

Avalon's lithium project moves to center stage

Avalon Advanced Materials Inc. (TSX: AVL | OTCQX: AVLNF) is something prismatic as, if one looks at it from different angles at different times, one sees different things. Management cannot be accused of not being nimble, neither can they be accused of short-termism. The company's main three targets it has had since last decade or before with the three *foci* being long-terms cultivars of the company, Nechalacho in the REE space, East Kemptville in the Tin space and Separation Rapids in the Lithium space.

When the latter project was just a twinkle in Avalon's eye late last century (sounds a long time ago!) the goal was the mining of Petalite as Lithium ion batteries were around but were not moving the needle in investors' Moodometers. Now the sex has been put into the Lithium equation it is timely for Avalon to breathe life into a project that had migrated to the backburner. The action here has been intense since last year and the project is now centre-stage at Avalon so we shall give it a look here and see what has been going on.

Petalite

Petalite is the preferred lithium mineral feedstock for certain specialty glass-ceramic products. Petalite is preferred over other lithium alternatives in glass-ceramic products for technical reasons, notably its consistently low impurity levels.

The petalite found at the Separation Rapids deposit contains very low levels of impurities, also offering potential for a high purity lithium chemical product at a relatively low-cost, to serve the needs of lithium ion re-chargeable battery manufacturers. A PEA was completed in September 2016,

confirming a technically viable process and that the recovery of a battery-grade lithium hydroxide product from Separation Rapids' petalite was a viable option.

Separation Rapids

The Separation Rapids deposit is one of the largest "complex-type" lithium-cesium-tantalum pegmatite deposits in the world, unusual in its enrichment in the rare, high-purity Lithium mineral petalite.

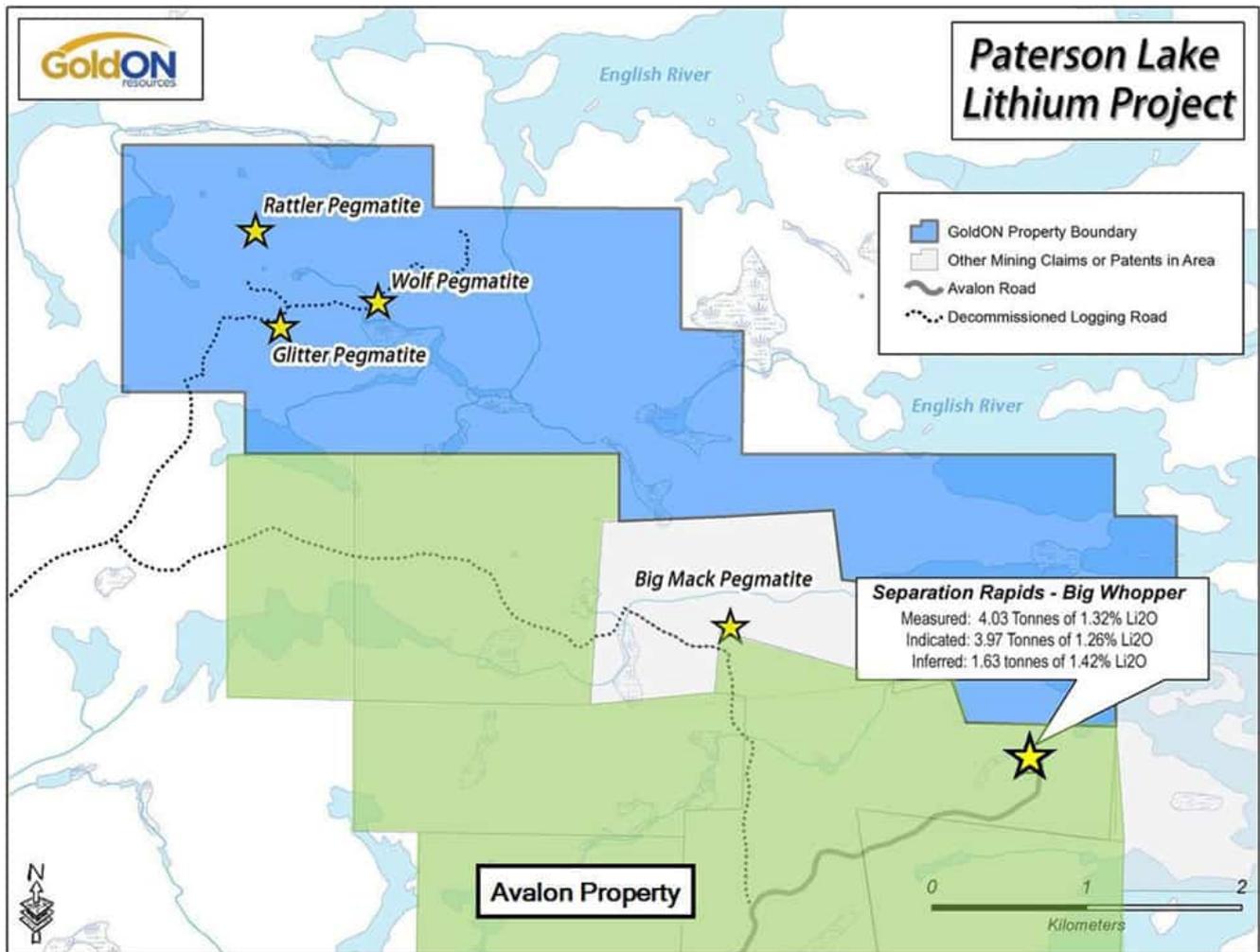
The 100%-owned Separation Rapids property is situated approximately 70 km by road north of Kenora, Ontario. The property consists of 15 Mineral Claims and one Mining Lease covering approximately 2,421 hectares. Tenure for the mineral resource is held under a 421 hectare, 21-year Mining Lease. Avalon also added three claims to the property covering 28 units (448 hectares), covering a corridor over the property access road.

