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Shale Gas Industry Panel: Current Issues and Best Practices

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**Frac Attack:
An Independent Analyst's Perspective on the Shale Boom**

Ann Davis Vaughan

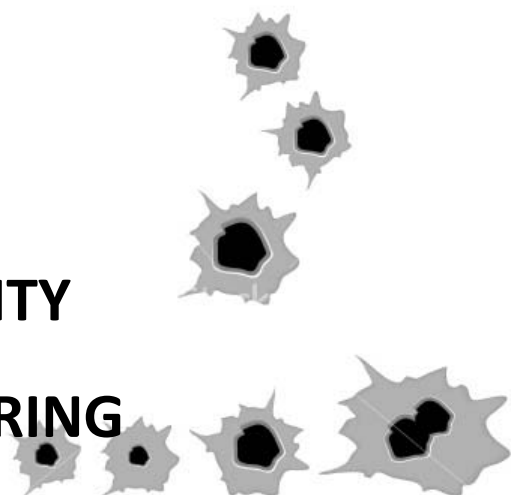
PRESENTATION OUTLINE:

- **Risks, Hype and Financial Reality of Hydraulic Fracturing in the Shale Plays:
The July 2010 Report with Tudor Pickering (ATTACHED)**
- **The Conversation Today: What the Mid-Term Elections Mean For Shale**
 - **Costs and Crackdowns to Expect in 2011 and 2012**
 - **Business Opportunities to Expect in 2011 and 2012**
 - **Gas Attack Part II: Infrastructure Growing Pains**

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**FRAC ATTACK:
RISKS, HYPE,
AND FINANCIAL REALITY
OF HYDRAULIC FRACTURING
IN THE SHALE PLAYS**



July 8, 2010

A Special Report

Jointly Presented By:



Ann Davis Vaughan



David Pursell

To Our Institutional Clients and Industry Executives:

Good ideas and information are “where you find them” and we are pleased to jointly author this report with Ann Davis Vaughan and Reservoir Research Partners. After many years of speaking with Ann in her Wall Street Journal role, we are excited to be able to collaborate on this timely report on the fracturing business and the various issues currently swirling around it.

Happy Reading,

Dan Pickering and David Pursell



About Reservoir Research:

Reservoir Research Partners is an independent research firm that provides highly customized, in-depth intelligence on companies, managers and trends to institutional investors. It applies investigative-reporting tools, well-honed interview skills and sophisticated, targeted analysis to give clients exclusive insights in detailed reports. By drawing on a reservoir of contacts and research know-how, the firm answers questions and detects problems and opportunities that numbers alone can't reveal.

The firm was founded in 2010 by Ann Davis Vaughan after two decades as an award-winning investigative and financial journalist, including nearly 14 years as a senior writer at The Wall Street Journal. Under the byline “Ann Davis,” she led The Journal’s global energy and commodity markets coverage from Houston. Prior to 2006, she covered Wall Street and the securities industry from New York. She is a recipient of the Gerald Loeb award, one of the highest honors in business journalism, for deadline reporting on the natural-gas markets in 2007.

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Summary

Public debate about the safety of hydraulic fracturing, a gas-drilling technique that has unlocked vast new sources of domestic energy, has escalated dramatically in recent months. We set out to push through the noise, inspect claims on both sides of the gas-drilling boom, and give investors a road map to the risks that producers may face. We start with the headline.

Hydraulic fracturing - or fracing - is unlikely to be banned. Given the scientific evidence available today and the economic impact of shutting down shale gas drilling, we don't see an outright ban sticking federally, nor in New York or Pennsylvania, and certainly not in the energy patches of the Gulf Coast and the West. The job losses, higher energy prices and landowner-rights challenges that would result are too unpalatable for Democrats, even those that don't like the energy business. PA has literally bet its budget on drilling by leasing state land – a nut that's hard for a financially troubled state to make up elsewhere. The likely passage of PA's much-anticipated new production tax will make it even more reliant on drilling. This report addresses the regulatory climate in pivotal fracing regions.

