
**WHO OWNS THE LITHIUM?
The Wild, Wild West of the Future**

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Recently, there has been a growing push to extract certain minerals such as lithium from brine. Brine mining is a process that typically uses evaporation to extract minerals.¹ There are two common methods: 1) brine is left in large ponds to evaporate naturally; and 2) brine is heated in a plant or facility to speed up evaporation.² The latter method is faster but requires more energy and higher initial costs for infrastructure.³ In both methods, the minerals left after evaporation are collected and chemically treated to separate lithium from other materials before final processing.⁴ A newer technology, called Direct Lithium Extraction (DLE), uses filters and membranes to capture lithium directly without needing to evaporate large amounts of brine.⁵ While evaporation is currently more common, DLE is expected to become an important method for lithium extraction in the future.⁶

While technologies have evolved to extract and produce lithium from brine, Texas law is behind the curve. Currently, no cases involving lithium production in Texas could be found. This dearth of guidance is creating a new wave of questions for those in the energy sector. Primarily, practitioners are asking: Who owns lithium? Who owns the brine? What rights do developers of same have?

¹ Nick Orman, *Mineral Classified Lands*, STATE BAR OF TEXAS OIL, GAS, & TITLE EXAMINATION, Ch. 14 (2024).

² *See id.*

³ *See id.*

⁴ *See id.*

⁵ *See id.*

⁶ *See id.*

The purpose of this paper is to explore these questions. The following will be a presentation of current Texas case law and statutory law, arguments for ownership rights based thereon, and hopefully, guidance for those wading into this new area of energy development.

A. Real Property Rights in Texas

In Texas, real estate can be divided into different parts, each with specific components and rights. A common division is separating mineral rights from surface rights.⁷ Such a severance occurs through legal documents like a mineral deed, a mineral/royalty reservation, or an oil, gas, and mineral lease.⁸ Statutes and regulations can likewise impact ownership of differing real property interests.

Problems tend to arise when the document creating the severance is vague as to the scope of the exact components or rights being conveyed or retained.⁹ Indeed, many documents use words or phrases such as “minerals,” “minerals of any kind or character,” or “other minerals” in connection with a grant or reservation without specifically defining the term “mineral.”¹⁰ This lack of definition causes confusion because the surface and mineral estates are not simply severed at the ground level. For this reason, Texas courts have grappled with questions of distinction of the

⁷ *Humphreys-Mexia Co. v. Gammon*, 254 S.W. 296 (Tex. 1923).

⁸ *See id.*

⁹ *See, e.g., Sun Oil Co. v. Whitaker*, 483 S.W.2d 808 (Tex. 1972) (fresh water not included in mineral estate reservation of “oil, gas, and other minerals”); *Heinatz v. Allen*, 217 S.W.2d 994 (Tex. 1949) (devise of “mineral rights” held not to include limestone and building stone); *Atwood v. Rodman*, 355 S.W.2d 206 (Tex. Civ. App.—El Paso 1962, writ ref’d n.r.e.) (“oil, gas, and other minerals” did not include limestone, caliche, and surface shale); *Union Sulphur Co. v. Tex. Gulf Sulphur Co.*, 42 S.W.2d 182 (Tex. Civ. App.—Austin 1931, writ ref’d) (solid sulphur deposits conveyed by ordinary oil and gas lease); *Praeletorian Diamond Oil Ass’n v. Garvey*, 15 S.W.2d 698 (Tex. Civ. App.—Beaumont 1929, writ ref’d) (gravel and sand not intended to be included in lease for “oil and other minerals”); *Reed v. Wylie*, 597 S.W.2d 743 (Tex. 1980) (near surface lignite, iron and coal is part of the surface estate as a matter of law).

¹⁰ *See id.*

minerals that belong to each estate for almost a century.¹¹ The evolution of this law will be explained in further detail below.

B. The Surface Destruction Test:

Early Texas case law introduced the “surface destruction test.” This test sought to define minerals by their location relative to the surface and the impact on the surface estate of extracting same.¹² In so doing, courts attempted to balance two conflicting presumptions: 1) that all valuable substances should be included as minerals, regardless of their known presence or value at the time of the agreement, preserving the rights of both surface and mineral owners; and 2) that if the surface owner intended to grant rights to minerals that could destroy the surface, those minerals should be specifically defined rather than broadly labeled as “minerals” or “other minerals.”¹³

The main issue with the surface destruction test was that it relied on case-by-case analysis, which created uncertainty in property law, where stability and predictability are essential.¹⁴ This approach led to inconsistent results, such as considering oil and gas as minerals if they could be extracted without surface destruction (e.g., drilling) but not counting easily defined minerals like uranium and iron if their extraction involved significant surface damage.¹⁵ Ultimately, this meant that whether something was classified as a “mineral” could depend on its location relative to the surface and the extraction method, which could change over time, rather than on the actual nature of the substance, itself.¹⁶

¹¹See, e.g., *Acker v. Guinn*, 464 S.W.2d 348 (Tex. 1971); *Moser v. U.S. Steel Corp.*, 676 S.W.2d 99, 102 (Tex. 1984).

