



Pilbara Minerals Ltd (PLS.ASX)

Best of emerging hard rock players due to world class asset

Event:

- We initiate formal research coverage on Pilbara Minerals Ltd (PLS).

Investment Highlights:

- PLS's flagship asset is its Pilgangoora Lithium Project in WA.** The company to date has determined a JORC Resource of 80.2Mt at 1.26% Li₂O, equivalent to 1.7Mt of contained LCE.
- Pilgangoora is the world's 2nd largest hard rock lithium deposit, ranking only behind the world class Greenbushes mine.** Compared to other emerging hard rock lithium producers, Pilgangoora ranks **above average in terms of size, grade, and costs**, as well as demonstrating favourable metallurgy to date.
- Ability to serve total lithium market including low-iron spodumene.** A key positive is the low iron content demonstrated from metwork which is sought after by the large glass and ceramics market.
- Hard rock producers are best placed to exploit high lithium prices and maximize NPV due to short lead times.** While hard rock producers are generally higher on the cost curve vs brines, they are advantaged by lower capex and shorter lead times, which in the current environment, enables them to exploit the high lithium price and maximize project NPV. **We estimate Pilgangoora's cash costs of US\$2,544/t LCE to be the lowest of the emerging hard rock suppliers, and would place it well in the bottom half of the industry cost curve.**
- High strategic appeal and offtake demand.** The world class nature of the deposit may attract suitors seeking to rapidly expand their lithium production in the high demand environment. PLS has signed MoUs that more than cover planned annual production with various companies. **Experienced CEO.** The recent appointment of Ken Brinsden, ex-Atlas Iron CEO, should bring valuable WA/Pilbara mining operational experience.
- Electric vehicles (EVs) fuel lithium demand.** Lithium demand is forecast to grow 10%-12% until 2020. The highest growth segment is batteries for EVs which is growing at >50% CAGR. Various sources estimate LCE demand will increase from current 150 to 200kt LCE by a further 100 to 300kt by 2025 due to increase in battery demand. This means the equivalent of **two to six Greenbushes mines are required.** The outlook ensures ample demand for Pilgangoora product.

Earnings and Valuation:

- We value PLS at \$0.38/share risked and \$0.61/share unrisks.** Our valuation is underpinned by DCF (NPV₁₀) for Pilgangoora assuming A\$180M pre-production capex, initial 2Mtpa throughout, and production of 275kt spodumene or 42kt LCE. We expect production beginning CY2018. We forecast cash margin of over US\$200/t spodumene based on blended price of ca. US\$465/t spodumene and C3 costs of US\$238/t.
- We forecast a maiden NPAT of \$5.4M in FY17 mostly from Tabba Tabba, and \$28M and \$47M in FY18 and FY19 mostly from Pilgangoora.

Recommendation:

- We recommend PLS as a Buy with a 12-month price target of \$0.47/share.** Our target is based on Pilgangoora being further derisked in 12 months time due to progress on DFS, financing, and permitting.

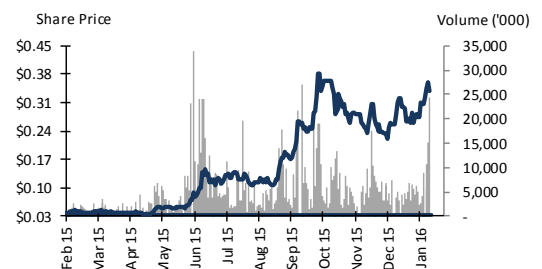
Recommendation	Buy
Previous	NA
Risk	High
Price Target	\$0.47
Previous	NA
Share Price (A\$)	\$ 0.340
ASX Code	PLS
52 week low - high (A\$)	0.034-0.405
Valuation (A\$/share) - risked	\$0.38
Methodology	DCF
Capital structure	
Shares on Issue (M)	806
Market Cap (A\$M)	274
Net Debt/(Cash) (A\$M)	-8
EV (A\$M)	266
Options (M)	91
Fully diluted EV (\$M)	297
12mth Av Daily Volume ('000)	4,700

Y/e Jun (A\$M)	2015a	2016e	2017e	2018e
Sales	0.0	0.0	24.0	102.5
Adj EBITDA	-3.2	-4.8	9.5	48.0
Adj NPAT underlying	-3.4	-4.9	5.4	28.0
Adj EPS diluted \$	-0.01	-0.01	0.01	0.03
PER x diluted	nm	nm	62.1	12.9
EV/EBITDA x	nm	nm	37.4	7.4

*Adj = undelying FSB estimate

Board	
Tony Liebowitz	Non-Executive Chairman
Neil Biddle	Executive Director
Robert G Adamson	Non-Executive Director
John Young	Executive Director

Share Price Graph



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Foster Stockbroking acted as Sole Lead Manager to the \$12M placement of 52M shares at \$0.23 in November 2015. Foster Stockbroking received fees for this service.



Pilbara Minerals (PLS)

Full Year Ended 30 June

Profit and Loss A\$M	2015a	2016e	2017e	2018e
Sales	0.0	0.0	24.0	102.5
Operating Costs	3.2	4.8	14.4	54.5
Underlying EBITDA	-3.2	-4.8	9.5	48.0
D&A	0.0	0.0	4.0	13.0
Underlying EBIT	-3.2	-4.8	5.5	34.9
Net Interest exp / (income)	0.2	0.1	0.1	4.2
Profit before tax	-3.4	-4.9	5.4	30.7
Tax exp / (benefit)	-0.1	0.0	0.0	2.7
Underlying NPAT	-3.4	-4.9	5.4	28.0
Non-recurring items	-2.1	0.0	0.0	0.0
Reported NPAT	-5.5	-4.9	5.4	28.0
Underlying EPS diluted (\$)	-0.01	-0.01	0.01	0.03

Financial Metrics	2015a	2016e	2017e	2018e
Sales growth %	nm	nm	nm	328%
EPS growth %	nm	nm	nm	382%
EBITDA margin	nm	nm	40%	47%
EBIT margin	nm	nm	23%	34%
Gearing (ND/ND+E)	-13%	-26%	21%	43%
Interest Cover (EBIT/net int)	nm	nm	41x	8x
Average ROE %	nm	nm	11%	29%
Average ROA %	nm	nm	5%	13%
Wtd ave shares (M)	589	758	879	953
Wtd ave share diluted (M)	589	855	985	1060

Cashflow A\$M	2015a	2016e	2017e	2018e
Underlying EBITDA	-3.2	-4.8	9.5	48.0
Change in WC	-0.2	0.6	-1.2	-3.2
Tax paid	0.0	0.0	0.0	-2.7
Other	-0.1	0.0	0.0	0.0
Net interest	0.0	-0.1	-0.1	-4.2
Share based payments	2.0	0.0	0.0	0.0
Operating Cashflow	-1.5	-4.3	8.2	37.8
Purchase of PP&E	-0.1	-2.2	-90.0	-95.0
Acquisitions	-1.0	0.0	0.0	0.0
Capitalised expenses	-0.5	-2.9	-2.9	-2.9
Investments	0.0	-2.0	0.0	0.0
Other	-1.6	-1.0	0.0	0.0
Investing Cashflow	-3.1	-8.1	-92.9	-97.9
Equity issue	5.2	15.0	60.0	0.0
Debt proceeds	1.7	4.0	120.0	0.0
Debt repayments	0.0	0.0	0.0	0.0
Other	-0.1	0.0	0.0	0.0
Financing Cashflow	6.8	19.0	180.0	0.0
Net Cashflow	2.2	6.6	95.3	-60.1

Sales and earnings multiples	2015a	2016e	2017e	2018e
P/E x	nm	nm	59.4	12.3
EV/EBITDA x	nm	nm	35.7	7.1
EV/EBIT x	nm	-1.4	1.2	0.2
Dividend yield %	0	0	0	0

Company Valuation	A\$M	A\$/sh	A\$M	A\$/sh
DCF, WACC 10% nominal				
	Unrisked	Unrisked	Risked	Risked
Segment	A\$M	A\$/sh	A\$M	A\$/sh
Pilgangoora Resource	623.4	\$0.70	436.4	\$0.49
Tabba Tabba	6.2	\$0.01	3.1	\$0.00
Pilgangoora Exploration Target	187.2	\$0.21	56.2	\$0.06
Corporate	-40.7	-\$0.05	-24.7	-\$0.03
Tax liability	-243.8	-\$0.27	-148.1	-\$0.17
Cash from options	6.2	\$0.01	6.2	\$0.01
Net cash (debt)	8.3	\$0.01	8.3	\$0.01
Company (fully diluted)	546.8	\$0.61	337.3	\$0.38
Diluted shares (M)*	896.5			

*Includes options which are in-the-money at FSBe valuation.

