American Law and Jurisprudence on Fracing

United States Energy Association
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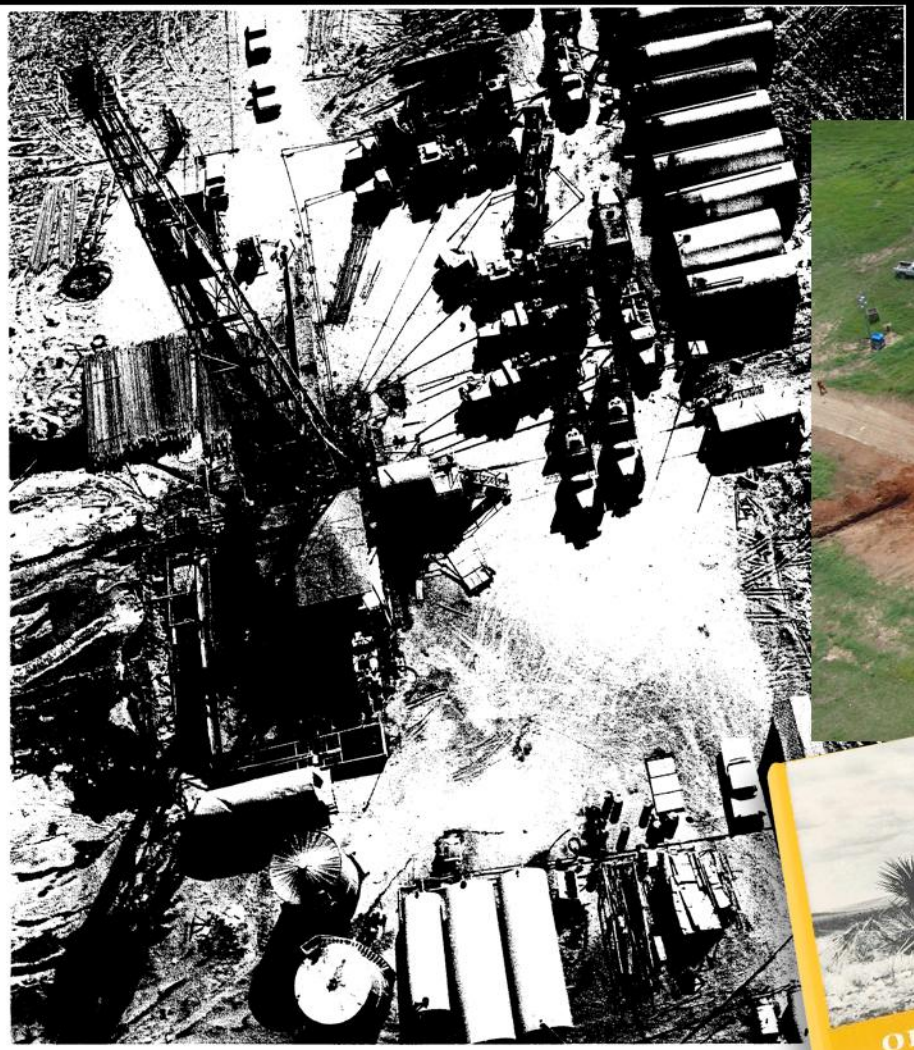
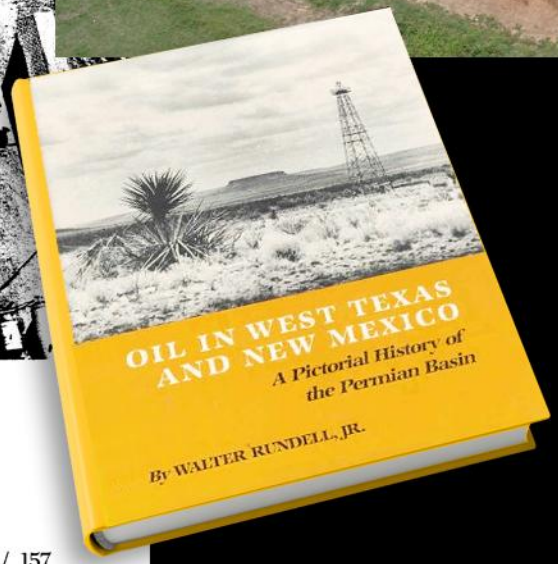
Regulatory Overview and Responses to Fracing

- Basic Postulates
- Background
- Environmental Concerns Posed By Fracing
- Fracing Regulation
- Considerations Pertinent to Fracing Regulation
- Conclusion



A Halliburton "frac" job in progress. Hydraulic fracturing consists of injecting gel water and sand into the gas- or oil-bearing formation at high pressures that force the strata apart, thus promoting a freer flow of oil or gas. The fluid is stored in cylindrical tanks, and the trucks carry engines that force the fluid into the formation. *Mahan & Associates, Inc.*



Basic Postulates

- Hydraulic fracturing or “fracing,” coupled with horizontal drilling, has opened up vast resources of shale gas, as well as oil, throughout the U.S.

