

# Frontier Lithium

## //Lithium



STORMCROW

## Initiating Coverage

**Very Profitable High-Grade Spodumene for Low-Tech Applications**

Apr 17, 2018 TSXV-FL

Target Positive  
\$0.95

- Batteries Rule, but Glass Pays: Most junior lithium producers are focusing on making battery chemicals. While we think there is a place for this, done right, we like companies that can make money the old-fashioned way, by selling spodumene concentrate to glass/ceramics makers, the way that Talison used to. Frontier plans to start by doing just this.
- Great Deposit: Frontier's PAK deposit has both high grade spodumene and low iron levels. This is the correct recipe for glass and ceramic making.
- Great Development Team: To successfully develop any deposit, you need good management. The best proof of good management is demonstrated expertise in what is needed. The Walker family's contracting company, Consbec, is among the very best drill and blast contractors in all of North America.
- The Right Market: Batteries are getting all the attention, but lithium is needed for specialty glass/ceramics that can withstand thermal shock. As battery manufacturers take all the spodumene they can get, glass makers are paying up for low-iron technical-grade spodumene concentrate. The business of selling this grade of concentrate can be very lucrative, without the risk of trying to reliably produce highly purified chemicals.
- POSITIVE Recommendation: We are initiating coverage on Frontier Lithium with a POSITIVE recommendation, and a \$0.95 price target.

**Jon Hykawy, PhD**  
President  
[jon@stormcrow.ca](mailto:jon@stormcrow.ca)

**Tom Chudnovsky**  
Managing Partner  
[tom@stormcrow.ca](mailto:tom@stormcrow.ca)

	New	Old
Recommendation	Positive	NA
Target	C\$0.95	NA

Recent Px:	C\$0.51
Shares O/S:	150.9M
Shares O/S FD	154.8M
Market Cap	C\$77M
Net Cash	~C\$600k



See the end of report for important disclosures



### Summary

There is no shortage of 1%  $\text{Li}_2\text{O}$  spodumene in this world. By this, we don't mean that all of these types of projects will remain unbuilt, in fact several of them have been, and are being, built right now. With sufficient demand in the market today, we need these projects. They are higher cost producers, but they will maintain their status in the market through their speed in gaining market share. Clearly, though, there is one mine that stands above all others in hard-rock lithium, and that is the Greenbushes Mine in Australia, operated by Talison on behalf of its present owners, Chengdu Tianqi Lithium and Albemarle.

So, if the Greenbushes Mine is such a fantastic thing, with a huge reserve and initial grades from its richest volumes of nearly 4% (meaning roughly 50% *in situ* spodumene) and very little lithium mica or iron to contaminate the concentrates, surely there must be other similar deposits out there. Unfortunately, the search for a Greenbushes clone hasn't been successful. As mentioned above, 1% spodumene deposits are fairly common, and 1.5% spodumene is considered anomalously rich.

Worse, where Greenbushes had portions of the mine that could produce spodumene containing very low iron, most of these other prospective spodumene mines contain fairly uniform and high levels of iron. What built Greenbushes, in an era when lithium batteries were not the dominant topic that they are today, was its ability to supply the glass and ceramics industry with low-iron spodumene concentrate.

Take a standard sheet of glass and lay it on a table. Now take a hot cast-iron skillet off a gas stove and put it on the sheet of glass. Almost certainly, that sheet of conventional glass will shatter. This happens because the glass under the hot skillet tries to rapidly expand with the heat, but the glass just outside the area covered by the skillet isn't trying to expand at all. The internal stress caused by the expansion of the glass under the skillet breaks the brittle, conventional glass. Yet we want stylish cooktops in our homes, and we cover them with sheets of glass that won't break if shocked by a source of heat.

Instead of a glass, which is really a solid jumble mostly made up of molecules of silicon dioxide,  $\text{SiO}_2$ , the glass manufacturers, led by groups like Corning, developed ceramics. These ceramics are crystals, orderly arrangement of atoms or molecules. Even in these types of crystals, if we only used  $\text{SiO}_2$ , the glass would break if suddenly exposed to heat. The molecules of  $\text{SiO}_2$ , when heated, want to move away from one another, making the ceramic expand. But these glassmakers tried something different. They added lithium oxide,  $\text{Li}_2\text{O}$ , to the mix.  $\text{Li}_2\text{O}$  has a rare property; when heated in a crystal form, the atoms of  $\text{Li}_2\text{O}$  move closer to one another, and the crystal contracts. By adding just enough lithium to the silicon when making these ceramics, the result is a material that doesn't overly expand and shatter, even if suddenly exposed to high temperatures.

