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Recent Developments in Hydraulic Fracturing Regulation and Litigation

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RECENT DEVELOPMENTS IN HYDRAULIC FRACTURING REGULATION AND LITIGATION

KEITH B. HALL*

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I. INTRODUCTION

Hydraulic fracturing—sometimes called “fracking” or “ing”¹—is a process that uses a high-pressure fluid to create frac-

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1. Hydraulic fracturing goes by a variety of names, including: “fracing,” “fracking,” “hydrofracturing,” and “hydrofracking.” Hannah Wiseman, *Fracturing Regulation Applied*, 22 DUKE ENVTL. L. & POL’Y F. 361, 361 (2012). “Fracking” has become the shortened term most often used in the media, but “fracing” is more traditional and still is often used by persons who regularly do oil and gas law or other work in the industry. NORMAN J. HYNE, Nontechnical Guide to Petroleum Geology, Exploration, Drilling and Production 423-26 (2d ed. 2001) (petroleum geologist using “fracing”); Christopher S. Kulander, *Environmental Effects of Petroleum Production: 2010-2011 Texas Legislative Developments*, 44 TEX. TECH L. REV. 863, 869 (2012) (oil and gas law professor repeatedly using “fracing”);

tures in an underground formation.² Those fractures can then serve as pathways for oil or gas to flow through the rock, thereby facilitating the production of oil and gas from low-permeability formations.³ Hydraulic fracturing was developed in the late 1940s and was used in many thousands of oil and gas wells over the next several decades without attracting much notice.⁴ But in the last several years, hydraulic fracturing has become controversial. The public, regulators, industry, and environmentalists have all given considerable attention to various environmental issues related to hydraulic fracturing and to other aspects of oil and gas activity,⁵ and there have been a large number of important developments in the law.

Bruce M. Kramer & Owen L. Anderson, *The Rule of Capture: An Oil and Gas Perspective*, 35 ENVTL. L. 899, 933–36 (2005) (two oil and gas law professors repeatedly using the word “fracing”).

2. NAT’L ENERGY TECH. LAB., U.S. DEP’T OF ENERGY, MODERN SHALE GAS DEVELOPMENT IN THE UNITED STATES: A PRIMER 15 (2009) [hereinafter SHALE GAS PRIMER] at ES-4, 57, available at http://www.netl.doe.gov/File%20Library/Research/Oil-Gas/Shale_Gas_Primer_r_2009.pdf.

3. *Id.* Oil and natural gas generally are not found in subsurface caverns. Instead, they are found in the pore spaces of certain underground rock formations. RICHARD C. SELLEY, *ELEMENTS OF PETROLEUM GEOLOGY* 239 (2d ed. 1998); JAMES G. SPEIGHT, *THE CHEMISTRY AND TECHNOLOGY OF PETROLEUM* 103 (2d ed. 1991). In some formations, the interconnections between pore spaces are sufficient to allow oil or gas to flow easily through the formation. *Id.* at 142; MARTIN S. RAYMOND & WILLIAM L. LEFFLER, *OIL AND GAS PRODUCTION IN NONTECHNICAL LANGUAGE* 167 (2006). But in other formations, the interconnections are not sufficient to allow oil or gas to flow easily. In those formations, oil and gas essentially remain trapped in isolated pore spaces unless the formation is fractured. See DANIEL YERGIN, *THE QUEST: ENERGY, SECURITY, AND REMAKING THE MODERN WORLD* 326 (1st. ed. 2011).

4. See Keith B. Hall & Lauren E. Godshall, *Hydraulic Fracturing Litigation*, 57 THE ADVOCATE, Winter 2011 at 13, 13.

5. *Id.* Hydraulic fracturing is just one part of the process of drilling and completing an oil and gas well. Some members of the public erroneously use “hydraulic fracturing” or “fracking” to refer to the entirety of oil and gas activity. The erroneous use of terminology is unfortunate because it has the potential to distort public discussions of oil and gas activity by causing persons to overestimate the risks involved in using hydraulic fracturing (if they hear hydraulic fracturing being blamed for some incident that actually is caused by some other aspect of oil and gas activity) and by distracting attention from other issues that merit attention, such as the regulation of the casing and cementing of wells. Similar observations have been made by multiple commentators. See, e.g., Hannah J. Wiseman, *Risk and Response in Fracturing Policy*, 84 U. COLO. L. REV. 729 (2013); Scott Anderson, *If the Problem Isn’t Hydraulic Fracturing, Then What Is?*, EDF (Feb. 16, 2012), <http://blogs.edf.org/energy/exchange/2012/02/16/if-the-problem-isnt-hydraulic-fracturing-then-what-is/> (article by policy advisor at Environmental Defense Fund); Keith B. Hall, *Hydraulic Fracturing and Well Drilling -- What Safety Issues Should We Be Discussing?*, *Envtl. & Energy L. Brief* (Apr. 24, 2011), <http://environmentalenergylawbrief.com/hydraulic-fracturing/hydraulic-fracturing-and-well-drilling---what-safety-issues-should-we-be-discussing/>. When some problem is caused by some aspect of oil and gas activity other than hydraulic fracturing, it can be as equally nonsensical to refer to that as a “fracking” problem as it would be to refer to a “traffic” problem if a person is injured while filling his car with gasoline. If one is referring to the entirety of the oil and gas exploration and production process, it is preferable to use such phrases as “oil and gas activity” or “exploration and production” or “shale gas development” (if the drilling happens to be in a shale formation from which natural gas is produced), rather than “hydraulic fracturing.”

This Article discusses some of the most significant recent developments in hydraulic fracturing regulations and litigation, as well as developments relating to aspects of oil and gas activity closely associated with hydraulic fracturing.⁶ These developments relate to numerous issues, including: (1) baseline testing of groundwater; (2) mandatory disclosure of fracturing water additives; (3) subsurface trespass claims; (4) the regulation of hydraulic fracturing under the Safe Drinking Water Act; (5) the regulation of the disposal of flowback under the Clean Water Act; (6) the regulation of venting during flowback under the Clean Air Act; (7) regulations to reduce the risk of induced seismic events at wastewater disposal wells, including wells used for the disposal of flowback; (8) litigation of contamination claims; (9) use of *Lone Pine* orders in contamination litigation; (10) use of the Endangered Species Act; (11) local government regulation of hydraulic fracturing and disputes regarding whether state laws preempt local laws; (12) regulation to minimize local inconvenience during the drilling and fracturing of wells; (13) regulation of fracturing on federal lands; (14) the sourcing of water for use in hydraulic fracturing; and (15) well construction standards.

II. BASELINE TESTING OF GROUNDWATER QUALITY

Sometimes a landowner or other person alleges that a company's oil and gas activities have caused groundwater contamination. The company may deny the allegation, thereby giving rise to a dispute. Such disputes can be difficult to resolve because a large number of natural phenomena⁷ and human activities⁸ can cause groundwater contamination of one type or another.⁹ For example,

6. Hydraulic fracturing has attracted considerable attention from legal scholars in recent years. See, e.g., Wiseman, *supra* note 5; Keith B. Hall, *Hydraulic Fracturing: Trade Secrets and the Mandatory Disclosure of Fracturing Water Composition*, 49 IDAHO L. REV. 399 (2013); Christopher S. Kulander, *Shale Oil And Gas State Regulatory Issues And Trends*, 63 CASE W. RES. L. REV. 1101 (2013); Bruce M. Kramer, *Federal Legislative And Administrative Regulation of Hydraulic Fracturing Operations*, 44 TEX. TECH L. REV. 837 (2012); David E. Pierce, *Developing A Common Law Of Hydraulic Fracturing*, 72 U. PITT. L. REV. 685 (2011); Owen L. Anderson, *Subsurface "Trespass": A Man's Subsurface Is Not His Castle*, 49 WASHBURN L.J. 247 (2010).

7. See, e.g., MARTHA G NIELSEN ET AL., U.S. GEOLOGICAL SURVEY, ASSESSMENT OF ARSENIC CONCENTRATIONS IN DOMESTIC WELL WATER, BY TOWN, IN MAINE, 2005–09 1 (2010), available at http://pubs.usgs.gov/sir/2010/5199/pdf/sir2010-5199_nielsen_arsenic_report_508.pdf (noting that arsenic is found naturally in the groundwater in some areas).

8. *Id.* at 1 (noting use of arsenic as a pesticide on crops).

9. The difficulty plaintiffs sometimes can have in proving their claims is illustrated by *Mitchell Energy Corp. v. Bartlett*, 958 S.W.2d 430, 447-48 (Tex. Ct. App. 1997), though the contaminant at issue in that case was not methane. It is not clear that the defendant caused the alleged contamination in that case—there was evidence of other potential causes—but it is clear that proving the plaintiffs' case would not have been a simple task. *Id.* (noting that plaintiff needed to provide evidence that ruled out other potential sources). See

methane contamination can occur naturally,¹⁰ but such contamination also can be caused by multiple types of human activity, including oil and gas exploration and development.¹¹ Further, because methane is odorless and tasteless,¹² it might not be immediately detected, and if it is detected, it may not be clear when the contamination occurred.

If a landowner had baseline water quality data—that is, data on the quality of his groundwater prior to the oil and gas activity that he alleges is the cause of contamination—the data would not necessarily be determinative in resolving the dispute, but it might be extremely useful. Unfortunately, landowners often lack such data. The absence of such data can make it more difficult to resolve such disputes and can make it more difficult for government officials and citizens to make public policy decisions that might be influenced by their understanding of the risks associated with oil and gas activity.

A few states have addressed this problem by enacting provisions that either require or encourage baseline testing before an oil or gas well is drilled or fractured. For example, Ohio amended its laws in 2012 to require baseline testing.¹³ Section 1509.06 of the Ohio Revised Code states that the application to drill a horizontal well must include the test results from the analysis of water samples from water wells located within 1500 feet of the proposed horizontal wellhead unless the owner of the water well refuses to allow the applicant to collect a sample. And if any owner of a water well refuses to allow the permit applicant to collect a water sample, the applicant must identify the location of the well.¹⁴

In early 2013, Colorado enacted a regulation which mandates that “[i]nitial baseline samples” be collected from “all Available Water Sources, up to a maximum of four (4), within a one-half (1/2) mile radius of a proposed Oil and Gas Well” prior to drilling the

generally Keith B. Hall, *Hydraulic Fracturing: Problems of Proof*, 74 OHIO ST. L.J. FURTHERMORE 71 (2013).

10. U.S. GEOLOGICAL SURVEY, OPEN-FILE REPORT NO. 2012-1162, DISSOLVED METHANE IN NEW YORK GROUNDWATER 1 (2012), available at http://pubs.usgs.gov/of/2012/1162/pdf/ofr2012-1162_508_09072012.pdf.

11. U.S. GEOLOGICAL SURVEY, FACT SHEET NO. 2006-3011, METHANE IN WEST VIRGINIA GROUND WATER 1 (2006), available at http://pubs.usgs.gov/fs/2006/3011/pdf/Factsheet2006_3011.pdf (noting multiple human activities that can cause methane to be present in groundwater). Natural gas is mostly methane. Hyne, *supra* note 1, at 241.

12. Connecticut Light & Power Co. v. United States, 299 F.2d 259, 261 (Ct. Cl. 1962); U.S. GEOLOGICAL SURVEY, OPEN-FILE REPORT NO. 2012-1162, DISSOLVED METHANE IN NEW YORK GROUNDWATER 1 (2012), available at http://pubs.usgs.gov/of/2012/1162/pdf/ofr2012-1162_508_09072012.pdf.

13. OHIO REV. CODE ANN. § 1509.06(A)(8)(c) (LexisNexis 2013). The language requiring baseline testing was added by 2012 Senate Bill 315.

14. *Id.*

well.¹⁵ If more than four “Available Water Sources” exist, the operator should sample those that are closest.¹⁶ The regulation includes substantial additional detail about the initial sampling and testing requirements.¹⁷ After the drilling operation, the operator must collect and analyze two rounds of “subsequent samples,” with one round being collected sometime between six and twelve months after completion of the well and another round being collected between sixty and seventy-two months following completion.¹⁸

Pennsylvania law does not require baseline testing, but a statute enacted in 2012 strongly encourages it.¹⁹ The statute provides that, if a groundwater supply located within 2500 feet of the vertical section²⁰ of an unconventional oil or gas well²¹ becomes contaminated within twelve months after the completion of hydraulic fracturing of the well, there is a “rebuttable presumption” that the unconventional oil and gas operations caused the contamination.²²

15. 2 COLO. CODE REGS. § 404-1:609(b) (2013). Initial samples must be collected within 12 months of setting the conductor pipe, an early stage in the drilling process; *Id.* § 404-1:609(d)(1) (describing timing of sampling); Hyne, *supra* note 1, at 241 (describing drilling and noting setting of conductor pipe early in process).

16. 2 COLO. CODE REGS. § 404-1:609(b)(1).

17. The operator is directed to collect samples from both down-gradient and up-gradient locations if such locations are available and the direction of groundwater flow is known. *Id.* § 404-1:609(b)(3). If the direction of flow is uncertain, the operator should attempt to collect samples from locations in a radial pattern around the proposed oil and gas well. *Id.* If aquifers exist at different depths, the operator should attempt to sample from the shallowest and the deepest depth. *Id.* § 404-1:609(b)(4).

18. *Id.* § 404-1:609(d)(2). The regulation also specifies certain substances for which the samples must be analyzed and requires certain actions if the substances are found in concentrations higher than specified levels. *See id.* § 404-1:609(e).

19. *See* 58 PA. CONS. STAT. § 3218 (2013).

20. Many of the oil and gas wells drilled into shale formations, a classic unconventional formation, are drilled vertically downward until drilling nearly reaches the desired depth, then the direction of drilling is gradually turned from vertical to horizontal, with the drilling then proceeding horizontally for perhaps a mile or more within the shale formation. Hannah Wiseman, *Regulatory Adaptation in Fractured Appalachia*, 21 VILL. ENVTL. L. J. 229, 236-37 (2010); *see also* Keith B. Hall, *Regulation of Hydraulic Fracturing Under the Safe Drinking Water Act*, 19 BUFF. ENVTL. L.J. 1, 7-8 (2011-2012). “Shale gas” is natural gas produced from a shale formation. Glossary of Terms, U.S. ENERGY INFO. ADMIN., <http://eia.gov/tools/glossary/index.cfm?id=S>.

