What the Frack? Judicial, Legislative, and Administrative Responses to a New Drilling Paradigm

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I. INTRODUCTION

Law must bend to science; it must accommodate technology. For nearly a century, oil and gas production was dominated by a single engineering model—one in which a vertical well was perforated at a single downhole location in order to drain as large an area as was feasible. The most successful wells were located in high-pressure formations of relatively high porosity and permeability. By the 1990s, hydraulic fracturing, or "fracking," in combination with horizontal drilling, made it possible to recover oil and natural gas from shales and other formations with low permeability. This fracking process of creating fissures in tight, underground formations allows oil and natural gas to flow from reservoirs that would not have been economically feasible to produce under the "standard model."

As the oil and gas industry evolved with this new technology, courts, legislatures, and government agencies have found it necessary to respond to the new drilling model by accommodating or displacing existing legal principles. No more than the tides would heed King Canute's commands will the earth yield its resources in response to ill-suited legislation, misinformed judicial opinions, or regulatory ukases. Now in its second decade, the shale revolution is still contending with legal principles that were sound a century ago but must be adapted to reflect hard facts about recovering oil and gas from tight rock confines. The tools and concepts are in place but must now overcome common law doctrines such as trespass, which has no more application a mile underground than it does a mile in the air. Just as landowners now recognize that they must accept,

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with compensation, a utility's planting of a gas pipeline or hoisting of an electric line across their property for the common good, so too will landowners need to accept the presence of a borehole—a small, perforated pipe that permits the migration of fluid hydrocarbons that are essential to our national security and economic well-being—a few inches in diameter a mile or more under their land.

This article discusses the advent of the new drilling and production model and several associated legal challenges.[1] Part II briefly describes the "standard model" of petroleum production. Part III then covers the development of modern drilling technologies such as fracking and horizontal drilling. Part IV provides an overview of state regulation of the oil and gas industry. Finally, Part V addresses selected issues created by the new production model across several jurisdictions.

II. THE STANDARD MODEL

Oil and gas exploration is a search for petroleum trapped underground. Following the drilling of the first oil well near Titusville, Pennsylvania in 1859, developers began to extract the resource in commercially viable quantities. Since little was known about the geologic characteristics of such underground resources—particularly the fugacious nature of oil and gas—courts applied legal principles such as *ferae naturae* to govern development. They developed the "rule of capture," which one court described as follows:

> [T]he owner of a tract of land acquires title to the oil or gas which he produces from wells on his land, though part of the oil or gas may have migrated from adjoining lands. He may thus appropriate the oil and gas that have flowed from adjacent lands without the consent of the owner of those lands, and without incurring liability to him for drainage.[2]

Every producing jurisdiction has adopted the rule of capture. The "rule" encouraged rapid production, often at unsustainable rates. Such production thus led to waste—both in the common source of supply and with respect to the surface of

1. For more on the law of oil and gas, see PATRICK H. MARTIN & BRUCE M. KRAMER, WILLIAMS & MEYERS OIL AND GAS LAW (rev. ed. 2013). For a discussion on many of the other pertinent issues affecting the oil and gas industry, see Symposium, *Seventy-Fifth Anniversary of the Arkansas Conservation Act*, 68 ARK. L. REV. 231 (2015).

2. Elliff v. Texon Drilling Co., 210 S.W.2d 558, 561-62 (Tex. 1948).

the land—as developers drilled more wells than were necessary to effectively and efficiently drain a reservoir.

For many years, the industry employed a single model. Under this "standard model," a developer drills a single well vertically from the surface directly into the common source of supply. Energy—natural or artificial—then forces the oil and gas below into the wellbore and up to the surface. This method is cost-effective, but vertical drilling allows a developer to recover only the oil located directly below the surface at a given depth. One vertically completed oil well under the standard model can efficiently drain eighty acres or more, while a vertically completed gas well can efficiently drain 800 acres or more. However, the "rule of capture" fostered denser drilling than was efficient.

There were too many wells, with wells too close together. Rapid production prematurely depleted natural reservoir pressure and caused coning and fingering that led to water intrusion. The rule of capture allowed a driller to drain a large area, and a neighboring landowner could not stop production absent physical intrusion onto his property. This eventually prompted government intervention, and states began to enact spacing rules, production allowables, pooling, and unitization.[3]

III. THE NEW MODEL

A. Fracking: An Advance in Drilling Technology

Fracturing of reservoir rock is nothing new. Edward A. L. Roberts patented his "exploding torpedo" in 1865, shortly after serving in the Civil War.[4] One Pennsylvania newspaper reported on the technology at the time:

> Our attention has been called to a series of experiments that have been made in the wells of various localities by Col. Roberts, with his newly patented torpedo. The results have in many cases been astonishing.
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> The torpedo, which is an iron case, containing an amount of powder varying from fifteen to twenty pounds, is lowered into the well, down to the spot, as near as can be ascertained, where it is necessary to explode it.

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3. State regulation is discussed in Part IV, *infra*.

4. *Shooters—A "Fracking" History*, AM. OIL & GAS HIST. SOC'Y, http://aoghs.org/technology/hydraulic-fracturing/ (last visited Mar. 10, 2015).

> It is then exploded by means of a cap on the torpedo, connected with the top of the shell by a wire.[5]

The torpedo could be more effectively charged with nitroglycerin, a dangerous proposition for its operator.[6] The Roberts Petroleum Torpedo Company thrived by using the technology, as production from a fractured well could increase by 1200% within a week.[7]

Akin to nitro blasting is another form of explosion that was tried but not adopted—nuclear blasting. The Plowshare program, which was designed to develop peaceful uses for nuclear energy, initiated three natural gas projects, but the results were largely unsuccessful.[8] The program produced radioactive gas unsuitable for commercial development.[9]

Commercial hydraulic fracturing of oil wells dates to 1949.[10] In the years since, courts have defined fracking, or hydrofracturing, as follows: "[A] method used to stimulate production of a well. A specially blended liquid is pumped down the well and into a formation under pressure high enough to cause the formation to crack open, forming passages through which oil or gas can flow into the wellbore."[11] One property of water is its lack of compressibility, and the lack of permeability in a shale structure means that pressurized water will not seep into the rock. With fracking, the rock breaks under the water's pressure. When fracking a well, hydraulic pressure can build up

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5. *Id.*

6. *See id.* ("[B]y 1868 nitroglycerin was preferred to black powder, despite its frequently fatal tendency to detonate accidentally.").

