Resolving Intra-Reservoir Horizontal Drilling Conflicts Using a Reservoir Community Analysis

by

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Introduction

• Each oil and gas *reservoir* consists of a “community of owners.”

• **Reservoir**: interconnected porous and permeable rock structure containing oil or gas under pressure.

• **Because of the interconnected nature of the rock structure, no individual member of the community has exclusive possession of the reservoir beneath its land.**
Introduction

• **Individual rights** in part of the reservoir.
• **Communal rights** in all the reservoir.
• **Correlative rights:**
  • **Negative non-possessory** correlative rights.
  • **Positive possessory** correlative rights.
Introduction

• A “reservoir community analysis” that assists in defining the correlative rights of reservoir community members.

• Review traditional negative non-possessory correlative rights.

• Defining new positive possessory reservoir correlative rights.

• Distinguish acceptable from unacceptable conduct within the reservoir.
Ad Coelum & Trespass

• The *ad coelum* doctrine defines reservoir rights by surface boundaries.

• “The owner of land in fee has the right to the surface and everything permanently situated beneath or above it.”

Ad Coelum & Trespass

• “The ownership and possession of the soil extended to the center of the earth, and usque ad coelum, and included everything upon its surface and within it bosom.”

• Duggan v. Davey, North Dakota Territorial Supreme Court, 1886.
Ad Coelum & Trespass

• The law of trespass reigns supreme under the ad coelum model by drawing stark lines of demarcation between “yours” and “mine.”
Ad Coelum & Trespass

• The Restatement (Second) of Torts § 158 imposes liability for trespass when a person “intentionally . . . enters land in the possession of the other, or causes a thing . . . to do so . . . .”

• Subsurface trespass is addressed in the Restatement (Second) of Torts § 159 where a “trespass may be committed on, beneath, or above the surface of the earth.”
Ad Coelum & Trespass

• **Comment e. to § 159** states that a subsurface trespass is “any . . . unprivileged entry on land beneath the surface.”

• The *reservoir community analysis* offers two ways that an “entry” into the portion of the reservoir in another owner’s possession would be permissible: *either the community member “owns” the right or its entry is “privileged.”*
Ad Coelum & Trespass

• Regardless of how the correlative right is viewed, the result will be the same: a mere physical entry will not automatically give rise to a trespass.

• Instead, the qualitative nature of the entry must be evaluated applying the reservoir community analysis.
Ad Coelum & Trespass

• Recognition of a *community of interest* in the reservoir:

• *Continental Resources, Inc. v. Farrar Oil Company*: the compulsory pooling order allowed the operator to use all subsurface encompassed by the pooled area to drill its horizontal well.
Ad Coelum & Trespass

• Nunez v. Wainoco Oil & Gas Co.
• Louisiana case quoted in Continental.
• “‘[W]hen the . . . [conservation authority] has declared the landowners share a common interest in a reservoir of natural resources beneath their adjacent tracts, such common interest does not permit one participant to rely on a concept of individual ownership to thwart the common right to the resource . . .’”
Ad Coelum & Trespass

• A similar community of interest was recognized by the court in *Fisher v. Continental Resources, Inc.* under North Dakota’s compulsory unitization statute.
Ad Coelum & Trespass

• Under a reservoir community analysis, if the conduct is compatible with community interests, it would not be a trespass.

• The community member would possess the right to engage in the conduct and the objecting member would lack the exclusivity required to establish a trespass claim.

• The foundation for this approach is the connected nature of the reservoir.
Realities of the Reservoir

• The one aspect of the geophysical system that has eluded the law is the concept that something that is connected cannot be isolated when defining property rights.

• It is not possible to draw a line through a reservoir and effectively separate one portion from another.

• Property lines cannot break the connections and isolate each owner’s part from the reservoir whole.
Positive Possessory Correlative Rights

• Positive possessory correlative rights refer to the right to affirmatively use, and possess, portions of the reservoir that extend beyond an owner’s reservoir boundary lines.

