

**RIGGING RIGHTS OF PASSAGE:
ANALYZING SUBSURFACE EASEMENTS
IN HORIZONTAL DRILLING[†]**

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INTRODUCTION

Horizontal drilling, as a key component in the domestic energy revolution underway in America, provides operators with tremendous access to untapped oil and gas reservoirs.¹ With horizontal drilling and hydraulic fracturing opening the door to unconventional oil and gas plays, state governments, attorneys, mineral owners, and the oil industry are adapting to the implications of lateral exploration throughout the United States.²

Courts and regulators will decide the most effective means of approaching subsurface trespass or interference issues stemming

¹ See, e.g., Robert D. Blackwill & Meghan L. O’Sullivan, *America’s Energy Edge: The Geopolitical Consequences of the Shale Revolution*, FOREIGN AFF., Mar.-Apr. 2014, at 102.

² Horizontal drilling spurred a “mini-boom” during the early 1990s in Texas from the technology’s principal beginnings in the Austin Chalk Formation, and in North Dakota’s Bakken Formation. See Christy M. Schweikhardt, Note, *Horizontal Perspective: Texas Oil & Gas Law in Light of Horizontal Drilling Technology*, 34 S. TEX. L. REV. 329, 329-31 (1993). In 1990, there were around 1,000 horizontal wells drilled worldwide. See ENERGY INFO. ADMIN., DRILLING SIDEWAYS—A REVIEW OF HORIZONTAL WELL TECHNOLOGY AND ITS DOMESTIC APPLICATION 8 (1993) [hereinafter DRILLING SIDEWAYS], available at http://www.eia.gov/pub/oil_gas/natural_gas/analysis_publications/drilling_sideways_well_technology/pdf/tr0565.pdf. By early 2013, there were over 200 rigs currently drilling horizontal wells in the Bakken formation alone. See Chip Brown, *North Dakota Went Boom*, N.Y. TIMES MAG. (Jan. 31, 2013), <http://www.nytimes.com/2013/02/03/magazine/north-dakota-went-boom.html>.

from horizontal drilling.³ The horizontal wellbore *must* pass through the subsurface in order to realize the drilling operation, and practitioners recognize differing approaches to addressing underground passage and intrusion.⁴ For a horizontal drilling and fracturing operation, the costs and any liability, including damages stemming from improper operation, are vast.⁵ While oil companies continue to develop horizontal drilling plays unabated, tension grows between accommodating modern technology, economic development, and existing property entitlements.⁶

The current state of affairs suggests obtaining subsurface easements to avoid any potential liability or interference for subsurface horizontal wellbore movement across property boundaries. The most common suggestion among practitioners is for operators to obtain subsurface easements from *both* the surface and mineral owner for horizontal exploration.⁷ Yet all practitioners commenting on the issue are keenly aware that their recommendation is limited because few cases directly address

³ “As most states grapple with new regulation, it is hoped that regulators recognize that the advantages of horizontal techniques are significant and that efforts must be made to foster and facilitate horizontal developments of domestic hydrocarbon reserves.” Michael J. Wozniak & Jamie L. Jost, *Horizontal Drilling: Why It’s Much Better to “Lay Down” than to “Stand Up” and What Is an “18° Azimuth” Anyway?*, 57 ROCKY MTN. MIN. L. INST. 11-1, 11-29 (2011).

⁴ See *infra* Part III.

⁵ “Onshore, the proliferation of horizontal drilling means that a typical well can cost into the millions.” Howard L. Boigon & Ana Gutierrez, *Expectations vs. Reality: Performance and Nonperformance Issues in Oilfield Goods and Services Contracts*, in OIL & GAS AGREEMENTS: CONTRACTING FOR GOODS, SERVICES, AND PEOPLE 2-1, 2-2 (2013).

⁶ See Michael Pappas, *Energy Versus Property*, 41 FLA. ST. U. L. REV. 435 (2014); Troy A. Rule, *Property Rights and Modern Energy*, 20 GEO. MASON L. REV. 803 (2013). “The common law rules relating to trespass and other torts that are implicated in the use of longer and longer horizontal well laterals and hydraulic fracturing have come under siege. Some of those rules need to be changed . . .” Bruce M. Kramer, *Horizontal Drilling and Trespass: A Challenge to the Norms of Property and Tort Law*, 25 COLO. NAT. RESOURCES, ENERGY & ENVTL. L. REV. 291, 338 (2014).

⁷ “[A] subsurface easement should be obtained from the surface owners or their lessees of tracts between the drillsite and the bottom hole location to prevent a subsurface trespass. If the minerals have been severed from the surface, easements should also be obtained from the mineral owners and their lessors.” Schweikhardt, *supra* note 2, at 353 (footnote omitted); see also John W. Broomes, *Spinning Straw into Gold: Refining and Redefining Lease Provisions for the Realities of Resource Play Operations*, 57 ROCKY MTN. MIN. L. INST. 26-1, 26-15 (2011).

whose permission must be sought in order to avoid liability.⁸ Horizontal exploration companies—as well as mineral and surface owners—are venturing into territory in need of clarification.⁹ Some recent developments refine the problem, namely, attempts by state legislatures to define subsurface pore space ownership. Other interested parties cite a need to reevaluate outmoded property entitlements in light of modern technology to limit liability; for instance, suggesting that liability should only attach for substantial subsurface interference and damage—or through conceptualizing the deep subsurface as a “public commons” and not a private entitlement.¹⁰

This Comment is the first to provide a brief survey of the ways practitioners suggest obtaining permission for horizontal drilling operations, while attempting to resolve the role subsurface easements play as one particular tension in the balance among traditional property conceptions, modern energy and technology, and the public interest in efficient oil and gas development. In analyzing subsurface easements, I argue courts should continue to adhere to traditional property entitlements—such as the right to exclude, the right to use, and the residue of the *ad coelum* doctrine—for both surface and mineral owners in horizontal drilling operations. While limiting liability through reconceptualizing a more public subsurface presents a persuasive scheme for analyzing subsurface trespass issues, affirming existing private property entitlements provides a stable, “bright-line” means of safely developing horizontal drilling while also maintaining efficient energy production.

The subsurface, in the oil and gas exploration context, is valuable to both mineral and, to some extent, surface owners. Likewise, unimpeded passage through the subsurface is crucial for

⁸ “I could find no case specifically dealing with the issue of who must grant a subsurface easement for a deviated well: the surface owner, the mineral owner, or the mineral owner’s lessee.” Warren J. Ludlow, *Property Rights vs. Modern Technology: Finding the Right Balance in a World of Energy Shortages*, in SEVERED MINERALS, SPLIT ESTATES, RIGHTS OF ACCESS, AND SURFACE USE IN MINERAL EXTRACTION OPERATIONS 14-1, 14-6 (2005). “[I]t does not appear that any courts have yet been called upon to resolve the questions posed . . . regarding horizontal wellbore interference . . .” Broomes, *supra* note 7, at 26-15.

⁹ “The common law jurisprudence on multiple mineral development or split estates is still in its infancy.” Kramer, *supra* note 6, at 331.

¹⁰ See *infra* Part III.B.

drilling operations as a means of limiting surface liability, cutting costs through multiple lateral wellbores, and, most importantly, effectively accessing the hydrocarbon reservoir. By properly respecting energy and property interests, property owners should be duly compensated for the “right to use” the subsurface. Policymakers, recognizing the compelling public interest in profitable energy production, should provide regulatory or statutory means to rectify practical difficulties arising from respecting traditional property rights through “commodification of the subsurface.”

Part I of this Comment will briefly address the horizontal drilling process in the United States and what practitioners identify as the relevant case law concerning ownership and liability issues related to horizontal drilling. Part I will also address the potential impact of recent pore space ownership legislation. Part II will discuss the merits and complications of four suggested approaches to obtaining easements in light of subsurface trespass and interference. Lastly, this Comment will argue the need for courts to continue to uphold traditional property entitlements in addressing subsurface liability in horizontal drilling while policymakers should regulate inherent practical difficulties to further accommodate the needs of modern technology and energy.

I. HORIZONTAL DRILLING AND SUBSURFACE RIGHTS

A. Horizontal Drilling Basics

Horizontal drilling may be simply defined as the “process of drilling sideways from a vertical well.”¹¹ In conjunction with hydraulic fracturing, this technology has evolved into its current transformational role in American energy production.¹²

A horizontal drilling company first gains information about the depth of the hydrocarbon reservoir through drilling a

¹¹ *What Is Horizontal Drilling?*, BARNETT SHALE ENERGY EDUC. COUNCIL, <https://d3n8a8pro7vhmx.cloudfront.net/northtexansfornaturalgas/pages/353/attachments/original/1430336694/BSEEC-FactSheet-HorizontalDrilling.pdf?1430336694> (last visited Aug. 11, 2015).