21. The Energy Information Administration’s glossary of terms defines “unconventional oil and natural gas production” as “[a]n umbrella term for oil and natural gas that is produced by means that do not meet the criteria for conventional production.” In turn, it defines “[c]onventional oil and natural gas production” as being production from “a well drilled into a geologic formation in which the reservoir and fluid characteristics permit the oil and natural gas to readily flow to the wellbore.” *Id.* Hydraulic fracturing often is used in unconventional formations. Thomas E. Kurth et al., *American Law and Jurisprudence on Fracing*, 58 ROCKY MTN. MIN. L. INST. 4-1, 4-5 (2012) (“Hydraulic fracturing is generally viewed as a completion technique that is a practical necessity to promote development of unconventional ‘tight’ shale reservoirs, particularly oil shale and gas shale.”).

22. For unconventional wells, the statute provides that the rebuttable presumption will apply if contamination occurs within twelve months after completion or “stimulation” of the well. Hydraulic fracturing is a form of “well stimulation.” The *Manual of Oil and Gas Terms* does not define “well stimulation,” but it notes that “stimulate” is defined by a West

A similar rebuttable presumption applies for conventional wells, though it applies for a smaller area and for a shorter period of time.²³

An operator can rebut the presumption that he caused the contamination by “affirmatively prov[ing]” that something else caused the contamination²⁴ or by showing that the owner of the water supply refused to allow the operator to sample the water.²⁵ The Pennsylvania statute also states that “[a]n operator electing to preserve a defense [based on rebutting the presumption] shall retain an independent certified laboratory to conduct a predrilling . . . survey of the water supply,” and shall provide the survey results to state regulators and the owner of the water supply that is sampled.²⁶ This provision arguably makes the presumption irrebuttable if the operator failed to perform the baseline testing.²⁷

The West Virginia Horizontal Well Act,²⁸ enacted in late 2011, contains somewhat similar provisions that apply to “horizontal” oil and gas wells.²⁹ The Act provides that if a water supply located

Virginia statute as “any action taken by well operator to increase the inherent productivity of an oil or gas well including, but not limited to, fracturing, shooting or acidizing, but excluding cleaning out, bailing or workover operations.” PATRICK H. MARTIN & BRUCE M. KRAMER, WILLIAMS & MEYERS: MANUAL OF OIL AND GAS TERMS 1092 (12th ed. 2003).

23. 58 PA. CONST. STAT. § 3218(c)(1). For a conventional oil and gas well (one that is not hydraulically fractured), the rebuttable presumption applies whenever a water supply located within 1000 feet of the well becomes contaminated within six months of completion of the well. *Id.*

24. *Id.* § 3218(d). The operator also can rebut the presumption by proving that the contaminated water supply is located outside the area for which the presumption is established, that the contamination occurred either before the operator’s drilling activity or after the time period for which the presumption applies, or that “the landowner or water purveyor refused to allow the operator access to conduct a predrilling . . . survey.” *Id.* If the defendant rebuts the presumption by proving that something other than his operations caused the contamination, that proof probably will be sufficient to defeat liability. If, on the other hand, the defendant rebutted the presumption by proving that the contamination occurred after the time period for which the presumption applies or that the owner of the water refused to allow the operator to sample the water, a court might allow the owner of the water supply to attempt to prove (without the aid of a rebuttable presumption) that the operator caused contamination.

25. The statute requires the operator to inform the landowner that he will lose the benefit of the rebuttable presumption if he refuses to grant the operator access to perform a predrilling survey. *See id.* § 3218(e.1).

26. *See id.* § 3218(e). The statute does not specify the chemicals for which an operator should test, but given the rebuttable presumption established by the statute, operators have an incentive to conduct a reasonably thorough analysis.

27. Perhaps a court would interpret this language as merely precatory. Otherwise, this provision could lead to unjust results. Assume, for example, that an operator did not perform the required baseline testing using an independent laboratory but there is irrefutable evidence that something else caused the contamination. It would be unfair in such a situation to impose an irrebuttable presumption that the operator caused the contamination.

28. W. VA. CODE §§ 22-6A-1 to -24 (2013).

29. In a horizontal well, the operator begins drilling vertically downward, then turns the direction of drilling to proceed in the horizontal direction when drilling reaches the formation from which the operator wishes to produce oil or gas. The advantage of this is that a

within 1500 feet of the vertical section of a horizontal well becomes contaminated, there will be a rebuttable presumption that the operator of the oil and gas well caused the contamination.³⁰ The operator of the well can rebut the presumption by proving that the “pollution existed prior to the drilling,” but the Act appears to provide that the operator forfeits the right to rebut the presumption on that basis unless he performed baseline testing prior to drilling.³¹ An operator also can rebut the presumption by proving that the contamination was caused by something other than the operator’s drilling activity, that the contamination occurred more than six months after the operator’s drilling operations, or that the contaminated water supply is not within 1500 feet of the oil and gas well, and an operator’s right to rebut the presumption in these ways does not appear to be conditioned on his having performed baseline testing prior to drilling.³²

In mid-2013, Illinois became the most recent state to enact a baseline testing requirement.³³ Section 1-80(b) of the new law requires each applicant for a “high volume horizontal hydraulic fracturing permit” to hire an independent third party to conduct baseline water quality sampling and analyses for each water source within 1500 feet of the oil and gas well site prior to any hydraulic fracturing. The recipient of the permit must also cause all water sources within 1500 feet of the oil and gas well to be tested again six months, eighteen months, and thirty months after completion of the hydraulic fracturing operation.³⁴

greater length of the well’s piping can be placed in the productive formation with horizontal drilling than with vertical drilling alone because a formation may extend a few hundred feet or less in the vertical direction, but miles in the horizontal direction. Placing a greater length of the wellbore in the productive formation is advantageous because oil or gas enters the well through perforations that the operator creates in the sections of pipe within the productive formation (rather than through an open at the end of the well), and a greater length of pipe in the productive formation allows for a greater length of pipe that can be perforated and therefore more perforations into which oil and gas can enter (as well as a greater length of area that can be fractured). See YERGIN, *supra* note 3, at 17. *But cf.* HYNE, *supra* note 1, at xl, 127, 285-86, 344-45; Lamont C. Larsen, *Horizontal Drafting: Why Your Form JOA Might Not Be Adequate for Your Company’s Horizontal Drilling Program*, 48 ROCKY MTN. L. FOUND. J. 51, 53 (2011).

30. W. VA. CODE § 22-6A-18(b).

31. *Id.* § 22-6A-18(d). Under the West Virginia Horizontal Well Act, an operator’s failure to perform baseline testing would not appear to preclude the operator from rebutting the presumption altogether, as the Pennsylvania statute arguably does.

32. *Id.* § 22-6A-18(c).

33. S.B. 1715, 98th Gen. Assemb., Reg. Sess. (Ill. 2013).

34. *Id.* at § 1-80(c).

III. MANDATORY DISCLOSURE OF HYDRAULIC FRACTURING FLUID COMPOSITION

A. State Regulations Requiring Disclosure

The fluid used in hydraulic fracturing typically is a mixture of water, proppants, and numerous additives that facilitate the hydraulic fracturing process in various ways.³⁵ Traditionally, the companies that perform hydraulic fracturing have kept the composition of their fracturing fluid confidential in order to preserve any competitive advantage they might have obtained over their rivals by developing a better mix.³⁶ However, in recent years, as concern about hydraulic fracturing grew, public support for regulations that would require the disclosure of fracturing fluid composition also grew.³⁷

In August 2010 Wyoming became the first state to enact regulations requiring the mandatory disclosure of hydraulic fracturing fluid composition.³⁸ In January 2011 Arkansas became the second state to do so.³⁹ After that, mandatory regulations began to be adopted by states at a rapid pace. As of August 2013 about nineteen states had enacted mandatory disclosure regulations, including the two states noted above, as well as Colorado,⁴⁰ Idaho,⁴¹ Illinois,⁴² Indiana,⁴³ Louisiana,⁴⁴ Michigan,⁴⁵ Mississippi,⁴⁶ Mon-

35. SHALE GAS PRIMER, *supra* note 2, at 56, 61, 62, ES-4. Proppants are small particles—frequently sand is used—that the fracturing fluid carries into the fractures. The proppants stay behind after the fracturing operation is complete. Their purpose is to prop open the fractures so that they do not reclose. The other additives included in the fracturing water typically include corrosion inhibitors, biocides, friction reducers, and other substances.

36. Hall, *supra* note 6, at 406.

37. Ben Casselman, 'Fracking' Disclosures to Rise: Gas Drillers Begin Supporting Laws Requiring Them to List the Chemicals They Use, WALL ST. J., June 20, 2011, available at <http://online.wsj.com/news/articles/SB10001424052702304887904576395630839520062>.

38. 55-3 WYO. CODE R. § 45(d)(ii) (LexisNexis 2012); see also Jacquelyn Pless, *Fracking Update: What States are Doing to Ensure Safe Natural Gas Extraction*, NAT'L CONF. OF STATE LEGS., <http://ncsl.org/issues-research/energyhome/fracking-update-what-states-are-doing.aspx> (last updated July 2011) (noting that Wyoming was first to adopt disclosure requirement). Wyoming's rule applies to "well stimulation." Hydraulic fracturing is a type of well stimulation.

39. 178-00-1 Ark. Code R. § B-19 (LexisNexis 2013); see also Bill Holland, *Arkansas to Require Hydraulic Fracturing Fluid Disclosure in January*, PLATTS (Dec. 8, 2010), <http://platts.com/latest-news/natural-gas/Washington/Arkansas-to-require-hydraulic-fracturing-fluid-6660232> (noting that in the following month, Arkansas would become the second state to require disclosure).

40. 2 COLO. CODE REGS. § 404-1205A (2013).

41. IDAHO ADMIN. CODE r. 20.07.02.055.01(c), (e) (2013); *id.* at 20.07.02.056.01.

42. S.B. 1715, Gen. Assemb., Reg. Sess. (Ill. 2013).

43. The Indiana legislature has directed the Indiana Department of Natural Resources to develop mandatory disclosure regulations. IND. CODE § 14-37-3-8 (2013). Indiana adopted a disclosure requirement by emergency rule, pending adoption of final rules. See 312 IND. ADMIN. CODE LSA Doc. 12-292(E) (2012).

44. LA. ADMIN. CODE tit. 43:XIX, § 118 (2013).

tana,⁴⁷ New Mexico,⁴⁸ North Dakota,⁴⁹ Ohio,⁵⁰ Oklahoma,⁵¹ Pennsylvania,⁵² South Dakota,⁵³ Texas,⁵⁴ Utah,⁵⁵ and West Virginia.⁵⁶ Collectively, these states are hosts to a large majority of the oil and gas activity in the United States. For example, in one recent week, more than ninety-five percent of drilling rigs operating either on land or in state waters were operating in states that have enacted mandatory disclosure rules.⁵⁷ Other states are considering the adoption of mandatory disclosure regulations, including such states as Alabama, Alaska,⁵⁸ California,⁵⁹ Florida,⁶⁰ Kansas,⁶¹ and New York.⁶²

The mandatory disclosure regulations enacted by the various states differ in some ways,⁶³ but also have important similarities. For example, the regulations uniformly make most information regarding fracturing fluid composition available to the public, but they all protect exempt information that qualifies as a trade secret from public disclosure.

45. MICH. DEP'T OF ENVTL. QUALITY, SUPERVISOR OF WELLS INSTRUCTION 1-2011, HIGH VOLUME HYDRAULIC FRACTURING WELL COMPLETIONS (2011).

46. 26-2:1 MISS. CODE R. § 26 (LexisNexis 2013).

47. MONT. ADMIN. R. 36.22.1015 (2013).

48. N.M. CODE R. § 19.15.16.19(B) (LexisNexis 2013).

49. N.D. ADMIN. CODE 43-02-03-27.1(1)(g) (2013).

50. OHIO REV. CODE ANN. § 1509.10 (LexisNexis 2013).

51. OKLA. ADMIN. CODE § 165:10-3-10(b) (2013).

52. 58 PA. CONS. STAT. § 3222(b.1) (2012).

53. S.D. ADMIN. R. 74:12:92 (2013).

54. 16 TEX. ADMIN. CODE § 3.29 (2013).

55. UTAH ADMIN. CODE r. 649-3-39(1.1) (2013).

56. W. VA. CODE R. § 22-6A-7(e)(5) (2013).

57. A review of Baker-Hughes rig count data for July 26, 2013 showed that 95.1% of rigs operating on land or in state waters were operating in states that have enacted mandatory disclosure regulations. The rig count data is available at *Rig Count Overview & Summary Count*, BAKER HUGHES, <http://phx.corporate-ir.net/phoenix.zhtml?c=79687&p=irol-rigcountsoverview> (last visited Feb. 12, 2014).

In Canada, the province of British Columbia also adopted mandatory disclosure regulations. An announcement regarding the British Columbia regulations is available at *Increased transparency for natural gas sector* BRITISH COLUMBIA (Sept. 8, 2011) <http://newsroom.gov.bc.ca/2011/09/increased-transparency-for-natural-gas-sector.html>.

58. ALASKA OIL & GAS CONSERVATION COMM'N., PROPOSED RULE 20 AAC 25.283, available at http://doa.alaska.gov/ogc/frac/02_02_Hydraulic%20Fracturing%20Proposed%20Regulations.pdf (last visited Feb. 12, 2014).

59. CAL. DEP'T OF CONSERVATION, PRE-RULEMAKING DISCUSSION DRAFT, HYDRAULIC FRACTURING, available at http://conservation.ca.gov/dog/general_information/Documents/121712DiscussionDraftoffHFRegs.pdf. (last visited Feb. 12, 2014).

60. Four hydraulic fracturing bills were introduced in the 2013 session, but none passed prior to the end of the session. H.B. 743, 2013 Leg. (Fla. 2013), available at <http://myfloridahouse.gov/Sections/Bills/billsdetail.aspx?BillId=49977>.

61. Andy Marso, *Proposed Regs Call for Limited Disclosure of 'Fracking' Chemicals*, TOPEKA CAPITAL-JOURNAL (July 22, 2013), <http://cjonline.com/news/2013-07-22/proposed-regs-call-limited-disclosure-fracking-chemicals>.

