ASX ANNOUNCEMENT | ASX : LTR

11th November 2021

Updated Downstream Scoping Study Highlights Next Growth Horizon for Kathleen Valley Project

Integrated Refinery capable of producing battery-grade lithium products emerging as the value maximising development pathway for Kathleen Valley Project

Updated Scoping Study validates the substantial upside from value-added processing

Highlights

- **An updated Downstream Scoping Study (DSS) has been completed, incorporating the outcomes of the Definitive Feasibility Study (DFS) released separately today on Liontown's 100%-owned Kathleen Valley Lithium Project (Project) in WA.**
- **The updated DSS confirms that the value maximizing pathway for Liontown is a staged-build, integrated *mining, processing and refining operation* based on the production of battery grade Lithium Hydroxide Monohydrate ($LiOH.H_2O$ "LHM") using 6% Li_2O Spodumene concentrate (SC6.0) as feedstock from Kathleen Valley.**
- **The DSS outlines a post-tax integrated Project $NPV_{8\%}$ (real) of $9.6B and IRR of 56% with an average annual EBITDA of $2.6B during refinery operation, using a weighted average long-term price of US$29,401/dmt LHM FOB.**
- **The integrated operation would be a long-life, high-margin project with an outstanding EBITDA margin (operating margin) of 77%, using long-term forecast prices.**
- **Competitive total integrated capital cost (CAPEX) estimate of $2B, including contingency, and LHM operating cost (OPEX) of US$5,864/dmt LHM. This estimate is benchmarked against recently announced projects, allowing for a construction timeline commencing in 2027.**
- **At the completion of the build, the integrated mine to refinery production will be ~86ktpa of LHM, making it one of the largest refineries outside of China in a Tier-1 operating jurisdiction and positioning Liontown as potentially the third largest supplier of LHM globally, based on 2031 Roskill LHM projections.**
- **Based on the exceptional DSS outcomes, Liontown will proceed with a Downstream Pre-Feasibility Study (DPFS) for the design and construction of the envisaged refining operations at Kathleen Valley. Detailed hydrometallurgical testwork will commence in Q1, 2022.**
- **In parallel to the DSS, Liontown has been progressing off-take discussions for Kathleen Valley. Some existing battery chain participants have expressed interest in partnering with Liontown on downstream processing, in Australia or elsewhere. In parallel with the DPFS, Liontown will also consider the relative merits of these proposals, either in addition to or substitution for the Refinery.**

Based on the proposed ramped 2.5 - 4Mtpa standalone mining and processing operation, the DSS has very strong fundamentals as demonstrated by **Table 1** below and the NPV sensitivity analysis outlined in **Figure 1**.

Table 1: 2021 Scoping Study Outcomes [1]

Description	DFS + LHM Refinery [9]
LOM Post-tax $NPV_{8\%}$ (A$B real, post-tax)	$9.6B
LOM Internal Rate of Return (IRR %)	56%
LOM Free Cash-flow (A$B post-tax)	$32.4B
Total Project CAPEX (A$B, SC6.0 Plant at $538M + 3-train 90kt Refinery at $1.5B) [3] [4] [5] [6][10][12]	**$2.0B**
Design production rate (ktpa, LHM per train)	29ktpa
Average LHM cash operating costs (US$/dmt LHM) [2][11]	US$5,864
Total spodumene sold (Mdmt SC6.0) [7][8]	5.321 Mdmt
Total hydroxide sold (Mdmt)	1.314 Mdmt
Life-of-mine (LOM) years	~ 23 years

Cautionary statement:

[1]The DSS referred to in this announcement has been undertaken to determine the potential viability of an integrated mine, process plant and a downstream refinery for the Kathleen Valley Lithium Project. The DSS for the process design, capital and operating costs associated with an LHM refinery has been prepared to an accuracy level of +/-30%. The DSS outcomes incorporate the results of the DFS including the SC6.0 Plant CAPEX which was prepared to an accuracy level of +/-15% (Released to the ASX on 11th November 2021). The DSS is a preliminary technical and economic study of the potential viability of an integrated mine, process plant and a downstream refinery.

The DSS is based on the material assumptions outlined elsewhere in this announcement. These include assumptions about the availability of funding. While Liontown considers all of the material assumptions to be based on reasonable grounds, there is no certainty that they will prove to be correct or that the range of outcomes indicated by the DSS will be achieved.

To achieve the range of outcomes indicated by the DSS, additional funding will likely be required. Investors should note that there is no certainty that Liontown will be able to raise the required funding when needed. It is also possible that (i) such funding may only be available on terms that may be dilutive to or otherwise affect the value of Liontown's existing shares and/or (ii) that Liontown could pursue other 'value realisation' strategies such as a sale, partial sale or joint venture of the Project, which if they occurred, could materially reduce Liontown's ownership of the Project.