¹² See *Moser*, 676 S.W.2d at 101; .

¹³ See *Moser*, 676 S.W.2d at 101

¹⁴ See *Reed v. Wylie*, 554 S.W.2d 169, 182 (Daniel, J., dissenting).

¹⁵ See *id.*

¹⁶ See *id.*

C. The Ordinary Meaning Test

To address the problems associated with the surface destruction test, the Texas Supreme Court replaced that test with the “ordinary and natural meaning” test in the 1984 case of *Moser v. U.S. Steel Corp.*¹⁷ This new test defines a mineral based on its common understanding. Specifically, if something is generally recognized as a mineral, it counts as a mineral, regardless of its depth below the surface.¹⁸

Nevertheless, due to long-standing treatment of substances derived from previous decisions under the surface-destruction test, the Court declared certain materials to belong to the surface estate as a matter of law, regardless of whether these substances are ordinarily considered “minerals.”¹⁹ These substances include water, building stone, limestone, caliche, surface shale, sand, gravel, near-surface lignite, iron, and coal.²⁰

While the ordinary meaning test clarifies what is considered a mineral, it does raise other questions because it separates the definition of “mineral” from its location. For example, uranium is classified as a mineral whether it is extracted by surface mining or through non-destructive methods like drilling.²¹ Conversely, materials like sand, limestone, and gravel are always considered part of the surface estate, regardless of how deep they are found.²² Moreover,

¹⁷ 676 S.W.2d 99.

¹⁸ *See id.* at 102.

¹⁹ *See id.*

²⁰ *See id.*

²¹ *See id.*

²² *See Coastal Oil & Gas Corp. v. Garza Energy Tr.*, 268 S.W.3d 1 (Tex. 2008); *Dunn-McCampbell Royalty Int., Inc. v. Nat'l Park Serv.*, 630 F.3d 431 (5th Cir. 2011); *see also Heinatz*, 217 S.W.2d at 997 (“[S]ubstances such as sand, gravel and limestone are not minerals within the ordinary and natural meaning of the word unless they are rare and exceptional in character or possess a peculiar property giving them special value.”).

uncertainty remains for substances like lithium, selenium, and boron, which are dissolved in subsurface brine/salt waters that belongs to the surface estate.²³

D. Rights of the Dominant Estate

When a mineral interest is granted or reserved, it generally includes the right to use the surface of the land as reasonably necessary to extract and remove minerals.²⁴ This is based on the general principle that the grantor intended to include all rights needed to use and enjoy the conveyed property unless expressly stated otherwise.²⁵ For instance, the value of the mineral interest would be nullified without access to the surface.²⁶ This right of surface use is supported by public policy that favors productive land use and efficient development of mineral resources.²⁷

Stated otherwise, the implied right of reasonable use allows the mineral owner to use the surface estate for mineral development.²⁸ This is governed by the dominant estate doctrine, which treats the mineral estate as dominant and the surface estate as servient.²⁹ The dominant estate doctrine gives the lessee, as holder of the mineral estate, broad rights to use the surface estate for activities related to mineral development, such as drilling wells, building roads, and burying

²³ See generally Carolyn L. McIntosh, Alexander M. Arensberg & Ross E. de Lipkau, *How to Mine Lithium from Groundwater—The U.S. Legal Framework*, 63 ROCKY MOUNTAIN MIN. L. INST. 17-1 (2017).

²⁴ *Coyote Lake Ranch, LLC v. City of Lubbock*, 498 S.W.3d 53, 60 (Tex. 2016).