• In the *ad coelum* world of trespass, possessing portions of the reservoir beyond reservoir boundaries is a tort.
Positive Possessory Correlative Rights

- *Stone v. Chesapeake Appalachia, LLC.*
- Citing West Virginia’s adherence to the *ad coelum* doctrine, held “that hydraulic fracturing under land of a neighboring property without that party’s consent . . . constitutes an actionable trespass.”
Positive Possessory Correlative Rights

- *Coastal Oil & Gas Corp. v. Garza Energy Trust.*
- No “actionable” trespass when a frac fissure extended into adjacent lands.
- Acknowledged it was not addressing the core trespass issue.
Positive Possessory Correlative Rights

- The court in *Coastal v. Garza*:
- Referenced its withdrawn opinion in *Geo Viking, Inc v. Tex-Lee Operating Company*, that held “fracing beneath another’s land was a trespass.”
- “We need not decide the broader issue here.”
- Held: “that damages for drainage by hydraulic fracturing are precluded by the rule of capture.”
Positive Possessory Correlative Rights

- *Stone on Coastal v. Garza*:
- “The *Garza* opinion gives oil and gas operators a blank check to steal from the small landowner.”
Positive Possessory Correlative Rights

- **North Dakota Correlative Rights**
- Commission approved a voluntary agreement to conduct secondary recovery operations in the Tioga-Madison reservoir.
Positive Possessory Correlative Rights

• North Dakota Correlative Rights
• “Their rights are independent of this agreement . . . .”
• But: “By refusing to join such agreement, however, appellants may not, at the same time, prevent other interests in the field from developing adjoining tracts under such agreement.”
Positive Possessory Correlative Rights

• **North Dakota Correlative Rights**

• **But:** The court noted that if the unit operations caused damage to the Syversons, they may have a right of action: “Whatever the result would be if the appellants could show actual damages, they certainly are not entitled to complain in the absence of such showing.”

• **But:** *Tide Water Associated Oil Co. v. Stott.*
Positive Possessory Correlative Rights

• **North Dakota Correlative Rights**

• In *Tide Water* the lessor sued its lessee under various implied covenant theories because the lessee was participating in a gas recycling operation and lessor refused to participate.

• “Any damage which they suffer is *damnnum absque injuria* and in nowise are such damages chargeable to appellants.”
Positive Possessory Correlative Rights

• North Dakota Correlative Rights
• Whenever a conservation commission restrains an oil and gas owner’s capture rights, it must be done equitably.
• This is the most common context in which the term “correlative rights” is used.
Positive Possessory Correlative Rights

• North Dakota Correlative Rights

• *Amoco Production Company v. North Dakota Industrial Commission.*

• Dispute over the proper orientation of a 320-acre spacing unit.

• Initial orientation was north/south using lay-down units that the Commission subsequently changed to an east/west orientation using stand-up units.
Positive Possessory Correlative Rights

• **North Dakota Correlative Rights**

• In *Amoco* the court held there was sufficient evidence to support the Commission’s decision to order stand-up spacing units to protect the correlative rights of the owners within the spacing units.

• **Contrast: Hystad v. Industrial Commission**

• Remand to explain non-uniform spacing.
Positive Possessory Correlative Rights

• **North Dakota Correlative Rights**

• *Hanson v. Industrial Commission of North Dakota.*

• Commission denied a request to inject produced saltwater into a currently producing formation.

• **Conflicting uses of the reservoir;** marshal each owner’s correlative rights.
Positive Possessory Correlative Rights

• North Dakota Correlative Rights

• *Herring v. Lisbon Partners Credit Fund, Ltd. Partnership.*

• Applied the North Dakota *ad coelum* statute, and a tree statute, to define the respective rights of owners when a *tree located on one property has roots or branches that extend into or over an adjacent property.*
Positive Possessory Correlative Rights

- North Dakota Correlative Rights

- The court In *Herring* quoted from *Abbinett v. Fox* the rule that there is “‘a correlative duty of a landowner to ensure that the use of his property does not materially harm his neighbor.’”
Positive Possessory Correlative Rights

• **North Dakota Correlative Rights**
• Although the adjacent owner will have a cause of action for damage caused by invading tree roots or branches, the court held there would be **no liability** because trees “‘cast shade, drop leaves, flowers, or fruit, or just because they happen to encroach upon adjoining property either above or below ground.’”
Positive Possessory Correlative Rights

• **North Dakota Correlative Rights**

• *Hermanson v. Morrell.*

• North Dakota statute addressing **lateral support.**

• “Each . . . owner is entitled to the lateral and adjacent support which the owner’s land receives from the adjoining land . . . .”

