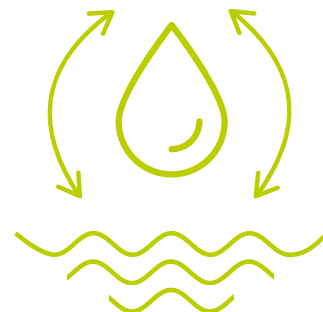


Water treatment: recovering lithium and closing the water loop

Wastewater from hydrometallurgy still carries valuable lithium, fluoride and phosphate, material that conventional processes simply discharge. REVITALISE partner Watercycle has applied its membrane-based water treatment technology to recover it.

The process extracts remaining lithium as lithium carbonate, from what would otherwise be wasted, while treated water is recirculated back into the recycling process rather than discharged.



RESULTS IN PRACTICE

- High purity lithium carbonate output, a high value product for battery manufacturing
- Water recirculated into the process rather than discharged
- A commercial modular DLEC™ plant already in operation, producing lithium for around 50 EVs a month

>75%
recovery

(as lithium carbonate)

PAIN POINTS ADDRESSED

- Lithium value lost to wastewater discharge in conventional processes
- Cost and environmental impact of discharging process wastewater
- Toxic or contaminated discharge creating environmental compliance risk

>99.5%
purity

(battery-grade)

TECHNOLOGY IN DETAIL

How it works

The first commercial DLEC™ process in Europe. The wastewater obtained from black mass processing is first pretreated to remove solids and organic materials. Lithium is then selectively extracted from the wastewater using our Direct Lithium Extraction and Crystallisation (DLEC™) technology. Watercycle demonstrated recovery of more than 75% of the original lithium in the wastewater in form of battery-grade lithium carbonate with purity of >99.5%.

What goes in

Any lithium-containing wastewater. A range of wastewater chemistries can be treated, including those obtained from black mass and battery shred processing, hydrometallurgical recycling or battery manufacturing. Wastewater containing complex mixtures of metals (Cu/Al, Fe) as well as transition metals (Ni, Co, Mn), organics, fluorides and phosphates can be treated. The higher the lithium concentration, the higher the overall recovery will be.

What comes out

Lithium carbonate and purified water. Lithium carbonate salts come out with a purity of 99.5%. Even lower grade lithium carbonate (99%), can be sold to the offtakers and refineries. The remaining water has a significantly lower chemical burden, allowing it to go back into process use, or discharged at lower cost.

What sets it apart

Reduced process time and water consumption. Lithium carbonate can be recovered in hours (instead of months), at a recovery rate of over 75% (instead of 30-50%), with reduced water consumption (compared to typical processes needing at least 80 m³/t LCE). Water gets reused throughout our process to minimise water consumption.

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