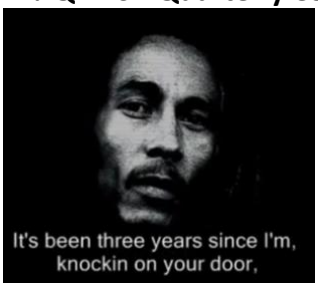
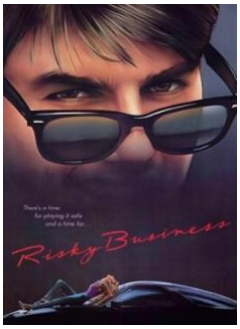
August 5, 2019, Lithium-ion Bull, Issue 50:
Wait in Vain? Q2 ASX Quarterly Confessions



Jamaica me Crazy, #Lithium

Inspired in part by a short Vacay in Montego Bay, today's issue of Lithium-ion Bull is the first written collaboration with my **Lithium-ion Rocks!** podcast co-host Rodney Hooper. And forms the basis for our launch shortly of **Season 2 Episode 1:**



Risky Business

We present below the July 2019 Mr. Market scoreboard and Rodney's dive into the ASX Quarterly Activity confessionals from 5 spodumene producers. Some observations as well for what we've learned, got right, got wrong the past year and takeaways looking at 2020.

BUT FIRST, EXCITING NEWS!

All fans of **Lithium-ion Bull**, **Lithium-ion Rocks** and Rodney's #LithiumEquityIntelligence on LinkedIn, Seeking Alpha etc. now have the opportunity to prove our economics textbooks correct: *There's no such thing as a free lunch.*

With the great help of our millennial genius Josephine Rey, Rodney and I have to figured out a way for the many who have asked (and the rest we are now asking!) to help support the work we continue to put in the public domain largely as a public service.

