I. INTRODUCTION

Since its introduction to the oil and gas industry more than 60 years ago, hydraulic fracturing has become one of the most significant developments in the production of oil and gas resources. The American Petroleum Institute and the Environmental Protection Agency estimate that 35,000 wells are hydraulically fractured in the U.S. annually, and over one million wells have been hydraulically fractured since its introduction in the 1940s. It is now estimated that 90% of all wells drilled in the U.S. today are stimulated by hydraulic fracturing, bringing U.S. oil and gas production to its highest levels in more than 14 years. The importance of hydraulic fracturing cannot be overstated. As conventional sources of domestic hydrocarbons are depleted and become less accessible by traditional exploration and production methods, new technologies like hydraulic fracturing that enable cost-effective production of hydrocarbons from non-conventional sources are becoming increasingly important.

Hydraulic fracturing involves the use of water—lots of water—and it is in this context that this paper focuses. The volume of water consumed by hydraulic fracturing is dependent on several factors, including the geology of the particular formation, the characteristics of the water being used, the number of stages in the hydraulic fracturing operation, and the length of the well lateral. It is estimated that an entire hydraulic fracturing operation in the Barnett, Fayetteville, Haynesville, or Marcellus Shale requires between 2.3 to 3.8 million gallons of water per well, and in the Eagle Ford Shale, 3.2 to 6 million gallons of water per well. Based on the estimate that 35,000

1 Hydraulic fracturing was developed and patented by Stanolind Oil Company and first used to stimulate an oil well site near Duncan, Oklahoma on March 17, 1949. Mark McPherson, Water Use and Water Law in Texas from an Oil and Gas Perspective 2 (St. Bar of Tex., Environmental Impacts of Oil and Gas, Houston, Tex., Jan. 13, 2012).


4 Sider, Gold & Lefebvre, supra n. 2, at B1.

wells are hydraulically fractured in the U.S. annually, it is believed that between 70 billion and 140 billion gallons of water are consumed through hydraulic fracturing each year—equivalent to the same amount of water annually consumed by the cities of Chicago or Houston.\(^8\)

While the volume of water used by hydraulic fracturing is relatively low when compared to other uses of water,\(^7\) it nevertheless faces growing regulatory and political pressure from an increasingly environmentally conscious and water dependent society. As a result, a significant component of hydraulic fracturing involves securing timely and reliable access to sufficient water resources.\(^8\) Competition between agricultural, commercial, industrial, municipal, oilfield, and other water uses as well as seasonal variations in precipitation make it difficult to satisfy the coexisting demand for water resources.\(^9\) Unsurprisingly, the use of large volumes of finite water resources for hydraulic fracturing is controversial.

Further exacerbating this controversy is the permanent removal from the hydrologic cycle of large volumes of wastewater generated by hydraulic fracturing and disposed of by disposal injection well. Water used in hydraulic fracturing is pre-treated with formation-specific chemical additives.\(^10\) These additives include anti-corrosive agents, biocides, friction reducers, lubricants, surfactant and clay stabilizers, and other chemicals and substances.\(^11\) The combination of these additives enables a propping agent to easily be carried into and hold open fractures in the formation created by hydraulic pressure, thus permitting hydrocarbons to move more freely out of the formation into the wellbore and to the surface.\(^12\) Though these additives comprise a small percentage of the overall volume of water used in hydraulic fracturing, it is enough to generally render the return water (known as “flowback water”) non-potable and unusable. Flowback water may

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\(^8\) American Petroleum Institute, supra n. 2, at 12; Gold & Campoy, supra n. 5.


\(^10\) Hydraulic fracturing fluid typically consists of between 3 to 12 chemical additives. The volumetric composition of this fluid is generally comprised of 99.51% water and sand, and 0.49% other additives. McPherson, supra n. 1, at 2; U.S. Dept. of Energy, supra n. 5, at 61–62.


\(^12\) Railroad Commission of Texas, supra n. 11.
additionally contain “produced water”—the native oilfield brine existing within the formation itself before hydraulic fracturing occurs. Produced water may contain unique, pre-existing contaminants native to the formation, including barium, calcium, chloride, iron, magnesium, naturally occurring radioactive materials, saline, and sulfur. While the overall characteristics of flowback water vary by geologic basin and specific rock strata, it typically contains concentrations of chemical additives and contaminants that require the mineral estate owner or the mineral lessee to take appropriate measures to ensure its proper handling and disposal. The most common method of disposing wastewater is by disposal well injection into porous formations thousands of feet underground.\textsuperscript{13}

\begin{footnotesize}
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\item The Texas Railroad Commission holds primary enforcement responsibility of the state’s Underground Injection Control Program and the authority to grant disposal well permits. When utilizing disposal wells, mineral interest owners can expect to encounter other obstacles in addition to cost, including obtaining approval of disposal well applications, disposal well construction standards, ongoing reporting requirements, and availability of suitable injection sites. Alternatives to disposing of wastewater by disposal well are generally limited to municipal or industrial treatment facilities, and/or placement into evaporation ponds on the surface estate. However, these alternatives also involve cumbersome obstacles.