²⁵ See *Stradley v. Magnolia Petroleum Co.*, 155 S.W.2d 649, 651 (Tex. Civ. App.—Amarillo 1941, writ ref'd); John S. Lowe, *The Easement of the Mineral Estate for Surface Use: An Analysis of Its Rationale, Status, and Prospects*, 39 ROCKY MOUNTAIN MIN. L. INST. 4-1, 4-5 (1993); David E. Pierce, *The Common Law of Surface Use to Develop Oil and Gas*, in OIL AND GAS AGREEMENTS: SURFACE USE IN THE 21ST CENTURY 1-1, 1-6 (Rocky Mountain Min. L. Found. Special Inst. 2017).

²⁶ See *Harris v. Currie*, 176 S.W.2d 302, 305 (Tex. 1943).

²⁷ See Lowe, *supra*, n. 25.

²⁸ *Merriman v. XTO Energy, Inc.*, 407 S.W.3d 244 (Tex. 2013); *Tarrant Cnty. Water Control & Improvement Dist. No. One v. Haupt, Inc.*, 854 S.W.2d 909, 911 (Tex. 1993); *Getty Oil Co. v. Jones*, 470 S.W.2d 618, 621 (Tex. 1971).

²⁹ See *Getty Oil*, 470 S.W.2d at 621.

pipelines.³⁰ As long as these activities are reasonable, the surface owner cannot interfere or demand compensation for damages or restoration of the surface.³¹

This right of reasonable use becomes relevant in the event lithium is ultimately treated as a “mineral.” This is so because development of lithium involves extraction from brine, a type of water. Thus, if water—specifically brine—belongs to the surface estate, then the question arises as to whether it is reasonable for a lithium (mineral) owner to use that water. This analysis, of course, first turns on whether “brine” belongs to the surface estate.

E. What is Brine?

Brine, under its ordinary meaning, is a solution of salt and water that occurs naturally on earth or is generated through sodium chloride mining—it is essentially a type salt water.³² As lithium is extracted from brine, it is necessary to determine whether brine belongs to the surface or mineral estate. Water belongs to the surface estate as a matter of law in Texas. But does brine belong to the surface?

Robinson v. Robins Petroleum Corp., Inc.

This question was answered in the Texas Supreme Court case of *Robinson v. Robbins Petroleum Corp., Inc.*³³ In holding that salt water, like fresh water, is a part of the surface estate, the Court stated: “[w]e are not attracted to a rule that would classify water according to a mineral

³⁰ See *id.*; see also *Ball v. Dillard*, 602 S.W.2d 521, 523 (Tex. 1980); *Humble Oil & Ref. Co. v. Williams*, 420 S.W.2d 133, 134–35 (Tex. 1967); *Warren Petroleum Corp. v. Monzingo*, 304 S.W.2d 362, 363 (Tex. 1957); see also, *Lowe*, *supra*, n. 25.

³¹ See *Lowe*, *supra*, n. 25, § 4.02

³² See Tyler Gillespie, *Property and Energy Law—Pay to Play: The Effect of the Brine Conservation Act’s Statutory “In-Lieu” Royalty Provision on the Long-Term Economic Viability of Arkansas’s Brine-Lithium Industry*, 46 U. ARK. LITTLE ROCK L. REV. 613, 621 (2024) (noting that “brine is basically salt water”); *Brine*, MERRIAM-WEBSTER, <https://www.merriam-webster.com/dictionary/brine>; Gisbert Westphal et al. *Sodium Chloride*, ULLMANN’S ENCYCLOPEDIA OF INDUSTRIAL CHEMISTRY. (Weinheim: Wiley-VCH. (2010).

³³ 501 S.W.2d 865 (Tex. 1973).

contained in solution. Water is never absolutely pure unless it is treated in a laboratory.”³⁴ Accordingly, it seems well-settled that salt water, and thus brine, belongs to the surface estate . . . or does it?

(1) Legislation

The Texas Legislature recently passed several pieces of legislation that impact brine mining and ownership. First, Texas Water Code Section 27.036 now defines “brine mining” to include the production of naturally occurring brine (involving Class V injection wells) and brine extracted by the solution of a subsurface salt formation (involving Class III wells).³⁵ Section 27.036 also clarifies that the Texas Railroad Commission (RRC) has jurisdiction over both types of brine mining.³⁶ This statute requires all persons to obtain a permit from the RRC before drilling a Class V brine injection well.³⁷ Furthermore, the RRC must seek primacy over Class V brine injection wells in Texas.³⁸ Thus, the legislature has determined that brine injection wells fall under the purview of the RRC.