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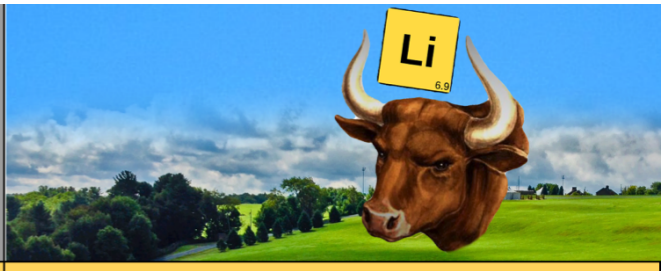
Mr Lithium Bull Market Scoreboard	USD Mkt ($m)	Share Price 12/30/18	Share Price 7/31/19	1 Mo Perf	YTD Perf	Comments
Big Producers	**$ 17,918**	**Aggregate Market Cap**				**Comments**
SQM	$ 7,762	$ 38.16	$ 29.49	-5%	-23%	ESG. ChiNationaliztion. But. Me & Julio Strange Bedfellows.
Albemarle Corporation	$ 7,731	$ 76.74	$ 72.96	4%	-5%	MIN JV = Oligopolistic Power. Blue Sky in Greenbushes/Atacama
Tianqi Lithium	$ 3,855	$ 29.32	$ 23.29	-8%	-21%	BIG DEBT. Rights offer - 50%, $2B mark to market loss $SQM
Ganfeng (HKSE)	$ 3,720	$ 12.34	$ 10.06	-6%	-18%	8/13 EGM: Convert + Rights Offer = $450M for LAC + 10kt converter
Mineral Resources Limited	$ 1,973	$ 15.80	$ 16.07	7%	2%	Mt. Marion profitable. Revised ALB JV reduces risk.
Livent	$ 940	$ 14.09	$ 6.44	-7%	-54%	Moody Blues Question. Philadelphia Freedom = Argentina Bondage?
Pilbara Minerals Limited	$ 558	$ 0.63	$ 0.47	-14%	-25%	Who Can it Be Now? SC6 Gigamine 49% avail. 12kt LiOH POSCO.
Orocobre Limited	$ 507	$ 3.19	$ 2.85	1%	-11%	10 yrs learning. Lo opex/hi margin. Japan Inc is WACC'd!
Small Producers	**$ 755**	**Aggregate Market Cap**				**Comments**
AMG	$ 864	$ 27.36	$ 26.10	-4%	-5%	SC6 price falling. Converters got power
Galaxy Resources Limited	$ 354	$ 2.23	$ 1.28	4%	-43%	Low quality SC6 & price falling. SDV Argentina risk/reward
Altura Mining Limited	$ 124	$ 0.16	$ 0.100	-13%	-35%	Good execution: operating/partners/sales. BUT: SC6 falling, big debt
Alita (Alliance/Tawana)	$ 104	$ 0.26	$ 0.082	-41%	-68%	Delayed Shipments -> Working capital woes/debt covenant issues
Emerging - Funded or Partnered	**$ 1,030**	**Aggregate Market Cap**				**Comments**
Kidman Resources Limited	$ 520	$ 1.07	$ 1.89	1%	77%	$WES investing $1B+ for 23kt hydroxide 2023. SQM's new flagship.
Lithium Americas (NYSE)	$ 327	$ 3.17	$ 3.69	-9%	16%	In Ganfeng We Trust. Few catalysts til '21 ramp. Not cheap. Hi debt.
Nemaska Lithium Inc.	$ 183	$ 0.64	$ 0.29	10%	-55%	Pallinghurst - Jupiter Halo, 25 c Rights Offer. Softbank?
Advanced Development/Exploration	**$ 1,408**	**Aggregate Market Cap**				**Comments**
Ioneer (Global Geo)	$ 186	$ 0.155	$ 0.185	37%	19%	Boron (40%) - Duopoly; Lithium (60%). Searlesite Rock
Liontown Resources	$ 109	$ 0.02	$ 0.14	40%	483%	Big WA discovery underway
Millennial Lithium	$ 105	$ 1.12	$ 1.67	6%	49%	New DFS shows long ramp to BG. Cash is King. Prefer LPI. NLC too
Sigma Lithium	$ 100	$ 1.85	$ 1.92	1%	4%	Low cost SC6 producer in Vale's backyard? Overdue DFS
Piedmont Lithium (NASDAQ)	$ 80	$ 6.13	$ 9.97	-16%	63%	KISS pure spodumene 20yr/20kt+ LiOH. ~$1B NPV. Lithium HQ USA
Argosy Minerals Limited	$ 76	$ 0.140	$ 0.110	47%	-21%	Small Scale, Chemistry, Cash position
Bacanora Lithium	$ 74	$ 0.24	$ 0.45	-10%	89%	Ganfeng's Big Adventure! Also Zinwald
AVZ Minerals Ltd.	$ 71	$ 0.067	$ 0.056	10%	-16%	DRC. Transport to Port
Standard Lithium	$ 63	$ 0.89	$ 0.95	6%	7%	Not KISS, but strong, committed partner in Germany's Lanxess
Lithium Power International	$ 62	$ 0.245	$ 0.345	21%	41%	CODELCO MOU. Most advanced brine. Full DFS. WA exploration
Neo Lithium Corp.	$ 56	$ 0.58	$ 0.63	-5%	9%	Hi grade. Proven Management. $30M cash
Savannah Resources	$ 56	$ 5.30	$ 4.38	-8%	-17%	SC6 WA of Europe. EU Refinery? Location?
Critical Elements Corporation	$ 49	$ 0.73	$ 0.41	-1%	-45%	Quebec stories tough unless/until Nemaska funded
Advantage Lithium Corp.	$ 43	$ 0.46	$ 0.36	-8%	-22%	Get for free owning ORE
Wealth Minerals	$ 38	$ 0.430	$ 0.375	9%	-13%	LPI much more advanced
European Metals Holdings	$ 38	$ 0.160	$ 0.215	15%	34%	Czech ESG considerations, but CEZ Utility deal looks a positive step.
Frontier Lithium	$ 36	$ 0.322	$ 0.300	-3%	-7%	Premium grade spodumene for glass? ON, Canada
European Lithium	$ 34	$ 0.082	$ 0.093	8%	13%	No scale
Plateau Energy Metals	$ 29	$ 0.68	$ 0.48	-20%	-29%	Unconventional. Title questions. Not KISS
Mali Lithium	$ 22	$ 0.16	$ 0.12	0%	-25%	Africa. Transport to Port.
Core Lithium	$ 20	$ 0.052	$ 0.044	10%	-15%	Watching. Chinese off-takes in place.
Galan Lithium	$ 17	$ 0.285	$ 0.190	3%	-33%	Very early. About to start drilling. Hombre Muerto
Lake Resources	$ 16	$ 0.077	$ 0.064	-17%	-17%	How is it different?
Pure Energy	$ 10	$ 0.070	$ 0.070	-22%	0%	Schlumberg took over. Little left for PE shareholders
E3 Metals Corp	$ 10	$ 0.31	$ 0.500	16%	64%	Newcomer. Brine from large oil field, Alberta
Sayona Mining Ltd.	$ 9	$ 0.018	$ 0.008	0%	-56%	First Nations, Quebec stories tough unless/untill Nemaska
Infinity Lithium	$ 9	$ 0.065	$ 0.071	-9%	9%	WATCHLIST - EU hydroxide in Spain
Aggregate Lithium Market Cap	**$ 21,112**	-11%				
Aggregate Lithium Market Cap 12/31/18	$ 23,741					