Given the uncertainties involved, investors should not make any investment decisions based solely on the results of the DSS.

The Production inventory and forecast financial information referred to in the DSS are based on the spodumene processing operation as detailed in the DFS and comprise Proved Ore Reserves (3.3%), Probable Ore Reserves (79.5%) and Inferred Mineral Resources (17.2%). The Inferred material included in the inventory is 14.3Mt @ 1.11% Li_2O & 102ppm Ta_2O_5. The Inferred material has been scheduled such that less than 10% is mined in the first 10 years, with the remainder to be mined through to the end of the mine life. SC6.0 produced by the spodumene processing operation is intended to provide feedstock for the refinery.

The Inferred material does not have a material effect on the technical and economic viability of the Project. Refer to page 24 of DFS announcement (released to the ASX on 11th November 2021) for additional information.

There is a lower level of geological confidence associated with Inferred Mineral Resources and there is no certainty that further exploration work will result in the determination of Indicated Mineral Resources or that the production target itself will be realised.

[2] Cash operating costs include all mining, processing, downstream refining, transport, state & private royalties, freight to port, port costs, site administration, overhead costs and tantalum credits. Excludes sustaining capital and royalties.

[3] Integrated CAPEX for LHM production includes $538M for the mine/ 6% Li_2O (SC6.0) processing plant (DFS) and $1.5B for the downstream refinery. Excludes working capital, finance costs, sustaining capital and corporate costs associated with project development.

[4] SC6.0 plant capital to DFS level +/-15% accuracy, DSS to +/-30% accuracy

[5] Spodumene DFS included no contingency on SC6.0 operating costs, LHM DSS includes no contingency on operating costs

[6] Spodumene DFS included ($31M) capital contingency, DSS includes ($258M) contingency on capital costs

[7]SC6.0 pricing per price per DFS 11th November 2021, ASX announcement "Kathleen Valley DFS confirms Tier-1 global lithium project with outstanding economics and sector-leading sustainability credentials".

[8] *All SC6.0 concentrate metrics based on a normalised 6% concentrate basis*

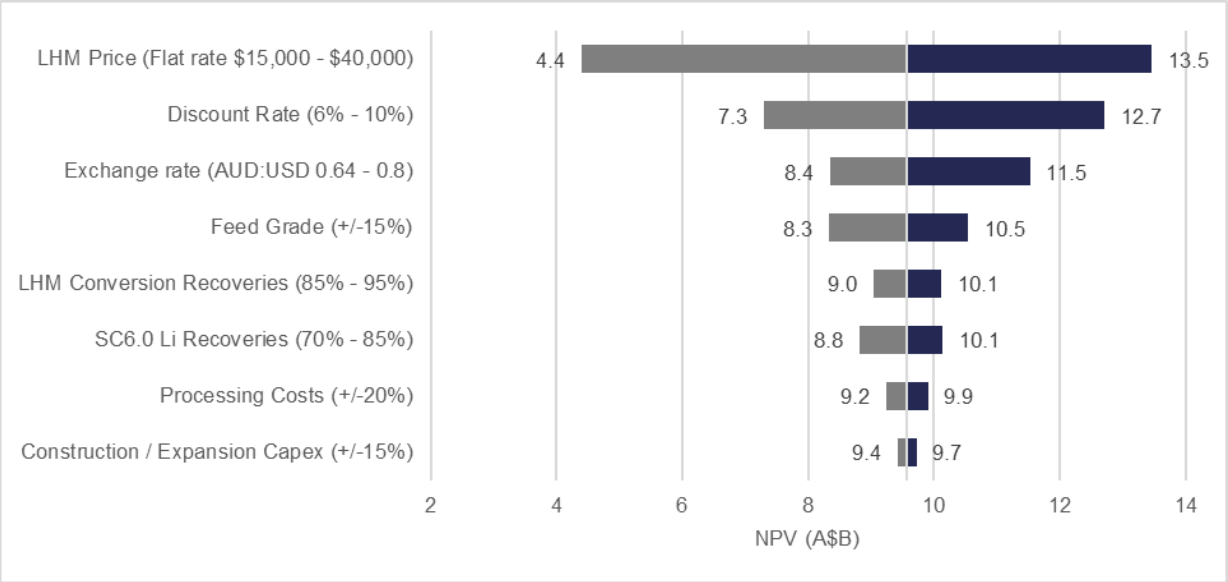
[9] *All Costs expressed in Australian $ unless noted otherwise and an exchange rate of AUD – USD of $0.73 used for any conversion.*

