

High Country News

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The West's latest prospecting frenzy? Extraterrestrial gold.

Companies are hunting for lithium near Moab, Utah.

Rebecca Worby | NEWS | Aug. 14, 2017

White Oil, *Oro Blanco*, Extraterrestrial Gold: lithium, the lightweight element key to rechargeable batteries, has recently acquired a slew of hyperbolic nicknames. As the demand for electric cars, laptops and smartphones has surged, the search is on for more domestic sources of this energy-critical element.

There's only one active lithium mine in the United States — in Nevada's Clayton Valley — but several corporations have recently staked lithium claims in the Paradox Basin, a geological province spanning much of southeastern Utah and some of the neighboring states. Based on decades-old oil and gas well data, they're rolling the dice on a classic mining gamble: What will the geology hold? Will historic numbers prove out? Even if they discover a high enough grade of lithium to be worth pursuing, a myriad of other challenges face companies trying to extract it and bring it to market.



Cypress Development Corporation collects rock samples from mudstone outcroppings to test for lithium. The project's claims are near Albemarle's Silver Peak Mine lithium brine wells in Nevada.

Courtesy Cypress Development Corp.

With demand growing at a fast clip—driving the price of lithium from \$4,000 per ton in 2014 to \$20,000 now—a corporation that finds high-grade lithium and develops an efficient extraction process just might feel like it has hit gold. That might not happen in Utah. It might not happen in the U.S., where production costs are high, at all. But that's not stopping the handful of companies hoping for a big strike in the sprawling sagebrush desert outside Moab.

Lithium is found in both hard-rock deposits and in salty brines. Right now, it's mainly mined in what's known as the "Lithium Triangle" where Argentina, Chile, and Bolivia meet, as well as in China and Australia. The economic and national security risks associated with foreign mineral dependence have pushed the pursuit of domestic sources of energy-critical elements like lithium. Recognizing this, Sen. Lisa Murkowski, R-Alaska, has introduced several bills meant to improve mineral security. "Instead of lessening our dependence, we are actually increasing our dependence," Murkowski said at a Senate Energy and Natural Resources Committee hearing in March. "We're not making headway on this issue."

Though a number of lithium claims have sprung up near the existing lithium mine in Nevada, Utah has caught the attention of several junior corporations, too. Over the last few years, at least eight different corporations have staked close to 200,000 acres of lithium claims in the Paradox Basin. Notably, none of the usual heavy-hitters of the

lithium industry—Albemarle, FMC and SQM—have moved in. Staking has been concentrated in two areas of the basin near Moab: the Big Flat – Long Canyon area about 20 miles west, and Lisbon Valley, about 40 miles south.



Lithium enriched cores drilled from mudstone in the Clayton Valley in Nevada.

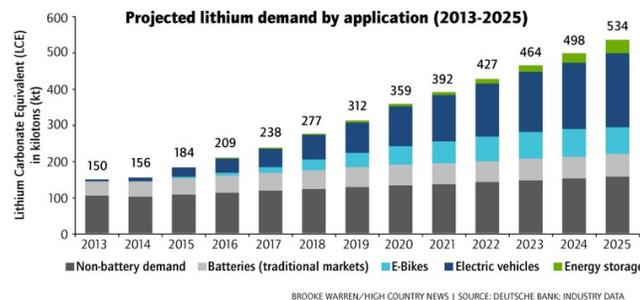
Courtesy Cypress Development Corp.

In the Paradox Basin, corporations including Liberty One Lithium, Scientific Metals and U.S. Cobalt generally tout a range of from 81 to 1,700 parts per million of lithium found in historic wells in the region. That 1,700—a grade that would rival the world's most concentrated known sources—frequently appears in the companies' marketing materials, and played a key role in sparking the rush to stake claims there. But it's an outlier—and it may be just plain wrong.

That alluring figure comes from the data for just one well. And according to Ed Anderson, CEO of TRU Group, which does lithium consulting, it was the result of one small but consequential arithmetic error. While looking into some Paradox Basin data as part of a project for an oil company in early August, Anderson's team tracked down a 1960s report that they believe to be the original source of the mythical number—and found that a misplaced decimal point may have thrown the figure off by a factor of ten. This would mean the well in question had a lithium grade of just 170 ppm.

The companies staking in the basin have not entirely hung their hopes on that 1,700. They've yet to begin sampling on their claims, according to the local Bureau of Land Management field office. While verifying a number like 1,700 would be thrilling for the companies, "we'd be happy with 300," said Darryl Jones, president and CEO of Voltaic

Minerals, which has claimed around 4,000 acres in the area. “If we can get 1,000, we’re pretty excited.” But the questionable nature of that number, and of historic data generally, only underscores the uncertainty of these enterprises in the first place.



Even if there does prove to be a high-enough concentration of lithium in brines in the Paradox Basin to be worth extracting, there will be other hurdles. The biggest is developing an extraction process efficient enough and inexpensive enough to make production there feasible. The Lithium Triangle mines and the Silver Peak mine in Nevada use solar evaporation, a complicated process that entails drilling a well, pumping out the brine, evaporating it in huge ponds, and using chemicals to remove byproducts. This process typically results in loss of up to 50 percent of the lithium in the brine. It’s time-consuming. Evaporation takes more than a year and a half. And the sprawl of the pools across hundreds of acres makes for a sizeable impact on the environment. (Hard-rock lithium mining, currently happening in Australia and China, has the impacts associated with other hard-rock operations, including land disturbance and impacts on groundwater, vegetation, wildlife, and air quality.)

Some of the corporations in the Paradox Basin are working to develop ways to bypass the slow solar evaporation process. MGX Minerals, the company with the largest holdings in the basin, is scaling up a new process to separate lithium from petroleum brine, the wastewater that results from oil and gas mining. This method could reduce evaporation time to less than a day. Voltaic is also testing new processes.

These are still early days for lithium in the Paradox. Until sampling begins, no one will know for sure what the brines hold. But as long as there’s a demand for more lithium to fuel the portable devices that we rely upon, lithium projects will likely continue to pop up wherever there’s a hint of possibility, regardless of their feasibility.

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