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#### **ENERGY** EDUCATION SERIES

### WEBINAR The Current State of Lithium Law

A "Quagmirish Fog"

Wednesday, November 20, 2024

Brad Gibbs Co-Owner | Houston

### Poll

## Which aspect of lithium development interests you the most?

- a) Environmental impact
- b) Ownership and legal frameworks
- c) Technology advancements (e.g., DLE)
- d) Market pricing and global supply chains

lithium 3 <b>J</b> 6,941
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### About the Speaker

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Brad represents clients in connection with upstream energy transactions, complex mineral titles, pooling issues, lease analysis, joint operating agreements, surface use issues, solar development and accommodation, title curative, and general oil and gas business matters. His primary focus is on North Dakota, Texas, and New Mexico. Connect with Brad on LinkedIn



### Texas Supreme Court Quote that Sums it All Up

"By the end of it all, [the majority's decision defining "other minerals"] gropes in this **<u>guagmirish fog</u>**: the surface belongs to the surface estate owner and the minerals belong to the mineral estate owner, except in pre-June 8, 1983 severances where nobody knows who owns what (not even a title examiner) until ownership has been litigated, in which case if some portion of a mineral is found within 200 feet of the surface, it belongs to the surface owner unless, of course, the land was purchased pursuant to the Land Sales Act of 1895, in which case even though the estates were severed before June 8, 1983, the minerals belong to the mineral estate, or the State."

– Justice Ray (Concurring), Schwarz v. State, 703 S.W.2d 187 (Tex. 1986)





### **Overview – Lithium is the Talk of the Town**

- Lithium is a critical mineral that has been discovered in Arkansas and Texas in the Smackover Formation
- New tech is driving new U.S. investment
- The interest in lithium has raised ownership questions that courts and legislatures will need to clarify
- In this presentation, we will review some lithium basics and the current state of the law (or lack thereof) in TX & AR





## What is Lithium?

- Lithium is a soft, silver-white alkali metal a chemical element and with the symbol Li and atomic number 3
  - It is a used as a mood-stabilizing medication to treat bipolar disorders
  - It is used in household and EV batteries, refrigerants, and air conditioners
  - > It is highly reactive and superconductive
  - It is a hit 1992 single from my junior high days that is now on classic rock stations











### Why do we care about Lithium?

### **Energy Transition**

- Lithium is used to make lithium-ion batteries, which are vital to millions of consumer products, including electric vehicle batteries
- Also, may be critical to large scale energy storage from renewable sources

#### **Public Policy**

- Legislatures, both federal and state, along with companies and many countries have expressed their intention to reach net zero emissions
  - Subsidies and tax incentives.
    Green New Deal & Inflation
    Reduction Act (lithium
    producers may get production
    tax credits that are equal to
    10% of operating costs)

#### **National Security**

- Most lithium now comes from Australia, Chile, Argentina, and China
- The U.S. imports hundreds of millions of lithium-ion batteries each year
  - The U.S. imported 3,400 metric tons in 2023



### **Selected Recent Lithium Headlines**



- ExxonMobil to begin lithium extraction in Arkansas as officials hope for the start of a boom (Arkansas Advocate <u>11/13/2023).</u>
  - First production targeted for 2027
- The Lone Star Lithium Boom (Texas Monthly 9/9/2024).
  - > The story of DLE tech
- Could the Arkansas Lithium Boom be Over Before it Starts? (OilPrice.com 10/1/2024).
  - > Mines are closing in Australia, but long-term prospects are good
- Direct Lithium Extraction: is the hype justified by the reality? (Wood Mackenzie 10/1/2024).
  - > Examines the economics of DLE and government subsidies
- <u>He Wants to Be the Lithium King. Run for President. And Live to 150. Teague Egan has big plans. First, he needs to deliver on the hype he's generated for his company. (The Wall Street Journal 10/6/2024).</u>
  - > Are lithium startups more hype than substance?
- <u>China is oversupplying lithium to eliminate rivals, US official says. (Reuters 10/8/2024).</u>
  - > Chinese lithium producers are flooding the global market and engaging in "predatory pricing"



