#### Presented:

40th Annual Ernest E. Smith Oil, Gas and Mineral Law

March 28, 2014 Houston, Texas

# Production Allocation Issues: Non-Participating Royalty Interest Owners in Vertically and Horizontally Pooled Units

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#### I. Introduction

The United States and, particularly, Texas, is experiencing an energy boom we haven't seen in over a decade. Advancements in horizontal drilling techniques are making it economical to produce from hydrocarbon-bearing formations once thought too uneconomical to produce. Sophisticated advancements in hydraulic fracturing and horizontal drilling have spurred this energy revolution, causing many oil and gas majors to quickly jump on board or risk getting left behind.

One area having a difficult time adapting to the fast-paced world of horizontal drilling is the law applicable to oil and gas jurisprudence. Advancements in technology have outpaced the legal framework. It is increasingly more difficult to apply old law (often developed in the context of vertical well development) to these cutting-edge concepts for developing hydrocarbon-rich formations utilizing a horizontal wellbore. The skyrocketing use of horizontal well development cannot be ignored and the body of existing oil and gas law must continue to develop and adapt to the issues created by horizontal development. At the forefront is ensuring the law protects property rights.

This paper will focus on the legal concepts that have developed when dealing with a non-participating royalty interest ("NPRI") owner considering ratification within a vertically pooled unit and the challenges of applying these concepts to the NPRI owner within a horizontally pooled unit.

### II. Background

# A. Definition: Non-Participating Royalty Interest

A non-participating royalty interest is "an interest in the gross production of oil, gas and other minerals carved out of the mineral fee estate as a free royalty, which does not carry with it the right to participate in the execution of, the bonus payable for, or the delay rentals to accrue under oil, gas and mineral leases executed by the owner of the mineral fee estate." *Plainsman Trading Co. v. Crews*, 898 S.W.2d 786, 789-90 (Tex. 1995). Said another way, an NPRI is an expense-free interest in oil or gas, if and when produced. *Id.* The NPRI owner lacks the benefits of the executive owner, having no right to negotiate or execute oil and gas leases, no right to receive bonus payments or delay rentals, and no right to develop and produce the minerals himself. *Id.* 

An NPRI can be created by reservation, as when a predecessor in title conveys his mineral interest but reserves a small interest in future profits, or by grant, as when the NPRI is purchased from the mineral interest owner. *See, e.g., In re Bass*, 113 S.W.3d 735, 738 (Tex. 2003) (NPRI created by reservation); *White v. White*, 830 S.W.2d 767, 768 (Tex. App.—Houston [1st Dist.] 1992, writ denied) (NPRI created by grant). For example, an instrument conveying all oil, gas, or other minerals but reserving one-half of all present and future royalties on oil or gas

produced and saved from the land would create a one-half NPRI interest in favor of the grantor. Thus, the interest is not created by an oil and gas lease, rather, it is carved out of the mineral owner's interest. Further, unlike a mineral interest owner, who is typically entitled to his proportionate share of production, less any costs of production, NPRIs are due a portion of the gross revenue from the proceeds of production and do not incur deductions for expenses associated with production. *Schlittler v. Smith*, 101 S.W.2d 543 (1937).

#### B. Distinction Between Ratification and Revivor:

The doctrines of revivor and ratification are often confused and frequently used interchangeably. *Bradley v. Avery*, 746 S.W.2d 341, 344 (Tex. App.—Austin 1988, no writ); *Sun-Key Oil Co., Inc. v. Whealy*, No. 2-06-198-CV, 2006 WL 3114466, at \*4 (Tex. App.—Fort Worth Nov. 2, 2006, no pet.) (mem. op.) Revivor has the effect of reviving a lifeless lease by subsequent execution of a document that clearly recognizes the validity of the lifeless lease. *Cannon v. Sun-Key Oil Co., Inc.*, 117 S.W.3d 416, 419-20 (Tex. App.—Eastland 2003, pet. denied). The execution of the subsequent document must make sufficient reference to the terminated lease in order to revive it. *Westbrook v. Atl. Richfield Co.*, 502 S.W.2d 551 (Tex. 1973). Ratification, on the other hand, applies to conveyances like an oil and gas lease that is inoperative, rather than terminated. *Whealy*, 2006 WL 3114466 at \*4. Ratification, like revivor, also requires execution of a formal document clearly recognizing the validity of the inoperative conveyance. *Id.*; *Hastings v. Pichinson*, 370 S.W.2d 1, 4 (Tex. Civ. App.—San Antonio 1963, no writ).

