

# LITHIUM AMERICAS CORP (LAC)

A pre-production firm poised  
to be the next lithium major



MASSIFCAPITAL

All prices are in USD.

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## Introduction

Lithium Americas Corp. (LAC) is the strongest junior lithium miner in the world today. It is poised to accelerate from a pre-production company to a mining major over the next decade. By 2024, we believe LAC will be worth \$35 per share, a 250% return. Within the decade, there are multiple paths forward for that return to grow further.

Global electrification places enormous pressure on illiquid mineral markets. International automaker product roadmaps suggest a need for lithium 6x the current global supply size within a decade. LAC will lead the new entrants in delivering critical green-field development supply to the market.

Missed in the race to grow volume is the importance of quality. Lithium is not a commodity; it is a specialty chemical. Value will accrue to the firms that own or feed mid-stream processing facilities capable of delivering the material required by Tier 1 battery manufacturers. Impurity (quality) differences in lithium sold in the third quarter of 2020 resulted in 3x price differentials.

By the middle of this decade, we expect LAC to be producing 70,000 tons of lithium carbonate equivalent (LCE) per annum (tpa). By the end of the decade, production will exceed 100,000 tpa. For perspective, that would place LAC on par with Albemarle Corp.'s (ALB) production and earnings capacity in 2019, a company that has a 15x market cap compared to LAC currently.

Key near term catalysts that drive the investment thesis include:

1. A final investment decision and release of the definitive feasibility study for the most advanced lithium deposit development in the United States, Thacker Pass.
2. Production start at LAC's Argentinean asset Caucharí-Olaroz.
3. The market for battery-grade lithium chemicals tightens considerably from 2022-2025.
4. LAC's free float increases, putting the firm in a position to receive sizeable passive investment flows.

We expand upon each point in detail throughout the report.

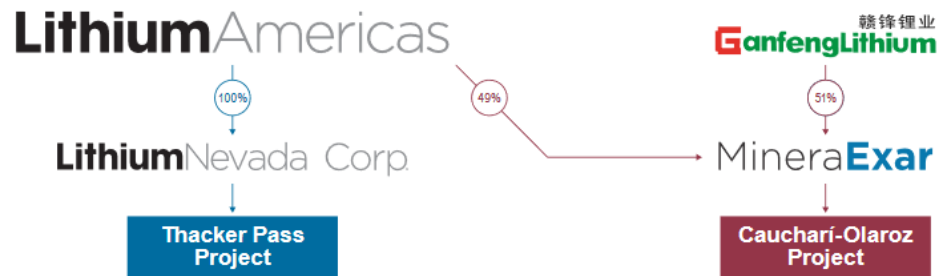
## Business Model

LAC is an advanced stage lithium developer bringing two world-class assets to market: the Caucharí-Olaroz mine in Argentina and Thacker Pass in Nevada. Caucharí is a lithium brine operation and is the largest known lithium brine resource in development in South America.<sup>1</sup> LAC owns 49% of the project. Ganfeng Lithium owns the remaining 51%. The firm's U.S. based project, Thacker Pass, is a sedimentary<sup>2</sup> lithium deposit, the largest known lithium resource in the United States, and the most advanced lithium project currently under development in the United States with over ten years of development and over \$100M invested to-date. LAC owns



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## Overview of Mine Assets

### CAUCHARÍ-OLARÓZ (CAUCHARÍ)

Situated in northwest Argentina, Caucharí has an estimated annual production capacity of 40,000 tpa of lithium carbonate and is expected to operate for 40 years. As a brine deposit, solar evaporation concentrates lithium in the salt brine and precipitates other salts in large scale ponds. Processing facilities remove impurities and transform the concentrated lithium brine into battery-grade lithium carbonate. The Caucharí project is unique for several reasons:

First, it is a Tier 1 geological deposit. The resource is the 3<sup>rd</sup> largest lithium brine deposit globally, behind the Uyuni in Bolivia and the Atacama in Chile – representing one of the stool legs that broadly defines the “Lithium Triangle” in South America. As a brine resource sitting in a high-altitude desert, solar evaporation does much of the heavy lifting, dramatically reducing energy requirements, and thus OPEX, placing it almost immediately at the lower left of the production supply curve.

Second, their partnership with Ganfeng Lithium has provided ample liquidity, critical mid-stream processing expertise, and the security of an offtake agreement for over 90% of the mine’s annual production at market prices. LAC has been fortunate with their partners to-date receiving key pond design elements from SQM leading up to the 2017 feasibility study, followed by Ganfeng’s investment to secure LAC’s share of project financing and guidance in designing and constructing the chemical processing plant.

Ganfeng Lithium is China’s largest lithium compound producer and the number one lithium metal producer globally. It is considered a global leader in lithium compound and metal processing and is arguably the world’s only vertically integrated lithium company with raw materials, lithium compounds, and lithium battery production in-house. Ganfeng has at least four long-term supply contracts with V.W., BMW, Tesla, and L.G. Chem. LAC now sits at the start of this supply chain. Ganfeng’s mid-stream expertise has also proven helpful for LAC.





