

# Insurance

## **Dr. Frackenstein: Or How I Learned to Stop Worrying And Love The Risk**

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# Commentary

## Dr. Frackenstein: Or How I Learned to Stop Worrying And Love The Risk

By  
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"I am become death, the destroyer of worlds."

*Quotation from Bhagavad Gita, recalled by J. Robert Oppenheimer as he watched the first atomic explosion at Trinity.*

"The sky is falling! The sky is falling!"

*Chicken Little*

Depending on your perspective, the above quotes may aptly reflect your view of the energy bonanza that has been sweeping the country over the past several years. This bonanza is due to new technologies that allow extraction of natural gas and oil deposits from unconventional sources. Horizontal hydraulic fracturing ("Fracking") allows extraction of these resources that are at depths far greater than conventional resources, and from sedimentary rock known as shale. Fracking, along with continuing discovery of shale plays, have

some industry experts declaring U.S. energy independence by 2017.

For those of us who remember the energy crisis of the 1970s and 1980s, the goal of energy independence is the keystone to America's energy, and perhaps foreign policy. From an economic standpoint, Fracking brings with it the promise of hundreds of thousands of jobs and a renaissance in American manufacturing due to affordable energy. For those that remember the 1989 Exxon Valdez disaster, and with memories of the Deepwater Horizon still fresh, many fear that the technology used to respond to catastrophic losses has not kept pace with advances in resource extraction.

As a result, the Fracking industry is under regulatory and public pressure to provide clean, affordable energy while not sacrificing the environment or human health and safety. While major oil companies have deep pockets to respond to minor as well as catastrophic events, the Fracking industry is comprised of a web of diverse – and somewhat less financially well-endowed – professionals, contractors, manufacturers, transporters and trades, each of whom may singlehandedly put into motion a series of events that could lead to a catastrophic loss. Moreover, the sheer size of the industry will only serve to increase the frequency of losses.

Can insurance, and in particular, pollution legal liability (PLL) insurance, provide the Fracking industry with the coverage necessary to develop this vast domestic resource in a cost-effective manner? After more than 25 years of underwriting experience, some of which has involved insuring conventional oil and gas operations, the answer should be a resounding "Yes!" However, should risks unique to Fracking, the relative immaturity of the industry, and its sheer size, give

PLL underwriters pause? Perhaps. This article attempts to highlight some of the potential risks arising from the Fracking industry, and to demonstrate that PLL underwriters should be able to understand and underwrite these risks profitably as the risk profile matures. Moreover, PLL underwriters should understand that, unwittingly or not, they are already covering Fracking risks.

### **What Is Shale Anyway?**

Shale, such as Marcellus shale, is composed of a dark-organic material that dates back almost 400 million years when vast areas of the U.S. were inland seas. Hence, the reason why salt or bromides are a by-product of Fracking. The shale was formed from the compaction of silt and what we commonly call "mud." Due to the decay of organic materials, and the heat due to compaction of the shale, over time, natural gas and oil were formed within shale deposits. The problem with reaching these resources is that oil and gas are trapped within tiny pores or adsorbed into the clay particles of shale, making it difficult to extract. Moreover, the shale deposits are generally orders of magnitude deeper than conventional oil and gas deposits.<sup>1</sup>

### **The Origins Of Horizontal Fracking – Your Neighborhood Dentist?**

So how does one extract a resource that is perhaps nine Empire State Buildings deep and trapped in layers of mud that has solidified into rock over 400 million years? Enter Fracking. Think of it as putting a straw in a cake to reach a layer of icing in the middle. You would get a lot more icing if the straw bent horizontally once it reaches the icing and then proceeded through the icing rather than inserting the straw vertically.

