Fractured, Fragmented Federalism: A Study in Fracking Regulatory Policy

Barbara Warner* and Jennifer Shapiro†

*Arkansas State University; bwarner@astate.edu
†Arkansas State University

Unlike the regulation of other heavy industries, fracking—in which companies create cracks in shale rock to extract gas, oil, or other substances—has been exempted from federal reach, leaving regulation to the states, which appear vulnerable to capture by energy interests. As fracking has expanded, become more complex, and generated considerable controversy, some states have sought to quash local government efforts to impose more stringent regulations. Citizens and activists have sought redress through the courts, and some states are fighting over the transport of waste disposal across state lines. The story is one of fractured, fragmented federalism that illustrates the key role played by regulated interests that prefer state to federal regulation, resulting in a variable, often weak state regulatory regime.

Much of regulatory policy scholarship has emphasized federal activity, with the federal government setting the broad parameters and state governments acting as the primary implementers. This is especially true in most social regulatory arenas, including environmental protection, where the federal government acts as overseer and gives states authority and discretion (Bowman and Kearney 1986; Crotty 1987; Lester and Bowman 1989; Welborn 1988). Given this, why did the federal government cut itself out of the regulatory picture in the area of fracking—ceding to states and industry primary authority over an issue that has many federal implications and precedents?

Given the recent emergence of fracking, it is important to state that this article is an early attempt to describe what may be an idiosyncratic policy—or perhaps one that will become more common in future years. It is a story of dominant interests that have aligned themselves with federal and state governments to benefit the fracking industry and push back against their own local governments, citizens, and advocacy groups. This federalism regulatory scenario is unusual because, unlike a classic federalism problem in which states act in the absence of federal regulation, here the federal government has largely and deliberately cut itself out of the regulatory picture in ways that are seemingly more conducive to the big business

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interests in the states and the states themselves. The abdication of federal regulatory authority has led to fractured and fragmented regulatory policy nationwide, increased court action, and interstate conflict over the transport of fracking waste across state lines. We begin with a brief regulatory history of fracking, including a recounting of the passage of the 2005 Energy Act that provided the critical federal exemption for fracking. We then examine local government regulatory challenges to their own states, followed by an examination of the state regulatory process regarding fracking. We end with a brief overview of some regulatory action on fracking and a summary discussion.

Fracking and Federalism

Federalism literature has long recognized the influence of regulated interest groups on state regulation. Studies show that interest group pressure is very much a shaper of state regulation (Gerber and Teske 2000), and that interest groups are particularly adept at strategically influencing the regulatory process (Wilson 1989). Moreover, industry interests, with the cooperation of the George W. Bush Administration, were effective at venue shopping—in this case moving regulatory authority to a more "favorable" lower level of government—the states—where typically there are fewer resources available for research, enforcement, and interstate coordination. Industry influence in choosing the most favorable level of government is supported by the literature (Anderson 1981; Cohen 1992; Noam 1982), as is the ability of regulated interest groups in choosing what they perceive to be the best arena for regulation (Teske 1990).

In the American federalist system, states are often seen as the best places to experiment with policy, theoretically making them "laboratories of democracy." Donahue (1997, 43) calls this "one of the commonest and most intuitively appealing arguments for weakening Washington's hand and giving the states more room to maneuver." As Donahue points out, single (federal) solutions do not fit all cases. Thus, as he notes, state innovation can be useful not only to the state in which it occurs, but also in other states. And certainly states are seen as "closer" to the people and more reflective of their interests. The question is whose interests—the people's, the states themselves, or special interests? In fracking policy, this closeness to the people has primarily meant state closeness to industry interests.

In the federal–state balance, another argument that undergirds devolution to the states falls under the heading of government scale, where theoretically "only small polities can command popular fealty" (Donahue 1997, 45). Or as former Massachusetts Governor William Weld said in support of state-level policy, "we're closer and more directly answerable to our citizens than the cloud-dweller in Washington" (Weld 1996). But when it comes to fracking, states have in some

cases even sought to override local governments, which are theoretically even "closer" to the people than the states.

The argument is also made that administration by lower levels of government increases efficiency because larger, more centralized governments (in this case the federal government) generate more problems in terms of communication, coordination, and complexity, while also providing more opportunity for waste and confusion. However, as Donahue (1997) points out, there are exceptions, and there is only limited evidence to assess the claim for more efficiency by states because federal and state governments seldom do the same thing and because each does its accounting differently. Where comparisons are possible, there is evidence for only modest increases in efficiency at lower levels of government (Donahue 1997). Moreover, if the argument for lower-level governments producing more efficiency holds, then states should be happy to allow their own local governments to make decisions on fracking policy.

The fact of the matter is that fracking regulatory policy is quite complex because of its interstate nature (in terms of shale formations spanning state lines, the transport of waste between states, the use of roads that cross state lines, the diffuse pollution issues associated with fracking, and, in rare cases, the negotiation of extraction of resources by states sharing a shale formation).