Second, like lithium extraction/production, there has similarly been a push for geothermal energy cultivation. This cultivation likewise involves brine. The Texas Legislature weighed in on this emerging energy by declaring that the ownership of “geothermal energy, heat, and associated properties” belongs to the surface estate.³⁹

Specifically, Texas Natural Resources Code Section 141.004 states:

- (a) Except as otherwise expressly provided by a conveyance, contract, deed, reservation, exception, limitation, lease, or other binding obligation, the

³⁴ *Id.* at 867.

³⁵ TEX. WATER CODE ANN. § 27.036.

³⁶ *See id.*

³⁷ *See id.*

³⁸ *See id.*

³⁹ TEX. NAT. RES. CODE ANN. § 141.004.

geothermal energy and associated resources below the surface of land are owned as real property by:

- (1) the landowner; or
 - (2) if the surface estate and the mineral estate of the land have been severed, the owner of the surface estate of the land.
- (b) Subject to the provisions of this chapter, the property rights described by this section entitle the owner of the geothermal energy and associated resources below the surface of land and the owner's lessee, heir, or assignee to drill for and produce the geothermal energy and associated resources.
- (c) This section does not:
- (1) apply to minerals dissolved or otherwise contained in groundwater, including in hot brines; or
 - (2) change existing law regarding:
 - (A) oil, gas, or mineral extraction regardless of its heat or energy potential;
 - (B) the rights of the dominant and servient estates; or
 - (C) the ownership and use of groundwater.⁴⁰

Breaking the statute down, the first thing the statute does is statutorily declare geothermal energy and associated resources to be part of the surface estate.⁴¹ But what is “geothermal energy and associated resources?” The Legislature defined this phrase in Texas Natural Resources Code Section 141.003 as follows:

- (4) “Geothermal energy and associated resources” means:
 - (A) products of geothermal processes, embracing indigenous steam, hot water and **hot brines**, and geopressed water
 - (B) steam and other gasses, hot water and hot brines resulting from water, gas, or other fluids artificially introduced into geothermal formations;
 - (C) heat or other associated energy found in geothermal formations; and
 - (D) any by-product derived from them.
- (5) “By-product” means any other element found in a geothermal formation which is brought to the surface, whether or not it is used in geothermal heat or pressure inducing energy generation. The term does not include:

⁴⁰ *Id.*

⁴¹ *Id.* § 141.004(a).

- (A) a mineral, as defined by Section 75.001, Property Code; or
- (B) oil, gas, or a product of oil or gas, as defined by Section 85.001.⁴²

Section 141.003 thus expressly defines geothermal energy and associated resources to include “hot brine.”⁴³ As such, under Section 141.004, the Legislature has statutorily determined that hot brine belongs to the surface estate. The definition goes on to include “any by-product derived from” the listed sources, which would include “hot brine.”⁴⁴ But, “by-product” is limited and does not include “a mineral” as defined by the Property Code or “oil, gas, or a product of oil or gas” as defined by the Texas Natural Resources Code.⁴⁵

The by-product limitation that excludes “a mineral” therefrom requires an examination of the Texas Property Code’s definition of “a mineral.” Texas Property Code Section 75.001 defines mineral as “oil, gas, uranium, sulphur, lignite, coal, and any other substance that is ordinarily and naturally considered a mineral in this state, regardless of the depth at which the oil, gas, uranium, sulphur, lignite, coal, or other substance are found.”⁴⁶ A brief glance at this definition demonstrates it is largely a codification of the holding in *Moser*.⁴⁷

Accordingly, Texas Natural Resources Code Section 141.004 appears to dictate that hot brine and its by-products, which may or may not include lithium, belong to the surface estate.⁴⁸ Nevertheless, Section 141.004 goes on provide further exclusions. Most importantly, the statute expressly excludes “minerals dissolved or otherwise contained in groundwater, including in hot

⁴² *Id.* § 141.003(4)–(5) (emphasis added).

⁴³ *Id.* § 141.003(4)(A).

⁴⁴ *Id.* § 141.003(4)(D).

⁴⁵ *Id.* § 141.003(5)

⁴⁶ TEX. PROP. CODE SEC. 75.001(a)(1).

⁴⁷ Compare *id.*, with *Moser*, 676 S.W.2d at 102 (adopting the ordinary meaning test but reaffirming prior holdings that building stone, limestone, cliché, surface shale, water, sand, gravel, and near-surface lignite, iron, and coal belong to the surface estate).

