

Avalon Advanced Materials advances forward towards becoming a lithium producer

written by Tracy Weslosky | January 25, 2023

As I was having my morning coffee today I came across some quite incredible news. The world's largest lithium miner Albemarle stated that they expect there will be a massive shortage of lithium this decade. The report stated that "[global lithium demand should hit 3.7 million tonnes by 2030.](#)" Given that the total lithium market was only at about 370,000 tonnes pa in 2020 that would mean a 10x increase in demand this decade. Albemarle expects [an 800,000 tonne lithium deficit by 2030](#) with lithium prices staying high. Albemarle CEO Norris [stated](#): "Incentivizing industry to fill this gap requires strong long-term pricing".

This got me thinking about who will be the next lithium miners to help meet this huge demand for lithium. Perhaps it will be [Avalon Advanced Materials Inc.](#) (TSX: AVL | OTCQB: AVLNF) ("Avalon").

Avalon 100% owns the advanced stage [Separation Rapids Lithium Project](#) in Ontario, Canada as well as the [Lilypad Cesium-Tantalum-Lithium Project](#) also in Ontario.

Separation Rapids predominant lithium ore is petalite which contains 4.5% Li₂O and is extremely pure. Petalite ore is already successfully [being mined in Zimbabwe](#) to supply the lithium ceramics industry. Avalon [state](#) on their website that they have "developed a process flowsheet to make lithium hydroxide from its petalite. The potential for production of high-grade lithium hydroxide (99.9%) was demonstrated through laboratory test work performed in 2015 and defined in a

Preliminary Economic Assessment filed in 2016.”



Lithium Minerals at Separation Rapids: a rare type of LCT pegmatite

- › There are two main lithium ore minerals in the Separation Rapids LCT pegmatite: **petalite** & **lepidolite**
- › Petalite is the predominant lithium mineral, with lepidolite occurring in distinct subzones comprising 20% of the resource
- › **Petalite** ($\text{Li Al Si}_4\text{O}_{10}$) contains 4.5% Li_2O with no impurities
- › **Lepidolite** ($\text{K}(\text{Li},\text{Al},\text{Rb})_2(\text{Al},\text{Si})_4\text{O}_{10}(\text{F},\text{OH})_2$) is a lithium mica containing other elements including **cesium**
- › They can each be concentrated to make saleable products:
 - Petalite can be used both as an industrial mineral for high strength glass and as a high purity feed to make battery grade lithium hydroxide or carbonate
 - Lepidolite concentrates are being used increasingly for production of battery grade lithium carbonate
- › **Tantalum** minerals are also recoverable along with **Rubidium-rich K-feldspars** as an industrial mineral by-product

Source: [Avalon company presentation](#)

Avalon continues to be somewhat under the radar despite having [an MOU to supply LG Energy Solution Inc. \(“LGES”\)](#) and plans to build a lithium hydroxide refinery in Thunder Bay, Ontario, Canada.

LGES is one of the leading global manufacturers of lithium-ion batteries for electric vehicles, mobility, IT, and energy storage systems.

Avalon’s agreement with LGES is to supply battery-grade lithium hydroxide starting in 2025. That suggests that LGES has good confidence in Avalon’s potential to make it to production. The MOU would see Avalon commit, for five years initially, to provide LGES with at least 50% of its planned initial lithium hydroxide production from its Thunder Bay JV refinery (planned

20,000tpa capacity), with the potential to increase production as demand grows.

The Thunder Bay lithium refinery would be designed to accept lithium concentrate material from both Avalon's Separation Rapids Project and other new projects in the region. In a January 10, 2023 regulatory filing Avalon [stated](#):

"Essar failed to confirm their interest in finalizing an agreement with Avalon and the Company is now pursuing agreements with other potential investing partners including LG Energy Solution ("LGES").....This agreement with LGES (when it gets finalized) will involve providing initial financial and development support for building a lithium refinery in Thunder Bay, Ontario that will be designed to accept lithium minerals concentrates, not only from Avalon's Separation Rapids Lithium Project north of Kenora, ON, but also from other aspiring new producers from the many lithium pegmatite resources that occur in northwestern Ontario. It will operate as a separate private business, called Avalon Lithium Inc., a newly established Avalon subsidiary in which LGES would potentially become a co- owner, when they finalize a formal agreement."

Avalon also has [an off-take agreement](#) with a major non-Chinese international glass ceramic manufacturer to supply petalite concentrate from Separation Rapids for the glass-ceramics market.

