



Fracking Facts: The Science, Economics, and Legal Realities

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Key Points

- No definitive link between fracking and earthquakes has been found, however, earthquakes are increasing globally and randomly.
- Numerous studies prove there is no link between fracking and groundwater contamination
- Emissions from fracking have declined significantly over the last decade. Mobile emissions from vehicles are much more prolific and are not subject to state regulation.
- Fracking bans cost the municipalities that enact them and the state hundreds of millions in gross product and tax revenue.
- Local governments are subject to supremacy of the state just as the state is subject to the supremacy of the federal government. Liberty is the governing principle, not local control.

Introduction

All eyes are on Denton and the Texas Legislature to see what will shake out from the city's sweeping fracking ban passed by a popular vote.

True to form, major media coverage has largely consisted of talking points, backed by questionable science, and presented by fracking detractors to bolster their position with little regard to the hard facts of the matter.

Hydraulic fracturing, commonly known as fracking, has been employed in the U.S. since the 1940s. While innovation has improved the precision of the process, the essentials are the same. Utilizing horizontal drilling, a mixture of mostly water, sand, and trace amounts of chemicals are used to create fissures in underground shale deposits allowing oil and natural gas trapped in hard rock to move toward the surface where it is collected.

To dispose of the wastewater, injection wells are typically drilled at depths of less than two miles below the surface to dispose of the water mixture used during the fracking process. Approximately 10–20 percent of the time, oil and gas companies are beginning to recycle their wastewater and return the water to its original quality.¹ In fact, the amount of wastewater recycling that is done is expected to double over the next decade. Additionally, fracking operations are increasingly utilizing poor quality brackish water for their drilling needs.²

Fracking, and the processes associated with it, are blamed for emissions of pollutants, earthquakes, and even groundwater contamination, though independent evidence consistently shows these allegations to be false. The evidence supporting fracking bans begins to look slim when attention is drawn to the facts.

Fracking Science

Last month Connecticut experienced an unusual cluster of earthquakes originating at an estimated three miles beneath the surface. Yet, no one has rushed to pin the blame on fracking. Why? Perhaps it's because fracking isn't occurring in Connecticut.³

The number of earthquakes is up across the globe. Scientists from the United States Geological Survey (USGS) published a paper last year reporting that the number of earthquakes in the first half of 2014 was twice that of the average number in 1979, and that the increase was occurring randomly.⁴ Importantly, most of that increase, and most of the earthquakes, occurred outside of the U.S. where virtually no fracking occurs.⁵ Could it be that detection devices for moderate or small earthquakes are now able to measure tremors that were once undetectable under previous instruments?

Nevertheless, Texans are being inundated with more and more claims that fracking is the cause of the earthquakes occurring in the Dallas–Ft. Worth metroplex.

Seismologists investigating the recent quakes in Irving, a municipality residing over part of the Barnett Shale, have pointed out there is no drilling actively near the origination points of the tremors. Further, even seismologists who blame the injection wells are forced to acknowledge that the impact of the injection well site is usually contained within six miles. The closest injection well to the Irving earthquake epicenter is 10 miles away.⁶

Southern Methodist University’s seismology team has provided some insight to the recent spate of metroplex quakes. The team identified a fault line that runs from Texas State Highway 114 in Irving and extends north by northeast toward Walnut Hill in Dallas, which lies east of Texas State Highway 75. Importantly, they note that this is not a new fault, but one that “is probably hundreds of millions of years old” which has reactivated.⁷

On this point, other researchers note that Dallas sits on top of an ancient mountain range, the Ouachita Mountain system. The subterranean roots of the geological formation sweep across south and north central Texas and into some nearby states like Oklahoma. The tectonic plates that formed the range are still there and can still slip.⁸

If not earthquakes, what about emissions and groundwater contamination?

The U.S. Department of Energy and several academic research institutions have repeatedly confirmed the lack of a single instance of groundwater contamination.⁹ Further, methane emissions that escape from natural gas fracking wells and which are blamed for global warming declined by 73 percent from 2011–2013. This is a period when the U.S. became the world’s largest producer of natural gas.¹⁰

Another popular anti-fracking bandwagon involves ground level ozone, or smog. Ground level ozone is formed when volatile organic compounds (VOC) mix with nitrogen oxides (NO_x) in the presence of sunlight.