• The right of each property owner to use their property is restricted to benefit all landowners.
Positive Possessory Correlative Rights

• **North Dakota Correlative Rights**

• Lateral support is both a limit on, and an enhancement to, property “ownership” that ultimately benefits the property of each landowner by protecting it from damage caused by negligent excavations.
Positive Possessory Correlative Rights

- **North Dakota Correlative Rights**
- **Volkmann v. City of Crosby.**
  
  Adopted the doctrine of reasonable use for percolating water in part to preserve the common source of supply for landowners owning land over the reservoir.

- **Early water law provides one of the first instances in which the term “correlative rights” was used.**
Positive Possessory Correlative Rights

• **North Dakota Correlative Rights**
• In many ways the usufructuary nature of water is similar to use of a reservoir to maximize removal of oil and gas.
• No single owner “owns” the geophysical system where the oil and gas reside, but they all seek to *use* it to recover the oil and gas within.
Reservoir Community Analysis

• The reservoir community analysis offers a principled process to define appropriate and inappropriate conduct within any connected rock structure.

• Can be applied to any rock structure that has some degree of porosity and permeability.

• The analysis is equally applicable to a rock structure used for liquid waste disposal.
Reservoir Community Analysis

- **Invading Frac Fissures**
- Courts to date have been asked to respond to frac fissures crossing subsurface boundary lines by applying a trespass analysis.
- The *ad coelum* doctrine establishes the subsurface boundary lines.
- The *ad coelum* analysis fails to account for what each party actually owns, and does not own, within the reservoir.
Reservoir Community Analysis

• All owners within a reservoir possess rights to use the geophysical system to maximize the recovery of oil and gas within their portion of the reservoir.

• This is subject, however, to the traditional correlative rights limitation that no owner can unreasonably use the geophysical system in a way that impairs the rights of other owners to maximize recovery from the reservoir.
Reservoir Community Analysis

• These are the negative non-possessory rights that in North Dakota could be the object of North Dakota Century Code § 9-10-01 prohibiting any person from injuring the “property of another or infringing upon any of the person’s rights.”
Reservoir Community Analysis

• The more difficult issue is defining rights to affirmatively and physically invade the space of other reservoir owners.

• These are the positive affirmative rights previously discussed.

• Frac fissures created during the hydraulic fracturing process provide an excellent example.
Reservoir Community Analysis

• Does an owner of a portion of a reservoir have the “ownership right” or “privilege” to deliberately cause frac fissures to extend beyond the boundaries of its land into adjoining lands?
Reservoir Community Analysis

• What are the parties’ “ownership” rights?
• First, every owner has certain *individual exclusive rights* within their portion of the reservoir that are defined by surface boundaries.
• This is the extent of the *ad coelum* analysis that establishes each owner’s membership in the reservoir community.
Reservoir Community Analysis

• Second, every owner has *communal rights* in the entire reservoir that we call correlative rights.

• Third, to the extent other community members have correlative rights in a member’s portion of the reservoir that member’s *exclusivity of ownership* is lacking.
Reservoir Community Analysis

• The community reservoir analysis is a process for defining correlative rights within a reservoir.

• Using the facts in *Coastal Oil & Gas Corp. v. Garza Energy Trust*, the court found that the Vicksburg T formation would be of no value unless it could be hydraulically fractured.

• Therefore, fracing the Vicksburg T formation would be an acceptable activity within the Vicksburg T reservoir community.
Reservoir Community Analysis

• North Dakota has addressed this first step, in general terms, with **North Dakota Century Code § 38-08-25** that states: “Notwithstanding any other provision of law, the legislative assembly designates hydraulic fracturing, a mechanical method of increasing the permeability of rock to increase the amount of oil and gas produced from the rock, an acceptable recovery process in this state.”
Reservoir Community Analysis

• Any specific protocol for developing a reservoir must, however, be tailored to the reservoir’s unique geophysical system.

• Back to the Vicksburg T formation . . .
Reservoir Community Analysis

• The next inquiry is whether allowing frac fissures to cross boundary lines is a permissible exercise of the reservoir owners’ correlative rights and therefore compatible with the Vicksburg T community standards.