Balance Sheet A\$M	2015a	2016e	2017e	2018e
Cash	3.2	9.8	105.2	45.1
Receivables	0.9	0.0	2.0	8.4
PPE	0.1	2.3	88.3	265.3
Capitalised exploration	1.8	1.8	1.8	1.8
Intangibles	1.2	1.2	1.2	1.2
Other	1.6	8.0	12.0	13.2
Total Assets	8.9	23.1	210.4	335.0
Accounts payable	0.7	0.4	1.2	4.5
Provisions	0.0	0.5	1.2	4.5
Debt	2.6	6.6	126.6	126.6
Other	0.0	0.0	0.4	90.4
Total Liabilities	3.4	7.5	129.4	226.0
Reserves and capital	24.9	39.9	99.9	99.9
Retained earnings	-19.4	-24.3	-18.9	9.1
Minorities	0.0	0.0	0.0	0.0
Total Equity	5.4	15.6	81.0	109.0

Commodity Assumptions	2015a	2016e	2017e	2018e
Prices				
Spodumene 6.5% Li ₂ O (US\$/t)	-	625	625	625
Spodumene 6% Li ₂ O (US\$/t)	-	427	438	432
Tantalite (US\$/lb)	-	60	60	60
A\$ (US\$)	-	0.72	0.69	0.69
Production				
Spodumene kt	-	0.0	0.0	139.7
LCE kt	-	0.0	0.0	21.1
Tantalite t	-	0.0	0.0	121.8
C3 costs US\$/t of spodumene	-	0	0	259

Capital structure	M
Ordinary shares	806.0
Options (ex price \$0.03 to \$0.15, expiries Dec 2016 to Dec 2017)	90.5
Fully diluted equity	896.5
Convertible notes (face value \$1.00)	4.7

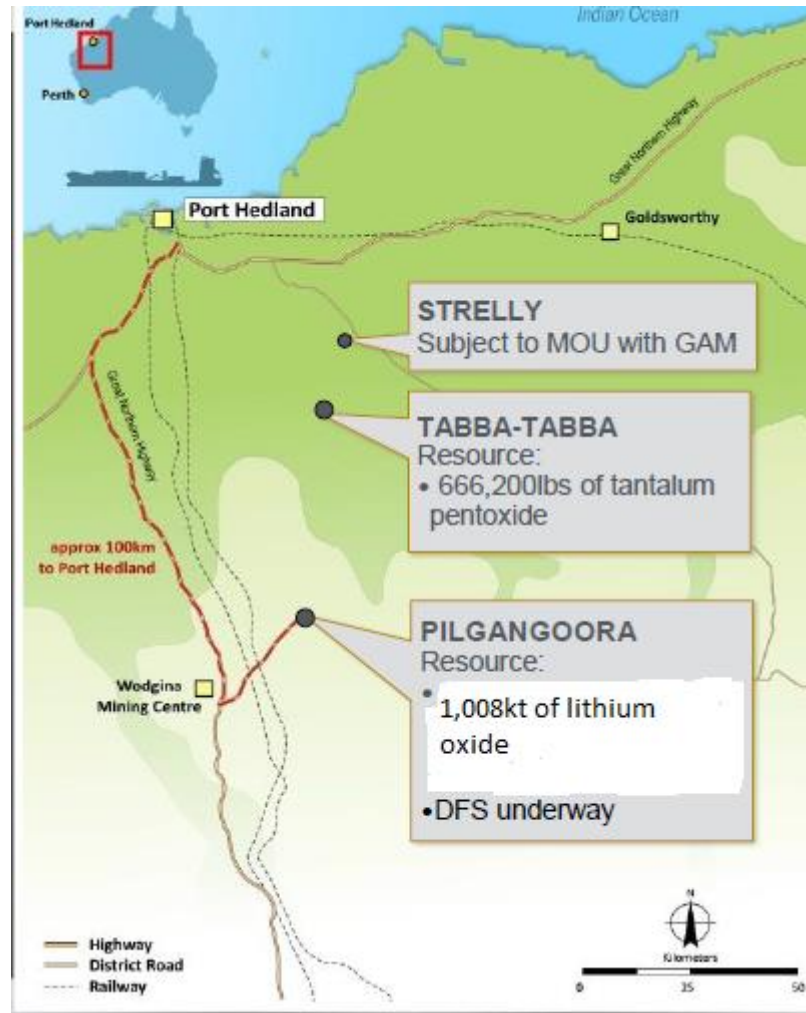
Source: Company; Foster Stockbroking estimates

INTRODUCTION

- Pilbara Minerals (PLS) is an ASX listed minerals explorer and developer. Its flagship project is the 100% owned Pilgangoora lithium project in WA which is undergoing a DFS. The company also is seeking to mine the Tabba Tabba tantalum project also located in WA. PLS is headquartered in Perth.

Figure 1: Location of PLS's Projects

Pilgangoora is located in the Pilbara, 82km from Port Hedland.



Source: Company; Foster Stockbroking estimates.

PILGANGOORA LITHIUM PROJECT (PLS 100%)

Background

- In April 2014 PLS signed an agreement to acquire Pilgangoora Lithium Project (Pilgangoora) from Global Advanced Metals Wodgina Pty Ltd (GAMW). As part of the purchase, GAMW has first right of refusal to purchase tantalum or lithium produced from Pilgangoora, and a 2.5% NSR is payable by PLS on sale or disposal of mineral or metallic products not sold to GAMW. Pilgangoora covers three mining leases and two exploration licenses, over an area of 31 km².
- Pilgangoora is located 55km from the Tabba Tabba project and is 82km south-east from Port Hedland, which has a population of 20,000 and is a major regional hub providing services and infrastructure support to the mining sector, notably iron ore. The project is also 25km NE from the Wodgina Tantalum mine owned by GAMW and located along strike from Altura Mining's lithium deposit.



- We understand the rationale for GAMW to sell Pilgangoora was its desire to focus on downstream operations such as manufacture and chemical processing of refined products, and less on mining. GAMW is a subsidiary of Global Advanced Metals (GAM), a global vertically integrated leader in tantalum production and refining. Pilgangoora contains tantalum in addition to lithium, and has had historical mining of tantalum since 1947, hence GAM's initial attraction to the project.

Geology – Large Open Pit Access Orebody Rich in Lithium

- Since PLS commenced drilling in 2013, Pilgangoora has evolved into a world class large hard rock orebody rich in high grade lithium (Li). The lithium is predominantly present in the orebody as the mineral spodumene, a pyroxene mineral with the formula $\text{LiAl}(\text{SiO}_3)_2$.
- Pilgangoora has a series of dykes and veins which dip 45° to 60° , thickening slightly with depth. It is located in a greenstone area which has been intruded by igneous rock pegmatites. Although pegmatites can be large e.g. over 100m in length and 200-300m in width, mineralisation among the pegmatites is usually restricted to alteration zones, and comprises varying amounts of mostly spodumene, tantalite, cassiterite and minor presence of lepidolite.
- Mineralisation begins at surface and to date has extended to as deep as 194m, with thicknesses of intersections ranging from 1 to 53m. Additionally, the orebody is wide, with drilling intersecting mineralisation up to 700m across where the Western, Central, and Eastern Pegmatite zones run essentially in parallel. Pegmatite widths vary, averaging 10 to 30m in Western Pegmatite and 2-15m in the Eastern Pegmatite.

Open pit orebody rich in lithium present as spodumene.

JORC Resource 80.2Mt containing 2.5Mt LCE

- PLS's JORC Resource estimate for Pilgangoora is 80.2Mt at 1.26% Li_2O for 1,008kt Li_2O (lithia, or lithium oxide). This is equal to 2.5Mt of lithium carbonate (Li_2CO_3) equivalent (refer Appendix for conversion factors). The resource was based on 411 drill holes - 100 drilled by GAMW and Talison Minerals (from which GAMW was founded) during 2008-2012, and PLS's own 302 hole campaign in 2014/2015 – for a total of 41,477m. Drill hole spacing varied from 50 to 200m over a strike length of ca. 4.5km. Quality of the resource is high, with over half residing in the Indicated category.
- Given the varied distribution characteristics between lithium and tantalum in the orebody, PLS reported the JORC Resources comprising different ore sizes for the lithium and tantalum components, all based on a 100ppm Ta_2O_5 cut-off.

JORC Resource of 80.2Mt for 2.5Mt of contained lithium carbonate equivalent (LCE) at grade of 1.26% Li_2O .

Figure 2: Pilgangoora JORC Resource – Lithium Component

Category	Ore (Mt)	Li_2O %	Li_2O kt	LCE kt	Fe_2O_3 %*
Indicated	35.7	1.31	469	1,161	0.63
Inferred	44.5	1.21	539	1,332	0.73
Total	80.2	1.26	1,008	2,493	0.69

100ppm Ta_2O_5 cut-off grade.

**Factored not raw.*

Source: Company; Foster Stockbroking estimates.