¹² See generally *New Developments in Upstream Oil and Gas Technologies: Hearing Before the S. Comm. on Energy and Natural Resources*, 112th Cong. (2011).

conventional vertical well.¹³ The horizontal operation then drills vertically until, using careful measurements, the horizontal operator calculates the proper point where the drill bit turns into the reservoir.¹⁴ From this “kickoff point,” the lateral wellbore extends thousands of feet through the subsurface along the mineral formation in preparation for hydrocarbon capture.¹⁵

Once the desired bottom hole location is reached, the operator inserts production casing to prepare for hydraulic fracturing.¹⁶ A “frack job” injects water through the wellbore at high pressure into the hydrocarbon reservoir “to induce fractures or expand existing natural fractures and to carry [sand and ceramic] ‘proppants’ into those fractures.”¹⁷ Fracturing increases the drainage area of the reservoir, creating greater productive capacity for the horizontal operation.¹⁸

¹³ See Rachel Curtis, *What Is Horizontal Drilling, and How Does It Differ from Vertical Drilling?*, INST. FOR ENERGY & ENVTL. RES. FOR NORTHEASTERN PA. (Jan. 14, 2011), <http://energy.wilkes.edu/pages/158.asp>.

¹⁴ *Id.* “[A] wellbore is drilled vertically thousands of feet down into the shale, below the deepest fresh water aquifer . . . [the] downhole drilling motor then makes a 90-degree turn, which takes about a quarter of a mile to make the turn, and continues into the shale . . .” *What Is Horizontal Drilling?*, *supra* note 11.

¹⁵ See U.S. ENVTL. PROT. AGENCY, *DIRECTIONAL DRILLING TECHNOLOGY 1* (2010), available at <http://www.epa.gov/cmop/docs/dir-drilling.pdf>. “Th[e] objective is to expose significantly more reservoir rock to the wellbore surface than would be the case with a conventional vertical well penetrating the reservoir perpendicular to its plane of more extensive dimension . . .” *DRILLING SIDEWAYS*, *supra* note 2, at 1.

¹⁶ See *What Is Horizontal Drilling?*, *supra* note 11. While hydraulic fracturing is essential to horizontal drilling, “fracking” trespass issues are not the focal point of this Comment. Trespass liability for hydraulic fracturing implicates traditional property rights, but will be avoided so as not to distract from a fuller subsurface easement analysis. See *infra* notes 86-90 and accompanying text.

¹⁷ Hannah Wiseman, *Untested Waters: The Rise of Hydraulic Fracturing in Oil and Gas Production and the Need to Revisit Regulation*, 20 *FORDHAM ENVTL. L. REV.* 115, 118 (2009).

¹⁸ “[H]ydraulic fracturing is absolutely necessary to profitably develop oil and gas from shale rock formations and other ‘tight’ formations.” David E. Pierce, *Developing a Common Law of Hydraulic Fracturing*, 72 *U. PITT. L. REV.* 685, 685 (2011).

*B. Subsurface Implications*1. The *Ad Coelum* Doctrine Governs Traditional Rights Against Trespass

The *ad coelum* doctrine presents one foundation for traditional property rights. Summarized, the doctrine provides that, to whomsoever the soil belongs, he owns also to the sky and to the depths.¹⁹ Following *ad coelum*, a fee simple owner purports to own the surface property as well as any subsurface space and formations.²⁰ The division between the mineral and surface estate is traceable to the doctrine,²¹ when the fee owner “severs” minerals from the surface.²² A mineral estate owner, under the doctrine, owns property rights as a proverbial “bundle of sticks” in the mineral estate, retaining, for instance, the right to lease or produce oil and gas from the property, subject to the “rule of capture.”²³

The theoretical “rule of capture” does not protect against liability from subsurface trespass.²⁴ In the oil and gas context, a

¹⁹ “Sir Edward Coke once gave utterance to the statement that ‘*cujus est solum, ejus est usque ad coelum*,’ which, taken literally, means that he who owns the soil owns upward unto heaven.” RESTATEMENT (SECOND) OF TORTS § 159(2) cmt. g (1965).

²⁰ See J. Thomas Lane et al., *Carbon Sequestration: Critical Property Rights and Legal Liabilities—Real Impediments or Red Herrings?*, 32 ENERGY & MIN. L. INST. 795, 817 (2011).

²¹ “The rule provides the foundational basis for common law mineral rights in the United States, allocating private ownership interests in coal and other stationary subsurface mineral deposits to the owners of surface land immediately above those resources.” Rule, *supra* note 6, at 806.

²² “[T]he *ad coelum* principle invests the surface estate owner with the capacity to sever the sub-surface minerals from the surface estate and create a separate mineral estate.” Samantha Hepburn, *Does Unconventional Gas Require Unconventional Ownership? An Analysis of the Functionality of Ownership Frameworks for Unconventional Gas Development*, 8 J. ENVTL. & PUB. HEALTH L. 1, 10 (2013).

²³ See Derek Cook & Jennie K. Martin, *Oil and Gas Basics: Understanding the Sticks to Avoid Stones and Broken Bones*, 76 TEX. B.J. 319, 319 (2013). The “rule of capture” provides that the mineral owner or lessor may drill his or her own tract and recover, without any liability, any oil and gas that may migrate from neighboring tracts. See Lane, *supra* note 20, at 828. State regulatory practices temper “the rule of capture” in attempts to prevent waste and protect correlative rights through unitization of multiple mineral owner interests into a single unit or mandating well spacing requirements. See Rule, *supra* note 6, at 808 & n.21.

²⁴ “[A] trespass may be committed on, beneath, or above the surface of the earth.” RESTATEMENT (SECOND) OF TORTS § 159(1) (1965).

trespass occurs when a well is bottomed on the land of another without consent, whether intentional or unintentional.²⁵ Subsurface trespass accompanies the drilling of directional wells without permission from the proper owner.²⁶ The liability and damages stemming from a subsurface trespass may depend on the good or bad faith conversion of oil and gas from the neighbor's land; the trespassing operation may also be enjoined.²⁷

2. *Ad Coelum* and "Takings" Defined in *United States v. Causby*

The Supreme Court significantly limited the *ad coelum* doctrine in the airspace context in *United States v. Causby*.²⁸ In *Causby*, the Court likened airspace to a "public highway" in which the surface owner only controls the immediate reaches of the atmosphere, or as much space above that the landowner can reasonably use.²⁹ The Court stated *ad coelum* "has no place in the modern world," or else every overhead airplane flight would risk a trespass.³⁰ The landowner still holds some small, limited private airspace rights,³¹ but aircraft may utilize the air "public domain" subject only to government regulation. Liability to surface owners exists solely for flights so low and frequent that they cause direct and immediate interference with landowner enjoyment.³²

The United States Constitution requires compensation when something directly and immediately interferes with a landowner's enjoyment of his or her property.³³ Eminent domain power, exercised through the Fifth Amendment's Takings Clause, allows

²⁵ See WILLIAMS & MEYERS, OIL AND GAS LAW § 227 (2013).

²⁶ *Id.*

²⁷ *Id.*; Owen L. Anderson, *Lord Coke, the Restatement, and Modern Subsurface Trespass Law*, 6 TEX. J. OIL, GAS, & ENERGY L. 203, 215-16 (2011) [hereinafter Anderson, *Lord Coke*] (detailing means for calculating damages in subsurface trespasses).

²⁸ 328 U.S. 256 (1946).

²⁹ *Id.* at 264.

³⁰ *Id.* at 260-61.

³¹ See Troy A. Rule, *Airspace and the Takings Clause*, 90 WASH. U. L. REV. 421 (2012).

³² *Causby*, 328 U.S. at 266-67.

³³ U.S. CONST. amend. V. ("nor shall private property be taken for public use, without just compensation"). In *Causby*, such action would constitute an "easement, if permanent and not merely temporary," because "[i]t would be a definite exercise of complete dominion and control over the surface of the land," destroying the "owner's right to possess and exploit the land." 328 U.S. at 262.

a government to confiscate, condemn, or authorize a third party to take private property³⁴ for a public purpose by paying the private owner “just compensation.”³⁵ Such action may constitute either a “physical” or “regulatory” taking depending on whether a permanent physical intrusion has taken place or the landowner’s property is sufficiently burdened by government regulation.³⁶

3. Pore Space Designation and Development

While some ambiguity exists, commentators generally accept that the owner of a surface estate also owns the subsurface pore space.³⁷ Under such consensus, a fee simple owner certainly owns the subsurface estate.³⁸ Cases dealing with severed mineral estates generally vest pore ownership in the surface, with the mineral owner possessing subsurface rights in specific contexts.³⁹ A number of states have attempted to designate pore space

³⁴ “Property interests . . . are not created by the Constitution. Rather, they are created and their dimensions are defined by existing rules or understandings that stem from an independent source such as state law . . .” *Webb’s Fabulous Pharmacies, Inc. v. Beckwith*, 449 U.S. 155, 161 (1980) (quoting *Bd. of Regents v. Roth*, 408 U.S. 564, 577 (1972)).

³⁵ See R. Lee Gresham & Owen L. Anderson, *Legal and Commercial Models for Pore-Space Access and Use for Geologic CO₂ Sequestration*, 72 U. PITT. L. REV. 701, 714 (2011). The Takings Clause “was designed to bar Government from forcing some people alone to bear public burdens which, in all fairness and justice, should be borne by the public as a whole.” *Armstrong v. United States*, 364 U.S. 40, 49 (1960).

³⁶ See Gresham & Anderson, *supra* note 35, at 714-15.