### A Couple More Headlines



- <u>U.S. approves massive lithium mine in Nevada</u>, <u>overriding protests</u>. (Washington Post, 10/24/20240).
   Could drive a rare wildflower to extinction
- <u>Vast deposit of "white gold" in Arkansas could be</u> <u>stunningly valuable.</u> (USA Today 10/23/20240).
  - \* "There could be between 5 and 19 million tons of lithium buried there, <u>enough to meet projected world demand for lithium car</u> <u>batteries nine times over</u>."
  - \* "The catch: figuring out how to extract that much lithium without wreaking havoc on the environment and the water table. Lithium is notoriously difficult to extract and has been linked to water depletion and other issues."



### How is Lithium Recovered: Hard-Rock Deposits

- Democratic Republic of Congo has the largest lithium spodumene hard-rock deposit in the world (1.5 billion tons of lithium)
- Wyoming and Nevada may also have significant hard-rock lithium deposits
- Involves crushing the spodumene, roasting at 2012°F, grinding, acid leaching, refining into lithium carbonate, and purification to battery grade standards







### How is Lithium Recovered: Brine Evaporation

- The traditional method of extracting from brine deposits using large evaporation ponds
  - > Series of ponds with growing concentrations
- Time consuming process that can take several months to a few years
- Like hard rock mining, heaving environmental impact on surrounding areas







### How is Lithium Recovered: Direct Lithium Extraction (DLE)

- DLE cuts production time to two weeks and has much less environmental impact
- A well produces brine and a chemical process extracts lithium via an ion exchange
  - > Every operation is different
- Water is reinjected into the brine aquifer
- Capital intensive
  - Will likely require heavy government incentives to be economic (at least at first)



# How is Lithium Recovered: Direct Lithium Extraction (DLE)

- Operated by Standard Lithium in JV with Equinor (Koch Brothers backed)
- Goal is to extract lithium from tail brine produced from bromine facility
- Other companies heavily investing are ExxonMobil Lithium, Albemarle Corporation, Lanxess, and Tetra Technologies
- On July 26, 2024, these companies filed a joint application with the Arkansas Oil and Gas Commission to set a royalty rate of 1.82%
  - > Landowners are demanding a royalty of 12.5%
  - Traditional brine royalties are 1% to 2% (different in other countries)







## Where is Lithium Found?

- The "Lithium Triangle" includes Chile, Bolivia, and Argentina, where the lithium is found in desert salt pans
- Lithium is also found in brine in Western China
- Australia mines lithium from spodumene through strip-mining techniques



Rank	Country	2021 Production (tonnes)	% of Total
#1	Australia 🎬	55,416	52%
#2	Chile 🍋	26,000	25%
#3	China 📟	14,000	13%
#4	Argentina 프	5,967	6%
#5	Brazil 🔯	1,500	1%
#6	Zimbabwe 🗯	1,200	1%
#7	Portugal 🖾	900	1%
#8	United States 🗂	900	1%
	Rest of World 🌍	102	0.1%
	Total	105,984	100%



## Lithium's Price and Market

- Lithium, like other metals, is priced in the commodity markets, where it is valued depending on supply and demand
- Most lithium in EV batteries comes from abroad
- As noted, potential lithium producers filed an application with the AOGC to establish a royalty rate for landowners
- By contrast, India's lithium royalty rate is 3%, while Australia's is 5%
- 2022 (\$80,000/MT), 2024 (~\$10,500/MT) due to stagnant EV sales, 2025 Forecast (\$20,000/MT)



EXW is a pricing method that is based on the cost of the product at the manufacturing site. The buyer is responsible for transportation, insurance, and customs fees. Source: S&P Global Market Intelligence. © 2024 S&P Global





# The United States Emerging Role in the Lithium Market

- The Silver Peak Mine in Nevada is the only active lithium mine in the US
  - There, lithium is extracted from evaporated Brine (NV Rhyolite Ridge mine just approved)
- Exxon acquired 120,000 acres in the Smackover strictly to produce lithium, with 2027 as the targeted date of first production
- The federal government made securing a domestic supply chain for lithium a priority when it included the mineral on the <u>2022 Critical</u> <u>Minerals List</u>
  - The <u>2022 Critical Minerals List</u> defines critical minerals as essential to the economic and national security of the United States and vulnerable to supply chain disruption
- China controls much of the global lithium supply chain, and the mineral is considered to be in supply risk by the Department of Interior