Figure 3: Pilgangoora JORC Resource – Tantalum Component

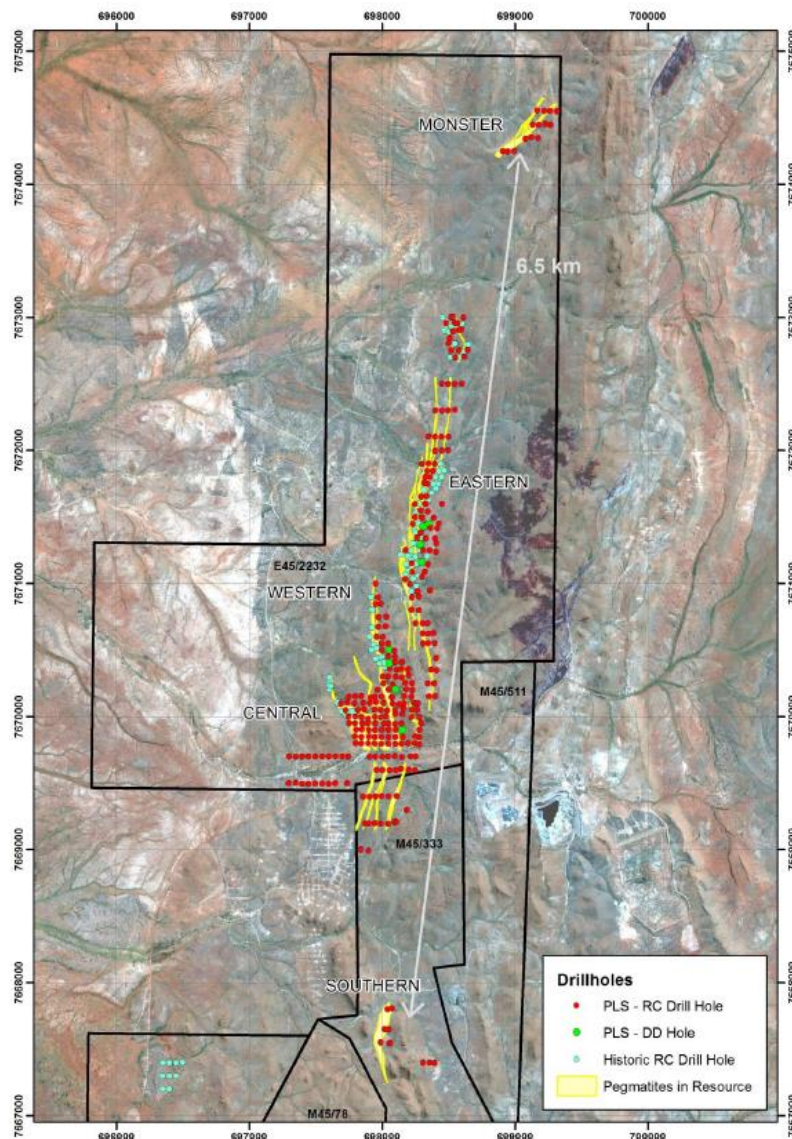
Category	Ore (Mt)	Ta ₂ O ₅ ppm	Ta ₂ O ₅ Mlbs	Ta ₂ O ₅ t
Indicated	17.9	182	7.2	3,255
Inferred	24.3	205	11.0	4,995
Total	42.3	195	18.2	8,250

100ppm Ta₂O₅ cut-off grade.

Source: Company; Foster Stockbroking estimates.

- PLS has also calculated from grade-tonnage curves that using a Li₂O cut-off grade of 1%, a total **JORC Resource of 59.3Mt at 1.44% Li₂O for 855kt of Li₂O, or 2.1Mt LCE** is derived, highlighting a still significant high-grade lithium resource. The company is also undertaking step out and infill drilling to improve both the quality of the resource categories by converting inferred to indicated, as well increasing the overall resource size.

Figure 4: Pilgangoora Resource Schematic



Source: Company; Foster Stockbroking estimates.



Exploration target of 100-110Mt containing 3.0 to 4.1Mt of LCE.

Exploration Target Implies Potential to Increase Resource by 70%

- There is potential for further resource growth through infill and step out drilling, as Pilgangoora remains open along strike and down dip. PLS is targeting 6km additional strike across both south and northern extensions vs the current 4.5km encompassing the existing resource. The resource remains open at depth especially at the Eastern Pegmatite zone.
- Exploration targets include the satellite prospects Monster – located 2km north of the Eastern and Western Pegmatites where drilling has returned lithium mineralisation at similar widths and grades; and at Western Domain prospect – 400m west of the Central Pegmatite Area.
- After analysis of drilling and exploration results to date, PLS has defined an Exploration Target of 100 to 110Mt at 1.2-1.5% Li₂O and 175-225ppm Ta₂O₅. This could add up 1.7Mt of contained Li₂O, or 4.1Mt of LCE, to the existing Pilgangoora resource, a ca. 70% increase.

Figure 5: Pilgangoora Exploration Target

Pegmatite Area	Ore Mt	Li ₂ O %	Ta ₂ O ₅ ppm	Li ₂ O t	LCE t
Northern	35 to 40	1.2 to 1.5	200 to 250	420 to 600	1,039 to 1,484
Central & Southern	65 to 70	1.2 to 1.5	150 to 200	780 to 1,050	1,929 to 2,597
Total	100 to 110	1.2 to 1.5	175 to 225	1,200 to 1,650	2,968 to 4,080

Source: Company; Foster Stockbroking estimates.

Met tests so far have resulted in low iron spodumene concentrate which should be acceptable for the glass and ceramics market.

Metallurgy – Low Iron Content a Big Plus: Product Potential for all Markets

Metallurgical tests positive to date – Low iron critical for glass & ceramics

- PLS has supplied bulk Pilgangoora samples various parties for metallurgical testwork and evaluation. The most important work has been undertaken by ANZAPLAN and Nagrom.
- ANZAPLAN is a German specialist in high purity industrial and strategic minerals. From bulk samples, it produced spodumene concentrate using simple flotation and magnetic separation. Flotation recoveries were in excess of 90% at a concentrate grade of 5.7% Li₂O and 0.37% Fe₂O₃.
- Magnetic separation after flotation reduced Fe₂O₃ to 0.11%. This meets specs of typical glass-grade spodumene products, which require low iron oxide content in range 0.06% to 0.17% Fe₂O₃. Iron oxide is the most critical impurity in spodumene for the glass and ceramics industry.
- After magnetic separation, the spodumene was screened in to 100-300 um fraction, which is a typical particle size distribution in glass applications. It resulted in final concentrate containing 6.5% Li₂O and 0.09% Fe₂O₃, the iron oxide at lower end of range and spodumene at high end for typical glass production.
- **Nagrom** produced a flow sheet for the recovery of both tantalum and lithium. It involved removing gangue (chiefly SiO₂) by gravity (wet tables) and regrind of middlings to liberate tantalum. The flowsheet produces two concentrates – tantalum and lithium. Results to date show a primary tantalum concentrate can be produced by simple gravity, while lithium can be upgraded by flotation and magnetic separation, essentially confirming ANZAPLAN's work. Further met work will determine both optimum particle size and flotation chemistry.

Coarse particles imply low intensity grinding

- PLS estimates the coarse-to-fine spodumene ratio estimated to be 4:1, with coarse particles defined as >1cm. This size is being targeted making it easier and more economic to beneficiate especially in requiring less energy intensive comminution.



- Other parties located in China, North America, and South America have also performed tests, including downstream conversion of Pilgangoora spodumene concentrate to lithium carbonate and hydroxide. These products are used in eventual end products such as batteries, greases, fluxing agents, and pharmaceuticals.

Two Products to Cover the Whole Li Market

- We anticipate Pilgangoora spodumene concentrate to meet the specs of the entire range of lithium end markets. We expect PLS to produce two products – a 6.5% Li₂O grade spodumene which is a technical or chemical grade (TG or CG) mostly for the glass and ceramics markets, which typically requires less than 0.1% Fe₂O₃ and Li₂O at least 6.5%. The other would be a 6.0% Li₂O spodumene product being battery or industrial grade (BG or IG) for all other markets including consumer electronics and high-growth electric vehicles.

Significant Offtake Interest Already More Than Covers Planned Output

- Unsurprisingly, given burgeoning demand from the battery market and a relative lack of new short term supply, PLS has attracted interest from a number of parties in China, North America, SE and Far East Asia encompassing the mining and downstream processing of lithium. It has already entered into ten MoUs with companies from Japan, China, South Korea, Europe, and North America comprising:

Major offtake interest to date more than covers planned output. MoUs to date with various parties across the globe including lithium processors, producers, and trading houses.