- These techniques also have brought oil and gas activities in close proximity to populated areas raising environmental concerns with local residents that have garnered media attention.

Basic Postulates (cont'd)

- This public focus has lead to increased regulation and enforcement.

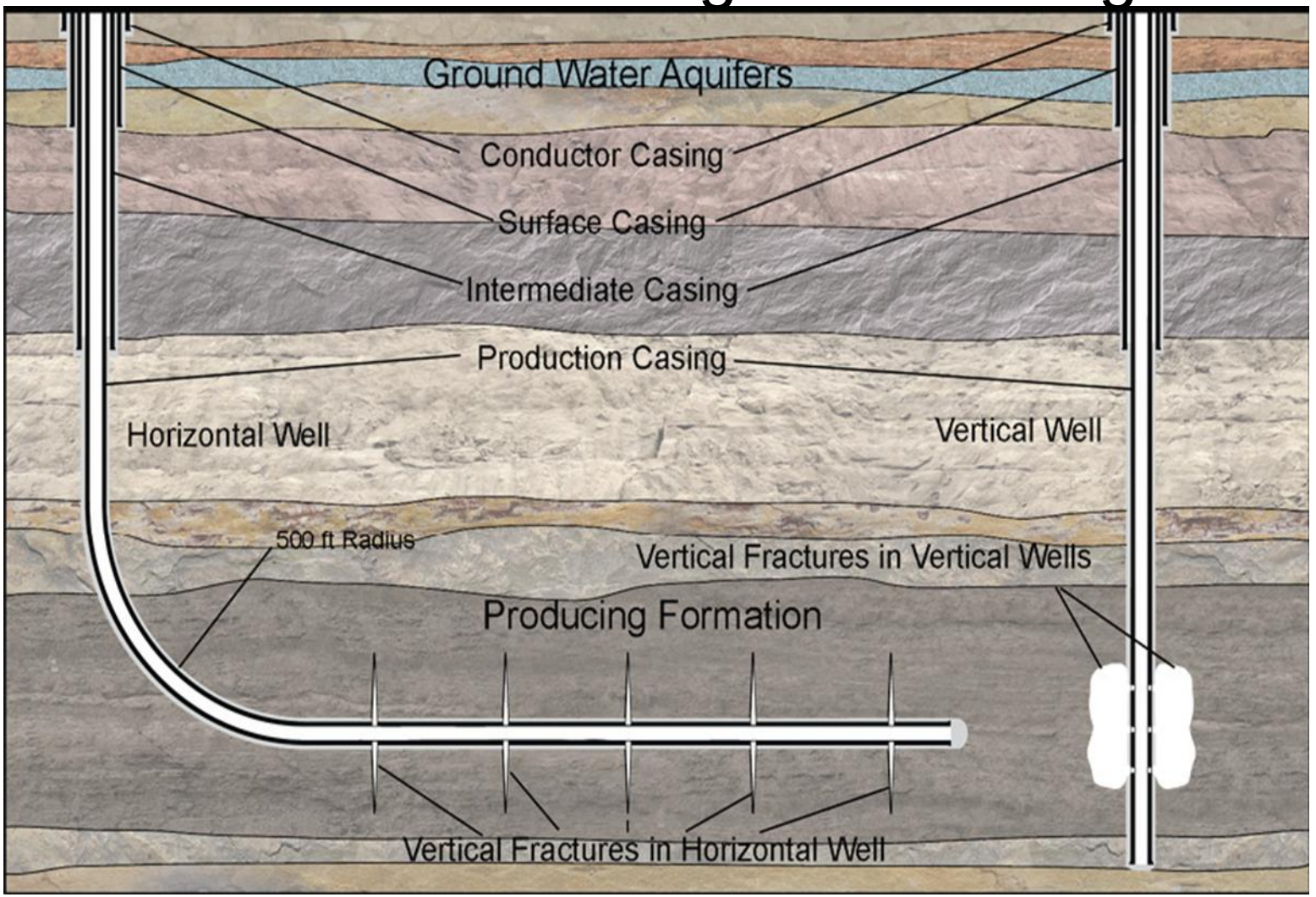
- Regulation of fracing, like of other activities, should be based on, and driven by, facts and science, rather than media perception and politics.