Finally, an argument is also made favoring state regulation based on the idea that there is likely to be more homogeneity at the state level, making consensus easier, political issues simpler, political procedures more transparent, and issues more manageable than at the national level. The argument is that transparent processes allow cause and effect to be more visible and therefore make it easier for voters to make informed voting decisions. Additionally, the argument goes, state lawmakers tend to be more like average citizens because of their tendency to serve part-time. But as Donahue (1997) counters, state legislators' amateurism and limited experience can reduce deliberative quality as regards some issues, increase the power of staff and the executive branch, and, most importantly for our purposes, increase the leverage of interest groups. Moreover, the processes involved with fracking and its regulation have been less than transparent.

Indeed, Donahue (1997) argues for special attention to the role of lobbyists. As he puts it, "electoral politics may be simpler and less professionalized at the state level[, but] lobbying increasingly operates with a scale and sophistication comparable to the norm in Washington," and "lobbyists for business groups almost surely exercise greater relative influence at the state than at the federal level" (Donahue 1997, 49).

Thus federalism scholarship tells us that regulatory policy is highly variable and that regulated interests will choose the governmental venue most to their liking when they can. In the case of fracking, they certainly have done so.

Analytical Approach

To better understand the choice of venue and its implications, we collected and collated our own data, based upon information from FracFocus,[1] a national fracking chemical registry managed by the Ground Water Protection Council and the Interstate Oil and Gas Compact Commission. This site is used by ten states. Furthermore, we spoke to state officials and attended a state fracking conference hosted by state officials and the fracking industry. We examined advocacy web sites and surveyed the State Review of Oil and Natural Gas Environmental Regulations (STRONGER) provisions for each state, creating our own online review of state STRONGER reviews (see Appendix I in supplementary data at *Publius* online). We also examined reputable news sites and industry news. Finally, we used the advocacy organization, Earthjustice,[2] to identify lawsuits involving fracking, researching the actual court opinions ourselves.

The Emergence of Fracking in the United States

Fracking regulatory policy is supported by a push toward more home-grown energy in the United States to reduce the dependency on foreign sources. Natural gas accounts for approximately 23 percent of the United States' energy demand (Energy Information Administration 2012). It is estimated that the U.S. natural gas supply will increase to 49 percent by 2035 (Energy Information Administration 2012).

More than 90 percent of all new oil and natural gas wells now use a modernized version of fracking (Tiemann and Vann 2011) that takes us far from the practices before the Civil War, which involved using nitroglycerin to detonate petroleum formations to increase well production. In 1865, Civil War Veteran Colonel Edward Roberts got the first of his many patents for what was described as an "exploding torpedo." Roberts' method involved filling a well with water and using gunpowder encased in an iron tube to fracture the rock containing the natural gas (American Oil and Gas Historical Society 2012). Most of the fracking from Roberts' time until about the late eighties was done on vertically drilled wells.

In 1986, George Mitchell, president of Mitchell Energy and Development (now part of Devon Energy), was the first to combine hydraulic fracturing with horizontal drilling in the Barnett Shale area of Texas in order to improve well productivity (Helman 2012; Energy in Depth 2012). Thereafter, wells were first drilled vertically into shale and then horizontally.

Today's fracking process begins with a well that is drilled about 10,000 feet vertically and then drilled horizontally into the rock layer containing the natural gas. At that point, hundreds of thousands of gallons of water, mixed with sand and chemical additives, are injected into the well. The pressurized fluid cracks the shale,

and the cracks are held open by the sand particles so that natural gas can flow up the well (Zoback, Kitasei, and Copithorne 2010).

From the late eighties to the early 2000s, most of the horizontal drilling and fracking was done in the Barnett Shale that spans seventeen Texas counties from Dallas to Fort Worth. In 2004, Range Resources started drilling[3] and fracking in the Marcellus Shale in Virginia's Appalachia area (Helman 2012). This latter exploration foreshadowed a boom in natural gas exploration that led to drilling in other shale basins.

As applied to fracking, geography is certainly a factor. At least twenty-four U.S. states have shale formations and wells that use fracking to recover this natural gas (Environmental Protection Agency 2012b). Some twenty-one of those states have gas wells registered at the site (Chemical Disclosure Registry 2013). Up to seven states share the major shale plays, and it is on these that we focus in this article.[4] Some states have more shale deposits than others and so are more involved in fracking. Figure 1 shows the number of gas wells in each state.

Regulatory History of Fracking

Regulation of the natural gas industry began at the state level in the late 1800s and the early 1900s (McGlynn 2011), focusing mainly on the transportation and production processes. Federal regulation dates to 1938, when the Natural Gas Act granted the Federal Power Commission (FPC) the authority to set rates on gas prices and enact regulations on interstate pipeline construction. Ten years later, the FPC started to set prices at the wellhead (structures built over a well opening) in order to standardize prices in the industry (McGlynn 2011).

As part of an overall trend in deregulation in the seventies, the Federal Energy Regulatory Commission (which replaced the FPC) deregulated pricing at the wellheads to avoid gas shortages and allowed companies to explore new natural gas reserves. This continued through the nineties, allowing all natural gas sellers equal opportunity to move gas supplies from wellheads to the consumer and to explore and develop new reserves (McGlynn 2011).