This ceramic is what covers the cooktops in many homes. This ceramic even has similar transparency to glass, making it look clean and modern. But one drawback is that both the



silicon dioxide and lithium oxide used to make this “glass” contain iron, likely in the form of iron oxide. Add enough iron oxide to glass, and it will take on a greenish hue. This is not something that anyone desires in the glass used in windows, and it isn’t desirable for cooktop glass, either.

Glassmakers are left with the choice to either buy a little bit of expensive spodumene to mix with a lot of reasonably-priced, low-iron silicon, or they can choose to buy a lot of expensive, iron-free silicon and mix it with a small amount of cheap, high-iron spodumene. Guess what option they choose?

Greenbushes, for a very long time, was the global, go-to choice for low-iron spodumene concentrate (containing less than 0.15%  $\text{Fe}_2\text{O}_3$ ) for the glass and ceramic industry, referred to, perhaps somewhat confusingly, as “technical” grade. However, around 2012 when Talison was acquired by Tianqi Lithium, the demand for lithium carbonate and hydroxide was really starting to speed up. Tianqi made the production of chemical-grade spodumene concentrate a priority for Greenbushes, and the supply of technical-grade spodumene concentrate started to tighten dramatically. It’s important to note that glassmakers are free to use pure lithium chemicals as a source for their lithium atoms. The problem isn’t one of basic supply, at its core, the problem is cost. Using chemicals has always been a lot more expensive than buying a low-iron spodumene concentrate.

Enter Frontier Lithium. Their PAK project in northern Ontario has average grades that are very much above the global 1% rate, and with sizeable volumes of material that is above 3% levels. Their spodumene is also very low in iron, so it is possible to create very high-grade technical concentrates. Of necessity, they will also produce a small volume of chemical-grade concentrate, as well. With a reasonable mine life of 16 years, producing an average 70,000 tpa 7.2%  $\text{Li}_2\text{O}$  technical-grade concentrate, and an average 7,000 tpa 6.6%  $\text{Li}_2\text{O}$  chemical grade concentrate, there is also still room for reserve expansion through further exploration, as the deposit remains largely open in all directions.

We like what Frontier can bring to the lithium industry, a source of needed technical-grade spodumene concentrate that can make Frontier a very profitable supplier of hard-rock lithium to glassmakers. We are initiating coverage on Frontier with a POSITIVE recommendation and a \$0.95 price target.

### **PAK – The Next Source for Technical-Grade Spodumene Concentrates**

Having grown up in Winnipeg, forgive the author for a moment as we scoff after being told that PAK is located “way up north”. Yes, it is cold at the latitude where PAK is situated, but no, it is not too far north to mine. Clearly, the 13,000 residents of Thompson, Manitoba that are living significantly further north manage to survive and thrive, and Thompson is a larger community than will ever be working at PAK.



**Exhibit 1 – PAK Location**



Source: Frontier Lithium

Of course, there are infrastructure issues associated with PAK. Roads will need to be upgraded and bridges installed. Initially, energy for the mine will be produced using diesel generators, but there is a hydroelectric dam some 30 km north of the deposit that could play a role in future. The Federal government has also committed to spending \$1.6 billion, through Watay Power, to significantly expand the reach of Ontario’s power grid in the north. Thus, there is sufficient access to energy, now and in the future, to make this mine workable, and the amount of product being produced allows it to be profitably shipped.

PAK, as we have described above, is endowed with a lithium reserve that is substantially better than the global average.