62. *New Recommendations Issued in Hydraulic Fracturing Review*, N.Y. DEP'T OF ENVTL. CONSERVATION (June 30, 2011), <http://www.dec.ny.gov/press/75403.html>.

63. A discussion and analysis of the differences between the various states' disclosure regulations is available elsewhere. See, e.g., Hall, *supra* note 6.

A significant case regarding trade secrets was recently decided in Wyoming.⁶⁴ In that state, operators must disclose to the Wyoming Oil and Gas Conservation Commission (Commission) the identity of all substances contained in the fracturing fluid, including any substances whose identity the operator claims is a trade secret.⁶⁵ The Commission makes the information disclosed to it available to the public, except that the Commission evaluates any claims by operators that information constitutes a trade secret, and if the Commission agrees that the identity of a particular substance qualifies as a trade secret, the Commission will not include the identity of that substance in the information made available to the public.⁶⁶

Pursuant to the Wyoming regulation, operators have disclosed information regarding fracturing fluid composition to regulators, and much of that has been disclosed to the public.⁶⁷ But operators have made trade secret claims as to identity of some substances.⁶⁸ Regulators have accepted many of those trade secret claims and therefore withheld the identity of those substances from the information made available to the public.⁶⁹

Certain environmental organizations challenged the Wyoming Oil and Gas Conservation Commission's acceptance of several trade secret claims.⁷⁰ To do so, they first made a request to the Commission for documents showing the identity of the substances claimed to be a trade secret.⁷¹ Wyoming, like most states, has a statute that makes most governmental records available to the public, and the environmental organizations relied on that statute.⁷² But, like the federal Freedom of Information Act⁷³ and the open records statutes in most states,⁷⁴ the Wyoming statute provided that any governmental documents that contain trade secret information are not subject to the open records statutes.⁷⁵ Relying

64. *Powder River Basin Res. Council v. Wyo. Oil & Gas Conservation Comm'n*, 43 Env'tl. L. Rep. (Env'tl. Law Inst.) 20072 (Wyo. Dist. Ct., Mar. 21, 2013), available at <http://elr.info/litigation/43/20072/powder-river-basin-resource-council-v-wyoming-oil-gas-conservation-commission> (last visited Feb. 12, 2014).

65. 55-3 WYO. CODE R. § 45(d)(ii) (LexisNexis 2012).

66. *Id.* at § 45(f); see also *Powder River Basin Res. Council*, 43 ENVTL. L. REP. at 20072.

67. *Id.*

68. *Id.*

69. *Id.*

70. *Id.*

71. *Id.*

72. WYO. STAT. ANN. §§ 16-4-201 to -205 (2013).

73. 5 U.S.C. § 552(b)(4) (2013).

74. W. VA. CODE ANN. § 29B-1-4(a)(1) (2013); TEX. GOV'T CODE ANN. § 552.110(b) (West 2013).

75. WYO. STAT. ANN. § 16-4-203(d)(v) (2013).

on that provision, the Commission denied the environmental organizations' public records requests.⁷⁶

But also like the open records statutes in most states, the Wyoming statute allows a person who makes a public records request to bring a court action to challenge any improper denial of a public records request.⁷⁷ Relying on that provision, the environmental organizations filed suit, asserting that the Commission's denial of their public records request was improper because, according to the environmental organizations, the information they sought did not qualify for trade secret status.⁷⁸ They argued that the identity of a particular chemical compound in fracturing fluid could never qualify as a trade secret and that only the combination of both the identity of a compound *and* its concentration in the fracturing fluid could potentially be a trade secret.⁷⁹ The district court rejected the organizations' claims.⁸⁰

B. FracFocus – A Central Website for Disclosures

At the same time that public support for mandatory disclosure grew, several companies began to voluntarily disclose the composition of their fracturing water. Some of these companies did so by posting information on their company websites. But in April 2011 the Ground Water Protection Council⁸¹ and the Interstate Oil Gas Compact Commission⁸² jointly launched FracFocus,⁸³ a website that was designed to be a central location where companies could voluntarily disclose the composition of fracturing fluid used anywhere in the United States on a well-by-well basis.⁸⁴

76. *Powder River Basin Res. Council*, 43 ENVTL. L. REP. at 20072.

77. WYO. STAT. ANN. § 16-4-203(f) (2013).

78. *Powder River Basin Res. Council*, 43 ENVTL. L. REP. at 20072.

79. *Id.* at 6.

80. *Id.* at 17.

81. "The Ground Water Protection Council (GWPC) is a nonprofit 501(c)6 organization whose members consist of state ground water regulatory agencies which come together within the GWPC organization to mutually work toward the protection of the nation's ground water supplies." *About the Ground Water Protection Council*, GROUNDWATER PROT. COUNCIL, <http://gwpc.org/about-us> (last visited Feb. 12, 2014).

82. The Interstate Oil and Gas Compact Commission describes itself as a "multi-state government agency" whose members include governors and state agency representatives from oil and gas producing states. *About the Interstate Oil & Gas Compact Commission*, INTERSTATE OIL & GAS COMPACT COMM'N, <http://iogcc.state.ok.us/about-us> (last visited Feb. 12, 2014); *see generally Member States*, INTERSTATE OIL & GAS COMPACT COMM'N, <http://iogcc.state.ok.us/member-states> (last visited Feb. 12, 2014).

83. *See generally* FRACFOCUS, <http://fracfocus.org/> (last visited Feb. 12, 2014).

84. Keith B. Hall, *Hydraulic Fracturing: Voluntary Disclosure of Fracking Water Additives*, ENVTL. & ENERGY L. BRIEF (Apr. 18, 2011), <http://environmentalenergylawbrief.com/hydraulic-fracturing/hydraulic-fracturing-voluntary-disclosure-of-fracking-water-additives>.

The movement for voluntary disclosure of fracturing water composition has been superseded in large part by the widespread enactment of mandatory disclosure regulations. Nevertheless, FracFocus has remained relevant, and actually has increased in importance, because many of the states that have enacted mandatory disclosure regulations have specified in their regulations that companies should make their disclosure by posting the information to FracFocus. For example, the Texas legislature enacted legislation in mid-2011⁸⁵ that directed the Texas Railroad Commission to draft regulations that require companies to disclose fracturing fluid composition on a well-by-well basis by posting information on FracFocus,⁸⁶ and the Commission complied with the directive, enacting such regulations in December 2011.⁸⁷

In October 2011 Louisiana enacted a mandatory disclosure regulation that gave operators the option of either posting their disclosures on FracFocus or sending the information directly to the Office of Conservation⁸⁸ (and many companies that fracture wells in Louisiana are choosing to post to FracFocus). In December 2011 Colorado enacted regulations requiring disclosure to the FracFocus website.⁸⁹ North Dakota began requiring companies to post disclosures at the FracFocus site on April 1, 2012.⁹⁰ Oklahoma enacted a regulation that became effective July 1, 2012, requiring companies either to post fracturing water information to FracFocus or to send the information to the state's Corporation Commission.⁹¹ The regulation further stated that if the company sends the information to the Corporation Commission only, the Commission will post the information to FracFocus.⁹²

FracFocus contains listings of the composition of fracturing water on a well-by-well basis. The website is designed so that a person can search for wells based on one or more of several criteria, including the company that operates the well, the state or county in which the well is located, or the API number⁹³ of the well.⁹⁴

85. H.B. 3328, 82d Leg., Reg. Sess. (Tx. 2011).

86. TEX. NAT. RES. CODE ANN. § 91.851(a)(1)(A) (2013).

87. See generally 16 TEX. ADMIN. CODE § 3.29 (2013). In Texas, oil and gas activity is regulated by the Railroad Commission.

88. LA. ADMIN. CODE tit. 43:XIX, § 118 (2011). In Louisiana, oil and gas activity is regulated by the Office of Conservation. In 2012, the Louisiana legislature enacted a statute requiring the Office of Conservation to draft regulations that would mandate certain disclosures, but the legislatively mandated disclosures mirror the disclosure requirements that already were in place. LA. REV. STAT. ANN. § 30:4(L) (2012).

89. 2 COLO. CODE REGS. § 404-1:205A (2013).

90. N.D. ADMIN. CODE 43-02-03-27.1(1)(g) (2013).

91. OKLA. ADMIN. CODE § 165:10-3-10(b) (2013).

92. *Id.* The Corporation Commission is the agency that regulates oil and gas activity in Oklahoma. *NBI Servs., Inc. v. Ward*, 132 P.3d 619, 626 (Okla. Civ. App. 2005).

93. The "API Number" is an identification number that is unique for each oil and gas well drilled in the United States.

Some users of the website requested the ability to search by an additional criteria—by fracturing fluid ingredients—and FracFocus recently added that capability to its system. Thus a person can search for all wells (or all wells in a given state or county or that are operated by a particular company) in which a particular substance is included in the fracturing fluid. The website has significant utility: it is fairly user friendly, it allows searches based on several criteria, and it is a central location for the disclosure of fracturing fluid composition from wells located almost anywhere in the country. The site also contains other information regarding hydraulic fracturing,⁹⁵ state regulations relating to the process,⁹⁶ and other information relating to well construction⁹⁷ and groundwater protection.⁹⁸

C. Federal Initiatives Regarding Disclosure

All of the mandatory disclosure regulations that have been enacted have been done at the state level, but certain mandatory disclosure initiatives have come from the federal level. For example, in September 2010 the United States Environmental Protection Agency (EPA) sent letters to nine service companies that perform hydraulic fracturing, requesting that the companies “voluntarily” respond to the EPA’s requests for information.⁹⁹ Eight of the companies voluntarily provided responses that satisfied the EPA, but the Agency was not satisfied with the “voluntary” response of the ninth company, and the EPA reacted by serving a subpoena on that company.¹⁰⁰

94. See *generally Find a Well*, FRACFOCUS, [http://www.fracfocusdata.org/Disclosure Search/](http://www.fracfocusdata.org/DisclosureSearch/) (last visited Feb. 12, 2014).

95. See *generally Hydraulic Fracturing: How it works*, FRACFOCUS, <http://fracfocus.org/hydraulic-fracturing-process> (last visited Feb. 12, 2013).

96. See *generally Regulations by State*, FRACFOCUS <http://fracfocus.org/regulations-state> (last visited Feb. 12, 2014).

97. See *generally How Casing Protects Groundwater*, FRACFOCUS, <http://fracfocus.org/water-protection/casing-process> (last visited Feb. 12, 2013).

98. See *Groundwater Protection & Water Usage*, FRACFOCUS <http://fracfocus.org/groundwater-protection> (last visited Feb. 12, 2014).

99. See *EPA Formally Requests Information From Companies About Chemicals Used in Natural Gas Extraction / Information on Hydraulic Fracturing Chemicals is Key to Agency Study of Potential Impacts on Drinking Water*, EPA, (Sept. 9, 2010), available at <http://yosemite.epa.gov/opa/admpress.nsf/d0cf6618525a9efb85257359003fb69d/ec57125b66353b7e85257799005c1d64%21OpenDocument>.

100. See *Eight of Nine U.S. Companies Agree to Work with EPA Regarding Chemicals Used in Natural Gas Extraction / EPA Conducting Congressionally Mandated Study to Examine the Impact of the Hydraulic Fracturing Process on Drinking Water Quality; Halliburton Subpoenaed After Failing to Meet EPA’s Voluntary Requests for Information*, EPA, (Nov. 9, 2010) available at <http://yosemite.epa.gov/opa/admpress.nsf/d0cf6618525a9efb85257359003fb69d/a96496444c546959852577d6005e63d6%21OpenDocument>.

Further, in response to a petition filed by Earthjustice and several other organizations, the EPA stated in late 2011 that it will draft regulations pursuant to the Toxic Substances Control Act (TSCA) to require companies to disclose information regarding “chemical substances and mixtures used in hydraulic fracturing.”¹⁰¹ The EPA has not specified what information will be subject to disclosure, but the Agency has stated that it will attempt to avoid duplication of “the well-by-well disclosure programs already being implemented in several states,” and that it anticipates that its TSCA regulations will “focus on providing aggregate pictures of the chemical substances and mixtures used in hydraulic fracturing.”¹⁰²

In a November 23, 2011, letter to Earthjustice, the EPA stated that “the first step” in its development of disclosure regulations will be to “convene a stakeholder process to develop an overall approach that would minimize reporting burdens and costs, take advantage of existing information, and avoid duplication of efforts.”¹⁰³ The EPA did not specify in its letter or its public announcement when it would convene the stakeholder process or publish notice of its proposed rulemaking. Earthjustice’s petition asked that chemical manufacturers be required to supply the EPA with “various records,” including the chemical and trade names of all substances manufactured for use in hydraulic fracturing, along with other information regarding each substance, including the amount produced, all existing data concerning the effects of exposure on health and the environment, copies of all health and environmental studies “known to” the manufacturers, and information regarding all adverse health or environmental effects that the manufacturers know have been “alleged to have been caused” by the substance.¹⁰⁴

Another federal initiative relating to mandatory disclosure has come from the Bureau of Land Management (BLM), which has proposed regulations that would have required mandatory disclosure of the composition of the fracturing water whenever fracturing is performed on federal lands. Those regulations, which are discussed in more detail in section XIV of this Article, would include a requirement that companies disclose the composition of fracturing fluid for wells located on federal lands. The operator

101. Letter from Stephen A. Owens, EPA, to Deborah Goldberg, EarthJustice (Nov. 23, 2011), available at <http://epa.gov/oppt/chemtest/pubs/EPA-Letter-to-Earthjustice-on-TSCA-Petition.pdf>

102. *Id.*

103. *Id.*

104. Letter from Deborah Goldberg, EarthJustice to Lisa P. Jackson, EPA (Aug. 4, 2011), available at http://epa.gov/oppt/chemtest/pubs/Section_21_Petition_on_Oil_Gas_Drilling_and_Fracking_Chemicals8.4.2011.pdf.

would have to make the disclosure either to FracFocus or BLM,¹⁰⁵ and BLM has indicated that if a company discloses information directly to BLM, the Bureau will then submit the information to FracFocus.¹⁰⁶

IV. SUBSURFACE TRESPASS CASES

Hydraulic fracturing operations have given rise to two cases in recent years in which plaintiffs asserted subsurface trespass claims, with one of the cases coming from Texas and the other from West Virginia.¹⁰⁷ In each case, the plaintiffs alleged that hydraulic fracturing operations that were conducted on a neighboring property caused fracturing fluids to enter the subsurface of the plaintiffs' property and cause fracturing there.¹⁰⁸ In each case, the plaintiffs argued that this subsurface intrusion constituted an actionable trespass.¹⁰⁹ But they did not allege that the fracturing caused any harmful contamination.¹¹⁰ Instead, in each case the plaintiffs alleged that they were harmed by the cross-boundary fracturing because it caused natural gas to drain from beneath their property to the well on the neighboring property.¹¹¹ Thus the plaintiffs alleged similar facts and asserted similar legal theories in each case. But the two cases reached different results regarding the viability of the plaintiffs' claims.