For municipal or industrial treatment facilities these burdens include the availability, capacity, and capability of these treatment facilities to adequately treat millions of gallons of wastewater from oilfield operations. Additionally, municipal treatment facilities face increasing regulatory restrictions on acceptance of wastewater and are often required to obtain approval from regulatory authorities prior to acceptance and receipt of industrial pollutants such as wastewater from oilfield operations. Even when approval is granted, treatment facilities must continually ensure that water quality standards are maintained at all times and that treatment of such pollutants do not interfere with available public water supplies or disturb existing aquatic eco-systems. For evaporation ponds these burdens include potential contamination of other water resources caused by leaks in underground pond liners, harm to livestock and crops that come in contact with wastewater, and disposal of solids that remain following evaporation. In each instance, water treatment technologies would reduce the net amount of waste generated, and reduce the need for, and the costs associated with compliance of, handling and disposing of wastewater from oilfield operations. American Petroleum Institute, \textit{supra} n. 2, at 20–21; D.B. Burnett & C.J. Vavra, \textit{Desalination of Oilfield Brine} (Texas A&M Produced Water Treatment, Aug. 2006); Railroad Commission of Texas, \textit{Saltwater Disposal Wells Frequently Asked Questions} (FAQs), http://www.rrc.state.tx.us/about/faqs/saltwaterwells.php (accessed Jan. 6, 2013); Range Resources Corporation, \textit{supra} n. 3; U.S. Dept. of Energy, \textit{supra} n. 5, at 68.
\item Sider, Gold & Lefebvre, \textit{supra} n. 2, at B4.
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Since there exists an abundance of depleted reservoirs that have been converted to accept wastewater in states like Texas, disposal of millions of gallons of wastewater is relatively inexpensive.\textsuperscript{14} In states like Pennsylvania, however, the lack of injection wells may require transporting wastewater hundreds of miles for disposal well injection,\textsuperscript{15} resulting in significant handling and disposal costs.

Controversy arising from the competing uses of finite water resources and the cost of handling and disposing wastewater have largely influenced the emergence and development of advanced water treatment technologies capable of lessening the impact of oilfield operations on water resources. Implementation and use of these technologies in traditional oilfield operations allows wastewater to be treated for reuse suitable for hydraulically
fracturing additional wells and in alternative agricultural, commercial, industrial, municipal, oilfield, or other applications. As a result, reclaimed water remains a part of the hydrologic cycle.

The financial benefits of water treatment technologies are already being felt in the oil and gas industry. Companies that once incurred significant costs to purchase water for oilfield operations may now realize cost savings totaling $200,000 over the lifetime of a typical well. Water treatment companies are marketing these technologies as significantly cheaper alternatives to injecting wastewater into disposal wells, with some claiming these technologies can cost as much as 80% less. The Wall Street Journal reports that the emerging market alone could be worth billions of dollars. Although technologies are simultaneously being developed to eliminate the need for water in hydraulic fracturing altogether, the widespread, inexpensive implementation and use of such technologies are several years away. Thus, water treatment technologies are quickly becoming one of the most economically, environmentally, politically, and strategically significant developments in the industry.

Water treatment technologies have been implemented in several of the major shale plays in the U.S. Devon Energy reported in 2008 that it was recycling 90% to 100% of the flowback water recovered from hydraulic fracturing in the Barnett Shale. Range Resources reported in 2009 that it was successfully recycling 100% of its flowback water in southwestern Pennsylvania, and Chesapeake Energy Corporation recently reported that the company is recycling 100% of the wastewater from wells in northern Pennsylvania. Currently, it is estimated that 60% of mineral lessees are now recycling portions of their wastewater used to complete wells in the Marcellus Shale. Fountain Quail Water Management, an oilfield services company, announced in 2011 it had recycled more than 14 million barrels of wastewater from the Barnett Shale that would otherwise have been injected into disposal wells and permanently removed from the hydrologic cycle.

Widespread acceptance, implementation, and use of water treatment technologies in hydraulic fracturing operations throughout the U.S. will heavily depend on economic, environmental, political, and regulatory considerations. For purposes of this paper we choose to specifically focus on the legal impediments under Texas real property law that limit full adoption and realization of the benefits of water treatment technologies by mineral estate owners or mineral lessees on water produced from the same surface estate of a tract in which the minerals are being produced. In this context, there appears to be little guidance from Texas courts regarding a mineral estate owner’s or mineral lessee’s use of wastewater. We use this opportunity to review and discuss

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16 Sider, Gold & Lefebvre, supra n. 2, at B1, B4; see also Cookson, supra n. 15; Range Resources Corporation, supra n. 3.
17 Sider, Gold & Lefebvre, supra n. 2, at B4.
18 Id. at B1.
19 Id.
21 Range Resources Corporation, supra n. 3; see Cookson, supra n. 15.
22 Sider, Gold & Lefebvre, supra n. 2, at B4.
23 Range Resources Corporation, supra n. 3.
analogous case law and its application to rights to treated wastewater.

The application of water treatment technologies and the principles of law discussed throughout this paper are not unique to hydraulic fracturing. But the prominence of hydraulic fracturing operations in producing hydrocarbons from non-conventional sources, the volume of water consumed by such operations, and the ever-present competition for finite water resources provide a timely backdrop to discuss water rights as effected by these technologies.

The principles of law discussed throughout this paper specifically focus on groundwater wholly produced from the surface estate of a tract (and the lands pooled therewith) in which the minerals become subject to production. Application of these principles differs, for example, when water is produced from the surface estate of one tract in order to support operations on another tract, or when water is otherwise owned by the mineral estate owner or mineral lessee. Situations involving the use of third-party water, or the commingling of such water with that produced from the subject surface estate, are beyond the scope of this paper.