³⁷ “[O]wnership of pore space by the surface owner is considered the majority view in the United States . . .” Jean Feriancek, *Resolving Ownership of Pore Space*, NAT. RESOURCES & ENV’T, Winter 2012, at 49, 49. “[T]he most likely ‘owner’ of the pore space is the surface owner.” Owen L. Anderson, *Geologic CO₂ Sequestration: Who Owns the Pore Space?*, 9 WYO. L. REV. 97, 99 (2009) [hereinafter Anderson, *Geologic*].

³⁸ See, e.g., *Emeny v. United States*, 412 F.2d 1319 (Ct. Cl. 1969) (holding that the federal government, under an oil and gas lease, could not inject helium into the subsurface of land owner in fee simple).

³⁹ See Lane, *supra* note 20, at 821 (citing cases). “The cases fall into two basic sets: those that support surface owner pore-space ownership and those that favor the mineral owner. By and large, Texas case law favors the surface owner.” Madeline Mathews, Note, *Carbon Sequestration and Pore Space Ownership in Texas*, 41 TEX. ENVTL. L.J. 205, 215 (2011). “[M]ineral owners, as holders of the dominant estate, have the right to explore for and produce oil, gas, and minerals without unreasonable interference from the surface owner. When a surface owner unreasonably interferes with the rights of the mineral owner, the surface owner may be enjoined and liable for damages.” Anderson, *Geologic*, *supra* note 37, at 106.

ownership through legislative action.⁴⁰ Pore space development is important to facilitate carbon sequestration efforts aimed at combating climate change, while also refining the ambiguity inherent in common law subsurface ownership.⁴¹

4. Directional Wellbore Passage Through Unpooled Tracts

From the principle that unauthorized movement across another's property constitutes a trespass, only a handful of courts have examined whose permission is necessary to allow directional wellbore passage across a neighboring tract en route to the leased oil and gas reservoir.⁴² Horizontal drilling increases the potential for future subsurface trespass and interference cases involving unpooled tracts.⁴³

a. *Humble Oil & Refining Co. v. L. & G. Oil Co.*

In *Humble Oil & Refining Co. v. L. & G. Oil Co.*, the Texas Court of Civil Appeals suggested that permission from the mineral

⁴⁰ See, e.g., WYO. STAT. ANN. § 34-1-152(a) (2015); N.D. CENT. CODE § 47-31-03 (2015).

⁴¹ “CCS [carbon capture and sequestration] involves capturing CO₂ from power generation and industrial processes, transporting the CO₂ to an area with suitable geology, and injecting it into deep geologic formations, sequestering the CO₂ underground for long periods of time.” Alexandra B. Klass & Elizabeth J. Wilson, *Climate Change, Carbon Sequestration, and Property Rights*, 2010 U. ILL. L. REV. 363, 364. “In many jurisdictions, the potential need to obtain leases from all possible pore space owners and uncertainty about who those owners are may continue to be a barrier to GCS development.” Feriancek, *supra* note 37, at 51. For instance, does a pore space statute “1) recognize limited private property rights in subsurface pore space; 2) recognize property rights in the pore space based on its existing use and reasonably foreseeable uses; [or] 3) recognize discrete property rights in the pore space”? See Matthew J. Lepore & Derek L. Turner, *Legislating Carbon Sequestration: Pore Space Ownership and Other Policy Considerations*, COLO. LAW., Oct. 2011, at 61, 64-65.

⁴² See *supra* notes 24-27 and accompanying text.

⁴³ According to established law, directional drilling in “pooled” or “unitized” acreage does not require permission of the pooled mineral or surface owner through whose subsurface the drill passes. See, e.g., *Cont'l Res., Inc. v. Farrar Oil Co.*, 559 N.W.2d 841 (N.D. 1997) (The North Dakota Supreme Court declined to invalidate a forced pooling order when Farrar, a pooled mineral lessee, sued for subsurface trespass when the horizontal wellbore penetrated Farrar's subsurface.); *Nunez v. Wainoco Oil & Gas Co.*, 488 So. 2d 955, 963 (La. 1986) (“Every person has the right to acquire, own, control, use, enjoy, protect, and dispose of private property. This right is subject to reasonable statutory restrictions and the reasonable exercise of the police power.” (quoting LA. CONST. art. I, § 4)).

owner or lessee is only necessary if drilling interfered with the mineral lessee's right to produce minerals.⁴⁴ The Texas Railroad Commission granted the defendants permission to drill two directional wells using a one-acre, off-lease tract purchased to drill to the permit location; Humble Oil, the mineral lessee of the one-acre tract, attempted to enjoin the defendants from drilling through its mineral lease in order to access the lease.⁴⁵ Humble Oil did not argue that it intended to produce minerals from the surface site immediately, but that it may do so in the future.⁴⁶ The court remarked that whether the drilling interfered with the lessee's rights was a question of fact, but conceded to the trial court, which denied the injunction and found no interference.⁴⁷ The Texas Court of Civil Appeals further established the present "interference" needed for the lessee to enjoin the surface operator in *Atlantic Refining Co. v. Bright & Schiff*: the lessee "must prove that he needs the surface at the time and place then being used by the other user."⁴⁸

b. Chevron Oil Co. v. Howell

In contrast to *Humble*, the Texas Court of Civil Appeals in *Chevron Oil Co. v. Howell* upheld an injunction for a directional well entering plaintiff's—Magna Oil Corporation—lease and bottomed on acreage leased by Chevron Oil because the court assumed subsurface passage results in mineral formation

⁴⁴ *Humble Oil & Ref. Co. v. L. & G. Oil Co.*, 259 S.W.2d 933, 938 (Tex. Civ. App. 1953).

⁴⁵ "[A]ppellant alleged that the entry on a one acre tract of land under the permits is a violation of its vested property and legal rights, it being the owner of an oil, gas and mineral leasehold estate on lands inclusive of said one acre tract . . ." *Id.* at 934.

⁴⁶ *Id.* at 938.

⁴⁷ *Id.* The court did not examine the nature of the lease granted, which gave Humble Oil the "exclusive" right to explore and produce oil or gas. See Kramer, *supra* note 6, at 329 (citing Stanley D. Rosenberg, Note, *Oil and Gas—Surface Owner's Right to Drill a Well from His Property, the Mineral Lease of Which Is Held by Another, and Bottom It in Adjoining Land Leased to the Driller—Humble Oil & Refining Co. v. L. & G. Oil Co.*, 259 S.W.2d 933 (Tex. Civ. App.—Austin 1953, error ref'd n.r.e.), 32 TEX. L. REV. 353 (1954)). The court ignored the "exclusive" nature of the lease, and "[t]hrough its findings that there was not an unreasonable interference with the 'exclusive' exploration and development rights, the court was clearly implying that the term 'exclusive' means something less." *Id.*

⁴⁸ *Atl. Ref. Co. v. Bright & Schiff*, 321 S.W.2d 167, 169 (Tex. Civ. App. 1959).

damage.⁴⁹ The plaintiff Howell, who owned the leased surface land and served as Magna Oil's Vice-President, had not given Chevron permission to penetrate its subsurface; Chevron claimed to operate under a license granted by the United States government to access both the surface and subsurface.⁵⁰ Chevron appealed the injunction claiming the drilling operation did not interfere with the lessee's mineral rights and that "there is no competent evidence of damage . . . to any oil, gas or mineral formation under the surface."⁵¹ The court denied Chevron's appeal by finding damage based on testimony that "to drill the hole is to damage the formation—'any time you drill into something there is bound to be some damage.'"⁵²

How can and will courts decide between *Humble* and *Chevron* in future cases? There was no substantial proof of damage to the subsurface in *Chevron*, though the court perhaps implied that any subsurface penetration without permission constitutes a trespass.⁵³ In contrast, the *Humble* court required a "showing of interference with the rights of the mineral owner or lessee."⁵⁴ "Interference" as drainage from the adjacent mineral estate without a showing of directional drilling interference—and following the reasoning applied in *Humble* and elucidated in *Atlantic Refining*—will not constitute a trespass because the operator is protected by the "rule of capture."⁵⁵ Following *Hancock*

⁴⁹ *Chevron Oil Co. v. Howell*, 407 S.W.2d 525 (Tex. Civ. App. 1966).

⁵⁰ *Id.* at 526-27.

⁵¹ *Id.* at 527-28.

⁵² *Id.* at 528; see also *Hancock Oil Co. v. Meeker-Garner Oil Co.*, 257 P.2d 988, 992 (Cal. Dist. Ct. App. 1953) ("[O]ne who drills through leased land to cause drainage from it violates the lessee's rights and commits a trespass against him. Such conduct being a trespass against the lessee, it can make no difference that the owner-lessor has consented.").

⁵³ "*Chevron* can be argued as authority for an injunction by the mineral lessee An injunction should only be granted upon showing of a real and substantial damage to the producing formation, and not on the superficial dicta in *Chevron* that any penetration will do damage to the producing formation." Carroll G. Martin, *Yours, Mine, and Ours: Conflicts Between Mineral and Surface Estates*, 46 ROCKY MTN. MIN. L. INST. 19-1, 19-27 (2000).