**Exhibit 2 – PAK 2018 Reserve (using 0.4% Li<sub>2</sub>O cut-off grade)**

Category	Commodity	Zone	Ore (t)	Li <sub>2</sub> O (%)	Ta <sub>2</sub> O <sub>5</sub> (ppm)	CsO (%)	Rb <sub>2</sub> O (%)	Contained Li <sub>2</sub> O (t)
Measured	Li	Upper Intermediate	324,720	3.95	60	0.03	0.12	12,830
	Li	Lower Intermediate	920,330	1.72	104	0.03	0.29	15,848
	Li	Total Lithium	1,245,050	2.30	93	0.03	0.24	28,678
	<b>Li/Ta/Rb</b>	<b>Bulk Pegmatite</b>	<b>1,245,050</b>	<b>2.30</b>	<b>93</b>	<b>0.03</b>	<b>0.24</b>	<b>28,678</b>
Indicated	Li	Upper Intermediate	333,200	3.23	70	0.04	0.20	10,776
	Li	Lower Intermediate	5,909,500	1.89	102	0.04	0.31	111,690
	Li	Total Lithium	6,242,700	1.96	100	0.04	0.30	122,465
	Ta/Rb	Central Intermediate	1,011,300	0.80	117	0.08	0.58	n/a
	<b>Li/Ta/Rb</b>	<b>Bulk Pegmatite</b>	<b>7,254,000</b>	<b>1.69</b>	<b>102</b>	<b>0.04</b>	<b>0.34</b>	<b>122,465</b>
Inferred	Li	Upper Intermediate	13,000	3.56	44	0.03	0.12	463
	Li	Lower Intermediate	1,819,000	2.09	95	0.02	0.29	37,982
	Li	Total Lithium	1,832,000	2.10	95	0.02	0.28	38,439
	Ta/Rb	Central Intermediate	85,000	1.16	151	0.08	0.49	n/a
	<b>Li/Ta/Rb</b>	<b>Bulk Pegmatite</b>	<b>1,917,000</b>	<b>2.01</b>	<b>97</b>	<b>0.02</b>	<b>0.29</b>	<b>38,439</b>
<b>Total</b>		<b>Bulk Pegmatite</b>	<b>10,416,050</b>	<b>1.82</b>	<b>100</b>	<b>0.04</b>	<b>0.32</b>	<b>189,582</b>

Source: Frontier Lithium

More than just pure grade, metallurgical testing to date has shown very low iron content. What little iron that appeared in early testing was eventually identified as tramp iron, or iron from the steel used during the crushing, milling and grinding done to prepare the raw ore for processing into concentrate. Removal of such iron is simple, either ensuring it is not introduced in the first place and/or magnetic extraction.

Spodumene crystal sizes are sufficiently large enough here that the concentrate produced can be quite high grade compared to global standards. Frontier management is anticipating the sale of a limited quantity of 6.6% Li<sub>2</sub>O chemical-grade concentrate and a 7.2% Li<sub>2</sub>O technical-grade material, compared to a typical 6% chemical-grade and 6.5% technical-grade.

It is also worth noting that the remaining material in the technical-grade concentrate is a clean quartz, the best source for silicon dioxide in glass and ceramic making. Frontier is investigating the potential to be paid for this material, as well, since the alternative for the glassmaker is to have to find a source for additional iron-free quartz.

Although these high-grade concentrates will provide higher selling prices per tonne, the industry has shown it is only willing to pay *pro rata* rates for lithium content. That is, the price of a hypothetical 6% concentrate containing 20% more lithium will be 20% higher than the price for a hypothetical 5% concentrate. Frontier will earn more per tonne, but sell fewer high-grade tonnes. However, having higher lithium content does reduce shipping costs per tonne of Li<sub>2</sub>O, and while that is not a large concern at present prices, every little bit helps.



### **Management – Frontier Knows How to Explore and Mine**

Frontier Lithium is managed by Trevor Walker, a member of the Walker family that has taken the lead in developing PAK. The family, combined, is presently the largest shareholder, controlling approximately 20% of Frontier Lithium. Ordinarily we are, generally, not fans of what might be termed “family” businesses. The exception would have to be in cases where the family has a demonstrated expertise in what they do. And in this case, the Walkers do have such expertise.

The Walker family are owners of Consbec Inc., North America’s largest surface drilling and blasting contractors. Consbec is the only private firm in Canada that manufactures and transports its own explosives, which should suggest something about its scale. The firm was started in 1981, and has successfully been involved in the mining business with experience spanning precious metals to industrial minerals.