In *Coastal Oil & Gas Corp. v. Garza Energy Trust*, a majority of Texas Supreme Court held that the plaintiffs did not have an actionable trespass claim.¹¹² The majority based its reasoning on the rule of capture,¹¹³ a traditional oil and gas principle that appears to have been applied in all states that have oil and gas activity.¹¹⁴ The rule of capture provides that if a person drills a well on his property, he is entitled to all of the oil and gas produced from

105. Oil and Gas; Hydraulic Fracturing on Federal and Indian Lands, 78 Fed. Reg. 31636, 31676 (proposed May 24, 2013) (to be codified in 43 C.F.R. pt. 3160).

106. *Id.* at 31640.

107. *Stone v. Chesapeake Appalachia, LLC*, No. 5:12-CV-102, 2013 WL 2097397 (N.D. W. Va. 2013); *Coastal Oil & Gas Corp. v. Garza Energy Trust*, 268 S.W.3d 1 (Tex. 2008).

108. *Stone*, 2013 WL 2097397 at *1; *Garza*, 268 S.W.3d at 7.

109. *Stone*, 2013 WL 2097397 at *1; *Garza*, 268 S.W.3d at 7.

110. In *Garza*, the court expressly notes that the only harm alleged by the plaintiffs was drainage. 268 S.W.3d at 12-13. In *Stone*, the court did not expressly state that, but the court only discusses drainage. *See generally Stone*, 2013 WL 2097397. If the plaintiffs had alleged that the intrusion of fracturing fluids caused other harms, then it would not have made sense for the court to discuss, as it did, whether the rule of capture might bar the trespass claim altogether.

111. *Stone*, 2013 WL 2097397 at *1; *Garza*, 268 S.W.3d at 7, 12-13.

112. *Garza*, 268 S.W.3d at 17.

113. *Id.* at 16-17.

114. PATRICK H. MARTIN & BRUCE M. KRAMER, WILLIAMS & MEYERS, OIL & GAS LAW § 204.4.

that well, even if the well drains some oil or gas from beneath the neighboring property.¹¹⁵ The rule of capture has been justified on the bases that it is difficult to determine how much oil or gas is drained from beneath a plaintiff's property by a neighboring well, that courts should be hesitant to prohibit a defendant from making productive works on his property, and that a plaintiff has a self-help remedy—he can drill his own well near the property line to offset what the defendant is doing.¹¹⁶

The dissent concluded that the rule of capture should not apply. The dissenters noted that courts have recognized that a defendant commits an actionable, subsurface trespass if he drills a well and the wellbore itself intrudes into the subsurface of the plaintiff's property without authority to do so.¹¹⁷ The dissent analogized the fractures, fracturing fluid, and proppants that allegedly intruded into the subsurface of the plaintiffs' property to a wellbore that intruded into someone's subsurface.¹¹⁸ Based on that analogy, the dissent opined that the plaintiffs had an actionable trespass.¹¹⁹

In *Stone v. Chesapeake Appalachia, LLC*, a federal district court in West Virginia faced a dispute similar to that in *Garza*.¹²⁰ The defendant moved for summary judgment, basing its motion in part on the reasoning of *Garza*.¹²¹ But the federal district court denied the motion, making an “*Erie* guess”¹²² that the West Virginia Supreme Court would reject *Garza*'s reasoning and hold that the rule of capture does not preclude a subsurface trespass claim that is based on drainage of oil or gas that is facilitated by cross-boundary fracturing.¹²³ The federal court acknowledged that the West Virginia Supreme Court has adopted the rule of capture,¹²⁴

115. *Id.*; *Garza*, 268 S.W.3d at 12-13.

116. JOHN S. LOWE, OIL AND GAS LAW IN A NUTSHELL at 8-11 (5th ed. 2009).

117. *Garza* 268 S.W.3d at 42-43.

118. *Hastings Oil Co. v. Texas Co.*, 234 S.W.2d 389 (Tex. 1950). *See also* *Williams v. Cont'l Oil Co.*, 14 F.R.D. 58 (W.D. Okla. 1953); *Gliptis v. Fifteen Oil Co.*, 16 So. 2d 471 (La. 1943); *Alphonzo E. Bell Corp. v. Bell View Oil Syndicate*, 76 P.2d 167 (Cal. App. 1938).

119. *Garza*, 268 S.W.3d at 44.

120. *See Stone*, 2013 WL 2097397.

121. *Stone*, 2013 WL 2097397 at *4.

122. In *Erie R.R. Co. v. Tompkins*, 304 U.S. 64, 78 (1938), the United States Supreme Court stated that principle that, when a federal court's jurisdiction is based on diversity of citizenship, the court generally must apply the substantive law of the forum state. When the forum state's highest court has not issued a decision directly on point, the federal court must make its best “*Erie* guess” regarding how the forum state's highest court would rule on the legal question. *Conlin v. Mortg. Elec. Registration Sys, Inc.*, 714 F.3d 355, 358-59 (6th Cir. 2013). *Stone* did not expressly state that the court's jurisdiction was based on diversity, but the court's decision implicitly referred to the fact that it was attempting to apply West Virginia law. 2013 WL 2097397 at *8 (“this Court . . . believes that the West Virginia Supreme Court of Appeals would find . . .”).

123. *Stone*, 2013 WL 2097397 at *8.

124. *Id.* at *2 (citing *Energy Dev. Corp. v. Moss*, 591 S.E.2d 135 (W. Va. 2003)).

but the federal court concluded that the rule likely would not apply under West Virginia law in a case in which hydraulic fracturing crosses property lines.¹²⁵ The federal court was persuaded by the reasoning of the *Garza* dissent, and by a secondary recovery case from Arkansas in which the defendant's operations had caused fluids to intrude into the subsurface of the plaintiff's land and displace minerals from that subsurface.¹²⁶

The question of whether plaintiffs have an actionable trespass in such circumstances has received considerable attention from scholars, who have pointed to rules arising from a variety of arguably analogous fact patterns as potentially providing the rule that should govern such claims.¹²⁷

V. SAFE DRINKING WATER ACT

Part C of the Safe Drinking Water Act¹²⁸ (SDWA) seeks to protect underground sources of drinking water by regulating underground injections.¹²⁹ Part C applies, or potentially applies, to several activities relevant to oil and gas activity, including hydraulic fracturing,¹³⁰ enhanced recovery operations,¹³¹ injection disposal,¹³² and the underground storage of hydrocarbons.¹³³ Of particular note have been certain recent developments relating to regulation of hydraulic fracturing under the SDWA—developments that can be better understood after a brief explanation of the history of the relation between hydraulic fracturing and the SDWA.

For years, the EPA took the position that the SDWA did not apply to hydraulic fracturing, though some groups disputed that interpretation and the United States Eleventh Circuit Court of Appeals rejected that interpretation in the late 1990s, holding that the SDWA's then current language applied to hydraulic fracturing.¹³⁴ But only a small fraction of the country's oil and gas activity

125. *Id.* at *8.

126. *Id.* at *6 (quoting the Coastal Oil & Gas Corp. v. Garza Energy Trust, 268 S.W.3d 1 (Tex. 2008) (Thomas, J., dissenting); also quoting Young v. Ethyl Corp., 521 F.2d 771 (8th Cir. 1975)).

127. See generally Anderson, *supra* note 6.

128. The Safe Drinking Water Act is found at 42 U.S.C. § 300f (2006). Part C of the SDWA is found at 42 U.S.C. § 300h (2006).

129. Legal Envtl. Assistance Found., Inc. v. EPA, 276 F.3d 1253, 1255 (11th Cir. 2001), *cert. denied*, 537 U.S. 989 (2002).

130. 42 U.S.C. 300h(d).

131. 40 C.F.R. § 144.6(b)(2) (2011).

132. 40 C.F.R. § 144.6(b)(1) (2011).

133. 40 C.F.R. § 144.6(b)(3) (2011).

134. See, e.g., Legal Envtl. Assistance Found., Inc. v. EPA, 118 F.3d 1467, 1469 (11th Cir. 1997); see also 151 Cong. Rec. S7278-79 (2005) (EPA stating to Congress that, prior to *EPA v. LEAF*, the EPA had never interpreted the SDWA as applying to hydraulic fracturing).

takes place within the three states that are part of the Eleventh Circuit's jurisdiction, and outside that circuit the EPA did not seek to apply the SDWA to hydraulic fracturing.¹³⁵ Thus considerable doubt remained regarding the applicability of the SDWA to hydraulic fracturing.

The 2005 Energy Policy Act¹³⁶ clarified things somewhat by providing that the SDWA generally does not apply to hydraulic fracturing but that the SDWA will apply in the event that the fracturing fluid contains "diesel."¹³⁷ But even after the Energy Policy Act made it clear that the SDWA applies to fracturing in certain circumstances, the EPA still did nothing to regulate hydraulic fracturing for several years.¹³⁸ But in 2010, the EPA signaled a change. At some point during that year, the EPA posted a page on its website with information regarding hydraulic fracturing. Among other things, the page stated:

While the SDWA specifically excludes hydraulic fracturing from UIC regulation under SDWA § 1421 (d)(1), the use of diesel fuel during hydraulic fracturing is still regulated by the UIC program. Any service company that performs hydraulic fracturing using diesel fuel must receive prior authorization from the UIC program. Injection wells receiving diesel fuel as a hydraulic fracturing additive will be considered Class II wells by the UIC program.¹³⁹

This caught many people in the oil and gas industry by surprise. Although the 2005 Energy Policy Act had made it relatively clear that the SDWA applied to hydraulic fracturing operations in which diesel fuel was an ingredient of the fracturing fluid, neither the EPA nor any state other than Alabama had ever used the SDWA

135. See Hall, *supra* note 20.

136. Energy Policy Act of 2005, Pub. L. No. 109-58 (2005) (codified throughout scattered sections of 26 and 42 U.S.C.).

137. The 2005 Energy Policy Act did this by revising the definition of "underground injection" to exclude hydraulic fracturing, unless the fracturing fluid contains diesel. 42 U.S.C. § 300h(d) (2006). For a discussion of the Safe Drinking Water Act's limited application to hydraulic fracturing, see Keith B. Hall, *Regulation of Hydraulic Fracturing Under the Safe Drinking Water Act*, 19 BUFF. ENVTL. L.J. 1 (2011-12); Kramer, *supra* note 6.

138. See Keith B. Hall, *Regulation of Hydraulic Fracturing Under the Safe Drinking Water Act*, 19 BUFFALO ENTL. L.J. 1, 26-27 (2011-12).

139. While the most updated version of the EPA webpage contains a slightly altered version of this language, the original wording of the post has been reported by various sources, INCLUDING L. POE LEGGETTE ET AL., FEDERAL REGULATION OF HYDRAULIC FRACTURING: A CONVERSATIONAL INTRODUCTION 23 (2012), available at <http://nortonrosefulbright.com/files/us/images/publications/20121113FederalRegulationofHydraulicFracturingAConversationalIntroduction.pdf>, and Lissa Harris, *EPA and Gas Drillers Square Off in Court About Diesel in Frac Fluid*, WATERSHED POST, Nov. 9, 2011, <http://www.watershedpost.com/2010/epa-and-gas-drillers-square-court-about-diesel-frac-fluid>.

to regulate hydraulic fracturing, even if diesel fuel was an ingredient. Further, the EPA had expressly taken the position in *LEAF* that its SDWA regulations did not apply to fracturing, and the agency had not revised its regulations or disclaimed its prior position, at least not at any time prior to the EPA's 2010 posting to its website.¹⁴⁰

Two industry groups, the Independent Petroleum Association of America and the U.S. Oil & Gas Association (collectively, the "IPAA") filed suit in late 2010 challenging the EPA's statement that companies must obtain a UIC permit before conducting hydraulic fracturing using diesel.¹⁴¹ The plaintiffs contended that the EPA's change in position effectively was the same as adopting a new regulation and that the EPA could not make such a dramatic change in its interpretation and application of its existing regulations without following procedures outlined by the Administrative Procedures Act (APA) for the adoption of a new regulation.¹⁴² That litigation settled in early 2012, with the plaintiffs agreeing to dismiss their claims and the EPA stating that it would publish a document with proposed guidance regarding how the EPA's permit writers should evaluate applications for permits to conduct hydraulic fracturing with a fracturing fluid that contains diesel. Further, the EPA stated that it would invite public comments regarding the proposed guidance.¹⁴³

On May 10, 2012, the EPA published *Permitting Guidance for Oil and Gas Hydraulic Fracturing Activities Using Diesel Fuels—Draft*.¹⁴⁴ The EPA solicited comments, with an original deadline for comments being July 9, 2012,¹⁴⁵ and an extended comment period that ran through August 23, 2012.¹⁴⁶ The guidance will only apply to EPA permit writers overseeing SDWA programs for states that do not have primacy, though the EPA has urged states that have primacy to take the guidance into consideration.¹⁴⁷

140. *Id.*

141. See Brief for Petitioners, *Indep. Petroleum Ass'n of Am. v. EPA*, No. 10-1233 (D.C. Cir. May 10, 2011), 2011 WL 2496293.

142. *Id.* at 32-33.

143. U.S. ENVTL. PROT. AGENCY, PROPOSED AMENDMENTS TO AIR REGULATIONS FOR THE OIL AND GAS INDUSTRY: FACT SHEET at 2 (2011), available at <http://epa.gov/airquality/oilandgas/pdfs/20110728factsheet.pdf>.