- **Two leading Chinese lithium carbonate producers** for more than 70% of planned capacity output, envisaging first delivery of spodumene concentrate in 2017 and a potential 20-year plus supply.
- **A distribution agreement for low-iron spodumene offtake with Shantou Fancy Mining Industry Co Ltd (SFM)**, affiliated with Chinese Fancy International Resource Corporation Ltd, for appx 25% of output. SFM is a leading Chinese processor and supplier of spodumene to the Chinese glass and ceramics industry. SFM will be PLS' exclusive distributor of spodumene to the glass, ceramics, foundry, and metallurgical manufacturing industries. It excludes direct sales to lithium chemical converters and producers.
- **A North American company and a Japan trading group** who both supply a range of minerals to the glass and ceramics industry and seek low iron spodumene concentrate.
- **An international raw materials trading house** for low iron spodumene. This party supplies the glass, ceramics, metallurgical, and metal industries. The MoU will work towards and an exclusive European distribution agreement.
- **Four Chinese lithium producers** for chemical grade lithium.
- We expect GAMW will purchase the tantalum offtake.

Favourable Pricing Environment Benefits PLS

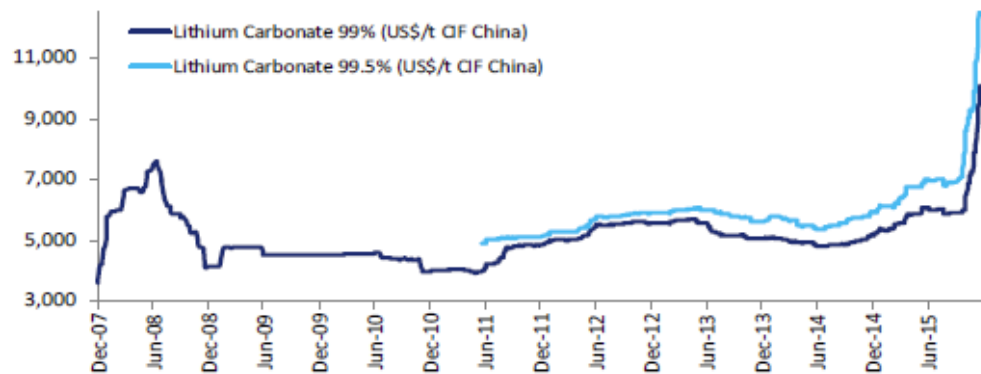
- **Pricing power.** We expect PLS to have some flex in negotiating favourable pricing given the current strong lithium price environment. Prices for lithium are often quoted on LCE basis, while for hard rock mineral producers spodumene prices also quoted. Pricing is usually set by direct negotiation and hence is usually opaque. It is dependent on product quality such as Li₂O grade and deleterious element levels.



- LCE prices have recently been reported to be US\$12,000/t of LCE, with a greater than 20% YoY increase. Some investment banks forecast that prices could rise to US\$7,000/t in 2017 as lack of sufficient large new projects appear and concerns that major integrated supplier Albemarle will sell less product to third parties. North American FMC Corporation announced 15% increase for its lithium products (chloride, carbonate, hydroxide etc) except specialty organics in all global regions effective October 2015. FMC cited market growth outpacing supply capabilities.

Increase in lithium prices reflects tight market and lack of major new supply.

Figure 6: LCE Prices (US\$/t)



Source: Asian Metals; Citi; Foster Stockbroking estimates

Pilgangoora DFS underway and timeline

- Given the large orebody and its high grade signalling a world class project, as well as the positive outlook for lithium demand and current strong price environment, PLS is already working towards a DFS for Pilgangoora, having commenced a PFS in mid-CY2015. The company is seeking to release PFS results by early March 2016 (inclusive of a maiden reserve), and a DFS by mid-CY2016 based on a 2Mtpa throughput.
- We expect the company to completing financing, permitting – including native title agreements, environmental, and mining approval - and binding offtake by mid-CY2017. We believe financing should not prove difficult – unlike for resources in general - given the specifics of strong demand for lithium, need for new supply to come on soon, and the strong price environment. Overlaying these themes is the world class nature of Pilgangoora which adds to the attractiveness.
- We expect production commencing early CY2018.



PILGANGOORA VALUATION AND CASHFLOWS

Pilgangoora Unrisked Valuation of A\$811M

- We have derived an unrisked pre-tax NPV₁₀ of \$811M using a DCF model for Pilgangoora, comprising \$623M based on existing JORC Resource and \$187M for the Exploration Target. We have used some approximate and conservative assumptions which we expect will be further refined post the company's release of its PFS results.

Our Key Assumptions:

- 45 year life of mine;
- Mining inventory based on two-thirds of the JORC Resource and two-thirds of Exploration Target being mined;
- Average head grade of 1.26% Li₂O for the JORC Resource and 1.35% for Exploration Target;
- Mining rate of 2Mtpa, commencing CY2018, increasing to 3Mtpa in CY2027;
- Pre-production capex of A\$180M, including overburden removal.
- Further project capex of A\$540M (real terms) over LOM;
- Sustaining Capex of A\$5M (real terms) p.a. over LOM;
- Long-term real price of US\$425/t for BG spodumene (6.0%) and US\$625/t for TG (6.5%) low-iron;
- Annual production of 275kt spodumene concentrate at 2Mtpa rate, increasing to 420kt at 3Mtpa, split 80% BG and 20% TG;
- LCE production of 42kt (2Mtpa) increasing to 63kt at 3Mtpa;
- Long-term A\$ = US\$0.73;
- 10% WACC, cashflows modelled in nominal terms with long-term inflator of 2.0%.
- C1 costs of US\$172/t of spodumene concentrate, or US\$2,544/t LCE, in 2020;
- C3 costs of US\$237/t spodumene;
- A blended realised spodumene price of US\$465/t – implying a cash margin of US\$200/t;
- Tantalum produced treated as credit;
- 65% lithium recovery.

Pilgangoora unrisked valuation of A\$811M.

We assume initial 2Mtpa mining rate, pre-production capex of A\$180M, and initial LCE production of 42ktpa.

We expect project to ramp up to 3Mtpa at later stage.

Scope to enhance NPV via higher throughput

- Given the large resource size, we think it likely that Pilgangoora will be likely upgraded to a larger plant (e.g. say 3Mtpa) to enhance both throughput and NPV at a later stage, especially if global demand for lithium grows over the next ten years at projected CAGR of 16%.



Figure 7: Forecast Pilgangoora Cashflows FY16-FY21

Y/e June	Unit	2016	2017	2018	2019	2020	2021
Commodity assumptions							
Spodumene conc. 6.5% Li ₂ O - CG/TG	US\$/t	625	625	625	625	625	638
Spodumene conc. 6% Li ₂ O - BG/IG	US\$/t	427	432	435	429	425	434
Tantalite	US\$/lb	60	60	60	60	61	62
A\$	US\$	0.72	0.69	0.69	0.70	0.71	0.72
Ore mined	Mt	0.0	0.0	1.0	2.0	2.0	2.0
Production							
Spodumene 6.5% Li ₂ O - CG/TG	kt	0.0	0.0	25.8	38.7	51.6	51.6
Spodumene 6% Li ₂ O - BG/IG	kt	0.0	0.0	118.8	167.7	223.6	223.6
Total Spodumene concentrate	kt	0.0	0.0	137.6	206.4	275.2	275.2
Li ₂ O - CG/TG	kt	0.0	0.0	1.7	3.4	3.4	3.4
Li ₂ O - BG/IG	kt	0.0	0.0	6.7	13.4	13.4	13.4
Total Li₂O	kt	0.0	0.0	8.4	16.8	16.8	16.8
LCE - CG/TG	kt	0.0	0.0	4.1	8.3	8.3	8.3
LCE - BG/IG	kt	0.0	0.0	16.6	33.2	33.2	33.2
Total LCE	kt	0.0	0.0	20.7	41.5	41.5	41.5
Tantalite mineral	t	0.0	0.0	103.1	206.1	206.1	206.1
Cashflow:							
Revenue:							
Spodumene 6.5% Li ₂ O - CG/TG	A\$M	0.0	0.0	23.4	46.0	45.3	45.6
Spodumene 6% Li ₂ O - BG/IG	A\$M	0.0	0.0	70.0	135.5	133.6	133.3
Total spodumene conc sales (A)	A\$M	0.0	0.0	93.4	181.5	178.9	179.9
Blended P'goora Spodumene Price	US\$/t	0	0	471	465	465	474
Unit costs per concentrate sold							
C1 costs	US\$/t	0.0	0.0	158	170	172	165
C2 costs	US\$/t	0.0	0.0	221	222	224	229
C3 costs	US\$/t	0.0	0.0	246	241	237	242
C3 costs (B)	A\$M	0.0	0.0	48.6	92.2	91.9	94.0
Pre-production capex (C)	A\$M	0.0	90.0	90.0	0.0	0.0	0.0
Chng in working capital (D)	A\$M	0.0	0.0	9.3	8.8	0.2	0.1
Pre-Tax Net Free Cashflow (A-B-C-D)	A\$M	0.0	-90.0	-54.5	80.4	87.2	85.8

Source: Foster Stockbroking estimates.