#### **Powered by China**

Value of lithium-ion batteries imported to the United States in 2022, by trade partner





### Leasing Lithium Rights in TX – Asking the Right Questions

#### Who to Lease?

- Surface owner, mineral owner, or both?
- Is it possible that you have to lease the brine from the surface owner but the lithium from the mineral owner?
- Brine is not a mineral in Texas, and lithium has not yet been categorized

#### What to Lease?

• Lithium, brine, and/or produced water?

#### **Calculation of Royalty Payments?**

- Since brine is not battery-grade lithium, we're likely looking at a netback approach
- No standard royalty percentage

#### If you lease just the mineral owner, how much surface can you use?

• Including groundwater, brine, and/or produced water



### Lithium in Arkansas

- Arkansas used to be under the ocean
- Brine in the Smackover Formation
  - Now, the brine in portions of the Smackover Formation contains abnormally high concentrations of chemical salts
  - For the most part, oil and gas wells drilled in the Smackover produce more brine than oil
- Bromine Extraction and Reinjection
  - However, the brine is rich in bromine (a flame retardant and swimming pool chemical, etc.)
  - Bromine plants extract the chemical and the "tail brine" is reinjected into the Smackover
  - > This is **NOT** the case in Texas and elsewhere





### Arkansas: Who owns the "Minerals"

- It is not always true that the owner of a mineral estate owns all of the minerals in Arkansas, including brine
- Instead, AR has developed the *Strohacker Doctrine* 
  - This doctrine determines who owns based on what minerals were known to be valuable when they were severed
- In *Missouri Pac. R. Co. v. Strohacker*, the Arkansas Supreme Court held that an 1892 deed reserving "<u>all coal and mineral deposits</u>" did not reserve oil and gas because <u>oil and gas were not regarded as minerals within legal and commercial usage, locally, at the time</u>





# Arkansas: Who owns the "Minerals" under Strohacker

- January 1, 1955, is considered the key Strohacker date for brine ownership
  - > It is the date bromine potential was discovered in Smackover brine
- If your mineral estate was severed from the surface <u>after January 1, 1955</u>, you will own the brine as part of your mineral estate
- If the severance occurred **before January 1, 1955**, the brine belongs to the surface owner
- Thus, if a deed reserved "other minerals" in 1920, lithium would <u>not</u> be included in the reservation and would remain with the surface



### Arkansas: Why Does Strohacker matter?

The *Strohacker* approach actually makes leasing lithium in Arkansas much easier than in Texas.

- Since brine itself is legally a "mineral," the only complexity under *Strohacker* is determining whether the mineral severance occurred:
  - before January 1, 1955 (surface owns brine/Li)
    OR
  - <u>after January 1, 1955</u> (mineral estate owns brine/Li)

- Arkansas also has a compulsory pooling scheme that can be applied to brine
- In Texas, brine belongs to the surface owner and lithium has never been legally defined as a mineral





## Texas Lithium Ownership

- In Texas, it is well-settled that the surface owner owns the groundwater, including brine (although the groundwater estate can be severed)
  - > Tex. Water Code §§ 36.001(5), 36.002(a)
- However, the constituent elements *in* the brine may belong to the mineral owner
- If Texas law were to establish lithium as a mineral, the mineral owner would *theoretically* own the lithium. However, the mineral owner would still need the rights to produce the groundwater/brine to remove the lithium
- In Texas, every valuable mineral/element must be separately adjudicated or defined by the legislature



### Texas Definition of "Other Minerals"

Plain language of the vesting instrument will control. Otherwise...