Notably, fracking is given many special exemptions from federal law that are not granted most other heavy industries. There are a number of reasons for this. First, because Congress exempted oil and gas waste from the regulation of hazardous waste under the Resource Conservation and Recovery Act (RCRA) of 1976, fracking waste is also exempted from the definition of hazardous waste under RCRA (even though some toxic components of fracking would normally fall under RCRA's strict requirements). Second, fracking enjoys special exemption from disclosure requirements under the federal Emergency Planning and Community Right to Know Act. The act requires companies to submit annual Toxic Chemical Release Forms reporting their use of toxic chemicals to the U.S. Environmental Protection

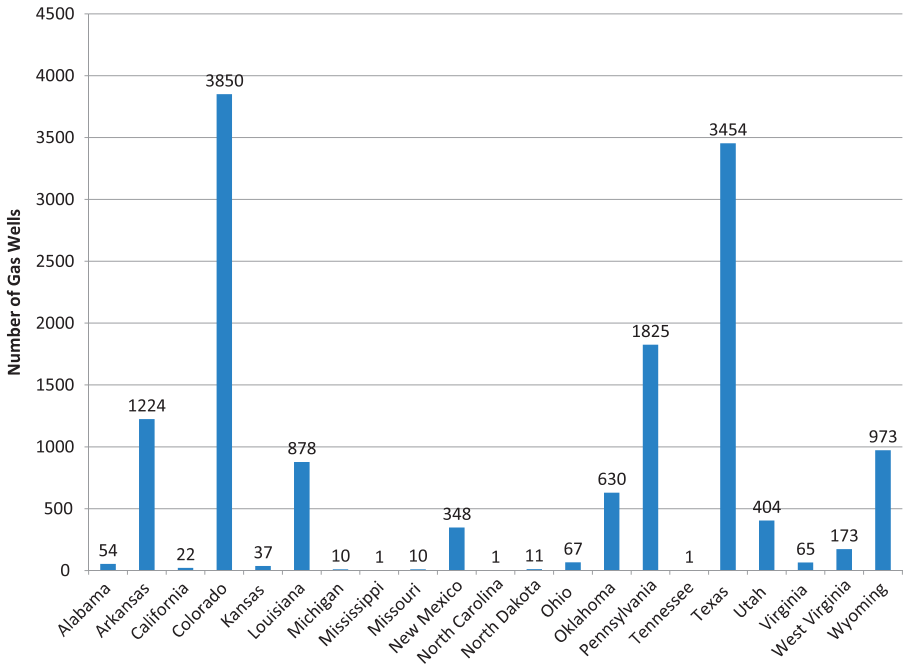

Figure 1 Number of gas wells in each state.

Note. While this figure contains only twenty-one of the twenty-four states that engage in fracking, these are the only states that have gas wells registered at the site. Other states either do not have registered gas wells or, as in the case of Montana, only have oil wells (FracFocus).

Agency (EPA). Fracking industries claim that some of the chemicals they use are proprietary and that their disclosure would harm their competitiveness. Third, neither the federal Clean Water Act (CWA) dealing with disposal issues, nor the Hazardous Materials Transportation Act (HMTA) covering transport of hazardous chemicals, regulates key components of fracking.

Finally fracking waste is exempt from the Safe Drinking Water Act's (SDWA) underground injection-well requirements, which are designed to protect drinking-water aquifers from potential contamination from the injection of liquid wastes into underground wells (the fracking process). As Spence (2010) notes, fracking wells clearly fall under the statute's definition of underground injection wells. Yet the Energy Policy Act (2005), as put forth by the George W. Bush Administration, contained a controversial provision, dubbed the "Halliburton Loophole," that precluded the federal government from regulating fracking under major environmental laws, by modifying the definition of "underground injection" to exempt all chemicals used in fracking, except diesel fuel. The name "Halliburton

Loophole'' derived from Vice President Cheney's prominent role in urging Congress to adopt this provision and Cheney's former position as the chief executive officer of Halliburton, a major energy company engaged in fracking.

In addition to exempting fracking from the SDWA (with the exception for diesel fuel), the 2005 Energy Policy Act affirmed that the states, rather than the federal government, had jurisdiction over the oil and gas industry (Rogers 2009). Issues of who could regulate what in fracking are even more complex in states that contain land managed by the Bureau of Land Management, including New York, Pennsylvania, Illinois and other states in the Midwest.

As expected, turning over fracking regulation to states has led to a wide variety of regulatory approaches. Some states delegate independent authority to their individual environmental regulatory agencies, while others regulate fracking solely through their own oil and gas commissions' well-permitting processes. State regulation standards related to the storage and disposal of chemicals, and liquid waste from their well-gas production, range from minimal to strict. Such variation in state standards can be seen in other cases where the federal government has delegated authority to the states in environmental regulation. As Konisky (2012) points out, ''most U.S. federal pollution control programs are based on a model of regulatory federalism in which the federal government has primary responsibility to set national standards, while states have the authority to implement and enforce these standards within their borders. This decentralized regime of environmental protection provides states with extraordinary discretion to determine their preferred level of enforcement of important federal pollution control programs.'' Konisky cites the regulatory regimes of the Clean Air Act (U.S. Congress 2004) and the CWA as two examples of this.

Citizen Pushback and a Critical Film

Since the early 2000s, the fracking industry has grown rapidly. But along with the growth have come increased complaints and lawsuits by citizen groups over alleged contamination by fracking fluids of the environment and drinking water, and allegations of harm to animal and public health. A variety of citizen groups and individuals also have tried to encourage their local and state governments, and Congress, to pass stricter laws on fracking via public meetings, rallies, and petitions (Oleniacz 2012).