144. U.S. ENVTL. PROT. AGENCY, EPA 816-R-12-004, PERMITTING GUIDANCE FOR OIL AND GAS HYDRAULIC FRACTURING ACTIVITIES USING DIESEL FUELS—DRAFT: UNDERGROUND INJECTION CONTROL PROGRAM GUIDANCE #84, available at <http://water.epa.gov/type/groundwater/uic/class2/hydraulicfracturing/upload/hfdieselfuelsguidance508.pdf>.

145. 77 Fed. Reg. 27451 (May 10, 2012).

146. 77 Fed. Reg. 40354 (July 9, 2012).

147. U.S. Env'tl. Prot. Agency, *supra* note 143. (EPA "fact sheet" discussing the new guidance document). The SDWA contains provisions that allow states to apply for "primacy" (a state that has primacy is delegated the role of enforcing and administering the SDWA

VI. CLEAN AIR ACT

During the flowback portion of hydraulic fracturing that is performed in shale plays, a two-phase mixture of gas and liquid flows from the well.¹⁴⁸ The liquid is mostly water, while the gas is mostly natural gas. Sometimes, companies have vented the gas, either because they did not have the equipment to recover the natural gas or because they did not yet have a pipeline connection to the well. That created a concern because natural gas contains volatile organic compounds (VOCs) that can contribute to ozone formation.¹⁴⁹ Further, natural gas is mostly methane, which is a greenhouse gas.¹⁵⁰

The EPA announced proposed regulations to address these concerns in July 2011¹⁵¹ and announced final regulations in April 2012.¹⁵² The regulations generally will require companies to use “green completions,” also called “reduced emissions completions,” in which the companies separate and recover the gas. The requirement will not apply to exploratory or delineation wells that are not near pipeline connections, but companies will be required to flare that gas (which would be better than venting it), rather than vent it, unless doing so would be a safety hazard.¹⁵³

Some states, such as Colorado and Wyoming, already require the use of reduced emissions completions.¹⁵⁴

VII. THE CLEAN WATER ACT AND THE DISPOSAL OF FLOWBACK AND PRODUCED WATER AT POTWS

Most operators dispose of flowback and produced water in underground injection wells,¹⁵⁵ a process that is regulated by the Safe Drinking Water Act¹⁵⁶ and that, for the most part, does not raise

with in its borders) by showing that they have implemented an underground injection control scheme that meets federal standards. 42 U.S.C. § 300h-1(b)(3) (2006).

148. U.S. ENVTL. PROT. AGENCY, *supra* note 143, at 2; U.S. ENVTL. PROT. AGENCY, *supra* note 144.

149. *Id.* at 3.

150. *Id.* at 7.

151. *Press Release, EPA Proposes Air Pollution Standards for Oil and Gas Production*, EPA, (July 28, 2011) <http://yosemite.epa.gov/opa/admpress.nsf/d0cf6618525a9efb85257359003fb69d/8688682fbbb1ac65852578db00690ec5!OpenDocument>.

152. *Id.*

153. 77 Fed. Reg. 49490 (Aug. 16, 2012).

154. 2 Colo. Code Regs. § 404-1:805(b)(3) (2013); AIR QUALITY DIVISION, WYO. DEP'T OF ENVTL. QUALITY, OIL AND GAS PRODUCTION FACILITIES CHAPTER 6, SECTION 2 PERMITTING GUIDANCE at 5 (2010), available at <http://deq.state.wy.us/aqd/Oil%20and%20Gas/March%202010%20FINAL%20O&G%20GUIDANCE.pdf>.

155. R.R. Comm'n of Tex. v. Tex. Citizens for a Safe Future & Clean Water, 336 S.W.3d 619, 621 (Tex. 2011).

156. 40 C.F.R. § 144.6(b)(1) (2013).

much controversy.¹⁵⁷ On occasion, however, operators have disposed of flowback or produced water by sending it to publicly owned treatment works (POTWs).¹⁵⁸ Such a practice, though apparently rare, raises a concern because POTWs may not be designed to remove some of the compounds found in flowback and produced water.

Responding to this concern, the EPA announced plans on October 20, 2011, to develop regulations that would require companies to pre-treat flowback before it is sent to a POTW.¹⁵⁹ The plans were announced as part of the “Final 2010 Effluent Guidelines Program Plan” (which was prepared pursuant to section 304 of the Clean Water Act) and require the EPA to publish a plan every two years identifying sources that discharge water either directly to surface waters or to treatment plants, and which the EPA has selected for new or additional regulations.¹⁶⁰ The EPA has stated that it plans to gather information from stakeholders, then draft regulations and seek public comments in 2014.¹⁶¹

VIII. EARTHQUAKES

Several types of human activities have occasionally been linked to induced seismic activity—earthquakes. Such activities include creating large reservoirs of water by damming rivers, withdrawal of fluids from beneath the surface, mining, pumping water under-

157. There are exceptions. In a few places, for example, the operation of underground injection disposal wells has been blamed for causing induced seismic activity. One example of such a location is Ohio. See *Ohio's New Rules for Brine Disposal Among Nation's Toughest*, OHIO DEP'T OF NAT. RESOURCES (Mar. 9, 2012), available at http://ohiodnr.com/home_page/NewsReleases/tabid/18276/EntryId/2711/Ohios-New-Rules-for-Brine-Disposal-Among-Nations-Toughest.aspx Another is Arkansas. See ARK. OIL & GAS COMM'N, ORDER 602A-2010-12, CLASS II COMMERCIAL DISPOSAL WELL OR CLASS II DISPOSAL MORATORIUM (Feb. 8, 2011), available at <http://aogc2.state.ar.us/Hearing%20Orders/2011/Jan/602A-2010-12.pdf>.

158. For a while, some operators in Pennsylvania were sending flowback and produced water to POTWs, but at the direction of Governor Tom Corbett, the Pennsylvania Department of Environmental Protection requested that companies cease doing so by May 19, 2011. See *DEP Calls on Natural Gas Drillers to Stop Giving Treatments Facilities*, PR NEWSWIRE (Apr. 19, 2011), available at <http://www.prnewswire.com/news-releases/pennsylvania-dep-calls-on-natural-gas-drillers-to-stop-giving-treatment-facilities-wastewater-120206249.html>.

159. See *EPA Announces Schedule to Develop Natural Gas Wastewater Standards*, EPA available at (Oct. 20, 2011) available at <http://yosemite.epa.gov/opa/admpress.nsf/d0cf6618525a9efb85257359003fb69d/91e7fad4b114c4a8525792f00542001!OpenDocument>; 76 Fed. Reg. 66286 (Oct. 26, 2011) (publication of plan), available at <http://gpo.gov/fdsys/pkg/FR-2011-10-26/pdf/2011-27742.pdf>; U.S. ENVTL. PROT. AGENCY, EPA 820-R-10-021, TECHNICAL SUPPORT DOCUMENT FOR THE 2010 EFFLUENT GUIDELINES PROGRAM PLAN (2011), available at http://water.epa.gov/lawsregs/lawsguidance/cwa/304m/upload/tsd_effluent_program_10_2011.pdf.

160. *Id.*

161. *Id.*

ground to recover geothermal energy, and the underground injection of fluids for disposal.¹⁶² The operation of injection disposal wells sometimes comes up during discussions of hydraulic fracturing.

Injection disposal wells generally are regulated under the Safe Drinking Water Act.¹⁶³ Such wells are used to dispose of a wide variety of waste fluids (including fluids unrelated to oil and gas activity), as well as for some purpose other than disposal, and hundreds of thousands of such wells have received permits in the United States under the Safe Drinking Water Act.¹⁶⁴ One of the types of fluid frequently disposed of in injection wells is the flowback wastewater from the hydraulic fracturing process.¹⁶⁵ On a handful of occasions, there have been earthquakes that authorities suspect were caused by the operation of injection disposal wells, and in some of those cases the disposal wells apparently were being used for the disposal of flowback water or the produced water from oil and gas wells.¹⁶⁶

Some media reports have inaccurately suggested that the injection disposal wells were wells in which hydraulic fracturing was being conducted,¹⁶⁷ but those reports give an erroneous impression. The process of operating an injection disposal well is different from hydraulic fracturing and should be distinguished from it.¹⁶⁸ In about three locations worldwide, there is substantial suspicion

162. NATIONAL RESEARCH COUNCIL, *INDUCED SEISMICITY POTENTIAL IN ENERGY TECHNOLOGIES* 18 (2012).

163. 42 U.S.C. § 300h(a)-(b) (2012).

164. U.S. ENVTL. PROT. AGENCY, UIC INVENTORY BY STATE, *available at* <http://water.epa.gov/type/groundwater/uic/upload/uicinVENTORYbyState2011.pdf>

165. R.R. Comm'n of Tex. v. Tex. Citizens for a Safe Future & Clean Water, 336 S.W.3d 619, 621 (Tex. 2011).

166. USGS FAQs: *Do All Wastewater Disposal Wells Induce Earthquakes?*, USGS <http://usgs.gov/faq/?q=categories/9833/3424> ("Only a small fraction of these disposal wells have induced earthquakes that are large enough to be of concern to the public."); *Youngstown Seismic Activity Questions and Answers*, OHIO DEP'T OF NAT. RES., <http://ohiodnr.com/downloads/northstar/YoungstownFAQ.pdf> (last visited Feb. 12, 2014) ("There are more than 144,000 operational Class II disposal wells in the United States, but only six have been linked to earthquakes"); ARK. OIL & GAS COMM'N, *supra* note 157 (implementing a moratorium on Class II injection disposal wells in a particular area and noting that there appeared to be circumstantial evidence linking such disposal wells to seismic activity). A "Class II" injection disposal well is an injection disposal well for brine from oil and gas operations. 40 C.F.R. § 144.6(b) (2011).

167. Cf. David J. Hayes, *Is the Recent Increase in Felt Earthquakes in the Central US Natural or Manmade?*, U.S. DEPT. OF THE INTERIOR, (Apr. 11, 2012), <http://doi.gov/news/doineWS/Is-the-Recent-Increase-in-Felt-Earthquakes-in-the-Central-US-Natural-or-Manmade.cfm#> (statement noting that some media reports "[u]nfortunately" had given impression that a U.S. Geological Survey scientist was reporting that hydraulic fracturing had caused earthquakes, when the scientist had found no such link and that instead scientist was reporting on apparent "correlation between wastewater injection sites and seismicity").

168. Keith B. Hall, *Frack Quakes? Can Hydraulic Fracturing Really Cause Earthquakes?*, ENVTL. & ENERGY L. BRIEF (Jan. 9, 2012), <http://environmentalenergylawbrief.com/hydraulic-fracturing/frack-quakes-can-hydraulic-fracturing-really-cause-earthquakes>.

that hydraulic fracturing itself, rather than the operation of an injection disposal well, caused induced seismic activity,¹⁶⁹ but the likelihood of any particular hydraulic fracturing operation inducing seismic activity appears very small given that, by some accounts, more than a million wells have been hydraulically fractured.¹⁷⁰ With respect to induced seismic activity, the real issue is injection disposal wells and certain other activities, rather than hydraulic fracturing itself.

In at least two states, authorities have taken steps to address the risk that injection disposal wells will cause induced seismic activity. In Arkansas, a series of earthquakes occurred and many people suspected a link between those earthquakes and oil and gas activity. The Arkansas Oil & Gas Commission issued an order to prohibit the operation of injection disposal wells in a particular area, but did not prohibit hydraulic fracturing in that area.¹⁷¹ The Arkansas Oil & Gas Commission noted that, “[b]ased upon the studies of the Arkansas Geological Survey,” there is “no evidence” that hydraulic fracturing caused the series of earthquakes, but that there is “circumstantial evidence” that injection disposal wells might have contributed to the seismic activity.¹⁷²

Another series of earthquakes occurred near Youngstown, Ohio in late 2011.¹⁷³ Ohio officials suspected that the operation of a particular injection well, the Northstar One Class II Injection Well, might be causing the seismic activity, which ranged from 2.1 to 4.0 on the Richter scale, and they ordered the operator of the well to cease injections.¹⁷⁴

In March 2012 the Ohio Department of Natural Resources (Ohio DNR) issued a statement and preliminary report that contained certain findings and recommendations regarding the issue.¹⁷⁵ Ohio DNR stressed that it is “extremely rare” for the opera-

169. The three locations are in Oklahoma, Canada, and the United Kingdom. See ROYAL ACAD. OF ENG'G, SHALE GAS EXTRACTION IN THE UK: A REVIEW OF HYDRAULIC FRACTURING 41-2 (2012), available at http://raeng.org.uk/news/publications/list/reports/Shale_Gas.pdf; AUSTIN HOLLAND, OKLA. GEOLOGICAL SURV., OPEN-FILE REPORT OF1-2011, EXAMINATION OF POSSIBLY INDUCED SEISMICITY FROM HYDRAULIC FRACTURING IN THE EOLA FIELD, GARVIN COUNTY, OKLAHOMA (2011), available at http://ogs.ou.edu/pubsscanned/openfile/OF1_2011.pdf; B.C OIL & GAS COMM'N, INVESTIGATION OF OBSERVED SEISMICITY IN THE HORN RIVER BASIN (2012), available at <http://bcogc.ca/node/8046/download?documentID=1270>.

170. Kurth et al., *supra* note 21, at 4-6.

171. ARK. OIL & GAS COMM'N, *supra* note 157.

172. *Id.*

173. OHIO DEP'T NATURAL RES., PRELIMINARY REPORT ON THE NORTHSTAR 1 CLASS II INJECTION WELL AND THE SEISMIC EVENTS IN THE YOUNGSTOWN, OHIO, AREA (2012), available at <http://ohiodnr.com/downloads/northstar/UICReport.pdf>.