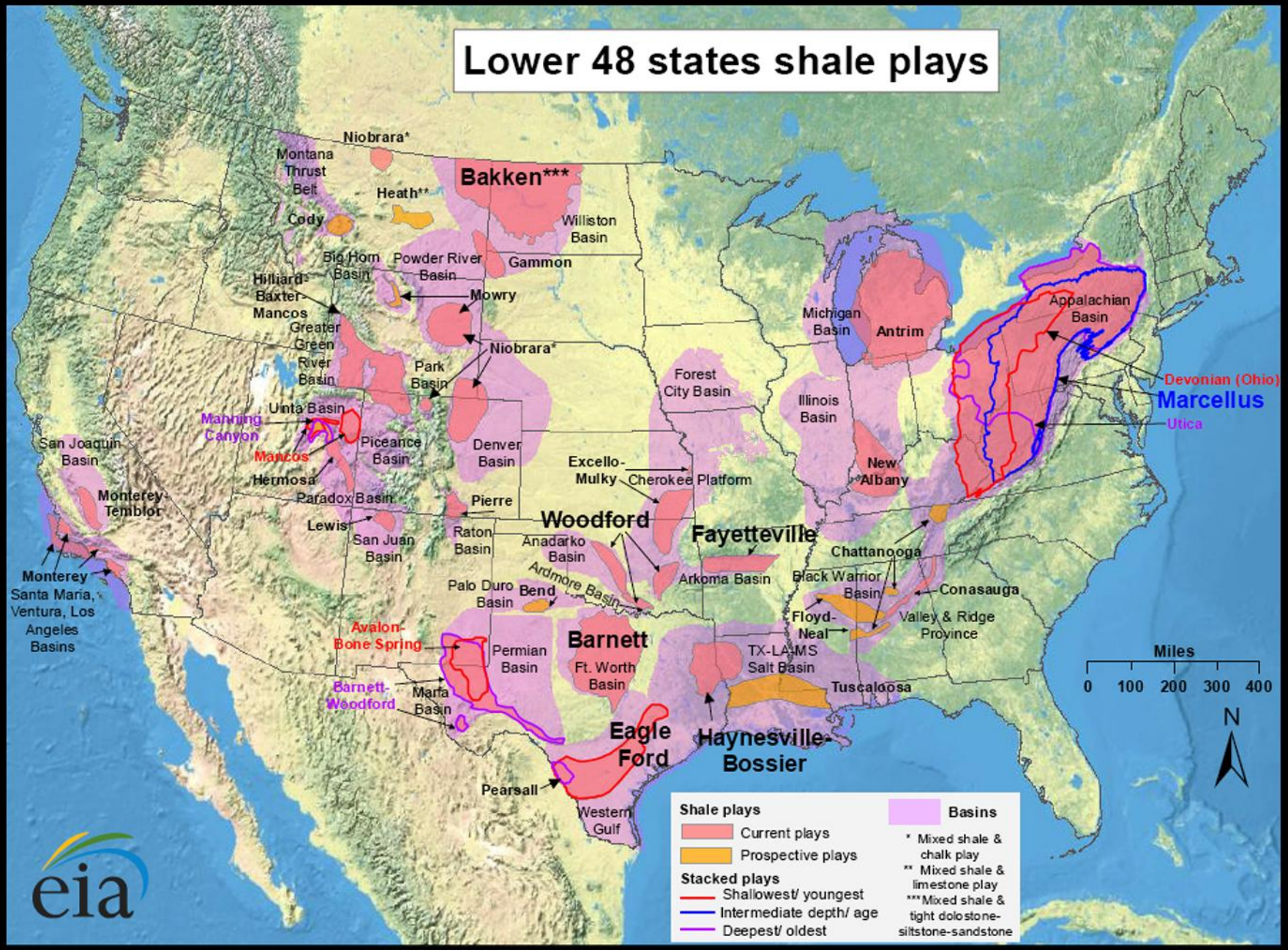
Background

What is Fracing?