Most of the controversies associated with fracking did not come into the national spotlight until citizen-turned-amateur documentarian Josh Fox released his film *Gasland* in 2010.[5] His harsh critique of the fracking industry focused on the problems allegedly caused by fracking and blamed the oil and gas companies, as well as federal agencies, for denying that the problems existed. Fracking companies heavily criticized the film and called it inaccurate.

Gasland alleged that a well could be fracked eighteen times before it was depleted, and that during that time it required up to seven million gallons of water and could use some 596 chemicals that were undisclosed (*Gasland* 2010). The documentary also alleged that in the life of each well, fracking could involve at least 1,150 truck trips to haul water, sand, and chemicals, including 400 to 600 tanker trucks. The film also highlighted the difficulties citizens faced in dealing with fracking companies, including claims that companies expedited the fracking process so that there was little time for complaints and used stalling techniques to prevail over the complaining citizens. An especially notable feature of *Gasland* was footage of residents setting on fire the water from their kitchen taps and on their property, as well as collections of animals allegedly killed by fracking fluids.

Industry contends that federal law requiring companies to keep information, such as material safety data sheets, about toxic constituents at fracking sites are adequate. These inform workers and the public what fracking chemicals in their *pure form* (our emphasis) are present at a worksite and help with emergency response to accidents. Industry contends that the dilution of such toxins in fracking makes the risks even more remote. However, drinking water contamination resulting from fracking is difficult to confirm because of the lack of information about the mixtures (Spence 2010), which is the real issue, not the pure form of the chemicals. And it is up to the states what type of reporting must be done when industry claims a mixture is proprietary.

Problems Associated with Fracking

One problem with the technique of horizontal drilling is that companies can drill under the property of well owners with or without their consent, leading to land rights disputes. Another issue involves the disposal of waste across state boundaries, creating land, water, noise, and air pollution, as well as the use of roads not equipped to handle so much vehicle and equipment traffic. It is especially difficult to hold out-of-state fracking companies accountable, according to *Gasland*.

Additionally, there have been allegations that fracking has caused earthquakes in Arkansas, New Mexico, Ohio, Oklahoma, and Texas. The cause of the earthquakes has been associated with the reinjection of wastewater from fracking into the injection wells, rather than the actual fracking process itself (Ausbrooks 2012; Eddington 2011; Liu and Kaplan 2011). If more doubts were raised about the safety of fracking in regard to geologic stability, that could exert pressure on the dominant coalition of states and industry, and provide an explanatory pathway to policy change (Sabatier and Jenkins-Smith 1999).

Public fears about the risks of fracking have been heightened by the industry's reluctance to fully release a list of all the chemicals found in fracking fluids. These fears were exacerbated in 2010 when a list of these fluids put out by the

Pennsylvania Department of Environmental Protection did not match an earlier list put out by the New York State Department of Environmental Conservation, although there was some overlap. Furthermore, both lists merely described the constituents found generally in such fluids. Both lists contained some toxic and dangerous chemicals (Spence 2010).

Various environmental groups, such as FracFocus and the Legal Environmental Assistance Foundation (LEAF),[6] also have highlighted various alleged problems associated with the industry and sought to gain media attention for them. But among the advocacy groups, there is no prominent, concerted, or coordinated effort to address fracking.

The variation in state regulatory approaches to fracking might conceivably lead to interstate conflicts, and some have occurred, especially between Ohio and Pennsylvania, New York and Pennsylvania, and New Jersey and Pennsylvania. The disputes are over waste disposal issues (Tittel 2012). Whether states will clash over the underground removal of their resources by other states via horizontal drilling, just as some homeowners have clashed, remains to be seen.[7]

Intergovernmental Conflicts

Some states have clashed with federal law when it comes to regulating disposal issues. In Ohio, for example, Governor John Kasich increased the fees that companies pay to ship wastewater into the state. However, the oil and gas companies and the governor also raised concerns that this may violate the Commerce Clause of the U.S. Constitution (Niquette 2012).[8]

Some states do not want to host the disposal of waste products from fracking. As a result, companies have resorted to hauling their waste to other states. For instance, companies that are fracking in Pennsylvania want to dispose of fracking wastewater and chemicals in New York, Ohio, and New Jersey (Tittel 2012). Fracking companies in Pennsylvania have sought to lease land in New York to dispose of their wastewater and chemicals. As a result, citizens in New York have flocked to meetings to urge legislators to deny the permits for such practices, elected officials have sent letters to regulators, and former U.S. Representative Eric Massa, D-New York, even threatened to lie down in front of fracking trucks. At this writing, no permits have been approved (Goldberg 2010). In 2010, New York's governor ordered a moratorium on natural gas drilling to allow for an environmental review of fracking that assesses its potential pollution and contamination consequences (Cernansky 2010; Esch 2010; New York Department of Environmental Conservation 2012). A waste disposal facility in New Jersey accepted the waste; however, citizens urged the legislature to pass a bill to ban this practice (Tittel 2012). Other states are either banning out-of-state waste or charging high fees for accepting the waste (Goldberg 2010; Niquette 2012; Tittel 2012).