174. *Id.*

175. *Id.*; *Ohio's New Rules for Brine Disposal Among Nation's Toughest*, *supra* note 157.

tion of injection disposal wells to induce seismic activity.¹⁷⁶ The statement elaborated, stating that “[t]here are more than 144,000 operational Class II disposal wells in the United States, but only six have been linked to earthquakes,” and that the U.S. Environmental Protection Agency considers injection disposal to be the preferred method for disposal of such fluids.¹⁷⁷ But the statement also noted that Ohio DNR had concluded that operations at the Northstar One injection disposal well probably were the cause of the earthquakes that occurred near Youngstown in late 2011.¹⁷⁸ Further, Ohio DNR stated that it would implement new regulatory requirements relating to injection disposal wells in order to reduce the likelihood of similar incidents in the future.¹⁷⁹

In its report, Ohio DNR added that geologists believe that several circumstances must all be present in order for the operation of an injection disposal well to induce seismic activity and that the simultaneous existence of all those conditions is very uncommon.¹⁸⁰ To induce an earthquake:

- a fault must already exist within the crystalline basement rock;
- that fault must already be in a near-failure state of stress;
- an injection well must be drilled deep enough and near enough to the fault and have a path of communication to the fault; and
- the injection well must inject a sufficient quantity of fluids at a high enough pressure and for an adequate period of time to cause failure, or movement, along that fault (or system of faults).¹⁸¹

Ohio DNR concluded that the Northstar One Class II Injection Well was drilled near a previously unmapped fault.¹⁸² To prevent similar problems from occurring in the future, Ohio DNR announced plans to reform its injection well regulations in several ways. For example, Ohio DNR stated that it would prohibit all future drilling into the Precambrian basement rock into which the Northstar One Injection Well was drilled.¹⁸³ The new regulations

176. *Ohio's New Rules for Brine Disposal Among Nation's Toughest*, *supra* note 157.

177. *Id.*

178. *Id.*

179. *Id.*

180. *Id.*

181. *Id.*

182. *Id.*

183. *Youngstown Seismic Activity Questions and Answers*, *supra* note 166.

also will require officials to review existing geological data for known fault areas within the state and will require that new injection disposal wells avoid those areas.¹⁸⁴

In addition, Ohio DNR will begin requiring that operators of disposal wells make various geophysical measurements. For example, operators will be required to measure the pressure of the injection reservoir prior to starting injections, to continuously monitor the formation's pressure during injections, and to provide an electronic feed of those results to Ohio DNR for its review.¹⁸⁵ Further, Ohio DNR will require that operators of injection wells install automatic shutoff systems that will halt injections if fluid injection pressures exceed a maximum level set by the agency.¹⁸⁶

IX. CONTAMINATION LITIGATION

In a number of states, plaintiffs have filed claims asserting that they have incurred personal injuries or property damages caused by contamination arising from hydraulic fracturing or other aspects of oil and gas activity.¹⁸⁷ The number of such cases has continued to grow, but few have yet gone to final judgment. Different observers who track hydraulic fracturing litigation have come to different counts of the number of pending cases. There are a few reasons why different individuals come to different counts, including: the challenge in learning about pending cases in which there has been no published decision, the fact that it sometimes is unclear whether a plaintiff who alleges contamination is claiming that the contamination resulted from hydraulic fracturing or some other aspect of oil and gas activity, and the fact that some individuals have concentrated on counting contamination lawsuits, while others have included in their counts lawsuits in which plaintiffs allege other types of damages, and still others include in their counts lawsuits that do not involve damages claims and which instead concern controversies regarding the proper interpretation of regulations or disputes about whether regulations are preempted. It appears to the author of this Article, however, that there have probably been at least two or three dozen suits in which plaintiffs have alleged contamination damages.

In such lawsuits, the plaintiffs typically assert one or more of the following types of harm: (1) personal injuries, (2) costs for peri-

184. *Id.*

185. *Id.*

186. *Id.*

187. See Hall & Godshall, *supra* note 4; Barclay Nicholson and Kadian Blanson, *Tracking Fracking Case Law: Hydraulic Fracturing Litigation*, NAT. RESOURCES & ENV'T, Fall 2011, at 25.

odic medical monitoring in the future, (3) the costs of replacing the plaintiff's water supply, (4) costs for clean-up of the plaintiff's property or the aquifer under the property, (5) loss of property value, and (6) punitive damages.¹⁸⁸

They typically assert one or more of the following causes of action based on: (1) the abnormally dangerous activity doctrine, (2) negligence, (3) breach of contract, (4) private attorney general or citizen suit statutes, (5) fraud, (6) trespass, and (7) nuisance.¹⁸⁹

X. LONE PINE ORDERS

Lawsuits in which plaintiffs alleged that they incurred personal injuries or property damage caused by contamination often involve complicated scientific and technical evidence, the use of multiple experts from different scientific and technical disciplines, and significant discovery. Such factors can make cases expensive for the parties to litigate and can cause such cases to consume a disproportionate amount of the court's resources and attention.

Given the significant expense of litigating cases involving complex technical or scientific issues, courts sometimes have reasoned that, before such a case proceeds, the plaintiffs should be required to produce certain types of evidence—such as evidence that should be available to the plaintiffs without formal discovery (or for which the plaintiffs already have been given a chance to conduct discovery) and which is essential to some required element of the plaintiff's case.¹⁹⁰ An order requiring the plaintiffs to produce such evidence before the case proceeds is sometimes called a *Lone Pine* order.¹⁹¹ Plaintiffs often argue that such orders are unfair and challenge their validity, whereas defendants argue that requiring the parties to engage in expensive discovery and pre-trial litigation can be unfair in complex cases if there is a possibility that the plaintiffs lack evidence that is essential to their case and which they allegedly could obtain without formal discovery. When federal courts have been asked to decide whether they have authority to grant such orders, they typically have concluded that they do, of-

188. *See, e.g., Fiorentino v. Cabot Oil & Gas Corp.*, 750 F. Supp. 2d 506 (M.D. Pa. 2010); *Harris v. Devon Energy Prod. Co.*, No. 4:10-CV-708, 2011 WL 2729242 (E.D. Tex. 2011).

189. *See, e.g., Fiorentino*, 750 F. Supp. 2d at 506, 508; *Harris*, 2011 WL 2729242.

190. *Lore v. Lone Pine Corp.*, No. 33606-85, 1986 WL 637507 (N.J. Super. Ct. Law Div., Nov. 18, 1986); *Strudley v. Antero Res. Corp.*, No. 2011CV2218, 2012 WL 1932470 (Col. Dist. Ct. Denver Cty., May 9, 2012) *rev'd* No. 12CA1251, 2013 WL 3427901 (Colo. App., July 3, 2013).

191. *See Strudley*, 2012 WL 1932470; *Roth v. Cabot Oil & Gas Corp.*, 287 F.R.D. 293, 299-300 (M.D. Pa. 2012); *Kamuck v. Shell Energy Holdings GP*, No. 4:11-CV-1425, 2012 WL 3864954 at *7 (M.D. Pa. Sept. 5, 2012); *Hagy v. Equitable Prod. Co.*, No. 2:10-cv-01372, 2012 WL 713778 at *4 (S.D.W. Va. Mar. 5, 2012).

ten citing Federal Rule of Civil Procedure 16 to support that conclusion.

The term “*Lone Pine* order” comes from a New Jersey case, *Lore v. Lone Pine Corp.*,¹⁹² in which a large number of plaintiffs alleged that polluted waters from a landfill had caused them to suffer personal injuries and incur a decrease in property values. The court entered a case management order that required the plaintiffs to produce certain evidence that would be essential for plaintiffs to prevail at trial, including:

- facts of each plaintiff’s exposure to alleged toxic substances from Lone Pine Landfill;
- reports of treating physicians or medical experts, supporting each plaintiff’s claim of injury and causation;
- each plaintiff’s address for the property alleged to have declined in value; and
- reports of real estate or other experts supporting each plaintiff’s claim of diminution of property value, including the timing, amount, and cause of diminution.¹⁹³

After the plaintiffs failed to submit the information requested, the court dismissed their claims with prejudice, explaining that the plaintiffs had failed to establish a “*prima facie*” case.¹⁹⁴

Courts are now being called upon to consider whether they should enter *Lone Pine* orders in cases in which plaintiffs allege that hydraulic fracturing or other oil and gas activity has caused contamination. One such case from the West is *Strudley v. Antero Resources Corp.*,¹⁹⁵ which appears to be the first hydraulic fracturing contamination or personal injury claim to go to final judgment. In that case, which was litigated in a Colorado state court, a family alleged various health problems that they contended were caused by the defendants’ activities relating to the exploration for and production of natural gas.¹⁹⁶ The court issued a *Lone Pine* order and dismissed the case with prejudice on May 9, 2012, after ruling that the plaintiffs had not made an adequate response.¹⁹⁷

The appellate court reversed. Interestingly, the appellate court did not seem to conclude merely that a *Lone Pine* order was inappropriate under the facts at issue. Instead, the court seemed to

192. *Lore*, 1986 WL 637507 at *1-2.

193. *Id.* at *1-2.

194. *Id.* at *1.

195. *Strudley*, 2012 WL 1932470 (family alleging health problems from exposure to hydraulic fracturing and natural gas operations).

196. *Id.*, slip op. at 3.

197. *Id.*, slip op. at 7.

conclude that Colorado's version of rule 16 does not authorize *Lone Pine* orders. This conclusion stands in contrast to most federal courts' interpretation of Federal Rule of Civil Procedure 16.

Federal district courts have addressed the propriety of issuing a *Lone Pine* order in at least three recent cases in which plaintiffs allege that contamination resulted from hydraulic fracturing or other aspects of oil and gas activity.¹⁹⁸ In each, the district court denied the defendants' request for a *Lone Pine* order, though the courts did so based on the circumstances of the individual cases, rather than based on a conclusion that the court lacked authority to issue such an order.¹⁹⁹

XI. THE ENDANGERED SPECIES ACT

The Endangered Species Act²⁰⁰ does not regulate hydraulic fracturing or oil and gas activity specifically, but the Act's provisions for protection of habitat can result in restrictions on a wide variety of activities, including oil and gas development or the withdrawal of water from streams, and such restrictions can incidentally affect hydraulic fracturing. And recently there have been notable developments under the Endangered Species Act. In December 2010 the U.S. Fish and Wildlife Service proposed listing the dunes sagebrush lizard, which is found exclusively in Southeastern New Mexico and West Texas, as an endangered species under the Endangered Species Act.²⁰¹ But on June 19, 2012, the Fish & Wildlife Service withdrew its proposed rule to list the lizard as endangered for purposes of the Endangered Species Act,²⁰² citing "landmark" conservation efforts by private landowners and by state government that had resulted in eighty-eight percent of the lizard's habitat in New Mexico and Texas being placed under conservation agreements that would minimize the impacts of development, while not prohibiting oil and gas activity altogether.²⁰³

198. *Roth v. Cabot Oil & Gas Corp.*, 287 F.R.D. 293, 299-300 (M.D. Pa. 2012); *Kamuck v. Shell Energy Holdings GP*, No. 11-CV-1425, 2012 WL 3864954, at *6 (M.D. Pa. Sept. 5, 2012); *Hagy v. Equitable Prod. Co.*, No. 10-cv-01372, 2012 WL 713778, at *4 (S.D.W. Va. Mar. 5, 2012).

199. *See, e.g., Roth*, 287 F.R.D. at 295, 298 ("Although no federal rule expressly authorizes the use of *Lone Pine* orders, federal courts have interpreted Rule 16 of the Federal Rules of Civil Procedure as supplying the authority to enter *Lone Pine* orders in complex litigation, pursuant to district courts' broad discretion to administer the civil actions over which they preside. . . . Upon consideration, we agree with Plaintiffs that this case does not warrant the imposition of a *Lone Pine* order.") *Id.* at 295.

200. Endangered Species Act, 16 U.S.C. §§ 1531-44 (2012).

201. 75 Fed. Reg. 77801 (Dec. 14, 2010).

202. 77 Fed. Reg. 36872 (June 19, 2012).

203. *See* U.S. DEP'T OF THE INTERIOR, LANDMARK CONSERVATION AGREEMENTS KEEP DUNES SAGEBRUSH LIZARD OFF ENDANGERED SPECIES LIST IN NM, TX (2012), available at http://fws.gov/southwest/es/Documents/R2ES/NR_for_DSL_Final_Determination_13June20

In December 2012 the Fish and Wildlife Service proposed listing the lesser prairie chicken as a “threatened species.”²⁰⁴ The original comment period ran through March 11, 2013,²⁰⁵ but the Fish and Wildlife Service recently reopened the comment period, which now runs through June 20, 2013.²⁰⁶ As with the dunes sagebrush lizard, there have been voluntary conservation measures²⁰⁷ that have been motivated in part by a desire to head-off onerous federal regulations. The Fish and Wildlife Service recently proposed certain rules regarding activities that would be permissible and those which would not be permissible in the lesser prairie chicken’s range.²⁰⁸

It is also notable that at least three recent proposals by the U.S. Fish and Wildlife Service to list aquatic species as endangered or threatened have mentioned either “oil and gas drilling” or “hydraulic fracturing.”²⁰⁹ Those proposals did not single out oil and gas drilling or hydraulic fracturing, but listed one or the other of those as part of a long list of activities that can affect habitat. The proposals noted that sometimes companies withdraw water from streams for use in fracturing.²¹⁰

XII. LOCAL GOVERNMENT REGULATION OF HYDRAULIC FRACTURING AND OIL AND GAS ACTIVITY

In many states, the state statutes and regulations that govern oil and gas activity are designed to provide a uniform statewide system of regulation.²¹¹ In some jurisdictions, these state laws ex-

12.pdf; see also U.S. DEP’T OF THE INTERIOR, CONSERVATION AGREEMENTS FOR THE DUNES SAGEBRUSH LIZARD (2012), available at <http://doi.gov/news/pressreleases/loader.cfm?csModule=security/getfile&pageid=304405> (giving a brief overview of the agreements).

204. 77 Fed. Reg. 73828 (Dec. 11, 2012).

205. *Id.*

206. 78 Fed. Reg. 26302 (May 6, 2013).

207. *Lesser Prairie Chicken Initiative*, USDA, http://www.nrcs.usda.gov/wps/portal/nrcs/detailfull/national/home/?&cid=nrcsdev11_023912 (last visited Feb. 12, 2014).

208. 78 Fed. Reg. 26302 (May 6, 2013); see also U.S. FISH & WILDLIFE SERVS., QUESTIONS AND ANSWERS: REOPENING OF COMMENT PERIOD FOR LESSER PRAIRIE-CHICKEN, (2013), available at http://fws.gov/southwest/es/Documents/R2ES/LPC_Reopen_4d_FAQs_FINAL_6April2013.pdf

209. 77 Fed. Reg. 43906, 43911 (July 26, 2012), (proposed endangerment listing for the diamond darter; referring to “oil and gas drilling”); 77 Fed. Reg. 14914, 14939 (Mar. 13, 2012), (final rule making endangered status listing for sheepsnose and spectaclecase mussels; referring to “hydraulic fracturing”); 77 Fed. Reg. 8632, 8650 (Feb. 14, 2012) (final rule making endangered status determination for rayed bean and snuffbox mussels; referring to “hydraulic fracturing”).