- Fracing is not a new development
  - First frac job was performed in 1947
  - Millions of wells have been safely fraced in the last 60 years
- Fracing is a well stimulation technique
  - Injection of fracing fluid opens up new channels in rock that makes it possible to extract oil and gas from areas where it would have been impossible before
  - Injection of proppant allows cracks to remain open
  - Injection fluids are 90% water 9.5% sand and .5% chemical additives
- Generally fracing is done thousands of feet below the surface and below the water table

Horizontal Drilling and Fracing

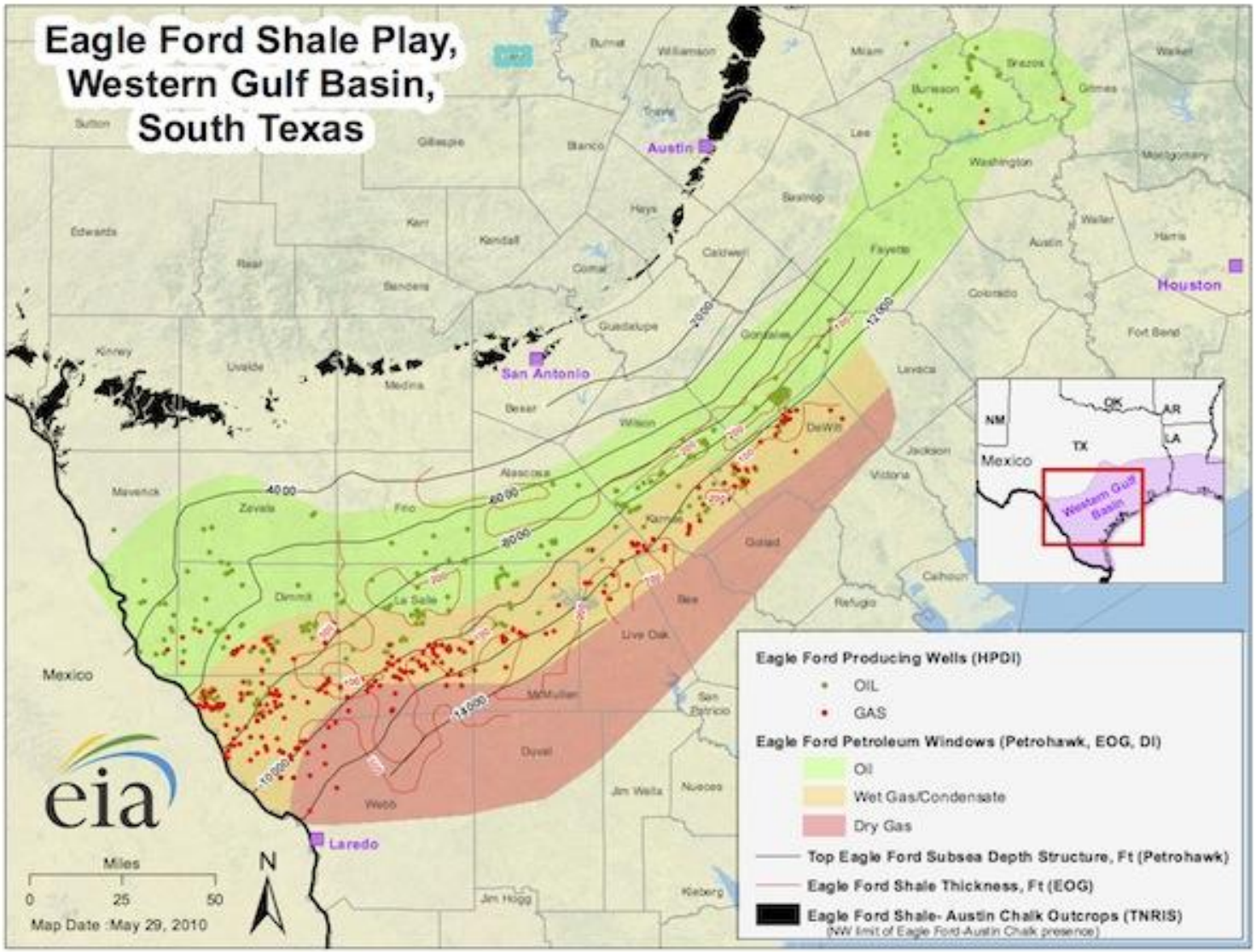




Source: Energy Information Administration based on data from various published studies.
Updated: May 9, 2011

Shale Formations

- **Marcellus Shale –** New York, New Jersey, Maryland, Pennsylvania, West Virginia, Ohio, Virginia
- **Barnett Shale –** Texas
- **Bakken Shale –** North Dakota, Montana
- **Haynesville Shale –** Texas, Arkansas, Louisiana
- **Eagle Ford Shale –** Texas
- **Utica Shale –** New York, Ohio, Pennsylvania
- **Internationally –** Poland, Israel, China, Australia, France, U.K., and many more