From this base, which has allowed for extremely cost-effective exploration and development to date, the company is now assembling a team of knowledgeable and talented individuals from within the hard-rock lithium industry to carry the company through its DFS and beyond.

#### **Trevor Walker – President and CEO**

Mr. Walker joined Frontier Lithium in 2010, and since then he has played the leading role in focusing the company on its PAK Lithium deposit in Northwestern Ontario. Under his leadership, the company has now advanced through PEA/PFS stage, and has built relationships with some of the world’s leading glass and ceramic makers. Prior to joining Frontier, Mr. Walker was Vice President of the Consbec Group of Companies, acquiring 10 years of experience in the mining and construction industries. During his tenure at Consbec, he worked closely with companies such as GoldCorp, Rio Tinto, Westdome, Barrick, Noranda, Agrium and Unimin, as well as many others. He holds an honours BA from the University of Western Ontario, and an MBA from Webster University in Geneva, Switzerland.

#### **Garth Drever – VP Exploration**

Mr. Drever is a geologist with over 35 years of mineral exploration experience, primarily with Cameco Corporation. He specializes in innovative technologies for detecting ore bodies and has worked on many uranium deposits worldwide. Mr. Drever’s past experience as an exploration geologist has included positions as Senior Geologist, District Geologist for Cameco Corporation. He began his career with the Geological Survey of Saskatchewan, managing geochemical and geophysical programs exploring for uranium in Northern Saskatchewan. From 2001 to 2007, he played a key role in the development of Cameco’s global exploration portfolio, with engagements in the USA, Australia, Africa, Asia, and Europe. More recently, Mr. Drever worked as exploration manager for Uravan Minerals, and as VP of Raven Minerals Corp., a private uranium exploration company. He holds a B.Sc. in geology from the University of Regina, and is a member of both the Association of



Professional Engineers and Geoscientists of Saskatchewan and the Association of Professional Geoscientists of Ontario.

**Michael Tamlin - Director**

Mr. Tamlin has more than 25 years of commercial and technical experience in mining, milling and hydrometallurgy, with significant expertise in lithium and tantalum concentrates and chemicals. His lithium experience covers the development of the Chinese chemical and global technical spodumene markets for the Greenbushes Mine in Western Australia (which currently produces the majority of lithium mineral concentrates, globally), the Zhangjiagang Lithium Carbonate Project and the Rincon Brine Project. Mr. Tamlin is currently the Chief Operating Officer of Neometals, an ASX-listed company which is producing spodumene concentrate from its Mt. Marion Lithium Mine in Western Australia and is studying the feasibility of constructing a lithium hydroxide plant. He brings to Frontier extensive experience in the development of both hard rock and brine lithium projects, lithium supply negotiations, lithium markets and management at the executive level with significant lithium producers.

**Peter Vanstone – Advisor**

Mr. Vanstone has highly specialized experience in rare metals, with over 30 years of lithium, tantalum, and cesium exploration and mine production in the Canadian Shield. He is the former Chief Geologist for the Tantalum Mining Corporation of Canada (Tanco). The Tanco Mine is located in southeastern Manitoba and was a lithium mineral concentrate producer from 1986 until operations were suspended in 2009. Tanco was also a tantalum mineral concentrate producer until March of 2013, and continues to produce cesium formate products for sale internationally.

**Gordon MacKay – Advisor**

Mr. MacKay is overseeing the development, facilitation and coordination of regulatory approvals, establishing closure plans and supporting ongoing engagement with neighbouring communities for Frontier. He has over 30 years of experience working in all aspects of mineral exploration and development, from exploration technology research to mine closure and reclamation. Most recently, from 2013 to 2018, Mr. MacKay acted as the Director of Mineral Development and Lands Branch in Ontario where he led all aspects of mineral exploration and mine regulation, including the implementation of a permitting regime for mineral exploration in Ontario. He restructured how Ontario reviews mine closure plans, bringing an increased level of technical expertise and credibility to the process. Mr. MacKay believes in building projects that respect and protect the environment and to working with Indigenous Peoples to ensure their full support and partnership in any projects within their traditional territories.