COMPARATIVE ANALYSIS - PILGANGOORA POSITIONED AS EMERGING WORLD CLASS ASSET vs PEERS

Comparing PLS and Pilgangoora with peers

- Lithium supply is sourced from two major styles of deposits – brines and hard rock minerals. In brines, lithium is present as a concentrated salt solution, and is pumped out into evaporation ponds where it is further concentrated. Lithium carbonate is typically an end product. By-products can include potassium and boron salts. Control of Mg content and evaporation rate are key factors.
- In hard rock, lithium is present as a mineral (typically spodumene) and needs to be extracted by mineral processing techniques typically involving grinding, crush, and gravity, flotation and/or magnetic separation. Iron is the most common deleterious element that requires control.

- Brines tend to have higher capex and longer lead times than hard rock deposits, but usually lower operating costs given the evaporation process, hence dominating the bottom end of the cost curve. A third potential source of supply – sedimentary/clay deposits – exists, but to date metallurgical issues, low grades, and mica have all prohibited these sources to come into production.

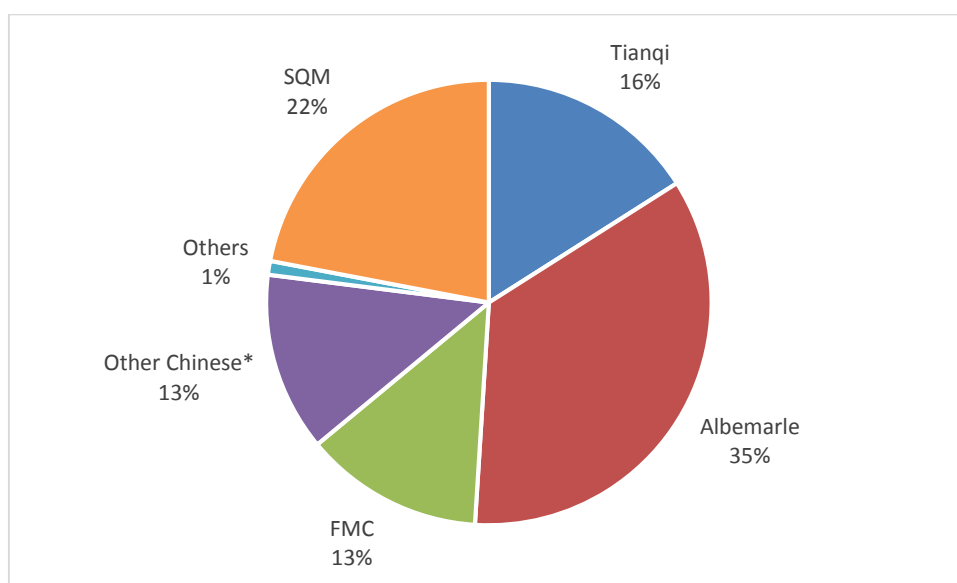
Figure 8: Comparison of Costs for Different Lithium Sources

Type	Costs US\$/t LCE
Brines	2,000-3,000
Clays/Sedimentary	2,500-3,000
Spodumene	2,000-5,000

Source: Companies; Foster Stockbroking estimates.

- **None of the major producers are pure lithium plays.** The lithium industry is highly concentrated, with about 90% of lithium production supplied by four producers – Albemarle, SQM, FCM, and Sichuan Tianqi. Appx. 15% of Albemarle’s revenue derives from lithium, with other revenues mostly from specialty bromine, phosphorous and alumina metal and compounds. Only 12% of SQM’s revenue is from lithium, its other major commodities being potassium, iodine, and nitrates. For FMC lithium contributes only 5% of sales.

Figure 9: Global Lithium Production By Supplier (LCE basis) 2015



Source: Companies; Foster Stockbroking estimates.

New Supply to be mostly from Hard Rock

- With the increasing demand for lithium over the next several years from higher demand from electric vehicles that is placing upwards pressure on price, there are new projects coming onstream. However most of the new supply is expected to come from new entrants. One reason is that Albemarle’s and SQM’s brine operations have long lead times, as well as permitting (Chile) and sovereign risk (Argentina) issues.
- In hard rock, Albemarle’s and Sichuan Tianqi operate the Greenbushes mine – the world’s largest Spodumene deposit - via their JV Talison (51% Tianqi, 49% Albemarle). However production has been essentially steady during rising lithium prices and there is uncertainty over



whether it will - or can – materially expand production. It produced 50kt of LCE in 2014 (Source: Albemarle).

- With the exception of Orocobre’s recently commissioned Olaroz lithium brine project and increase in production from Albemarle’s La Negra (Together adding ca. 33kt LCE), we expect all new major supply over the next several years to come from hard rock mineral supply which may add 330kt LCE by 2020.

Not Just the Cost Curve – Hard Rock Can Maximise NPV by Short Lead Time

- The cost curve is only one side of story. Short lead time and project capex is the other. With the expected high price environment over the next few years the developers with new hard rock projects are best placed to take advantage of high prices and maximise NPV, whereas the brine developers - given lengthier lead times – may miss this window.

PILGANGOORA BEST OF THE NEW HARD ROCK PROJECTS ACROSS KEY METRICS

- Figures 10 and 11 compare the new emerging hard rock companies. It can be seen that PLS’ Pilgangoora exceeds the average of its peers’ key parameters on many counts:
 - **The largest JORC Resource of contained LCE from a single project;**
 - **The 3rd highest Li₂O grade (or equal 2nd highest if the high grade 1.44% component is included);**
 - **Lower than average capex;**
 - **Lower than average cash costs;** and
 - **Potentially highest production output.**
- Given these positive comparatives metrics it is no surprise the stock trades at a premium based on its EV/t of LCE of \$144 vs the peer average of \$104.
- Additionally to date Pilgangoora has shown to be metallurgically clean with low iron concentration and no mica problems. For example, Nemaska’s Whabouchi cannot sell premium concentrate to the glass and ceramics sector because of high iron content, while Mt Cattlin (GXY and GMM) has had mica and product reliability issues, requiring refurbishment and modifications to plant.

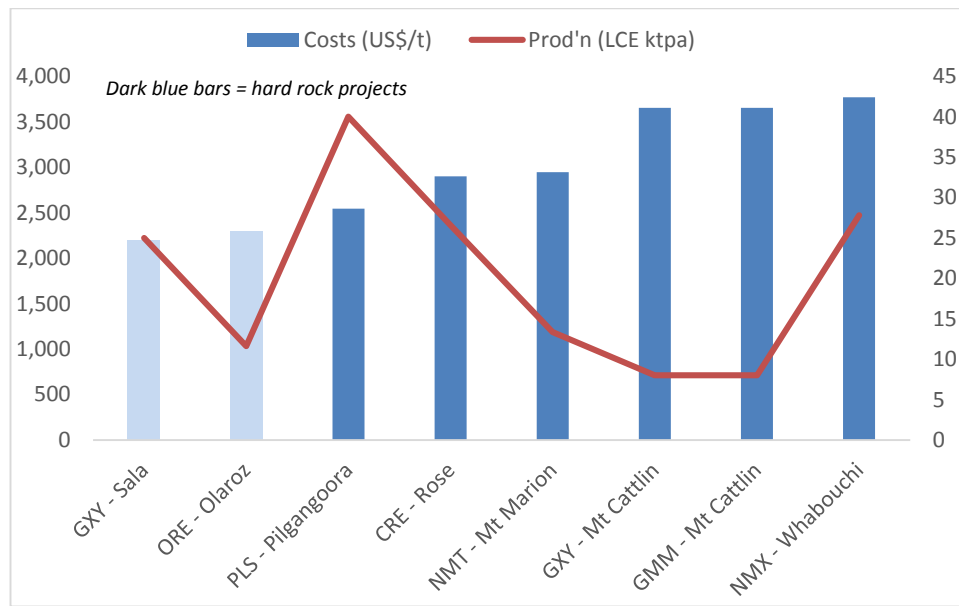
Of the new hard rock entrants, PLS’s Pilgangoora has 1) The largest contained LCE resource, 2) The lowest cash costs, and 3) Highest production output.