### III. NPRIs Considering Ratification in a Vertically Pooled Unit: A Powerful Position

Typically, oil and gas companies approach royalty and non-executive mineral interest owners to ratify an oil and gas lease covering the lands in which they own their interest because they seek the right to pool their interests covered by the oil and gas lease. Pooling allows lessees to join tracts from one or more leases to form a single unit where a single tract is often insufficient in size to meet the Texas density or spacing requirements. *Browning Oil Co., Inc. v. Luecke*, 38 S.W.3d 625 (Tex. App.—Austin 2000, pet. denied); *see also* 2 Ernest E. Smith & Jacqueline Lang Weaver, Texas Law of Oil and Gas § 11.1[B] (2d ed. 2012) (stating purpose of pooling is to allow an operator to combine separately owned smaller tracts of land in order to drill a well in compliance with the Texas Railroad Commission's spacing requirements). Operations anywhere within the unit are treated as though they occurred on all land within the unit, and production from a well within the pooled unit is treated as though it is producing on all tracts pooled into the unit. *Southland Royalty Co. v. Humble Oil & Refining Co.*, 249 S.W.2d

<sup>&</sup>lt;sup>1</sup> Compare this with an instrument conveying one-half of all oil, gas, or other minerals in or under the [described] land, reserving the exclusive right to execute oil and gas leases on the land forever. This would create a one-half non-executive mineral interest in favor of the grantee as the grantee owns a one-half interest in oil, gas, or other minerals but lacks the right to join in the execution of a lease.

914, 916 (Tex. 1952). Royalty is typically distributed according to the proportion each pooled interest's acreage bears to the entire unit. *MCZ*, *Inc. v. Triolo*, 708 S.W.2d 49, 52-53 (Tex. App.—Houston [1st Dist.] 1986, writ ref'd n.r.e.) (citing *Brown v. Smith*, 174 S.W.2d 43, 46 (Tex. 1943)).

Pooling is essentially "bringing together two or more small or irregularly-shaped tracts of land to form a drill site in connection with a program of uniform well spacing." *Whelan v. Manziel*, 314 S.W.2d 126, 132 (Tex. Civ. App.—Texarkana 1958, writ ref'd n.r.e.). Once pooled, royalty owners own an undivided interest in production from the entire pooled unit. *Luecke*, 38 S.W.3d at 634.

In Texas, the owner of the executive right (the right to lease minerals and sign an oil and gas lease) has the authority to negotiate and execute oil and gas leases covering non-participating interests. Manges v. Guerra, 673 S.W.2d 180, 183 (Tex. 1984). This means the holder of the executive right may bind NPRIs to provisions in an oil and gas lease. Id. However, the executive right holder may not grant a lessee the right to pool the non-participating interests unless either the right to pool such interests was reserved in the instrument creating those interests or the non-participating interests give consent. See Montgomery v. Rittersbacher, 424 S.W.2d 210, 213 (Tex. 1968) ("[P]ooling on the part of the holder of the executive rights cannot be binding upon the non-participating royalty owner in the absence of his consent."); MCZ, Inc., 708 S.W.2d at 53 ("The holder of executive rights cannot pool the interests of a non-participating royalty owner without the latter's consent."). Texas has adopted the view that pooling represents a cross-conveyance and that granting the executive right holder such power would amount to conveying an NPRI's interest absent his consent. Brown v. Smith, 174 S.W.2d 43, 46 (Tex. 1943). If the executive right holder had the power to pool an NPRI's interest, he would essentially have the power to diminish that interest by pooling it in with interests from other tracts of land. Montgomery, 424 S.W.2d at 213. Thus, an NPRI owner is bound by the lease negotiated and executed by the executive, but the executive may not agree to pool the NPRI's interest; that agreement must come from the NPRI owner himself.

### A. To Ratify or Not Ratify?

Whether or not it is in the best interest for an NPRI owner to ratify an oil and gas lease depends on the circumstances. Has a well already been drilled? Is the well on the tract covering your interest or on a non-drillsite tract? How many wells does the lessee intend to drill in the future? Where will the future wells be drilled, on the tract covering your interest or on tracts in which your tract is pooled? These are some of the factors an NPRI owner should consider when deciding whether to pool his interest and deciding the method for pooling his interest.