The next steps for Avalon include a winter drilling campaign ([deeper drilling](#) at Separation Rapids main lithium pegmatite resource known as the Big Whopper), completing Feasibility Study-level cost estimates, project engineering and pilot plant work to optimize lithium battery materials process flowsheet & costs for the refinery and confirm the location for the refinery on a vacant industrial site in Thunder Bay. Also to complete

environmental assessments and project permitting. Beyond that Avalon plan to begin small scale commercial operations with sales of petalite and mineral by-products while the new battery materials refinery is constructed [ready for production in 2025/26](#), all going well.

Avalon Advanced Materials ticks many boxes for investors. Great lithium assets in Ontario Canada, supportive local, state and Federal governments, and a preliminary agreement to work with a multi-billion dollar company such LGES to establish a lithium supply chain in Canada. All at a time when it appears lithium will have a great decade. Execution risks to achieve lithium production remain high, but should de-risk with each successful step along the way. What's not to like with Avalon Advanced Materials on a market cap of [C\\$68 million](#).

InvestorIntel plans to have some interviews in 2023 with CEO Don Bubar to get an update on how the Company's plans are progressing.

Developing critical materials for the green economy in a sustainable way is the Avalon Advanced Materials' highway

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[Avalon Advanced Materials Inc.](#) (TSX: AVL | OTCQB: AVLNF) is a new breed of resource company that places environmental

stewardship at the top of the list of priorities as opposed to it being an afterthought. The Company has embraced the principles of sustainability as core to its business practice and has made a strong commitment toward implementing corporate social responsibility best practices and recently secured [a top 5% ESG Risk rating](#) amongst its peer companies from Sustainalytics.

Avalon is a Canadian mineral development company that operates primarily in Canada with a focus on the metals and minerals for use in clean energy and new technology including lithium, rare earths, cesium, tin, indium, gallium, germanium, tantalum and zirconium. The Company is in various stages of developing three of its five mineral resource properties with particular emphasis on lithium, cesium and rare earths.

Avalon's most advanced project is the 100% owned Separation Rapids Lithium Project, located in the Paterson Lake Area of Ontario. The Separation Rapids deposit is a potential source of lithium minerals for use in the glass and ceramics industry as well as lithium compounds for the battery industry. The company completed a Pre-Feasibility Study in 1999 to produce petalite (the predominant lithium mineral at Separation Rapids) for glass-ceramics. A new Preliminary Economic Assessment model was created in 2016 to produce lithium battery materials, which was subsequently updated in 2018 based on new glass-ceramic markets. The simplified business model with initial focus on lithium mineral concentrates for glass and ceramics has an initial CAPEX of C\$77.7 million (475,000 tpa mill capacity) for a 20 year operational life with average annual revenues of C\$90 million and average annual costs of C\$60 million for an NPV pre-tax (8% discount rate) of \$156 million and an IRR (pre-tax) of 27.1%.

Building on the Separation Rapids opportunity, [Avalon recently announced it has entered into a Letter of Intent](#) (LOI) with Fort

William First Nation (FWFN) to collaborate on the development of a lithium battery materials refinery located on industrial lands owned by FWFN in Thunder Bay, Ontario. This facility would be designed to accept lithium mineral concentrates from Avalon's Separation Rapids Lithium Project (70 km north of Kenora) and Rock Tech's Georgia Lake Lithium Project (145 km northeast of Thunder Bay), as well as potentially other emerging, new lithium mining operations in northern Ontario, to produce lithium hydroxide and other lithium battery materials.

Another example of what makes Avalon different than most resource companies is the binding [LOI signed in February](#) for four industrial minerals properties and a demonstration-scale processing plant located at Matheson, Ontario to process the tailings from a historic phosphate mining operation at the site. Work done has demonstrated that the tailings contain phosphate levels ranging from 15-20% P_2O_5 and can be sold "as is" for use in various agricultural fertilizer products. Additionally, analytical work done on the tailings indicates the presence of significant concentrations of rare earths, scandium and zirconium, which preliminary tests indicate will be recoverable through additional processing. The phosphate-rich tailings are already generating revenues and additional processing of the tailings could provide significant potential for future revenue growth. This is a great example of Avalon's core values working in harmony. The company gets access to a closed mine site with potential to recover critical minerals like rare earths from the mine wastes, while remediating the long term environmental liability.

Avalon is a leader among mineral developers in adopting best practices to reduce its environmental footprint, prevent water contamination and engage with local communities. This focus gives Avalon a strategic advantage when it comes to securing grants, funding and partnerships with governments and First

Nations, let alone the evolving investment community. Aligning the company with its stakeholders' values reduces risk and creates opportunities like the Fort William First Nation LOI. Just remember, [it's not easy being green](#), but it can be profitable.