7. *Id.*

8. S. H. FALLER, ENVTL. PROT. AGENCY, SURFACE RADIOACTIVITY AT THE PLOWSHARE GAS-STIMULATION TEST SITES: GASBUGGY, RULISON, RIO BLANCO 1 (1995), *available at* http://www.lm.doe.gov/Rulison/RUL000036.pdf. These were Project Gasbuggy (1967) in Rio Arriba County, New Mexico; Project Rulison (1969) near Parachute, Colorado; and Project Rio Blanco (1973) in Rio Blanco County, Colorado. *See "Gasbuggy" Tests Nuclear Fracking*, AM. OIL & GAS HIST. SOC'Y, http://aoghs.org/technology/project-gasbuggy/ (last visited Mar. 10, 2015); *see also* RUSSELL GOLD, THE BOOM: HOW FRACKING IGNITED THE AMERICAN ENERGY REVOLUTION AND CHANGED THE WORLD 80-82 (2014) (discussing the projects). Project Rio Blanco involved three nuclear devices weighing thirty-three kilotons each that were detonated almost simultaneously in a single well at three different depths. *"Gasbuggy" Tests Nuclear Fracking*, *supra* note 8.

9. *"Gasbuggy" Tests Nuclear Fracking*, *supra* note 8.

10. *See Shooters—A "Fracking" History*, *supra* note 4.

11. T.W. Phillips Gas & Oil Co. v. Jedlicka, 42 A.3d 261, 264 n.1 (Pa. 2012).

to 8000 pounds of pressure per square inch (psi).[12] This pressure allows oil and gas to flow in tight underground formations, and the substances move into the wellbore and up to the surface.

The evolution of fracking technology has allowed developers to recover oil and gas from shales with low permeability, a task that was once neither technologically possible nor commercially feasible. Fracking, along with horizontal drilling, has dramatically increased the amount of oil and gas available for domestic consumption and for export.

B. Horizontal Drilling

Although horizontal drilling dates to the early days of the oil and gas industry, widespread use did not begin until the 1980s.[13] Horizontal drilling involves the turning of the wellbore at depth. Engineers use directional drilling and horizontal drilling to control the bottom hole location of the well. Although horizontal drilling usually results in increased costs for developers, the increased productivity of a horizontal well offsets the additional expenses.

C. Salient Features of the New Model

The use of fracking and horizontal drilling techniques has stimulated oil and gas drilling and development activity in the United States. In recent years, the practice has continued to increase. This can be referred to as the "new model" or "new paradigm."

The new model has faced not only controversy over its impact on the environment, but also the challenge of applying old rules based on outdated assumptions under the standard model. This article focuses on spacing of wells, allowables for production, pooling, common law property rules, and how these concepts apply to the new model.

The new model utilizes horizontal laterals that drain only a few hundred feet around the borehole but extend a distance of well over a mile. With the new model, the common law rule of trespass becomes a threat to efficient production. A developer

12. GOLD, *supra* note 8, at 160.

13. *See* Patricia A. Moore, *Horizontal Drilling—New Technology Bringing New Legal and Regulatory Challenges*, 36 ROCKY MT. MIN. L. INST. 15-1, 15-2 (1990).

cannot drill around an individual who owns a two-acre tract if the owner says, "I refuse to allow a well to be drilled under my property from one or two miles down." This holdout makes it economically or physically impossible for the developer to extract oil or natural gas from under the property of willing owners. The industry is no longer worried that there will be too many wells, but whether enough can be allowed. With side drainage limited, wells must be aligned for efficient development; otherwise, substantial gaps will leave hydrocarbons in the ground, never to be produced.

In a situation with six or a dozen developers and thousands of landowners and mineral owners, it is virtually impossible to get them to agree to line up their wells in a uniform pattern. Compulsory pooling is desirable to overcome the recalcitrant landowner who would deny his or her neighbors the ability to obtain the oil and gas from beneath their property. And it is necessary for the state to superintend the most efficient and orderly pattern of development by the producing companies. Spiteful disputes between clashing personalities should not be allowed to interfere with achieving the maximum efficient recovery of hydrocarbons.

IV. TRADITIONAL STATE CONSERVATION REGULATION

Today, regulation of oil and gas is achieved primarily at the state level. The federal government had little involvement during the industry's primitive years, and state regulation varied considerably across jurisdictions.

A. Spacing Rules

Well-spacing regulations limit the ability of a developer to drill wells in a certain proximity to other wells or property lines. Such regulations effectively restrain the number of wells that may be drilled in a certain area, thereby protecting the correlative rights of other landowners in a common source of supply. Well-spacing regulations may apply across an entire jurisdiction, as well as to a particular reservoir, field, or unit. Most state oil and gas conservation agencies are vested with the authority to grant exceptions on a well-by-well basis, generally in order to prevent waste and to protect private property rights. These exceptions

may take the form of increased-density orders, which have prompted recent litigation in some states.