⁵⁴ *Id.* at 19-24. "[T]he holding of [*Chevron*] is sensible because Chevron did not have permission to access the surface. However, the reasoning is troubling" Wozniak & Jost, *supra* note 3, at 11-25 (footnote omitted).

⁵⁵ "This is logical because the drainage caused by the deviated well is no greater than drainage that would have been caused by a well with a surface location on the same tract as the bottom hole location." Martin, *supra* note 53, at 19-26-19-27.

however, any drilling through leased acreage may constitute a trespass, regardless of consent.⁵⁶

c. *Lightning Oil Co. v. Anadarko E&P Onshore, LLC*

The Texas Court of Civil Appeals in *Lightning Oil Co. v. Anadarko*, though pending trial, perhaps provided a first look at how courts may decide future subsurface trespass and interference issues in horizontal drilling.⁵⁷

In *Lightning Oil*, Lightning owned minerals in a severed estate with the surface estate owned by Briscoe Ranch, Inc.⁵⁸ Lightning Oil also owned minerals, along with the Texas government, in the Chaparral Wildlife Management Area, adjoining the Briscoe Ranch mineral estate. Anadarko obtained a mineral lease from the Texas government to explore for minerals under Chaparral WMA. Anadarko planned to drill one horizontal well, with others to follow, into the Chaparral estate from a surface location on Briscoe Ranch. In order to reach the Chaparral lease, Anadarko's horizontal wellbore would pass through the Lightning owned minerals.⁵⁹ Lightning sought an injunction to prevent Anadarko from drilling through its mineral estate, asserting that the proposed Anadarko well would interfere with and substantially harm Lightning's plans for future wells, which the trial court denied.⁶⁰

On interlocutory appeal, the appeals court did not address whether Anadarko's proposed actions constituted a trespass, but only whether the court should grant Lightning a temporary injunction.⁶¹ The appeals court determined that because Lightning failed to produce evidence that it would suffer

⁵⁶ *Hancock Oil Co.*, 257 P.2d at 992.

⁵⁷ *Lightning Oil Co. v. Anadarko E & P Onshore, LLC*, No. 04-14-00152-CV, 2014 WL 5463956 (Tex. App. Oct. 29, 2014).

⁵⁸ *Id.* at *1.

⁵⁹ "Anadarko obtained permission from Briscoe Ranch, the surface owner, and entered into a written Surface Use and Subsurface Easement Agreement allowing it to establish drill sites for horizontal wells that will enter and cross through Lightning's Mineral Estate . . ." *Id.* at *1-2.

⁶⁰ "[T]he trial court found that Anadarko's conduct may constitute a trespass into Lightning's mineral rights, but, based on the evidence presented, 'there is no interference' with Lightning's mineral interests . . ." *Id.* at *2.

⁶¹ *Id.* at *3.

“probable, imminent, and irreparable” injury from Anadarko’s first proposed well through Lightning’s mineral estate, Lightning was not entitled to a temporary injunction.⁶² The appeals court dispensed with Lightning’s arguments that hydraulic fluid could leak out from inadequate production casing and damage Lightning’s mineral estate and that drilling would obligate Lightning, as lessee, to drill offset wells costing “millions of dollars” to prevent drainage from Anadarko’s proposed well.⁶³ The court also determined that Anadarko’s placement of the wellbore would not currently interfere with Lightning’s future drilling plans.⁶⁴ The court remarked that Lightning showed “a potential for injury to Lightning’s mineral interests in the future,” but not of the degree permitting an injunction.⁶⁵

II. SURFACE AND SUBSURFACE USES IN HORIZONTAL DRILLING

A. Determining the Policy Vehicle for Subsurface Development

While permission from a surface or mineral owner in horizontal drilling could be labeled a license, permission is normatively termed an easement as it recognizes a form of interest in land.⁶⁶ For instance, implied easements allow a mineral owner, as the dominant estate, to make reasonable use of the surface estate to extract minerals, such as building a road to the drill site or conducting seismic operations.⁶⁷ In the absence of

⁶² *Id.* at *5.

⁶³ *Id.* at *3-4. Lightning testimony acknowledged that in the small chance of a casing failure or blowout, Lightning’s “loss could be quantified and compensated”; furthermore, “even if Anadarko [drilled] from a different surface location and did not enter [Lightning’s mineral estate], Lightning would have the same offset [lease] obligation” if drainage occurred. *Id.* at *4.

⁶⁴ *Id.* at *4. Testimony recognized that Lightning’s proposed well could be drilled without any interference from Anadarko’s proposed wells: “[Lightning’s] proposed Cutlass Well No. 3 ‘would never encounter any portion of Anadarko’s planned wellbores’ due to the 330 foot spacing rules for the field.” *Id.*

⁶⁵ *Id.* at *5.

⁶⁶ Black’s Law Dictionary defines an easement as “[a]n interest in land owned by another person, consisting in the right to use or control the land, or an area above or below it, for a specific limited purpose (such as to cross it for access to a public road).” BLACK’S LAW DICTIONARY 622 (10th ed. 2014).

⁶⁷ *See, e.g.,* Gerrity Oil & Gas Corp. v. Magness, 946 P.2d 913, 927 (Colo. 1997) (“Th[e] ‘due regard’ concept requires mineral rights holders to accommodate surface

express contractual permission, a mineral owner cannot use the surface of an adjacent tract of land to extract minerals from the subsurface, but rather, permission must be granted from the surface owner of the well surface location.⁶⁸ Furthermore, most jurisdictions accept that a tenant in common *cannot* grant a specific easement in common property or create a right of way without the consent or authorization of other co-tenants.⁶⁹

In consideration of such common law principles, subsurface easements fit into the conflict commentators recognize in striking a balance between modern energy technology and property rights: by either respecting established property entitlements or reshaping property by accommodating energy development.⁷⁰ Preserving existing property rights promotes stability, clarity, and development by limiting uncertainty; favoring energy benefits society by “keeping up with the times” to best allocate resources.⁷¹ For instance, societal interests may be better served by converting some subsurface private space to a public “commons,” as has been

owners to the fullest extent possible consistent with their right to develop the mineral estate.”).

⁶⁸ See Ludlow, *supra* note 8. “It is a well established principle of property law that the right to use the surface of land as an incident of the ownership of mineral rights in the land, does not carry with it the right to use the surface in aid of mining or drilling operations on other lands.” Russell v. Tex. Co., 238 F.2d 636, 642 (9th Cir. 1956).

⁶⁹ See Ludlow, *supra* note 8; Tex. Mortg. Co. v. Phillips Petroleum Co., 470 F.2d 497, 499 (5th Cir. 1972) (“It is well settled that a tenant in common cannot, without the precedent authority or subsequent ratification of his cotenants, impose an easement or dedication upon the common property in favor of a third party.”); King v. Oakmore Homes Ass’n, 195 Cal. App. 3d 779, 783 (Cal. Ct. App. 1987) (“[O]ne joint tenant has not by reason of the relationship any authority to bind his cotenant with respect to the latter’s interest in the common property.” (quoting Carbine v. Meyer, 272 P.2d 849, 854 (Cal. Ct. App. 1954))); Ecenbarger v. Lesoine, 438 A.2d 969, 973 (Pa. Super. Ct. 1981) (“When property is thus jointly owned, *all* of the co-owners must join in the deed before an easement on their jointly owned property will arise . . .”). This concept is somewhat contrasted with the rights of mineral cotenants to develop the minerals underneath the surface. See generally Marla E. Mansfield, *A Tale of Two Owners: Real Property Co-Ownership and Mineral Development*, 43 ROCKY MTN. MIN. L. INST. 20-1, 20-19 (1997) (“[A] tenant in common, without the consent of his cotenant, has the right to develop and operate the common property for oil and gas and for that purpose may drill wells and erect necessary plants. He must not, however, exclude his cotenant from exercising the same rights and privileges.”).

⁷⁰ See Pappas, *supra* note 6, at 436; Rule, *supra* note 6, at 803.

⁷¹ See Rule, *supra* note 6, at 812-14.

done with airspace.⁷² However, policymakers should consider whether private citizens will have “true access” to the reconceptualized asset, the potential for takings claims, and whether the commons will facilitate overexploitation of the resource.⁷³

In weighing private and public interests, policymakers should further consider the effect of implementing “property rule remedies” or “liability rule remedies” to protect established property entitlements like the “the right to exclude” and “the right to use.”⁷⁴ A property rule remedy, in the subsurface easement context, grants the right holder the autonomy to voluntarily transact with a third party for that right, and the protection of the courts through injunctive relief to veto any infringement on such right.⁷⁵ A liability rule remedy gives the right holder only an objectively determined value when a third party is willing to pay for the right, as well as no veto power for violation. “[P]ayment of monetary damages will be sufficient to compromise his property right.”⁷⁶

⁷² For instance, the *Causby* Court affirmed airspace as a “public highway” because otherwise, “every transcontinental flight would subject the operator to countless trespass suits. Common sense revolts at the idea. To recognize such private claims to the airspace would . . . seriously interfere with . . . control and development in the public interest . . .” *United States v. Causby*, 328 U.S. 256, 261 (1946).

⁷³ See Rule, *supra* note 6, at 819-20.