⁴⁸ TEX. NAT. RES. CODE SECTION 141.004.

brines.”⁴⁹ The statute further states it does not change existing law as it applies to oil, gas, or mineral extraction; rights of the dominant and servient estates; or groundwater use and ownership.⁵⁰ These exclusions appear to be a direct attempt to balance competing interests, likely related to the emerging interest in lithium production, by providing a narrow declaration as to geothermal energy that does not include lithium, itself.

Stated otherwise, the result of the statute and its exclusions and limitations seems to be that while hot brine and its by-products are owned by the surface estate, the Legislature is refusing to classify minerals dissolved in hot brines as part of this ownership declaration.⁵¹ As lithium is dissolved in brine, it seems lithium is not statutorily owned by the surface estate under the statute. Thus, where lithium is concerned, there is still no answer on ownership; thus, all roads seem to lead back to the ordinary meaning test from *Moser*.

F. Produced Water

The above brine analysis is further complicated by the fact that lithium-rich brine is often contained in “produced water” from oil and gas operations. So what is the meaning of “produced water” and who owns it?

Williams and Meyers define “produced water” as “any water originating from subsurface formations that is brought to the surface along with oil or natural gas.”⁵² Texas scholars, like Professor Peter Hosey from St. Mary’s School of Law, offer a more detailed explanation, describing produced water as water that comes out of the well with crude oil during production, including water from the shale formation and water injected during hydraulic fracturing that flows

⁴⁹ *Id.* § 141.004(c)(1).

⁵⁰ *Id.* § 141.004(c)(2).

⁵¹ *See id.* § 141.004.

⁵² Bruce M. Kramer & Patrick H. Martin, WILLIAMS AND MEYERS, MANUAL OF OIL AND GAS TERMS 930 (18th ed. 2021).

back to the well.⁵³ As recently stated by the El Paso court of appeals *Cactus Water Services, LLC v. COG Operating, LLC*:

Fracking involves “pumping fluid down a well at high pressure so that it is forced out into the formation,” which “creates cracks in the rock that propagate along the azimuth of natural fault lines in an elongated elliptical pattern in opposite directions from the well.” The fluid contains proppants that keep those cracks open and allow oil and gas to flow to the wellbore. However, what travels to the wellbore involves other substances too, both hydrocarbon and not.⁵⁴

Cactus Water Services directly addressed the ownership of produced water from hydraulic fracturing operations between a mineral lessee and surface owners. The mineral lessee held mineral leases on approximately 37,000 acres in Reeves County, Texas, allowing it to explore and produce oil and gas.⁵⁵ The mineral lessee’s fracking operations created produced water.⁵⁶ Under Texas law, produced water is treated as a “waste product,” and as such, mineral lessees are responsible for handling and disposing of produced water.⁵⁷

Nevertheless, the surface estate owners argued that the mineral leases did not cover produced water because water is not a hydrocarbon.⁵⁸ In this connection, the surface estate owners claimed ownership of the produced water.⁵⁹ Conversely, the mineral lessee contended that the leases include the entire oil and gas product stream, which encompasses produced water as a waste byproduct.⁶⁰

⁵³ Bobby Biedrzycki, Peter Hosey, & Reagan Marble, *Produced Water: The Next “Title” Wave of Litigation*, U. TEX. LAW CLE (2022).

⁵⁴ 676 S.W.3d 733 (Tex. App.—El Paso 2023, pet granted) (citations omitted).

⁵⁵ *See id.* at 735.

⁵⁶ *See id.*

⁵⁷ *See id.* at 738–39.

⁵⁸ *See id.* at 738.

⁵⁹ *See id.*

⁶⁰ *See id.*

The El Paso court, relying heavily on Texas statutory and regulatory laws, classified produced water as oil and gas waste, distinct from groundwater.⁶¹ The court emphasized that produced water, as waste, falls under the lessee’s responsibilities and rights under the mineral lease, including disposal obligations.⁶² The court thus concluded that the mineral leases intended to cover all aspects of oil and gas production, including managing produced water.⁶³ As such, any later agreements by surface owners to transfer produced water rights were invalid.⁶⁴

It is important to note that *Cactus Water Services* involved a strong dissent favoring surface-estate ownership of “produced water.” Additionally, the Supreme Court of Texas granted a petition for review. Questions arising in the wake of *Cactus Water Services* include: Would the analysis change if the mineral lessee had been selling the produced water for profit instead of disposing of it? What if the mineral lessee decided to use the produced water for evaporation extraction of substances like lithium? What if the produced water were determined to be “hot brine”—would this create a conflict between statute and case law?