The final technical reports for Caucharí showed a meaningful decline in capital intensity from \$17,000 tpa to \$14,000 tpa driven by higher levels of concentration realized in the evaporation ponds relative to initial expectations. With increased clarity on recovery rates, Ganfeng used their brine processing experience to alter mid-stream facilities to maximize battery-grade lithium carbonate output. This change is easily audited in their operating cost expectations, which increased by about \$824 per ton of LCE output for reagents. The ~43% increase in OPEX reflects process optimization designed to consistently achieve stringent, low impurity specifications from battery material customers. It is hard to understate the importance of this development. Battery grade LCE can have a \$4,000 per ton premium over higher impurity LCE, easily 3x the increase in forecasted OPEX. At \$3,576 per ton of LCE, the project remains well within the lowest 10% of the industry's production cost curve.

Coming into 2020, Caucharí had 12 active brine pumping wells, yielding more than 3 million cubic meters of brine into the evaporation ponds. Following a pause earlier this year due to COVID-19 protocols, construction activities at Caucharí are back underway. As of the end of Q3 2020, 81% of the \$565 million budgeted capital expenditures were committed, including \$347 (61%) already spent. All critical equipment remains on track to be delivered by the end of 2020, with the expectation that construction is complete by the end of 2021 and production starting in early 2022.

#### THACKER PASS (THACKER)

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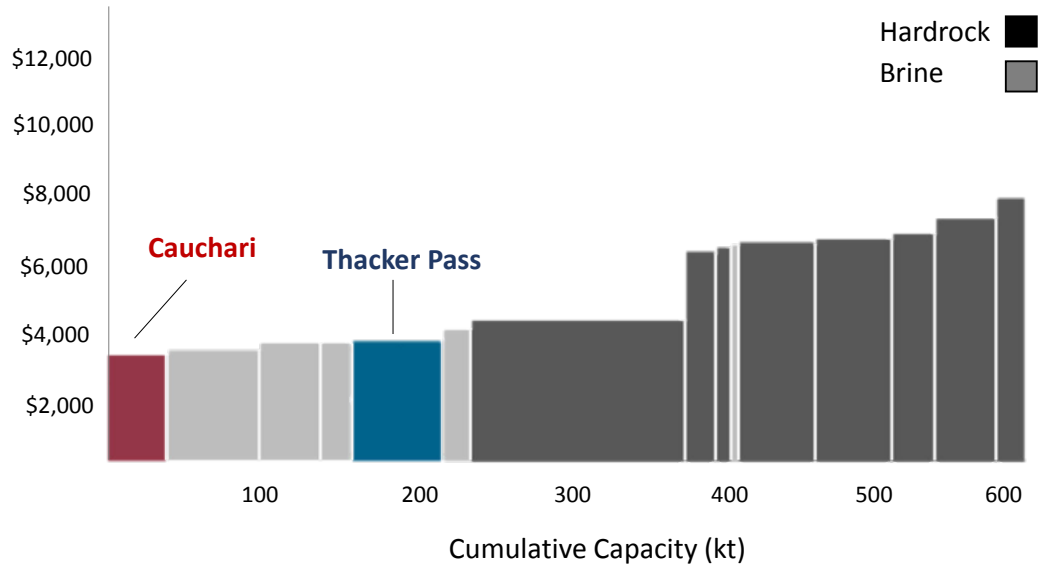
The project proposes a lithium claystone mining operation with a production capacity designed to reach 60,000 tpa of battery-grade lithium carbonate for 46 years. The project will be developed as an open-pit mining operation, allowing the operation's extraction portion to be carried out with conventional and commonly available equipment. Lithium bearing clay sits close to the surface, allowing for a relatively shallow pit with an average depth of 75 meters. The crushed ore will be processed in a leaching circuit using sulfuric acid to separate the lithium from the clay. Given the reliance on sulfuric acid, a sulfuric acid plant will be built on-site, converting molten sulfur into acid, providing the critical acid leaching ingredients and enough electricity to power the entire operation with excess energy sold back to the grid.

Thacker is 100% owned by LAC, with offtake rights currently uncommitted. Key pre-production development steps are being met in a timely manner; the final environmental impact statement was finalized on December 4<sup>th</sup>, 2020, an important milestone from the U.S. Bureau of Land Management, and all major permits are expected to be completed by the end of Q1 2020. The definitive feasibility study is currently underway, and a record of decision is expected to be released within the next quarter. In September, the Nevada Governor's Office of Economic Development unanimously approved tax abatements, which are expected to be granted for the first phase of the construction period.