The Texas Commission on Environmental Quality (TCEQ), which operates the most comprehensive air-monitoring network in the DFW metroplex, showed that in 2009, mobile source emissions far exceeded emissions emanating from the Barnett Shale by a magnitude of 49 percent versus five percent. In 2012, TCEQ studies showed that mobile NO_x in the Barnett Shale exceeded those of oil and gas NO_x by approximately 15 times. VOCs from oil and gas operations were half that of the mobile VOCs.¹¹

In the Eagle Ford Shale area, beginning 50 miles south of San Antonio, the story is the same. In 2013 it was reported that the drilling related emissions from the entire Eagle Ford area would easily be matched by the air pollution produced in Bexar County.¹² In fact, by 2018, VOCs and NO_x from the Eagle Ford Shale are projected to account for only three percent of the San Antonio–New Braunfels metropolitan area’s total emissions.¹³

Economies of Shale

The real harm from fracking occurs when you ban it. The Perryman Group was commissioned by the Fort Worth Chamber of Commerce to complete a comprehensive analysis of the fracking ban in the city of Denton to include its economic impact. Estimating the potential economic benefit of continued fracking to the city over the next 10 years, Perryman factored in historically moderate increases in drilling over time. Its conclusion was that without a ban, Denton would gain \$295.8 million in gross product, 2,603 person-years (a person working for a year) of employment, \$12.3 million in tax revenue, and \$28.6 million for Denton schools all stemming from oil and gas production.¹⁴

Regulations do not occur in a vacuum. Using the same factors and time frame as above, the Perryman Group estimated that the state of Texas could be expected to see gains in gross product of \$424.2 million, 3,413 person-years of employment, and tax revenue of \$23.2 million if the city of Denton were to continue fracking.

What about losses? The same study estimates that Denton could lose \$251.4 million in economic activity, 2,077 person-years of employment, \$5.1 million in local tax revenue, and \$4.6 million in tax revenue for its schools. That's without counting the additional loss to the state.

For many, economic predictions based on a law only a few months old might not seem compelling. However, Texas is not the only state with fracking, and it's not the only state to have faced a fracking ban. New York, the only state to have legislated an entire state moratorium on fracking, currently faces a threat of secession from 15 southern-tier towns that are interested in joining Pennsylvania. The simple reason: Pennsylvania allows fracking and their citizens are prospering.¹⁵

If the fracking ban is upheld judicially or left legislatively untouched, Denton will be forfeiting for itself and the state a prodigious amount of jobs—real jobs for real people and their families.¹⁶

The Shales of Justice

Questions about the limits to municipal authority have been brought to the forefront by Denton's fracking regulation that passed last November. While Denton's ban only targeted one type of drilling—fracking—opponents say the ban will effectively preclude all types of oil and gas drilling since most of the deposits underlying the municipality can only be reached through hydraulic fracturing.



The Railroad Commission (RRC) issues drilling permits for oil and gas companies in Texas. Until now, local municipalities have had very little to say about how and where these permits are issued.

Are municipalities without recourse? No. Through zoning authority, municipalities can legally impose restrictions on when and where drilling activities can happen. This ability stems from their authority to protect the health, safety, and welfare of their citizens. For example: municipalities have successfully restricted drilling activities occurring late at night and they have enacted setback ordinances requiring drilling operations to be a certain distance from residential neighborhoods.¹⁷

With this in mind, two prominent constitutional legal challenges have arisen.

The first challenge is rooted in preemption—the idea that authority flows from the states, downstream, to the various localities. Any municipal regulation that interferes with the legislatively assigned task of a state agency preempts the law is therefore unconstitutional as violative of the supremacy clause.

The Texas Oil and Gas Association uses just this argument in its suit against Denton, which they filed the morning after the fracking ban passed. They claim that the Legislature gave authority

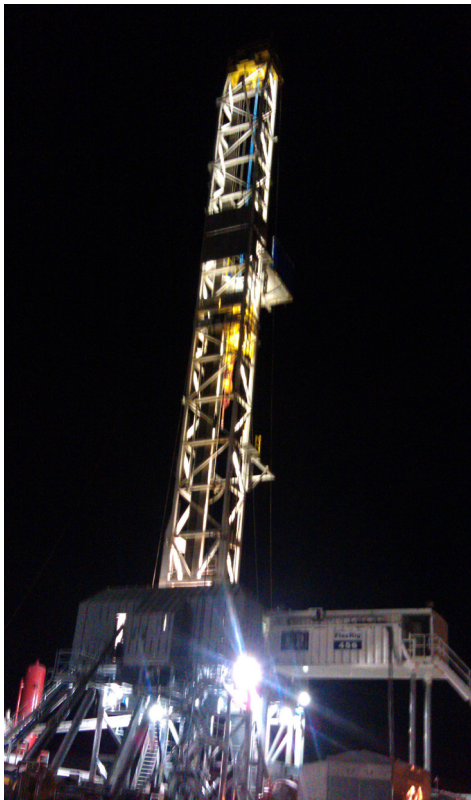
to state agencies to regulate oil and gas production, and as such, Denton’s fracking ban is unconstitutional.¹⁸ Since Denton is the only city in Texas to have enacted a ban of this type, litigation outside of Texas provides some insight into the probability of success for a challenge based on state pre-emption.