Louisiana has enacted a well-spacing rule that prevents a developer from drilling an oil well at a depth of greater than 3000 feet any closer than 330 feet from a property line, or within 900 feet of another well in the same pool.[14] The state regulates gas wells similarly; the only difference is that the well-proximity limitation is expanded to 2000 feet.[15] Arkansas's well-spacing rules might be of particular relevance to this symposium. General Rule B-3 provides that oil and gas wells developed in a unit cannot be located any closer than 280 feet from a unit boundary.[16] General Rule B-43 governs development in the Fayetteville Shale—an area of prolific gas development in recent years—and requires unconventional wells to be located at least 560 feet from another well in the common source of supply and conventional wells to be located at least 1120 feet apart.[17]

B. Production Controls

Production controls limit the rate and amount of oil or gas a developer may extract during a given time period or in a certain geographic area. Maximum efficient rates represent one form of a production control, limiting production to the maximum rate at which oil can be produced without excessive decline or loss of reservoir energy.

C. Pooling and Unitization

1. Pooling

Pooling is the integration of interests in separately owned tracts for an area where a single well has been, or will be, drilled such that drilling and production costs are shared among the working-interest owners, and production is shared by all owners of rights in the mineral estate.

When compelled by the state, pooling consolidates the interests in separately owned small or irregularly sized tracts for the purpose of integrating the minimum acreage necessary for a drilling unit. Forced pooling often requires state conservation

14. LA. ADMIN. CODE tit. 43, § 1905 (2014).
15. LA. ADMIN. CODE tit. 43, § 1905.
16. 178-00-001 ARK. CODE R. B-3 (LexisNexis 2015).
17. 178-00-001 ARK. CODE R. B-43(i)–(j) (LexisNexis 2015).

agencies to make difficult choices, as compulsory pooling laws typically require a pooling order to be "just and reasonable." It is important to distinguish between pooling by the exercise of a pooling clause and pooling accomplished by order of the state conservation agency. The agency's order for a unit will maintain the lease even if the requirements of the pooling clause, such as the recordation provision, have not been fulfilled.

Each of the producing states allows voluntary pooling where the parties have agreed upon the sharing of the costs of development and proceeds of production. Most states also permit their conservation agencies to issue compulsory pooling orders if the parties are unable to agree upon a sharing. Louisiana, Oklahoma, and Texas have each passed compulsory pooling laws that illustrate the modern approach to the practice.

a. Louisiana

> When two or more separately owned tracts of land are embraced within a drilling unit which has been established by the commissioner . . . the owners may validly agree by separate contract to pool, drill, and produce their interests and to develop their lands as a drilling unit.
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> (1) Where the owners have not agreed by separate contract to pool, drill, and produce interests, the commissioner shall require them to do so and to develop their lands as a drilling unit, if he finds it to be necessary to prevent waste or to avoid drilling unnecessary wells.[18]

b. Oklahoma

> When two or more separately owned tracts of land are embraced within an established spacing unit, or where there are undivided interests separately owned, or both such separately owned tracts and undivided interests embraced within such established spacing unit, the owners thereof may validly pool their interests and develop their lands as a unit. Where, however, such owners have not agreed to pool their interests and where one such separate owner has drilled or proposes to drill a well on the unit to the common source of supply, the Commission, to avoid the drilling of unnecessary wells, or to protect correlative rights, shall . . .

18. LA. REV. STAT. ANN. § 30:10(A) (2014).

> require such owners to pool and develop their lands in the spacing unit as a unit.[19]

c. Texas

> When two or more separately owned tracts of land are embraced in a common reservoir of oil or gas for which the commission has established the size and shape of proration units, whether by temporary or permanent field rules, and where there are separately owned interests in oil and gas within an existing or proposed proration unit in the common reservoir and the owners have not agreed to pool their interests, and where at least one of the owners of the right to drill has drilled or has proposed to drill a well on the existing or proposed proration unit to the common reservoir, the commission, on the application of an owner . . . for the purpose of avoiding the drilling of unnecessary wells, protecting correlative rights, or preventing waste, shall establish a unit and pool all of the interests in the unit within an area containing the approximate acreage of the proration unit, which unit shall in no event exceed 160 acres for an oil well or 640 acres for a gas well plus 10 percent tolerance.[20]

Under the Texas pooling law, the applicant must show he has made a fair and reasonable offer to pool voluntarily to the owners of the other interests in the proposed unit.[21]

2. Unitization

Unlike pooling, unitization consolidates mineral or working interests covering all or part of a common source of supply in order to efficiently and economically drain that common source. Spacing, drilling, or pooled units may be included within a larger unitized area. Most producing states—Texas being the notable exception—have enacted a compulsory unitization law.[22] State conservation agencies achieve unitization according

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19. OKLA. STAT. ANN. tit. 52, § 87.1(e) (West 2015).

20. TEX. NAT. RES. CODE ANN. § 102.011 (West 2013).

21. TEX. NAT. RES. CODE ANN. § 102.013 (West 2013).

22. *See* 1 BRUCE M. KRAMER & PATRICK H. MARTIN, THE LAW OF POOLING AND UNITIZATION § 6.02 (3d ed. 2014). For some representative compulsory unitization statutes, see ARK. CODE ANN. § 15-72-315 (Repl. 2009); CAL. PUB. RES. CODE §§ 3640–3642 (West 2015); KAN. STAT. ANN. § 55-1304 (West 2015); LA. REV. STAT. ANN. § 30:5(B) (2014); MISS. CODE ANN. § 53-3-7(1)(a) (West 2015); N.M. STAT. ANN. §§ 70-7-1

to a detailed statutory process generally initiated by the submission of a plan.