While recent events would have one believe that Fracking is a relatively new phenomena, the idea of drilling horizontally came from – or all places-dentistry. According to the U.S. Department of Energy's Energy Information Administration, in 1891, John Smalley Campbell secured the first patent to make use of flexible shafts to rotate drilling bits. This technology was aimed at the dental industry, but the patent also covered other uses, such as drilling into boilerplates.<sup>2</sup> In 1929, the first true horizontal well was drilled in Texas, but these early wells were very shallow, e.g., 500 feet in depth.<sup>3</sup> It was not until the early 1980s that downhole telemetry equipment brought horizontal drilling "within the realm of commercial viability."<sup>4</sup> It was not until the mid-1990s that horizontal fracturing – used in tandem with horizontal drilling – became economically viable.<sup>5</sup>

Since then, domestic production of shale gas has grown to 34 percent of U.S. natural gas production.<sup>6</sup> As of 2010, the industry has created over 600,000 jobs. This figure is expected to increase to 1.6 million by 2035.<sup>7</sup> The Marcellus Shale formation, one of the largest such formations in the world, spans 95,000 miles through Ohio, West Virginia, Pennsylvania and New York. Some estimate that the natural gas potential of Marcellus shale is at 500 trillion cubic feet. In fact, shale gas production has been so successful that natural gas prices are at a decade low.

### **What is Fracking?**

While vertical fracking has been in use since the late 1940s, as noted above, widespread use of Fracking did not occur until the last decade or so. The differences between horizontal and vertical fracking are fairly dramatic. For instance, the drilling depth for vertically fractured wells is generally 500 to 2,000 feet. A typical horizontal fractured well can be between 5,000 to 10,000 feet, since this is where the layer of shale often lies. Water use is another significant difference. While a vertical well may use on average 50,000 gallons of water per well, a horizontal well can use on average up to 5 million gallons of water.

The fracturing part of Fracking is just what it sounds like – fracturing the shale. This process takes place within the shale layer, termed the "pay zone." The pay zone is reached after the drill bit is turned and continues horizontally (known as the "kick off point") through the pay zone, which can be between 50 to 300 feet thick. The horizontal stretch of the pay zone can be from 1,000 to 10,000 feet in length. After the drill bit is removed, production casing is inserted into the pay zone and cemented into place.<sup>8</sup> A perforating gun, which includes explosive charges, is inserted into the casing. When the charges are detonated, a tunnel is punched through the casing and into the shale formation. After perforation, a mixture of water, chemicals and proppants (sand or synthetic materials used to prop open the fractures) is pumped into the formation under high pressure, fracturing the shale. Once the water is removed, gas will flow out of the formation, sometimes for up to thirty years. This process can be repeated multiple times from the same well pad.

### **What Are The Risks From Fracking?**

While it is impossible to forecast all of the potential risks that may arise from Fracking, a snapshot is

beginning to emerge from the forty or so lawsuits that have been filed around the county thus far. These suits fall into a few general categories:

#### **Employee Claims**

In *Bombardiere v. Schlumberger Technology, et al.*, U.S. District Court, N.D.W.V., No. 1:11-CV-50, the plaintiff was employed by a subcontractor at a well located in Pennsylvania. He allegedly was exposed to fracking chemicals without proper training and protective gear, and carried these chemicals home with him, resulting in additional exposure. Because of his exposure, he claims to have developed various injuries, increased risk of cancer, and psychological trauma. Causes of action against his employer and the owners/operators of the well include, among other things, negligence, statutory violations, strict liability, and wrongful interference with employment. He seeks lost income, medical expenses, medical monitoring, punitive damages, and attorney fees and costs.

#### **Putative Class Actions**

*Tucker et al. v. Southwestern Energy Co., et al.*, U.S. District Court, E.D.Ark, No. 1:11-CV-00044 is typical of several class actions that have been filed throughout the U.S.