Like Caucharí, Thacker Pass expects to be a relatively inexpensive mining operation. The open pit's cash costs are estimated at \$4,088 per ton; cheaper than most hard rock spodumene mining but more expensive than the top tier brine resources found in South America. However, inclusive of excess electricity and sulfuric acid by-product sales, the average OPEX for the entire project is reduced to \$2,570, a 37% reduction from mine operation OPEX and likely cheaper than their Caucharí asset.

**Operating Cost Curve \$/tpa LCE**



Source: LAC Investor Presentations, Massif Capital

## Valuation & Market Conditions

Today, LAC finds themselves in a dominant position. They have a strong balance sheet with over \$145 million in cash, and the Caucharí project is fully funded from cash and available credit.<sup>3</sup>

Mechanically, LAC is a simple valuation. The company has two natural resource assets, and the value of those assets is based on two variables: the quantity of the resource and the price of the resource.

We can underwrite production volumes easily, but assumptions on market prices require some context.

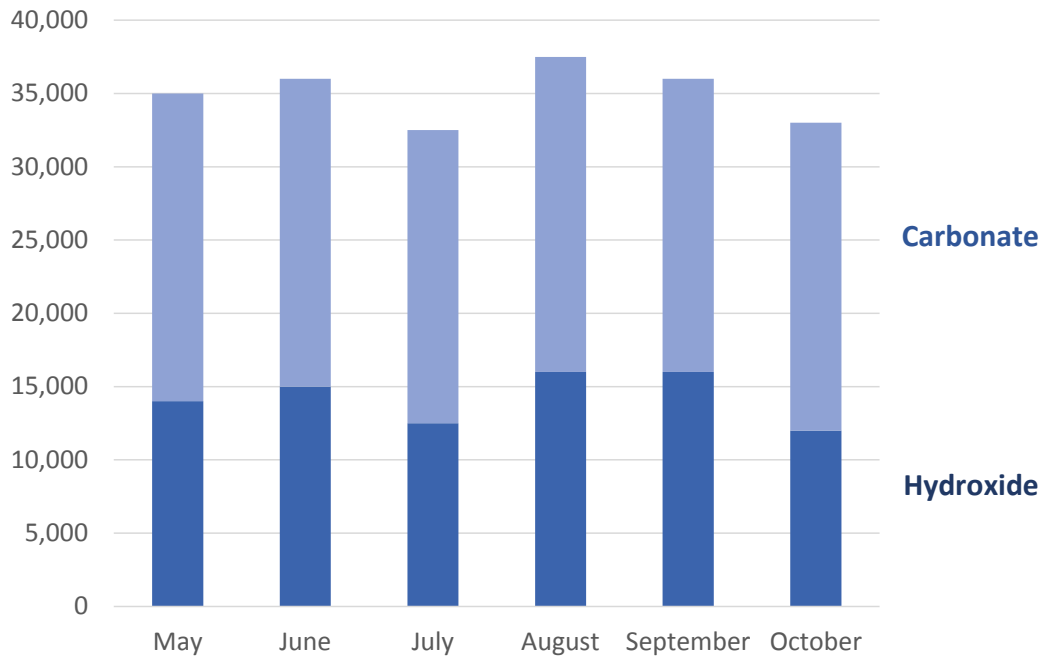
### LITHIUM SUPPLY

Global lithium supply sits at roughly 432,000 tpa.<sup>4</sup> That figure will need to triple by 2024 to meet forecasted demand.<sup>5</sup>

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**Supply: Hydroxide & Carbonate Calendar Year 2020**



Source: Massif Capital, Benchmark Mineral Intelligence

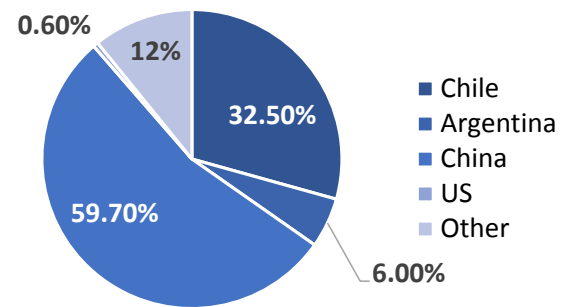
Supply will not expand to meet accelerating demand with prices at or below marginal production costs, which is where we find ourselves today. Additionally, there can be a significant time lag before new supply can hit the market once the economic conditions are in place to begin development.