Economics – Why PAK Will Prevail

Stormcrow has assembled our projections for the value of spodumene concentrates through 2028. While we have long held that lithium chemical prices will retreat, the degree of retreat in spodumene concentrates is liable to be much less. In the past, we have observed a shift in the allocation of profits within the supply chain when a commodity faces a shortage.

The example of rare earths from 2010 is informative. In 2009, rare earth prices were low, even though demand was booming. Profits were largely made by the companies at the refining and application positions in the supply chain. When China clamped down on export quotas, the prices of rare earths in the market skyrocketed, some by 100x. These prices could not be sustained, and demand fell. The price of rare earths fell with demand, but most stayed well above their lows of 2009. However, the fraction of their final value that rare earth miners were able to charge the refiners increased over the period, and has not declined. Similarly, while steel companies may have a tough time, the iron ore miners have continued to make money, all through the period of boom and bust.

Our projections of concentrate prices in the market are:

Exhibit 3 – Future Spodumene Concentrate Prices, Frontier Grades (US\$/tonne)

	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
6.6% Chemical	\$ 1,181	\$ 891	\$ 732	\$ 656	\$ 685	\$ 740	\$ 965	\$ 1,004	\$ 987	\$ 1,008
7.2% Technical	\$ 2,250	\$ 1,365	\$ 1,423	\$ 1,137	\$ 1,225	\$ 1,385	\$ 1,780	\$ 1,509	\$ 1,414	\$ 1,443

Source: Stormcrow (2018)

The increase in prices is partly due to the impact of this transfer of profitability to the commodity producer, and partly the function of a more robust market, with more buyers clamoring for supply simply raising the potential for multiple bids on available product.

If we use the annual shipped tonnage from Frontier, as outlined in their recent PFS, along with their costs of production but our price deck (with longer-term prices reverting to either the prices used by Frontier or our 2028 price, whichever is lower) then we are able to calculate a value for Frontier. We base this NPV on a 12% discount rate, which we believe is appropriate as the deposit is strong, there is essentially zero technical risk in producing a mineral concentrate from a properly developed mineral deposit, and PAK has been properly developed, to date.

If at some point in the future Frontier were to choose to attempt to manufacture lithium chemicals, then its value would obviously increase, but at present the company has not announced such plans. However, the company is working with XPS Consulting and Testwork, a Glencore company, to establish proof-of-concept for the production of lithium carbonate from PAK concentrates.