#### **B.** NPRI Interest: Drillsite Tract

If a well has already been drilled and it is located on the tract where the NPRI has his interest (the NPRI owner is on a drillsite tract), it is typically in the best interest of the NPRI

owner not to ratify the oil and gas lease and thereby avoid pooling his interest with other tracts in a vertically pooled unit. This is because an NPRI owner receives his full fractional share from the gross production from the well located on his tract, undiluted by the pooling of other tracts in the unit. *See MCZ*, *Inc.*, 708 S.W.2d at 53 (non-consenting NPRI owner entitled to full fractional royalty).

For example, if an NPRI owner owns a fixed 12.5% interest in 40 acres (he's entitled to 12.5% of the gross proceeds from a well drilled on the 40 acre tract), an operator drills a well on the NPRI's 40 acre tract, and pools it with a neighboring 40 acre tract, the NPRI owner will receive his full fractional interest of production (his full 12.5%) from the lease well if he does not ratify the lease covering his 40 acres. However, if he does ratify the lease covering his 40 acre tract, his interest would then be proportionally reduced to accommodate the additional acreage by pooling his 40 acre interest with the neighboring 40 acres. Now, the NPRI owner's interest will be diluted by 40/80, reducing his interest by one-half.

### C. NPRI Interest: Non-Drillsite Tract

Where a well has already been drilled and it is not located on the tract where the NPRI owner has his interest (the NPRI owner is on a non-drillsite tract) but the NPRI's tract is included as part of a pooled unit, it is typically in the best interest of the non-drillsite tract NPRI owner to ratify the oil and gas lease and thereby consent to pooling his interest.<sup>2</sup> Otherwise, his interest will not be included in the unit (because his interest has not been cross-conveyed), and he will not share in production from the unit.

Taking the example above, consider our same NPRI owner who owns 40 acres under a lease that has been pooled with a neighboring 40 acres, but now the well is located on the neighboring 40 acres. Here, the NPRI owner is entitled to zero royalty unless his interest is pooled. By ratifying the lease covering his 40 acre interest, the NPRI owner will now share in the production from the unit well although his interest will be diluted by 40/80.

#### D. Methods of Pooling the NPRI

# i. Ratify the Oil and Gas Lease

As illustrated in the examples above, one way for an NPRI owner to pool his interest is to ratify the oil and gas lease covering his interest. *Minchen v. Fields*, 345 S.W.2d 282, 285 (Tex. 1961). This has the same effect as if the NPRI owner executed the lease covering his interest and, although it will entitle the NPRI owner to a share of production on a diluted basis for non-drillsite tract wells, it will also result in diluting his interest for drillsite tract wells pooled into a unit. This brings up a notable downside for an NPRI ratifying an oil and gas lease covering his

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<sup>&</sup>lt;sup>2</sup> Rather than wait on an oil and gas operator to provide the NPRI with a lease ratification, an NPRI need only to sign a ratification, record it, and present it to the oil and gas operator. The NPRI will then be entitled to his proportionally reduced share of the production.

interest—the NPRI's ratification of the oil and gas lease has the effect of ratifying all subsequent pooling actions by the operator under that lease. *See MCZ, Inc.*, 708 S.W.2d at 53-54 (ratification reaches beyond the one transaction); *Ruiz v. Martin*, 559 S.W.2d 839, 843-44 (Tex. Civ. App.—San Antonio, 1977, writ ref'd n.r.e.) (effect of ratification is same as execution of original lease). Thus, if an NPRI ratifies an oil and gas lease covering his interest in order to share in production from a non-drillsite tract well and, subsequently, the operator drills four additional drillsite tract wells within the pooled unit or forms a separately pooled unit, the NPRI owner's interest will be diluted by the pooling of acreage from the other tracts as a result of his ratification. Had the NPRI owner not ratified the oil and gas lease covering his interest, he would not share in the production from the non-drillsite tract well (on a diluted basis), however, he would receive his full fractional interest, undiluted, from the four drillsite tract wells.

### ii. Joint Execution of Oil and Gas Lease

Another method for pooling the NPRI can be done by the NPRI owner jointly executing the oil and gas lease. *Brown v. Smith*, 174 S.W.2d 43, 46 (Tex. 1943). Having the same effect as if an NPRI owner ratifies the oil and gas lease covering his interest, this option is likely not in the NPRI owner's best interest as it negates his right to wait and see, thereby losing his ability to decide at a later point if he wishes to pool his interest.