Fracking and the Courts

Individuals in many cases are taking on the titans of the fracking industry through lawsuits, alleging problems with citizen and animal health, environmental harm, violation of land rights, a strain on local transportation systems, and waste disposal. Some of these suits have challenged the federal government. In other cases, they have targeted the fracking companies that have the legal and financial clout to respond to challenges. However, some successful cases have produced tinkering around the regulatory edges.

The first legal complaint regarding fracking occurred in 1994, when the LEAF petitioned the EPA to withdraw approval of Alabama's Underground Injection Control (UIC) program. The dispute was over who should regulate fracking under the SWDA—the state or the EPA. The LEAF argued that Alabama's UIC program was deficient because it did not regulate the fracking of coal-bed methane gas, as set forth in the SWDA. The EPA denied the petition, ruling that fracking was not considered an underground injection process because the fluids did not permanently stay in the ground and could not therefore contaminate the drinking water supply (Rogers 2009).

Dissatisfied, the LEAF filed a petition with the 11th Circuit Court of Appeals, alleging that the EPA's interpretation was inconsistent with the language of the SDWA. In 1997, the court overturned the EPA's decision and said that fracking of coal beds was indeed regulated under the SDWA (Rogers 2009). But even after the ruling, there remained controversy over the definition of fracking and underground injection, and over who should regulate fracking (Rogers 2009).[9]

In April 2012, as a result of a lawsuit against the EPA by two environmental groups alleging the agency had failed to oversee toxic emissions from fracking, the EPA adopted regulations to reduce smog-forming volatile organic compounds (VOCs) resulting from fracking (Phillips 2012). Fracking fluid waste may be stored in man-made reservoirs that are aerated to disperse them, thus creating air pollution (Colorado School of Public Health 2012). However, the seemingly timid EPA made it clear that the rules were not meant to hinder the growth of the natural gas industry, but were instead designed to encourage best management practices and "already-in-place" technologies. The regulations required gas and oil companies to capture up to 95 percent of the VOCs emitted from the wells, which they could then sell to other industries. The regulations created the first national standards for fracking (Environmental Protection Agency 2012b; Kusnetz 2011; Environmental Protection Agency 2011a). Citizen and environmental groups cautiously welcomed the regulations, but were unhappy that they only addressed air pollution and no other contamination issues, such as groundwater contamination.[10] These groups also were dissatisfied with what they perceived as the leniency given the oil and gas industry in being granted two years to implement the

regulations. Most of the industry opposed the regulations, saying it already was employing best practices (Groeger 2012).

Citizens who have filed lawsuits against fracking companies have a difficult time marshaling the resources needed to challenge the industry, despite some spotty victories. Among the hurdles for citizens are finding the expertise and money to test the water, soil, and air to back up their claims. Citizens either ask state and federal agencies to conduct these tests, or they spend their own money at costs of up to $500 per test (Wisconsin State Laboratory of Hygiene 2011). But they more than likely need tests from different labs. If they allege health problems, they need medical tests from various doctors. Citizens also must pay for attorneys or seek help from citizen action groups. And once a lawsuit has been filed, the court process can drag on for years (Thomas 2012). In most of the cases that are dismissed, courts have ruled that the plaintiffs did not have the necessary evidence for their claims.

Among the states in which citizens have filed lawsuits over fracking are Arkansas, Colorado, Louisiana, Pennsylvania, Texas, and Wyoming. There are allegations over the contamination of drinking water, surface water, well water, and groundwater; air pollution; improper disposal of waste; criminal trespass; exposure to combustible gases, toxic sediments and hazardous chemicals; health problems; and emotional distress, to name the main categories. Citizen groups also have filed suits seeking full public disclosure of chemicals used in fracking, rather than just the nonproprietary chemicals.

Local Governmental Challenges to Fracking

The most controversy over fracking has come from local governments that are at odds with their own states over whether to allow fracking, potential contamination, and waste disposal. City and county governments can implement their own requirements to supplement state requirements, if local authorities deem them necessary and the states allow them. This may include additional permits or local ordinances that are adopted around highly populated areas to protect citizens and the environment from potentially harmful drilling effects (Department of Energy, Office of Fossil Energy, National Energy Technology Laboratory 2009). The local ordinances usually require oil and gas companies to acquire additional permits to drill in protected areas, flood zones, residential areas, and high-traffic areas. Regional water authorities also may require that companies acquire additional permits to operate in local river and water basins (Department of Energy, Office of Fossil Energy, National Energy Technology Laboratory 2009).

Some local governments have legally challenged states. In *Cooperstown Holstein Corp. v. Town of Middlefield* (2012), the New York Supreme Court ruled that towns could establish their own regulations outlawing drilling and fracking inside the city

limits or on city-owned land, even if the state allowed drilling and fracking. Middlefield Township in New York won decisive legal victories over the oil and gas companies that were fracking in its immediate area (Wiessner 2012).

Other localities have followed Middlefield's example. For example, the township of Nockamixon, the Borough of Yardley, and five other municipalities in Pennsylvania have banned fracking in their municipalities (Navarro 2012). However, the state of Pennsylvania fought back by enacting legislation prohibiting local municipalities from enforcing these bans. The state claimed there was an overriding interest in moving toward energy independence and that unconventional drilling for gas could be done in an environmentally safe manner (Pennsylvania Department of Environmental Protection 2012). The Cooperstown decision prompted several townships in Southwestern Pennsylvania to petition a panel of Commonwealth Court judges to reject the part of this legislation pertaining to zoning laws. And indeed the panel found that Pennsylvania could not require municipalities to require drilling where their zoning laws prohibited it (Olson 2012).