⁷⁴ See Pappas, *supra* note 6, at 450-51. “Property expectations in the right to exclude and the right to use and enjoy would be of little good without government-enforced remedies.” *Id.* at 450; see also James E. Krier & Stewart J. Schwab, *Property Rules and Liability Rules: The Cathedral in Another Light*, 70 N.Y.U. L. REV. 440 (1995).

⁷⁵ See Pappas, *supra* note 6, at 451.

⁷⁶ *Id.* “[A] liability-rule remedy is the minimum expected remedy.” *Id.* at 452. Property rule and liability rule remedies must be fashioned to fit the circumstances:

[P]roperty-rule protection is often appealing because of its propensity for “encouraging investment, facilitating market exchange, and protecting [an asset’s] subjective value.” However, even the strongest advocates of property-rule protection concede that it can generate “unacceptable inefficiencies” in some situations. . . . [L]iability rules [are used] “to fine-tune basic exclusionary regimes in high-stakes contexts.” In particular, liability-rule protection can better promote efficiency in instances where imperfect information, holdout problems, free-rider problems, or other barriers are likely to impede . . . bargaining necessary to allocate scarce resources to their highest valued uses.

Rule, *supra* note 6, at 833 (footnotes omitted).

B. Appraising Surface and Subsurface Uses in Horizontal Drilling

In developing means for dealing with subsurface easements, policymakers must acknowledge not only the foundational importance of unimpeded horizontal drilling through the subsurface, but also other external considerations. In the global scheme, horizontal drilling and hydraulic fracturing drives the current boom in domestic oil and natural gas production by providing cheap energy and strong economic growth for states in horizontal plays.⁷⁷ As technology and drilling techniques continue to improve, horizontal drilling and hydraulic fracturing should further solidify American independence from foreign energy sources and secure its place as the world's top oil supplier.⁷⁸ In turn, oil companies will continue to enjoy the financial success of horizontal drilling and hydraulic fracturing operations, despite the increased costs of drilling.⁷⁹

On the ground, horizontal drilling protects operators by limiting the number of surface locations needed to drill into hydrocarbon reservoirs. Multilateral drilling, or drilling through “stacked laterals,” is often utilized in horizontal drilling operations where several wellbore branches and wells are drilled

⁷⁷ See Michael Cembalest, *The Most Important Energy Developments of 2012: How Countries Are Planning for Independence Day*, 43 ENVTL. L. REP. 10121, 10122 (2013) (quoting LEONARDO MAUGERI, OIL: THE NEXT REVOLUTION 6 (2012)).

The shale/tight oil boom in the United States is not a temporary bubble, but the most important revolution in the oil sector in decades. It will probably trigger worldwide emulation over the next decades . . . given the fact that most shale/tight oil resources in the world are still unknown and untapped.

Id.

⁷⁸ See Grant Smith, *U.S. Seen as Biggest Oil Producer After Overtaking Saudi*, BLOOMBERG (July 4, 2014, 10:56 AM), <http://www.bloomberg.com/news/2014-07-04/u-s-seen-as-biggest-oil-producer-after-overtaking-saudi.html>; see also Daniel Yergin, *Congratulations, America. You're (Almost) Energy Independent.*, POLITICO (Nov. 2013), <http://www.politico.com/magazine/story/2013/11/congratulations-america-youre-almost-energy-independent-now-what-98985.html>.

⁷⁹ “Horizontal and directional drilling have also proven exceedingly economical, with some studies reporting production increases from 200% to 2500%.” Robert P. Thibault et al., *A Modern Look at the Law of Subsurface Trespass: Does It Need Review, Refinement, or Restatement?*, 54 ROCKY MTN. MIN. L. INST. 24-1, 24-5-24-6 (2008); see also Jason A. Proctor, Note, *The Legality of Drilling Sideways: Horizontal Drilling and Its Future in West Virginia*, 115 W. VA. L. REV. 491, 498 (2012) (calculating costs of a typical horizontal drilling and hydraulic fracturing operation).

from a single vertical wellbore.⁸⁰ Accordingly, the operator can save hundreds of thousands of dollars through the use of a limited number of drill sites. In addition to saving time and costs, the operator escapes greater liability to surface owners that stem from maintaining multiple drill sites through multilateral horizontal drilling.⁸¹ A horizontal drilling location may also be desirable due to surface obstructions.⁸²

For either the surface or mineral owner, the reasonable use and development of the subsurface presents limited, though valuable, opportunities.⁸³ Generally, for the mineral owner, the right to use the subsurface to conduct drilling operations is a foreseeable, reasonable, and established entitlement, subject only to the state's police power.⁸⁴ For the surface owner, the right to use and exclude others from subsurface use is strongly tied to whatever implications stem from pore space designation.⁸⁵

⁸⁰ “[N]ot only can one well site support the drilling of multiple wells in one layer of rock, radiating from the initial vertical borehole like spokes on a bicycle wheel, but also the same well site can potentially support the drilling of multiple lateral drainholes in multiple layers of strata” Thomas E. Kurth et al., *American Law and Jurisprudence on Fracing*, 58 ROCKY MTN. MIN. L. INST. 4-1, 4-11 (2012).

⁸¹ *Id.* “The location of wellbores outside of the correlative interval may become the new standard operating procedure to the extent that a single surface location may be the host to numerous horizontal laterals.” Kramer, *supra* note 6, at 331. “One of the benefits of horizontal drilling, from an environmental perspective, is the fact that horizontal drilling and hydrofracturing can limit surface disturbance. For example, one well pad on a five-acre area can be used to drill as many as ten wells.” John W. Carroll, *Environmental Issues Arising from Development of the Marcellus Shale*, in NAVIGATING LEGAL ISSUES AROUND THE MARCELLUS SHALE 51 (2011).

⁸² See Carroll Martin, *Occupied Territory: Competing Land Uses by the Owners of the Surface and Mineral Estates*, 59 CAIL INST. ON OIL & GAS L. § 14.03 (2008) (“The directional well often is needed because of surface obstructions such as residential or commercial development, bodies of water, or rough terrain.”).

⁸³ This is to distinguish oil, gas, or other mineral operations which, for the mineral owner, undoubtedly provide value. For the surface owner, the subsurface space “[i]n light of the large scale, permanent geological sequestration proposed, the notion that the subsurface is unusable and valueless property is no longer valid.” Sarah Anne Lishman, Comment, *Deep in the Heart of Texas: How Carbon Sequestration Will Affect Valuation of the Subsurface*, 45 ST. MARY'S L.J. 283, 295 (2014). Other subsurface uses, such as pipelines and sewers, logically fall under “right to use” and “right to exclude” entitlements. For a discussion of valuing surface and subsurface easements, see Donald Sherwood, *Easement Valuation*, RIGHT OF WAY, May-June 2006, at 30.

⁸⁴ See, e.g., *Phillips Petroleum Co. v. Cowden*, 241 F.2d 586, 590 (5th Cir. 1957) (“[T]he right to explore for oil and minerals is a valuable property right that can be legally protected.”); Mansfield, *supra* note 69.

⁸⁵ See *supra* notes 37-41 and accompanying text.

Of all factors, policymakers should also consider deep subsurface migration of fluids as an instrumental battleground in determining rights for subsurface exclusion and use.⁸⁶ Most famously, the Texas Supreme Court in *Coastal Oil & Gas Corp. v. Garza Energy Trust* allowed the rule of capture to trump subsurface mineral ownership rights when fracking fluid crossed subsurface property boundaries.⁸⁷

While hydraulic fracturing and horizontal drilling may temper traditional property entitlements, courts are willing to selectively reassert the primacy of the *ad coelum* doctrine in the context of oil and gas.⁸⁸ In *Stone v. Chesapeake Appalachia, LLC*, a United States district court declined to follow *Garza* and held hydraulic fracturing trespass actionable.⁸⁹ Notably, the

⁸⁶ “[T]he trend in the law is that property owners do not have the right to exclude deep subsurface migration of fluids.” *FPL Farming, Ltd. v. Tex. Natural Res. Conservation Comm’n*, No. 03-02-00477-CV, 2003 WL 247183, at *3 (Tex. App. Feb. 6, 2003). An Ohio court, considering whether injecting wastes into deep subsurface constituted a subsurface trespass upon surface owner rights, reasoned the surface owner must accept some limitations on property use as with airspace and diminishing *ad coelum*: “[A]ppellants’ subsurface rights in their properties include the right to exclude invasions of the subsurface property that actually interfere with appellants’ reasonable and foreseeable use of the subsurface.” *Chance v. BP Chems., Inc.*, 670 N.E.2d 985, 992 (Ohio 1996).

⁸⁷ *Coastal Oil & Gas Corp. v. Garza Energy Trust*, 268 S.W.3d 1 (Tex. 2008). The court specifically stated that the law of subsurface trespass need not extend more than two miles below the subsurface because Lord Coke, just as he could not imagine airplanes, neither could he fathom petroleum exploration: “[C]ujus est solum ejus est usque ad coelum et ad inferos—‘has no place in the modern world.’ Wheeling an airplane across the surface of one’s property without permission is a trespass; flying the plane through the airspace two miles above the property is not.” *Id.* at 11 (footnote omitted).