Eagle Ford Shale Play,
Western Gulf Basin,
South Texas
Austin
San Antonio
Houston
Laredo
Mexico
Eagle Ford Producing Wells (HPDI)
OIL
GAS
Eagle Ford Petroleum Windows (Petrohawk, EOG, DI)
Oil
Wet Gas/Condensate
Dry Gas
Top Eagle Ford Subsea Depth Structure, Ft (Petrohawk)
Eagle Ford Shale Thickness, Ft (EOG)
Eagle Ford Shale- Austin Chalk Outcrops (TNRIS)
(NW limit of Eagle Ford-Austin Chalk presence)
eia
Miles
0
25
50
N
Map Date :May 29, 2010
NM
OK
AR
TX
LA
Mexico
Western Gulf Basin


Austin
San Antonio
Eagle Ford Shale

President Obama's 2012 SOTU

"We have a supply of natural gas that can last America nearly 100 years. And my administration will take every possible action to safely develop this energy. Experts believe this will support more than 600,000 jobs by the end of the decade."

Practical Considerations

- It takes approximately 23 days to drill a well, a week to frac, and two weeks for flowback before a well is connected to a pipeline.
- A rig can be up to 1.5 miles away from the formation.
- One pad site can support up to 32 wells.
- An average pad site is three to five acres.
- Once a well is connected to a pipeline and begins producing, 80%-90% of the pad site can be restored.

The Fracing Debate

- Proponents
  - Opens up new reserves
  - Keeps energy supply domestic
  - Clean natural gas
  - Creates jobs
  - When done properly, no environmental risks (*e.g.* University of Texas study)
- Opponents
  - Environmental issues?
    - Groundwater?
    - Pollution?
    - Earthquakes?
  - Would prefer to see focus on renewable energy
  - Water use


Photo Travel Pages
www.photostravelpages.com

Environmental Concerns Alleged

- Air quality
  - volatile organic compound and other emissions
  - greenhouse gases (GHGs), including methane
- Water quality
  - aquifer contamination
  - surface contamination
- Water quantity -- consumptive use
- Earthquakes
- Noise, odor, light, and traffic
- Land use compatibility

Greenhouse Gases

- "Compared to coal, the [GHG] footprint of shale is at least 20% greater and perhaps more than twice as great on the 20-year horizon . . ." "Methane and the greenhouse-gas footprint of natural gas from shale formations," R. Howarth et al. (Cornell 2011)

- "GHG impacts of shale gas are . . . only 56% that of coal." "The Greenhouse Impact of Unconventional Gas for Electricity Generation," N. Hultman et al. (Univ. of MD 2011)

See http://www.energyindepth.org/new-study-debunks-cornell-ghg-paper-again/

- "Carbon dioxide emissions in the U.S. are at their lowest in 20 years. It's not because of wind and solar power."
  - Bjorn Lomborg, author of The Skeptical Enviornmentalist, in Why are Carbon Dioxide Emissions Down so Much in the U.S."? Fracking. http://www.slate.com/articles/health_and_science/project_syndicate/2012/09/thanks_to _fracking_U_S_carbon

Alleged Aquifer Contamination

- Pavillion, WY (Encana)
  - Comment Period Recently Extended for the 3rd time
- Dimock, PA (Cabot Oil & Gas)
  - EPA Tests Show No Sign of Contamination
- Parker County, TX (Range Resources)
  - EPA Recently Dropped Case after Repeated Blunders

See Fact-Based Regulation for Environmental Protection in Shale Gas Development (UT Energy Institute 2012)
http://energy.utexas.edu/index.php?Itemid=160&id=151&option=com_content&view=article

Water Use in Shale Gas Development

- Barnett Shale Water Uses
  - natural gas industry: less than 1%
  - public water supply: 82.5%
  - Irrigation: 6 %
  - industry/mining: 4.5%
  - Livestock: 2 %

- Unlike other uses, the use of water in fracing a well is temporary.

Earthquakes and Fracing

- Geologists and politicians have been arguing for about whether fracing can cause earthquakes.

- A comprehensive study released by the National Research Council found they can, but that the number of earthquakes linked to fracing operations is very small.

- The study concluded the greatest risk of earthquakes comes not from drilling deep shale or from fracing, but from pumping the wastewater from those operations back down into deep sandstone or other formations for permanent disposal.

