

# Sigma Lithium Corporation

## EV Materials

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Rating  
**SPECULATIVE BUY**

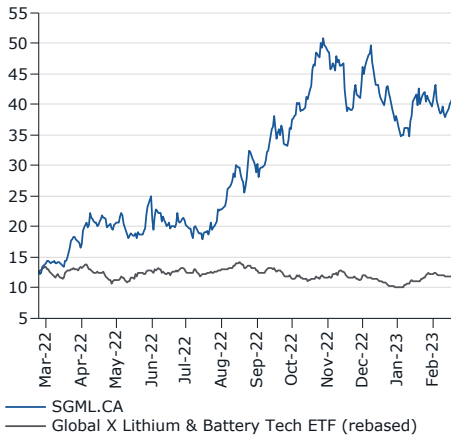
Price Target  
**C\$65.00**

**SGML-TSXV**

Price  
**C\$46.39**

### Market Data

52-Week Range (C\$) :	11.25 - 54.23
Avg Daily Vol (000s) :	30.28
Shares Out. (M) :	103.5
Market Cap (C\$M) :	4,801.4
Dividend /Shr (C\$) :	0.00
Dividend Yield (%) :	0.0



Source: FactSet

Priced as of close of business 21 February 2023

Sigma Lithium is developing a group of pegmatite lithium properties in northeast Minas Gerais State Brazil. Its flagship project, Grota do Cirilo, is host to the largest hard rock lithium deposit in the Americas. SGML is targeting Phase 1 production of 270ktpa of battery-grade lithium concentrate commencing in early 2023, nearly tripling shortly thereafter to 766ktpa SC5.5 in Phase 2/3.

## Site visit takeaways: On the home stretch

**We reiterate our SPEC BUY rating on Sigma Lithium and C\$65.00/sh target price following our site visit last week to the company's Grota do Cirilo project in Brazil,** where Phase 1 construction is currently underway. The tour was hosted by Sigma's senior management team, which included CEO Ana Cabral and COO Brian Talbot. We came away impressed by the progress of construction on site, and with an increased level of confidence in the company's ability to commence production in April 2023 and start generating cash flow as early as Q2 this year. In our view, there is significant potential for Sigma to re-rate as it transitions from a developer to a producer generating free cash flow.

We continue to believe that Sigma is uniquely positioned as a fully funded, near-term producer with substantial growth on the horizon and a large portion of its production still uncommitted. These attributes make the company an attractive takeout target, in our view, a thesis that is further supported by the [Tesla takeover media speculation](#) on Friday.

Our key takeaways from the site visit are detailed below.

**Phase 1 plant construction progressing to plan:** Construction continues to accelerate with ~1,200 workers on site. Phase 1 detailed engineering is 100% complete and all critical items for construction are present on site, with total deliveries sitting at 92%. The remaining 8% is related to spare equipment, as a form of risk mitigation.

Commissioning of the crushing circuit is now complete with the company having produced a continuous sequential batch of crushed material in early February (on track with company guidance). While we were on site, the crushing circuit was operational and ramping up throughput to ~50% (Figures 1-3). The Dense Media Separation plant is also rapidly advancing and is targeting completion in March 2023, with the plant now ~80% complete (Figures 4-5). The largest focus of work is the completion of ~6km of piping, which Brian considers critical path and the biggest potential risk to timeline. Overall, our impression was that plant construction is tracking in line with management targets (rare for a lithium development project), and that first production is on track for April 2023.

In our view, Brian Talbot and his team have been instrumental to the progress made on site. Brian has brought a group of experienced managers from Australia and Africa who are overseeing the local teams, allowing Sigma to leverage both the high-quality local mining workforce and Brian's teams' prior DMS experience.

**Mining activities on track and meeting cost expectations:** Pre-stripping of the north pit is now complete, and ore is currently being stockpiled from the weathered zone (Figures 6-8). This zone was previously excluded from the Phase 1 mineral reserve; however, material recovered to date is grading an impressive 1.6-1.7% Li<sub>2</sub>O, which is notably above the existing mineral reserve grade at Xuxa (1.55% Li<sub>2</sub>O). Management indicated that its plan is to blend ore from the weathered zone with reserve ore to help reduce fines, and therefore improve recoveries. Pre-stripping at the south pit is also currently underway. Initial mining costs are tracking in line with the estimates outlined in the Phase 1 Feasibility Study (~\$2.20/t). Brian cited the productivity of the local mining team, and the significant cost advantages relative to Australia which are more than offsetting the higher strip ratio. (~40% lower cost due to reduced diesel consumption, cheaper labour, etc.)