Plaintiffs, residents of Cleburne, County, Arkansas, allege that as a result of fracking activities, their well water was contaminated with Alpha Methystyrene, a poisonous chemical and known component of fracking fluid. They assert claims based upon strict liability for ultrahazardous activities, negligence, and trespass. They seek class action status for any resident of Arkansas that lives within a three-mile radius of a gas well. Plaintiffs seek over \$1 million in compensatory damages and \$5 million in punitive damages. Their damages include loss of use and enjoyment of their property, contamination of and diminution in value of their property, fear, shock, mental distress and physical harm.

*Lane et al. v. PHP Billiton Petroleum (Arkansas) Inc., et al.*, Circuit Court of Faulkner County, Arkansas, No. 23-CV-11-482 involves a different risk that is allegedly tied to Fracking – earthquakes. But thus far, most of the seismic activity seems to be related to drilling deep injection wells that are used for disposal of Fracking fluids. In *Lane*, it is difficult to determine from the complaint if the alleged seismic activity is due to injection wells or Fracking.

Plaintiffs, residents of Faulkner County, Arkansas, allege that fracking activities have caused numerous earthquakes in and around Faulkner County, Arkansas, some as large as 4.7 in magnitude. Plaintiffs state that there have been over 599 seismic “events” in Guy, Arkansas since September 2010. The complaint identifies two injection wells and alleges that the operations and maintenance of the injection wells caused or contributed to seismic activity. The plaintiffs also allege that the earthquakes “are related to, and caused by, the oil and gas drilling operations conducted by Defendants.” The complaint seeks class action status for all other individuals similarly situated. Plaintiffs assert the following causes of action: public nuisance; private nuisance; absolute liability for ultrahazardous activity; negligence; and trespass. They seek to recover for property damage, annoyance, loss of peace of mind, economic loss and business interruption, together with seeking punitive damages, injunctive relief and costs of suit.

#### **Property Damage/Diminution In Value/ Bodily Injury**

*Armstrong v. Chesapeake Appalachia, LLC, et al.*, Court of Common Pleas, Bradford County, Pennsylvania, No. 10-cv-000680 is typical of claims arising from the Marcellus shale play.

Plaintiff, a resident of Bradford County, Pennsylvania, lives within three miles of several wells that were allegedly fracked. She alleges that methane, ethane and other pollutants were discharged onto the ground and aquifer near her residence and into the groundwater well used for potable water at her residence. She alleges that the contamination of her well and damage to natural resources was due to negligent drilling techniques, including defective and ineffective well casings, and negligent planning, training and supervision of employees/agents. In addition to contamination of her well, plaintiff alleges that she was exposed to hazardous chemicals, resulting in various injuries. She also claims to have lost the use and enjoyment of her residence, suffered psychological effects of chemical poisoning and incurred costs for potable water. Her complaint sets forth causes of action based upon: strict liability for violation of the Pennsylvania Hazardous Sites Cleanup Act, 35 P.S. §§ 6020.101, *et seq.* (“HSCA”);<sup>9</sup> negligence; private nuisance; strict liability for ultrahazardous activities; trespass; and medical monitoring costs. Plaintiff seeks compensatory damages, punitive

damages, remediation costs, injunctive relief and attorneys' fees and costs.

### Regulatory Violations

*Citizens for Pennsylvania's Future v. Ultra Resources, Inc.*, U.S. District Court, M.D.P.A., No. 4:11-cv-01360. Plaintiff is a statewide, public interest, membership organization that advocates on behalf of the environment and public health in Pennsylvania. It contends that the defendant has violated the federal Clean Air Act, 42 U.S.C. §§ 7401, *et seq.*, ("CAA") Pennsylvania's State Implementation Plan, and Pennsylvania's New Source Review regulations, 25 Pa. Code Chapter 127, Subchapter E. The CCA, like most state and federal environmental statutes, contains a citizen suit provision that permits a citizens group or group of individual citizens, to enforce the CAA in the same manner as the government.