[10] *Project totals exclude working capital, finance costs, sustaining capital and corporate costs associated with project development.*

[11] *For each tonne of LHM produced, 6.6 tonnes of SC6.0 are required to be processed by the refinery*

[12] *Current estimated project cashflows are sufficient to fund the refinery project capital. Refer to funding commentary on page 22.*

Figure 1: Kathleen Valley LHM Integrated Project – NPV Sensitivity Analysis



The scope of the DSS relates solely to the process design, capital and operating costs associated with an LHM refinery, however the financial analysis also uses information published as part of the DFS released separately on 11th November 2021 titled "*Kathleen Valley DFS confirms Tier-1 global lithium project with outstanding economics and sector-leading sustainability credentials*".

Executive Summary

Liontown Resources Limited (**ASX: LTR; "Liontown" or "Company"**) is pleased to announce the results of an updated Downstream Scoping Study (DSS) for its 100%-owned **Kathleen Valley (KV) Lithium Project ("Kathleen Valley Project" or "Project")** in Western Australia.

The DSS has been revised following the completion of the Definitive Feasibility Study (DFS) for 6% Li_2O concentrate (SC6.0) production at KV and the development of a long-term strategic growth plan for the KV Project (see ASX release *"Kathleen Valley DFS confirms Tier-1 global lithium project with outstanding economics and sector-leading sustainability credentials*" released on the 11th November 2021). The DFS, included an Ore Reserve of 68.5Mt @ 1.34% Li_2O and 120ppm Ta_2O_5 and a Production Inventory of 82.7Mt @ 1.30% Li_2O & 117ppm Ta_2O_5, which underpins a 4Mtpa mining and processing operation over a ~23-year mine life.

The updated DSS strongly reinforces the exceptional financial and economic returns that would be generated by the addition of an on-site, downstream processing plant to produce a battery-grade pre-cursor product.

In parallel with the KV DFS, Liontown engaged Lycopodium Minerals Pty Ltd (Lycopodium) to update a previous scoping study published in October 2020. The updated DSS evaluates the impact of integrating the mine, process plant and a downstream refinery, that would be built via a staged approach (Integrated Project) at Kathleen Valley, and produce battery-grade LHM incorporating SC6.0 production envisaged as part of the DFS.

Lycopodium has re-validated scoping-level operating and capital cost estimates (+/-30% accuracy) for scalable downstream facilities built in stages (on a per train basis) capable of processing feed of ~up to 570ktpa SC6.0 based on three LHM trains. The refinery will be capable of ultimately producing 86ktpa of battery-grade LHM on-site at Kathleen Valley. It is anticipated that offtake contracts would commence as SC6.0 only with the potential to shift to LHM as the expandable downstream capability is developed. The balance of SC6.0 produced from the project would be sold on spot markets via offtake agreements given that the projected SC6.0 output exceeds the envisaged ultimate refining capacity.

As the financial analysis demonstrates, an Integrated Project built progressively is an attractive proposition, given the location of the Project relative to key infrastructure including power and gas, the supply of key consumables such as acid from the nearby mining and logistics centre of Kalgoorlie, and, importantly, having a suitable area for tailings. Operating cost savings can also be achieved compared with other locations through significantly reduced transport volumes of final product.

The DSS has provided a strong basis for a Downstream Pre-Feasibility Study (DPFS) which will further investigate the robust fundamentals and compelling economics of a downstream refinery at Kathleen Valley.

The Integrated Project has the potential to make Liontown the 3rd largest supplier of LHM in the world, based on 2031 Roskill LHM projections.

Liontown's Managing Director, Tony Ottaviano, said:

"The compelling logic and exceptional financial returns associated with Liontown pursuing a downstream value-adding strategy through integrating the mine concentrator and refinery at Kathleen Valley opens up a truly exciting future for Liontown.

"Having a clear pathway not only to produce 6% spodumene concentrate at Kathleen Valley but also to participate more substantively in the battery value chain gives Liontown an outstanding position from which to plan our future as a leading integrated global battery materials company.

"The integrated mining concentrate production and refining approach clearly realises much greater value for Kathleen Valley and, importantly, for our stakeholders. As is the Liontown way, we will continue to adopt a disciplined approach to test work, piloting and design, which is evidenced-based.

"Initial precursor test work suggests the Kathleen Valley concentrate is very well suited for upgrade to a refined downstream product, which means that we can now pursue the PFS for the downstream project."