See http://www.scientificamerican.com/article.cfm?id=fracking-can-cause-earthquakes (June 15, 2012)

Earthquakes and Fracing (cont'd)

- A seismologist at the University of Texas at Austin concluded that injection-triggered quakes might be more common than thought, but noted that fluid injection may trigger earth quakes only if fluids reach and relieve friction on a nearby fault. See http://www.livescience.com/22151-fracking-earthquakes-fluid-injection.html

- Ohio regulators studying the cause of minor earthquakes near Cleveland concluded that fracing had nothing to do with the tremors that were very likely caused by the injection of wastewater into deep disposal wells.

- Ohio is now imposing new regulations governing the placement and operation of these deep disposal wells. Some or all of the wastewater injected down those Ohio wells came from drilling and fracing operations, but not from fracing per se. See

http://www.forbes.com/sites/christopherhelman/2012/03/12/epa-doubts-its-own-anti-fracking-study-while-ohio-determines-fracking-did-not-spawn-earthquake-swarm/

Regulation of Oil and Gas Activities

	Federal	State	Local
Air Quality	X	X	
Water Quality	X	X	
Waste Management	X	X	
Chemical Disclosure	X	X	
Water Quantity/Use		X	
Earthquakes		X	
Noise, Odor, Light & Traffic			X

Federal Regulation of O&G Activities

- General Pollution and Other Environmental Programs
- Oil and Gas Leasing
  - Regulatory requirements – DOI BLM Proposed Regulation (May 4, 2012)
  - Lease provisions

Federal Pollution Programs

- Clean Water Act (CWA)
- Clean Air Act (CAA)
- Underground Injection Control (UIC) Program of Safe Drinking Water Act (SDWA)
- Resource Conservation and Recovery Act (RCRA)
- Comprehensive Environmental Response, Compensation and Liability Act (CERCLA)

Common Elements of Federal Pollution Programs*

- Federal government sets regulatory floor.
- States may assume responsibility or qualify for federal programs.
- Regulation is by rule or permit.
- Permit requirements are based on
  - technology
  - ambient environment.
- Significant sanctions (administrative, civil, and criminal) may be imposed for non-compliance.
- Agencies and, in some instances, citizens may sue not only for noncompliance, but also to abate imminent and substantial threats.

* Excluding CERCLA

Federal O&G Regulation

- CWA
  - Effluent Limitations
  - NPDES Permits
    - Process – produced water, fracing flowback
    - Stormwater – contaminated runoff from well pad
  - Oil Spill
    - spill prohibition
    - planning and response requirements

Federal
O& G Regulation (cont'd.)

- CAA
  - Permitting under SIPs – individual and by rule
  - NSPS/NESHAPS – Green completions
  - Section 112(r) – General Duty Clause
- RCRA – hazardous waste oil and gas exemption
- UIC/SDWA
    - Class II permitting
    - fracing exemption – proposed EPA guidance on use of diesel
- CERCLA -- petroleum exemption