210. 77 Fed. Reg. 8632, 8650 (Feb. 14, 2012) (referring to water withdrawals for hydraulic fracturing).

211. See, e.g., *Ne. Natural Energy, LLC v. City of Morgantown*, No. 11-C-411, slip op. at 6 (Cir. Ct. W. Va. Aug. 12, 2011). There are other articles that focus on the question of local regulation of oil and gas activity. See, e.g., Keith B. Hall, *When Do State Oil and Gas or*

pressly preempt local ordinances that attempt to regulate oil and gas activity.²¹² And in some jurisdictions where state oil and gas laws do not expressly preempt local ordinance, courts have held that the state law provides a comprehensive system of regulations that occupy the entire field, thereby implicitly preempting any local ordinances that purport to regulate oil and gas activity.²¹³ In addition, in many states, a local ordinance will be preempted if it directly contravenes state law.²¹⁴

In some jurisdictions, certain types of local ordinances will be preempted, while other types will not be. In such jurisdictions, the typical rule will be that a true zoning or land use planning ordinance that specifies certain areas or zones where particular types of activity are allowed will not be preempted, while other ordinances that purport to regulate oil and gas activity will be preempted. By “true zoning or land use planning ordinance,” this Article means that a local jurisdiction cannot immunize an ordinance from preemption by labeling it as “zoning” or “land use planning” if the ordinance goes beyond specifying where various types of activity are allowed and not allowed.

In recent years, many local jurisdictions have enacted ordinances that purport to regulate oil and gas activity and there have been numerous disputes regarding whether such ordinances are preempted. For example, the City of Morgantown, West Virginia enacted an ordinance that purported to prohibit hydraulic fracturing anywhere within the City’s jurisdiction, as well as anywhere within one mile of its jurisdiction.²¹⁵ A state district court concluded that West Virginia’s oil and gas laws provide a comprehensive regulatory scheme that occupies the entire field, leaving no room for operation of local regulations, and that the ordinance therefore was preempted.²¹⁶ The court’s judgment striking down the ordinance became final when the City failed to appeal.²¹⁷

Mining Statutes Preempt Local Regulations?, NAT. RES. & ENV’T., Winter 2013, at 13, 13 (2013).

212. See, e.g., N.Y. ENVTL. CONSERV. LAW § 27-0303 (McKinney 2013); LA. REV. STAT. ANN. § 30:28 (2012).

213. See, e.g., *Ne. Natural Energy, LLC*, No. 11-C-411, slip op. at 9 (Cir. Ct. W. Va. Aug. 12, 2011).

214. *Huntley & Huntley, Inc. v. Borough Council of the Borough of Oakmont*, 964 A.2d 855, 863, 863 n.6 (Pa. 2009).

215. See, e.g., *Ne. Natural Energy, LLC*, No. 11-C-411, slip op. at 9 (Cir. Ct. W. Va. Aug. 12, 2011).

216. *Id.*

217. Keith B. Hall, *Judgment Striking Down Morgantown Fracturing Ban is Now Final After City Inadvertently Misses Appeal Deadline*, ENVTL. & ENERGY L. BRIEF (Sept. 28, 2011), <http://environmentalenergylawbrief.com/hydraulic-fracturing/judgment-striking-down-morgantown-fracturing-ban-is-now-final-1/>.

In 2009, the Pennsylvania Supreme Court handed down two decisions on the same day, one holding that a local ordinance purporting to regulate oil and gas activity was preempted and the other decision holding that an ordinance regulating oil and gas activity was not preempted.²¹⁸ The court distinguished between the two local ordinances by noting that the Pennsylvania Oil and Gas Act expressly preempted most local ordinances but that it made an express exception for ordinances enacted pursuant to the Municipal Planning Code, and that the ordinance that was upheld was a zoning ordinance.²¹⁹

Pennsylvania recently enacted a statute to further restrict the authority of local governments to regulate oil and gas activity.²²⁰ Plaintiffs challenged the new restriction on local authority, and the trial court entered an order holding that a key portion of the statute was unconstitutional.²²¹ That judgment was upheld on appeal,²²² but the State is seeking further review of the decision.

Ohio's oil and gas statutes provide a comprehensive scheme of regulations, and purport to preempt local ordinances, with certain minor exceptions.²²³ In *Morrison v. Beck Energy Corp.*, the Ohio Department of Natural Resources granted a permit to Beck Energy to drill on certain land that it had leased with the City of Munroe Falls.²²⁴ The City brought suit to stop Beck from drilling, stating that local ordinance barred drilling unless the operator first: paid a \$800 permit application fee to the City, obtained a drilling permit from the City, posted a \$2000 performance bond, and obtained a conditional zoning certificate after a public hearing.²²⁵ The trial court granted an injunction to bar Beck from drilling until it had complied with the City's ordinances.²²⁶ The appellate court reversed. It stated that, standing alone, the Ohio legislature's intent to preempt local ordinances was not sufficient to preempt the City's ordinances.²²⁷ But under the preemption analysis required under Ohio jurisprudence and the state constitution's home-rule

218. *Range Res.-Appalachia, LLC v. Salem Township*, 964 A.2d 869, 877 (Pa. 2009) (holding that ordinance regulating surface development was preempted by the Pennsylvania Oil and Gas Act); *Huntley & Huntley Inc.*, 964 A.2d (Pa. 2009) (zoning ordinance not preempted by Pennsylvania Oil & Gas Act).

219. *Compare Range Resources*, 964 A.2d at 876-77, with *Huntley*, 964 A.2d at 864-6.

220. 58 PA. CONN. STAT. § 3303 (2013).

221. *See Robinson Township v. Commonwealth*, 52 A.3d 463, 468 (Pa. Commw. Ct. 2012).

222. *Id.* at 494.

223. Ohio Rev. Code Ann. § 1509.02 (West 2013); *See State ex rel. Morrison v. Beck Energy Corp.*, 2013-Ohio-356, 989 N.E.2d 85.

224. *See State ex rel. Morrison v. Beck Energy Corp.*, 2013-Ohio-356, 989 N.E.2d 85, at ¶ 1.

225. *Id.* at ¶¶ 44-48.

226. *Id.* at ¶ 53.

227. *Id.* at ¶ 54.

provisions, the ordinances were preempted because they actually conflicted with state law and they were an exercise of police power, not merely an ordinance concerned with local self-governance.²²⁸

A New York oil and gas statute expressly preempts local ordinances that purport to regulate oil and gas activity.²²⁹ The statute makes an exception for tax and road ordinances, but otherwise does not make any explicit exception.²³⁰ Nevertheless, several local jurisdictions in New York have enacted ordinances to regulate oil and gas activity. The ordinances enacted by at least two of those jurisdictions—Dryden and Middlefield—have been challenged in court. Each town’s ordinance bans oil and gas activity altogether within the town’s jurisdiction. In both cases, the trial court upheld the ordinance, and the appellate court affirmed the decision.²³¹ The court reasoned that, even though the statute that preempts local ordinances does not contain an explicit exception for zoning ordinances, the statute was not intended to preempt zoning. Further, though some authorities have expressed skepticism regarding whether ordinances that ban an activity throughout a jurisdiction should qualify as zoning,²³² the New York courts that considered the challenges to the Dryden and Middlefield ordinances held that the ordinances were not preempted and instead were permissible as “zoning.”²³³

In Colorado, like New York, several local governments have enacted ordinances that purport to regulate oil and gas activity. For example, the Longmont City Council enacted an ordinance in

228. *Id.* at 96, 97-98; *see also* *Natale v. Everflow E., Inc.*, 959 N.E.2d 602, 611 (Ohio Ct. App. 2011) (finding that local ordinance was preempted).

229. N.Y. ENVTL. CONSERV. LAW § 23-0303(2) (McKinney 2013) (“The provisions of [New York’s oil and gas law] shall supersede all local laws or ordinances relating to the regulation of the oil, gas and solution mining industries; but shall not supersede local government jurisdiction over local roads or the rights of local governments under the real property tax law.”).

230. *Id.*

231. *Norse Energy Corp. USA v. Town of Dryden*, 964 N.Y.S.2d 714, 724 (N.Y. App. Div. 2013); *Cooperstown Holstein Corp. v. Town of Middlefield*, 964 N.Y.S.2d 431, 432 (N.Y. App. Div. 2013).

232. *Voss v. Lundvall Bros.*, 830 P.2d 1061, 1068-69 (Colo. 1992) (holding that “land use” ordinance that banned oil and gas activity throughout the jurisdiction was preempted, but suggesting that an ordinance would not be preempted if it prohibited oil and gas activity only in certain zones and the ordinance did not frustrate purpose of state oil and gas laws). *But cf.* *Exton Quarries, Inc. v. Zoning Bd. of Adjustment*, 228 A.2d 169, 179 (Pa. 1967) (“The constitutionality of zoning ordinances which totally prohibit legitimate businesses such as quarrying from an entire community should be regarded with particular circumspection; for unlike the constitutionality of most restrictions on property rights imposed by other ordinances, the constitutionality of total prohibitions of legitimate businesses cannot be premised on the fundamental reasonableness of allocating to each type of activity a particular location in the community.”); *Huntley & Huntley Inc. v. Oakmont*, 964 A.2d 855, 862 (Pa. 2009) (ordinance cannot prohibit activity that state law authorizes).

233. *Norse Energy Corp. USA*, 964 N.Y.S.2d at 724; *Cooperstown Holstein Corp.*, 964 N.Y.S.2d at 432.

July 2012 purporting to strictly regulate oil and gas activities,²³⁴ and in November 2012 the voters in Longmont enacted a proposal that purports to ban hydraulic fracturing.²³⁵ The State of Colorado, acting through the Colorado Oil and Gas Conservation Commission, has sued Longmont, seeking a declaratory judgment that much of the new ordinance is preempted.²³⁶ The Colorado Oil and Gas Association filed a separate suit, which the State later joined, seeking to overturn the ballot initiative that purports to ban hydraulic fracturing with the city limits.²³⁷ Both lawsuits are still pending.

XIII. LOCAL INCONVENIENCE ISSUES

Once a well is put into production, the wellsite tends to be fairly quiet, but during the drilling process and again during the fracturing process the site can be very busy. Several hundred truckloads of equipment, personnel, water, sand, and other supplies must be delivered to the site. This can create traffic problems. The traffic can also exert significant wear and tear on roads, particularly if numerous wells are being drilled and fractured. Other potential aggravations for those living or working near the wellsite include noise and dust.²³⁸ Also, for those living near a wellsite, light pollution can be an aggravation (the wellsite typically will be thoroughly lighted for worker safety because the operator likely will operate twenty-four hours a day during the drilling process).

The Louisiana Office of Conservation has issued Order No. U-HS to regulate noise, vibrations, lighting, fencing, minimum distances between wells and homes, and the general upkeep of drilling sites in urban areas.²³⁹ Earlier this year, Utah adopted new provisions to protect the interests of surface owners.²⁴⁰

234. Scott Roach, *State Sues Longmont Over Oil and Gas Drilling Regulations*, TIMES-CALL (July 30, 2012), http://timescall.com/news/longmont-local-news/ci_21193961/colorado-files-lawsuit-against-longmont-oil-gas-drilling.

235. Scott Roach, *Longmont's Fracking Ban Vote Crossed Party Lines*, TIMES-CALL (Nov. 17, 2012), http://timescall.com/news/longmont-local-news/ci_22018644/longmonts-fracking-ban-vote-crossed-party-lines.

236. Colo. Oil & Gas Conservation Comm'n v. City of Longmont, No. 2012-cv-702 (Dist. Ct. Boulder Cnty); Roach, *supra* note 234.

237. Mark Jaffe, *Colorado Joins in Suit to Knock Down Longmont Fracking Ban*, THE DENVER POST (July 11, 2013), http://denverpost.com/breakingnews/ci_23643679/state-joins-suit-knock-down-longmont-fracking-ban.

238. Keith B. Hall, *Hydraulic Fracturing: What are the Legal Issues?*, 59 LA. B.J. 250, 252 (Dec. 2011/Jan. 2012).

239. OFFICE OF CONSERVATION, STATE OF LA., ORDER NO. U-HS (2009), *available at* <http://dnr.louisiana.gov/assets/docs/news/2009/U-HS.pdf>.

240. UTAH ADMIN. CODE r. 649-3-38 (2013), *available at* https://oilgas.ogm.utah.gov/pub/Notices/Rule_Surface_Owner_Protection_R649-3-38.pdf.

The Colorado Oil and Gas Conservation Commission revised its regulations to increase setback distances and to impose various operating requirements relating to the operation of pits and the control of noise, dust, lighting, and odors whenever an operator proposes to drill within 1000 feet of an “occupied structure.”²⁴¹ The regulations also increase an operator’s “notice and outreach” obligations.²⁴² In a press release, the Colorado Oil and Gas Conservation Commission referred to the new setback requirements, stating: “The rules also set a new standard for the Rocky Mountain West as they exceed our neighboring states of Kansas, Wyoming, Utah, New Mexico, Nebraska, Arizona and Texas.”²⁴³ Director Matt Lepore was quoted as saying: “We believe these [new regulatory requirements] collectively amount to the strongest criteria for setbacks in the country, will hold industry to a new standard and represent a national model.”²⁴⁴

XIV. BUREAU OF LAND MANAGEMENT PROPOSED REGULATIONS

In May 2012 the Bureau of Land Management released proposed regulations that would have provided certain rules relating to hydraulic fracturing operations performed on federal lands. The rules would have included provisions relating to the mandatory disclosure of hydraulic fracturing fluid composition, well construction standards, and disposal of flowback.²⁴⁵ The BLM accepted comments on the proposed regulations through September 10, 2012.²⁴⁶ On January 18, 2013, BLM announced that it was withdrawing its original draft and would issue a new draft that incor-

241. 2 COLO. CODE REGS. § 404-1:604 (2013). The other changes involve several regulations. An explanation of the changes, redline of the changes, and clean version of the revised regulations is available at *COGCC New Setback Rules*, COLO. OIL & GAS CONSERVATION COMM’N, http://cogcc.state.co.us/RR_HF2012/Setbacks/finalrules/FinalSetBack.Htm (last visited Feb. 12, 2014).

