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**American Law and Jurisprudence on Fracing****Written by:****Christopher S. Kulander****Thomas E. Kurth****Michael J. Mazzone****Mary S. Mendoza**

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## *American Law and Jurisprudence on Fracing*

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### *Introduction*

The substantial growth of domestic unconventional shale resources in recent years has partially been a result of the increase in the use of hydraulic fracturing. Hydraulic fracturing is generally viewed as a completion technique that is a practical necessity to promote development of unconventional “tight” shale reservoirs, particularly gas-shale. Hydraulic fracturing entails treating water, oil, or gas wells to stimulate more production than otherwise would have been achieved using standard drilling and production techniques. This report deals with hydraulic fracturing and the legal and technical issues associated with it.

This report first covers what hydraulic fracturing is and why it is done. It identifies the current location of the largest shale gas fields where hydraulic fracturing is common and the effect of hydraulic fracturing on domestic production. It then covers the environmental issues, focusing on the anecdotal and evidentiary call and response among environmental groups, regulators, landowners, and producers. It then discusses how traditional oil and gas jurisprudence impacts hydraulic fracturing, emphasizing both surface versus mineral estate issues and disputes that arise between two adjoining mineral owners.

We examine the regulatory frameworks currently in place in thirteen (13) states where hydraulic fracturing is common. This state-level analysis is made with an eye towards regulations specific to hydraulic fractioning and the fluids used, as well as more overarching regulations that include hydraulic fracturing among other exploration and production activities, such as general pollution disposal regulations that cover used hydraulic fracturing fluid as well as other liquid waste from drilling. In several instances, this report describes bills under consideration, as well as important opinions from state courts. We also consider hydraulic fracturing on semi-sovereign tribal land.

Finally, this report analyzes the current and contemplated laws and regulations governing hydraulic fracturing on the federal level. In particular, it discusses the history of the litigation and legislative efforts challenging the current federal exception enjoyed by hydraulic fracturing. It also highlights the friction between state and federal oversight.

## *Hydraulic Fracturing—an Overview*

Most people are familiar with the “gusher” well where reservoir pressure underground pushes oil up the wellbore. Oil and gas are harder to extract from “tight” rock formations, which do not allow passage of oil and gas through and up a well. Such formations, often shale or coal, may be filled with gas or oil, but allow those fluids to flow only along preexisting cracks or “fractures.”

Naturally-occurring fracture patterns have long been used to heighten development in otherwise uneconomic formations. One example is the Austin Chalk, a tight fossiliferous chalk and marl formation found in the Gulf Coast region of the United States. The Austin Chalk in Texas and coal seams in Appalachia are marked by zones of natural fractures which trend in a common direction.<sup>1</sup> While the Austin Chalk is often saturated with hydrocarbons, it typically remains uneconomic unless a horizontal borehole intersects a number of the fractures. Therefore, seismic and surfacial mapping techniques were developed to find these natural fracture zones and orientations.<sup>2</sup>

The usefulness and application of hydraulic fracturing only became apparent with the discovery that “tight” shale formations could be economically developed with hydraulic fracturing techniques—that is, by making *artificial* fractures. Now, instead of relying on natural fractures zones, developers made their own fractures.

Hydraulic fracturing—known colloquially as “fracing,” “fracking” and, in this report, as “fracing”—is a process in which fluid is injected into a well at very high pressures in order to either widen and deepen existing cracks or create new fractures in the tight formation.<sup>3</sup> Generally, increased fracturing will allow more oil or gas to be produced from a well previously thought dry or in decline. Petroleum companies vary the type of fluid used for fracing depending on the rock type, depth or other factors. The fluids used can include water, water mixed with solvents, or drilling mud. The fluid is mixed with the “proppant,” which is typically sand, ceramic pellets or other small granular material that is carried into the fractures where it remains to prop the crack open thereby allowing the oil or gas to flow.

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<sup>1</sup> See Byron R. Kulander and Stuart L. Dean, *Coal-cleat Domains and Domain Boundaries in the Alleghany Plateau of West Virginia*, American Association of Petroleum Geophysicists (“AAPG”) Bulletin, 1374-1388 (1993), v. 77, no. 8.; see also Kevin P. Corbett, David R. Van Alstine and Janell D. Edman, *Stratigraphic Controls on Fracture Distribution in the Austin Chalk: an Example from the First Shot Field, Gonzalez Co., Texas*, 1997 AAPG Hedberg Research Conference.

<sup>2</sup> See e.g. Ilyas Juzer Najmuddin, *Austin Fracture Mapping Using Frequency Data Derived from Seismic Data* (2003) (unpublished PhD. dissertation, Texas A&M University) (on file with Texas A&M University Library) available at <http://repository.tamu.edu/bitstream/handle/1969.1/34/etd-12112002-153843-1.pdf?sequence=1> (last visited May 3, 2010).

<sup>3</sup> The American Petroleum Institute (“API”) maintains a short video of current fracing techniques at <http://www.api.org/policy/exploration/hydraulicfracturing/hydraulicfracturing.cfm> (last visited April 23, 2010).

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