## iii. Pooling Agreement

To avoid the consequences of granting blanket pooling authority to oil and gas lessees, NPRIs have become more sophisticated, utilizing pooling agreements to grant a lessee pooling authority on a limited basis. Allen D. Cummings, Pooling and Community Leases: Problems and Options for the Executive Owner, the Non-Executive and the Lessee, State Bar of Texas, 15th Annual Advanced Oil, Gas and Mineral Law Course (1997); Jeffery L. Hart & J. Bruce Bennett, Selected Pooling Issues, State Bar of Texas, 27th Annual Advanced Oil, Gas And Energy Resources law Course 5 (2009) ("A separate [pooling] authorization is also required if there are outstanding royalty interests that are owned by persons other than the executive rights lessors who sign the lease."). Typically, NPRIs are not afforded the opportunity to make pooling concessions on a well-by-well basis for wells drilled under a lease they have jointly executed or ratified. However, pooling agreements can grant a lessee limited pooling authority on a unit-byunit basis. Allen D. Cummings, Pooling and Community Leases: Problems and Options for the Executive Owner, the Non-Executive and the Lessee, State Bar of Texas, 15th Annual Advanced Oil, Gas and Mineral Law Course (1997). Such agreements now allow NPRIs to avoid the problem of having their interest diluted by the pooling of other lands in subsequent pooling efforts. With the execution of a pooling agreement, NPRIs may enjoy the benefit of waiting to see if it is beneficial for them to pool their interests on a well-by-well basis.

# IV. The Rise of Horizontal Drilling: Challenges in Applying Outdated Rationales from the Vertical Well Era.

While the law related to pooling NPRIs seems somewhat straightforward and neatly applied, consider that the law developed during a time oil and gas exploration utilized, almost exclusively, vertical wellbores. 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, 178 (2011-2012); see also, generally, Christy M. Schweikhardt, Note, Horizontal Perspective: Texas Oil & Gas Law in Light of Horizontal Drilling Technology, 34 S. Tex. L. Rev. 329, 329-30 (1993) (expansion of horizontal drilling occurred in 1980s). As technological advancements have made the use of horizontal drilling more prevalent, especially in Texas, it has also exposed the complexities of trying to develop methods for allocating royalties from a pooled unit intended for a horizontal well. See 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, 213 (2011-2012) ("The continued expansion of horizontal drilling will undoubtedly present new land and legal challenges for the oil and gas industry, its regulators, and the interest owners it affects to resolve."). Applying traditional law to new concepts is proving quite difficult, and rules related to allocating production for royalty calculation purposes from pooled horizontal units become unclear in their application. *Id.* at 182; see also Luecke, 38 S.W.3d at 636 (horizontal wells require greater assigned acreage than vertical wells). At the forefront of this confusion is how to address production allocation to non-consenting NPRIs within a horizontally pooled unit. See Bruce M. Kramer, Pooling for Horizontal Wells: Can They Teach an Old Dog New Tricks?, 55 Rocky Mtn. Min. L. Inst. § 8.03 (2009) (illustrating concerns with current legal standards for calculating shares of non-executive interest owners' production in a horizontally pooled unit who refuse pooling of their interest).

Today, it is unclear what rights a non-consenting NPRI owner has and how to measure an NPRI owner's royalty due to issues created by the use of horizontal drilling. One thing is clear, however. Traditional legal principles derived from the era of vertical well exploration are not equipped to solve new issues created by the use of horizontal drilling.

#### A. Horizontal Drilling

A horizontal well is "[a]ny well that is developed with one or more horizontal drainholes having a horizontal drainhole displacement of at least 100 feet." 16 Tex. ADMIN. CODE § 3.86(a)(4) (2013). Like vertical wells, horizontal wells are initially drilled vertically down to a formation suspected of holding hydrocarbons. *Luecke*, 38 S.W.3d at 634. At a pre-determined point, the drill stem proceeds horizontally into the formation. *Id.* Horizontal wellbores can extend across several leased tracts each having different owners and contain multiple production points along the drainhole rather than only one drillsite. *Id.* at 632.