**Exhibit 4 – PAK Valuation (all values C\$ unless noted)**

Year	2018	2019	2020	2021	2022	2023	2024	2025	2030	2036
Cap-Ex and Sustaining	\$ 73,880,626	\$ 73,399,641	\$ 12,614,477	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 7,710,657	\$ -
Technical (t)				84,746	77,876	72,172	68,705	70,717	65,268	69,258
Mkt Price (C\$)				\$ 1,423	\$ 1,137	\$ 1,225	\$ 1,385	\$ 1,780	\$ 1,443	\$ 1,443
Revenue				\$ 120,626,896	\$ 88,541,240	\$ 88,417,021	\$ 95,144,925	\$ 125,899,366	\$ 94,181,764	\$ 99,939,213
Chemical (t)				6,028	6,379	6,741	6,946	7,060	6,658	7,358
Mkt Price (C\$)				\$ 732	\$ 656	\$ 685	\$ 740	\$ 965	\$ 938	\$ 938
Revenue				\$ 4,409,334	\$ 4,183,634	\$ 4,615,622	\$ 5,138,183	\$ 6,814,871	\$ 6,245,296	\$ 6,901,660
Total Revenue				\$ 125,036,230	\$ 92,724,874	\$ 93,032,643	\$ 100,283,108	\$ 132,714,237	\$ 100,427,060	\$ 106,840,873
NSR/Royalty				\$ 1,875,543	\$ 1,390,873	\$ 1,395,490	\$ 1,504,247	\$ 1,990,714	\$ 1,506,406	\$ 1,602,613
Open Pit Mine Costs										
Ore				\$ 1,274,041	\$ 1,348,209	\$ 1,424,698	\$ 1,468,078	\$ 1,492,253	\$ 1,407,262	
Waste				\$ 8,064,557	\$ 8,058,916	\$ 8,248,763	\$ 9,020,107	\$ 8,485,729	\$ 1,878,681	
Underground Mine Cost										
Ore Mining										\$ 15,814,043
OH & Indirects										\$ 5,155,004
Ore Haulage										\$ 4,210,789
Back Filling										\$ 6,381,805
Drawpoints										
Ore Development										
Processing				\$ 5,538,125	\$ 5,860,527	\$ 6,193,016	\$ 6,381,586	\$ 6,486,671	\$ 6,117,222	\$ 6,760,125
Tailings				\$ 319,134	\$ 355,597	\$ 391,109	\$ 411,601	\$ 417,046	\$ 395,446	\$ 441,354
General & Administration	\$ 1,833,125	\$ 1,833,125	\$ 1,833,125	\$ 1,985,953	\$ 1,985,953	\$ 1,985,953	\$ 1,985,953	\$ 1,985,953	\$ 1,985,953	\$ 1,823,969
Dewatering (Open Pit & Ug)				\$ 329,016	\$ 329,016	\$ 329,016	\$ 329,016	\$ 329,016	\$ 329,016	\$ 329,016
Compressed air				\$ 136,940	\$ 136,940	\$ 136,940	\$ 136,940	\$ 136,940	\$ 136,940	\$ 273,880
Fuel (Gen set)				\$ 4,287,371	\$ 4,287,371	\$ 4,287,371	\$ 4,287,371	\$ 4,301,367	\$ 4,301,367	\$ 2,861,028
Propane				\$ 634,000	\$ 634,000	\$ 634,000	\$ 634,000	\$ 634,000	\$ 634,000	\$ 570,560
Internet/Communication				\$ 199,620	\$ 199,620	\$ 199,620	\$ 199,620	\$ 199,620	\$ 199,620	\$ 199,620
Camp Catering (100 Staff)				\$ 1,256,250	\$ 1,256,250	\$ 1,256,250	\$ 1,256,250	\$ 1,256,250	\$ 1,256,250	\$ 1,005,000
Concentrate Haul- 745 km (Stage 1 & 2)				\$ 9,193,597	\$ 8,533,338	\$ 7,992,289	\$ 7,661,932	\$ 7,877,231	\$ 7,284,678	\$ 7,759,647
Water Treatment				\$ 2,483,000	\$ 2,483,000	\$ 2,483,000	\$ 2,483,000	\$ 2,483,000	\$ 2,483,000	\$ 2,483,000
Concentrate Storage				\$ 840,247	\$ 840,247	\$ 840,247	\$ 840,247	\$ 840,247	\$ 840,247	\$ 840,247
Total Op Cost	\$ 1,833,125	\$ 1,833,125	\$ 1,833,125	\$ 38,417,394	\$ 37,699,857	\$ 37,797,762	\$ 38,599,948	\$ 38,916,036	\$ 30,756,086	\$ 58,204,351
EBITDA	\$ (1,833,125)	\$ (75,713,752)	\$ (75,232,767)	\$ 74,004,359	\$ 55,025,017	\$ 55,234,881	\$ 61,683,161	\$ 93,798,201	\$ 61,960,317	\$ 48,636,522
Taxes										
Federal					\$ 8,253,753	\$ 8,285,232	\$ 9,252,474	\$ 14,069,730	\$ 9,294,048	\$ 7,295,478
Provincial					\$ 5,502,502	\$ 5,523,488	\$ 6,168,316	\$ 9,379,820	\$ 6,196,032	\$ 4,863,652
Mining					\$ -	\$ -	\$ 3,084,158	\$ 4,689,910	\$ 3,098,016	\$ 2,431,826
After-Tax	\$ (1,833,125)	\$ (75,713,752)	\$ (75,232,767)	\$ 74,004,359	\$ 41,268,763	\$ 41,426,161	\$ 43,178,212	\$ 65,658,741	\$ 43,372,222	\$ 34,045,566
Discount Factor	12%									
DCF	\$ (1,833,125)	\$ (67,601,564)	\$ (59,975,101)	\$ 52,674,841	\$ 26,227,045	\$ 23,506,316	\$ 21,875,426	\$ 29,700,680	\$ 11,132,569	\$ 4,427,271
NPV	\$ 138,858,847									
Cash	\$ 1,058,000									
Debt	\$ 471,000									
Options/Warrants	\$ 3,950,101									
Shares Out	150,917,415									
Target	\$ 0.95									

Source: Stormcrow (2018)

Based on projected production levels commencing in 2021 and our own spodumene concentrate price deck, and using a 12% discount rate, we are establishing a target price on Frontier of \$0.95 per share. Our target does NOT anticipate rising lithium prices, but does anticipate that both lithium chemical and concentrate prices will remain well above historical levels, when lithium concentrates sold for perhaps \$400 a tonne, and lithium chemicals for \$4,000 a tonne.