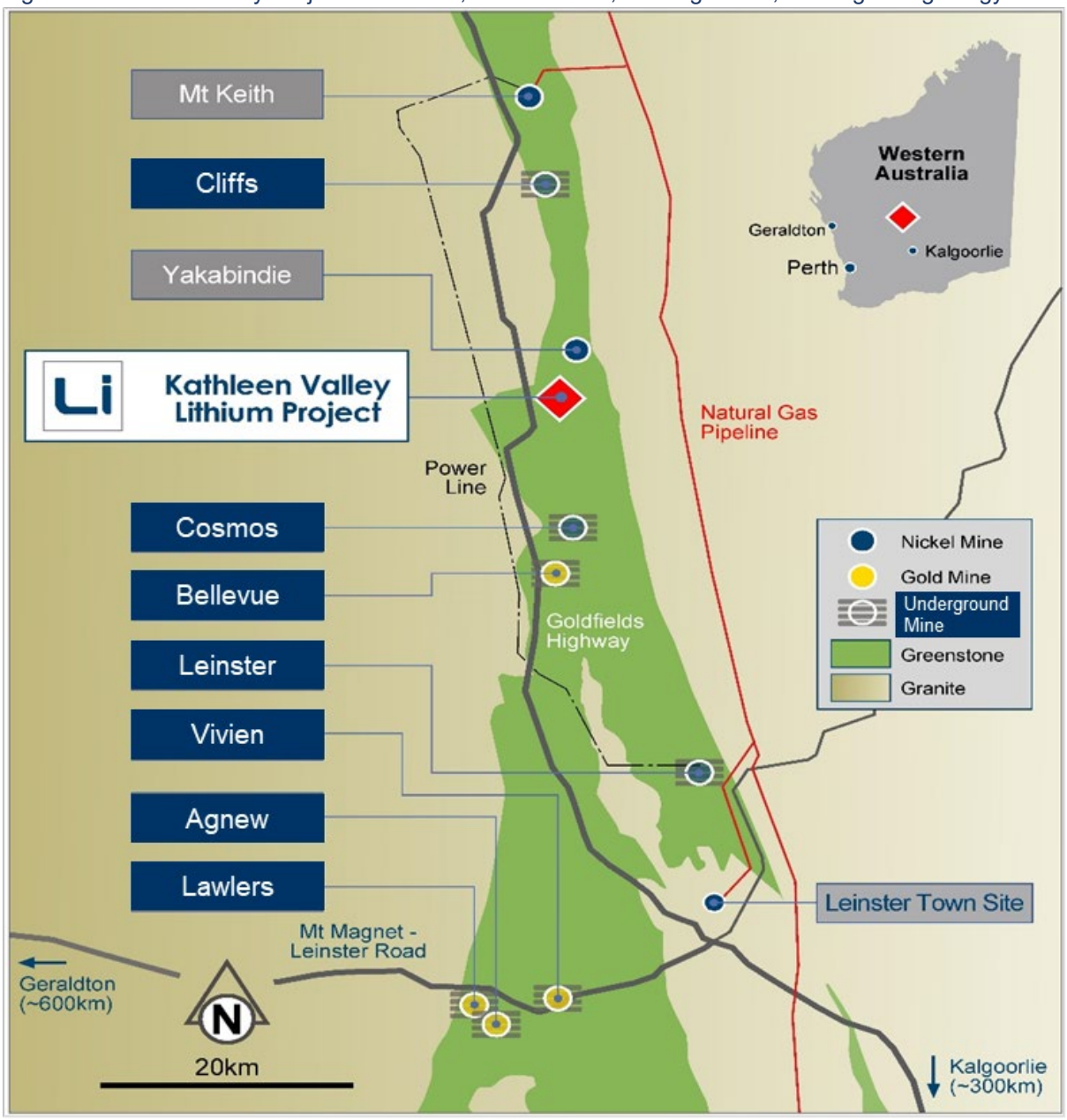
"Having value-added downstream processing on site in the North-eastern Goldfields producing battery-grade products is a very exciting opportunity not just for Liontown, but also for the State of Western Australia – providing an opportunity for us to leverage our world-class resources, people and infrastructure to create a high-value product for the global lithium-ion battery industry.

"Our commitment to pursue this project will also complement our strong commitment to excellence as part of our ESG framework, our emissions strategy and our desire to become an employer of choice attracting the best talent in the Australian resource sector to work for a truly future-facing battery materials supplier. As for DFS we will also ensure early inclusion of the Tjiwarl Native Title Holders, and heritage considerations in the design, planning and layout of the Integrated Project"

Kathleen Valley Integrated Project – Project Background

The 100%-owned Kathleen Valley Lithium Project is located on four granted Mining Licences and one Mining Licence Application approximately 680km north-east of Perth and 400km north of Kalgoorlie in the North-eastern Goldfields of Western Australia (**Figure 2**).