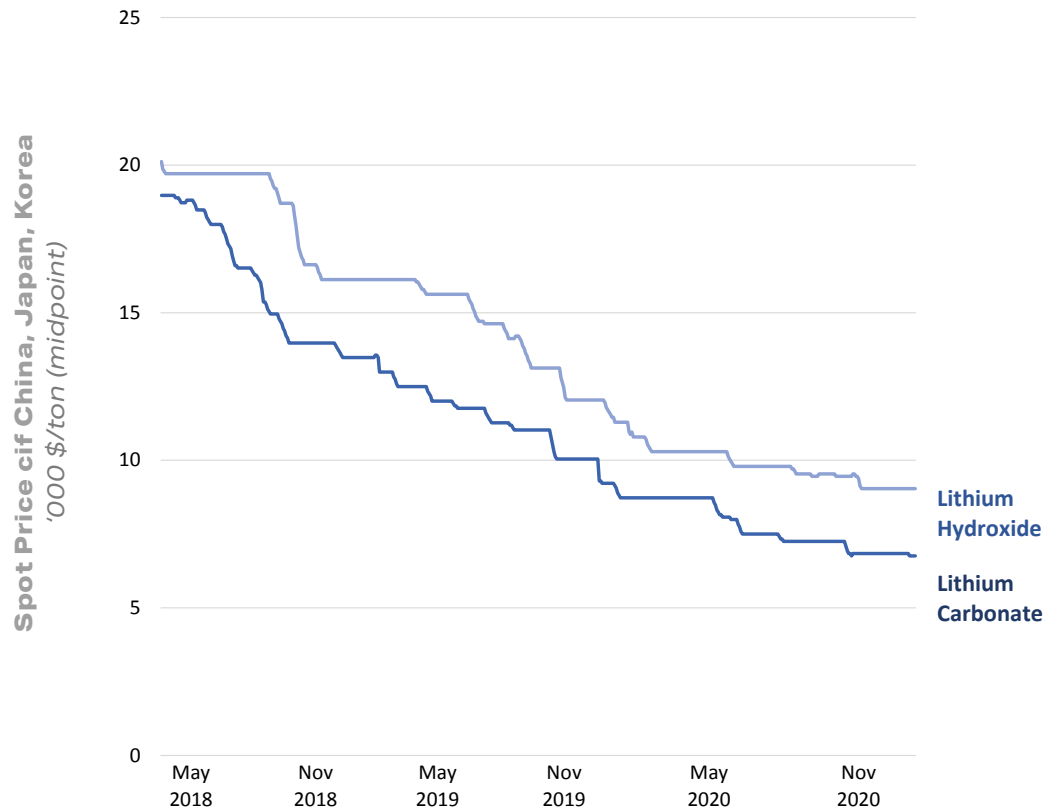
The last decade sheds light on this problem and should be used as a data point to calibrate forward expectations. In 2011, there were 200,000 tpa of capacity in the market. The 2016 ambition was for the market to be at 600,000 tpa with about 300,000 tpa of new capacity and 100,000 tpa of planned expansion. 2016 was just shy of 400,000 tones. Of the planned expansion and new capacity targets, the industry had a 31% success rate.

From 2015–2018, at the height of the last market price spike (thus the point of peak potential and incentive for producers), the industry only managed to grow, on average, by 11% per year. That will need to double to a 20% CAGR over the next six years to meet forecasted demand.

Price volatility is not kind to lengthy and capital-intensive development plans. As prices have fallen off a cliff since late 2018, major producers have adjusted their production expansion plans. ALB and SQM scaled backed planned production increases in the second half of 2019, with Livent following suit.

**Lithium Supply: October 2020**





Source: Massif Capital, Fast Markets, Benchmark Mineral Intelligence

The price series above represents contractual midpoints. The range, however, depending on quality and location, can be wide. By way of example, Australian producer Orocobre saw average realized prices of \$3,102 per ton last quarter (on its way to China). Yet, import statistics reveal \$10,000 per ton of product flowing into Japan and Korea, home to most Tier 1 battery manufacturers.

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Seemingly in need of cash, Chinese chemical converters are selling product below cost. Prices today are below the cash costs of many Chinese producers that purchase and convert spodumene to lithium carbonate at \$7,000–\$9,000 tpa. The situation is unsustainable, but it is unleashing another move down in carbonate, and hydroxide prices, both in and outside of China, as processers are looking to move products aggressively. SQM continues to harp on regaining market share, which has increased its willingness to sell large quantities of lithium to China and subsequently pulled ALB into a similar selling pattern. We have seen this behavior twice from SQM since they began production in the 1990s. While claiming to build inventory and pursue a disciplined market approach, volume and pricing data suggests the opposite. This is not sustainable. It is also produced the misconception to many market observers that different grades of lithium are interchangeable. Lithium is not a fungible good, and price disparity is a clear indication of this.

To meet robust demand, long term pricing will likely need to include an incentive component on top of marginal cost. LAC has argued that a \$10,000 per ton long term price is potentially conservative given the challenging financing environment for



junior miners. Industry specialists, Benchmark Minerals, calls for a practical pricing floor of \$12,500 per ton; a function of marginal cash costs of \$7,000–\$8,000 per ton, a post-D&A base of \$9,500 per ton, and another \$3,000 per ton incentive premium. We think this is a reasonable assessment.

## DEMAND DRIVERS

Lithium demand doubled from 2014–2019, with E.V. penetration growing to only ~2% of the market. In the last price spike we observed in lithium, from 2015–2017, E.V.'s made up about 1% of the market.

