

**Charles Watson**, 67, picked up his sledgehammer and pounded a wooden stake into the dust in this remote stretch of desert, as he'd done thousands of times before. He wrote out a note with his name and point coordinates, folded it carefully, stuffed it into a small, plastic vial and tied it to the stake with a metal wire. Then he spray-painted the top of the stake red.

"The critical part to this whole thing is writing the date on it," Watson said. "Because it denotes that if someone comes after me, that we were here first."

This desert plain, accessible by truck and a ride on an ATV, is miles from the nearest town. A nearby dirt road off the highway ends in a historic mining town called **Gold Point** (population 7), so named, Watson said, "because they found a shitload of gold there." A [gold mine](#) operated there from the 1920s until the 1960s when it finally caved in. Watson had determined this desolate spot, with tumbleweeds strewn about, was worth staking after a geological analysis predicted minerals might have been deposited there by ancient volcanic eruptions.

But Watson wasn't looking for gold. Now, he said, "This is [lithium](#) country."

All over the American West, people like Watson are racing to stake as many claims as they can, trying to get to lithium-rich ground before the next guy. Lithium, the key component in [electric car batteries](#), is in high demand — but there's just one active mine currently producing it in the U.S. And nowhere is the lithium prospecting boom hitting harder than at this crossroads, the historic mining town of Tonopah.

There, two dust-covered Dodge Vipers were parked outside the Mizpah Hotel, one of the oldest establishments in town that was founded when the town first boomed at the beginning of the 20th Century. Gleaming new white diesel trucks, emblazoned with the names of upstart lithium companies, line the streets. The TV behind the hotel's reception desk advertised for Geoxplor Corp, a company that says it's "exploring for lithium in Nevada." The CEOs of junior mining companies sat atop barstools at the Mizpah's bar, and locals audibly complained about a rare wildflower that's holding up the construction of a new mine.

Along Tonopah's scant downtown, signs are up on what had been abandoned storefronts that read "American Lithium Corp." and "Advanced Geologic Exploration, Inc" (Watson's business) and "Tonopah Lithium." There's a store nearby that sells wooden claim stakes, and business, for them, is booming. Watson has stored hundreds of them in the attic above his office.

According to the founding myth of **Tonopah**, a turn-of-the-century prospector picked up a rock to throw at his runaway burro, when he realized it was unusually heavy. It was full of

silver. The town boomed, and then busted as the local silver mine tapped out by the 1920s. But a prospecting boom has come again to this crossroads in central Nevada.

"The drillers in town are filling our motel rooms," said Joe Westerlund, Tonopah's town manager. "Restaurants are full. It's good for the local economy, what's happening right now. It'd be even better if they opened a mine."

The domestic lithium boom intensified last year after President Joe Biden signed the Inflation Reduction Act which, among other things, required batteries for any new electric vehicles be sourced in the U.S. or a short list of allies to qualify for a tax credit. As part of the administration's climate policy — and to lower dependence on China, which currently dominates the global lithium supply — the Department of Energy has awarded billions of dollars to upstart lithium companies. Private cash is flowing in, too, with companies like General Motors backing a new lithium mine in northern Nevada with a \$650 million investment.

And though the Biden administration wants the U.S. to produce more lithium, there's no real plan for how to get it.

"Where are you going to put the lithium mines? Nobody has any fucking clue," said Patrick Donnelly, Great Basin director for the Center for Biological Diversity. "It's left up to the market and venture capital. We're pinning our entire future and the welfare of all future generations of humans on that. It's crazy."

But while prospectors are staking claims, drilling expensive exploratory holes in the ground, and hyping their claims with press releases to boost their stock prices, not a single ounce of lithium has been pulled out of the ground. But that doesn't mean the "rush" isn't minting money. As the old adage goes: In a gold rush, sell shovels. One worker at a nearby drill site said he made \$90,000 for five months of work last year. The people who sell pickaxes are doing great. And private investors from all over the world are placing their penny-stock bets on who will ultimately be able to cash in on the bulk of the lithium on public land around Tonopah.