Additionally, the issues discussed throughout this paper represent one piece of a broader, comprehensive problem. Interlocking state and local issues regarding the regulatory treatment of treated wastewater, permitting requirements for commercial water recyclers, the sufficiency of a water transportation infrastructure, and water restrictions imposed by groundwater control districts are examples of issues that must be resolved before water treatment technologies will achieve widespread acceptance in oilfield operations and the full financial benefits of such technologies can be realized.

As used throughout this paper “surface” or “surface estate” means all interests in the fee simple estate, except the mineral estate granted to or reserved by the mineral interest owner (i.e., the fee simple title save the title to the minerals in place); “mineral estate” means those interests held by the mineral interest owner; “mineral interest owner” means the mineral estate owner or the mineral lessee, as applicable; and “mineral lease” means a standard-form mineral lease containing pooling provisions.

II. BY VIRTUE OF REUSE, A MARKET IS BORN

In the context of wastewater produced by oilfield operations, water treatment technologies create value where none was thought to exist. Water produced from the surface estate and utilized in hydraulic fracturing contains chemical additives and formation-specific contaminants that generally renders wastewater non-potable, unusable, and of little future value to the surface estate owner. However, water treatment technologies are changing the way surface estate owners and the industry view and handle wastewater.

By virtue of reuse, a market is born. Disposal of wastewater is being replaced by the reuse of such wastewater treated by water treatment technologies. Treated wastewater can be used to hydraulically fracture additional wells, used in other oilfield operations, or sold for various agricultural, commercial, industrial, or municipal purposes. Whether by cost-savings or economic gain, these technologies create value where none was thought to exist. Thus, who stands to benefit from the value created by water treatment technologies and litigation over ownership of treated wastewater are of paramount significance.

Texas law neither contemplates thereuse of such wastewater, nor the
ownership of the economic benefits created thereby. In reviewing and discussing analogous case law and its application to rights to treated wastewater, we examine the implied right of surface use and explore various principles that limit or place into context the implied right, each of which have implications on the widespread acceptance, implementation, and use of water treatment technologies in oil and gas operations throughout the state.

III. THE IMPLIED RIGHT OF SURFACE USE

Texas follows the theory of mineral ownership in place. Under this theory, a fee simple owner holds all substances underneath his acreage subject to their migration across property lines (e.g., oil and gas). Following severance of the surface and mineral interests (as in the case of an oil and gas lease), the mineral interest owner is afforded superior rights over the surface estate—the rights of the mineral interest owner are said to be “dominant.”

The dominant rights of the mineral interest owner afford it the necessary authority to carry out mineral exploration, production, and development activities. Absent language to the contrary, these activities carry certain rights to the surface implied in all grants of minerals even if a mineral lessor did not intend the full legal implications of the grant. The commonly stated principle of law is that the grant of minerals carries with it the implied right of use of such part and so much of the surface as is reasonably necessary to comply with the terms of the mineral lease and effectuate its purpose.

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25 Ownership of oil and gas in place was recently affirmed in Edwards Aquifer Authority v. Day, 369 S.W.3d 814 (Tex. 2012). Here the Texas Supreme Court held:

‘In our state the landowner is regarded as having absolute title in severalty to the oil and gas in place beneath his land. The only qualification of that rule of ownership is that it must be considered in connection with the law of capture and is subject to police regulations. The oil and gas beneath the soil are considered a part of the realty. Each owner of land owns separately, distinctly and exclusively all the oil and gas under his land and is accorded the usual remedies against trespassers who appropriate the minerals or destroy their market value.’

Id. at 831–832 (footnote omitted) (quoting Elliff v. Texon Drilling Co., 210 S.W.2d 558, 561 (Tex. 1948)); see also Stradley v. Magnolia Petroleum Co., 155 S.W.2d 649, 651 (Tex. Civ. App.-Amarillo 1941) (“Oil or gas in place is real estate and the ownership thereof may be severed from the ownership of the surface.”) (citations omitted)).

26 Sun Oil Co. v. Whitaker, 483 S.W.2d 808, 811 (Tex. 1972) (“The rights implied from the grant are implied by law in all conveyances of the mineral estate and, absent an express limitation thereon, are not to be altered by evidence that the parties to a particular instrument of conveyance did not intend the legal consequences of the grant.”); Getty Oil Co. v. Jones, 470 S.W.2d 618, 621 (Tex. 1971).

27 Sun Oil, 483 S.W.2d at 810 (“The oil and gas lessee’s estate is the dominant estate and the lessee has an implied grant, absent an express provision for payment, of free use of such part and so much of the premises as is reasonably necessary to effectuate the purposes of the lease, having due regard for the rights of the owner of the surface estate.”) (citations omitted)); Getty Oil, 470 S.W.2d at 621 (“It is well settled that the oil and gas estate is the dominant estate in the sense that use of as much of the premises as is reasonably necessary to produce and remove the minerals is held to be impliedly authorized by the lease; but that the rights implied in favor of the mineral estate are to be exercised with due regard for the rights of the owner of the servient estate.”) (citations omitted)); Brown v. Lundell, 344 S.W.2d 863, 865 (Tex. 1961) (“We agree that the owner-operator of the lease has the right to use so
Since the purpose of a mineral lease is to enable the mineral interest owner to carry out exploration, production, and development activities, in the context of fee simple ownership, the landowner must have impliedly intended that a right to use the surface pass to the mineral interest owner. Without the implied right the mineral interest owner would be unable to develop the minerals, and the benefits sought by the parties through the mineral lease would be unrealized.