The threat of new federal oversight is more serious in the wake of the BP oil-spill disaster. If you think no one will connect deepwater oil to onshore shale, think again. Both the oil spill and recent gas-drilling accidents spotlight the inherently difficult nature of the oil and gas business and have tarnished industry credibility. Groups opposed to fracing have wasted no time making connections between the two.

Fracturing is currently regulated by the states—vigorously, according to industry; inadequately and inconsistently, according to opponents. Opponents want federal oversight under the Safe Drinking Water Act (SDWA), from which fracing was exempted in 2005. BP and others had been making headway this spring preserving state jurisdiction in a Senate climate bill. But BP can no longer ask for favors, and it's a bigger risk today for politicians to champion perceived “exemptions” for drillers.

In just the past few weeks, a camp of gas producers broke ranks to negotiate a potential compromise with the staunchest critic in Congress of fracing, Rep. Diana DeGette of Colorado. A draft that surfaced mandates disclosure of fracing chemicals under the SDWA. Industry stalwarts strongly oppose this, warning EPA could stick its nose further in the tent and exert control on drilling. This rift could get ugly.

Whether or not the feds take charge, compliance and environmental costs will increase. The industry will have no choice but to spend more money to protect itself from liability and reputational risk as the shale-drilling boom marches on. Some companies are in fact already choosing to spend more; one major producer told us, “We don't see the costs as that overwhelming.”

The reasons for more precautions are simple: Horizontal drilling and multi-stage fracing can be disruptive to communities, and accidents have increased as drilling ramps up. New shale production needs checks and balances to gain public acceptance. Some state regulators who publicly defend their record told us privately they need to update drilling and waste-disposal standards to fit the surge in new

activity. Some big producers told us stiffer state rules work in their favor, by weeding out bad actors whose sometimes haphazard efforts help run environmentalists' campaigns for them.

The other reason companies will take more precautions is that shale drilling is profitable even at \$4 to \$5 gas, where tempers are the hottest. In PA, where the economy is already transformed by the drilling boom, producers told us it is simply worth it financially to go up against a wall of opposition to drill a well. Even in some regions of NY, we believe companies with strong nerves and a willingness to control their environmental footprint will drill profitable leases--eventually. (It just won't be in the NYC watershed.)

The added tab per well, without federal regulation, could reach \$200,000 to \$500,000, on top of current costs per well between \$2.5 million and \$10 million. Bigger-ticket items include extra well casing, more rigorous cementing and water treatment. Figures vary with locale and geology. This report provides intelligence on steps producers have already taken--or may have to take later on--and how this affects shale economics.

If Congress does mandate EPA oversight of fracing, the industry predicts further costs of \$125,000 to \$250,000 per well. We think costs could be less than that, given changes companies are making voluntarily. Still, federal jurisdiction could dramatically slow drilling in Pennsylvania and New York, which are among the minority of states that don't already help enforce EPA underground injection rules. They would need to apply for a delegated type of authority called "primacy." It's also possible the fracing process itself will have to be reengineered somewhat—to greater expense.

An EPA study on fracing is just getting underway and could slow down the legislative train. Last year, Democrats who introduced the Fracturing Responsibility and Awareness of Chemicals Act—or FRAC Act, which calls for broader federal oversight of fracing—asked EPA to reexamine the relationship between fracing and drinking water.

We attended hearings in April on the study's design. EPA officials outlined plans for a kitchen-sink study of shale drilling's impacts across its "life cycle." Barring a major onshore accident, Democrats may wait to push federal drilling standards until scientists weigh in. (Chemical-disclosure standards could come sooner.) The agency aims to finish the study in 2012. We think it could take longer, up to 2013.

The EPA study will most likely identify risks to public health from sloppy drilling practices. We expect the agency to call for better well design and materials-handling. States are already stiffening their standards in an effort to head off federal action.

The EPA study may end up as a positive for producers, by buying time to achieve wider adoption of drilling "best practices". As one lobbyist told us, if you can't beat the enemy, try to write its rules. The bigger question is how far the industry will go. We detected a schism among companies who want to preempt federal mandates by improving practices, and smaller independents who argue that if they give an inch, regulators will make them go a mile.

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