Figure 10: Comparison of Emerging Hard Rock* Lithium Companies

Company	Code	Price	EV A\$M	LCE Mt	Li ₂ O %	EV/LCE \$/t	Costs US\$/t LCE	Prod LCE kt	Capex US\$M	Target	Project	Stage	Location
Galaxy Resources	GXY	\$0.17	267	1.7	0.2%	160	2,562	33	na	2016	Mt Cattlin, Sal Da Vida, James Bay	Development	WA, Argentina Canada
Pilbara Mining	PLS	\$0.34	237	1.7	1.3%	144	2,544	40	126	2017	Pilgangoora	Feasibility	WA
General Mining Corp.	GMM	\$0.27	112	0.6	1.2%	196	3,654	8	na	2016	Mt Cattlin, James Bay	Development	WA, Canada
Nemaska Lithium	NMX	\$0.41	96	1.2	1.5%	77	3,771	28	365	2018	Whabouchi	Feasibility	Quebec
Altura Mining	AJM	\$0.58	55	0.8	1.2%	71	na	0	na	na	Altura P’goora	Feasibility	WA
Neometals	NMT	\$0.16	47	0.4	1.4%	131	2,945	13	na	2016	Mt Marion	Development	WA
Critical Elements Corp	CRE	\$0.18	25	0.9	0.9%	29	2,900	27	269	na	Rose	Feasibility	Quebec
Glen Eagle Resources	GER	\$0.08	5	0.2	1.0%	23	na	15	45	na	Authier	Feasibility	Quebec
Average			105	0.9	1.1%	104	3,063	21	201				

Source: Companies; Foster Stockbroking estimates. Equity interests shown.
*GXY figures include Sal de Vida brine project

Figure 11: Comparison of Companies' Emerging Lithium Projects

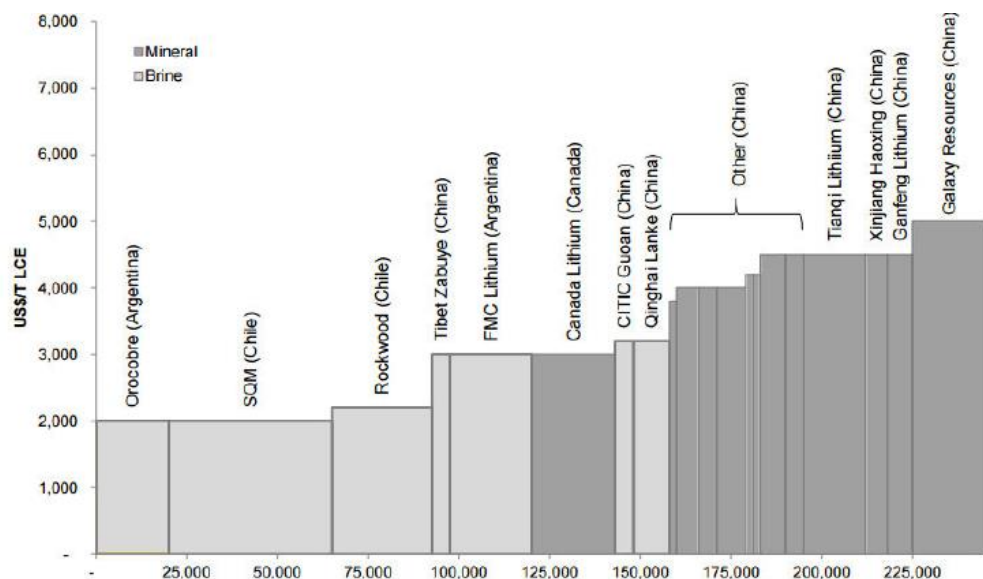


Source: Companies; Foster Stockbroking estimates.
Production shown is company's equity share of project.

PILGANGOORA LOWEST COST OF EMERGING HARD ROCK PRODUCERS...

- Figure 11 show that Pilgangoora is the lowest cost of the emerging hard rock projects at US\$2,544/t vs US\$2,900-US\$3,800/t for peers. The size and grade no doubt assists in Pilgangoora's positioning on the cost curve.
- Indeed, from Roskill's industry costs curve, our estimate of cash costs of US\$2,544/t for Pilgangoora would place it well in the bottom half of the cost curve, below the higher brine cost operations (Figure 12).

Figure 12: LCE Industry Cash Cost Curve



Source: Roskill; Foster Stockbroking estimates.

Pilgangoora's cash costs should place it well inside the bottom half of the industry cost curve.



Pilgangoora's production of 42ktpa LCE is the largest of emerging new producers, and we estimate will rank second to that of existing hard rock producers.

...AND THE LARGEST BY PRODUCTION

- Figure 11 also shows that Pilgangoora, at a 2Mt/pta rate, would be the largest of the emerging new producers, inclusive of the brine projects, with 42kt/pta of LCE vs 25kt for the next largest projects.
- **Potential to be 2nd largest producer.** We note that Greenbushes produced 100kt LCE in 2014 (source: Albemarle). We expect Pilgangoora could be the 2nd largest hard rock lithium producing mine, especially as it has the potential to go to 3Mt/pta rate which it would then produce 63kt LCE.

HIGH DEGREE OF CORPORATE APPEAL FROM PILGANGOORA'S ATTRIBUTES

- **We expect PLS to attract the attention of major industry players in the lithium markets, given the key attributes Pilgangoora possesses:**
 - **Low iron concentration – ability serve all customer markets;**
 - **High lithium grade (1.28% or 1.42% for the high grade resource);**
 - **Large long life resource (> 20 years);**
 - **Relatively low capex;**
 - **Low position on hard rock cost curve;**
 - **Low sovereign risk; and**
 - **No mica issues.**
- We note that there is high degree of vertical integration in the industry, especially among the large players such as Albemarle, FMC, and Tianqi. Albemarle and Tianqi own Greenbushes which is the only Tier 1 hard rock asset in production, with a 50 year life and grade over 2.8%-3.3% Li₂O.

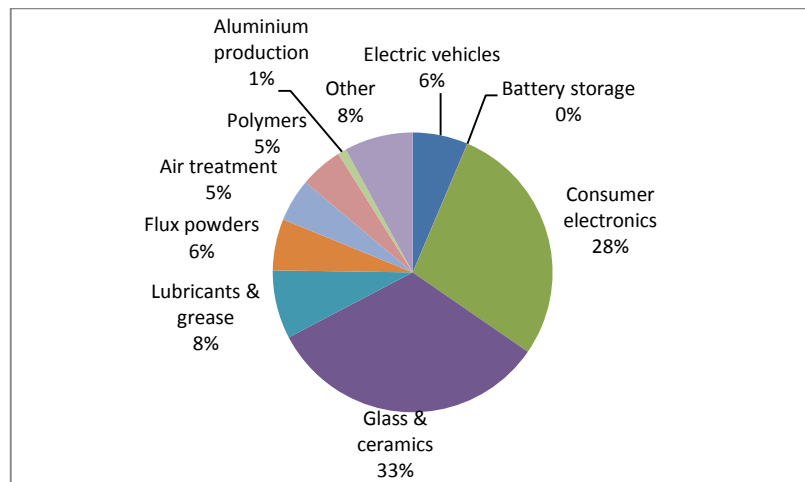
LITHIUM MARKET ESTIMATED AT 150kt-200kt LCE. TO GROW BY UP TO 3x BY 2025

- **Market size of lithium in 2015 has been estimated to be ca. between 150-200kt LCE** according to various sources, with value of US\$1,400M. It comprises intermediate and specialist products, of which lithium carbonate is the largest, followed by lithium chloride.

Market segments: **Battery segment the largest...**

- Lithium and its compound have several industrial applications including glass and ceramics, grease and lubricants, and batteries for consumer electronics and electric vehicles (EV). **The largest segment is battery** - where lithium is used in lithium ion batteries - **comprising 34% of demand, divided into consumer electronics (28%) and electric vehicles (6%)**. Within consumer electronics mobiles are the largest component, followed by portable PCs, tablets, power tools, and digital cameras.
- **Glass and ceramics comprise 33%**, where lithium is used as a flux in their manufacture, lowering the temperature required, reducing energy costs, and improving the quality of glass including its thermal shock resistance.

Figure 13: Lithium Demand by Segment



Source: Company; Albemarle; FMC; Foster Stockbroking estimates.

Electric vehicles (EVs) the highest growth segment

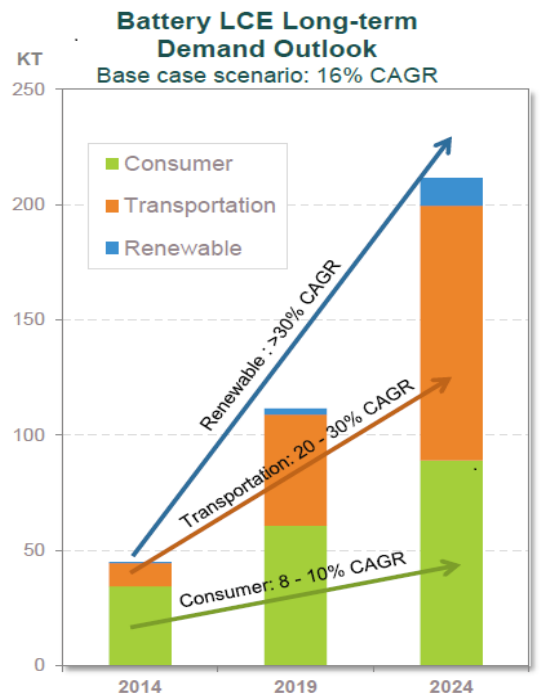
- **Growth in lithium demand is being forecast by various sources to be 10-12% CAGR from 2014 to 2020.** The chief reason for the double digit growth rate over the next several years is the demand from the electric vehicles (EV) segment which requires lithium for batteries and electric motors.
- **The high growth in the EV segment is expected to be ca. >50% CAGR** by some investment banks. The next highest growth segment is consumer electronics at 4-5% CAGR, driven mostly by increasing smartphone penetration in developing world. The other segments such as glass and ceramics are growing in line with GDP.
- As a result of this growth, EVs may account for 30% of lithium demand in 2020 vs only 6% currently. 70M cars were sold globally in 2014, of which less than 3% or <2.1M were EVs. However EVs are expected to grow by ca. 27% CAGR to 2020, totalling ca. 9M. In 2025 EVs are expected to comprise 22% of auto market. It has been estimated that every 1% penetration of the auto market by EV equates to appx. 7kt LCE, or 4% increase in existing lithium demand, assuming 175kt LCE annual rate.
- The worlds’ major automakers are embracing and releasing EV models with Nissan, Mitsubishi, Tesla, Chevrolet, Toyota and BMW having the leading selling EVs in the market in 2014. Major Li-ion battery manufacturers include Samsung, LG, Panasonic, Sony, while Foxconn and Tesla are also investing in battery manufacture.