Lithium demand doubled from 2014–2019, with E.V. penetration growing to only ~2% of the market. In the last price spike we observed in lithium, from 2015–2017, E.V.'s made up about 1% of the market. Looking ahead to 2025, we expect to see the E.V. market triple in size. We are about to go from 40,000 tons of growth per year to 200,000 tons of growth per year, and there is no excess supply in the system to readily meet that. However, for the automaker, lithium's price needs to move upwards of 20% to see only a 1% cost increase in the battery cell. This would be a rounding error on the sticker price of an E.V. In short, price spikes in the lithium market would need to be severe and sustained for any meaningful response and pull back from the demand.

As of the third quarter, 2020, downstream demand is accelerating. E.V. production in China is up 48% year over year through October, while E.V. sales in Europe grew 63% month over month in September, following a 57% growth in E.V. sales through the first half of the year in a vehicle market that declined 37%. Industry sources note that chemical consumers are urgently requesting deliveries under short delivery horizons to replenish stockpiles and prepare for growing sales forecasted for 2021. For the major international automakers, fear over future battery cell security persists, despite capacity running ahead of demand for at least another 18 months. Increasingly battery cells are designed specifically for the customer, and we are beginning to see cases where an automaker is becoming heavily involved in the development of the cell, highlighting the concern over a limited number of Tier 1 suppliers.

Substantial investment in cell manufacturing capacity continues. Swedish manufacturer Northvolt raised another \$600M in late September in support of their goal to reach 150 GWh of cell output by 2030. G.M. announced an additional \$2.2B of investment in the U.S. supply chain, primarily to construct an E.V. manufacturing facility in Tennessee. L.G. Chem, who partnered with G.M., plans to bring an additional 30 GWh of cell production to Ohio by 2023. This follows their announcement that they will separate their E.V. battery business from the rest of the firm to raise enough capital to triple its cell capacity. Paired with a record Q3 profit of \$790M USD, up 156% year-over-year, on recovering orders from the E.V. supply chain, one need not look much further than L.G. Chem to take a temperature on the sentiment within the industry. Mercedes-Benz, Honda, and BMW have all announced strategic partnerships with battery suppliers at the start of the third quarter, following closely at the heels of Volkswagen's purchase of the Chinese battery producer Gotion.

In 2017, there were 17 lithium-ion battery mega-factories under construction globally. By early 2019, there were 70 under construction. Today, 18 months later, there are





158 mega-factories either under construction or in the pipeline.<sup>6</sup> Since the fall of 2017, near the height of peak lithium prices, planned lithium battery cell capacity has expanded from 289 GWh to 2,656 GWh, an 819% increase.

We are left with a highly fragmented market by quality and location, challenging to scale supply quickly, and a consumer that is price inelastic with a rapidly growing appetite.

## VALUING THE BUSINESS

Today, assuming a \$12,000 per ton price for LCE<sup>7</sup> and a 10% discount rate, we believe that LAC's ownership of Cauchari is worth \$609 million and Thacker Pass is worth \$1.2 billion for a combined net asset value (NAV) of \$1.9 billion. Less net debt (which is additive for LAC as their cash balance of \$145 million exceeds their long-term liabilities of \$128 million), over 100.6 million shares outstanding, and we arrive at an implied share price of \$18.9, an 80% increase from current prices.<sup>8</sup>

### PV of Cash Flows (\$USD Millions)

Figures for Cauchari are inclusive of ownership %

Discount Rate (%)	Realized Prices (\$/ton)		Cauchari-Olaroz		Thacker Pass			
	\$8K	\$10K	\$12K	\$14K	\$8K	\$10K	\$12K	\$14K
8%	\$326	\$647	\$815	\$1,060	\$654	\$1,320	\$1,986	\$2,651
9%	\$270	\$501	\$701	\$919	\$455	\$1,023	\$1,591	\$2,159
10%	\$223	\$386	\$609	\$801	\$299	\$788	\$1,278	\$1,760
LAC Parent NAV	\$1,887							
Cash	\$145							
Long Term Liabilities	\$128							
Net Debt	-\$17							
Shares Outstanding	100,624							
Current Share Price	\$10.5							
<b>Implied Share Price</b>	<b>\$18.9</b>							

By 2024, with both projects operational, we believe LAC is worth \$35 per share under the same discount rate and market price assumptions.