Until recently, a fee simple owner's private ownership of groundwater in place remained uncertain. This uncertainty was laid to rest in the Texas Supreme Court decision of Edwards Aquifer Authority v. Day. Here, the court unanimously held that a fee simple owner owns the groundwater in place underlying his land as a vested real property right subject to constitutional protection. The court analogized groundwater ownership to that of the fee simple ownership of oil and gas in place, and confirmed that no basis existed between the two to conclude that the common law permitted a distinction. Thus, following severance of the surface and mineral interests and absent language to the contrary, groundwater in place is part of the surface estate and the rights thereto belong to the surface estate owner. As Texas courts confirmed years earlier in cases like Sun Oil Company v. Whitaker and Fleming Foundation v. Texaco, Inc.,

absent language to the contrary, water is a part of the surface estate and the implied right of surface use includes use of such part and so much of the water as is reasonably necessary to comply with the terms of the mineral lease and effectuate its purpose.

The implied right of surface use enables mineral interest owners to use water belonging to the surface estate. However, the scope of the implied right is not limitless. Texas decisions limit the breadth of the implied right and define the extent to which it may be imposed. For purposes of this paper, we discuss four categories of principles or limitations in the

much of the land, both surface and subsurface, as is reasonably necessary to comply with the terms of the lease contract and to carry out the purposes and intentions of the parties."

28 The foundational backbone of the implied right of surface use is clearly articulated in Tarrant County Water Control v. Haupt, Inc.: It is a well established doctrine from the earliest days of the common law that the right to the minerals carries with it the right to enter and extract them, and all other such incidents thereto as are necessary to be used for getting and enjoying them. This common law right was created 'because a grant or reservation of minerals would be wholly worthless if the grantee or reservor could not enter upon the land in order to explore for and extract the minerals.'


29 369 S.W.3d 814 (Tex. 2012).

30 Edwards Aquifer Authority, 369 S.W.3d at 832–833 (“Groundwater rights are property rights subject to constitutional protection . . ..”).

31 Edwards Aquifer Authority, 369 S.W.3d at 831–832 (“We now hold that [ownership of oil and gas in place] correctly states the common law regarding the ownership of groundwater in place.”).

32 483 S.W.2d 808, 811 (Tex. 1972) (“Water, unsevered expressly by conveyance or reservation, has been held to be a part of the surface estate.” (citation omitted)).

context of their application to water treatment technologies and the rights to treated wastewater: A mineral interest owner’s implied right of surface use must (a) adhere to the accommodation doctrine; (b) be reasonable and non-negligent; (c) yield to principles of ownership, not use; and (d) benefit the mineral estate.

A. Accommodation Doctrine

The implied right of surface use has been limited by a series of Texas decisions that have taken into consideration the coexisting value of the surface and mineral estates. One category of limitation tempers the dominant rights of a mineral interest owner by requiring it to conduct operations giving due regard to the surface estate owner’s existing use of the surface, provided that the mineral interest owner is reasonably able to do so.34

The “accommodation doctrine,” first clearly articulated in 1971 by the Texas Supreme Court in Getty Oil Company v. Jones,35 requires a mineral interest owner to reasonably accommodate the existing use of the surface by a surface estate owner, and in certain circumstances may require a mineral interest owner to adopt alternative usage of the surface.36 In Getty Oil, Jones bought the surface of a tract of land subject to an existing oil and gas lease.37 In exercising its rights to develop the minerals, Getty Oil drilled two wells and installed beam-type pumping units on each well.38 The extended height of the pumping units precluded and impaired the use of Jones’ existing elevated sprinkler irrigation system, which rotated in a circular motion around a pivot point.39 Holding that Getty Oil had reasonable surface use alternatives, the court stated:

The due regard concept defines more fully what is to be considered in the determination of whether a surface use by the lessee is reasonably necessary. . . . Under the circumstances indicated here; i.e., where there is an existing use by the surface owner which would otherwise be precluded or impaired, and where under the established practices in the industry there are alternatives available to the lessee whereby the minerals can be recovered, the rules of reasonable usage of the surface may require the adoption of an alternative by the lessee.40

In so holding, the decision placed greater emphasis on the existence of reasonable alternatives available to mineral interest owners. The court stated:

It is also indicated that there is available to Getty the two types of pumping

34 Sun Oil, 483 S.W.2d at 810 (“The oil and gas lessee’s estate is the dominant estate and the lessee has an implied grant, absent an express provision for payment, of free use of such part and so much of the premises as is reasonably necessary to effectuate the purposes of the lease, having due regard for the rights of the owner of the surface estate.” (citations omitted; emphasis added)); Getty Oil, 470 S.W.2d at 621 (“It is well settled that the oil and gas estate is the dominant estate in the sense that use of as much of the premises as is reasonably necessary to produce and remove the minerals is held to be impliedly authorized by the lease; but that the rights implied in favor of the mineral estate are to be exercised with due regard for the rights of the owner of the servient estate.” (citations omitted; emphasis added)).
35 470 S.W.2d 618 (Tex. 1971).
36 Getty Oil, 470 S.W.2d at 622.
37 Getty Oil, 470 S.W.2d at 620.
38 Getty Oil, 470 S.W.2d at 620.
39 Getty Oil, 470 S.W.2d at 620.
40 Getty Oil, 470 S.W.2d at 622 (citations omitted).
installations—the beam-type pumps in cellars or the hydraulic pumps on the surface—which are reasonable alternatives to its present use of the surface; and that Getty’s use of an alternative method of producing its wells would serve the public policy of developing our mineral resources while, at the same time, permitting the utilization of the surface for productive agricultural uses. Under such circumstances the right of the surface owner to an accommodation between the two estates may be shown . . . .