Other Pertinent Environmental Programs

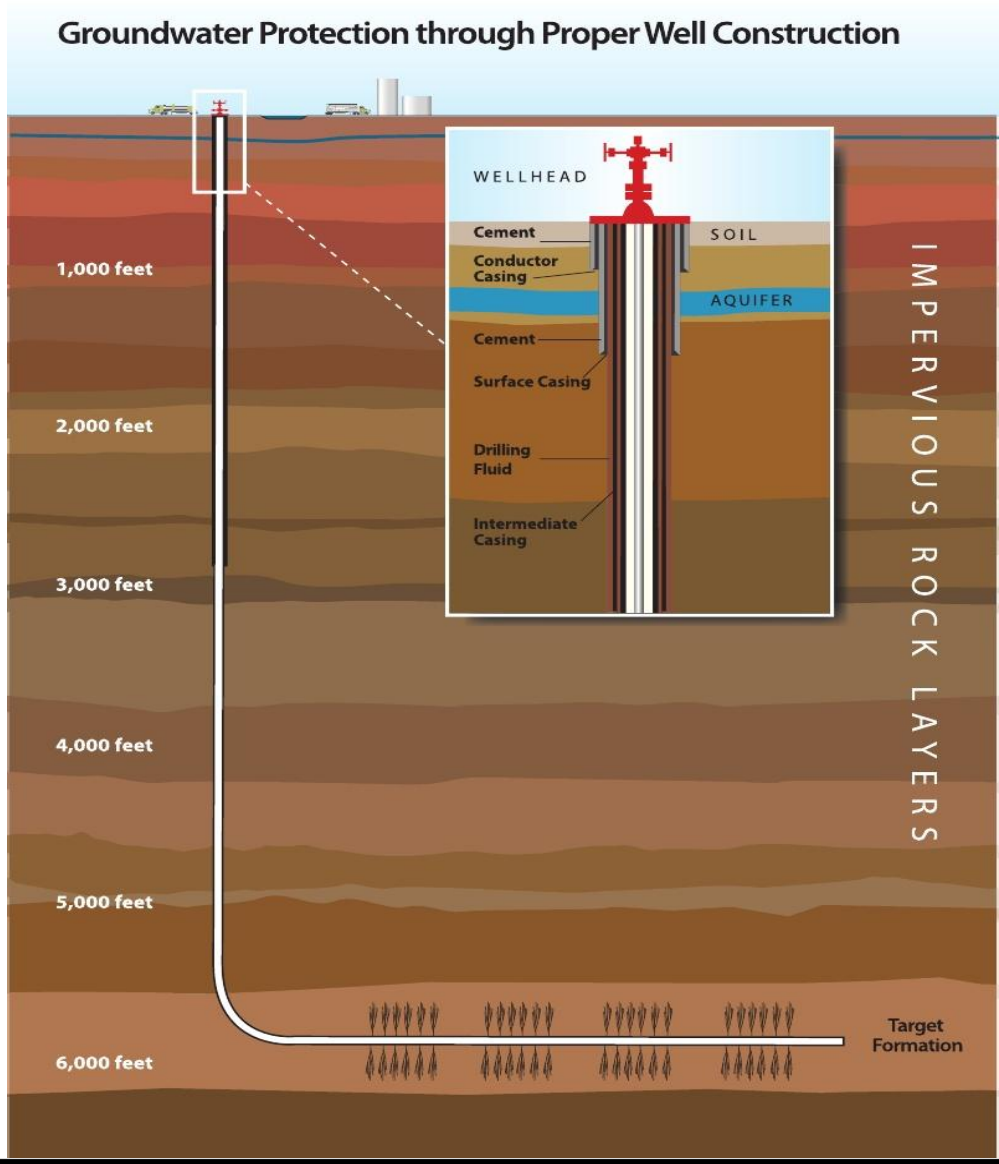
- Toxic Substances Control Act (TSCA)
- Emergency Planning and Community Right to Know Act (EPCRA)
- Endangered Species Act (ESA)
- Migratory Bird Treaty Act (MBTA)
- National Environmental Policy Act (NEPA)

EPA Comprehensive Fracing Study

- Progress Report Released in December 2012
- Full Results expected in 2014

State O&G Regulation

- Permitting requirements
- Well Construction Requirements, e.g., casing, blowout preventers
- Testing requirements
- Water withdrawal, disposal, recycling regulations
- State water and air quality regulations
- Impact fee statutes
- Moratoriums
- Location Restrictions




DONT
Frack
With
NEW YOR

FracFocus
Chemical Disclosure Registry

WELCOME

Welcome to FracFocus, the hydraulic fracturing chemical registry website. This website is a joint project of the Ground Water Protection Council and the Interstate Oil and Gas Compact Commission.

On this site you can search for information about the chemicals used in the hydraulic fracturing of oil and gas wells. You will also find educational materials designed to help you put this information in perspective.

LEARN MORE

Welcome | Hydraulic Fracturing | Casing & Cement | State Regulations | Chemical Use

Looking for information about a *well site near you?*

Search for nearby well sites that have been hydraulically fractured to see what chemicals were used in the process.

FAQs

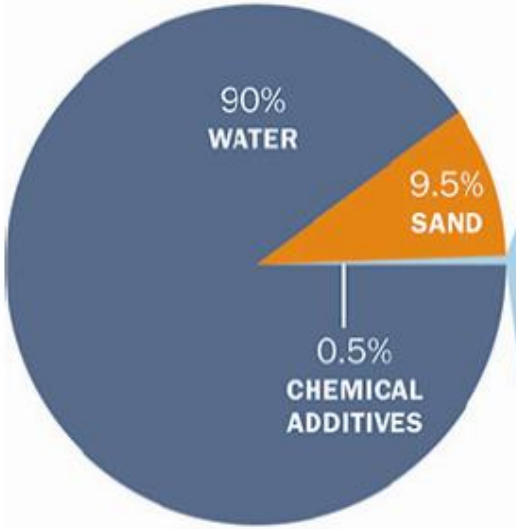
0 / 0

Q. When I go to the Regulations by State page, I don't see the map. What's wrong?

A. You may have an older version of the Adobe Flash Player installed. You can go to the Adobe site to download the latest version of the player.