**PV of Cash Flows @10% DR & \$12K market prices for LAC Assets**

	2020	2024
Cauchari	\$609	\$976
Thacker	\$1,278	\$2,510
LAC NAV	\$1,887	\$3,486
<b>Implied Share Price</b>	<b>\$19</b>	<b>\$35</b>

**Implied Share Price - Varying Price of LiCO3**

	2020	2024
\$8,000	5	16
\$10,000	12	25
\$12,000	19	35
\$14,000	26	44
\$16,000	32	54

**Implied Share Price - Varying Discount Rates**

	2020	2024
5%	53	71
8%	28	45
10%	19	35
12%	13	28
14%	9	23

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Lastly, resource projects can be considered options to invest, rather than a future cash flow stream. Employing a DCF method to value a resource project may underestimate the real value of a project. Within the DCF framework, investors generally discount cash flows at a rate that reflects risk. Whatever the risk may be, businesses with uncertain payoffs get a lower value. By contrast, options markets reward higher volatility with higher valuations derived from the asymmetry of payoffs. In short, is uncertainty (volatility) a source of risk or value? We contend that a mixture of both is appropriate for LAC, particularly when evaluating Thacker Pass. We layout three reasons below:

1. It was explicitly noted in the Q3 earnings release that the company is assessing changes to the parameters of the feasibility study to target a potentially higher production capacity and a revised product mix due to discussions with potential customers and J.V. partners.
2. Based on the recently released final environmental impact statement, the chemical processing facility is designed to produce lithium carbonate and lithium hydroxide. Notably, the 33,000 tpa of LCE (moving to 66,000 tpa in Phase II) will be distributed among lithium carbonate, lithium sulfide, and lithium hydroxide with “market conditions determining the blend of finished products.”<sup>9</sup> As noted earlier, the spread differentials between various grades of lithium chemicals can be substantial. Furthermore, the project expects to be the first mine on the planet designed from the ground up to make lithium metal. Approximately 800 tpa, building to 1,600 tpa is expected. Solid-state batteries are still several years away from commercial production. Still, if lithium metal ever replaces the lithium-ion battery’s anode, it will have profound impacts on the energy storage markets. While speculative, we would not be surprised if LAC announces a partnership with a solid-state battery company within the next 18 to 24 months. Setting speculation aside, lithium metal currently fetches 10x the market price of lithium hydroxide and lithium carbonate on the market, demonstrating further the optionality that may be at LAC’s fingertips over the next few years.<sup>10</sup>



3. Thacker Pass may evolve to having strategic importance to the United States. While China only owns ~23% of the raw materials that feed the E.V. ecosystem, they own 80% of the midstream, chemical refining process. As a result, they have also produced 66% of the cathodes and anodes and 73% of the downstream battery cells. The lesson: owning the chemical refining capacity ensures that trade flows of raw materials point towards your country.<sup>11</sup> Senator Lisa Murkowski recently noted: “the problem is that as a nation, we have outsourced the production, the processing, the refining of minerals that we need. And we particularly outsource this to China, which leaves our manufacturers at a significant disadvantage, having to form complex global supply chains”. Slipping under the radar in the final weeks of the Trump Administration is new [guidance](#) that opens up \$42 billion in loans through the DOE, encouraging companies to seek loans for the production, processing, and recycling of “critical minerals” that are central to electric vehicles, renewable energy, advanced nuclear, hydrogen fuel cells, and carbon capture.

It is not clear how to value the strategic importance of Thacker Pass to the United States, or even if any value should be attributed to it at all. Nor is it obvious how to value management’s optionality to tailor production schedules and product mixes leading up to, and after, the mine gets turned on.

It is not clear how to value the strategic importance of Thacker Pass to the United States, or even if any value should be attributed to it at all. Nor is it obvious how to value management’s optionality to tailor production schedules and product mixes leading up to, and after, the mine gets turned on. We can say that all these pieces, particularly in tandem, represent real call options that most certainly are understated within a discrete DCF analysis.

The table below highlights the call option value for Thacker Pass, varying LCE’s price while holding all other variables constant. It is critical to note that accuracy here is not an appropriate goal, nor the likely outcome with option modeling. But it can be a useful thought exercise, particularly for businesses that face volatile commodity markets and have the option to adopt investment decisions based on those rapidly evolving markets.

<b>Black-Scholes Call Option Valuation Matrix for Thacker Pass</b>				
Price of LCE	<i>\$/ton</i>	\$6,000	\$10,000	\$12,000
Thacker Reserves	<i>million tons</i>	3.1	3.1	3.1
Marginal Cost of Extraction*	<i>\$</i>	\$4,088	\$4,088	\$4,088
Annual Std. Deviation of LCE	<i>%</i>	32%	32%	32%
Annual After Tax Cash Flow	<i>\$ millions</i>	\$321	\$321	\$321
Cost of Developing Resource	<i>\$ millions</i>	\$1,059	\$1,059	\$1,059
Life of Mine	<i>years</i>	46	46	46
Risk Free Rate	<i>%</i>	2%	2%	2%
<b>Call Option Value per Share</b>	<b><i>\$/share of LAC</i></b>	<b>\$18</b>	<b>\$74</b>	<b>\$103</b>
DCF Value per Share	<i>\$/share of LAC</i>	(\$2)	\$8	\$13