2020 Hindsight. Foresight 2020.

We suggested in Lithium-ion Rocks! Season 1 Finale it's time to #ChangeTheConversation

- 2022/23 battery quality lithium chemicals shortage.
- US and EU Security of Supply.
- #BatteryArmsRace
- #ScrambleForLithium

And yet, the **PRICE** discussion never ceases to abate. The equity research, sales & trading divisions of the most influential global investment banks are focused on servicing their principal profit-drivers -- short-term, frequent trading hedge funds. It is K.I.S.S. -- and has been very, very correct -- to simply reduce the highly complex and nuanced lithium industry to a directional bet on the weekly spot price distributed for free by price reporters like **FastMarkets.** 18 months of declines. Like Chinese Water Torture, China Trade War Torture.

> **2020 Hindsight:** Nothing "specialty" about lithium chemical equities. They trade with iron ore-like volatility and have other similarities – e.g., wide pricing disparities based on quality differentials. To dismiss iron ore analogies is to not learn from history. I paid attention. But didn't anticipate the speed of the Velocitility. I believed those who told me two years ago that Chinese converter expansions were like their steel expansion – don't underestimate how fast they will build. The damage to investor psyche from Livent's missteps one quarter from IPO, may take years to recover.
>
> **2020 Hindsight:** Multiple de-rating: 6-9 is the new 12-15 when thinking about EV/EBITDA multiples, even for the blue-est chip producers -- unless/until major lithium producers demonstrate some oligopolistic moat with sustainable, high quality earnings.
>
> Drinking too much Coke – ie, **LiTHiuM** IPO promotion – has proved damaging to my health. **The Real Thing: -60%** with no seeming bottom in nine months.
>
> My read of Albemarle's revised JV and deeper engagement across assets with MIN is as a means of exerting some market power, and thus positive to future earnings quality.
>
> **The Good Li Fe:** a lithium price spike like the current iron ore price spike can lead to the same pleasant experience that, say, FMG, has experienced over the past year. 2020/21/22? Not clear precisely "when", but it's unlikely an "if".
>
> > **2020 Foresight:** how is it possible that iron ore cash machines FMG and RIO are not all over deeply discounted lithium in their Pilbara backyard?

Commodity Investing 101: Commodity Equities Follow Commodity Prices

2020 Hindsight: Listening, as I did, to those who said SQM's quarterly pricing was more relevant than weekly spot pricing was wrong. SQM's pricing, as Javier from Morgan Stanley suggests, is a lagging indicator. The spot price has proved to be a very accurate leading indicator of SQM & ORE's rapidly falling prices.

U.S. & Them

2020 Hindsight: My personal "big miss" #TheBigLongGoneWrong? was thinking it would be a political imperative of the White House to not have a trade overhang into the election. It now appears it may be a political positive for Trump through the election so long as US economy/employment continues its strong momentum which seems likely. Pushing Fed to cut rates + Agreeing with Congress a large 2-year spending bill + Uninspiring #DemDebates = emboldened re-election prospects. September 1: new tariffs loom. Yuan above 7.

FEARsight 2020: More Rare Earth saber rattling and USA Security of Supply paranoia

To Cut a Long Story Short…

The lithium and ALB, SQM, LTHM bears from 2018 at 15-20X EV/EBITDA were smart. Morgan Stanley. Alliance Berstein. BMO. Macquarie. Air Supply theses underpinning "The Big Short" stories have been proven "right for the wrong reasons". But they've been right. And sooner than they anticipated.

If we've learned nothing in the past 18 months it is to NOT dismiss those continuing to pound the bear drum, as Morgan Stanley continued to do with further in-depth, highly opinionated and influential analysis of lithium within the context of their entire firm's extensive global equity research across the EV supply chain.

One day Morgan Stanley will change its mind and start recommending lithium stocks, but I suspect it will likely be due to a change in their outlier low 2025 LCE forecast based on "fuzzy math?" lithium-intensity of 0.51 kg/kWh as pointed out first in Rodney's March 29 LinkedIn post, Lithium Bulls vs. Bears.

But it might also be because stock prices capitulate further with valuations overshooting to the downside. Expect each negative export price data point to be trumpeted as confirming their bearish view.

Wodgina & Whabouchi

Rodney comments below on the big change to the Albemarle/Mineral Resources JV, greater details of which should be a main topic on ALB's Thursday, August 8 conference call.

In case you missed my LinkedIn commentary on Pallinghurst's LOI: Nemaska Lithium Matters. Jupiter's Halo

Paradoxes & Conundrums

Benchmark Minerals' Andy Miller deserves praise for his note: The Lithium Price Paradox.

