Vermont](#), in what is largely considered a symbolic gesture due to the state's limited deep shale deposits, became the first state to ban fracking. To date, multiple states have joined Vermont in its prohibition including [Delaware](#), [Maryland](#), [New York](#), [New Jersey](#), and [Pennsylvania](#). By Executive Order, Governor Newsom in California ordered the end of the issuance of new permits for hydraulic fracturing by [January 2024](#). Without state legislative action, however, Newsom's order may later be overturned by succeeding governors.

Regulations controlling the process, chemical disclosure requirements, and the agencies involved with enforcing them also vary widely by state and are, in many instances, extremely technical. In [Texas](#), the Railroad Commission oversees the state's chemical disclosure requirements, while the Texas Commission on Environmental Quality governs issues of air quality, surface water management and water quality, and waste management. In contrast, [Pennsylvania law](#) includes the state's Oil and Gas Act, Coal and Gas Resource Coordination Act, and Oil and Gas Conservation Law, as well as several environmental protection laws, all of which regulate oil and natural gas activity. The Pennsylvania Department of Energy Protection, however, explicitly refuses to intervene in matters regarding hydraulic fracturing [leasing disputes](#).

By comparison, [West Virginia](#) has codified standards involving the construction of wastewater storage pits and the [composition of fracturing solutions](#), while Colorado's [Hydraulic Fracturing Chemical Disclosure Rule](#) requires unconventional drilling operators to publicly disclose the ingredients and concentrations of fracturing chemicals for each well within 60 days of completion. Further regulations are also pending in many states including in California where the [California](#)

[Geologic Energy Management Division](#) published its long-awaited [Draft Rule](#), which would establish a required setback area of 3,200 feet between drilling areas and man-made structures, such as homes and schools. That Rule, however, is not in effect and as of December 2021 is still within the public comment period.

States also vary widely in their taxing of oil and gas corporations. Some states, such as [North Carolina](#), have incentivized oil and gas companies by creating favorable tax brackets for corporations engaged in such operations. Others, however, have imposed [severance taxes](#) — meaning taxes on materials severed from the ground, including oil and gas.

Like many states, localities have also worked to regulate hydraulic fracturing. The [city of Pittsburgh](#), for example, prohibited hydraulic fracturing in 2005, and [Allegheny County](#) is now considering a county-wide ban as well. In 2012, Culver City became the [first municipality in California](#) to request that the state ban hydraulic fracturing. [Mora County, New Mexico](#), followed Culver in 2013 to become the first county in the country to ban hydraulic fracturing, though the action was later found to be unconstitutional. Shreveport, Louisiana, where residents complain of [heavy noise pollution](#), is considering legislative action, and nearby [Bossier Parish](#) banned nighttime fracturing earlier this year. These local regulations, however, are not without conflict and, in some instances, extensive legal debate.

Some states prohibit localities from regulating fracturing. [Oklahoma Senate Bill 809](#), signed into law in 2015, prohibits local governments from banning unconventional drilling but does allow them to set reasonable restrictions on noise, traffic, fencing, and surface operations. After [Denton, Texas](#), banned fracturing, Governor Greg Abbott overturned the action by executive order and prohibited localities from doing it again. In 2015, [the Ohio Supreme Court](#) heard a case involving a similar ordinance and found that a city enforcing its local zoning ordinances against an oil and gas company action violated the Ohio state constitution.

### **Impact of Hydraulic Fracturing on Real Estate**

As expected, hydraulic fracturing tends to either [significantly increase](#) or [substantially impair](#) the value of real estate. Value, of course, depends on [two separate evaluations](#): the surface value of the property and what lies below. To address any questions regarding valuation, real estate professionals should consider using appraisers who use mineral rights resources and guidelines available, such as those from the Appraisal Institute, the American Institute of Minerals Appraisers, the International Valuation Standards Council, and [more](#). Potential fracturing revenue of upwards of [\\$35,000 per month](#) would, of course, appeal to some buyers, but home buyers, in particular, worry about the effects of hydraulic fracturing. For example, a [Duke University study](#) based in Pennsylvania found that the prices of homes using well water dropped by an average of \$30,1676 when hydraulic fracturing occurred within a distance of 1.5 kilometers. Homes using city water, however, gained an average of \$4,800 in value after shale wells opened nearby.