Three fundamental considerations provide the backbone of the accommodation doctrine. First, is there an existing use of the surface by the surface estate owner? Second, does use of the surface by the mineral interest owner preclude or impair the surface estate owner’s existing use? And, third, under established practices in the industry, are reasonable alternatives available to the mineral interest owner that still permit it to comply with the terms of the mineral lease and effectuate its purpose? In each instance, the surface estate owner carries the burden of proof. Absent sufficient proof supporting a surface estate owner’s accommodation doctrine claim, the mineral interest owner’s implied right of surface use prevails.

In the context of hydraulic fracturing, a surface estate owner wishing to limit a mineral interest owner’s use of water under the accommodation doctrine will likely face difficulty sustaining its claim. The surface estate owner might argue that its existing use of water from the surface estate is precluded and impaired by the mineral interest owner’s use of large volumes of water for hydraulic fracturing, and that the availability of water from other tracts of land constitutes a reasonable alternative that does not prevent the mineral interest owner from complying with the terms of the mineral lease and effectuating its purpose by other means. However, this argument would likely not withstand judicial scrutiny in light of the Texas Supreme Court’s decision one year after Getty Oil in Sun Oil Company v. Whitaker.

In Sun Oil the court rejected the application of Getty Oil and the accommodation doctrine, holding instead that mineral interest owners were under no obligation to seek alternative uses of the surface not provided by the surface estate itself. Thus, the accommodation doctrine would not overcome a mineral interest owner’s implied right of surface use where there are no reasonable alternatives available to the mineral interest owner within the confines of the surface estate.

For purposes of hydraulic fracturing operations, this result likely means a mineral interest owner is permitted to exercise its implied right of surface use to

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41 Getty Oil, 470 S.W.2d at 622–623.
42 It appears there is some question as to whether the accommodation doctrine requires proof that the surface estate owner or mineral interest owner have reasonable alternative uses of the surface estate. See Merriman v. XTO Energy, Inc., 2011 WL 1901987 (Tex. App.-Waco 2011) (mem.).
43 Getty Oil, 470 S.W.2d at 623.
44 483 S.W.2d 808 (Tex. 1972).
45 Sun Oil, 483 S.W.2d at 812 (“Our holding in Getty Oil Co. v. Jones is not applicable under the facts of this case. It is limited to situations in which there are reasonable alternative methods that may be employed by the lessee on the leased premises to accomplish the purposes of this lease.” (citation omitted; emphasis in original); “To hold that Sun can be required to purchase water from other sources or owners of other tracts in the area, would be in derogation of the dominant estate.”).
access water solely from the surface estate for such operations, even if such operations preclude and impair the pre-existing use of the surface estate owner. However, the relatively few Texas cases interpreting and applying the accommodation doctrine make it difficult to analogize its application beyond the facts of *Getty Oil* and *Sun Oil*, and it remains to be seen exactly how a Texas court may rule in this circumstance.

### B. Reasonable and Non-Negligent Uses of the Surface

The second category of limitations pertains to the scope of the mineral interest owner’s implied right in the context of reasonable and non-negligent uses of the surface estate. The reasonable use standard requires mineral interest owners to conduct activities in a manner that is appropriate in character and scope given the circumstances. Even if the mineral interest owner’s use is reasonable, the negligence standard imposes further limitation by requiring that it conduct its activities in a non-negligent manner. This is generally the case where the mineral interest owner has a right to act, but does so negligently. The distinction between the two limitations is often blurred and both are frequently alleged in lawsuits against mineral interest owners; however, each limitation uniquely tempers a mineral interest owner’s implied right. The reasonable use limitation is of particular relevance since Texas courts have historically held that a mineral interest owner may use as much water as is reasonably necessary to comply with the terms of the mineral lease and effectuate its purpose.

In the case of *Sun Oil*, the Texas Supreme Court held the mineral interest owner’s use of freshwater for waterflood operations was reasonably necessary to comply with the terms of the mineral lease and effectuate its purpose even where such use materially prevented the surface estate owner from cultivating the land as an irrigated farm. The court held that, absent language to the contrary, the grant of minerals “carried with it a grant of the way, surface, soil, water, gas and the like essential to the enjoyment of the actual grant of the oil.” As discussed in the previous section, the court based its decision in part on the determination that Sun Oil was under no obligation to seek alternative uses of the surface not provided for by the surface estate itself. Reasonable use, the court reasoned, “extends to and includes the right to use water from the leased premises in such amount as may be reasonably necessary to carry out the lessee’s operations under the lease.” Thus, no evidence existed supporting the surface estate owner’s claim that Sun Oil’s use of the water was unreasonable.