Under the Clean Air Act and state regulations, any facility that emits over 100 TPY or more of NO<sub>x</sub> cannot operate unless it has been permitted through the state's New Source Review ("NSR") program. Plaintiff contends that all of defendants' gas well pads, compressor stations, and metering stations within a 558-mile area should be considered one "facility" under the CAA because all of defendant's operations are interconnected. By totaling the NO<sub>x</sub> emissions from all of these sources, plaintiff contends that defendant's emissions trigger NSR. Because the defendant had not obtained an NSR permit, plaintiff is seeking to have the court declare that defendant is in violation of the CAA, enjoin defendant from any further violations of the CAA, order the defendant to comply with the CAA, and to pay civil fines and penalties. Plaintiff also seeks to recover attorneys' fees and costs.

### Claims Where Courts Have Ruled On Motions to Dismiss

Thus far, courts have ruled on a handful of motions to dismiss suits, with varying results. In *Lipsky et al. v. Durant, Carter, Coleman LLC, et al.*, District Court, Parker County, Texas, No. CV11-0798, Range Resources was able to dismiss a claim based upon improper venue. But Range Resources took its defense to the next level by pursuing a multi-million dollar defamation claim against the plaintiffs and their environmental consultant.

The Lipskys are residents of Parker County, Texas and claimed that their potable water well was contaminated

with high levels of methane due to nearby fracking activities of defendants. They sought \$6.5 million in damages because of the methane contamination. Based upon information that the Lipskys' consultant provided, the U.S. EPA issued an emergency order to the owner of the gas wells, Range Resources, to abate the gas. In January 2011, the Texas Railroad Commission, which has jurisdiction over oil and gas wells in Texas, held a public hearing regarding the Lipskys' complaints. But neither the Lipskys nor the U.S. EPA, appeared at the hearing. In his deposition transcript, Lipsky stated that his consultant did not have sufficient information at that time to participate in the hearing.

Based upon evidence presented by the defendants, the Commission determined that the methane gas in the Lipskys' well was naturally occurring and did not result from the defendants' activities. The Lipskys attempted to appeal the Commission's holding, but the Parker County District Court denied the appeal due to improper venue. In response to the lawsuit, Range Resources filed a \$4.2 million counterclaim seeking damages due to the Lipskys alleged defamation of Range Resources. The counterclaim also alleges that the Lipskys committed civil conspiracy with their consultant by lobbying EPA to issue its emergency order against Range Resources. Range Resources also initiated a third-party action against the Lipskys' consultant.

Range Resources contends that the methane is unrelated to its fracking activities, came from shallow deposits, and that the area in and around the Lipskys' property has a long history of venting gas from water wells. They also allege that the Lipskys' attempted to fabricate their claims by publishing a video of a garden hose that was on fire and that was allegedly attached to their well. Range Resources alleges that the hose was actually attached to the well's vent. Based upon information submitted by Range Resources, EPA has withdrawn its order.

In *Strudley et al., v. Antero Resources Corp.*, District Court Denver, Colorado, No. 2011-cv-2218, the plaintiffs were not on the receiving end of a countersuit, but nonetheless fared no better with their claims.

The Strudleys, residents of Silt, Colorado, claim that their well and ambient air were contaminated as result of defendants' fracking activities. They alleged general unspecified "health injuries" caused by exposure to a long list of chemicals and pollutants. They also seek loss

of use and enjoyment of their property, diminution in value of their property, loss of quality of life, and other damages.

In an unusual decision, the court ordered that the plaintiffs would have to prove a *prima facie* showing of exposure and causation prior to the commencement of discovery, in order to move forward with their case.<sup>10</sup> The showing would have to be supported by expert opinion, and would have to identify each hazardous substance that plaintiffs claim they were exposed to, provide every study or report that demonstrates contamination of their property, list of all health care providers that treated plaintiffs, and identify and quantify all contamination of their property. In a May, 9, 2012 order, the court found that plaintiffs failed to submit sufficient evidence to meet the court's prior order, and dismissed the case with prejudice.