**Conclusions – PAK is Our Pick**

We like what we see with respect to Frontier and the PAK deposit. Based on nearly 190,000 tonnes of contained Li<sub>2</sub>O in the present resource, at a good high grade of 1.82%, and the potential for increases with more drilling, PAK looks good on a global scale. That the spodumene within PAK also contains very little iron opens up the potential of selling a higher-value technical-grade concentrate to the glass and ceramic makers, which holds out the hope of building a very profitable business with very little risk.

We also like the management and development team that Frontier has in place. The involvement of Trevor Walker and the depth of knowledge of the Walker family in developing deposits and building mines is extremely welcome. The development of PAK has been done in a highly cost-effective and professional manner to date, and we hope this continues.

Our analysis suggests, as in many other mineral areas where demand has accelerated, that the price of mineral concentrates will rise as demand for lithium continues to increase. More, we believe that technical-grade concentrates will gain in price even faster than chemical-grade concentrates, given the demand for chemicals and the resulting lack of technical-grade material. That makes Frontier's approach to the business, selling technical-grade spodumene concentrates, a good one. Based on our forward-looking price analysis on concentrates, and a 12% discount rate that we believe fairly values the lack of ongoing technical risk and manageable financial risk, we are initiating coverage on Frontier Lithium with a POSITIVE recommendation and a \$0.95 target price.



**Keywords**

<b>Industry</b>	Lithium, Batteries, Critical Materials, Mining, Industrial Minerals,	
<b>Relevant Companies</b>	Lithium Americas – TSX:LAC	Bacanora Minerals – TSXV:BCN
	Orocobre Limited – TSX:ORL, ASX:ORE	Galaxy Resources – ASX:GXY
	Tesla Motors – NSDQ:TSLA	Sociedad Quimica y Minera de Chile (SQM) – NYSE:SQM
	Sichuan Tianqi Lithium – SHE:002466	Albemarle Corporation --- NYSE:ALB
	Western Lithium – TSX:WLC	FMC Corp – NYSE:FMC
	Jiangxi Gangfeng Lithium: SHE:00 2460	Altura Mining – TSXV:AJM
	Nemaska Lithium Inc. – TSXV:NMX	Cobre Montana – ASX:CXB
	Critical Elements Corp. -- TSXV:CRE	Pilbara Minerals – ASX:PLS
	Neometals Ltd. – ASX:NMT	
<b>Why do we use keywords?</b>	<i>We feel people who could stand to benefit from the contents of this report, are not solely ones who already follow the specific company or sector discussed herein. As such, we hope to provide this free service to as wide an audience as possible—and keywords help to this end.</i>	

**Important Disclosures**

- Stormcrow Capital Ltd. (“Stormcrow”) is an Exempt Market Dealer registered with the Ontario Securities Commission. Stormcrow has both issuer and investor clients. Stormcrow is also a financial and technical/scientific consultant that provides certain of its clients with some or all of the following services: (i) an assessment of the client’s industry, business plans and operations, market positioning, economic situation and prospects; (ii) certain technical and scientific commentary, analysis and advice that is within the expertise of Stormcrow’s staff; (iii) advice regarding optimization strategies for the client’s business and capital structure; (iv) due diligence investigation services; and (v) opinions regarding the future expected value of the client’s or a offeror/offeree’s equity securities so as to allow the client to then make capital market, capital budgeting and capital structure plans. With the consent of Stormcrow’s issuer client, the client and/or its industry sector may be the subject of an investment or financial research report, newsletter, bulletin or other publication by Stormcrow where such publication is made publicly available at [www.stormcrow.ca](http://www.stormcrow.ca) or elsewhere or is otherwise distributed by Stormcrow. Any such publication is limited to generic, non-tailored advice or opinions and should not be construed as investment advice that is suitable for the reader or recipient. Stormcrow does not offer personalized or tailored investment advice to anyone (other than its current investor clients) and Stormcrow’s research reports should not be relied upon by anyone in making any investment decisions. Rather, investors should speak in person with their personal financial advisor(s) to obtain suitable investment advice.
- The company that is the subject of this report is currently a client of Stormcrow.