### **More than one lithium future**

Lithium, energy-dense and lightweight, is perfect for building electric car batteries and E-bike batteries and everything else that we'll need to electrify society to achieve a lower-carbon future. It's in high demand right now, and the U.S. barely produces any of it.

That's in part because, in **Nevada**, lithium doesn't come neatly packaged and ready to plug into car batteries. It generally isn't found in hard rocks, like silver or gold, but is instead more likely to be subsumed in clays deposited millions of years ago in basins that were once lakes between mile-high mountain ranges. Or it's buried thousands of feet below the

desert's surface, dissolved in the brine of underground aquifers.

Lithium companies know, more or less, how to extract lithium from brine and hard rock deposits, which is how the world's dominant mines in South America and Australia do it. No one's found a promising hard rock lithium deposit in Nevada yet, and no one's figured out how to pull it out of clay on an industrial scale.

The United States' sole lithium mine is located in Clayton Valley just a few miles outside Tonopah. It consists of a network of glistening aquamarine evaporation ponds that stretch across the desert basin. They're filled with brine pulled up from deep underground, which is treated with chemicals and dries out to leave behind lithium. The company that operates this mine is currently hiring a "bird hazer", who would likely blare sirens or fire weapons to prevent birds from landing in the evaporation ponds. What might have lived in the footprint of that mine no longer does. In South America, the largest of these types of mines can be seen from space.

Opened in the 1960s, Clayton Valley Project, operated by the North Carolina-based Albemarle Corporation, produces just 1 percent of the world's supply of lithium.

If a mine were to extract lithium from clay deposits near Tonopah — which no one's ever done at industrial scale — it would likely be an open-pit operation, a method also used for coal mining. These mines would involve what is essentially a massive hole that expands across the desert. A more responsible company will fill the hole back up once it's done mining. Other companies could allow the holes to fill with rainwater, which would become toxic. A proposed new law in Nevada would require mining companies to backfill the holes they dig and prevent the creation of new pit lakes, but right now, open-pit mines in Nevada are not required to backfill.

The easier way to extract lithium is to suck it out of brine by putting a thousand-foot straw into the earth, pumping up the water and letting it evaporate in huge ponds, as they do at Clayton Valley. When the water evaporates, lithium, and other minerals are left behind.

To lower the environmental footprint of these mines, a new technology, called direct lithium extraction, proposes to filter the lithium out of brine without the enormous evaporation ponds. It would involve, essentially, sucking up brine from deep underground, running it through a sort of high-tech filter to extract the lithium, and then sending the lithium-less water back down to the aquifer from which it was originally extracted. Environmental organizations say this tech is promising, and would like to see it developed. The process works in a lab; no one's built a full-scale mine using direct lithium extraction yet. But new mining companies are hopeful that the tech will mature. As a result, no one's proposing to build mines that use evaporation ponds, which are environmentally harmful and difficult to

get permitted.

"I use the phrase reckless creativity," said Steven Emerman, a retired geology professor and mining consultant, describing the current state of lithium mining. "You can stake a claim in the West and you could say there's a lithium deposit there with no concept as to how you're going to mine it."

Despite the prospecting rush, how much lithium we'll actually need is still very much an open question. We might need as many as 70 new lithium mines by 2035, but the next technological innovation — say, sodium batteries — might come along and displace lithium. Or the U.S. could invest big in public transportation and lower dependence on electric vehicles over the next several decades (as unlikely as that may be). Experts generally agree that we need more lithium, but just how much is up for debate.

"There isn't just one future out there, in which we absolutely need X metric tons of lithium," said Thea Riofrancos, a political science professor at Providence College who studies lithium markets.

That's not stopping bullish lithium miners from trying to race to build as many mines around Tonopah as quickly as they can.