However, in *Berish, et al. v. Southwestern Energy Production Co., et al.*, U.S. District Court, M.D.P.A., No. 3:10-cv-1981, the defendants were unable to dismiss plaintiffs' claims involving alleged groundwater contamination allegedly arising from Fracking.

The *Berish* action was brought by the same law firm used in the *Armstrong* action, above. It contains the same causes of action and seeks the same types of damages as in the *Armstrong* action, but is brought on behalf of several individuals and their minor children who live within 700 to 1,700 feet of defendants' wells. Plaintiffs also claim that their potable wells were contaminated due to defendants' discharge of fracking fluids, or "drilling mud," including diesel fuel, barium, manganese and strontium. The defendants were unsuccessful in their attempts to dismiss plaintiffs' claim for strict liability for ultrahazardous activity. However, except for one plaintiff that alleged physical injury due to emotional distress, all other claims that alleged emotional distress without any associated physical injury were dismissed. The court permitted plaintiffs to amend their complaint to add counts based upon inconvenience and discomfort because this is a recognized cause of action under Pennsylvania law. See *Berish v. Southwestern Energy Production Co.*, 763 F.Supp.2d 702 (M.D.P.A. 2011).<sup>11</sup>

### Risks As Seen Through the Eyes of the Industry

In addition to risks presented in the above suits, the industry itself described the risks inherent in the oil and gas industry as follows:

Our business is subject to operating hazards and environmental regulations that could result in substantial losses or liabilities

Oil and natural gas operations are subject to many risks, including well blowouts, craterings, explosions, uncontrollable flows of oil, natural gas or well fluids, fires, formations with abnormal pressures, pipeline ruptures or spills, pollution, releases of toxic natural gas and other environmental hazards and risks. If any of these hazards occur, we could sustain substantial losses as a result of:

- Injury or loss of life;
- Severe damage to or destruction of property, natural resources and equipment;
- Pollution or other environmental damage;
- Clean-up responsibilities;
- Regulatory investigations and penalties; or
- Suspension of operations.

As we begin drilling to deeper horizons and in more geologically complex areas, we could experience a greater increase in operating and financial risks due to inherent higher reservoir pressures and unknown downhole risk exposures.<sup>12</sup>

In addition to the identified risks, underwriters also need to be cognizant of the players that support the Fracking industry. Many of these risks are already insured under PLL insurers' books and may therefore seem familiar. Examples of parties involved in the industry include:

#### Professional Exposures

Engineers and consultants who are involved up front in locating desirable drilling sites by conducting seismic testing using "thumper trucks" – specially equipped trucks with hydraulic "thumpers" that send low frequency sound waves into the subsurface. The reflection of the waves is used to provide three-dimensional charts showing the location of gas deposits. Another method used for seismic testing involves use of explosives to

generate sound waves. Thus, in addition to a professional exposure, seismic testing using explosives could result in strict liability since explosive use will likely be considered an ultrahazardous activity.

Other professional exposures can arise from preparation of inaccurate property surveys, inaccurate or incomplete baseline environmental assessments, errors in investigating and remediating releases and professional services rendered in design of upstream and downstream facilities that result in failures of well casings, or damage or loss to compressor stations, pipelines, or storage facilities.

### **Transportation Exposures**

With 2 million gallons being the equivalent of 320 trucks, just providing water for the Fracking process presents a challenge. Flowback, the mixture of mud, water and Fracking chemicals that flows back as a well is drilled, also produces a waste stream that must be transported. Since the volume of flowback can approach 40 percent of the volume of water injected into a well, the volume becomes significant. Given the industry's heavy dependence on transportation, this exposure could be significant.