Leasing for fracturing remains a concern in the real estate market. Hydraulic fracturing leases can

prove [difficult to confirm](#). Potential buyers may be entirely unaware of a third-party oil and gas company's rights to the purchased property, sometimes due to a [lack of recording](#) of the lease agreement altogether. Although [state law](#) would dictate whether the lease would survive after a buyer purchased the property, determining who owns what can become an [expensive endeavor](#) that brings multiple parties into [years-long litigation](#). Potential buyers and even the current land owner may be unaware of the extent of the rights guaranteed by a lease, which can, in some cases, extend to [groundwater access](#), raising additional [drinking water concerns](#) for buyers and current homeowners.

[Severance issues](#) prevail as well since separate entities may own separate mineral rights, adding additional confusion to an already convoluted transaction. In any case where fracturing is a concern, real estate professionals should take care to make certain that the ownership interest of every party is confirmed and that the [proper disclosures](#) are given.

Another set of potential complications for both home owners and real estate professionals are the requirements of third-party [mortgage companies](#). Some mortgage companies [will not finance a property](#) if mineral rights are severed. This can raise significant title insurance issues as well, as a [title company](#) may make mineral rights reservations in their policies. Furthermore, home owner insurance providers may refuse to cover [fracturing risks](#) or exclude all property linked to [commercial activity](#), which may put buyers at risk of [defaulting on their mortgage agreements](#). Any property with a history of hydraulic fracturing should be well researched and extensively reviewed for these potential pitfalls, of which remedies may prove costly.

### **REALTORS® and Hydraulic Fracturing**

Hydraulic fracturing continues to polarize the nation with states and local governments engaging in extensive litigation over fracturing regulations and citizens strongly opposing or strongly supporting unconventional drilling. Both laymen and professionals alike have been dropped front-and-center into a controversial debate deeply rooted in American politics. Some REALTOR® associations have issued public positions on unconventional drilling including the Garret County Board of REALTORS® in Maryland, which [publicly opposed](#) drilling in the Deep Creek Lake Watershed. In contrast, the [Board of Directors of the Loveland-Berthoud Association of REALTORS®](#) and the [Board of Directors of the Longmont Associate of REALTORS®](#), both in Colorado, announced opposition to a proposed hydraulic fracturing ban. The [National Association of REALTORS®](#), like the National Association of Home Builders, remains neutral regarding the matter.

### **Conclusion**

Fortunately, there are resources available to real estate professionals facing hydraulic fracturing concerns. The NAR has an extensive [white paper](#) on the subject, while the Environmental Protection Agency has many [studies](#), [assessments](#), and [infographics](#) available. The [United States Geological Survey](#) and the [Independent Petroleum Association of America](#) offer additional resources as well, which are free to the public. Real estate professionals are advised to take caution when a transaction involves hydraulic fracturing. Property values, ownership of mineral rights, the availability (or lack thereof) of title or homeowners insurance, and questions of mortgage requirements

are only a few of the potential concerns. By educating themselves on the topic, real estate professionals can confidently traverse unknown territory and, in the end, may even strike (black) gold.

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## ADDITIONAL STATE & LOCAL RESOURCES

**White Papers:** Comprehensive reports prepared for NAR on issues directly impacting the real estate industry. Examples include: Rental Restrictions, Land Banks, Sales Tax on Services, State & Local Taxation, Building Codes, Hydraulic Fracturing, Foreclosure Property Maintenance, Climate Change, Private Transfer Fees.

**Growth Management Fact Book:** Analysis of issues related to land use and modern growth management topics include density — rate of growth, public facilities and infrastructure, protection of natural resources, preservation of community character, and affordable housing.

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