• This is a technical question that should focus on the reservoir’s geophysical system and not a surface boundary line.
Reservoir Community Analysis

• In many instances, to avoid leaving bands of unrecovered oil and gas, it may be desirable to frac across boundary lines.
• This question should be answered by what is best for the Vicksburg T reservoir community to allow each owner to maximize the recovery of oil and gas from the reservoir.
Reservoir Community Analysis

• Once the focus is on what is best for the Vicksburg T reservoir community, then the conduct can be qualitatively evaluated instead of conducting a survey to establish a boundary line.

• This approach gives meaning to all owners’ correlative rights and allows them to exercise those rights even when it may impact portions of the reservoir owned by others.
Reservoir Community Analysis

• Correlative rights, as defined for a particular reservoir community, become a collective ownership right -- and limitation.
Reservoir Community Analysis

• **Invading Frac Pressures**
• More invasive factual scenarios are those where one reservoir owner causes pressures to flow through a frac fissure that comes into communication with another wellbore.
• The result has been termed “**frac hits**.”
Reservoir Community Analysis

• In theory it can occur whenever two wells are in close proximity in the same reservoir and, in the process of fracture treating what is typically the newly-drilled horizontal well, the resulting fracture is brought into communication with an existing, typically vertical well.
Reservoir Community Analysis

• The **Alberta Energy Regulator** (AER), on May 21, 2013, adopted **Directive 083** which, among other things, addresses the frac hit phenomenon.

• One purpose of the Directive is to “reduce the likelihood of **unintentional interwellbore communication** between a subject well and an offset well.”
Reservoir Community Analysis

• A reservoir community analysis can be used to allocate rights and responsibilities among developers operating differently within the same reservoir.

• For example, vertical operators and horizontal operators.
Reservoir Community Analysis

• Assume a reservoir owner desires to drill a horizontal well in a reservoir containing an existing vertical well.

• The developer is concerned about avoiding or minimizing any interwellbore communication with an offsetting vertical well.

• Assume the remedy is to shut-in the vertical well while the horizontal well is undergoing hydraulic fracturing.
Reservoir Community Analysis

• **Suppose the vertical well owner:** (1) refuses to shut-in; (2) demands compensation for lost revenue while shut-in; or (3) asserts damage to the well or the reservoir.

• How will these issues be resolved?
Reservoir Community Analysis

• As with the frac fissure situation the immediate tendency would be to look at boundary lines and proceed down the *ad coelum/trespass* line of arguments.

• Again, a reservoir community analysis offers a solution that properly defines the parties’ ownership interests and the interests of the reservoir community.
Reservoir Community Analysis

• The community goals are to ensure the reservoir geophysical system is used in a manner that will achieve the greatest possible recovery of oil and gas.

• When the question is posed in this manner, the rights and liabilities of the community members may be viewed differently.
Reservoir Community Analysis

• For example, if horizontal development of the reservoir will likely increase the recovery of oil and gas from the reservoir, should the existing vertical well operators be obligated to take the necessary action to accommodate horizontal development?
Reservoir Community Analysis

• It is not a question of who was there first.
• No operator should be able to impair technological progress in the reservoir when progress promotes reservoir community goals.
Reservoir Community Analysis

- If vertical well operators, through litigation or threat of litigation, can chill community-compatible horizontal development, the situation begins to look much like the mineral owner that refused to consent to the waterflood operations in *Syverson v. North Dakota State Industrial Commission*. 
Reservoir Community Analysis

• Proper definition of each owner’s correlative rights in a reservoir will resolve these issues because the conclusion will often be that the complaining owner never owned the right they seek to protect.

• Often the “exclusivity” they seek to advance is a qualified right as a member of the reservoir community.
Reservoir Community Analysis

• As the court observed in *Hystad v. Industrial Commission*: “[C]orrelative rights includes interdependent rights and duties of each landowner in the common source of supply.”

• They are members of a reservoir community.
Reservoir Community Analysis

• The reservoir community analysis is not a change in property rights.

• The precise contours of ownership become further defined as issues arise and are resolved.

• The need for more precise identification of property rights in the reservoir is at hand.