Figure 2: Kathleen Valley Project – Location, infrastructure, existing mines, and regional geology



The Project is readily accessible by sealed highways which connect with mineral exporting ports at Geraldton and Fremantle.

Other infrastructure located close to the Project includes a power line, a natural gas pipeline and existing mine camps with sealed airstrips capable of accommodating large passenger aircraft.

The Company released the Kathleen Valley Lithium Project DFS on 11th November 2021. The DFS studied the establishment of a ramped 4Mtpa mining and spodumene processing operation, producing SC6.0.

Key financial outcomes of the DFS included:

- *LOM free cash flow post tax of $12.2B*
- *Project payback of approximately 2.3 years post-production*
- *Post-tax $NPV_{8\%(real)}$ of $4.2B and IRR of 57%*
- *Pre-production capital expenditure of $473M[3]*
- *LOM cash costs of US$327 /dmt[1] SC6.0 (inclusive of tantalum credits, excluding royalties) [1] [2]*
- *AISC US$/t Li_2O (dmt) Yrs 1-10 of ~US$452 /dmt of SC6.0 (including tantalum credits & royalties) [4]*
- *Ore Reserve of 68.5 Mt @ 1.34% Li_2O and 120ppm Ta_2O_5*

[1] Cash operating costs include all mining, processing, transport, state, freight to port, port costs, site administration, overhead costs and tantalum credits. Excludes sustaining capital and royalties.

[2] As royalties are predominantly sales-price dependent they have not been included in cash costs. Royalties equate to $106/t of 6% Li_2O LOM.

[3]Excludes expansion capital, working capital, finance costs, sustaining capital and corporate costs associated with project development for the initial 2.5Mtpa process plant

[4] All In Sustaining Capital Costs (AISC), as referred to above, are cash operating costs including all mining, processing, transport, freight to port, port costs, site administration/ overhead costs, royalties and sustaining capital.

Refer to the Cautionary Statement on page 2 of this announcement for further information regarding the production targets and forecast financial statements in this announcement.

In examining the value accrued at each stage of the Battery Value Chain, downstream processing of spodumene into LHM presents an attractive and logical growth opportunity for Liontown following construction of the Kathleen Valley mine and SC6.0 concentrator. Relevant factors considered included:

- Higher margin and larger market:
  - Entry into the higher-value “end-product” market; and
  - Large market sector projected to be worth >US$20B by 2030[1] and a more diverse customer base.
- Integrated Operation:
  - Enables Liontown’s participation further down the attractive and fast-growing EV and battery mineral value chain; and
  - Competitive advantage with “pure play” conversion competitors, with secured spodumene supply from Kathleen Valley.
  - The Project benefits from being well located close to existing infrastructure, including power and gas, the supply of key consumables such as acid from the nearby mining and logistics centre of Kalgoorlie, having a suitable area for tailings and transportation options to major ports.

[1] Per Roskill Cost model Service-refining October 2021. 2030 sales forecast of 686kt tonnes LHM and project pricing of US$29,285 /t LHM.

- Diversification:
  - Will enable flexibility for spodumene and hydroxide sales and production; and
  - Liontown can expand its customer base from convertors (or pass-through/ tolling offtake arrangements) to cell manufacturers and automotive Original Equipment Manufacturers (OEM's).
- Compelling Economics:
  - The DSS has demonstrated attractive economics for a LHM plant;
  - Short payback, strong IRR and significant NPV relative to capital cost; and
  - Aligns with both Western Australian and Australian Federal Governments initiatives, as a value-adding strategy that goes beyond the mining and export of critical minerals.
- Risk Mitigation:
  - Second-mover advantage will help to ensure that the technology and operating parameters are well understood;
  - Staged approach to development reduces implementation risk; and
  - Planned development following construction of the mine and concentrator enables flexibility on the timing of development, optimisation of project sizing and the potential for a significant component to be funded from existing cash-flow.

The DSS examined the integrated downstream refining of SC6.0 product on-site at Kathleen Valley. The refinery has been designed as a series of three process trains that will be progressively built such that there is minimal impact on the operating project. Likewise, the timing of the Integrated Project has taken into consideration a conservative development timeframe.

While the location of the refinery at KV brings logical benefits, the next stage of study work will further optimise the location of the refinery and consider other alternatives (for example, Kalgoorlie).

As outlined in the KV DFS, following conventional open pit/underground mining and delivery to the Run-of-Mine (ROM) pad, ore will be processed to produce SC6.0 and tantalum concentrates. Tantalum concentrate/s will be transported off-site for further upgrade and delivery to downstream customers. Once all three LHM processing trains are built per the Integrated Project scenario, the SC6.0 would predominantly be refined on-site to deliver a battery-grade LHM via a fully integrated mining, concentration, and refinery facility.