⁸⁸ In *Hill v. Southwestern Energy Co.*, the court held that the plaintiffs, whose subsurface spaces defendant’s fracking fluid migrated under, stated a claim for trespass: “Whether *ad coelum* [sic] remains the law in Arkansas, as plaintiffs argue, or the governing rule requires actual interference with some reasonable and foreseeable use, as the gas companies contend, the answer is the same at this point in this case.” *Hill v. Sw. Energy Co.*, No. 4:12-cv-500-DPM, 2013 WL 5423847, at *4 (E.D. Ark. Sept. 26, 2013) (footnote omitted); see also *Faith United Methodist Church & Cemetery of Terra Alta v. Morgan*, 745 S.E.2d 461, 467-68 (W. Va. 2013) (“[A] land owner with a fee simple title owns everything over the land and under it to the center of the earth. This rule extends to the minerals, be they solid (like coal), fluid or fugacious minerals (like oil and gas).”).

⁸⁹ “Under [the *Garza*] rule, the companies may tell a small landowner that either they sign a lease on the company’s terms or the company will just hydraulically fracture under the property and take the oil and gas without compensation.” *Stone v. Chesapeake Appalachia, LLC*, No. 5:12-CV-102, 2013 WL 2097397, at *6 (N.D. W. Va.

Chesapeake court reaffirmed the *ad coelum* doctrine in the subsurface context where subsurface trespass occurred in declaring that there should be “no reason why the desires of the industry should overcome the property rights of small landowners.”⁹⁰

III. ANALYZING TRADITIONAL AND MODERN APPROACHES TO SUBSURFACE EASEMENTS

The subsurface easement issue in the horizontal drilling context may encompass a variety of operational possibilities, but the most common scenario envisioned by practitioners involves horizontal drilling across unpooled property tracts owned by separate owners.⁹¹

A. Protecting Traditional Property Entitlements of Surface and Subsurface Owners

1. Easements from Both Surface and Subsurface Owners

The first approach to the permission and trespass issues outlined above suggests that the operator should obtain

Apr. 10, 2013), *vacated*, No. 5:12-CV-102, 2013 WL 7863861 (N.D. W. Va. July 30, 2013). It should be noted, for precedential value, the court later granted the parties' Joint Motion to Vacate the Court's Order after party settlement.

⁹⁰ *Id.* at *7. “[T]he West Virginia Supreme Court of Appeals as recently as 2003 reaffirmed the [*ad coelum*] maxim, stating that ‘we are considering the case of a lessor who owned from the heavens to the center of the earth.’” *Id.* (quoting *Energy Dev. Corp. v. Moss*, 591 S.E.2d 135, 143 n.14 (W. Va. 2003)). The court defined subsurface trespass under West Virginia law as an “actual, nonconsensual invasion of the plaintiff's property, which interferes with the plaintiff's possession and use of that property.” *Id.* (quoting *Rhodes v. E.I. du Pont de Nemours & Co.*, 636 F.3d 88, 96 (4th Cir. 2011)).

⁹¹ Perhaps the simplest example to demonstrate the issue involves the following: for a drilling unit located on the surface of Tract A, the wellbore will go through the subsurface of Tract A, the subsurface of Tract B (through either a severed or unsevered mineral estate), and into the leased mineral reservoir of Tract C. Generally, for a severed Tract B mineral estate, the operating company must decide whether to obtain the permission from either the surface owner(s), the mineral owner(s), the mineral lessor(s), or both the mineral and surface owners for the horizontal wellbore to cross from Tract A and Tract B into Tract C. This and other scenarios have been analyzed by several practitioners. *See, e.g.*, Wozniak & Jost, *supra* note 3, at 11-42-11-46; H. Philip Whitworth & D. Davin McGinnis, *Square Pegs, Round Holes: The Application and Evolution of Traditional Legal and Regulatory Concepts for Horizontal Wells*, 7 TEX. J. OIL, GAS, & ENERGY L. 177, 200-04 (2012).

easements from surface owners, the subsurface mineral owners, and lessees. Primarily, by seeking both easements, the operator can minimize liability by avoiding potential trespass for a question that has not yet been adequately addressed by the judiciary or legislature.⁹² The scheme is helpful as it emphasizes traditional conceptions of property ownership—the right to exclude and the right to develop minerals beneath the surface—to avoid common law trespass liability.⁹³ Though case law and pore space designation points to the proposition that the surface owner owns and may develop the substrata of property,⁹⁴ the possibility that a wellbore will interfere with the right to develop the mineral estate favors the operator obtaining protection from both surface and subsurface owners while all interested parties wait for direct future guidance from higher authorities.⁹⁵ Practitioners have often advocated for this approach because it avoids liability, though at the expense of squarely answering the issue.⁹⁶

2. Easements from Surface or Subsurface Owners

The second approach tailors the subsurface easement issue to persuasive common law or specific state statutory property conceptions. The most compelling argument in this scheme is to obtain some easement solely from the surface owner, in accordance with *Humble* or *Lightning Oil*, as long as there is no interference with the mineral owner's right to develop the tract through which the wellbore passes.⁹⁷ Further, in states that have

⁹² See *supra* notes 7-9 and accompanying text.

⁹³ “[A] party seeking an off-lease surface location might do well to preemptively resolve the issue by ensuring that the surface owner and the mineral owner (or his lessee) of the proposed drill-site tract all enter into agreements and/or easements authorizing the project.” Broomes, *supra* note 7, at 26-15.

⁹⁴ See *supra* notes 37-41 and accompanying text.

⁹⁵ “To be fully protected, then, an explorer would obtain easements from every owner, both surface and mineral, of each tract in which the proposed well will penetrate before it reaches its bottom hole location.” Ludlow, *supra* note 8.

⁹⁶ See Gordon T. Whitman, *Five Things that Every Texas Energy Lawyer Should Know About Louisiana Oil and Gas Law*, 52 ANN. INST. ON MIN. L. 14, 18-21 (2005) (further discussing lack of judicial guidance on whether subsurface easements should be granted from all cotenants).

⁹⁷ “[A]n easement from the surface owner may prove sufficient in most situations unless there is a likelihood that passage through the off-unit subsurface could interfere with production from these lands.” John W. Morrison & Wade C. Mann, *Reservoir Development: Competing Rights of Horizontal and Vertical Developers and Other*

adopted legislation that vests pore space ownership in the surface owner, the operator should specifically look to the surface owner to obtain a subsurface easement.⁹⁸ Another counterview, following the analysis outlined in *Chevron*, holds that the operator should look to the mineral owner for an easement because the passage of the wellbore through the subsurface creates a presumption that both interference with the right to develop and damage to the mineral reservoir has occurred.⁹⁹ Determining subsurface ownership through a statutory pore space designation may be the approach of the future as carbon sequestration efforts increase. However, the time period in which such statutory measures materialize is unknown as horizontal drilling operations continue unabated and liability questions remain unresolved.¹⁰⁰ Moreover, a court may still tie pore space determinations to common law principles.¹⁰¹ Further, when elucidating the subsurface easement issue by advocating one specific approach, the courts could, and may likely, “catch up” and render one method moot.¹⁰²

Oddities of Vertical Legal Principles Gone Sideways, 58 ROCKY MTN. MIN. L. INST. 11-1, 11-25 (2012).

⁹⁸ “[T]he operator’s intrusion into the pore space may create trespass liability unless the operator obtains a subsurface easement or other contractual mechanism allowing it to drill through the pore space.” Wozniak & Jost, *supra* note 3, at 11-24.

⁹⁹ The mineral owner may embrace two solutions. The first is the mineral owner may only enjoin the operation upon showing surface owner activity will interfere with the right to develop. The second places a presumption that the mineral estate is burdened when the wellbore crosses the mineral owner’s subsurface creating “an unreasonable interference that may be enjoined.” Kramer, *supra* note 6, at 331.

¹⁰⁰ “The pore space or reservoir used . . . [is] owned by different persons or entities. The inability of the . . . operator to obtain leases or consent from the owners of all tracts may lead to liability concerns or claims of trespass” Feriancek, *supra* note 37, at 50.

¹⁰¹ The principle that “the mineral owner has an implicit right of reasonable use to facilitate enjoyment of mineral rights” complicates the surface owner pore space designation. Gresham & Anderson, *supra* note 35, at 709-10.

¹⁰² “[R]esolving the [pore space] ownership issue does not necessarily resolve the question of whether a particular use of the surface or subsurface is legal even where consent from the owner is obtained.” Kramer, *supra* note 6, at 296.

B. Accommodating Modern Energy by Limiting Private Entitlements

1. Subsurface Trespass for Only Substantial Damage

The third approach protects exploration companies by limiting liability to surface and mineral owners for only egregious subsurface trespass situations upon proof of substantial damage or interference with the mineral estate. This view moves away from traditional, *ad coelum* property conceptions in favor of likening the subsurface to overhead airspace.¹⁰³ For this approach, there would be no subsurface trespass “against the mineral owner *unless* the mineral owner suffers actual and substantial harm beyond drainage—such as where the location of the well or wellbore leaves no suitable well or wellbore location for the mineral owner to exploit the minerals beneath.”¹⁰⁴ In this arrangement, courts are instructed to allow the operator to drill from an off-lease surface to the leased mineral reservoir “without securing permission from either the surface or mineral owner so long as the well bore is not perforated to produce hydrocarbons directly.”¹⁰⁵

The “substantial damage” standard limits the potential for enjoined operations and provides an answer for liability if a subsurface mineral owner seeks to bar access, thus countering the “strict application of trespass law to the subsurface” that could implicate whether or not horizontal drilling is “an economic enterprise.”¹⁰⁶ Further, the approach follows the sensible analysis provided by the *Humble* court that recognizes trespass for only

¹⁰³ “[T]echnological advancements in deep subsurface horizontal drilling and reservoir stimulation techniques that may encroach upon another’s subsurface, once as inconceivable as airplanes encroaching upon another’s airspace, are now so commonplace that courts must consider whether these and other deep subsurface activities can give rise to an action in trespass.” Anderson, *Lord Coke, supra* note 27, at 204.