But one thing no one but me ever seems to bring up is the **China Conundrums**. The converter table excerpted from Andy's note in Rodney's note below shows over 250kt of conversion capacity "in construction". At $6-8kt capital intensity (vs. a whopping $24kt at ALB/Kemerton) 250kt conversion represents less than $2B investment. We discuss regularly the tight liquidity conditions within China. And yet, Tianqi for some reason uniquely suffers no liquidity constraint. Tianqi invested $4B in SQM and is down more than $2B – imagine, that money could easily be solving China converter and WA spodumene producer woes….

I expect we'll soon see ALB, likely with MIN, buying from the below shopping list to process Wodgina. And I will continue to raise questions and seek answers about China/Tianqi's encroachment into Chile/SQM's crown lithium jewel.

Brokered Financings & Brokered Conferences

While Oz is focused on *Diggers and Dealers,* this week brings conferences from **Canaccord** "*The Future of Transport"* in Boston and **Jefferies** *Global Industrials Conference* in New York: **Piedmont Lithium, Lithium Power International, Lithium Americas, NeoLithium** are presenting, all of which have had generally positive developments and are among the few **in the green YTD**, in some cases, materially so.

In the past month, **Piedmont** raised AUD21M with Fidelity, one of America's and the world's most important institutions, lead the raise with $9M order equating to ~9% position while Australia's largest and most important fund AUS Super retained its ~13% position on the share register. Piedmont also published a material resource upgrade ensuring a 20+ year mine and impressive metallurgical test results demonstrating superior pure spodumene ore quality and expected high recoveries, akin to the historic production from the area. In my opinion, the ~$1B+ NPV Piedmont Lithium Project – and the Carolina Tin Spodumene Belt region – will soon be recognized as a Tier One asset of strategic American and global interest. It should attract similar competitive interest & value recognition as Kidman's Mt Holland and Mineral Resources Wodgina.

New WA hard rock discovery **Liontown** raised AUD18M and, with USD 109M market cap has climbed to #2 among the Advanced Development/Exploration names on the Mr. Market Scoreboard behind only **ioneer.**

#Chile #OpenForBusiness!

As telegraphed by senior Chilean mining officials at the Fastmarkets 11th Annual Lithium conference in Santiago in June, development of new brine projects is among the highest priorities, with the Maricunga project flagged as the "next cab off the rank".

Lithium Power International and **Codelco,** the world's largest copper producer and Chile's largest exporter signed an MOU for the advancement of the Maricunga brine project.

> ***Lithium Power International's Chief Executive Officer, Cristobal Garcia-Huidobro, commented:***
>
> *"The Company is extremely pleased to reach this MOU with CODELCO, following significant negotiations. The objective of the MOU is to define the terms for a definitive agreement to develop a joint project in the Maricunga Salar under a public-private alliance model, which would allow it to become the third lithium producer in Chile.*
>
> *This JV would allow for a very robust and scalable project, and would also fast-track LPI's flagship Maricunga development, including provision of all the necessary permits. It* ***would include CODELCO's key CEOL contract and the Nuclear Commission permit covering the entire salar, which would complement the expected approval of MSB's EIA before year-end.*** *This means there will be certainty regarding the permitting of the project.*
>
> ***Consolidation of the mining concessions would include an option to increase production capacity and/or extend the life of the mine beyond its expected 20-year span, therefore creating additional value for all shareholders.***
>
> *Focus will now be on the finalisation of the environmental approval process (EIA) and ongoing negotiations with potential financing and strategic partners.* ***The aim is for initial construction to commence during the first half of 2020,*** *after the finalisation of the terms of the definitive JV agreement".*

#Maricunga
#NoDramas

Australian Lithium Hard Rock Update

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proprietary analysis like that below provided today FOR FREE.

As most ASX-listed lithium issuers published their Q2 Quarterly Activities reports, Rodney has taken the time to read through and synthesize them all with the following takeaways:

Wodgina lithium project deal adjustment:

Albemarle/Min Resources have agreed to alter the original transaction and change the terms of the JV. Albemarle will now purchase 60% of the Wodgina lithium project for effectively $1.3bn, paid with US$820m in cash and 40% of Kemerton's two 25,000/t hydroxide trains. The 40% interest is worth US$480m based on a US$1.2bn total cost. Wodgina SC can be processed at Kemerton or at another offshore location. Based on a US$1.2bn cost, Kemerton has a US$24,000/t of installed capacity price tag. It should be noted this excludes the mine concentrator and only includes the conversion plant. What would the cost per installed ton of capacity cost at Wodgina? Originally Albemarle and Min Resources budgeted US$1.6bn for 100KT = US$16,000/t, well below Kemerton. Given the remote location of the Pilbara, US$16,000/t was never realistic. Based on the original purchase price of US$1.15bn for 50% of the JV and US$800m capex, Albemarle needed a US14,000/t long term hydroxide price to reach their 17% targeted IRR. Given the likely capex cost overrun and fall in LiOH prices, Albemarle were looking at single digit returns if they proceeded with the original deal terms.
The only way to secure a 17% IRR would be to substantially lower the capex costs. Hence their inclusion of the "offshore" clause in the latest deal amendments. Albemarle is likely to be able to buy spare chemical conversion capacity in China for US$6-8000/t. Assuming Albemarle either processes the Wodgina SC at Kemerton or buys **existing** conversion capacity, the result is the same – 100KT of LiOH conversion capacity (at Wodgina) is being removed from the market indefinitely. There is also market talk that Kemerton has a tailings/environmental issue and the ramp up will be delayed. This is helpful to the industry as near-term demand is under pressure.

High grading:

Both Galaxy Resources and Altura continue to process feedstock with grades well above their average project resource (see below).

Delayed ramp ups:
Downstream buyers and offtake partners are either delaying or not accepting deliveries. The reduction in EV subsidies in China is taking its toll on future sales. Post June the ~50% subsidy reduction took full effect. Further, sales of passenger cars have fallen substantially in 2019, meaning EV sales have faced major headwinds. **Based on cathode production numbers released for June 2019 and anecdotal evidence from EV manufacturer's production plans, expect China EV sales growth to continue to slow for the balance of the year**. As a result, non-vertically integrated spodumene concentrate producers have built up inventory. Some are cutting back production in the near term (Pilbara Q3).

Achieved sales prices and cash balances:

Sales prices fell steeply versus Q1 despite the reduction in sales volumes. Companies such as Alita and Altura have debt on their balance sheets and covenants (interest payments) to meet, forcing the sale of production volumes. Despite cash raises by various companies during Q2 all spodumene concentrate producers showed lower closing cash balances versus Q1.

Brief company summaries:

Altura: Shanshan 200m strategic share placement t 11.2c, now 19.4% shareholder. Continues to expand offtake partners, now selling to 5 parties. Limited inventory build, low cost of production. High debt level and punitive funding rate. Debt refinancing is critical, Q3 interest payment due.

Pilbara Minerals: Still looking for a 20%-49% strategic partner. Ganfeng buying easing up. Q3 production down on Q2. Cash balance falling.

Alita: Excellent quality product and secures premium pricing. However, offtake partner deliveries slowing and delay in securing additional SC buyers. Cash balance low, risk of debt covenant breach.

Galaxy: Inventory build in Q2, expectation for higher sales in Q3. High grading, hence low cost of production. Recovery rates still low. Substantial cash balance. Sstrategic stake in Alita.

Mineral Resources, Mt. Marion: Lower production volumes in Q2 and price fall. 4% SC must be marginal from Q3.

Mineral Resources, Wodgina: Tailings issues slowing ramp of production. Renegotiated deal terms (see above).

Industry statistics Q2 2019:

Company	Alita	Altura	Galaxy	Mt Marion	Pilbara Minerals
Qtr Production (t)	38,717	42,402	56,460	90,000	63,782
Qtr Sales (t)	18,669	38,491	29,439	81,000	43,214
Cash cost of prod US$	545	392	337	N/A	528
Sales Price US$	749	600	N/A	608.95	644
Qtr closing inventory (t)	32,296	12,403	54,000	N/A	53,000
Cash balance A$m	20.05	9.51	250.4	N/A	63.2

Since our inaugural episode of Lithium-ion Rocks! in January we have been repeating the same mantra – history is on our side. Lithium chemical supply growth has consistently been below 20% p.a. despite forecasts for far greater growth by both incumbents and juniors. As battery prices fall and emission standards are enforced in China and Europe, EV adoption is set to rise with overall lithium chemical demand growth expected to consistently rise 20% p.a. from here on. In response to increasing demand, various hard rock mines have begun spodumene concentrate (SC6) production in the past 2 years. Almost all conversion of SC6 is in China. As Benchmark Minerals recently helpfully broke down, growth in conversion capacity is spread across Tiers 1 through 3 with varying success:

China's 2019 lithium expansion targets

	Company name	Target capacity (tpa)	Due for completion	Current status	Utilisation rate
Tier 1	Ganfeng	20,000	2018	Production	>90%
	Ganfeng	17,500	2018	Production	>90%
	Tianqi	24,000	2019	Commissioning	-
	Livent	9,000	2019	Production	>90%
	Albemarle	20,000	H1 2019	Production	<60%
Tier 2	General Lithium	16,000	Q4 2018	Production	75%
	Yahua	20,000	Q4 2018	Construction	-
	Lanke	20,000	Q4 2019	Construction	-
Tier 3	Jiangte Motor	25,000	Q2 2018	Production	28%
	Qinghai Lithium	10,000	2019	Construction	
	Dingsheng	10,000	Q2 2019	Commissioning	-
	Zhiyuan	13,000	2018	Production	60%
	Guangxi Tianyuan	25,000	Q3 2019	Construction	-
	Minmetals Salt Lake	10,000	Q2 2019	Commissioning	-
	Tangshan Xinfeng	20,000	Q3 2019	Construction	-
	Ganzhou Yuanhuitong	10,000	Q3 2019	Construction	-
	Sichuan Siterui	5,000	Q1 2019	Construction	-
	Jiangxi Yunwei	10,000	Q3 2019	Construction	-
	Inner Mongolia Zhili	15,000	Q4 2019	Construction	-
	Zangge	10,000	2019	Construction	-
	Liaoning Hongjing	20,000	2019	Construction	-
	Wuli Jinhaiwan	20,000	2019	Construction	-
	Hebei Tianyuan	12,000	2019	Construction	-
	Nanshi	10,000	2019	Construction	-
	Youngy	20,000	2019	Construction	-

Source: Benchmark Mineral Intelligence

The list includes a number of newcomers with little experience. In addition, limited liquidity and a drawn-out trade war has further exacerbated their financial difficulties. Almost all the names on the list are brines or are non-vertically integrated companies – meaning they source their SC6 from Australian independents. The spot price of lithium carbonate and hydroxide in China

has fallen to the point that non vertically integrated producers are at breakeven, the only route to improved margins is a drop in their SC6 input prices. Until demand for chemicals exceeds supply, the prices of LiOH, Li2CO3 and SC6 will likely remain weak.

Like shale producers in 2015/2016 – SC6 producers are operating on cash cost economics and not covering AISCs – as a result their cash balances are falling fast. Moreover, actual recoveries are well below feasibility study estimates, resulting in cash costs higher than forecasted. Below is a high-level analysis of where each SC6 producer stands currently.

(Alliance)/Alita:

Q2 cash cost of US$545/wmt and an average selling price of US$749/dmt. Based on planned shipping of 15,000/t in end July/ early August and a $680/t SC6 price, Alita needs to ship an additional 29,798/t in Q3 in order to meet the A$15m cash balance required by the Tribeca loan agreement. Failure to meet this requirement on 1 October 2019 could mean a further issue of shares for cash and / or a major reduction in production during Q4. Huge inventory build at Alita, cash raised recently has been converted to working capital. They need to sell down inventory soon.

Date	Cash balance A$m	Comment
30-Jun-19	20.052	Quarterly Report
25-Jul-19	10.000	Share Issue - Conditional placement - Jiangxi subsidiary
25-Jul-19	16.600	Cash balance at announcement
25-Jul-19	-13.452	Q3 expenses spent to date
Early Aug	14.28	15,000t sale of SC6 (¬$625/t @1.4 AUD)
Early Aug	30.880	
End Sept	-44.248	Q3 expenses (remaining balance), $57.7m less 25 July
End Sept	-13.368	Q3 end cash if no further SC6 sales
01-Oct-19	15.000	Required cash balance - Tribeca debt facility
Q3 sales	28.368	Required SC6 sales revenue (Q3) or LC's to meet Tribeca cash balance
	29 798	Implied SC6 sales based on US$625/t 1.4 AUD

Date	Inventory	
30-Jun-19	32296	wmt at port and mine site as at date
Sep-19	32000-40,000	dmt production for the quarter
Q3	44 798	Sales during Q3
Sep-19	25,000?	Closing inventory

Altura:

It looks as if Altura has been "high grading" a bit with YTD mined grade of 1.16% relative to its resource head grade of 1.06%. Sale price averaged US$600/dmt, similar to the March quarter.