The Texas Supreme Court confirmed its *Sun Oil* decision in *Robinson v. Robbins Petroleum Corporation, Inc.* Here, the court held the “ownership of the minerals carries with it the right to use the surface, including water, to the extent reasonably necessary to develop and produce the minerals.” In doing so, the *Robbins Petroleum* court interpreted the implied right of surface use to permit the

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47 Id. at 11.
48 Id. at 8.
49 Id. at 8–12.
50 *Sun Oil*, 483 S.W.2d at 811 (quotations and citation omitted; emphasis added) (quoting *Guffey v. Stroud*, 16 S.W.2d 527, 528 (Commn. of Appeals-Sec. B 1929)).
51 *Sun Oil*, 483 S.W.2d at 812.
52 *Sun Oil*, 483 S.W.2d at 811 (emphasis added).
53 501 S.W.2d 865, 867 (Tex. 1973).
54 *Robbins Petroleum*, 501 S.W.2d at 867 (emphasis added).
mineral interest owner to use water for waterflood operations to re-pressure the formation.\textsuperscript{55} Even where the use of water would shorten the life of the surface estate owner’s water supply by several years, as in \textit{Sun Oil},\textsuperscript{56} or where the use of water would completely drain water from a pond used by the surface estate owner in the watering of livestock pasturing on the land, as in \textit{Carroll v. Roger Lacy, Inc.},\textsuperscript{57} Texas courts have generally held that such uses do not violate the terms of the mineral lease and are not unreasonable exercises of the implied right of surface use.\textsuperscript{58}

Given the \textit{Sun Oil}, Robbins Petroleum, and \textit{Carroll} decisions, it appears Texas courts have traditionally granted more rights to mineral interest owners than they might have otherwise successfully negotiated for themselves.\textsuperscript{59} Based on the historical approval of water use, unless strong evidence to the contrary is shown, a Texas court would likely find that water use by a mineral interest owner for hydraulic fracturing does not violate the reasonable use limitation of the implied right of surface use. Whether this limitation may one day require mineral interest owners to adopt water treatment technologies to treat wastewater remains to be seen.

C. Surface Use vs. Ownership

Texas law establishes that a mineral interest owner holds an implied right of surface use, not ownership. The importance of this distinction means that while a mineral interest owner may use such part and so much of the surface as is reasonably necessary to comply with the terms of the mineral lease and effectuate its purpose, the implied right does not grant ownership of the surface to the mineral interest owner.

The Texas Supreme Court has made this distinction in numerous decisions often in passing and in the context of defining the implied right of the mineral interest owner. In \textit{Getty Oil} the court held “the oil and gas estate is the dominant estate in the sense that use of as much of the premises as is reasonably necessary to produce and remove the minerals is held to be impliedly authorized by the lease.”\textsuperscript{60} Similarly, in \textit{Sun Oil} the court upheld the dominance of the mineral interest owner’s rights over the servient, surface estate, but tempered its holding by noting the implied right was limited to “use of such part and so much of the premises as is reasonably necessary to effectuate the purposes of the lease.”\textsuperscript{61} In the cases of \textit{Brown v. Lundell}\textsuperscript{62} and \textit{Humble Oil & Refining Company v. Williams}\textsuperscript{63} the court held, respectively, that the mineral interest owner had the right to “use so much of the land... as is reasonably necessary to comply with the terms of the lease,”\textsuperscript{64} and “use as much of the premises, and in such a manner, as was reasonably necessary to comply with the terms of the lease and to effectuate its purposes.”\textsuperscript{65}

The Texas Supreme Court’s language is significant for two reasons, each of which represents a significant impediment to widespread acceptance,

\textsuperscript{55} Robbins Petroleum, 501 S.W.2d at 867.
\textsuperscript{56} Justice Daniel’s dissenting opinion noted that Sun proposed to consume 4,200,000 barrels of the Whitaker’s water yielding an additional 1,000,000 barrels of oil worth about $3,000,000 and shortening the life of Whitaker’s water supply by at least eight years. Sun Oil, 483 S.W.2d at 813 (Daniel, J., dissenting).
\textsuperscript{58} Carroll, 402 S.W.2d at 317.
\textsuperscript{59} See Cross, \textit{supra} n. 46, at 8.
\textsuperscript{60} Getty Oil, 470 S.W.2d at 621 (emphasis added).
\textsuperscript{61} Sun Oil, 483 S.W.2d at 810 (emphasis added).
\textsuperscript{62} 344 S.W.2d 863 (Tex. 1961).
\textsuperscript{63} 420 S.W.2d 133 (Tex. 1967).
\textsuperscript{64} Brown, 344 S.W.2d at 865 (emphasis added).
\textsuperscript{65} Humble Oil, 420 S.W.2d at 134 (emphasis added; citations omitted).
implementation, and use of water treatment technologies throughout the state. First, the rights of a mineral interest owner are described in the context of use, not ownership. In each instance, the court’s recognition of a mineral interest owner’s implied right of surface use implicitly recognizes the surface estate owner’s ownership of the surface. Second, the court’s language confines surface use to effectuating the purposes of the mineral lease. In so doing, the court prohibits a mineral interest owner from using the surface in any manner that does not benefit the mineral estate of the subject tract and lands pooled therewith. This latter impediment is discussed in further detail in the following section.

The sale of an asset cannot be divorced from the issue of ownership; i.e., one must own something in order to sell it. Since a mineral interest owner’s right to water is usufructuary—giving it a present right of use only—it cannot sell that which it does not own. Upon the expiration of the mineral lease and absent language to the contrary, the fee simple determinable interest held by the mineral lessee automatically reverts to the mineral estate owner, and with it all rights, implied or otherwise. Notwithstanding the court’s likely deference toward the reasonably necessary use of water in hydraulic fracturing, mineral interest owners utilizing water treatment technologies to treat wastewater would ultimately be prevented from realizing any economic benefit from the sale of treated wastewater since such wastewater would remain the property of the surface estate owner. Thus, a mineral interest owner must ultimately obtain ownership of water from the surface estate owner in order to sell treated wastewater and derive any economic benefit from the sale.