### **A gold rush mentality for a lithium present**

When Watson hammered his wooden stake into the ground he was theoretically taking the first step in the potential construction of a new lithium mine on public land. Anyone who's prospected in the U.S. in the last 150-years has done so in exactly the same way, whether they were looking for lithium or gold. This claim-staking procedure is enshrined in the General Mining Act of 1872, which was passed the year after the United States stopped making treaties with Native tribal nations. It was designed, according to the Government Accountability Office, Congress's nonpartisan research arm, to "spur the settlement of the then sparsely populated West." In the process of doing so, it led to the displacement of Native American tribes who were already living on that land.

Federal and state law requires that, in order to stake a mining claim, a prospector must erect a "monument" — in most cases, a simple wooden stake — on the site of the claim. It must be at least four feet tall and hammered at least one foot into the ground. Prospectors affix a small container to the post with a written note on the inside, indicating that it's their claim. Some use old Altoids boxes; others, like Watson, use plastic containers that look like film canisters.

Any U.S. citizen can stake a claim anywhere on federal land, and most federal land is in Alaska and the West. When a prospector stakes a claim for lithium, they generally have the rights to the minerals found anywhere on a 20-acre plot surrounding the physical stake.

The Nevada Department of Mines estimates that there are more than 18,000 active mining claims for lithium in the state — an estimate, they say, that is likely an undercount.

But to Watson, there's something distinctly American about mining in this way. Allowing prospecting and mine development on public land is, in a sense, democratizing the land. "Before the United States of America, the land and the people on the land were owned by kings and queens," Watson said. The U.S. changed that. "If you're a U.S. citizen, you can stake a claim for minerals if you find them. But you have to have two feet on the ground to do it." Here, Watson said, "if you find it, you get to keep it."

To the younger generation of lithium hunters, the old system could use a refresh. Emily Hersh, the 38-year-old CEO of **Luna Lithium**, is in the business to help solve the climate crisis. And to her, the old-school system feels archaic. "Keep the sticks," she said, "but give me a digital map."

At an international mining conference in Toronto, Hersh tried to explain the archaic way that the U.S. goes about claim staking to Augusto Cautí, the former deputy mining minister of Peru, who was visibly taken aback. "Why?" he asked, incredulously.

To Hersh, it makes sense to require prospectors to physically go to the site where they're staking a claim — as the current system requires. But the whole system is built around gold-rush principles, driven to encourage the colonization of the American West in the 19th Century, which no longer apply in the 21st Century. The paperwork and bureaucracy and lack of a streamlined permitting process, she thinks, are slowing production. "We are stuck in a gold rush mindset for a lithium rush century," she said.

### **"Claim jumpers or riff raff?"**

We drove out into the desert with Hersh, who was taking us to stake a claim. She's part of the next generation of prospectors but her methods, per regulations, are the same as Watson's: pound a wooden claim stake into the ground and attach a small vial with a note in it.

An hour outside Tonopah just off the highway, Hersh brought us to a spot to have lunch with a great view of a misty salt marsh with dozens of claim stakes dotting the horizon. We sat in our cars, near an abandoned mining shack with a dirty mattress inside, to eat our sandwiches. As we were getting ready to head out, a black pickup came seemingly out of nowhere and pulled up alongside our rental SUV. A woman in her 70s wearing thick, wrap-around sunglasses rolled down her window.

"Are you claim jumpers or riff raff?" she asked. She thought we might be trying to steal her mining claims — which would make us "claim jumpers," though she'd later insist she was joking. At the time, we thought she might be a drifter — there's no shortage of them in the

area around Tonopah — or a touchy small-time prospector. I took her business card. In Tonopah later that day, I'd learn from other prospectors that she's Barbara Craig, 72, a former Olympic skier who is one of the most successful lithium hunters in central Nevada. "When you are at the exploration development phase, you don't have anything to sell besides an idea," she said "Certainly in the lithium space now, you've got a lot of reason for people to speculate."