The decisions by the New York and Pennsylvania judges have the potential to set precedents that local municipalities might cite to control the future of fracking on a localized basis, even in states that prohibit municipalities from having this power over zoning (Colorado, Idaho, Ohio, and Texas come to mind) (Horn 2012; Navarro 2012).

State Regulation of Fracking: A Study of Federalism

To date, states vary in their regulations regarding their participation in voluntary reviews of their programs, disclosure of fracking fluids, and the choice of regulatory bodies for oversight of the fracking industry. This has led to a hodgepodge of policies, rather than a more uniform approach that might be achieved with more federal oversight.

Beginning in 1990, states cooperated with the EPA to develop voluntary guidelines on the regulation of oil and gas exploration, as well as guidelines on the monitoring and permitting of these resources (Arkansas Hydraulic Fracturing State Review 2012). In 2009, a nonprofit organization called the STRONGER, representing states as a whole (particularly those involved in fracking), was formed.[11] STRONGER created a Hydraulic Fracturing Workgroup that developed guidelines for its member states to evaluate their regulatory programs regarding fracking (Arkansas Hydraulic Fracturing State Review 2012). Guidelines covered casing and cementing, spill-contingency plans, reporting and monitoring of fracking activities, training staff in the environmental impacts and hazards of fracking, educational information about fracking, assessment of the available water supplies for fracking, and the management of fracking waste (STRONGER 2010).

States may request STRONGER reviews of their regulatory systems. Only six states have undergone specific fracking reviews (Arkansas, Colorado, Louisiana, Ohio, Oklahoma, and Pennsylvania). See the Appendix I in supplementary data at *Publius* online for a summary of states and their STRONGER reviews.[12]

One of the key regulatory issues relates to disclosure regulations regarding the chemicals used in fracking. In 2010, Wyoming became the first state to implement disclosure regulations. However, Governor Dave Freudenthal, a Democrat,[13] said he only wanted these rules to keep the regulatory power of the industry at the state level, rather than escalate it to the federal level (Bleizeffer 2010). Soon after, many other states followed suit with their own disclosure rules (Bleizeffer 2010; Energy in Depth 2012). Two states (Utah and Virginia) requested that operators volunteer to disclose their chemicals on the FracFocus web site (FracFocus 2013b). But states use various language regarding disclosure, so it is often difficult to ascertain what is required. For example, four states (Arkansas, Montana, North Dakota, and Oklahoma) require full disclosure of the chemicals used in fracking fluids, but they do not make it clear if those chemicals are ones that companies deem proprietary.

Other states differentiate between proprietary and nonproprietary chemicals. For instance, three states that require public disclosure of chemicals exempt those that companies deem proprietary (Ohio, Michigan, and Mississippi). Other states require disclosure of proprietary chemicals only upon request (for instance, some states require disclosure to health or government officials, if requested). Texas requires disclosure of proprietary chemicals to health entities. Some eleven states have no disclosure regulations (Alabama, California, Idaho, Illinois, Kansas, Kentucky, Minnesota, Nevada, New York, South Dakota, and Tennessee). Nevertheless, companies still have a lot of control over the release of environmental information under state-administered regulatory regimes. Finally, the choice of administrative agency responsible for regulating fracking varies across the states. States typically regulate fracking through their oil and gas boards, or their environmental agencies (Environmental Protection Agency 2011b). In addition, some states have several regulatory agencies with distinct responsibilities, whereas others have only one distinct agency or commission. These commissions have responsibility for issuing well permits and providing oversight of all oil and gas operations (Department of Energy, Office of Fossil Energy, National Energy Technology Laboratory 2009).

Greater Federal Involvement?

In response to complaints by citizen groups over alleged contamination by fracking fluids of the environment and drinking water, as well as allegations of harm to the public health, in 2008 Democratic Congress members Diana DeGette of Colorado, Maurice Hinchey of New York, and Jared Polis of Colorado tried to eliminate the

exemption of fracking from the SWDA by introducing the Fracturing Responsibility and Awareness of Chemicals Act (DeGette 2009). The legislation died in the House Committee on Energy and Commerce, and no further action was taken on the bill (Library of Congress 2012b). U.S. Senator Bob Casey, D-Pennsylvania, introduced a similar bill that year. It died in the Senate Committee on Environment and Public Works, and no further action was taken on it (Library of Congress 2012a).

Some federal action occurred in 2009, following citizen complaints about suspected water pollution as a result of fracking in Pavillion, Wyoming. As a result of these complaints, the EPA began testing local water supplies. In its initial analysis, the EPA found that the water supply contained what it called a "tentatively identified compound" or compounds that may or may not be related to fracking fluid. The main chemical was 2-butoxyethanol, or 2-BE, which is used in fracking. But the EPA did not say that the compounds(s) could cause public health issues. Instead, it said that a possible origin of 2-BE was ordinary household cleaners being poured down the sink (Energy in Depth 2012; Lustgarten 2009).