So what is clear? The results of the brine cases and statutes indicate that hot brine belongs to the surface estate. Naturally occurring brine is likely owned by the surface state as well. Brine mixed with produced water, for now in West Texas at least, seems to belong to the mineral estate.

G. What is Lithium?

From the above analysis, it seems likely that brine—“hot brine” by statute and naturally occurring brine under *Robinson*—belongs to the surface estate.⁶⁵ Produced water is less clear.

⁶¹ *See id.* at 739–41.

⁶² *See id.*

⁶³ *See id.*

⁶⁴ *See id.*

⁶⁵ TEX. NAT. RES. CODE SECTION 141.003, .004; *Robinson*, 501 S.W.2d 865.

Regardless of who owns the brine, however, lithium appears to be a separate substance that is derived therefrom. The Arkansas Legislature, cutting to the chase, statutorily defined “brine” to include any substances extracted therefrom.⁶⁶ But Texas has no such statute at this time, and its recent statutory enactments seem to indicate that it is not willing to go that far.

Thus far, lithium is undefined in Texas. Ownership of undefined substances is subject to the ordinary meaning test.⁶⁷ The Supreme Court of Texas potentially laid the groundwork for defining lithium in the *Robinson* case.⁶⁸ Despite holding that salt water, like fresh water, belongs to the surface estate, the Court made an important observation in dicta that seems to mirror the Legislature’s balancing of interests in enacting sections 141.003-004 of the Texas Natural Resources Code as applied to substance extraction from brine:

*It is the water with which these parties are concerned and not the dissolved salt. If a mineral in solution or suspension were of such value or character as to justify production of the water for the extraction and use of the mineral content, we would have a different case. The substance extracted might well be the property of the mineral owner, and he might be entitled to use the water for purposes of production of the mineral.*⁶⁹

No Texas case has yet decided whether lithium belongs to the mineral estate. However, this dicta from *Robinson* will likely be used in future arguments to support the proposition.

1. Arguments for Lithium as part of the Mineral Estate

The two primary arguments for lithium belonging to the mineral estate come straight out of *Moser*.⁷⁰ First, lithium does not fall within the substances declared “surface minerals” as a

⁶⁶ ARK. CODE ANN. § 15-76-306-307.

⁶⁷ See *Moser*, 676 S.W.2d 99.

⁶⁸ 501 S.W.2d at 867.

⁶⁹ *Id.* (emphasis added).

⁷⁰ 676 S.W.2d at 103.

matter of law in *Moser*.⁷¹ Second, and stemming from the first, because lithium has not been declared a part of the surface estate, the ordinary meaning test outlined in *Moser* should apply.⁷²

In applying the ordinary meaning test, a working definition of “lithium” must be determined. Lithium is a chemical element—“a soft silver-white element of the alkali metal group that is the lightest metal known and that is used in chemical synthesis and in storage batteries.”⁷³ “Lithium, the lightest metal yet known, exists in produced water in potentially commercial-grade amounts idly waiting to be extracted. Thus, writers have coined the element as the ‘white gold’ of electric vehicles.”⁷⁴ The British Geological Survey treats lithium as a “mineral.”⁷⁵ Per the *Handbook of Lithium and Natural Calcium Chloride*: “[l]ithium is a comparatively rare element . . . found in many rocks and some brines.”⁷⁶ The University of Waterloo Earth Science Museum reports:

Pure lithium, like sodium, calcium or potassium, is a naturally occurring mineral. It is found abundantly in certain rocks, in water, and in minute amounts in plant and animal tissues. It is estimated that there is 12 million tons of lithium on earth. There are few lithium minerals. They are distributed in the Earth’s crust in low concentrations. The minerals lepidolite, petalite and spodumene are a few of the most important ores of lithium . . . A lot of the time hard rock mining of lithium is both expensive and unnecessary. Most lithium is recovered from brines, or water

⁷¹ *See id.*

⁷² *See id.*

⁷³ *Lithium*, MERRIAM-WEBSTER, <https://www.merriam-webster.com/dictionary/lithium>.

⁷⁴ Rodrick Wetsel & Hannah Davis, *The Quest for Lithium: California Dreaming or Key to the Magic Kingdom?* 18 TEX. J. OIL GAS & ENERGY L. 198, 203 (2023) (footnote omitted) (citing Anne Marie Helmenstine, *What Is the Lightest Metal?*, THOUGHTCO (Aug. 28, 2020), thoughtco.com/what-is-the-lightest-metal-608450); *see also* Jeniece Pettitt, *How the U.S. Fell Behind in Lithium, the ‘White Gold’ of Electric Vehicles*, CNBC (Jan. 15, 2022, 3:22 AM), <https://www.cnbc.com/2022/01/15/how-the-us-fell-way-behind-in-lithium-white-gold-for-evs.html>; Bob Campbell, *Lithium from Produced Water?*, ODESSA AMERICAN (Dec. 18, 2022), <https://www.oaoa.com/local-news/lithium-from-produced-water/>.