One prominent statutory requirement for unitization plans involves the identification of the common source of supply. A conservation agency typically must conclude that the common source of supply exists within the area to be unitized under the proposed plan. The relevant Oklahoma statute illustrates this requirement:

> Each unit and unit area shall be limited to all or a portion of a single common source of supply. Only so much of a common source of supply as has been defined and determined to be productive of oil and gas by actual drilling operations may be so included within the unit area.[23]

3. Statutory Effects of Pooling and Unitization

a. Louisiana

Louisiana law provides for the prescription of a mineral servitude. The applicable Mineral Code article states as follows:

> Operations conducted on land other than that burdened by a mineral servitude and constituting part of a conventional or compulsory unit that includes only a part of the land burdened by the servitude will, if otherwise sufficient to interrupt prescription according to Articles 29 through 32, interrupt prescription only as to that portion of the tract burdened by the servitude included in the unit provided such operations are for the discovery and production of minerals from the unitized sand or sands.[24]

The rules of use regarding interruption of prescription can be altered to allow unit operations to interrupt prescription as to the entire area burdened by the servitude.[25]

b. Oklahoma

In Oklahoma, the state legislature enacted a "statutory Pugh clause" in 1977. This law now provides that acreage of a lease partially located in a unit will not be held as to the area outside

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to -21 (West 2014); OKLA. STAT. ANN. tit. 52, § 287.1 (West 2015); WYO. STAT. ANN. § 30-5-110 (West 2014).

23. OKLA. STAT. ANN. tit. 52, § 287.4 (West 2015).

24. LA. REV. STAT. ANN. § 31:33 (2014).

25. LA. REV. STAT. ANN. § 31:75 (2014).

the unit if the unit is 160 acres or more in size.[26] The pertinent portion of the legislation states that "[i]n case of a spacing unit of one hundred sixty (160) acres or more, no oil and/or gas leasehold interest outside the spacing unit involved may be held by production from the spacing unit more than ninety (90) days beyond expiration of the primary term of the lease."[27] This statute does not apply retrospectively to leases executed before its enactment.[28] The law will apparently apply to a unit formed by despacing.[29]

c. Mississippi

The applicable Mississippi law states as follows:

> The portion of unit production allocated to a separately owned tract within the unit area shall be deemed, for all purposes, to have been actually produced from such tract, and operations with respect to any tract within the unit area shall be deemed for all purposes to be the conduct of operations for the production of oil or gas, or both, from each separately owned tract in the unit area. However, when an oil, gas and mineral lease contains land partially within and partially without said unit area, the unit agreement and production from the unit shall have no force and effect on lands lying outside of such unit area and failure of the lessee or lessees thereof to drill and develop such lands lying outside said unit area within one (1) year or during the term of the lease, whichever is a longer period of time, from the date of determination of the unit area by the state oil and gas board shall render such lease or leases on lands lying outside said unit area void and of no force and effect, unless otherwise held by production other than from unit production.[30]

D. Spacing or Drilling Units

In addition to location or spacing requirements for wells, state conservation agencies also promulgate special rules for specific fields or reservoirs. These "spacing," or "drilling,"

26. OKLA. STAT. ANN. tit. 52, § 87.1(b) (West 2015).
27. OKLA. STAT. ANN. tit. 52, § 87.1(b).
28. *See* OKLA. STAT. ANN. tit. 52, § 87.1(a).
29. *See* OKLA. STAT. ANN. tit. 52, § 87.1(a).
30. MISS. CODE ANN. § 53-3-111 (West 2015).

units are authorized or required by legislative act. A single "unit" has been described as "the area that will be effectively and efficiently drained by a single well."[31]

State conservation agencies are not required to integrate ownership interests in order to create a drilling unit. An agency may first create the unit, and interest owners may then agree to a pooling agreement. Alternatively, the state agency may issue a compulsory pooling order after establishing the unit. States may accomplish both during a single proceeding.

In Oklahoma, the establishment of the spacing unit has historically pooled a one-eighth royalty and has entitled all owners to a share of production; a separate action of the Corporation Commission has been necessary to pool the working interests for the purpose of cost allocation. In Louisiana, the conservation agency usually establishes a drilling unit and pools the separate tracts in the same proceeding.[32] Although a single hearing creates the drilling unit and pools the separate interests, the findings and order issued from the proceeding separately address the unit and the pooling of the interests in different paragraphs. Notably, if a non-producing tract is included in a spacing or proration unit in Texas, the state's rule of capture does not change.

V. SELECTED ISSUES OF THE NEW DRILLING AND PRODUCTION MODEL

A. Multiple-Unit Wells and Louisiana Litigation

By issuing increased-density orders, a state conservation agency allows developers to drill additional wells in a drilling or spacing unit. For example, a state conservation agency may issue an increased-density order for a unit encompassing 640 acres—originally established in such a size on the premise the area could be effectively and economically drained by a single well—in order to more efficiently develop the unit or to prevent drainage. A change in production allowables may or may not accompany the increased-density order.

Increased-density orders have led to litigation in Louisiana. The state's conservation agency frequently issues orders

31. 1 KRAMER & MARTIN, *supra* note 22, § 5.03.
32. *Id.*

allowing alternate wells in a drilling unit.[33] This allows a developer to produce the unit by drilling an additional well or wells. It may produce from both the original well and the alternate well so long as it does not exceed the unit's production allowable. Shale plays generally need additional wells to effectively drain a unit. Anywhere from four to sixteen wells may be needed, and increased-density orders and alternate wells allow this to be accomplished.

Recent lawsuits have challenged the authority of Louisiana's state conservation agency to allow more than a single well in a drilling unit. State law provides that "[a] drilling unit, as contemplated herein, means the maximum area which may be efficiently and economically drained by one well."[34] In *Walker v. J-W Operating Co.*,[35] a Louisiana appeals court upheld the agency's "authority to issue permits for alternate wells pursuant to its grant of authority to prevent waste and its authority to 'make . . . reasonable rules, regulations, and orders' to effect that goal."[36] The court noted that various state conservation commissioners had approved the drilling of additional wells for over fifty years.[37] Moreover, the court acknowledged that the legislature had recognized the practice of permitting alternate wells in two separate legislative acts.[38] These acts amended Louisiana law to provide that "nothing herein shall be construed as limiting the authority of the commissioner to approve the drilling of alternate unit wells on drilling units previously established pursuant to R.S. 30:9(B)."[39] The court ultimately held that "[n]othing in Section 30:9 prohibit[ed] the permitting of alternate wells on a unit previously established pursuant to Section 30:9."[40] Despite this ruling, another panel of the same court later held that a declaratory judgment action could go forward with the same claims that were rejected in *Walker*.