#### Surface Destruction Test:

- Under this rule, a substance belongs to the surface estate if the commercial way to mine the mineral was by strip mining
  - > So, a near-surface substance would not be considered a "mineral"
- Applies prior to June 8, 1983
- Examples: building stone, limestone, caliche, water, sand, and gravel







### Texas Definition of "Other Minerals"

### **Ordinary Meaning Test**

- Under this test, a substance is a mineral if it is within the "ordinary and natural meaning" of the word "mineral"
- In effect, each substance must be tested by litigation to determine if it is a "mineral" within the ordinary and natural meaning of that term. <u>Applies after June 8, 1983</u> (*Moser v. U.S. Steel*, 676 S.W.2d 99 (Tex. 1984))
  - > Uranium = mineral estate
  - > Other minerals, including Lithium = "A Quagmirish Fog"
  - > Uranium is thought to have "legal" similarities to Lithium
  - > Lithium is next to Sodium on the periodic table (alkali metals)





### What's a Lithium Prospector to Do?

- Look first to the documents creating the surface and mineral rights
  - > Unless very recent, they probably won't address lithium
  - > There is a good chance lithium is a mineral, but this has not been determined
- You may need to take a lithium lease from the mineral owner <u>and</u> negotiate a separate lease or surface use agreement with the surface owner
  - Under the "dominant estate theory" the owner of mineral rights has an implied easement to use as much of the surface as is necessary to produce the minerals
  - > The dominant estate theory has not been applied to lithium, and the scope of a lithium owner's rights to enter the surface and use, deplete, or reinject the brine for lithium extraction is unclear



### Sidenote on Lithium Leases - Often "Discrete"

- It may be titled an "Oil, Gas, and Mineral Lease"
- It will probably have a long primary term (5 to 10 years, maybe longer) and a small royalty on substances other than oil and gas (*e.g.*, 1/32, 2%, 3%)
- It may broadly define "**other minerals**" to include "dissolved and undissolved minerals, brine, bromine, uranium, lithium, or any other products produced, recovered, or manufactured from any gas or liquid"
- It will provide for pipelines to specifically move, inject, or reinject, water and brine



### What About "Produced Water"?

- Oil and gas production produce huge amounts of wastewater. "**Produced water**" is the term for this slurry of nonhydrocarbon liquids generated by production
  - > Billions of barrels produced in Texas per year
  - > May include mineral salts such as lithium and sodium bromide (sodium + bromine)
  - Historically viewed as a waste by-product, it now has value not only for its potential lithium but also for recycling in oil and gas operations in areas with water scarcity. Big business.
- Because of the historic burden of produced water, Tex. Nat. Res. Code § 122.002 granted title to produced water to whoever takes possession of it for the purpose of treating it for subsequent beneficial use, unless a conveyance instrument expressly provides otherwise. This only applies to instruments executed after September 1, 2019.
  - > Unconstitutional taking without just compensation? No one cared until now...





# Cactus Water Services, LLC v. COG Operating, LLC

- In this 2023 El Paso Appellate case, the issue is whether the produced water belonged to the surface or mineral estate
  - > Although not a lithium case, it could make a difference on how to lease the brine
- The Collier Family leased their minerals to COG and later leased the produced water rights to Cactus
- The trial court and El Paso Ct. of Appeals each held for COG, holding that produced wastewater is not groundwater, but instead oil and gas waste; thus, produced water is within the lessee's grant of "oil, gas, and other hydrocarbons"
- A Petition for Review, along with Amicus Curiae briefs have been filed with the Texas Supreme Court.
  - > May turn on the title docs and leases



### Conclusion

- Significant real property questions have arisen determining who has the right to lithium and brine when the surface and mineral estates are severed
- Legislatures, courts, or both will need to step up and make decisions to determine the owner
- When a lithium developer wishes to produce lithium, who the lessee should take a lease from the mineral or surface owner will need to be resolved too if the estate is severed.
  - > It could be the surface owner, the mineral owner, and/or the produced water owner
  - > It will likely vary depending on the specific circumstances of the lithium prospect
  - > **Caution**: Don't assume that a lease from the surface owner is enough!





### Accreditation

- AAPL Component Code: OG112024
- Approved for 1 core **CPLTA** point
- Approved for 1 non-core **CDOA** credit

### About the Speaker

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