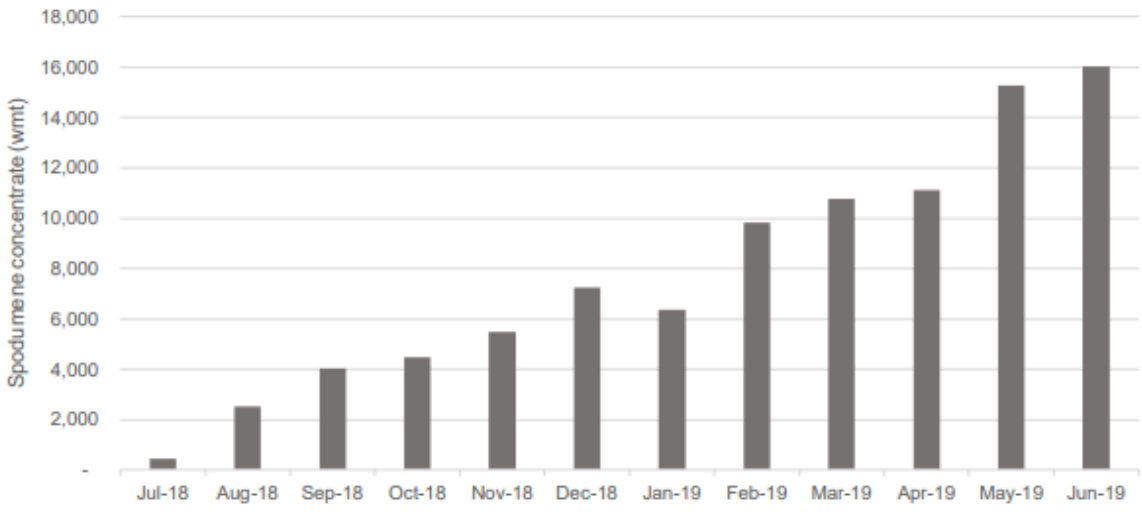
Table 1 – Mining and process quantities

	Units	Q1 FY19	Q2 FY19	Q3 FY19	Q4 FY19	Total FY19
Ore mined	wmt	323,539	350,099	404,087	439,559	**1,517,284**
Waste mined	wmt	1,512,840	1,491,011	1,426,256	1,546,719	**5,976,826**
Total material mined	bcm	625,881	625,008	622,929	675,726	**2,549,544**
Ore processed	wmt	98,135	256,931	251,200	337,786	**944,052**
Strip ratio	waste:ore	4.7	4.3	3.5	3.5	**3.9**
Ore mined grade Li_20	%	1.21	1.19	1.16	1.10	**1.16**
Lithium concentrate produced	wmt	7,379	25,794^	29,627	42,402	**105,202**
Lithium concentrate shipped	dmt	-	24,419	14,770	38,491	**77,680**

^ Includes low-grade material produced during commissioning, this material would require re-processing and /or blending in order to be included in saleable product.

Production has been increasing monthly as have recoveries. This is reflected in the cash cost per ton now sitting at US$392/wmt FOB. 12,403 wmt stockpile split between port storage and mine site.

Figure 1 – Altura Spodumene Concentrate Production AFY 2018-19



Pilbara Minerals:

Pilbara has been in search of a 20%-49% minority partner for some time, the process was due to be finalized in Q2. However, the delay in ramp up of chemical conversion capacity in China at Pilbara's off-take partners (and in general) has resulted in an SC6 oversupply, limiting the immediate need for potential partners to lock in Pilbara's future supply. There have also been questions raised about the level of moisture and iron in their product. The POSCO JV, which relates to stage 3 production, is still planned. Until a partner is finalized for stage 2 this JV will remain on hold.

Cash costs of US$528/dmt CFR China, against sale prices of US$644/dmt CFR China. Inventory build-up to 51,468/dmt, some of which is low grade. Cash balance down to $63.576m, that includes an exercise of options during the quarter (one off) that raised A$10.697m.

Table 1: Total ore mined and processed

	Units	Q4 FY18	Q1 FY19	Q2 FY19	Q3 FY19	Q4 FY19	FY19 Total
Ore mined[1]	*wmt*	336,648	487,987	762,531	540,426	640,173	2,431,117
Waste mined[1]	*wmt*	2,859062	1,921,907	2,154,690	2,445,917	1,900,027	8,422,540
Total material mined	*wmt*	3,195,710	2,409,894	2,917,220	2,986,342	2,540,200	10,853,657
Ore processed	*dmt*	-	173,667	420,221	414,223	456,541	1,464,652

Table 2: Production and shipments

	Units	Q4 FY18	Q1 FY19	Q2 FY19	Q3 FY19	Q4 FY19	FY19 Total
Direct Shipping Ore (DSO) sold	*wmt*	145,974	205,766	0[1]	0[1]	0[1]	205,766
Spodumene concentrate produced	*dmt*	-	11,015	47,859	52,196	63,782	174,852
Spodumene concentrate shipped	*dmt*	-	0	46,598[1]	38,562	43,214	128,373
Tantalite concentrate produced	*lb*	-	22,151	56,663	33,374	67,075	180,077

Date	Cash balance A$m	Comment
30-Jun-19	63.576	Quarterly Report
End Sept	-66.169	Q3 expenses
End Sept	-2.593	Q3 end cash if no further SC6 sales
Q3 sales	39.060	Assumes 45kt sales at US$620/t, 1.4 AUD
	36.467	Cash balance at the end of Q3