Since acquiring the property in 1996, Avalon has expended approximately CAD\$10mn on exploration and development work. Initial exploration work conducted in 1997-2001 included geological mapping, trenching, ground magnetic surveys, mineralogical studies and diamond drilling totalling 10,152 m in 69 holes. Subsequent work focused on tantalum potential and other potential industrial mineral products.



Early exploration work culminated in 1999 with the completion of a comprehensive Pre-Feasibility Study on the viability of producing petalite with by-product feldspars, by independent consultant Micon International Inc.

Back in March 2017 Avalon announced it had closed a transaction with GoldON Resources Ltd. to acquire a 100% interest in the seven-claim, 1,008 hectare, Paterson Lake property (shown in blue above) located adjacent to the north and west of the Separation Rapids Lithium Project.



The Paterson Lake claims host three known lithium pegmatite occurrences known as the Glitter, Wolf and Rattler, along with a number of other, smaller, under-explored lithium – tantalum – rubidium – tin bearing pegmatites. These have never been drilled. These lithium pegmatite occurrences are between 5 and 6 kilometres away on trend with the Separation Rapids deposit along with a number of other, smaller less explored pegmatite occurrences. One of these, called the Glitter pegmatite, according to the Ontario Geological Survey, contains both petalite and lepidolite, has yielded assays of between 1.03 and 1.64% Li₂O over five successive 1m samples.

The Resource

At Separation Rapids the Measured and Indicated Mineral Resources are eight million tonnes averaging 1.29% lithium oxide and 39% feldspar. The Inferred Mineral Resources

contribute an additional 1.63 million tonnes at 1.42% lithium oxide and 39% feldspar to a maximum vertical depth of 260 metres. The deposit is open to depth and along strike.

The PEA

In September 2016 the results of Preliminary Economic Assessment on project were announced. The goal here was to investigate the potential for recovery of a lithium product suitable for the battery market. The results confirmed a technically viable process for the recovery of a battery-grade lithium hydroxide product.

The PEA development concept includes an open-pit mine, with milling onsite to produce a lithium mineral concentrate and by-product feldspar. The lithium mineral concentrate would then be processed in a hydrometallurgical plant (presently contemplated for Kenora) to produce lithium hydroxide for the battery industry or sold directly into the ceramics industry.

