

By SUPPLY CHAIN CONNECT STAFF



USGS Uncovers an Abundant Supply of Lithium in Arkansas

New study finds that there are millions of tons of lithium in the Smackover Formation in southern Arkansas.

As the primary component of lithium-ion batteries used in electric vehicles (EVs), electronics, medical devices and energy storage systems, lithium is in pretty big demand right now. In fact, the [American Association for the Advancement of Science \(AAAS\)](#) says global demand for lithium “greatly exceeds known supplies.” As the world transitions away from fossil fuel energy sources, that demand is only expected to increase.

At least some of that demand could be addressed by a plethora of lithium located underground in Arkansas. According to the United States Geological Survey (USGS),

high concentrations of lithium in brines have been observed in the Smackover Formation in the southern portion of the state.

The [Smackover Formation](#) is a limestone aquifer that spans across several states in the southern United States, including Arkansas, Louisiana, Mississippi and Alabama. Formed during the Jurassic period, this geological formation has been tapped for oil and gas, as well as brine for production of bromine, since the 1950s.

“The high concentration of lithium in Smackover brines presents a unique opportunity to produce lithium through direct extraction,” energy law firm Liskow & Lewis explains. “Currently, large-scale lithium production from brine is done using evaporation ponds, which is costly and takes a considerable amount of time.”

The law firm says new advancements in chemical and mechanical extraction techniques have made it possible to separate lithium from brine much more quickly and with lower ecological impact. “The high lithium concentration in Smackover brines makes this formation the perfect target for operators looking to scale up those newer methods,” it adds.

Novel Testing Methodology

Using a combination of water testing and machine learning, the USGS-led study estimated that between 5 and 19 million tons of lithium reserves are located beneath southwestern Arkansas. If commercially recoverable, the amount of lithium present would meet projected 2030 world demand for lithium in car batteries nine times over.

The USGS says it used a “novel methodology” involving water testing and artificial intelligence (AI) to determine the amount of lithium that could possibly be extracted from brine reservoirs in the Smackover Formation. Extracting lithium from brines co-produced during oil and gas operations provides an opportunity to extract a valuable commodity from what would otherwise be considered a waste stream, the organization adds.

“Lithium is a critical mineral for the energy transition, and the potential for increased U.S. production to replace imports has implications for employment, manufacturing and supply-chain resilience,” said David Applegate, USGS director. “This study illustrates the value of science in addressing economically important issues.”

Nine Times Global EV Demand

Katherine Knierim, the study’s principal researcher, estimates that there’s enough dissolved lithium present in that region to replace U.S. imports of lithium and more. “It is important to caution that these estimates are an in-place assessment,” she points out. “We have not estimated what is technically recoverable based on newer methods to extract lithium from brines.”

This new discovery is also significant because the U.S. relies on imports for more than 25% of its lithium. The USGS estimates there is enough lithium brought to the surface in the oil and brine waste streams in southern Arkansas to cover current estimated U.S. lithium consumption. The low-end estimate of 5 million tons of lithium present in Smackover brines is also equivalent to more than nine times the International Energy Agency’s projection of global lithium demand for electric vehicles in 2030.