

Lithium from Ultra-Saline Brine Made Viable

As demand accelerates for sustainable, domestic lithium sources, Canada is emerging as a key player to develop domestic supply. Among its most promising resources are subsurface brine deposits – deep underground reservoirs rich in lithium and other minerals. One such project is tapping into high-salinity brines at depths exceeding two kilometers. Supported by established energy infrastructure and a favorable regulatory environment, this site presents a bold opportunity to produce battery-grade lithium with a significantly smaller environmental footprint.

The Challenge

A leading lithium producer in Canada faced a critical challenge: making lithium extraction from its highly-saline brine economically viable. Complex impurities in the brine source demanded costly, sophisticated processes to achieve high lithium recovery rates above 95%. But with thermal evaporation adding even more capital and operational burden, the total flowsheet cost threatened the project's economic feasibility. That's where alkaLi comes in.

The Solution

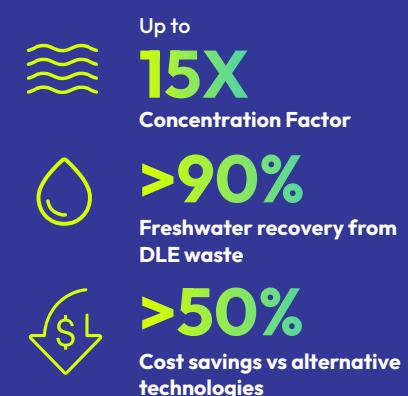
Collaborating with the client to engineer a more cost-effective flowsheet, alkaLi deployed its Concentrate technology built around Gradiant's proprietary CFRO (Counter-Flow Reverse Osmosis) – the heart of the EC² platform. A fully customized pilot system, optimized with advanced pre-treatment, enables CFRO to handle the extreme salinity and complexity of high-TDS brine streams – delivering high recovery where conventional membranes fail.

The Benefits

alkaLi's Concentrate technology has redefined the economics of lithium extraction for this client – transforming a challenging process into a commercially viable solution. The system delivers 15X concentration, over 90% freshwater recovery from extraction waste, and 95% lithium recovery. The result: lower costs, higher yields, and a sustainable, scalable solution. With a pilot successfully demonstrated, the process is now advancing to full commercial deployment.

Fast Facts

Location:	Canada
End-User:	Leading Lithium Producer
Solution:	Lithium Concentration
Industry:	Resource Recovery of Lithium
Feedwater Source:	DLE Eluate from Subsurface Brine
Technology:	alkaLi EC ² , featuring CFRO
System Configuration:	Single Train, Multi-Stage
Commissioning Date:	Q3 2024
Delivery Model:	Design-Build



Pilot Results (All units in mg/L)

Parameters	Feed	Concentrate
TDS	10,000 - 15,000 mg/L	Up to 225,000 mg/L
Li	800 - 1,000 mg/L	Up to 15,000 mg/L