The metrics of the mooted operation were:

- 10 year mine life
- An average mining rate of 950,000 tonnes per year would yield an average annual production of 14,600 tonnes of lithium hydroxide for 10 years and 100,000 tonnes per year of feldspar mineral concentrate for 20 years (recovered from previously processed material for an additional 10 years)
- IRR of 19% on a pre-tax basis and a 16% IRR on an after-tax basis, assuming 100% equity financing.
- NPV at an 8% discount rate is CAD\$343 million pre-tax and CAD\$228 million after-tax.
- Total capital cost of \$514mn, inclusive of \$86 million in contingencies and \$7 million in sustaining capital
- Average lithium hydroxide price assumption of US\$11,000/tonne and the CAD:USD exchange rate assumption was US\$1.00 = CDN\$1.30.

Next Steps

The company is planning a follow-up drilling program in the second half of 2017 to continue testing the depth extension of the known resource. The deepest intersection to date in Hole SR98-57 encountered 1.47% Li_2O over a true width of 31.7m at a depth of 180m to 270m. As a result a minimum of 2,000m in five deeper holes is currently planned, subject to financing.

In addition, a summer geological mapping, prospecting and sampling program has been carried out to begin evaluation of numerous other known lithium pegmatite occurrences on the western part of the property. This will include the new Paterson Lake claims.

Conclusion

As we have noted in these pages recently Lithium is “taking a breather”... indeed it’s been holding its breath for almost a year now. The underlying dynamic, if anything, gets better and yet the Lithium stocks are almost universally still wallowing in misery as the market tries to work out who is real and who is just following the fad. With Avalon having been involved in this project since the 1990s one could not accuse of Avalon of that.

The dilemma now is the size of the capex. This is still in the upper quartile of Lithium projects and financing just isn’t easy these days. That situation can turn on a dime though if an amenable offtaker walks in the door with a large chequebook and determination to see a project through to production. In the short term it would be good to see some scaled down production scenarios or at least a phased onset of production.

Most of the crop of 2016 Lithium wannabes don’t even have drilling results let alone a PEA or PFS so Avalon has set itself in a category apart. Now the task is to find a partner that might make this one of the few from this latest “go

around” to move to the higher plane of actually having output of Lithium for a burgeoning marketplace.

Don Bubar on building an Ontario lithium battery materials demonstration plant

Don Bubar, President, CEO and Director of Avalon Advanced Materials Inc. (TSX: AVL | OTCQX: AVLNF) in an interview with InvestorIntel CEO Tracy Weslosky discuss updates from Avalon. They start by discussing how Don saw opportunity in a past producing tin-indium mine that closed prematurely in Nova Scotia. He sees the possibility of near-term cash flow by extracting value from the stockpiled waste dumps at surface. Don goes on to welcome Patricia Mohr as Avalon’s newest board member and, looking forward, tells the audience to expect more news on the Separation Rapids Lithium Project and the demonstration plant in Kenora, Ontario.

Tracy Weslosky: We’ve had a number of very interesting stories. I really liked the one that Lara Smith did saying, “it’s crunch time” and we’re expecting results on your 2000 meter drilling program that you announced in spring. Where are we at with this program?

Don Bubar: We’re just waiting on analysis now. We’ve got all the core split and into the lab and waiting for the results to come back so then we can see what they all mean and tell us about the mineralogy there. In particular the main reason we were doing it was to better understand the distribution of lithium there now that we know there’s more than one lithium mineral in this resource. In addition to the petalite there’s

also the lepidolite and other lithium micas there that we never fully accounted for in our historical resource.

Tracy Weslosky: Don, you have many years of leadership experience in the resource sector. Your goals for your shareholders are very well defined. I'm very impressed with the plan of action with your demonstration plant. Can you tell us a more?

Don Bubar: Well you're right Tracy. One thing I learned early on in the specialty minerals business is you got to introduce the product to the market as early as you possibly can so that it can get accepted and you can get those offtake agreements from potential customers that can then be relied upon to access the capital to build a full-scale operation. We know we have the resource. We know how to process it to make some of the lithium products that the market wants right now. We feel the next step for us is to build a demonstration scale pilot plant to start making some of those materials, show that we can make them to meet the customers' expectations on product quality and specifications and then start delivery.

Tracy Weslosky: We have a lot of new readers this year at InvestorIntel this summer that are looking at new stories. They may not be familiar with Avalon Advanced Materials. I liked the quote you had about how you'll be building this lithium battery materials demonstration plant in Ontario and this will establish Ontario as a new regional center for the production of critical materials... to access the complete interview, [click here](#)

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