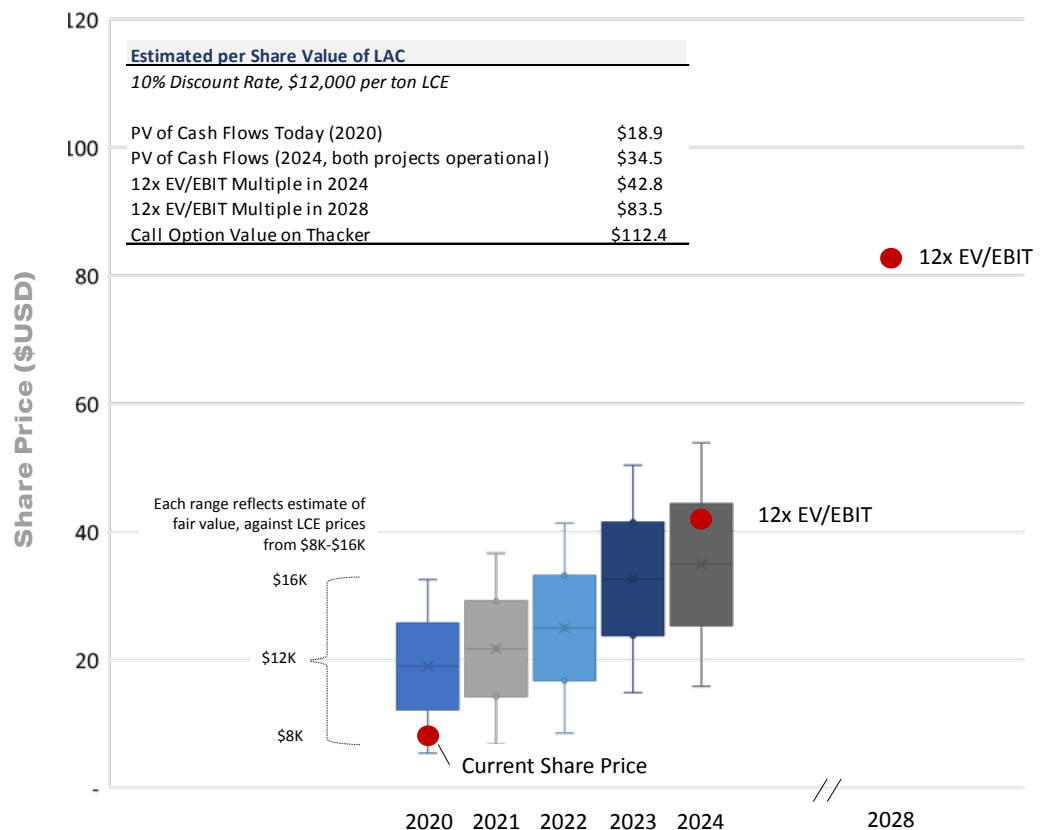
In the first column, we assume that the price of LCE is \$6,000. Perhaps not an unreasonable assumption for an investor looking at the spread between prices today and merely picking a mid-point. These assumptions would render the project uneconomic according to DCF, with a -\$2 per share contribution to it is parent LAC. Yet we know that lithium prices are volatile, with a standard deviation upwards of 50%



historically. Under the same assumptions, the call option value yields a positive \$18 per share value, awfully close to our estimated value of LAC today under a \$12,000 price assumption. The lithium reserves are not viable at \$6,000 prices but are still valuable because of the potential to create value should lithium prices go up. A DCF approach at static prices understates this value.

This example is merely illustrative; we believe that today's battery-grade carbonate is being purchased for \$10,000 per ton, and our base case price assumptions rest at \$12,000 per ton – the price needed in the industry to incentivize green-field production. Just as the call option value is important to consider at \$6,000, it is also important to consider at \$12,000. The fact that a DCF analysis shows a positive NPV at \$12,000 prices does not suggest that examining a call option value is less meaningful. The volatility in prices has not changed, and we do not expect it to change, given the inelasticity of demand. The chemical processing flexibility, strategic offtake agreements, and the possibility of upward production volume revisions is a real option for the business. For an investor in LAC at \$10 though, it is mostly a free option at this price and provides asymmetry in an investment whose fundamentals alone suggest an annualized 37% return over 3 years.

The fact that a DCF analysis shows a positive NPV at \$12,000 prices does not suggest that examining a call option value is less meaningful. The volatility in prices has not changed, and we do not expect it to change, given the inelasticity of demand.



We believe LAC is worth \$35 per share and can hit that, conservatively, by 2024. Pricing multiples suggest this is well within reach. By 2025, a full year into the Phase I production for Thacker Pass and the third year of production for Caucharí, we estimate LAC to have \$361 million in EBIT. LAC's eventual industry peers, ALB, SQM,



Livent, have traded in the range of 12x–22x EV/EBIT over the last three years. A 12x EV/EBIT multiple with \$361 million in EBIT implies a \$42 share price for LAC. As Thacker Pass expands into Phase II, we expect EBIT to reach \$538 million towards the end of the decade. At a 12x EV/EBIT multiple, this implies an \$83 per share valuation. Both figures assume the price of LCE does not exceed \$12,000 per ton.