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33. The alternate well must be distinguished from the substitute well, which *replaces* the driller's original well on the unit.

34. LA. REV. STAT. ANN. § 30:9(B) (2014).

35. No. 2012 CA 0662, 2012 WL 6677913 (La. Ct. App. Dec. 21, 2012).

36. *Id.* at *8 (omission in original) (quoting LA. REV. STAT. ANN. § 30:4(c) (2014)).

37. *Id.* at *5.

38. *Id.* at *6.

39. LA. REV. STAT. ANN. § 30:5.1(A)(9), (B)(13) (2014).

40. *Walker*, 2012 WL 6677913, at *6.

In *Gatti v. State*,[41] the plaintiffs sought to enjoin the state conservation agency from establishing drilling units in an area in excess of the area drainable by a single well. The plaintiffs also asked the court to retroactively nullify any unit larger than an area drainable by a single well and to declare that Louisiana law did not authorize alternate wells.[42]

The court reversed a trial court's dismissal of the case when it rejected one of the defendants' primary arguments—that Louisiana Revised Statute section 30:12 provided the exclusive means of challenging an order issued by the state conservation agency and did not allow a litigant to seek a declaratory judgment limiting the scope of the agency's authority.[43] This holding would have effectively allowed parties to collaterally attack orders issued by the conservation agency.

On appeal, the Louisiana Supreme Court reversed.[44] But the court did so without rendering an opinion, thereby leaving the issue somewhat unresolved.[45] The full decision reads as follows:

> Writs granted. The court of appeal is reversed. The district court's ruling, which granted the defendants' exceptions of lack of subject matter jurisdiction, no cause of action, no right of action and prescription/peremption are reinstated. The plaintiffs' claims are dismissed without prejudice, as originally ordered by the district court.[46]

What does this mean? Probably that the issue is mostly settled in favor of allowing the conservation agency to exercise its discretion in permitting multiple unit wells. However, legislative modification might be desirable.

B. Risk Penalties and Alternate Wells

Because multiple wells are required to adequately drain a relatively large unit, the pace of development in a unit and in a large shale area can become a matter of dispute among working-interest owners within a unit or in the larger play. Once a

41. No. 2013 CA 0289, 2014 WL 3517548 (La. Ct. App. Jan. 15, 2014), *rev'd*, 146 So. 3d 541 (La. 2014).

42. *See id.* at *1-2.

43. *Id.* at *2.

44. *Gatti*, 146 So. 3d at 541.

45. *Id.* at 542.

46. *Id.*

successful well is drilled in a unit, there is often a likelihood that additional successful wells will be drilled on the unit. When gas prices are relatively low, drilling many wells almost simultaneously can be problematic. Joint operating agreements often contain a risk-penalty provision should a working-interest owner go non-consent on a proposed additional well subject to the joint operating agreement. This provides the owner of a small working interest with an opportunity to propose wells on a unit which the operator may be reluctant to drill. If the operator goes non-consent, then the small working-interest owner can make a great deal more money by virtue of the non-consent penalty than he could if he were the majority owner. In Louisiana, this situation has led to administrative disputes, proposed legislation, and litigation. Consider the following illustration of this problem.

Where a small minority interest owner can drill a well and look to a much larger interest owner for a 200%, 300%, or 400% risk penalty under a joint operating agreement, the drilling party may have little incentive to seek efficient recovery of natural gas or maximum production from the entire unit. Imagine a 640-acre unit with four wells that can produce natural gas worth $100 million, and each well costs $8 million. Suppose the majority interest owner has 80% of the ownership interest, and a minority owner has 3%. With maximum recovery from four wells at a cost of $32 million, the 3% owner would invest almost $1 million to get back $3 million before paying any severance tax or royalties, thus perhaps clearing $1.5 million. If, on the other hand, the 3% owner could propose a second unit well with the majority owner going non-consent under the joint operating agreement, the 3% owner could put up the full $8 million for a well and produce $25 million from it. He could then perhaps keep all $25 million as a risk penalty. The 3% owner could make nearly ten times the money from one well as he could have if all four wells had been drilled. Perhaps the third and fourth wells would never be drilled. If a small working-interest owner could force this scenario, he would make every majority owner in a unit the hostage of each small working-interest owner throughout a shale play. With this, the small interest owner is incentivized to maximize the recovery from the risk penalty, not to maximize production from the entire unit.

In Order No. 361-L-122, dated February 14, 2014, Louisiana's state conservation agency denied the application of Larchmont Resources to drill, designate, and utilize three alternate unit wells for three units located in the Elm Grove Field in Bossier Parish.[47] A majority of owners with the right to drill opposed the application.[48] The agency made the following finding:

> [T]he available geological, engineering or other appropriate information indicate[d] that approval of the applicant's request [was] not in the interests of conservation, nor [was] it necessary to prevent waste, to avoid the drilling of unnecessary wells, to allow for orderly development, or to protect the correlative rights of the owners of the tracts in said units.[49]

The order "reserve[d] to the unit operator the ability to propose alternate unit wells for said units at a later time."[50] Order No. 691-C-29 outlined the same findings with regard to the Swan Lake Field.[51]

Undaunted, the parties behind Larchmont Resources sought legislation that would have required the granting of these applications by a non-operator. House Bill 1204, filed in the Louisiana legislature, provided the following:

> The commissioner shall approve an increased well density within a unit's current boundaries established for stratigraphic zones which comprise the Haynesville Shale upon application by any working-interest owner and the commissioner finding, after notice and a public hearing, that the geological, engineering, and other relevant evidence establishes that the developed area cannot be efficiently and economically drained by the current unit well or wells. The commissioner shall issue a permit to drill an alternate unit well to a successful applicant, upon the election of the current unit operator not to participate pursuant to R.S. 30:10 or otherwise, and in compliance with R.S. 30:28 and applicable rules and regulations.[52]

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47. LA. OFFICE OF CONSERVATION, ORDER NO. 361-L-122, at 1 (2014).
48. *Id.*
49. *Id.*
50. *Id.*
51. *See* LA. OFFICE OF CONSERVATION, ORDER NO. 691-C-29 (2014).
52. H.B. 1204, 2014 Leg., Reg. Sess. (La. 2014).