⁷⁵ *Mineral Profile—Lithium*, BRITISH GEOLOGICAL SURVEY, <https://www.bgs.ac.uk/news/mineral-profile-lithium/#:~:text=This%20new%20addition%20relates%20to,all%20need%20batteries%20containing%20lithium.>

⁷⁶ Donald E. Garrett, *HANDBOOK OF LITHIUM AND NATURAL CALCIUM CHLORIDE* 1 (2014).

with a high concentration of *lithium carbonate*, which is trapped in the Earth's crust.⁷⁷

It therefore appears that lithium is a metallic substance. More specifically, pure lithium is a simple element that occurs in rocks, and lithium carbonate is a chemical compound that occurs in brines. Are metallic elements or chemical compounds considered “minerals?” Gold, silver, copper, platinum, lead, zinc, molybdenum, and uranium are metallic elements considered hard rock minerals in some contexts.⁷⁸ Oil and gas are chemical compounds clearly considered minerals. Thus, it does not seem a leap to assume lithium, upon careful scrutiny of meaning, would classify as a “mineral.”

Moreover, as noted, the dicta from the *Robinson* opinion should weigh heavily in favor of lithium belonging to the mineral estate:

If a mineral in solution or suspension were of such value or character as to justify production of the water for the extraction and use of the mineral content, we would have a different case. The substance extracted might well be the property of the mineral owner, and he might be entitled to use the water for purposes of production of the mineral.⁷⁹

This of course leads to the next issue—if lithium belongs to the mineral estate but it is located in brine, does the mineral estate owner, as the dominant estate owner, have the right to reasonably develop the brine to extract and produce the lithium?

Again, in jurisdictions under the El Paso Court of Appeals, for now, produced water appears to be owned by the mineral estate owner. Thus, in those jurisdictions, arguably, if the mineral owner chooses to extract lithium from produced water, the produced water belongs to said owner so there should be no issue—unless lithium is eventually determined to belong to the surface

⁷⁷ Kathy Feick, *Lithium*, UNIVERSITY OF WATERLOO: EARTH SCIENCE MUSEUM, <https://uwaterloo.ca/earth-sciences-museum/resources/detailed-rocks-and-minerals-articles/lithium>. University of Waterloo.

⁷⁸ 31 TEX. ADMIN. CODE § 10.1(a)(5) (defining “Mineral” as including “base and precious metals”).

⁷⁹ *Robinson*, 501 S.W.2d at 867.

estate. If the Texas Supreme Court denies affirms the El Paso Court of Appeals’s decision, this law will apply throughout Texas.

As to all other brines, if lithium is determined to be owned by the mineral estate owner, the mineral estate owner can reasonably use the surface estate to develop its minerals.⁸⁰ In connection therewith, Texas law holds that the mineral estate owner has the right to the surface estate owner’s water to the extent it is reasonably necessary for mineral development.⁸¹ A mineral interest owner can use the water only to benefit the mineral estate of the specific tract (and any pooled tracts) and not for any other purposes.⁸²

2. Arguments for Lithium as part of the Surface Estate

Texas courts have held that ground water and salt water (other than produced water) belong to the surface owner. The legislature has defined hot brine as belonging to the surface estate. Robinson indicates naturally occurring brine also belongs to the surface estate. As noted, Arkansas has statutorily defined brine as including all minerals that can be extracted therefrom. Thus, were Texas courts or Legislature to find Arkansas law persuasive, one or the other could declare lithium, as a substance extracted from brine, to be owned by the surface estate.⁸³ That said, again, the legislature stopped short of doing so in enacting TNRC Sections 141.003-004. And, at least in jurisdictions governed by the El Paso court of appeals, brine that results from “produced water” seems to be owned by the mineral owner. The scale seems to be tipping toward lithium as a mineral belonging to the mineral estate. Only time will tell.

⁸⁰ *Merriman*, 407 S.W.3d 244; *Haupt*, 854 S.W.2d at 911; *Getty Oil*, 470 S.W.2d at 621.

⁸¹ *Robinson*, 501 S.W.2d at 867.