Groundwater Protection: Priority Number One

Oil and natural gas producers have stringent requirements for how wells must be completed. The genesis of these requirements is water safety.



Compound	Purpose	Common application
Acids	Helps dissolve minerals and initiate fissure in rock (pre-fracture)	Swimming pool cleaner
Sodium Chloride	Allows a delayed breakdown of the gel polymer chains	Table salt
Polyacrylamide	Minimizes the friction between fluid and pipe	Water treatment, soil conditioner
Ethylene Glycol	Prevents scale deposits in the pipe	Automotive anti-freeze, deicing agent, household cleaners
Borate Salts	Maintains fluid viscosity as temperature increases	Laundry detergent, hand soap, cosmetics
Sodium/Potassium Carbonate	Maintains effectiveness of other components, such as crosslinkers	Washing soda, detergent, soap, water softener, glass, ceramics
Glutaraldehyde	Eliminates bacteria in the water	Disinfectant, sterilization of medical and dental equipment
Guar Gum	Thickens the water to suspend the sand	Thickener in cosmetics, baked goods, ice cream, toothpaste, sauces
Citric Acid	Prevents precipitation of metal oxides	Food additive; food and beverages; lemon juice
Isopropanol	Used to increase the viscosity of the fracture fluid	Glass cleaner, antiperspirant, hair coloring

Source API

Local O&G Regulation

- Zoning
- Setbacks
- Noise
- Light
- Odor
- Traffic
- Moratoria
- Preemption

Private Party Litigation

- None have been successful in implicating fracing
  - Contamination
    - Air
    - Groundwater
  - Noise, odors and light
  - Breach of contract
  - Municipal litigation

CAUSE NO. CV11-0798

STEVEN and SHYLA LIPSKY	§	IN THE DISTRICT COURT
V.	§	
DURANT, CARTER, COLEMAN LLC, SILVERADO ON THE BRAZOS DEVELOPMENT COMPANY #1 LTD, JERRY V. DURANT, Individually JAMES T. COLEMAN, Individually, ESTATE OF PRESTON CARTER, RANGE PRODUCTION COMPANY, And RANGE RESOURCES CORPORATION	§	PARKER COUNTY, TEXAS
V.	§	
ALISA RICH	§	43rd JUDICIAL DISTRICT

ORDER DENYING PLAINTIFF'S SEC. 27 ANTI-SLAPP MOTION TO DISMISS RANGE'S COUNTER CLAIMS

The Court, having reviewed the law and the evidence as well as motions, briefs and arguments of counsel in this case, denies Plaintiff's Sec. 27 Anti-Slapp Motion to Dismiss Range's Counter Claims.

The Court references with concern the actions of Mr. Steven Lipsky, under the advice or direction of Ms. Alisa Rich, to intentionally attach a garden hose to a gas vent – not to a water line – and then light and burn the gas from the end nozzle of the hose. This demonstration was not done for scientific study but to provide local and national news media a deceptive video, calculated to alarm the public into believing the water was burning. There is further evidence that Rich knew the regional EPA administration and provided or assisted in providing additional misleading information (including the garden hose video) to alarm the EPA. Moreover, the emails in question which refer to this deceptive garden hose demonstration as a "strategy" appear to support that a "meeting of the minds" took place and that a reasonable trier of fact could believe, together with other evidence, that the elements of a conspiracy to defame Range exist.

Therefore, pursuant to Texas Civil Practice and Remedies Code, Sec. 27 as a finding of fact and conclusion of law, the Court observes that Range has presented sufficient clear and specific evidence to maintain a prima facia case with regard to the counter claim against Plaintiffs and the third party action against Alisa Rich in that a reasonable trier of fact could believe that a conspiracy to defame Range existed between the Lipskys and Ms. Rich.

Regulatory Litigation

- Government enforcement actions against exploration and production companies
- Challenges to agency action in promulgating regulations or issuing (or not issuing) permits
- Challenges to zoning requirements or to state laws preempting local zoning
- Challenges to moratoria, and alleged takings

Summary of Fracing Risks and Considerations

- Effluent/emission limitations
- Operational specifications
- Chemical disclosure
- Testing and monitoring
- Construction Specifications
- Moratoriums
- Locational restriction
- Local Bans / Zoning Restrictions
- Private Party Litigation
- Environmental review and permitting

- **Law Applicable to Hydraulic Fracturing in the Shale States**
  - *By:* Thomas E. Kurth, Michael J. Mazzone, Mary S. Mendoza and Christopher S. Kulander

http://www.haynesboone.com/american-law-and-jurisprudence-on-fracing-2012/

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