### **This could be big, if true**

Mining lithium might ultimately be good for the planet and fighting climate change, but there's no way to do it without harming the immediate environment around the mine. Still, even Patrick Donnelly, who's been deeply involved with opposing mine projects with the Center for Biological Diversity, concedes that we do need lithium — and a lot of it. "Most of these things are going to be prospected by some yahoo and then bought up," Donnelly said. "If we keep pursuing these same old shitty mines with the same old shitty mining companies and the same old impacts, we're not going to be able to get all the lithium we need."

Donnelly has pissed off a few hopeful miners in Tonopah as he's tried to slow down lithium mine development in the West. At the hotel bar the night before we met Donnelly, a man who said he was a botanist passed around an op-ed he'd written calling Donnelly a "self-centered opportunist" for trying to protect an endangered wildflower from a prospective lithium mine. Donnelly was eager to get out of Tonopah, and when we stopped at the local gas station to fuel up for a long drive and acquire provisions for our journey, he stayed in his car and out of sight. He didn't want to provoke a confrontation with the locals.

We were headed to Railroad Valley, a remote desert basin approximately the size of Rhode Island, about two hours outside of Tonopah along the longest stretch of highway in the lower 48 without a gas station. We were going to see an exceedingly rare fish.

In that valley, **Vincent Ramirez**, the CEO of 3PL Operating, an upstart mining operation, has amassed the largest block of mining claims for lithium ever assembled in the state of Nevada. Railroad Valley, contrary to the way one might think of the desert, can be lush. After a rain, the valley blooms. Golden eagles perch on craggy branches above his claims and snow-capped peaks shoot up out of the basin. Migratory birds use it as a stopover. Donnelly plans to return there in June to scout for a rare orchid.

Ramirez, like many other hopeful mine developers in Nevada, is bullish about his site. "We could run all the electric cars in America with our lithium," he said. "We could supply the military with all the boron they would need for ceramic armor. We could supply the jets of America for 100 years with our neodymium."

"This isn't a little thing that's going to change my life," he added. "This is something that could change everybody's life. It's big."

It is big, if it's true. Several hopeful lithium miners told VICE News the same thing: If their mine gets up and running, it'd be a game changer.

When I met Craig in her office the next day, she told me that she has staked tens of thousands of claims over the course of her prospecting career. This is how she makes money, enough of it that she recently bought herself a new house and planned to sell stock she'd exchanged for her mining claims, in just one of many deals, for around \$800,000.

"My husband used to say that I could spot lithium going 40 miles per hour down a dirt road," she said. In the spring of 1988, Bob Craig, whom she would later marry, took her on a first date to Furman Bay in Alaska by seaplane to look for gold after a landslide.

"That's when it all gelled for me," she said.

As an athlete, she fell in love with the physicality of prospecting and the rush that comes when she finds something valuable on the land. Bob died in 2021. She's kept up their life's work, and is an icon here in a field dominated by men.

Indeed, if a new mine is finally built near Tonopah, chances are good that Craig will have been involved. She staked claims on the site where one hopeful mining company, Ioneer, which recently secured a conditional \$700 million federal loan, is hoping to break ground on a new lithium mine, a project currently held up by litigation aiming at protecting Thiems buckwheat, an endangered wildflower. She also staked claims now owned by American Battery Technology Company, which got \$57 million in federal cash through last year's infrastructure law to build an ambitious mine project just outside of Tonopah.

### **Stock market speculation**

Once a claim is staked on public land, the race is on to mine it.

But many of the companies on the hunt to find lithium in Nevada have no intention of building a mine. Rather, they're here to prove a claim is rich in lithium and then sell it on to the next company who might then do the same. Some go to the trouble of drilling thousands of feet down into the ground to pull out rock samples to test for lithium. The more legit the claim, the better chance they stand of making a quick buck. The vast majority of the mining claims in Nevada will be traded and speculated on, but only a handful will lead to new mines. In the next few decades, experts project that just two or three lithium mines might actually get off the ground in the U.S.