In 2009, the U.S. House and Senate introduced companion bills that proposed additional fracking regulation. The "Fracturing Responsibility and Awareness of Chemicals Act" (Library of Congress 2012a) sought to repeal fracking's exemption from the SDWA and "require disclosure to the state and public of the chemical constituents using in fracking, with the exception of the "proprietary formulas." Neither bill made it to a floor vote. However, the parts of the FRAC Act that lifted exemption from the SDWA addressed fairly remote risks because fracking takes place at a great distance from drinking water aquifers (Spence 2010).

In March 2010, as a result of pressure from environmental groups, citizen activist groups and a request from Congress, the EPA announced it would conduct another study on the environmental impact of fracking on surface-water quality. The new study was to revisit a 2004 EPA study on coal-bed methane that did not fully address issues related to fracking. As of this writing, this study is scheduled to be published in final form in 2014.

More federal action came in 2010 when the U.S. House Committee on Energy and Commerce launched an investigation into the environmental and health impacts of fracking, saying it wanted to ensure that fracking was done in a safe and sustainable way that did not harm the environment. The committee requested information about the drilling process, the number of wells fracked, the wells' distance from drinking water sources, the chemicals used to frack a well and any reported environmental and health effects associated with fracking (Committee on Energy and Commerce 2010; Shankman and Lustgarten 2010). The committee used the data collected to publish a report about the chemicals used in fracking (Committee on Energy and Commerce 2011). The report concluded that the leading companies were using fracking fluids that contained 750 compounds, of

which more than 650 were known possible human carcinogens or air pollutants (Committee on Energy and Commerce 2011). While the federal study of fracking has come into the picture late, a variety of federal laws could be used to regulate fracking, if the political will were there and the state-industry subsystem were not so entrenched.[14]

President Barack Obama made his first public statement on fracking in his State of the Union Address in January 2012. He used the opportunity to promote natural gas as a way to create jobs. However, he said he would require all companies that drilled on public lands to disclose the chemicals they used in their operations. He also said that while he wanted to explore the use of natural gas, he wanted to make sure it was done safely and without harming citizens (Obama 2012).

In May 2012, the Interior Department proposed that companies involved in fracking on federal and Native American lands disclose all chemicals used in the process. The proposal also would require all oil and gas operators to have a water management plan in place to deal with fracking fluids that flow back from the well bore to the surface (Johnson 2012).

President Obama's 2013 budget subsequently earmarked $45 million for a multi-agency study on fracking to examine all aspects of the drilling process, including water and air quality issues, as well as other environmental concerns. Some of the funds were to be used to enact the recommendations from a study by a panel that was to be made up of members of the EPA, the U.S. Interior Department and the U.S. Department of Energy. This panel was to examine the safety of fracking. As of this writing, funding for this panel has not been approved by Congress (Soraghan 2012).

However, even with these efforts, the federal government continues to leave the main regulatory authority to the states. Some of the representatives from the oil and gas companies have said that any federal regulation would duplicate many of the regulations that states have implemented (Johnson 2012). Alabama, Alaska, Montana, North Dakota, Texas, and Wyoming have sent Congress resolutions requesting that the exemption of fracking from the SWDA be maintained (Tiemann and Vann, 2011). In the petitions, the states cite their long history of what they say is their successful regulation of fracking. They also say that federal regulations would slow the development of natural gas as a revenue source for the states (Tiemann and Vann, 2011). To try to ensure that fracking is not federalized, the fracking industry has contributed $20.5 million to members of Congress and has spent $725 million on lobbying (Browning and McElroy 2011).

Conclusion

The 2005 Energy Act created an unusual situation in which Congress (as directed by the White House) willingly gave up considerable power over fracking by

handing off its authority to the states. A hodgepodge of policies has resulted. In a rush toward profits and a possible source of energy independence, states and their citizens were initially enthusiastic about fracking, and some still may be. Certainly state legislators, governors, and some state agencies are strongly signaling they want to retain their historic authority to regulate the oil and gas industry, and fracking companies support them in this, even though the lax regulation of the industry is raising questions. There is increased wrangling between states, between municipalities and companies, between municipalities and their states, between citizens and the government, and between citizens and companies. There have also been a number of lawsuits filed (some still pending) by governments, advocacy groups, and citizens. The siren song of energy independence and the profit motive is strongly entangled in this debate.

The area of most conflict in the fracking industry appears to be among local communities, towns, and townships over contamination and waste disposal, although there are a few issues between the states over waste disposal. Some municipalities are fighting their states, and some states are pushing back. Trans-boundary issues between states have emerged, especially over waste disposal.

The prospects for major federal laws concerning fracking seem remote at this point, barring a high-profile accident or punctuated equilibrium (Spence 2010). As noted, gas producers did not support the FRAC Act, and the current Congress seems unlikely to take on the industry. Thus the states will likely continue to take the lead in the regulation of this potentially important energy source, and the industry interests are likely to continue to hold sway there.

Supplementary Data

Supplementary data can be found at www.publius.oxfordjournals.org.