# B. The Problem: Allocating Production of Non-Consenting NPRI Owners After Horizontal Pooling

Horizontal drilling has radically changed our perception of what we view as the "drillsite tract." "Each tract traversed by the horizontal wellbore is a drillsite tract, and each production point on the wellbore is a drillsite." *Id.* at 634. This is different from a vertical well where you only have one drillsite tract. In the vertical well scenario, the production credited to the NPRI owner hinged on whether his interest was on the drillsite tract or non-drillsite tract. *Brown v. Getty Reserve Oil, Inc.*, 626 S.W.2d 810, 815 (Tex. App.—Amarillo 1981, writ dism'd). If the drillsite tract NPRI owner refuses to consent to pooling, he is entitled to his full share of production from the vertical well. *See id.* (NPRI on drillsite tract received full fractional share of royalty after refusing to ratify pooling agreement).

Today, any tract penetrated by a horizontal wellbore is considered a drillsite tract. *Luecke*, 38 S.W.3d at 634. A horizontal wellbore that penetrates multiple tracts creates the possibility of having multiple drillsite tracts burdened by unique NPRIs within a horizontally pooled unit. *See id.* at 638 (discussing a horizontal well that crossed seven separate tracts of land each containing different royalty interest owners). All, none, or a combination of NPRI owners may refuse to ratify the oil and gas lease and, thereby, refuse consent to the pooling of their interest while insisting on a full share of production from the horizontal well. One can imagine the problems with this. How is a non-consenting NPRI owner's share of production calculated? Does an NPRI owner receive royalties on production only from the portion of the lateral penetrating his tract? Is an NPRI entitled to a share of production from the entire well?

Unfortunately, Texas has yet to address the problem of calculating the royalty owed to non-consenting drillsite tract NPRI owners penetrated by a horizontal wellbore across multiple tracts. However, the result proposed in the latter question seems unlikely as one Texas appellate court, rejecting the application of legal principles appropriate to vertical wells, found the best result is to calculate an interest holder's royalty share on production attributable to the interest holder's tract with reasonable probability. *Id.* at 647.

In Luecke, lessors executed three leases covering separate tracts of land. Id. at 636.

Tract 1 - 150 acres Tract 2 - 88.12 acres Tract 3 - 193.735 acres

The leases contained standard pooling provisions limited by an "anti-dilution provision" which required any pooled unit to include at least sixty percent of the acreage from each tract

included in the unit.<sup>3</sup> *Id.* at 636-37. Recognizing the benefits of horizontal drilling, the lessee sought to nullify the anti-dilution provision in the leases by allowing the lessee sole discretion to pool any portion of lessor's land to create a horizontal well unit utilizing the greatest acreage allowable. *Id.* at 638. Lessors refused to amend. *Id.* Nevertheless, the lessee drilled two horizontal wells. *Id.* The Jennifer #1 was a horizontal well that crossed seven separate tracts of land, only one of which belonged to lessors, and the vertical portion of the well and part of the horizontal drain hole were physically located on lessors' Tract 2. *Id.* The Hayes #1 was a horizontal well where the vertical portion of the well was not located on lessors' tracts, but portions of the horizontal drain hole crossed lessors' Tracts 1 and 3. *Id.* at 638-39. Both wells were drilled on pooled units containing significant acreage not owned by lessors. *Id.* at 639. Lessors sued contending the two horizontal wells violated pooling provisions in their leases. *Id.* Ultimately, the appellate court affirmed the finding in favor of the lessors but remanded the case back to the trial court to determine lessors' damages based on the amount of production attributable to their tracts with reasonable probability. *Id.* at 647.

While *Luecke* deals with allocating production as it relates to payment of royalty to lessor mineral interest owners, it glaringly exposes the law's incapability to solve problems arising from the existence of NPRIs. A non-consenting NPRI's rights are not affected by pooling and, therefore, an operator's ability to determine the amount of allocation attributable for purposes of determining the NPRI's royalty share remains confusing. For example, under the confusion of goods doctrine, discussed below, an operator may be required to account to a non-consenting NPRI owner as though all of the production came from his tract, unless the operator can show with reasonable certainty the amount of production obtained from each tract. This is precisely the problem posed by the utilization of horizontal drilling—determining the amount of production attributable to each tract with reasonable probability.

# C. Possible Methods to Allocate Production After Horizontal Pooling

Attempts to apply current oil and gas jurisprudence to resolve the issue is akin to putting a square peg in a round hole. Until the amount of production attributable to various tracts penetrated by horizontal wellbore can be determined with reasonable probability, the royalty obligation owed non-consenting drillsite tract NPRI owners will remain difficult to determine.