¹⁰⁴ *Id.* at 220.

¹⁰⁵ *Id.* at 225.

¹⁰⁶ “If traditional surface trespass law is applied to the subsurface, numerous subsurface uses could be greatly hindered, if not made impracticable.” Owen L. Anderson, *Subsurface “Trespass”: A Man’s Subsurface Is Not His Castle*, 49 WASHBURN L.J. 247, 281 (2010) [hereinafter Anderson, *Subsurface*].

substantial interference with the mineral owner's right to develop.¹⁰⁷

Such a seemingly unauthorized movement through the subsurface may constitute a taking.¹⁰⁸ Therefore, commentators appropriately recognize that the *Causby* refinement of *ad coelum* may not fit as neatly in the subsurface context.¹⁰⁹ Likening the subsurface movement to the passage of an airplane overhead accommodates modern energy by limiting trespass to only instances of substantial interference.¹¹⁰ However, in this scheme, policymakers should discern that subsurface intrusion *is* "clearly distinguishable" from airspace travel.¹¹¹ For instance, subsurface ownership is usually held by a specific number of property owners; furthermore, any intrusion, in the oil and gas context, will likely last "for a substantial period of time."¹¹² Payment of compensation for airspace intrusion, in contrast, is impractical because the intrusion, in virtually all instances, is remote and fleeting.¹¹³

2. Designate Private Subsurface as a "Public Commons"

The final scheme essentially dispenses with private conceptions of subsurface rights.¹¹⁴ The approach has often been cited from a compelling public interest in enabling a nationwide

¹⁰⁷ See *supra* notes 44-48, 53-56 and accompanying text.

¹⁰⁸ See *supra* notes 33-36 and accompanying text.

¹⁰⁹ Among the distinguishing factors are the historical and continuing severance, sale, and marketing of subsurface rights, the compelling public interest in air travel versus "multiple competing [subsurface] uses," and government authorization of airspace travel. See Gresham & Anderson, *supra* note 35, at 717.

¹¹⁰ "Accordingly, just as the Restatement preserves an actionable trespass where an aircraft causes actual damages, the rule should support a claim for trespass where a deep subsurface invasion 'interferes substantially with the other's use and enjoyment of his land.'" Anderson, *Lord Coke*, *supra* note 27, at 206.

¹¹¹ *Id.*; JACQUELINE P. HAND & JAMES CHARLES SMITH, NEIGHBORING PROPERTY OWNERS 69 (1988).

¹¹² HAND & SMITH, *supra* note 111, at 69.

¹¹³ *Id.*

¹¹⁴ "[C]ommon law rules are increasingly modified by statutes that promote governmental intervention in oil and gas production at the expense of traditional property rights." John G. Sprankling, *Owning the Center of the Earth*, 55 UCLA L. REV. 979, 1010 (2008) (citing injection well permit requirements, pooling, or unitization requirements). Such statutes "effectively amend the 'general concept of ownership of the subsurface by the surface owner of the land' because that owner cannot 'rely on a concept of individual ownership to thwart the common right to the resource.'" *Id.* (quoting *Nunez v. Wainoco Oil & Gas Co.*, 488 So. 2d 955, 964 (La. 1986)).

carbon sequestration program in an attempt to combat global climate change.¹¹⁵ Because the common law has not adequately addressed pore space ownership, “the pore space should be seen as a public resource.”¹¹⁶ As *Causby* limited *ad coelum*, subsurface private entitlements should give way to the government as “the ‘most useful manager’ of the pore space in the CCS context” because private owners are too numerous to “effectively operate and allocate the storage resource.”¹¹⁷ Furthermore, public pore space ownership would not necessarily impact mineral development if private subsurface uses are legislatively prioritized.¹¹⁸

Public ownership rationally conceptualizes rejecting *ad coelum* subsurface ownership in the sense that humans can make only the slightest use of the planet’s crust, and consequently, “American law has never determined [ownership] more than two miles below the surface.”¹¹⁹ Proponents recognize that in the oil and gas context, the principles governing *ad coelum* have been significantly eroded by the rule of capture, pooling and unitization, and state regulatory practices.¹²⁰ The subsurface right to exclude has been further diminished in cases such as *Coastal Oil & Gas Corp. v. Garza Energy Trust*.¹²¹ In this scheme, an

¹¹⁵ “To further the development of [carbon sequestration] as a public good providing national benefits, traditional property conceptions must give way to modern realities . . .” James Robert Zadick, Note, *The Public Pore Space: Enabling Carbon Capture and Sequestration by Reconceptualizing Subsurface Property Rights*, 36 WM. & MARY ENVTL. L. & POL’Y REV. 257, 272 (2011). “[F]ederal ownership of pore space could arguably reduce the transaction costs associated with project development, thereby facilitating the rapid scaling of commercial geologic carbon storage projects.” Kevin L. Doran & Angela M. Cifor, *Does the Federal Government Own the Pore Space Under Private Lands in the West? Implications of the Stock-Raising Homestead Act of 1916 for Geologic Storage of Carbon Dioxide*, 42 ENVTL. L. 527, 531 (2012).

¹¹⁶ Zadick, *supra* note 115, at 268-69.

¹¹⁷ *Id.* at 276.

¹¹⁸ While “[b]eneficial deep subsurface uses almost uniformly involve mineral extraction,” carbon sequestration is most efficient in subsurface spaces such as old oil and gas fields, saline aquifers, and unmineable coal seams, inasmuch that “conflicts with resource extraction would be minimized.” *Id.* at 275.

¹¹⁹ Sprankling, *supra* note 114, at 1020.

¹²⁰ *See id.* at 1008-10.

¹²¹ 268 S.W.3d 1, 11 (Tex. 2008) (“[T]hat maxim—*cujus est solum ejus est usque ad coelum et ad inferos*—has no place in the modern world.”); Sprankling, *supra* note 114, at 1018 (“The foundation for these decisions is the public policy encouraging oil and gas production, which outweighs an owner’s traditional right to exclude.”).

owner's rights, respecting reasonably foreseeable use, should perhaps "extend only 1000 feet below the surface, with an exception [honoring] mineral rights"; the space below could be owned by the government.¹²²

If existing mineral entitlements were somehow respected under a public commons approach, surface and mineral owners may still face a number of issues. Plainly, if the government owns the subsurface space, private property owners would be "deprived of their ability to profit" from subsurface space, thus inviting "takings" claims.¹²³ Arguably, the deep subsurface conducive to carbon sequestration falls outside "private beneficial use" and "[p]rivate, atomistic ownership of the pore space has little inherent economic utility."¹²⁴ However, the public approach might be impractical based on the potential "volume and magnitude of takings proceedings" while also attempting to provide private owners adequate compensation.¹²⁵ Conceivably, a public pore space program, accomplished through eminent domain, would not properly compensate private property owners who may make reasonable and valuable use of the subsurface for carbon sequestration efforts.¹²⁶ Moreover, a public commons approach may prove problematic because some courts *do* "recognize absolute property rights in subsurface trespass cases" reflecting "[e]stablished and complicated" subsurface entitlements.¹²⁷

¹²² Sprankling, *supra* note 114, at 1021.

¹²³ Tracy J. Logan, Comment, *Carbon Down Under—Lessons from Australia: Two Recommendations for Clarifying Subsurface Property Rights to Facilitate Onshore Geologic Carbon Sequestration in the United States*, 11 SAN DIEGO INT'L L.J. 561, 588 (2010). "Such a property-rights adjustment would . . . disproportionately burden owners in lands conducive to CCS, denying them just compensation for the use and occupation of their subsurface areas without providing any unique benefits to them in return." Rule, *supra* note 6, at 822.

¹²⁴ Zadick, *supra* note 115, at 277-78.

¹²⁵ Logan, *supra* note 123, at 588.

¹²⁶ See Lishman, *supra* note 83, at 330 ("The right to exclude from one's private property is essential to the American way. If a benefit is derived from the use of subsurface property for carbon dioxide storage, those who produce pollution ought to pay to receive that benefit.")

¹²⁷ Lepore & Turner, *supra* note 41, at 65.