CONCLUSION: UP TO 300kt LCE DEMAND FROM BATTERIES ALONE

An extra 100kt to 300kt of LCE will be in demand in 2025 due mostly to the growth in the battery segment from EVs, consumer electronics, and storage.

- By 2025, the additional LCE demand from batteries in EVs alone has been estimated by the most conservative forecasters to be **100kt**, a 50% increase on current total LCE production, assuming on average 25kg of LCE in each new EV.
- Albemarle expects a ca. **200kt** lift in LCE from 2014 to 2024 from battery usage across EVs, consumer electronics, and renewables storage (Figure 14).
- The most bullish forecast we have seen are from major global investment banks, some which factor **300kt** additional LCE from EVs alone.

Figure 14: Lithium Use in Various CE and EVs



Source: Albemarle.

SUPPLY SIDE MAY REQUIRE TWO TO SIX GREENBUSHES MINES

Increase in Li demand over next ten years will require the equivalent of two to six Greenbushes mines, ensuring that Pilgangoora’s production will be amply absorbed.

- A 100kt to 300kt increase in LCE demand by 2025 would mean an additional two to six Greenbushes mines to come onstream within ten years.
- Assuming all the projects shown in figure 10 come onstream, this would be an additional 164kt of LCE which would be satisfactory if the most conservative scenario (additional 100kt LCE demand) panned out, but less so if the mid case (200kt additional LCE demand) or bull case (300kt additional) occurred. Also some of the projects have timing, financing, sovereign risk, and metallurgical issues.
- We expect PLS to be well positioned, and see no problem in its production being absorbed, as already witnessed by its MoU for offtakes.

Battery costs continue to fall, making EVs more attractive

- Battery costs are declining, having reduced appx 14% from US\$1,000/kWh in 2007 to \$410/kWh in 2014 and US\$250-\$350/kWh now. US\$150/kWh is seen as point of mass commercialisation of EV. Tesla is targeting \$125/kWh by 2020, Also electric vehicle range is expected to increase, with Renault aiming for double the range by 2020.

Lithium only a small cost of EV batteries

- Lithium is estimated to comprise only 2% of total Li ion battery cost. The cost of Li metal in a typical car battery is estimated to be US\$32.

Energy Storage

- Upside risk but at early stage is that lithium batteries can manage short term fluctuations, increase reliability and reduce grid congestion. Applies to both conventional and renewable energy sources. Tesla and Enel are already examining rollout of energy storage systems in USA and RSA.

**TABBA TABBA TANATALUM PROJECT (PLS rights to 100%)****Agreement with GAM for PLS to mine**

- In 2013 GAMW, which owns the Tabba Tabba tenements, entered into a mining and offtake agreement with the Tabba Tabba JV (between PLS and Nagrom Mining Pty Ltd) to develop and mine the deposit. In September 2015, PLS agreed to purchase Nagrom's interest, giving it 100% of the right mine Tabba Tabba. Consideration to Nagrom comprised \$2M and release of any loans plus \$1.3M payable to delivery of first tantalite concentrate, as well as up to a maximum of 20M options, which are subject to milestones.

Tabba Tabba tantalum project.

Resource

- Tabba Tabba has a JORC Resource of 318kt at 950ppm Ta₂O₅ (tantalite, or tantalum pentoxide), equivalent to 666k lbs of Ta₂O₅, with 79% in the Measured and Indicated category. The resource was estimated from historical exploration as well as that undertaken by PLS and Nagrom.

Figure 15: Tabba Tabba Reserves

Category	Ore (kt)	Ta ₂ O ₅ ppm	Ta ₂ O ₅ klbs
Proved	32	1,420	100.1
Probable	101	1,249	278.1
Total Reserves	133	1,290	378.3
Measured	35.1	1,380	107.1
Indicated	187.0	1,020	418.9
Inferred	96.0	660	140.2
Total Resources	318.1	950	666.2

Cut-off 400ppm Ta₂O₅.

Source: Company; Foster Stockbroking estimates

DFS – 19 month life but high IRR

- A DFS was completed by PLS and Nagrom in 2014. While only 19 months life-of-mine, IRR was 162% with capex mostly sunk. Mining inventory used for DFS is 80% comprised of reserves, 14% of inferred, and 6% of measured and indicated ex-reserves. Site access is via the sealed Marble Highway and then 25km along the Wollyereen station dirt road. Mining is to be conventional truck and shovel, drill and blast, open cut, with a single pit down to 40m depth and strip ratio 3.33. Processing is to be by conventional gravity circuit, crushing, grinding, HMS, and spirals. Infrastructure includes accommodation village, water supply from existing bores and dams, workshops, offices, and diesel power plant.

Figure 16: Tabba Tabba DFS

Parameter	Unit	Value
Project revenue	A\$M	30.2
EBITDA	A\$M	16.0
Ore throughout	ktpa	118
Ta ₂ O ₅ recovery	%	82%
LOM	months	19
LOM production	klbs	364
Minimum concentrate grade	%	5%
NPV ₁₀	A\$M	14.4
IRR	%	162%

Source: Company; Foster Stockbroking estimates.



- As part of mining Tabba Tabba, PLS has a life-of-mine (LOM) five year fixed price plus CPI mining and offtake agreement with GAMW. A key term is that Tabba Tabba is to supply a minimum 5% Ta₂O₅ grade concentrate at mine gate to GAM. PLS has not disclosed the price for Ta₂O₅ that has been agreed. We note that the tantalum market has been weak recently.

Commissioning Problems Delay Production

- PLS has suspended commissioning of Tabba Tabba due to the design throughput rate not being achieved, with ball mill and jigs being deficient and requiring repairs and modifications. This has delayed Tabba Tabba receiving its Operating Permit. The company is undertaking an engineering assessment of the exact work required, cost, and time frame to implement any changes. PLS may likely seek any recovery of costs from Nagrom, which designed, constructed and installed the plant. At this stage we expect modification costs and time to implement will be modest, and that commissioning will recommence by mid-CY2016. However we believe that PLS is examining all options for Tabba Tabba.

Tabba Tabba Valuation A\$15.2M unrisks

- We have modelled Tabba Tabba using a DCF with similar assumptions as outlined in the DFS by PLS. Our price assumption for tantalite is US\$60/lb, equating to appx. above A\$86/lb (assuming US\$0.70). We assume Tabba Tabba will now commence production mid CY2016, assuming that assessment of modification required and their implementation would be undertaken by then. We also assume no additional cost to be incurred by PLS, assuming that Nagrom will be bearing these costs. We have arrived at an unrisks NPV of A\$15.2M unrisks vs A\$14.4M in that of the DFS.

We value Tabba Tabba at A\$15m unrisks.

Figure 17: Forecast Tabba Tabba Cashflows

Y/e June	Unit	2016e	2017e	2018e
Commodity assumptions				
Tantalite	US\$/lb	60.00	60.00	60.00
A\$	US\$	0.72	0.70	0.70
Ore mined	kt	0.0	118.0	43.9
Tantalite production	klbs	0.0	276.2	87.9
Tantalite revenues	A\$M	0.0	23.8	7.6
C1 costs	US\$/lb	0.0	21.2	26.0
C2 costs	US\$/lb	0.0	24.2	29.0
Total C3 costs	US\$/lb	0.0	24.2	29.0
Total C3 costs (B)	A\$M	0.0	9.6	3.7
Chng In Working Capital (C)	A\$M	0.0	2.0	-2.0
Pre-Tax Net Free Cashflow (A-B-C)	A\$M	0.0	12.3	5.9
NPV (10% WACC)	A\$M	\$15.2		

Source: Company; Foster Stockbroking estimates

OTHER PROJECTS: NON-CORE

- Strelley Project (PLS rights to 100%).** PLS has an MoU with GAMW to include the Strelley Project in the mining and offtake agreement. Strelley is located 15km NE from Tabba Tabba and is also prospective for Ta₂O₅. Other projects are Pinnacle Hill appx 7km south west of Pilgangoora, prospective for tantalum and tin bearing pegmatites, and the West Pilbara JV (45% PLS) with JV partner is Fox Resources.