**Phase 1 ramp-up expectations:** Sigma expects the ramp-up to nameplate capacity to take ~3 months from start-up, which implies run-rate production by July or August of 2023. Based on the production profile presented in Figure 10, pro-rata this would imply production of up to 185kt SC5.5 in 2023 (8/12 months at 277kt). This is relatively in line with our current forecast of 180kt SC5.5.

We also note that the Phase 1 Feasibility Study assumed a 15% loss to fines. Sigma believes this can be reduced by crushing to a coarser size (12mm vs. 9.5mm), which would reduce fines and improve recovery leading to higher than projected production levels.

**Potential sale of tailings provides unpriced upside:** Our current forecasts do not provide any value for the potential sale of Sigma's tailings. Management is currently advancing commercial discussions and believes that it could sell its tailings material (~300,000tpa) at an average realized price of US\$1,200/t CIF in the market today. This pricing reflects current demand out of China, which could retract over time, but even at a "worse case" scenario Sigma is confident that it could sell its tailings at ~US\$200/t based on in country demand from the ceramics industry. This would add an incremental US\$60m in FCF per year (in the most conservative case) and potentially up to US\$360 million (at US\$1,200/t).

**Phase 2 + 3 coming into focus:** With Phase 1 well advanced, critical work in support of the combined [Phase 2 + 3 expansion](#) is now underway. In February, Sigma commenced detailed engineering and FEL-3 level capex costing (through obtaining firm quotes from suppliers). This work is expected to inform a Definitive Feasibility Study, which is targeting completion in Q2 2023. The board is then expected to make a formal investment decision, which would allow for the ordering of long lead items mid-year.

Phase 2 + 3 development timelines are expected to benefit from the considerable existing infrastructure on site, including the power substation, roads, and offices, as well as the portion of earthworks that was completed in tandem with Phase 1. Management also expects procurement and engineering processes to be expedited given learnings from Phase 1 development. Based on a 12-month construction timeline, Phase 2 + 3 could be operational as early as mid-2024. However, to be conservative, we continue to model first production in 2025, as well as a 20% increase in the upfront capital cost (US\$155m).

**Is Brazil the next big lithium hub?** Our time in Brazil led us to believe that the Vale do Jequitinhonha region is significantly underexplored. And with Sigma currently at the forefront, we believe that over time, this region has the potential to grow and become one of the largest lithium production hubs globally.

Both the Minas Gerais Government and Federal Government have been actively driving progress in the local industry by creating a modern regulatory environment for lithium exploration and production. This has helped create an attractive operating environment for miners in Brazil, inviting increased investment and activity from a number of players. Including Sigma, there are currently more than seven publicly traded lithium exploration companies active in the region (Lithium Ionic, Latin Resources, etc).

**Sigma has only scratched the surface; significant exploration upside still exists:** To date, Sigma has defined a total mineral resource of ~86Mt grading 1.43% Li<sub>2</sub>O. The current production Phases focus on just one part of Sigma's broader land package, with only 4 of the 9 former artisanal mines having been properly explored to date (Figure 11). Beyond these five targets, Sigma's geologists have identified >200 other pegmatites with outcropping spodumene. Of particular interest, is the Sao Jose property to the south where 1.5% Li<sub>2</sub>O samples have been discovered at surface and large spodumene crystals are visible. To date, this area has been essentially unexplored. Approximately 50,000m is planned across Sigma's property in 2023.

**Phase 4 resource expected in the first half of 2023:** As a reminder, in Q4 2022, Sigma delayed the release of an updated mineral resource for the Murial deposit (Phase 4), given significant drilling success that warranted follow-up. Current management expectations are a resource greater than 20Mt (30-50Mt?) and between 1.0%-1.5% Li<sub>2</sub>O, with the potential for Murial to become one of Sigma's largest deposits. We highlight recent results (Figure 12) which intersected high-grade at thicknesses up to 86m and 104m, well above the average width of Sigma's other deposits (~20-30m). The deposit remains open at depth, to the north and to the south. Six drill rigs are currently active on site (Figures 13-14), with an additional 25,000m of drilling planned in 2023.

**Last but not least - the M&A rumour mill keeps on turning:** Friday after market, Bloomberg reported that Tesla is eyeing a potential takeover of Sigma Lithium, sending the shares 16% higher on Monday. In our view, this is not entirely surprising. We've always viewed a takeover by Tesla, or another large-OEM or mining company as an inevitable outcome for the company. This report, also follows on several major announcements over the previous weeks (LAC/GM, LG Chem/PLL, etc.) which we believe underscore the importance of securing lithium in a tight market. In our view, an acquisition of Sigma is highly likely in the next 12 months, and further M&A would be supportive of all lithium equities.

