

Creating A New Green Lithium Extraction Process by Using Nanotechnology

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Calgary tech startup Summit Nanotech is the world's first women-led mining technology company. They're getting worldwide attention for the development of a new lithium extraction technology using nanotechnology.

Since the downturn in the oil and gas industry, there have been repeated calls for Alberta to diversify its economy. The province invests hundreds of millions of dollars every year to help grow both the tech and green energy sectors, industries that could have a bright future in a province rich with talent.

Amanda Hall is a prime example of that. She was able to draw on her experience in resource extraction with Alberta's oil and gas industry, developing green technology to be used in energy storage.

Hall left her job in geophysics at Canadian Natural Resources Ltd. in 2018 and began a self-taught foray in nanotechnology. Nanotechnology is a field of research and innovation concerned with building materials and devices on the scale of atoms and molecules.

"I just started thinking about how I could build something industrially that would mimic the human kidney, and make lithium extraction better," Hall said.

With that, Hall developed the only female-led mining technology company in the world: [Summit Nanotech Corp.](#) Using nanotechnology, Hall and her team say they have created an improved method of lithium-ion resource extraction from produced brine water.

"We've come up with a much more elegant approach — I say, feminine, approach — at bringing a resource out of the ground, and then giving it to the electric vehicle sector," Hall said.

Lithium has become a multi-million dollar industry and continues to grow with the increased use of electric vehicles, portable devices and mobile gadgets. It is estimated that by 2025, lithium demand will increase to five times today's levels.

Using sponges developed through nanoscience, Hall and her team have created technology that will allow producers to extract lithium directly from the wellhead without the need for expansive ponds and toxic chemicals. The process is expected to reduce costs and decrease chemical waste by 90 per cent.

The firm's website touts that its process is the most "green lithium extraction in the world."

"The sponge has lithium selective cavities in it, just the exact size of a lithium-ion. And so, as if you put a fluid in against this sponge, it will only suck up lithium, nothing else, and it holds on to it. And then when you wash it, you wash the lithium off the sponge just by changing the environment it's in. So we don't have to use any acids," Hall said.

all and her team have spent the last two-and-a-half years in the lab perfecting their design and are now building the company's first full-scale 12-metre tall unit. "It's our baby, but it's huge," Hall said. "It's a mini-refinery, essentially."

That "mini-refinery" will then be sent via shipping container to the first of the company's three pilot partners: [Lithium Chile](#). The other two partners are Saskatchewan-based [Prairie Lithium](#) and 3 Proton Lithium (3PL) Operating Inc. in Nevada.

"Nevada is important because Elon Musk is right down the road from us. He just bought 10,000 hectares of lithium-rich clay," Hall said. "We've been told that Elon is watching us, which is kind of cool."

Not only does the innovation put Alberta on the map globally for new green energy technology, it also should mean between 50 and 200 jobs for other Albertans in the next three to five years.

"Once we scale up, we will not only be constructing our lithium extraction units here, we're going to start a membrane manufacturing company here, too," Hall said.

Summit Nanotech has received benefits from Alberta Innovates as well as from the federal government as part of the Women in Cleantech Challenge. The company was also selected by the National Angel Capital Organization as one of the top 30 startups of 2019.

Read the [original article](#) on Global News.