Absent such ownership, mineral interest owners are unlikely to be incentivized to adopt water treatment technologies. Costs expended on such technologies would create no cost or economic benefits for the mineral interest owner, and the implementation of water treatment technologies would yield to less costly disposal well alternatives. Furthermore, recent confirmation in Edwards Aquifer Authority that groundwater in place is a vested real property right subject to constitutional protection would mean that Texas courts would likely not sustain a mineral interest owner’s claim to any ownership interest in treated wastewater produced from the surface estate, since denial of the surface estate owner’s ownership would give rise to a takings claim akin to that argued in the case.66

D. Surface Use Must Benefit the Mineral Estate

The fourth category of limitation on the implied right of surface use confines use of the surface to that which benefits the mineral estate of that tract only, and lands pooled therewith. Absent language to the contrary, a mineral interest owner is prohibited from using the surface of one mineral estate for the benefit of another. Since the purpose of a mineral lease is to enable the mineral interest owner to carry out mineral exploration, production, and development activities on the subject tract, the fee simple owner must have impliedly intended that a right to use the surface pass to the mineral interest owner. It follows then that use of the surface cannot be for the benefit of activities or any other purposes that do not benefit the mineral estate of the subject tract.

Texas cases have consistently held the implied right of surface use is limited to that which benefits the mineral estate of the subject tract only. In Robinson v. Robbins Petroleum Corporation, Inc.67 the mineral interest owner sought to undertake

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66 Edwards Aquifer Authority, 369 S.W.3d at 832–833.
67 501 S.W.2d 865 (Tex. 1973).
waterflood operations to re-pressure the formation. In doing so, Robbins Petroleum produced saltwater from the surface owned by Robinson, which Robinson acquired subject to the existing Wagoner oil and gas lease. Saltwater produced from the surface, which Robbins Petroleum included in a secondary recovery waterflood unit, was utilized to drive waterflood operations throughout the entire, field-wide unit, portions of which did not benefit the Wagoner lease. Robinson argued the use of his surface estate was unreasonable to the extent that it benefited other mineral estates within the unit and not included in the Wagoner lease. The court, distinguishing its ruling in Sun Oil as applicable to circumstances where use of the surface was for waterflood operations benefiting a single mineral estate only, agreed, holding:

Even if the waterflood operation is reasonably necessary to produce oil from premises of the Wagoner lease, it does not follow that the operator is entitled to the use of Robinson’s surface for the secondary recovery unit that includes acreage outside the Wagoner lease. Nothing in the Wagoner lease or the reservation contained in Robinson’s deed authorized the mineral owner to increase the burden on the surface estate for the benefit of additional lands.

Robinson, as owner of the surface, is entitled to protection from uses thereof, without his consent, for the benefit of owners outside of

and beyond premises and terms of the Wagoner lease.

Likewise, in TDC Engineering, Inc. v. Dunlap a Texas appellate court held the mineral interest owner had the right to dispose of saltwater in injection wells located on the surface from which the saltwater was produced, but did not have the right, absent language to the contrary, to dispose of such saltwater on land covered by another mineral lease.

Where the express terms of a mineral lease permit pooling of tracts owned by separate surface estate owners, Texas cases have upheld a mineral interest owner’s implied right of surface use, but maintained that such surface use must be for the exclusive benefit of the collective mineral estate. In Delhi Gas Pipeline Corporation v. Dixon the court confirmed a mineral interest owner’s use of the surface was reasonable where the surface was included in a pooled unit as expressly permitted by the terms of the mineral lease. Delhi Gas laid a gas gathering pipeline, a portion of which ran across the surface owned by Dixon, to transport natural gas from a well located on another tract within the unit. In reaching its decision the court acknowledged that the pipeline served only to transport gas from the well within the unit, and held that the pipeline did not violate Dixon’s rights even though transportation of the gas benefited a tract other than his own. In so holding the court stated the mineral interest owner had “the right to use as much of the premises as is reasonably necessary to produce and remove the oil, gas, and other minerals [including] the right to use as much of the surface estate as is

72 Robbins Petroleum, 501 S.W.2d at 867–868 (citations omitted).
74 TDC Engineering, 686 S.W.2d at 348.
75 737 S.W.2d 96 (Tex. App.-Eastland 1987).
76 Delhi Gas, 737 S.W.2d at 97.
77 Delhi Gas, 737 S.W.2d at 97.
reasonably necessary to produce oil or gas from a well located on a production unit with which the tract has been unitized.”

Similarly, in *Miller v. Crown Central Petroleum Corporation* the Millers purchased the surface of two tracts subject to an existing oil and gas lease, which permitted the pooling of lands. Following several years of oil production from the formation, Crown Central obtained approval from all mineral interest owners to undertake waterflood operations. Without the Millers’ approval, Crown Central buried a pipeline beneath the surface of the Millers’ tracts to transport saltwater to another tract included within the waterflood operation. Finding that the language of the mineral lease expressly granted Crown Central the right to pool the Millers’ tracts with other lands, the court held there was insufficient evidence to support a finding that Crown Central acted unreasonably, since its use of the surface benefited the mineral estate as provided by the mineral lease.

Application of this limitation to treated wastewater means that, notwithstanding the implied right of surface use, the use of such wastewater is confined to that which benefits the mineral estate of the subject tract only and lands pooled therewith. This only permits mineral interest owners to take advantage of treated wastewater to hydraulically fracture additional wells or utilize such wastewater in other oilfield operations so long as it benefits the subject mineral estate and lands pooled therewith. However, the use of treated wastewater would be prohibited and unreasonable to the extent it benefited a tract other than the tract from which it was produced, or was used for purposes unrelated to effectuating the mineral lease.