At the hearing on the bill, a lawyer for one supporter indicated that litigation was in progress on the agency's denial of the application. No further action was taken on the legislation.[53] At last announcement, the bill was still pending in the House Committee on Natural Resources and Environment.[54]

C. Cross-Unit Wells

The shale revolution is currently taking place in some areas that have long produced oil and natural gas and for which units have already been established. Even though the shale area is at a different depths and is not in communication with a reservoir that has produced in the past, a state conservation agency may be reluctant to change the relative equities among mineral owners within an existing unit. When one takes into account that a field rule may limit a well from being drilled or completed within, for example, 330 feet of another unit boundary, the result is a gap of at least 660 feet,[55] which cannot be produced. A borehole that might be most efficiently extended to 8000 feet would be limited to about 4500 feet for a 640-acre square unit. That means the unit and rules based on the standard model result in an inefficient well and an unproduced gap, neither of which benefits any of the interested parties. Adherence to the standard model causes both a loss of money and hydrocarbons. One solution is to permit cross-unit wells as exceptions to the spacing requirements and to develop special rules to allocate production that comes from adjacent units.

1. Louisiana

Louisiana's state conservation agency recognizes the need for preventing gaps and allowing longer laterals by granting exceptions that allow laterals to cross unit lines. An example is Order No. 191-H-176, which became effective on April 8, 2014.[56] This pertained to alternate wells in three Haynesville Units.[57] A diagram attached to the order illustrated how the

53. *See HB 1204*, LA. STATE LEG., https://www.legis.la.gov/legis/BillInfo.aspx?s=14RS&b=HB1204&sbi=y (last visited Mar. 10, 2015).

54. *Id.*

55. *See* KY. REV. STAT. ANN. § 353.610(1) (West 2015).

56. LA. OFFICE OF CONSERVATION, ORDER NO. 191-H-176 (2014).

57. *See id.* at 1.

wells crossed unit boundaries.[58] The basis for allocation between the units is found in Finding No. 6:

> [U]nit production from said cross unit horizontal alternate unit wells should be allocated to each unit in the same proportion as the perforated length of the lateral, as defined in the DEFINITIONS section herein, in that each unit bears to the total length of the perforated lateral, as determined by an "as drilled" survey performed after the cross unit wells are drilled and completed; and that unit production should continue to be shared on a surface acreage basis.[59]

Concerned mineral owners in Louisiana questioned whether operators might use short-segment, cross-unit drilling to interrupt the prescription of mineral servitudes and mineral royalties and to maintain leases without an underlying reason for conservation purposes. The Louisiana State Legislature addressed this issue in Act 394 of 2014:

> [T]he practice of granting exceptions to the [spacing] rules and allowing oil and gas operators to drill within the three hundred thirty feet property line and into the adjacent property. R.S. 31:16 provides that mineral rights are real rights and subject to either a prescription of nonuse for ten years or to special rules of law governing the term of their existence. One practical implication of allowing an exception to the three hundred thirty foot boundary rule is that the drilling of cross-unit wells could prevent the prescription of nonuse from running on the adjacent property.[60]

The legislature provided for the establishment of a "Cross-Unit Well Study Commission" to study the issue of prescription, and presumably related matters, arising from cross-unit wells.[61] The Commission was directed to report its findings and recommendations to the Senate Committee on Natural Resources and the House Committee on Natural Resources and

58. *Id.* at 4.
59. *Id.* at 2.
60. 2014 La. Sess. Law Serv. Act 394 (West).
61. *Id.* § 1.

Environment by March 16, 2015.[62] So far, the Commission has held four meetings and is currently drafting an approach.[63]

2. Arkansas

The approach to horizontal wells in Arkansas is spelled out in a special rule promulgated by the Arkansas Oil and Gas Commission for the Fayetteville Shale, the Moorefield Shale, and the Chattanooga Shale Formations.[64] General Rule B-43 establishes a norm of 640-acre drilling units with a maximum of sixteen wells per 640 acres for each separate, unconventional source of supply within an established drilling unit.[65] Each well location must be at least 560 feet from any other well in the same common source of supply that extends across or encroaches upon a drilling unit.[66] Each well must "be at least 448 feet, [with] an allowed 20% variance, from all other well locations in the same common source of supply within an established drilling unit."[67] These setbacks may be waived if all affected owners consent in writing.[68]

Of particular interest are cross-unit laterals, which are given special treatment for allocation of production using a "calculated area." Subsection (o)(2)(E) of General Rule B-43 provides:

> E. The method for sharing the costs of and the proceeds of production from one or more separately metered wells shall be based on acreage allocation as follows:
>
> i) An area measured 560 feet along and on both sides of the entire length of the horizontal perforated section of the well, and including an area formed by a 560 feet radius from the beginning point of the perforated interval, and a 560 feet radius from the ending point of the perforated interval shall be calculated for each such separately metered well (the "calculated area").