**Figure 1: Commissioning of crushing circuit now complete**



Source: Canaccord Genuity

**Figure 2: Ramping up throughput to ~50%**



Source: Canaccord Genuity

**Figure 3: Metso-Outotec HP400 crusher**



Source: Canaccord Genuity

**Figure 4: Dense Media Separation plant ~80% complete**



Source: Canaccord Genuity

**Figure 5: Bird's-eye view of Dense Media Separation plant construction**



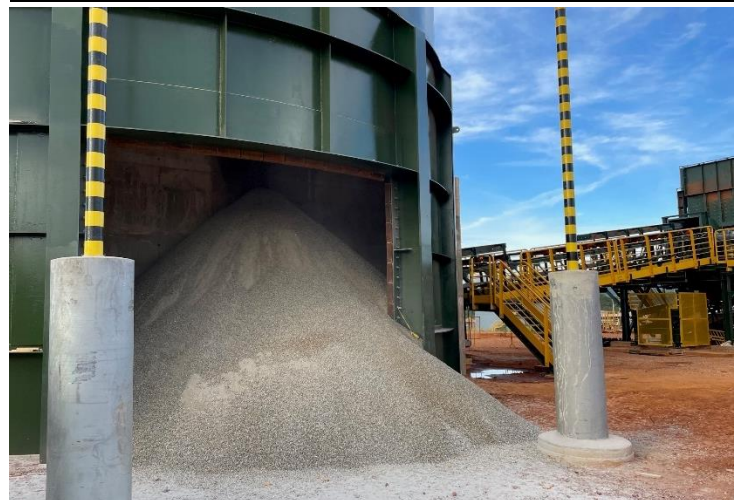
Source: Canaccord Genuity

**Figure 6: Phase 1 north pit and south pit**



Source: Canaccord Genuity

**Figure 7: Crushed material stockpile\***



Source: Canaccord Genuity

\*SGML can fill up the entire cylinder; there is some overflow "escape" that enables the company to stockpile ore for secondary side feeding down the conveyor line after the ore bin