The DSS was completed to an overall +/- 30% costing accuracy using the key parameters and assumptions defined both in the DFS and set-out in **Table 2** below, and as further outlined in this announcement.

All monetary values in this document are expressed in Australian dollars unless noted otherwise.

Table 2: Integrated Project Key Parameters

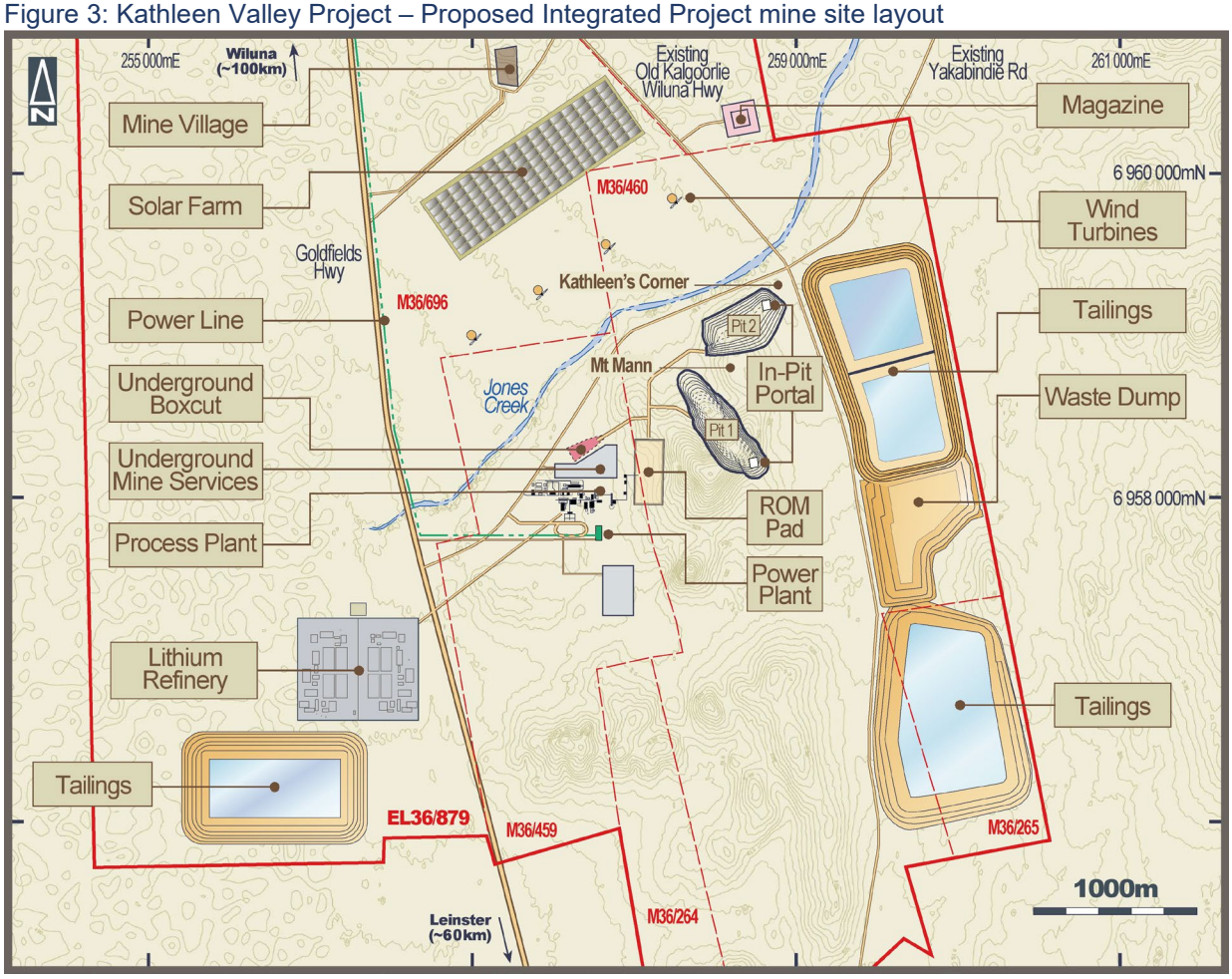
Parameter	LHM
General and Economic	
Discount rate (real, post-tax)	8%
SC6.0 weighted average price (US$/dmt FOB) for product sold as SC6.0	US$1,289
Weighted average LHM Price (US$/dmt FOB) for LHM sold	US$29,401
Weighted average Tantalum concentrate price (US$ per contained pound FOB Fremantle)	US$84
Exchange rate – AUD : USD	0.73
Mining and Production of SC 6.0	
Spodumene plant Processing rate (2.5Mtpa to 4Mtpa per DFS)	4 Mtpa
Ore Reserve	68.5Mt @1.34% Li_2O, 120ppm Ta_2O_5
Life-of-Mine Production Inventory	82.7Mt @ 1.30% Li_2O, 117ppm Ta_2O_5
LOM average % Li_2O and ppm Ta_2O_5 grades (diluted, % / ppm)	1.30 / 117
Average Li_2O Concentrate overall average recovery (%)	78%
Ta_2O_5 average overall recovery (% includes offsite upgrade losses)	38%
Feedstock SC6.0 concentrate grade (% Li_2O)	6%
Moisture content of SC 6.0	9%
Downstream Integrated Refinery	
Number of processing Trains (#)	3
Recovery Li (%)	90%
Calcination Temperature (°C)	1,100
Sulphuric Acid Addition (mol/mol)	1.25 (H_2SO_4 : Li_2O)
Acid Roast Temperature (°C)	250
Acid Leaching Residence Time (minutes)	120
LHM Crystalliser Stages (per train)	3
LHM production based on 190ktpa SC6.0 feed rate per LHM train	28.8ktpa LHM
Conversion ratio of SC6.0 tonnes per LHM tonne	6.6
Cost Assumptions	
SC6.0 LOM average operating cost excluding transport (US$/dmt SC6.0 produced)[1]	US$378
SC6.0 transport cost (to Geraldton incl. Port Charges) (US$/dmt SC6.0 sold)	US$55
LHM weighted average processing conversion cost (US$/dmt LHM excluding cost of SC6.0 feedstock)[2]	US$3,303
LHM transport cost (to Fremantle incl. Port Charges) (US$/dmt LHM)	US$70
Royalties	As per DFS, based on spodumene feedstock market value
Corporate tax rate	30%
NPV Date	FID for SC6.0 DFS (Q2, 2022)
Estimated opening tax losses (A$M)	$55