### **Wastewater Management**

In Pennsylvania, bromides from Fracking and traditional oil and gas extraction have reportedly interacted with chlorine in wastewater treatment works to form trihalomethanes, a suspected carcinogen.<sup>13</sup> Tertiary butyl alcohol (TBA), an oxygenate used in gasoline, is generated from the degradation of tertiary butyl hydroperoxide, which is a component of some Fracking solutions.<sup>14</sup> In addition to bromides, flowback contains other naturally occurring substances such as Radium-226, which is formed when Uranium-238, a naturally occurring radioactive material decays. Radium-226 is abundant in gas producing shale formations. While experts are split on whether concentrations are high enough to impact wastewater treatment plants, Radium exposure to workers could be an issue if Radium is concentrated in filter media, storage tanks or other equipment used at well pads.

### **Sediment Issues**

In Pennsylvania alone, it is expected that 38,000 to 90,000 acres of forest may be cleared for well pads, and another 60,000 to 150,000 cleared for pipelines.<sup>15</sup> On an annual basis, this could generate tens of

thousands of pounds of nitrogen and phosphorus runoff, and millions of pounds of sediment runoff. As a result, owner/operators could face steep fines for failing to implement or maintain sediment and erosion control plans that are required under the federal Clean Water Act's National Pollutant Discharge and Elimination Permit (NPDES) program.

### **Air Quality Issues**

In addition to fugitive emissions arising from the release of natural gas, air issues can arise from diesel engines – a small fleet of engines are used to pump the water/fracking mixture into the well during the Fracking process – as well as emissions from compressor stations, glycol dehydrators (used to dehumidify the gas) and surface impoundments, all of which can combine to result in exceedences of air permits resulting in fines, as well as claims by downwind residents.

### **Downstream Exposures**

Once the gas is extracted, it is distributed via a network of pipelines, pumps, and compressor stations to storage facilities and ultimately to end users. Ruptured pipelines, faulty equipment or natural events could result in a disruption of supply. This could result in a business interruption exposure to those downstream entities. Shell is considering constructing a billion dollar "cracker" facility in Pennsylvania that will turn "wet gas," e.g., butane, ethane and propane, into ethylene, which is a precursor used to manufacture certain plastics. Data centers, huge consumers of energy, are targeting Pennsylvania as a result of cheap gas. As more industries depend on shale gas for their energy, business and contingent business interruption exposure will likewise increase.

### **Agricultural Exposures**

Rural farmers in Pennsylvania are at ground zero when it comes to upstream Fracking activities. In addition to fears that livestock will be impacted by spills of Fracking fluids or flowback, cattle farmers in particular have concerns that water sources will become contaminated or scarce. The recent drought has caused the Susquehanna River authority to ratchet back on the amount of water that maybe withdrawn from the river. Moreover, dairy cattle are particularly sensitive to changes in the taste of water. Therefore, even if an alternative water supply is used to replace contaminated water, dairy cows may thumb their noses at a different water supply and stop producing milk as a result.

### Manufacturing Exposure

If a loss is due to faulty equipment, or if a particular constituent of Fracking fluid is found in groundwater, that manufacturer or supplier could face claims of strict product liability. A source of underwriting uncertainty will undoubtedly come if companies continue to refrain from disclosing the chemicals used in their Fracking fluid.<sup>16</sup> This information has been withheld on the basis that the formulations are proprietary. Moreover, while the industry claim that Fracking fluid is 99 percent water, given the volumes of water used, (1 million gallons of water may contain 20 tons of Fracking chemicals)<sup>17</sup>, areas with significant Fracking activity may give underwriters pause. What's more, given the numerous products involved in the Fracking process, underwriters may be completely unaware that their Minnesota manufacturer has a Fracking exposure in Pennsylvania.

### Getting Your Arms Around The Risk

Despite all of the inherent risk associated with Fracking, insurers seem to be split on whether the juice is worth the squeeze. Recently, a leaked email from Ohio-based Nationwide Mutual Insurance disclosed that Nationwide would not afford coverage for any Fracking related risks. At the other end of the spectrum, Joe Boren, CEO of Ironshore's environmental unit recently characterized environmental risks from livestock as presenting bigger risks than Fracking.<sup>18</sup> In fact, Ironshore is one of the few PLL insurers to offer a policy specifically tailored to the Fracking industry.