Outlined below, we hypothesize what will drive LAC forward over the next 18 months.

## CATALYSTS

- 1. Thacker Pass definitive feasibility study (DFS) results and record of decision.** 2021 will be an eventful year for Thacker Pass. The DFS marks a crucial step in mine development, further de-risking the project.
- 2. Caucharí-Olaroz completes construction and commences operation.** This development turns LAC into a producing mine. The rate of change off “zero” should not be overlooked; financial statements begin to reflect the value of their assets.
- 3. Demand for lithium accelerates,** producers struggle to scale, and prices begin to reflect the marginal unit of supply from a greenfield project. Inelasticity suggests prices will swing well beyond this point in the near term. Notably, the LAC thesis is not dependent on appreciating lithium prices; the company converting resources into earnings forms the base of the thesis. That said, LAC finds themselves pivoting from pre-production company to production company commensurate with a market on the precipice of unprecedented growth against a supply base notoriously challenging to scale. Our conviction in a LAC investment is undoubtedly supported by an extremely bullish capital cycle analysis of lithium.
- 4. Free float increases, putting LAC in a position to receive larger passive investment flows.** Back in 2017, Bangchak – a Thai oil and gas company – joined Ganfeng in providing capital to LAC in support of their share of project financing for Caucharí. At the time, Bangchak owned 50 million shares at an average cost of 0.85. Following a 5:1 reverse stock split, as LAC was up-listed to the NYSE from the OTC market, Bangchak had ~14 million shares. A year ago, Bangchak was the second-largest shareholder of the business, with 15.8% ownership. Today, they have dropped to under 10% ownership of the company, with the latest filing showing ~9.6 million shares owned. We cannot ascribe intent, but it is not surprising to see a cash strapped Thai oil company that was an early creditor with a very low-cost basis begin to cash in on their investment. Subsiding sale pressure from Bangchak will be positive for LAC. Furthermore, as free float begins to increase in LAC, their exposure to passive flows may increase. The Lithium & Battery Tech ETF, LIT, ranks companies in their selection pool according to free float, re-balancing the constituents on an annual basis.<sup>12</sup>





## RISKS TO THESIS

Development risk is a crucial concern for investment in LAC. If LAC cannot bring either mine to production, or the time to production is extended significantly, the equity value will suffer. The development risk for Caucharí is muted compared to Thacker Pass. Construction progress can still be interrupted, but the project is in its final approach. For Thacker Pass, the development risk is defined by the commercially untested processing of sedimentary lithium mining. The pilot programs to scale the leaching circuit have been successful, but the error bands around the actual throughput and OPEX for this new process are wide. Just as part of the upside optionality for Thacker Pass is a larger, more value generative mine, the downside optionality is present as well.

Secondary to development risk is lithium price risk. Stagnant lithium demand would be problematic for both market prices and sentiment in the industry. The pace at which automotive OEM's can scale their electric vehicle rollouts is still unknown. Given the time-to-build concerns with upstream supply, producers are likely to overshoot or undershoot real-time demand more often than not. Should this dynamic continue to generate actual (or perceived) volatility in realized lithium prices, we expect that equities reflect that dynamic. We view this risk as secondary to development risk as LAC has numerous non-price catalysts as it moves from pre-production to production.

## Footnotes

<sup>1</sup>At 19.9 Mt lithium carbonate equivalent (LCE), Caucharí-Olaroz is more than 13 Mt higher than the next largest project, the Olaroz development by Orocobre with 6.4 Mt of measured & inferred resources.

<sup>2</sup>Primarily clay.

<sup>3</sup>Available capital from credit facilities is \$202 million as of December 2020.

<sup>4</sup>Roughly 60% of that is in the form of lithium carbonate and 40% in the form of lithium hydroxide. We expect a more even 50/50 split towards the middle of the decade.

<sup>5</sup>The lithium supply measured in lithium carbonate equivalent (LCE) is not mined supply but rather processed supply. China owns a much smaller proportion of the total overall mined lithium supply globally but continues to dominate the chemically processed (or converted) brine/spodumene resources that form carbonate and/or hydroxide chemicals of various purities.

<sup>6</sup>Benchmark Mineral Intelligence.

<sup>7</sup>The price we believe is appropriate to incentivize production capacity to that satisfies demand.

<sup>8</sup>As of early December 2020. Price assumed is \$10.5 USD per share.

<sup>9</sup>Final Environmental Impact Statement, Thacker Pass Lithium Mine Project, U.S. Bureau of Land Management, December, 2020.

<sup>10</sup>Spot lithium metal (99.9% Li) prices in China fluctuated between \$82,000 per ton and \$120,000 per ton in 2019. United States Geological Survey, Mineral Commodity Summaries, January 2020.

<sup>11</sup>Benchmark Minerals, Q3 Review 2020.

<sup>12</sup>[LIT, Lithium & Battery ETF Documents.](#)



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