#### i. Confusion of Goods

The confusion of goods doctrine, alleged by Plaintiff lessors in *Luecke* as the appropriate measure of damages, provides that if an operator cannot determine with reasonable certainty the amount of production from each tract of land penetrated by a horizontal wellbore, then the operator may be required to account to each tract owner as if all production is allocable to each

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<sup>&</sup>lt;sup>3</sup> The anti-dilution provision was later amended to provide that if a pooled unit was too large for the covered tract to constitute sixty percent of the unit, the unit must be filled "only [with] other lessor owned land."

tract penetrated by the wellbore. *See id.* at 639 (lessors arguing entitlement to royalty on all production from two invalidly pooled units). Where goods owned by different parties are so confused that each owner's goods cannot be distinguished, then the burden is on the party commingling the goods to identify the share of each owner. *Humble Oil & Refining v.* West, 508 S.W.2d 812, 818 (Tex. 1974). An operator would have to show with reasonable certainty the amount of oil and gas produced from each tract penetrated by a horizontal wellbore. *Id.* If the operator cannot make such a showing, owners in each separate tract would be entitled to receive their ownership share of production from the total production from the well. *Mooers v. Richardson Petro. Co.*, 204 S.W.2d 606, 608 (Tex. 1947).

This doctrine imposes a heavy burden on operators to disburse royalty exceeding the amount rightfully attributable to each tract. Unless an operator can show with reasonable certainty the amount of production attributable to each pooled tract, he could potentially account to tract owners as if 100% of the production came from each tract. Although this doctrine was rejected by the *Luecke* court and seems an unlikely method for allocating production for purposes of determining a non-consenting NPRI owner's royalty share, unfortunately for operators, this method may still be in play. *See Luecke*, 38 S.W.3d at 649 (rejecting confusion of good theory); *Cf. Humble Oil & Ref. Co. v. West*, 508 S.W.2d 812, 818 (Tex. 1974) (accepting confusion of goods doctrine as theory for recovery).

## ii. Royalty Paid on Surface Acreage Basis

Allocating production to non-consenting drillsite tract NPRI owner's on the basis of their portion of acreage committed to the horizontally pooled unit would have the effect of diluting the NPRI's interest. A non-consenting NPRI owner is entitled to his full fractional share of production, undiluted by other pooled tracts. Allocating production based on the NPRI owner's pro rata share of acreage committed to the unit would dilute the NPRI owner's share without his consent.

#### iii. Royalty Paid on Percentage of Horizontal Drainhole

This doctrine examines the ratio of the length of the horizontal drain hole across a pooled tract to the length of the entire horizontal drain hole. While practical, this method fails to recognize the realities of horizontal pooling, where take points or fractures may not be evenly distributed along the horizontal drain hole. If so, can this method allocate production to tracts in a horizontally pooled unit with reasonable probability? It seems unlikely.

# iv. Royalty Allocated on a Productive Acreage Basis Along the Horizontal Drain Hole.

Another method examines paying royalty on a productive acreage basis and requires expertise in determining how much production to allocate to certain tracts based on fractures underlying the land. *See Luecke*, 38 S.W.3d at 639 (defendant lessee's expert witness testified as

to how production could be allocated to lessor's land based on fractures underlying their land). Practically, this model seems inefficient. Requiring expert testimony for the purposes of distributing royalty from a horizontal well is likely cost prohibitive, absent litigation.

# v. Royalty Paid on Proportionate Share of Total Perforated (Producing) Wellbore

In line with *Luecke's* mandate that the amount of production from a tract be determined with reasonable probability, this method calculates the proportionate share of the total perforated wellbore underlying each tract penetrated by the horizontal wellbore by taking the ratio of the length of the drain hole across a tract between the first take point and last take point to the total length of the horizontal drain hole between the first take point and the last take point. This method seems most likely to yield a determination of the production from a horizontally pooled unit that is attributable to drillsite tracts with reasonable probability. However, it ignores the scenario where you have a non-consenting drillsite tract owner that has no take points on his particular tract. Also, this method may also require significant expertise for determining how to allocate production from each tract of land penetrated by a horizontal wellbore that is cost prohibitive.

### V. Conclusion

The progressive use of horizontal drilling techniques has muddied the once clear rights of non-consenting NPRI owners. In light of *Luecke's* mandate that production be attributed to tracts with reasonable probability, developing a method that properly allocates production to various tracts within a horizontally pooled unit for royalty calculation purposes that also considers the position of the non-consenting NPRI owner will be a challenge. One thing is clear, the law developed during the era of vertical well drilling is not equipped to handle the challenges raised by advancements in horizontal drilling techniques.