[1] *Includes royalties and tantalum credits, excludes sustaining capital. Refer to the separate DFS announcement published on 11th November 2021.*

[2] *For each tonne of LHM produced, 6.6 tonnes of SC6.0 are required to be processed*

Figure 3 shows the proposed site layout of the Integrated Project including mining areas, processing facilities, refinery and non-process infrastructure.

Figure 3: Kathleen Valley Project – Proposed Integrated Project mine site layout



Downstream Scoping Study Metallurgy & Process Flowsheet/s

The scope of the DSS relates solely to the process design, capital and operating costs associated with the LHM refinery. However, the analysis also uses information published as part of the DFS released on 11th November 2021.

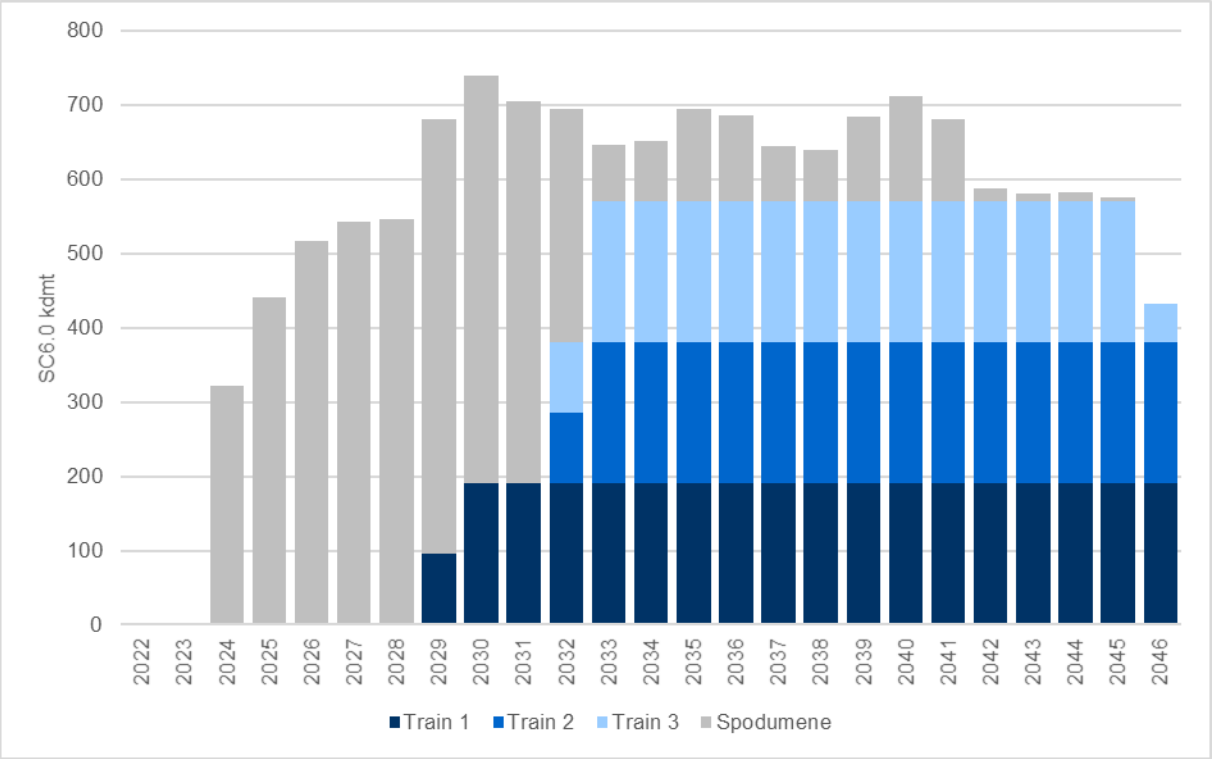
Lycopodium was again engaged by the Company to prepare a DSS encompassing updated capital and operating cost estimates to produce LHM products from a SC6.0 spodumene concentrate.