Jason Latkowcer, the CEO of Pan American Energy, stood next to his company's two-story tall drill on the flats just outside of Tonopah, wearing a hardhat and reflective vest. The drill wasn't running that day — it was down for a safety inspection — a minor frustration for

Latkowcer who wants to deliver results as soon as possible.

"You got to go in when the getting is good," he said "There's just a lot of upside that could be recognized for investors."

The Pan American drill is where it is, out in the flats outside of Tonopah, because another company, American Battery Technology Company, just announced that it found a huge store of lithium right next to Latkowcer's claims. He's betting that, if his neighbor found a lot of lithium, he might have a valuable chunk of it, too. (There's an industry term for this strategy: "closeology.")

Pan American's stock is listed on the Canadian Stock Exchange, on an American penny-stock exchange, OTC-PINK, and the Frankfurt Stock Exchange. In a few short days in 2021, his company's stock value shot from around 12 cents up to over \$5, before settling at around 45 cents. That kind of stock-price volatility isn't at all unusual among junior mining companies.

Last month, Latkowcer picked up the scent of lithium on his site. They found lithium, he said, at every depth that they drilled. "How deep it goes is unknown," Latkowcer said. "That creates a blue sky narrative." So he issued a press release and his company's stock, on the German market, shot up about 5 percent on the news, which "wasn't as significant as we expected," Latkowcer said.

The company got listed on the Canadian Stock Exchange through what's called a reverse takeover, in which a private company buys enough shares in a public company to, effectively, become the public company. Pan American Energy got its ticker symbol on the Canadian stock exchange through a company called Golden Sun Mining, which misled investors about the amount of gold it had at one of its potential mine sites (it had none). An insider at the company was busted for secretly trading on the company's stock using an undisclosed Panamanian brokerage account. There is no relationship between Golden Sun and Pan American, Latkowcer said. Taking over Golden Sun's ticker symbol was just the cheapest, fastest way to get on the stock exchange.

Even if **Pan American Energy** never pulls any lithium out of the ground, investors stand to make money (or lose big) betting on its stock price. And experts told VICE News that there's plenty of incentive to hype the amount of lithium on site, regardless of how much is there. Aimee Boulanger, the director of the Initiative for Responsible Mining Assurance, sees a lot of speculation in lithium right now — which isn't always based on how much lithium is actually in the ground. Her organization independently vets mines to minimize environmental harm, by connecting local residents with mine operators and the companies that buy the minerals, including major car companies.



Independent experts who reviewed Ramirez's data indicated that he did, indeed, have a large block of claims that were likely rich in lithium, and they were impressed with the breadth of the data he'd collected. But precise geological accounting of the amount of lithium present in an area as large and remote as Railroad Valley is nearly impossible, they cautioned, and how much lithium his company could profitably extract is uncertain.

"If this project doesn't work then no project is going to work," Ramirez responded. "It's so much larger and more efficient to mine than any other project. I am confident that it will be economic."

Like many of the desert plains in Nevada's Great Basin, Railroad Valley used to be a lake. The water dried up — mostly. There are deep aquifers that burble up above ground in hot springs on the otherwise dried-out expanse. **That water is rich in lithium**, and the fish that swim in it are adapted to its specific biochemical makeup. These creatures have been isolated in tiny springs for so long that they've speciated.

One such lithium-loving fish, the **Railroad Valley** springfish, is endemic to Railroad Valley, meaning that it exists there and nowhere else. It's minnow-like, about an inch long, with a white belly, bright yellow eyes, and shades of emerald green along its spine. And it's a federally-listed endangered species. Donnelly, as well as the Fish and Wildlife Service, the Bureau of Land Management, and the Nevada Department of Wildlife — all of whom are protesting Ramirez's water rights applications for his mine — think that if Ramirez gets his mine, it could threaten the only springs where this fish lives.

"Humanity faces twin crises, the climate crisis and the extinction crisis," Donnelly said. "And we can't solve one at the expense of the other."

Source: Vice