IV. DEVELOPING A SUBSURFACE EASEMENT SCHEME

A. *Protecting Operator Liability While Respecting Common Law Rights*

Courts will soon provide some clarity to the subsurface easement issue in horizontal drilling operations. In the interim, for parties involved in horizontal oil and gas exploration, easements should—at the least—be obtained from surface owners and also from mineral owners through which the wellbore moves in order to fully avoid common law trespass and interference issues.¹²⁸ As a practical matter, courts have not provided guidance on this issue, and operators may effectively limit liability.¹²⁹ A number of trends should continue to refine this approach. First, state statutory designation of the subsurface pore space may lend credence to the position that surface owners grant permission for the wellbore to traverse the subsurface.¹³⁰ Second, courts will likely, and should, attach liability for only substantial damage or interference with the mineral estate, as suggested by Professor Anderson and *Humble*, rather than apply the dated analysis provided in *Chevron*.¹³¹ Likewise, continuing strong state regulatory systems for oil and gas exploration, including proper spacing and permitting requirements, will minimize potential horizontal trespass and interference issues as well as protect correlative rights.

B. *Need for Adherence to the Ad Coelum Doctrine*

In regard to obtaining subsurface easements, courts and the energy industry should acknowledge and affirm the viability of the *ad coelum* doctrine in the oil and gas context. The *Garza* decision, mentioned briefly, threw convention into question regarding subsurface trespass and liability in light of horizontal drilling and hydraulic fracturing by remarking that *ad coelum* “[had] no place in the modern world.”¹³² Yet, courts continue to deal with

¹²⁸ See *supra* notes 92-96 and accompanying text.

¹²⁹ See *supra* notes 92-96 and accompanying text.

¹³⁰ See *supra* notes 37-41 and accompanying text.

¹³¹ See *supra* notes 103-07 and accompanying text.

¹³² *Coastal Oil & Gas Corp. v. Garza Energy Trust*, 268 S.W.3d 1, 11 (Tex. 2008). The court specifically held that the law of trespass need not extend more than two

subsurface trespass and ownership disputes while respecting *ad coelum* rights in the subsurface.¹³³

At a minimum, courts continue to, and should, recognize *ad coelum* as it provides some degree of certainty in subsurface rights and ownership. For instance, in *Alyce Gaines Johnson Special Trust v. El Paso E & P Co.*, the dispute centered upon whether an existing lease's granting clause allowed or prohibited the opportunity for the plaintiff to lease for other exploration at greater subsurface depths.¹³⁴ The *ad coelum* doctrine analysis was instrumental in resolving the case as a "landowner may convey, reserve or lease his rights to explore and develop his *land* for production of minerals and reduce them to possession" when the granting clause is unrestricted.¹³⁵ When land has a specific and defined meaning, as accomplished in affirming *ad coelum*, both public and private owners are aware of their rights and obligations to one another.¹³⁶

Perhaps more importantly, the residue of the *ad coelum* doctrine proves its resiliency in the oil and gas context because it provides the means in which the mineral estate is severed, held, and marketed.¹³⁷ If policymakers attempt to diminish traditional subsurface conceptions through a "public commons" doctrine, the oil and gas industry, property owners, commentators, and

miles below the subsurface because Lord Coke, just as he could not imagine airplanes, neither could he fathom petroleum exploration. *Id.*

¹³³ See *Stone v. Chesapeake Appalachia, LLC*, No. 5:12-CV-102, 2013 WL 2097397, at *6 (N.D. W. Va. Apr. 10, 2013), *vacated*, No. 5:12-CV-102, 2013 WL 7863861 (N.D. W. Va. July 30, 2013) ("The *Garza* opinion gives oil and gas operators a blank check to steal from the small landowner."); *Faith United Methodist Church & Cemetery of Terra Alta v. Morgan*, 745 S.E.2d 461, 468 (W. Va. 2013) ("[A] land owner with a fee simple title owns everything over the land and under it to the center of the earth."); *Energy Dev. Corp. v. Moss*, 591 S.E.2d 135, 143 n.14 (W. Va. 2003) ("Thus we are considering the case of a lessor who owned from the heavens to the center of the earth.").

¹³⁴ *Alyce Gaines Johnson Special Trust v. El Paso E & P Co.*, 773 F. Supp. 2d 640, 642-43 (W.D. La. 2011).

¹³⁵ *Id.* at 645 (quoting LA. REV. STAT. ANN. § 31:15 (2010)).

¹³⁶ "Land . . . has a specific and defined meaning. . . . 'Unless otherwise provided by law, the ownership of a tract of land carries with it the ownership of everything that is directly above or under it.' As the Louisiana Civil Code makes clear Louisiana property law embraces the colorful Latin maxim of *cujus est solum ejus est usque ad coelum et ad inferos* ('for whoever owns the soil, it is theirs up to Heaven and down to Hell')." *Id.* (citations omitted).

¹³⁷ See *id.*; see also *supra* notes 20-23 and accompanying text.

practitioners may forego the stability and certainty *ad coelum* provides. While a “public commons” approach could admittedly make an exception for mineral entitlements, policymakers should weigh whether certainty, especially dealing with severing and marketing minerals, would be affected, along with the potential headache in private takings claims.¹³⁸ Secure property law and title in mineral estates, as an outgrowth of *ad coelum*, promotes efficient energy development more drastically (though rationally) than reconceptualizing the subsurface.

C. Practical Considerations in Respecting Easements and Entitlements

Where courts should, and will likely not, unmoor themselves from traditional property entitlements, policymakers can acknowledge and remedy practical difficulties in obtaining subsurface easements as needed.

For instance, the primary difficulty in securing easements from the surface, but especially the mineral estate, is obtaining consent from multiple, fractionalized cotenants. Because a traditional property analysis suggests that easements may only be granted upon agreement of all property cotenants, operators admittedly face the burden in obtaining consent.¹³⁹ For instance, if a mineral owner is asked for a subsurface easement, he may decline because drainage from “his” subsurface minerals is likely to occur.¹⁴⁰ If the oil company cannot obtain the easement, horizontal exploration and the public interest in energy development is effectively stymied.

Cotenancy concerns with subsurface easements may be somewhat allayed. First, if the risk of drainage or interference

¹³⁸ “Demolition is easier than construction. If we accept the premise that the center of the earth orthodoxy must be abandoned, then the difficult question is what should replace it.” Sprankling, *supra* note 114, at 1039.

¹³⁹ See Ludlow, *supra* note 8; see, e.g., *Tex. Mortg. Co. v. Phillips Petroleum Co.*, 470 F.2d 497, 499 (5th Cir. 1972) (“It is well settled that a tenant in common cannot, without the precedent authority or subsequent ratification of his cotenants, impose an easement or dedication upon the common property in favor of a third party.”).

¹⁴⁰ “Due to the proliferation of fractional mineral ownership, obtaining unanimous consent would be often difficult and costly, if not impossible in many situations, especially because mineral owners have a natural incentive to deny access due to the drainage they might suffer.” Anderson, *Subsurface*, *supra* note 106, at 263.

with use is low or non-existent, property owners would, and should, have no issue granting subsurface easements for a reasonable price. Second, the operator must already obtain permission for surface use from all surface owners in acquiring the drill site.¹⁴¹ Furthermore, operators may include subsurface easement rights or language in leases with mineral owners permitting future wellbore passage.¹⁴² However, all things considered, policymakers may consider regulation requiring the operator to gain the consent of a lower percentage of cotenants as one means of easing the burden of dealing with fractionalized mineral or surface interests.¹⁴³ Addressing subsurface easements in such a way is one example of the balance regulators can strike between accommodating modern energy while respecting common law property rights.

CONCLUSION

Where hydraulic fracturing stands as the likely arena in which subsurface rights may be “reshuffled,”¹⁴⁴ horizontal wellbore passage also implicates subsurface liability issues where subsurface trespass and interference occurs. As horizontal exploration continues to boom, courts will carefully weigh the burdens presented between competing surface and mineral estate uses, though surface owners tend to lay claim to subsurface pore space and easement grants absent substantial damage or interference with the mineral estate.

Aside from analyzing subsurface trespass or interference issues, this Comment does not discuss a number of subsurface easement questions. For instance, how long does, and should, a subsurface easement for horizontal drilling vest? What determines proper value in bargaining for the subsurface easement? For any interested party, horizontal drilling and increased hydraulic fracturing provide further questions and exciting possibilities for future research.

¹⁴¹ See, e.g., *supra* note 59 and accompanying text.

¹⁴² “[L]essee[s] are starting to include ‘subsurface easement’ language in their leases as an exhibit to the lease form.” Whitman, *supra* note 96, at 18.

¹⁴³ *Id.*

¹⁴⁴ See Rule, *supra* note 6, at 826-28.

Where exploration tends to concede to modern energy and the public's regulatory interest, surface and mineral owners may expect future limits on the power to grant subsurface easements.¹⁴⁵ While a healthy balance between respecting traditional entitlements and accommodating modern energy should be encouraged, policymakers should carefully consider the judiciary's continued adherence to the *ad coelum* doctrine in the subsurface context. Subsurface *ad coelum* may be practical fiction, but a useful fiction, nonetheless. Both property owners and the oil and gas industry would be well served through effective regulation that balances the realities of horizontal drilling and hydraulic fracturing with the complexities and inertia present in traditional property law. Better minds will know when and where to implement the right mix of liability and property rules in this evolving legal arena.¹⁴⁶

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¹⁴⁵ *Id.*

¹⁴⁶ *See supra* notes 70-76 and accompanying text.

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