Date	Inventory	
30-Jun-19	53 000	dmt at port and mine site as at date
Sep-19	62 169	wmt production for the quarter
Q3 -	45 000	Sales during Q3 (dmt)
Sep-19	65 959	Closing inventory (dmt)

Galaxy:

Results for Q2 were far better than Q1 and previous. This was as a result of "high grading" ore processed (1.39% vs resource grade of ~1.15%). Sales were substantially below production, resulting in further stockpiles during Q2. The end stockpile from production in Q2 2019 was ~54,000/dmt. Sales in Q3 2019 (60-70k/dmt) are projected to be substantially higher than H1 (~44,500/dmt). Production in Q3 is targeting 45,000-55,000/dmt – below the anticipated sales of 60,000-70,000/dmt.

Cash cost per dmt of US$337 FOB is unsustainable – lower grades will see higher COP.

NO disclosure on sale prices…

Cash balance of US$176.3m at end June 2019 – liquidity not an issue for GXY.

PRODUCTION & OPERATIONS

Table 1: Production & Sales Statistics

	Units	Q1 2019	Q2 2019	YTD 2019	FY Guidance
Mining					
Total material mined	bcm	1,168,120	1,178,925	2,347,046	-
Ore mined	wmt	437,932	379,187	817,119	-
Grade of ore mined	% Li_2O	1.03	1.39	1.20	1.15
Processing and Sales					
Ore processed	wmt	409,849	426,846	836,695	1,700,000 – 1,800,000
Grade of ore processed	% Li_2O	1.15	1.40	1.28	-
Mass yield	%	10.5	13.5	12.0	-
Recovery	%	51	58	55	-
Concentrate produced	dmt	41,874	56,460	98,334	180,000 – 210,000
Grade of concentrate produced	% Li_2O	5.7	6.0	5.9	-
Concentrate sold	dmt	15,192	29,439	44,630	-
Grade of concentrate sold	% Li_2O	5.6	5.9	5.8	-
Production Costs					
Cash cost per tonne produced	US$/t FOB	453	337	387	-

Mt Marion (Ganfeng/Mineral Resources):

Pricing for Q3 falling materially from Q2. US$608.95/dmt 6%, typical penalties for 0.1% grade is US$15, therefore 4% SC would sell for ~US$308.85/dmt – likely to be marginally profitable in Q3. MR claiming that the 6% upgrade project is on target. However, 6% sales still only represented 69% of the total and shipped volumes were down considerably. This is consistent with Ganfeng taken less material from other offtake partners. Could shipping fall even further in Q3 given the drop in prices, especially for SC4%?

Mt Marion 6% Spodumene Concentrate Pricing

Mineral Resources Limited (ASX: MIN) ("**MRL**" or the "**Company**"), on behalf of Reed Industrial Metals Pty Ltd which owns and operates the Mt Marion Lithium Project ("Mt Marion") advises that the sale price for 6% spodumene concentrate shipments for the quarter ended 30 September 2019 will be US$608.95 per dry metric tonne ("dmt") compared with US$682.38 per dmt for the quarter ended 30 June 2019.

Mt Marion remains a profitable and highly valuable long-life lithium asset for MRL.

Reed Industrial Metals Pty Ltd is owned 50% by MRL and 50% by Ganfeng Lithium Co. Ltd (SZAE: 002460).

Wodgina ore should start being produced in Q3. There have been delays due to some tailing issues.

Mt Marion Lithium Project

'000 WMTs	Q4 FY19	Q3 FY19	Q4 FY18
LITHIUM SPODUMENE			
Mined	668	757	799
Produced	90	107	109
Shipped	81	111	95

Volumes presented as 100% for the Mt Marion project. MRL operates 100% of the Mt Marion project, in which it owns a 50% interest effective 18 March 2019 (ASX: 18/03/19).

Mining continued with total material movement of 6.6 million wet metric tonne (WMT) achieved during the quarter. The mining activities provide ongoing access to the ore body to meet processing requirements.

The processing plant's utilisation decreased to 81%, down 5% from the previous quarter. However, this was offset by an increase in throughput rate from 325 tonnes per hour (tph) to 334 tph. This has resulted in beneficiated tonnes increasing to 600,216 WMT compared to 599,495 WMT in the previous quarter.

Spodumene concentrate production was impacted by construction of the All-in 6% Concentrate Upgrade Project (Ai6 Project) and was less than the previous quarter with a total production of 90,168 WMT. However, the proportion of high-grade (6%) spodumene concentrate was up to 69% compared to 66% in the previous quarter. A total of 81,080 WMT was shipped during the quarter; a decrease of 27% against the prior quarter's shipments due to the ramp up phase associated with the Ai6 project.

Disclaimer

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