⁸² *See id.*

⁸³ ARK. CODE ANN. § 15-76-306-307.

3. *What's next?*

While writing this paper, it came to the authors' attention that the RRC adopted significant rule changes that appear to directly address the evolving landscape of brine production. The rule changes affect sections in Chapter 3 of Title 31 of the Texas Administrative Code, including sections 3.1, 3.5, 3.7, 3.12–3.14, 3.16–3.17, 3.36, 3.78, and 3.81–3.82. A detailed list of the voluminous proposed changes is beyond the scope of this paper, but the authors would be remiss not to point out several prominent issues and questions that may arise from these changes.

Generally, the new rules emphasize that the RRC regulates applications for permits to Drill, Deepen, Reenter, or Plug Back that include oil, gas, brine, and geothermal. Throughout these rules, brine is often expressly added and listed along with “geothermal resources” or “fluids.” As noted, geothermal resources have been defined by the legislature to be owned by the surface estate. That definition includes brine but excludes substances within brine. And the RRC seems to be expressly including both throughout the changes because the RRC regulates both, but the RRC makes no mention or reference to ownership.

Importantly, too, the rules eliminate the phrase “oil and gas” throughout the sections at issue. The assumption here is that the RRC is clarifying that the scope of activities regulated by the RRC goes beyond “oil and gas” activities. Stated otherwise, because RRC is now regulating brine resource wells and brine injection wells that do not necessarily involve oil and gas activities, the RRC is proposing changing its language to be more inclusive of its total scope. This begs the question: does the fact that the RRC has been charged with regulating brine activities—instead of the Texas Commission on Environmental Quality—raise the possibility that Texas is leaning toward considering substances contained in brine and even brine itself a “mineral” because the RRC typically regulates mineral-related activities? The counterpoint, however, is that the RRC is regulating geothermal resources, too, which have been statutorily declared to be part of the surface

estate. Thus, the fact that the RRC is regulating interests owned by both the surface and the mineral estate diminishes the argument that Texas is leaning toward any specific ownership rights with respect to lithium-rich brine.

The furthest reaching effect of the changes is that the RRC is now defining previously undefined terms. They define “brine” as “[s]aline water, whether contained in or removed from an aquifer, which may contain brine resources or other naturally-occurring substances such as entrained oil or gas, including hydrogen sulfide gas.”⁸⁴ Notably, this definition “does not include brine produced as an incident to the production of oil and gas.”⁸⁵ The new rules are careful not to include the word “mineral” in this definition, and it appears to exclude “produced water.” Is this perhaps in response to the *Cactus* case?

The rules define “brine production project” as “[a] project the purpose of which is the extraction of brine resources from a brine field. The term includes brine production wells, Class V spent brine return injection wells, monitoring wells, brine flowlines, and any equipment associated with the project.”⁸⁶ The rules further define “brine resource” as “[e]lements, minerals, salts, or other useful substances dissolved or entrained in brine, including, but not limited to, lithium, lithium ions, lithium chloride, halogens, or other halogen salts, but not including oil, gas, or any product of oil or gas. The term does not include brine extracted pursuant to §3.81 of this title (relating to Class III Brine Mining Injection Wells).”⁸⁷ This new definition expressly removes the word “mineral” from the prior definition, referring instead to “substances.” Interestingly, the definition does not include “lithium”—only “halogen salts” as an example.

⁸⁴ TEX. ADMIN. CODE § 3.82(b)(5).

⁸⁵ *Id.*

⁸⁶ *Id.* § 3.82(b)(7).

⁸⁷ *Id.* § 3.82(b)(11).

H. Conclusion

Many questions in brine and lithium ownership are left unanswered by Texas law and are ripe for litigation. It would be dangerous for any practitioner, this early in the development of this law, to say one way or the other who owns brine, who owns lithium and how far the implied grant of reasonable use will be extended. The arguments are presented; but resolution belongs to future courts or the legislature.

As such, the recommendation for developers of lithium is to proceed with caution and lease everyone—both surface estate owners and mineral estate owners. The biggest issue, here, however, is how will the producer pay? These are separate estates; thus, what would a division order look like? It seems the only answer, at this point, would be get a stipulation of interest. If the parties refused to sign, then a title issue exists, and the producer could suspend the funds and file an interpleader—this puts the issue to the courts and leaves the producer as a disinterested stakeholder. This position is the safest place for lithium developers at this point in the game. It is only a matter of who wants to take this issue to the courts first.