Notes

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1. FracFocus says it was created ‘‘to provide the public access to reported chemicals used for hydraulic fracturing within their area. To help users put this information into perspective, the site also provides objective information on hydraulic fracturing, the chemicals used, the purposes they serve and the means by which groundwater is protected. The primary purpose of this site is to provide factual information concerning hydraulic fracturing and groundwater protection. It is not intended to argue either for

or against the use of hydraulic fracturing as a technology. It is also not intended to provide a scientific analysis of risk associated with hydraulic fracturing. While FracFocus is not intended to replace or supplant any state governmental information systems[,] it is being used by a number of states as a means of official state chemical disclosure. Currently, ten states—Colorado, Oklahoma, Louisiana, Texas, North Dakota, Montana, Mississippi, Utah, Ohio and Pennsylvania—use Fracfocus in this manner. Finally, this site does not deal with issues unrelated to chemical use in hydraulic fracturing such as Naturally Occurring Radioactive Material (NORM). This topic is beyond the current scope of this site'' (FracFocus 2013a).

2. Earthjustice says it is ''a non-profit public interest law organization dedicated to protecting the magnificent places, natural resources, and wildlife of this earth, and to defending the right of all people to a healthy environment'' (''Our Mission—Earthjustice 2013).
3. While drilling is involved in fracking, drilling does not always include fracking. Companies drill for oil, for instance, without fracking. This article only deals with fracking.
4. A shale play is defined as the exploration of shale in an area.
5. Previous documentaries did not get the level of publicity enjoyed by *Gasland* and were mixed in their views about fracking. They include *Haynesville: A Nation's Hunt for Energy* by Gregory Kallenberg (2009), which documented how three citizens in Louisiana were benefiting from the natural gas industry, and *Split Estate: The Film* by Debra Anderson (Anderson 2009), which documented how the citizens of Garfield County, Colorado, were dealing with the problems allegedly associated with fracking in their backyards.
6. The LEAF, founded in 1979, calls itself a nonprofit environmental law firm dedicated to helping citizens in Alabama, Florida and Georgia protect their right to a clean environment. It provides free services to citizens and grassroots organizations, acting almost like the American Civil Liberties Union. It is the only environmental public interest law firm in Florida, Georgia, and Alabama that focuses solely on the protection of human health from toxic contamination. The LEAF is known for its work on underground injection wells, anti-degradation, dioxin, and community assistance (Environmental Protection Agency 2012a; Children's Environmental Health Network 2012).
7. While shale plays may cross state boundaries, it is rare for wells to be drilled across multiple states. However, with horizontal drilling, it is possible for one state to drill from within its own boundaries into the shale of another state. Whether the drilling state has to get the other state's permission depends upon states laws regarding permitting. In many cases each state will issue a permit for wells that cross state boundaries (Nickolaus 2012).
8. While it may seem as if Governor Kasich was here questioning his own action, he was actually questioning whether he was following the Interstate Commerce Clause about requiring extra fees for out-of-state companies to dump waste in his state, thus trying to regulate how much waste was being dumped in his state, especially following the earthquakes in Youngstown. While he indicated he was not happy about the increasing

volume of wastewater from neighboring states, the U.S. Constitution prohibits interference with shipments. He declined to speculate about what might be done. Kasich said in an interview on January 26, 2012, "when people are using our things, and they could disrupt our ability to have progress here, we have to be concerned about it. . . . We're thinking about what we can do and not violate the interstate commerce clause" (Niquette 2012).

9. It is important to note that this petition happened before the Energy Act of 2005, so the LEAF did not have a clear definition of what was allowed and what was not.
10. It should be noted that the Energy Act of 2005 exempted the natural gas industry from the SWDA, not the Clean Water Drinking Act. The Energy Act did not regulate groundwater contamination by the natural gas industry. But it has been monitored in the case of Pavillion, Wyoming. There was never an exemption for air quality in the Act.
11. STRONGER calls itself a "non-profit, multi-stakeholder organization whose purpose is to assist states in documenting the environmental regulations associated with the exploration, development and production of crude oil and natural gas. . . . The state review process is a non-regulatory program and relies on states to volunteer for reviews. U.S. EPA and the U.S. Department of Energy have provided grant funding to STRONGER to support its activities. The American Petroleum Institute has also provided no-strings attached funding to support the state review process. STRONGER invites participation in the state review process. We seek volunteers from both states and interested citizens" (STRONGER 2013).
12. A much more detailed table is available from the authors via email request to bwarner@astate.edu.
13. It is interesting that even this Democratic governor was not pro-regulation when it came to fracking. Democrats ideologically tend to be more in favor of regulation than Republicans.
14. Federal laws that could be used to regulate the oil and gas industry are the Safe Drinking Water Act of 1974 (amended in 1986 and 1996); the Federal Water Pollution Control Act (U.S. Congress, 2002a), or Clean Water Act Amendments of 1972 (amended in 1977 and 1987); the Resource Conservation and Recovery Act of 1976 (amended in 1984); the Clean Air Act Amendments of 1970 (amended in 1990 and 2004); the Toxic Substances Control Act of 1976 (U.S. Congress 2002b); the Comprehensive Environmental Response, Compensation, and Liability Act (Superfund) of 1980 (revised in 1986 with the Superfund Amendments and Reauthorization Act) (U.S. Congress, 1980); the Emergency Planning and Community Right-to-Know Act of 1986; National Environmental Policy Act of 1969 (U.S. Congress, 1969); and the Energy Policy Act of 2005 (U.S. Congress 2005).

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