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62. *Id.*

63. *See Cross Unit Well Study Commission (Act 394 of 2014)*, LA. DEP'T NAT. RESOURCES, http://dnr.louisiana.gov/index.cfm?md=pagebuilder&tmp=home&pid=1228 (last visited Mar. 10, 2015).

64. 178-00-001 ARK. CODE R. B-43(a) (LexisNexis 2014).

65. 178-00-001 ARK. CODE R. B-43(f).

66. 178-00-001 ARK. CODE R. B-43(i)(1)–(2).

67. 178-00-001 ARK. CODE R. B-43(i)(3).

68. 178-00-001 ARK. CODE R. B-43(i)(3).

> ii) Each calculated area shall be allocated and assigned to each drilling unit according to that portion of the calculated area occurring within each drilling unit.[69]

A diagram using this "calculated area" approach looks like a Band-Aid. The great majority of the wells drilled in the Fayetteville Shale since 2010 have been cross-unit wells. Order No. 198-2-2014-07, issued by the Arkansas Oil and Gas Commission on August 5, 2014, illustrates the authorization of a cross-unit horizontal well, the specification as to well costs, and the description of the "calculated area."[70]

D. Cross-Lease Wells and Non-Pooling

Some states have readily adapted to the challenge of the new model by establishing pooled units that allow successful drilling with few reported controversies. Other states have responded with legislative or regulatory fixes that avoid pooling of interests but do allow producers to circumvent the otherwise applicable spacing regulations. Recent developments from Texas and Pennsylvania serve as examples.

The Texas Railroad Commission has developed an "allocation well" concept in response to operator requests to drill horizontal wells across property lines without getting the appropriate Rule 37 spacing exception. An allocation well can be described as "a horizontal well that traverses the boundary between two or more leases that have not been pooled and for which no agreement exists among the royalty owners as to how production will be shared."[71]

Springer Ranch, Ltd. v. Jones[72] involved a 1956 lease on 8545 acres in Texas.[73] The land was later divided into three tracts.[74] A contract entered into by the parties in 1993 provided:

> [the parties] contract and agree with each of the other parties, that all royalties payable under the above described

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69. 178-00-001 ARK. CODE R. B-43(o)(2)(E) (LexisNexis 2014).

70. *See* Appendix A, *infra*. The "calculated area," or "Band-Aid," is calculated in "Finding of Fact No. 3."

71. *See* Clifton A. Squibb, *The Age of Allocation: The End of Pooling as We Know It?*, 45 TEX. TECH. L. REV. 929, 930 (2013).

72. 421 S.W.3d 273 (Tex. App. 2013).

73. *Id.* at 276.

74. *Id.*

> Oil and Gas Lease from any well or wells on said 8,545.02 acre tract, shall be paid to the owner of the surface estate on which such well or wells are situated, without reference to any production unit on which such well or wells are located.[75]

This worked well enough for several vertical wells, but for a horizontal well, the wellhead was located on one tract while the terminus was on another.[76] Who was entitled to royalties? The court rejected a claim that the division between the two owners should be based on the total length of the wellbore, including the vertical segment, since there was no production from it.[77] Instead, the court allocated production based on the length of the lateral between the first takepoint in the correlative interval to the last takepoint at the terminus of the horizontal wellbore.[78]

In *Browning Oil Co. v. Luecke*,[79] a Texas appeals court scrutinized a jury verdict that had awarded a royalty owner the full value of all minerals produced from a horizontal wellbore that traversed over a portion of the lease after the lessee had improperly pooled the royalty owner's interest.[80] The royalty owners had a portion of both horizontal drainholes and the vertical drill site on their acreage.[81] The court stated:

> We decline to apply legal principles appropriate to vertical wells that are so blatantly inappropriate to horizontal wells and would discourage the use of this promising technology. The better remedy is to allow the offended lessors to recover royalties as specified in the lease, compelling a determination of what production can be attributed to their tracts with reasonable probability.[82]

The court then remanded the case for a determination of damages.[83]

In 2013, the Pennsylvania General Assembly enacted the following statute that allows a lessee of adjoining lands to drill a

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75. *Id.* at 277 (alteration in original).
76. *Id.*
77. *Springer Ranch, Ltd.*, 421 S.W.3d at 285.
78. *Id.* at 289.
79. 38 S.W.3d 625 (Tex. App. 2000).
80. *Id.* at 632.
81. *Id.* at 638.
82. *Id.* at 647.
83. *Id.* at 650.

horizontal well that traverses the property line between the two separate leases:

> Where an operator has the right to develop multiple contiguous leases separately, the operator may develop those leases jointly by horizontal drilling unless expressly prohibited by a lease. In determining the royalty where multiple contiguous leases are developed, in the absence of an agreement by all affected royalty owners, the production shall be allocated to each lease in such proportion as the operator reasonably determines to be attributable to each lease.[84]

Allocation of production between the two or more separate, but contiguous, leases is left to the reasonable discretion of the operator. To date, the predominant method of allocation for horizontal wells appears to be the length of the lateral in the productive horizon under the owner's land as compared to the total length of the lateral in the productive horizon.

VI. CONCLUSION

This article touches only a few of the many legal issues arising from the "Fracking Revolution." Others have been raised by commentators making presentations on this program. As technology continues to change and improve, many additional legal challenges will arise. Interested persons in the producing states can watch regulatory, legislative, and judicial developments in other states and learn much from those experiences regarding what to emulate and what to avoid.

84. 58 PA. STAT. ANN. § 34.1 (West 2014).

Appendix A

ARKANSAS OIL AND GAS COMMISSION
301 NATURAL RESOURCES DRIVE
SUITE 102
LITTLE ROCK, ARKANSAS 72205

ORDER NO. 198-2-2014-07 August 05, 2014

General Rule B-43 Well Spacing Area
Cleburne County, Arkansas

AUTHORITY TO DRILL AND PRODUCE WELL / SHARING COSTS AND NATURAL GAS PRODUCED

After due notice and public hearing in El Dorado, Arkansas, on July 22, 2014 the Arkansas Oil and Gas Commission, in order to prevent waste, carry out an orderly program of development and protect the correlative rights of each owner in the common source(s) of supply in this drilling unit, has found the following facts and issued the following Order.