**PLS COMPANY VALUATION - \$0.61/SHARE UNRISKED, \$0.38 RISKED**

- We value PLS at an unrisked NPV of A\$547M and risked at \$337M, equivalent to A\$0.61/share and A\$0.38/share respectively. Our company valuation is underpinned by our DCF valuations for the Pilgangoora project. In contrast, Tabba Tabba is immaterial to the company valuation.
- We have risked the Pilgangoora Resource NPV by 30% to account for financing, DFS, and permitting risk, and have risked the Pilgangoora Exploration target to account for additional geological risk.

We value PLS

*\$0.61/share unrisked and
\$0.38/share risked.*

*Our valuation is
underpinned by our DCF
of Pilgangoora.*

Figure 18: Valuation of Pilbara Minerals PLS

PLS Segment	Unrisked A\$M	Unrisked A\$/sh	Risked A\$M	Risked A\$/sh
Pilgangoora Resource	623.4	\$0.70	436.4	\$0.49
Tabba Tabba	6.2	\$0.01	3.1	\$0.00
Pilgangoora Exploration Target	187.2	\$0.21	56.2	\$0.06
Corporate	-40.7	-\$0.05	-24.7	-\$0.03
Tax	-243.8	-\$0.27	-148.1	-\$0.17
Cash from options	6.2	\$0.01	6.2	\$0.01
Net cash (debt)	8.2	\$0.01	8.2	\$0.01
Company (fully diluted)	546.8	\$0.61	337.3	\$0.38
Diluted shares (M)*	896.5			

**Includes options which are in-the-money at FSBe valuation of 34cps.*

Source: Foster Stockbroking estimates.

- We estimate the company currently has net cash of \$8.2M comprising ca. \$12.9M in cash (end December 2015) and \$4.7M in debt (in the form of convertible notes). Terms of the notes are December 2016 and March 2017.
- We have included all options in our diluted share capital and the cash accruing from them, given these are all in-the-money at our risked valuation. Strike prices vary from \$0.03 to \$0.15 and expiries range from December 2016 to December 2017.

PLS EARNINGS FORECASTS

- We forecast PLS to make a loss in FY16 of -\$4.9M, but NPAT of \$5.4M in FY17 due to first full year production from Tabba Tabba. In FY18 we forecast first six months to Pilgangoora to be main contributor to forecast NPAT of \$28M. In FY19 we forecast \$47M in due to Pilgangoora's first full year of production.
- Our earnings forecast assume a combination of both debt and equity are used to fund Pilgangoora. We believe other options may be available to PLS, especially from interested offtake partners.



VALUATION SENSITIVITY

- PLS's valuation is highly sensitive to the spodumene price and A\$ below:

Figure 19: PLS Valuation Sensitivity to Spodumene Price and A\$

Assumption	Change	Chng in NPV unrisksd \$/share	Chng in risked NPV \$/share
Spodumene price	+/-10%	+/- \$0.15	+/- \$0.09
A\$	+/-10%	+/- \$0.20	+/- \$0.13

Source: Company; Foster Stockbroking estimates.

BUY RECOMMENDATION AND \$0.47 PRICE TARGET

We initiate with a Buy recommendation and 12-month price target of \$0.47/share.

- We initiate on PLS with a Buy recommendation and 12-month price target of \$0.47/share. This is based on a 12-month target assuming further derisking of the Pilgangoora project and the Exploration Target.
- We arrive at our 12-month price target by assuming at that time in we will have reduced our risk factor for Pilgangoora to 15% from 30% now, and on the Exploration Target to 50% from 70% now. Our reasoning is that between now and then the release of a successful DFS showing attractive economics, and progress on permitting, financing, and offtake will all have progressed the project towards mining.
- We believe Pilgangoora has the potential to be a world class asset due to its long life, high grade, low iron product Spodumene product, and low sovereign risk environment overlayed by a positive lithium ion battery macro – courtesy of EV growth - for the next several years.

PLS CAPITAL STRUCTURE

Figure 20: PLS Capital Structure

Capital	M
Ordinary shares	806.0
Options (ex price \$0.03 to \$0.15, expiries Dec 2016 to Dec 2017)	90.5
Fully diluted equity	895.0
Convertible notes (\$1.00)	4.7

Source: Company; Foster Stockbroking estimates.

MANAGEMENT – CEO BRINGS IN VALUABLE WA & PILBARA EXPERIENCE

- **Ken Brinsden. CEO.** Ken Brinsden was appointed CEO effective 18 January 2016. A Mining Engineer with 20 years experience in surface and underground operations, he has worked for WMC Resources, Normandy, Central Norseman gold Corporation, Goldfields, and Iluka Resources various production, management, and mine development roles. Most recently was MD at Atlas Iron. His valuable experience in operating and managing mines in WA and the Pilbara should assist PLS in developing Pilgangoora.



RISKS

The following risks may negatively impact the PLS shareprice

- **Resource risk.** There is a risk that in the future resources may be negatively revised, impacting the size and quality of the projects, and that any exploration targets may not be confirmed.
- **Sovereign risk.** Any change in political government, legislation, or fiscal regimes of Australia or Western Australia may markedly impact the ownership, financing, permitting, or economics of each of PLS's projects.
- **Commodity price risk.** Declines in Spodumene or LCE prices may negatively impact the revenues and profitability of PLS's projects
- **Currency risk.** The PLS shareprice is denominated in A\$ and yet its commodities priced in US\$. Any rise in the A\$ may reduce translational impact of US\$ into A\$.
- **Operating risk.** Problems may occur during the mining, processing, transporting and selling of product that may negatively impact revenues, costs, and profit. These problems may or may not be foreseen in any feasibility, economic assessment, scoping, or conceptual studies undertaken by the company or other parties.
- **Financing risk.** The company may not be able to source the requisite funding for developing its project(s), so may require highly dilutive equity raising and/or debt that may dilute shareholders or cause the company to not meet debt payments.
- **Technology risk.** Changes in technology may reduce the demand for lithium and /or electric vehicles, dampening growth, prices and the profitability of PLS.

BOARD

- **Tony Liebowitz. Non-Executive Chairman.** FCA. Fellow of Institute of chartered Accountants. Previously a global partner with Price Waterhouse Coppers in Corporate Finance and Investment Banking for 12 years. Over 30 years experience in corporate finance, and investment banking.
- **Neil Biddle. Executive Director,** Consultant Geologist. BAppSc (Geology), MAusIMM. Geologist and Corporate Member of the AusIMM. Since 1987 has been MD and Exploration Manager of several ASX listed companies including Managing Director of TNG Ltd, Border Gold NL, and Consolidated Victorian Mines. Over 30 years experience in exploration and mining.
- **Robert G Adamson. Non-Executive Director.** Consultant Geologist. BSc, MSc, MAusIMM, Geologist with over 40 years experience with several publicly listed mining companies, in Australia, Africa, North America, and Asia. Has been independent mineral industry consultant since 1993.
- **John Young. Executive Director.** Exploration Manager. BAppSc Geology, Grad Dip Technology Management, MAusIMM. Geologist and Corporate Member of the ausIMM with over 25 years experience in global exploration and mining. Ten years experience with tantalite, tungsten, and molybdenite projects, including with Haddington Resources Ltd where he was Exploration Manager at their Bald Hill Tantalum mine. Was also CEO of Marenica Energy and Director of Thor Mining PLC. Also a Director of Mosman Oil & Gas Ltd.

**APPENDIX****Figure A-1: Lithium Conversion Factors**

Convert from:		To Li	To Li ₂ O	To spodumene 6% conc.	To LCE
Lithium	Li	1.000	2.153	35.883	5.323
Lithia (lithium oxide)	Li ₂ O	0.464	1.000	16.667	2.473
Spodumene 6% concentrate	6% wt/wt Li ₂ O	0.028	0.060	1.000	6.741
Lithium carbonate equivalent (LCE)	Li ₂ CO ₃ equiv.	0.188	0.404	0.148	1.000

Source: Foster Stockbroking estimates.

Figure A-2: Lithium Use in Various CE and EVs

Application	LCE content
Mobile phone	3g- 6g
Notebook	30g
Power tool	30-40g
Hybrid EV	1.6 kg
Plug-in Hybrid EV 15 kWh	11.8 kg
Battery EV 25kWh	20 kg
Tesla 70-85kWh	50.8 kg-63kg

Source: Industry Sources; Foster Stockbroking estimates.



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