States also may become a driver of PLL insurance for Fracking. In Ohio, a well owner must have at least \$1 million in liability coverage for any one well.<sup>19</sup> The limit increases to \$3 million in an urban zone.<sup>20</sup> New York's proposed regulations require transporters of brine to carry \$300,000 in liability insurance.<sup>21</sup> While campaigning, Pennsylvania Governor Tom Corbett suggested that drillers in the Marcellus shale should be required to purchase liability insurance. But no such requirement exists in the regulations recently passed by the Pennsylvania legislature.<sup>22</sup>

As with most evolving risks, it will take time for the complete picture of risks to emerge from the Fracking industry. Thus far, several studies have been undertaken on the issue of whether Fracking can be a cause of groundwater contamination. From a cynical perspective, the studies' results appear to mirror the view of the entity financing the study. Therefore, it is difficult to

determine at this point which risks are real and which are not.

While many PLL underwriters come from environmental and consulting background, these skills may not enable them to assess Fracking risks where all of the facts have yet to be developed and fully understood. But tools do exist to limit these unknown risks. While it has yet to be determined if or how water that is pumped 10,000 feet or more below ground surface will impact ground or surface waters, underwriters can obtain baseline information on site conditions prior to commencement of operations. They can also examine loss runs for individual insureds, and assist insureds in improving loss control and in shifting risk to other parties though the use of contractual indemnity provisions. Large self-insured retentions, combined with low limits and annual claims-made policies will also serve to limit PLL insurers' exposure, not unlike the PLL industry practices in its infancy.

Therefore, depending on risk appetite, the sophistication and experience of underwriters and brokers, and support from reinsurers, PLL insurers may view Fracking as the best new avenue to grow their business, or a bridge too far. No matter what course is taken, underwriting discipline, including development of underwriting guidelines, claims practices and emergency response networks, can all be employed to mitigate exposure as the true nature of Fracking emerges. Combined with uniform regulatory standards, Fracking may yet live up to its inflated expectations while not sacrificing safety or the environment.

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### Endnotes

1. See Shale is the most abundant sedimentary rock and is in sedimentary basins worldwide; available at: <http://geology.com/rocks/shale.shtml>.
2. See DRILLING SIDEWAYS – A REVIEW OF HORIZONTAL WELL TECHNOLOGY AND ITS DOMESTIC APPLICATION, ENERGY INFORMATION ADMINISTRATION (DOE/EIA-TR-0565) at 7 (1993); available at: <ftp://ftp.eia.doe.gov/petroleum/tr0565.pdf>.
3. *Id.* (citing The Austin Chalk & Horizontal Drilling, POPULAR HORIZONTAL, (January/March 1991), p. 30).