**Figure 8: Weathered ore stockpile from Phase 1**



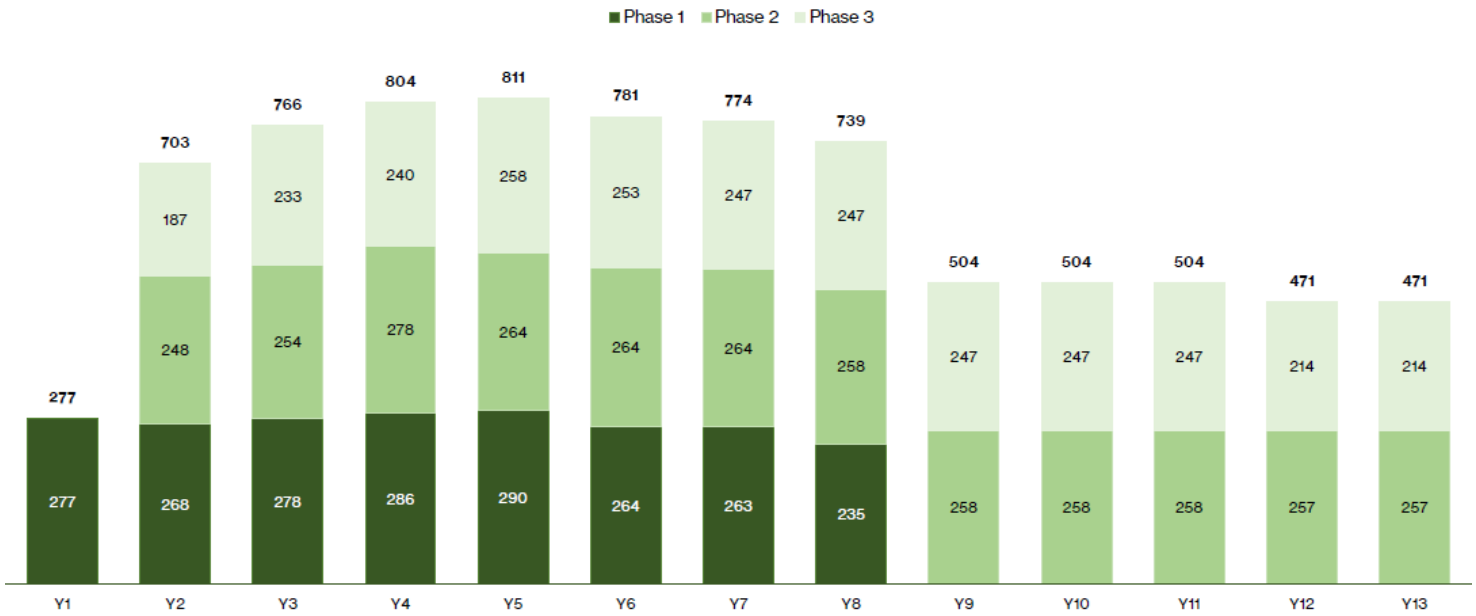
Source: Canaccord Genuity

**Figure 9: Blasted rock showing visible spodumene crystals**



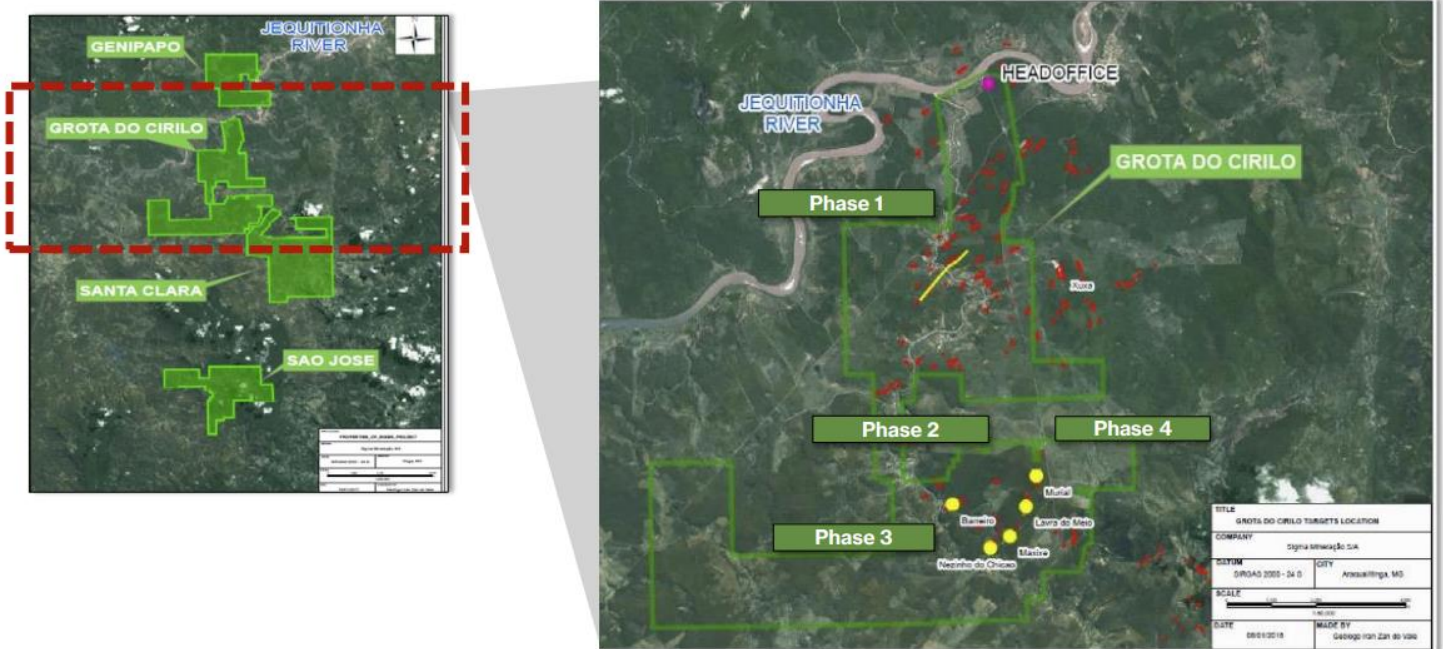
Source: Canaccord Genuity

**Figure 10: Phased production ramp-up at Grota do Cirilo (000s t)**



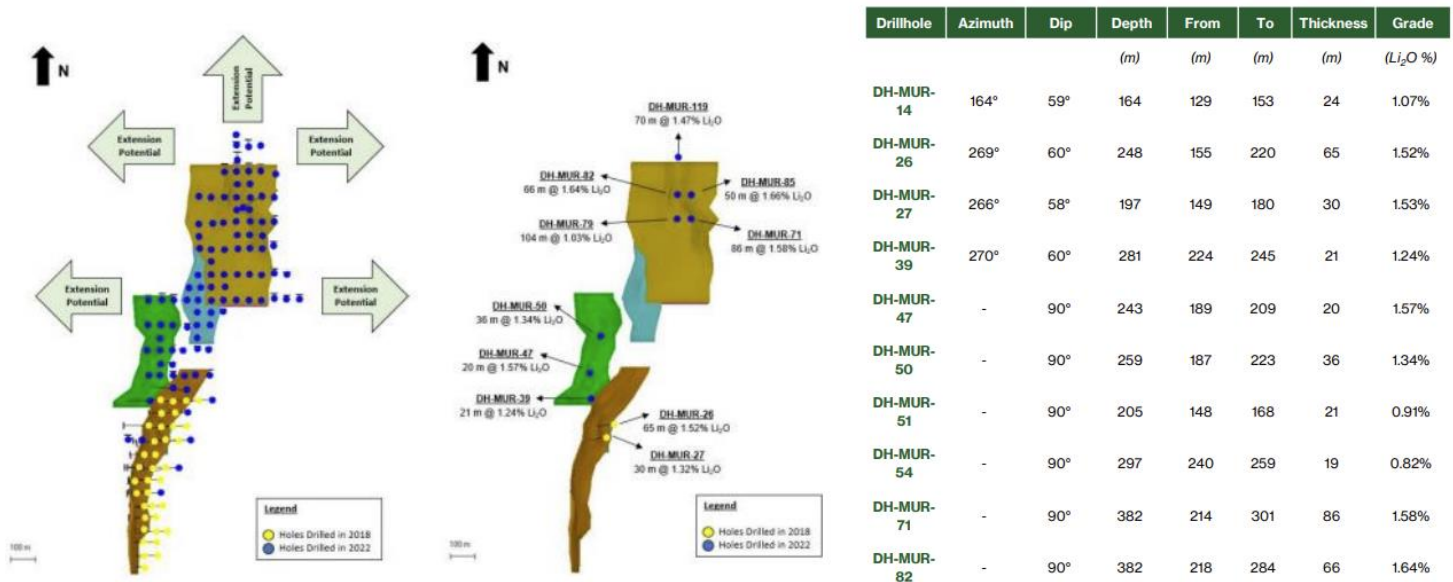
Source: Company reports

**Figure 11: Sigma Lithium property map**



Source: Company reports

**Figure 12: Phase 4 drill program summary and select intercepts**



Source: Company reports

**Figure 13: Operating drill rig at Phase 4**



Source: Canaccord Genuity

**Figure 14: Two of six rigs currently active on site**



Source: Canaccord Genuity

**Figure 15: Lithium price sensitivity analysis – target NAVPS**

CG Price Deck - Px Δ									
	-20%	-15%	-10%	-5%	0%	5%	10%	15%	20%
<b>NAVPS</b>	\$36.80	\$40.67	\$44.53	\$48.39	\$52.25	\$56.12	\$59.98	\$63.84	\$67.71
<b>NAVPS (% Δ)</b>	-30%	-22%	-15%	-7%	0%	7%	15%	22%	30%

Flat Line Price - SC								
	\$1,000	CGe Long Term - \$1,500	\$2,000	\$3,000	\$4,000	\$5,000	Spot Asian Metals - \$6,110	\$7,000
<b>NAVPS</b>	\$19.30	\$41.49	\$63.66	\$107.99	\$152.32	\$196.65	\$245.85	\$285.29
<b>NAVPS (% Δ)</b>	-53%	0%	53%	160%	267%	374%	493%	588%

Source: Canaccord Genuity estimates

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## **Investment Recommendation**

Date and time of first dissemination: February 21, 2023, 19:25 ET

Date and time of production: February 21, 2023, 19:25 ET

## **Target Price / Valuation Methodology:**

Sigma Lithium Corporation - SGML

Our target price is based on an equal weighting of 7.0x five-year forward average EBITDA and 1.0x NAV, measured as at 1 October 2023.

## **Risks to achieving Target Price / Valuation:**

Sigma Lithium Corporation - SGML

### ***Lithium price and market risk***

Our estimates and valuation are extremely sensitive to lithium prices, and we can make no assurances that the future price trajectory of the metal will be in line with our estimates. A weaker-than-expected price could impact the advancement of Sigma's projects and projected cash flows. These factors could materially impact our valuation.