242. 2 COLO. CODE REGS. § 404-1:305 (2013).

243. See COLO. OIL & GAS CONSERVATION COMM’N, *COGCC APPROVES SWEEPING NEW MEASURES TO LIMIT DRILLING IMPACTS*, (2013), available at http://cogcc.state.co.us/RR_HF2012/Setbacks/COGCC_APPROVES_SWEEPING_NEW_SETBACK_RULES.pdf.

244. *Id.*

245. See BUREAU OF LAND MGMT, U.S. DEP’T OF THE INTERIOR, *INTERIOR RELEASES DRAFT RULE REQUIRING PUBLIC DISCLOSURE OF CHEMICALS USED IN HYDRAULIC FRACTURING ON PUBLIC AND INDIAN LANDS* (May 4, 2012), available at http://blm.gov/wo/st/en/info/newsroom/2012/may/NR_05_04_2012.html; see also 77 Fed. Reg. 27691 (May 11, 2012) (to be codified at 43 C.F.R. pt. 3160).

246. The original deadline for public comments was July 12, 2012, but BLM extended the public comment period by sixty days. See BUREAU OF LAND MGMT, U.S. DEP’T OF THE INTERIOR, *BUREAU OF LAND MANAGEMENT EXTENDS PUBLIC COMMENT PERIOD FOR PROPOSED HYDRAULIC FRACTURING RULE*, (2012), available at http://blm.gov/wo/st/en/info/newsroom/2012/june/NR_06_25_2012.html; see also 77 Fed. Reg. 38024 (June 26, 2012).

porated significant revisions later in the year.²⁴⁷ The BLM released the revised proposed regulations in May 2013²⁴⁸ and, because of the significant revisions, opened the revised proposed regulations to a new round of public comment.

Some people in the industry had suggested that BLM should not adopt its own regulations and instead should let state regulations govern, but BLM rejected that suggestion.²⁴⁹ There are several points worth highlighting in the proposal. First, in a change from the prior draft of proposed regulations, the revised proposal would apply only to hydraulic fracturing, not to other types of well stimulation, such as acidization.²⁵⁰ The proposed regulations would require operators to provide BLM with a prediction of fracture lengths prior to BLM approving permits to perform hydraulic fracturing on federal lands, and it would require operators to disclose the composition of the fracturing fluid they use on a well-by-well basis to FracFocus.²⁵¹ BLM rejected some environmentalists' call for a baseline testing requirement.²⁵² BLM reasoned that the issue of baseline testing was best left to state regulation given that even if an oil or gas well that is to be hydraulically fractured is on federal lands, the nearby water supplies may not be.²⁵³ The regulations generally will require companies to use cement evaluation logs on each well to verify the integrity of the cementing of the well.²⁵⁴ But if a company conducts a cement evaluation log which demonstrates that a particular well has a satisfactory cement job, the company can designate that as a "type" well, and the company need not conduct evaluation logs on subsequent wells that use the same design and are located in a similar area as that in which the "type" is located.²⁵⁵ The proposed regulation would allow use of lined pits for temporary storage of flowback, but the BLM expressly invited comment on whether it should require the use of closed containers for flowback.²⁵⁶

247. Nick Snow, *BLM Pulls Proposed Fracing Rules, Works on New Version*, OIL & GAS J. (Jan. 21, 2013), available at <http://ogj.com/articles/2013/01/blm-pulls-proposed-fracing-rules--works-on-new-version.html>.

248. The proposed regulations appear at 78 Fed Reg. 31636 (May 24, 2013) (to be codified at 43 C.F.R. pt. 3160), available at <http://www.gpo.gov/fdsys/pkg/FR-2013-05-24/pdf/2013-12154.pdf>.

249. *Id.* at 31643-44.

250. *Id.* at 31645.

251. *Id.* at 31640.

252. *Id.* at 31649.

253. *Id.*

254. *Id.* at 31675.

255. *Id.* at 31676.

256. *Id.* at 31655-56.

XV. WATER SOURCING AND USE

In hydraulic fracturing, water typically serves as the “base fluid” that is used to impose the hydraulic pressure that fractures the underground formation.²⁵⁷ Although companies are relying on recycled water to serve as all or a portion of their base fluid more frequently than in the past, a large portion of water used in hydraulic fracturing still is “new” water that comes from underground or surface sources. The amount of water that is used will depend on various factors, including the length of the wellbore area where the formation will be fractured. Perhaps 50,000 gallons of water might be used to conduct a small-scale frac job on a shallow, vertical gas well, but three to six million gallons or more of water might be used to hydraulically fracture a horizontal well with a lateral that is a mile or more in length in a shale formation.²⁵⁸ This is not an extraordinary amount of water when compared to other industrial and agricultural uses,²⁵⁹ but when water is already in short supply, the added demand for water to provide a supply for fracturing can help put a strain on supplies.

The circumstances relating to water supply and the laws governing the rights to use groundwater and surface water will vary significantly from state to state, but two examples of developments in two states illustrate noteworthy points. First, in states where water supplies are short, companies will be pushed to treat and recycle flowback water (or other wastewater) for use in future fracturing in order to reduce the amount of freshwater required. Second, even in states that are viewed as water-rich, increased use of water can have impacts and raise legal issues.

The first example comes from Texas, which has been in a drought condition for a considerable time, and that at times has created tensions regarding water use. In March 2013 the Texas Railroad Commission adopted regulatory revisions that went into effect in April 2013 to encourage oil and gas operators to recycle

²⁵⁷ SHALE GAS PRIMER, *supra* note 2, at ES-4.

²⁵⁸ Michigan Department of Environmental Quality, *Hydraulic Fracturing of Oil and Gas Wells in Michigan* at 3 (April 2013) (available at http://www.michigan.gov/documents/deq/Hydraulic_Fracturing_In_Michigan_423431_7.pdf).

²⁵⁹ One source states that 5 million gallons of water is about the amount of water typically used to irrigate about eight to ten acres of corn for one growing season. Michigan Department of Environmental Quality, *Hydraulic Fracturing of Natural Gas Wells in Michigan* at 2 (May 31, 2011) (available at http://www.michigan.gov/documents/deq/Hydrofrac-2010-08-13_331787_7.pdf).

flowback water by using it as part of the supply water for subsequent fracturing operations. The revisions, including significant revisions to title 16, section 3.8 of the Texas Administrative Code, are designed to encourage recycling by making it easier for companies to satisfy any regulatory requirements that would have to be met in order to recycle (for example, by allowing certain recycling and certain storage for recycling to be done without the necessity of a permit).

The second example comes from Louisiana. In the Haynesville Shale in northwestern Louisiana, operators use about four to five million gallons for fracturing a typical horizontal well.²⁶⁰ When companies first began fracturing wells in the Haynesville Shale in 2008, they used groundwater to supply most of their water.²⁶¹ The groundwater often came from the Carrizo-Wilcox aquifer, the same aquifer that many landowners use to supply their domestic water needs.²⁶² The Louisiana Office of Conservation (“Conservation”) soon began receiving complaints from landowners that their private water wells were “going dry,” and many people blamed the problem on the extensive use of groundwater for hydraulic fracturing.²⁶³

Under traditional Louisiana rules regarding use of groundwater, if the companies performing the fracturing owned a water well, or had permission to use someone else’s well, they would be entitled to pump as much water as they wished, even if their usage disadvantaged others by causing the aquifer’s level to drop.²⁶⁴ That rule was modified slightly by legislation enacted in 2003 that gives the Office of Conservation some limited authority to restrict usage.²⁶⁵

On October 16, 2008, Commissioner of Conservation, James H. Welsh, issued a memorandum “encourag[ing]” oil and gas operators to use water from surface sources (such as streams and ponds) for their fracturing “where practical and feasible.”²⁶⁶ Further, if

²⁶⁰ Remarks of Commissioner Jim Welsh at EPA Workshop (at page 4 of 8) on 3/29/11, available at <http://dnr.louisiana.gov/assets/docs/conservation/documents/EPAWors.pdf>.

²⁶¹ *Id.*

²⁶² *Id.*

²⁶³ *Id.*

²⁶⁴ *Adams v. Grigsby*, 152 So. 2d 619 (La. Ct. App.), *writ ref’d*, 153 So. 2d 880 (La. 1963); LA. REV. STAT. ANN. 31:4, 31:14.

²⁶⁵ LA. REV. STAT. ANN. 38:3097.1 to 3097.8.

²⁶⁶ The statement is available at <http://dnr.louisiana.gov/index.cfm?md=newsroom&tmp=detail&aid=509>. A PDF

that was not feasible, Commissioner Welsh “recommended” that they use water from the Red River Alluvial aquifer, which has water that is less suitable for domestic use than the water in the Carizzo-Wilcox aquifer. Most operators complied with Welsh’s request that they switch to using surface water. Statistics show that, from October 2009 through January 2011, surface water supplied more than seventy percent of the water used for fracturing wells in the Haynesville.²⁶⁷ The operators’ voluntary response avoided the need for regulation.

But the switch to surface water raised another issue: namely, whether Louisiana law prohibits the state from allowing companies to use surface water free of charge. Article 450 of the Louisiana Civil Code provides that the waters in running streams and navigable water bodies are “public things” that belong to the state.²⁶⁸ Article 452 of the Louisiana Civil Code states that “[p]ublic things . . . are subject to public use in accordance with applicable laws and regulations,”²⁶⁹ and section 9:1101 of the Louisiana Revised Statutes states that there will be no charge for anyone using such surface water for “municipal, industrial, agricultural or domestic purposes.”²⁷⁰ But article VII, section 14(a) of the Louisiana Constitution prohibits the donation of state property.²⁷¹ In 2010, the Louisiana Attorney General issued an opinion stating that if the state allows a company to use surface waters without charge, the state effectively is making a tacit donation of state-owned property in violation of the constitution.²⁷² The legislature responded by enacting legislation that authorizes the Department of Natural Resources (DNR) to enter cooperative endeavor agreements that allow companies to use surface water.²⁷³ The agreements must be in writing, and companies must pay “fair market

version is available at
http://dnr.louisiana.gov/assets/docs/conservation/groundwater/Appendix_L.pdf.

²⁶⁷ “Sustaining Louisiana’s Freshwater Aquifers, Presentation Narrative Commissioner Welsh presents case study on Hydraulic Fracturing at EPA Workshop in Arlington, VA.” at slide 10 (3/29/2011), PowerPoint presentation is available at <http://dnr.louisiana.gov/index.cfm?md=pagebuilder&tmp=home&pid=442&pnid=0&nid=170>.

268. LA. CIV. CODE ANN. art. 450 (2013).

269. LA. CIV. CODE ANN. art. 452.

270. LA. REV. STAT. ANN. § 9:1101 (2013).

271. LA. CONST. art. VII, pt. XIV(a).

272. La. Att’y Gen. Op. No. 10-0173 (Nov. 23, 2010).

273. Act No. 955, 2010 La. Acts 3315 (codified as amended at La. Rev. Stat. Ann. § 30:961-63 (2013)).

value” for the water.²⁷⁴ Since then, DNR has entered a number of such agreements.²⁷⁵

XVI. STATE WELL CONSTRUCTION STANDARDS AND OTHER REGULATIONS

Various states have enacted or revised a variety of other regulations, including well construction standards. For example, Utah adopted regulations that were effective November 12, 2012 relating to wellbore integrity, well control, surface operations, and management of flowback.²⁷⁶ North Dakota revised regulations relating to pits, disposal of wastes, and well construction, effective April 1, 2012.²⁷⁷ Other states, including Illinois, Ohio, Pennsylvania, and West Virginia have also enacted or revised statutes and regulations.

The United States Occupational Safety and Health Administration has cautioned that levels of airborne silica (from sand) are too high at some hydraulic fracturing sites and that care should be taken to control dust and protect workers in order to minimize the risk of silicosis.²⁷⁸

In May 2012 Vermont banned hydraulic fracturing,²⁷⁹ but the ban has only symbolic importance. Vermont has no ongoing oil and gas activity and has had almost no such activity in the past. The Vermont Geological Survey indicates that there never has been a productive oil or gas well in Vermont, that there have been only a few attempts to drill an oil or gas well in the state, and that the last attempt was nearly thirty years ago.²⁸⁰

XVII. CONCLUSION

274. LA. REV. STAT. ANN. § 30:961(B).

275. A list of Cooperative Endeavor Agreements entered from 2010 thru 2012 is available on the Louisiana Department of Natural Resources website at: http://dnr.louisiana.gov/assets/docs/conservation/groundwater/Appendix_D.pdf

276. UTAH ADMIN. CODE r. §§ 649-3-39 (2013).

277. N. D. INDUS. COMM’N ORDER No. 18123, CASE No. 15869, IN THE MATTER OF A HEARING CALLED ON A MOTION OF THE COMMISSION TO CONSIDER THE ADOPTING NEW RULES AND AMENDMENTS TO THE “GENERAL RULES AND REGULATIONS FOR THE CONSERVATION OF CRUDE OIL AND NATURAL GAS” CODIFIED AS ARTICLE 43-02 NORTH DAKOTA ADMINISTRATIVE CODE (Jan. 23, 2012) (revising N.D. ADMIN. CODE 43-02-03-19, -19.1, -19.3, -21).

278. *Worker Exposure to Silica During Hydraulic Fracturing*, U.S. DEP’T OF LABOR, https://www.osha.gov/dts/hazardalerts/hydraulic_frac_hazard_alert.html (last visited Feb. 12, 2014).

279. 29 VT. STAT. ANN. tit. 29, § 571(a) (2013).

280. *Earth Resources - Oil & Gas*, VT. GEOLOGICAL SURVEY, <http://anr.state.vt.us/dec/geo/oilandgas.htm> (last updated Mar. 29, 2012).

In the last few years, hydraulic fracturing has drawn considerable public attention. The process raises numerous legal issues, several of which relate to potential impacts on the environment. Federal, state, and local governments have responded with a large number of new regulations to address these issues, and there continue to be frequent developments relating to the regulation of hydraulic fracturing. In addition, parties have litigated several issues relating to private rights that have arisen in connection with hydraulic fracturing activities. It appears likely that, for the foreseeable future, there will continue to be ongoing change and development in the law of hydraulic fracturing.