4. *Id.*
5. See Halliburton Energy Services. 2008. U.S. SHALE GAS: AN UNCONVENTIONAL RESOURCE. UNCONVENTIONAL CHALLENGES. HALLIBURTON White Paper; available at: [http://www.halliburton.com/public/solutions/contents/shale/related\\_docs/H063771.pdf](http://www.halliburton.com/public/solutions/contents/shale/related_docs/H063771.pdf).
6. See HIS Global Insight (USA) Inc., THE ECONOMIC AND EMPLOYMENT CONTRIBUTIONS OF SHALE GAS IN THE UNITED STATES (Dec. 2011).
7. *Id.*
8. For a general description of the fracking process, see Interactive Fracturing 101 at [http://www.halliburton.com/public/projects/pubsdata/hydraulic\\_fracturing/fracturing\\_101.html#](http://www.halliburton.com/public/projects/pubsdata/hydraulic_fracturing/fracturing_101.html#).
9. While the Pennsylvania Supreme Court has yet to rule on whether a private right of action exists under HSCA, state appellate courts and federal district courts in Pennsylvania have held that a private right of action to recover "response costs" under HSCA does exist. See *Smith v. Weaver*, 445 Pa.Super. 461, 665 A.2d 1215 (1995). "Response costs" includes: "Other reasonable and necessary or appropriate costs of response incurred by any other person." 35 P.S. § 6020.702.
10. The court's order, commonly referred to as a "Lone Pine Order," stems from *Lore v. Lone Pine Corp.*, where plaintiffs sued for injuries and diminution in property value allegedly due to a landfill operated by Lone Pine and 463 other generator/transporter defendants. No. L 33606-85, 1986 N.J. Super. LEXIS 1626 (N.J. Super. Ct. Law Div. Nov. 18, 1986). Such case management devices are most often applied in mass tort cases.
11. The judge held that it was premature to dismiss the claim for ultrahazardous activity until such time that discovery was complete. This is consistent with another federal court opinion involving strict liability for claims arising from fracking. See *Fiorentino v. Cabot Oil & Gas Corp.*, 750 F.Supp.2d. 506 (M.D.P.A. 2010).
12. See Range Resources Corp 424B5 Prospectus (May 18, 2006); available at: <http://www.secinfo.com/dsvrp.vazp.htm#j76>.
13. See Tim Lucas, IN THE MIDST OF A FRACKING FIRESTORM, DukeEnvironmental Magazine (Fall 2011); available at: <http://www.nicholas.duke.edu/dukenvironment/fl11/in-the-midst-of-a-fracking-firestorm>.
14. See Tertiary Butyl Alcohol (TBA) Biodegradation, Some Frequently Asked Questions (Mar. 5. 2012); available at: [http://www.api.org/-/media/files/ehs/clean\\_water/bulletins/26\\_bull.ashx](http://www.api.org/-/media/files/ehs/clean_water/bulletins/26_bull.ashx).
15. See Karl Blankenship, Marcellus Shale drilling may take huge chunks out of PA forests, Chesapeake Bay Journal, Dec. 2011; available at [http://www.bayjournal.com/article/marcellus\\_shale\\_drilling\\_may\\_take\\_huge\\_chunks\\_out\\_of\\_pa\\_forests](http://www.bayjournal.com/article/marcellus_shale_drilling_may_take_huge_chunks_out_of_pa_forests).
16. For a list of fracking fluids compiled by the Pennsylvania Department of Environmental Protection see [http://assets.bizjournals.com/cms\\_media/pittsburgh/datacenter/DEP\\_Frac\\_Chemical\\_List\\_6-30-10.pdf](http://assets.bizjournals.com/cms_media/pittsburgh/datacenter/DEP_Frac_Chemical_List_6-30-10.pdf).
17. See Robert Myers (Lock Haven University), Environmental Dangers of Hydro-Fracturing the Marcellus Shale; available at: <http://lhup.edu/rmyers3/marcellus.htm>.
18. See Matthew Brodsky, Toxic Water: Pollution and Scarcity Flow Together, Risk and Insurance (May 1, 2011); available at: <http://www.riskandinsurance.com/story.jsp?storyId=533336486>.
19. See OHIO ADMIN. CODE § 1509.07 (West 2012).
20. *Id.*
21. The Federal Motor Carrier Act of 1980 requires that all commercial vehicles operated on public roadways carry public liability insurance, including insurance for environmental damage. This is accomplished by adding an MCS-90 Endorsement to business auto policies. While the endorsement requires the insurer to pay a pollution loss, if the policy does not expressly provide pollution coverage, the insurer can seek to recover any pollution loss directly from its insured.
22. See Erich Schwartzel, INSURANCE COMPANIES SLOW TO COVER DRILLING RISKS, *Pittsburgh Post-Gazette*, Jul. 25, 2012; available at: <http://shale.sites.post-gazette.com/index.php/news/archives/24711-insurance-companies-are-slow-to-cover-risks-of-drilling>. ■



**MEALEY'S LITIGATION REPORT: INSURANCE**

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