### ***Project risk***

Phase 1 of the Grota do Cirilo Project is well advanced with a Feasibility Study complete and detailed engineering and pre-construction work well underway. However, Phase 2 is still at a Pre-Feasibility Study level. Accordingly, the project is subject to changes in operational parameters, including estimates of initial capital and operating costs that could impact our assessed valuation. To be conservative, we have escalated our capital and operating costs estimates and applied a higher discount rate to our valuation.

### ***Permitting risk***

Our estimates and valuation assume the successful receipt of Phase 1 and Phase 2 permits, including modifications to existing environmental permits where required. However, there is no guarantee that this will be the case or that permits will be received within our assumed timelines.

### ***Financing risk***

As an exploration and development company with no operating cash flow, Sigma is reliant upon the capital markets to remain a going concern. There is no guarantee that Sigma will be able to access capital markets on a go-forward basis as a result of a potential change in market sentiment and/or pricing.

### ***Jurisdictional risk***

Investments in emerging markets such as Brazil pose a greater degree of risk as they are more susceptible to destabilization. As a result, Sigma's operations could be adversely impacted by political and economic instability and/or changes in government policy that could affect the ownership of assets, mining activities, exchange rates, and taxation, among others. Given the heightened jurisdictional risk, we assume an elevated 10.5% discount rate to value Grota do Cirilo vs. the typical 8% used to value operating lithium assets in safe jurisdictions.

Furthermore, we recognize increased requirements, delays in licensing, and other hurdles that have impacted many mining companies in the region as a result of recent tailings dam failures in Brazil.

### ***Foreign exchange risk***

Sigma's projects are located in Brazil, with the majority of costs expected to be denominated in Brazilian Reals (~70% of operating costs). Given that lithium contracts are routinely denominated in US dollars, and SGMA reports in Canadian dollars, the exchange rate could have a significant impact on SGMA's financial performance.

**Distribution of Ratings:**

**Global Stock Ratings (as of 02/21/23)**

Rating	Coverage Universe		IB Clients
	#	%	%
Buy	602	63.91%	23.59%
Hold	168	17.83%	12.50%
Sell	16	1.70%	6.25%
Speculative Buy	146	15.50%	39.73%
	942*	100.0%	

\*Total includes stocks that are Under Review

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**BUY:** The stock is expected to generate risk-adjusted returns of over 10% during the next 12 months.

**HOLD:** The stock is expected to generate risk-adjusted returns of 0-10% during the next 12 months.

**SELL:** The stock is expected to generate negative risk-adjusted returns during the next 12 months.

**NOT RATED:** Canaccord Genuity does not provide research coverage of the relevant issuer.

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**12-Month Recommendation History (as of date same as the Global Stock Ratings table)**

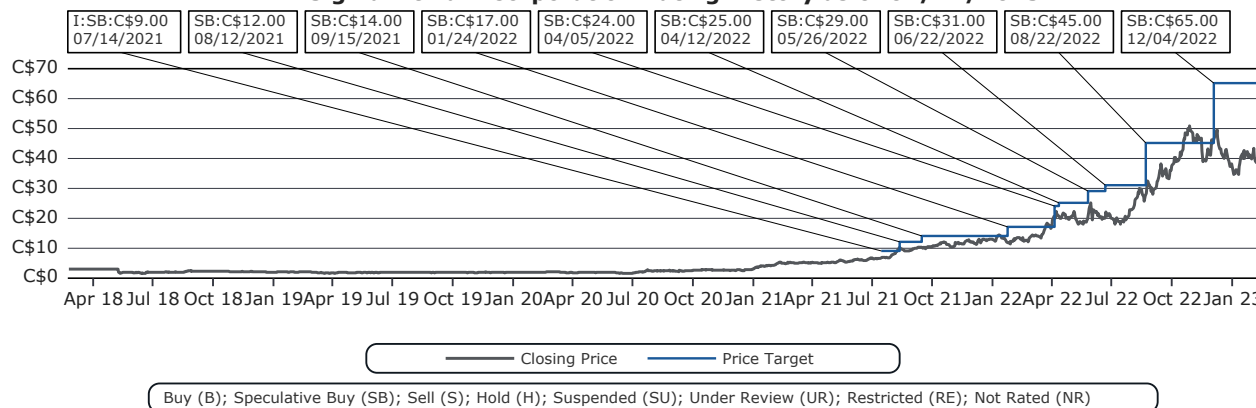
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**Sigma Lithium Corporation Rating History as of 02/17/2023**



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