For example, a similar pre-emption claim was met with success at the end of February in Ohio. In 2004 the Ohio General Assembly amended Chapter 1509 of the revised code (R.C.) to provide for “uniform statewide regulation” of oil and gas production within Ohio and to repeal “all provisions of law that granted or alluded to the authority of local governments to adopt concurrent requirements with the state.”¹⁹ Despite this codification of state pre-emption, the city of Munroe Falls imposed an injunction on Beck Energy Corp. when it began drilling operations, citing a 1997 municipal regulation.²⁰

The Ohio Supreme Court held that R.C. 1509 was a valid exercise of the state’s police powers and that the city’s ordinances conflicted with state law. By explicitly reserving for the state, to the exclusion of local governments, the right to regulate “all aspects” of the location, drilling, and operation of oil and gas wells, including “permitting relating to those activities,” R.C. 1509 prohibits municipalities from exercising valid regulatory control over infrastructure in a discriminatory, obstructive, or unfair way.²¹

The second challenge landowners will be making is regulatory takings claims based on the 5th Amendment of the U.S. Constitution: “nor shall private property be taken for public use, without just compensation.” Specifically, this type of claim states that municipalities, by banning fracking, have taken the landowner’s mineral rights without compensation.

When the government physically takes an individual’s property it is required under federal law to pay the landowner a just amount of compensation—the best example of this is the exercise of eminent domain. However, a taking has still occurred when a governing body enacts a regulation that removes all, or substantially all, of the property’s potential or actual economic productivity.



In *Penn Central Transport Co. v. New York City*, the U.S. Supreme Court recognized that “*Pennsylvania Coal Co. v. Mahon* is the leading case for the proposition that a state statute that substantially furthers important public policies may so frustrate distinct investment-backed expectations as to amount to a ‘taking.’”²² The issue facing the Court in *Pennsylvania* was a regulation on coal mining, which made it commercially impractical to mine coal under private property that was not owned by the mining interest. The regulation effectively curtailed all mining activities that were previously authorized by contract between the surface owner and mining interests. In invalidating the statute as a regulatory taking, Justice Holmes said, “We are in danger of forgetting that a strong public desire to improve the public condition is not enough to warrant achieving the desire by a shorter cut than the constitutional way of paying for the change. As we already have said, this is a question of degree[.]”²³

Similar to the coal mining restriction in *Pennsylvania*, Denton, in enacting a ban that restricts the only means of extracting shale gas, has affected a total prohibition on the landowner’s right to the value from the minerals under the surface of his property, thereby constituting a regulatory taking.

Fracking bans put city officials in an uncomfortable position. Mark Burroughs, Denton’s mayor, said he supports some restrictions on fracking but he believes the all-out ban goes too far. Burroughs said that once passed, “the city has to follow [the ban]. We could be bound to enforce an illegal act, which throws into a whole panoply of open issues.... We as a city would be bound to defend it, whether we believed it was illegal or not.”²⁴

Governor Greg Abbott has been outspoken about his belief that state law has the power to supersede municipal regulations that unduly restrict the rights and freedoms of Texans. Speaking at the Texas Public Policy Foundation, Abbott warned that a quilt of patchwork bans could threaten the integrity of the Texas model, which has made the state so successful.²⁵

Clarifying the legal limits of municipalities does not erode the importance of local control. Government power held closer to the people often makes that power more responsive. However, local governments and municipalities, through laws and ordinances, are just as adept at violating our liberty protected in the Constitution as the federal government. Local control is not the primary governing principle in our state or our country—liberty is.²⁶

Conclusion

Emotional appeals and fuzzy facts masquerading as science confound these debates about local fracking bans. The economics, science, and law do not favor proponents of these local bans. And the city of Denton has reached into the pockets of every Texan with its fracking ban on the basis of flawed science.

If the ban stands, it will cost the city and the state hundreds of millions in economic stimulus and tax revenue. And for what? Uncontaminated groundwater, earthquakes brought about by random events and the configuration of tectonic plates, and pollutants that overwhelmingly arise from cars and trucks—not from fracking.

A judicial answer to the legality of this type of municipal regulation could easily take years once the appeals process is complete. In the meantime, the Texas Legislature and state leadership branch have the ability to be proactive by eliminating the ability of cities to ban fracking. ★

Notes

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- ²² *Penn Central Transportation Co. v. New York City*, 438 US 104, 128 (1978).
- ²³ *Pennsylvania Coal Co. v. Mahon*, 260 US 393, 416 (1922).
- ²⁴ Dropkin, *State Impact NPR*.
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About the Author



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Prior to joining the Foundation in January 2015, Thompson studied at St. Mary's University School of Law and Graduated with a Doctor of Jurisprudence (J.D.) in 2014. She was raised in the Dallas area and completed her undergraduate coursework at Dallas Baptist University in 2008, where she graduated with a Bachelor of Science degree in political science and an honors award in her field of study.

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