STATEMENT OF THE CASE

SEECO, Inc., (the "Applicant"), filed its application for authority to drill and produce its proposed Green Bay Packaging 11-10 2-13H24 well, pursuant to Arkansas Oil and Gas Commission General Rule B-43 (o), and to share the costs of such well and the natural gas produced therefrom between the working interest owners and royalty interest owners of the existing units consisting of Section 24, Township 11 North, Range 10 West, and Section 13, Township 11 North, Range 10 West, Cleburne County, Arkansas.

FINDINGS OF FACT

From the evidence introduced at the hearing, the Commission finds:

1. That the Applicant is operator and owns or has the support of the majority working interest within Section 24, Township 11 North, Range 10 West, and Section 13, Township 11 North, Range 10 West, Cleburne County, Arkansas.

2. The Applicant proposes to drill a cross-unit horizontal well targeting the Fayetteville Shale and any intervening formations. The surface hole is planned in the Southeast Quarter of Section 13, Township 11 North, Range 10 West down to a bottom hole location in the Southeast Quarter of Section 24, Township 11 North, Range 10 West.

3. Utilizing an area encompassed an exterior which is defined by a distance of 560 feet measured perpendicular to both sides of the proposed well bore and a radius extending 560 feet from the first perforation (heel) and the last perforation (toe), the applicant estimates that the allocation area encompassing the perforated well bore is approximately 95.24% of Section 24, Township 11 North, Range 10 West, and 4.76% of Section 13, Township 11 North, Range 10 West.

4. The Applicant proposes that operations will be conducted under the terms of Model Form Operating Agreements adopted by the Commission, with the non-consent penalty being 400% for the proposed well; and that the above allocation of cost shall be effective for the drilling of the proposed well through the setting of production casing. The following terms will also govern the drilling and completion of the proposed well:

   (A) After the setting of production casing, but before a completion attempt is made, drilling cost will be reallocated, based upon the actual perforated interval available for completion in the as-drilled well bore. This re-allocation may result in a revision to working interest and all costs paid to that point will be adjusted.

   (B) If a well bore is lost during the drilling or completion operation and a replacement well bore is proposed with an alternate azimuth that will result in a further reallocation of working interest participation or the allocation of the production, the replacement well will be treated as a new well proposal with the revised interest. All parties that participate in the drilling and completion attempt in the initial well will be liable for their proportionate share of the actual

cost of operation to the point of setting a plug for side-track operations, based on their original interest.

(C) Should any party that elected to participate in the initial well elect to not participate in the replacement well, the penalty for a non-consent election in the replacement well will be imposed on only the replacement well costs. A non-participating party in the initial well will not be afforded the opportunity to participate in the replacement well and their penalty will be imposed on the cumulative cost of the initial well and the replacement well.

(D) Any re-allocation after the setting of production casing will be final for the completion attempt and for the ultimate allocation of production from the well between the respective units.

5. That the granting of this application will be protective of the correlative rights of all interested parties and will prevent waste of the natural gas by permitting an efficient method of developing the resource within multiple drilling units

6. That no objections were filed.

CONCLUSIONS OF LAW

1. That due notice of public hearing was given as required by law and that this Commission has jurisdiction over said parties and the matter herein considered.

2. That this Commission has authority to grant said application under the provisions of Act No. 105 of 1939, as amended.

ORDER

It is, therefore, Ordered by the Commission:

1. The Applicant's application for authority to produce its Green Bay Packaging 11-10 2-13H24 well is hereby approved.

2. The Applicant shall share the costs of such well and the natural gas produced therefrom in the manner described in Finding Nos. 3 and 4 above.

3. That if the subject well encroaches upon but does not cross the drilling unit boundary of an adjoining drilling unit (an "encroaching well"), the Commission shall not consider the encroached-upon drilling unit to be held by production from the encroaching well.

4. That the following requirements are placed upon the drilling units from which production is allocated by applicant's well:

    a. There is at least one well located, as defined in subsection (a)(2) of General Rule B-3, at a non-exceptional well location and located entirely within each included drilling unit that is producing or capable of producing gas; or

    b. Within twelve (12) months following the date the well for which approval is granted is spud, there will be at least one well located, as defined in subsection (a)(2) of General Rule B-3, at a non-exceptional well location and located entirely within each included drilling unit that is either a well that is producing gas, or a well that is capable of producing gas and awaiting connection to a pipeline; or

    c. There is at least one well or a combination of multiple wells, including cross unit wells and/or encroaching wells located, as defined in subsection (a)(2) of General Rule B-3, within each included drilling unit that have a total combined perforated lateral length within the drilling unit of not less than 4160 feet, and are producing or are capable of producing gas; or

    d. Within twelve (12) months following the date the well for which approval is granted is spud, there will be at least one well or a combination of multiple wells, including cross unit wells and or encroaching wells located, as defined in subsection (a)(2) of General Rule B-3, within each included drilling unit that have a total combined perforated lateral length within the drilling unit of not less than 4160 feet, and are producing or are capable of producing gas and awaiting connection to a pipeline.

This Order shall be effective from and after August 05, 2014; and the Commission shall have continuing jurisdiction for the purposes of enforcement, and/or modifications or amendments to the provisions of this Order. This Order will automatically terminate under any of the following conditions; well drilling operations have not been commenced within one year after the effective date; or one year following cessation of drilling operations if no production is established; or within one year from the cessation of production from the units.

ARKANSAS OIL AND GAS COMMISSION
Lawrence E. Bengal, Director