3. Stormcrow and/or some of Stormcrow's officers, directors, or significant shareholders own, directly or indirectly, shares in the company that is the subject of this report. As at the date of this report, Stormcrow and its officers, directors, and significant shareholders beneficially hold an aggregate of less than 1% of the outstanding equity shares of the company that is the subject of this report. The research analyst(s) and/or associates who prepared this report (or their household members) do not currently beneficially hold an equity position in the company that is the subject of this report.
4. Although it is a policy of Stormcrow that Stormcrow and its employees are to refrain from trading in a manner that is contrary to, or inconsistent with, Stormcrow's most recent published investment recommendations or ratings, Stormcrow does permit itself and its employees to sell shares in circumstances where working capital and cash flow requirements require the sale of securities that would otherwise continue to be held. Any shares currently held by Stormcrow and/or some of Stormcrow's officers, directors, or significant shareholders in the company that is the subject of this report are held for investment purposes and may be sold (or additional shares acquired) in the future depending upon market conditions or other relevant factors.
5. Stormcrow has, within the previous 12 months, provided paid investment banking or consultant services or has acted as an underwriter to the company that is the subject of this report.
6. Stormcrow expects that it may provide, within the next 12 months, paid investment banking or consulting services, or that Stormcrow may act as an underwriter to the company that is the subject of this report.
7. Stormcrow intends to provide regular market updates on the affairs of the company that is the subject of this report (at Stormcrow's discretion) and make these updates publicly available at [www.stormcrow.ca](http://www.stormcrow.ca). Readers who wish to receive notice when such updates become available, should email to [info@stormcrow.ca](mailto:info@stormcrow.ca) with the subject heading "Get Update Notifications".
8. All information used in the publication of this report has been compiled from publicly available sources that Stormcrow believes to be reliable. Stormcrow does not guarantee the accuracy or completeness of the information found in this report and Stormcrow may not have undertaken any independent investigation to confirm or verify such information. Opinions contained in this report represent the true opinion of Stormcrow and the author(s) at the time of publication.
9. The securities described in this research report may not be eligible for sale in all jurisdictions or to certain categories of investors. This report and the content herein should not be construed by anyone as a solicitation to effect, or attempt to effect, any transaction in a security. This document was prepared and was made available for information purposes only and should not be construed as an offer or solicitation for investment in any securities mentioned herein. The securities referred to herein should be considered speculative in nature and should be considered to involve a high amount of financial risk where investors may lose all of their investment.
10. Forward-looking information or statements in this report contain information that is based on assumptions, forecasts of future results, estimates of amounts not yet determinable,



and therefore involve known and unknown risks, uncertainties and other factors which may cause the actual results, performance or achievements of their subject matter to be materially different from current expectations. No representation is being made that any investment or security will or is likely to achieve the return or performance estimated herein. There can be sharp differences between expected performance results and the actual results.

**Dissemination of Research**

This report is intended solely for the use of persons in jurisdictions where Stormcrow is registered or where the dissemination of this report does not require registration. Stormcrow is not registered as a securities broker-dealer (or an equivalent thereof) in the United States, United Kingdom or any other jurisdiction other than noted above. Stormcrow is not subject to U.S. or U.K. rules with regard to the preparation of research reports and the independence of analysts. This report does not constitute an offer to sell or a solicitation to buy any of the securities discussed herein.

**Investment Rating Criteria**

We do not provide an investment rating, beyond indicating whether the target price exceeds current trading ranges by a reasonable range, indicated as “Positive”, or whether the target price is either below or roughly equivalent to the current trading range, indicated as “Negative”. Each investor generally has an individual target return in mind, we leave it to the individual investor and his/her/its financial advisor to determine how our target and the current price and investment risks would fit within their portfolio.