IV. BREACH OF THE IMPLIED RIGHT OF SURFACE USE

As discussed herein, the current framework of Texas law does not support the use or sale of treated wastewater to the extent that it does not benefit the mineral estate. Such use or sale would violate the exclusivity limitation set forth in the *Robbins Petroleum, TDC Engineering, Delhi Gas, and Crown Central* decisions, and the ownership principle set forth in the *Getty Oil, Sun Oil, Brown, and Humble Oil* decisions. In these situations, Texas triers of fact may decide against mineral interest owners, believing that they acted unreasonably and violated the reasonable use limitation set forth

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78 *Delhi Gas*, 737 S.W.2d at 97–98 (citations omitted).
80 *Crown Central*, 309 S.W.2d at 877–878.
81 *Crown Central*, 309 S.W.2d at 877.
82 *Crown Central*, 309 S.W.2d at 877.
83 *Crown Central*, 309 S.W.2d at 878–879. The *Crown Central* court held:

The leases expressly granted lessee the right to pool the two Miller tracts with other land and that production on the pooled acreage should be treated as if it were production from the land covered by leases on the Miller tracts. . . .

Since appellees had the right to pipe salt water across said land, they are not liable to the Millers for damages unless they either took more of the Millers’ surface than was reasonably necessary for carrying out the purposes of the leases, were negligent, or intentionally injured them.

84 According to a recent opinion of the Texas Court of Appeals, the mineral lessee must prove the existence of production from the non-drill site tract located within the pooled unit or else it cannot use the surface of the non-producing, but unitized, tract where the mineral lease on the non-producing tract is not in the surface estate owner’s chain of title. *See Key Operating & Equipment, Inc. v. Hegan*, 2013 WL 103633 (Tex. App.-Houston 2013).
forth in the *Sun Oil*, *Robbins Petroleum*, and *Carroll* decisions.

A successful claim for breach of the implied right of surface use may result in the payment of damages by the mineral interest owner to the surface estate owner, in addition to the mineral interest owner being enjoined from future use in violation of the implied right. In the context of treated wastewater used or sold for purposes that do not benefit the mineral estate, the surface estate owner would be entitled to damages to the extent the mineral interest owner’s use exceeded its permissible use.\(^\text{85}\)

\(^\text{85}\) *Robbins Petroleum*, 501 S.W.2d at 868 (“We hold that Robinson is entitled to recover the value of that portion of the salt water which has been consumed for the production of oil for owners of lands outside the Wagoner lease. . . . This assumes that this particular unit operation is reasonably necessary for the production of Wagoner lease minerals. If this is not the case, Robinson is entitled to damages for all of the water which has been used without his consent.”); *Getty Oil*, 470 S.W.2d at 623 (“We further hold, as urged by Getty, that in event it is ruled that Getty is making an unreasonable surface use, Getty will have the right to install non-interfering pumping units; and in such event Getty will not be liable in damages beyond the decrease in the value of the use of the land from the time the interfering pumps were installed to the time of their removal.”); *Humble Oil*, 420 S.W.2d at 134 (“A person who seeks to recover from the lessee for damages to the surface has the burden of alleging and proving either specific acts of negligence or that more of the land was used by the lessee than was reasonably necessary.” (citations omitted)); *Crown Central*, 309 S.W.2d at 879 (“Since appellees had the right to pipe salt water across said land, they are not liable to the Millers for damages unless they either took more of the Millers’ surface than was reasonably necessary for carrying out the purposes of the leases, were negligent, or intentionally injured them.”); *Magnolia Petroleum*, 155 S.W.2d at 651 (“In response to the one issue submitted by the court the jury found that the Magnolia used and occupied six acres more of the surface of the land than was reasonably necessary for its full enjoyment of the minerals in and under said section 24 and that the value of the use of said six acres of land was the sum of $30.”).

This assumes such use is reasonably necessary. If it is determined that the mineral interest owner’s use was unreasonable, the surface estate owner may be entitled to damages for all of the wastewater used without its consent.\(^\text{86}\)

\(^\text{86}\) *Robbins Petroleum*, 501 S.W.2d at 868.

The practical effect of these judicially imposed limitations means that, absent language or an agreement to the contrary, mineral interest owners incurring the expense of water treatment technologies are prohibited from benefiting from the use or sale of treated wastewater in activities unrelated to the mineral lease. Such an outcome is unlikely to incentivize Texas mineral interest owners to adopt water treatment technologies.

V. CONCLUSION

The uniqueness of water treatment technologies in the context of wastewater from oilfield operations is its ability to create value where none was thought to exist before. Thus, who stands to benefit is of paramount significance.

Most modern day mineral leases drafted by seasoned practitioners contain robust surface use provisions specifically setting forth the terms, conditions, and limitations of water use by a mineral interest owner. However, mere surface use provisions are not enough to enable a mineral interest owner to fully benefit from the value created by water treatment technologies.

Since mineral leases generally do not convey water ownership rights to mineral interest owners, practitioners and mineral interest owners are encouraged to negotiate the outright purchase and ownership of water directly from a surface estate owner as part of a surface use agreement or grant under a mineral lease.
Such ownership of water enables the mineral interest owner to utilize water treatment technologies in order to treat wastewater, and realize cost-savings or economic benefits resulting from its sale in various applications; in each case without consideration of the principles and limitations of the implied right of surface use discussed herein.