The envisaged LHM flowsheet has been sized to process up to 570ktpa of SC6.0 and would comprise of three parallel processing trains to produce a nominal total of 86tpa battery grade LHM. Additional SC6.0 produced over and above the 570ktpa processed via the refinery would be sold in the spot market in line with DFS pricing assumptions.

The refinery flowsheet will comprise SC6.0 calcination, followed by sulphation roasting, leaching, neutralisation, impurity removal, Pregnant Leach Solution (PLS) concentration, causticisation, Glauber's salt crystallisation, anhydrous sodium sulphate crystallisation, LHM crystallisation, product drying and packaging. Refer to flowsheet shown in **Figure 8** (Refer to page 16 of this document).

A staged low risk approach to the construction of the downstream refinery has been adopted in the Company's analysis with a single refining train expected to be commissioned in year six of the SC6.0 plant operation with a one year ramp-up, followed by a further two trains three years later. Refer **Figure 4**.

Figure 4: Kathleen Valley Project – Proposed Staged refinery expansion (by processing Train)



Downstream Scoping Study Financial Outcomes

Based on a proposed 4Mtpa standalone mining, processing and staged refining operation, the DSS has demonstrated strong financial metrics for the Integrated Project (**Table 3 and Figure 5**) as outlined below:

Table 3: Kathleen Valley Integrated Project – Key Metrics

Description	LHM[10]
Integrated Project Economics	
Post-tax NPV$_{8\%}$ (A$B real, post-tax) [1]	$9.6
Internal Rate of Return (IRR %)	56%
LOM Free Cashflow (A$B, post tax)	$32.4
SC6.0 Metrics	
Average cost of SC6.0 produced per DFS (US$/dmt LOM including tantalum credits, royalties and excludes transport and logistics) [8][9	US$378
SC6.0 Transport costs to Geraldton including Port Charges (US$/dmt SC6.0 for product sold and not converted to LHM)	US$55
SC6.0 AISC per DFS (US$/dmt SC6.0 produced), excluding transport [11]	US$400
LHM Metrics	
Design production rate per LHM train (ktpa LHM)	28.8ktpa
LOM Integrated Capex (A$B, SC6.0 Plant + Refinery) [3] [4] [6]	$2.0B
Average weighted LHM pricing Real Spot (US$/dmt sold) [7]	US$29,401
LOM Average LHM cash operating costs (US$/t LHM produced) [2] [5][8][9]	US$5,864

[1] Refer to the Cautionary Statement on page 2 of this announcement for further information regarding the production targets and forecast financial statements in this announcement.

[2] Cash operating costs for LHM produced includes all mining, processing, downstream refining, transport, state & private royalties, freight to port, port costs, site administration, overhead costs and tantalum credits. Excludes sustaining capital.

[3] Integrated Capex for LHM production includes $538M for the mine/ SC6.0 processing plant (DFS) and $1.5B for the downstream refinery. Excludes working capital, finance costs, sustaining capital and corporate costs associated with project development.

[4] SC6.0 plant capital to DFS level +/-15% accuracy, DSS to +/-30% accuracy.

[5] DFS included no contingency on SC6.0 operating costs, DSS included no contingency on operating costs.

[6] DFS included ($31M) capital contingency, DSS included ($258M) contingency on capital costs. Project totals exclude working capital, finance costs, sustaining capital and corporate costs associated with project development.

[7] LHM pricing per Roskill price estimates for 2024-2041, 2041 price assumed for years after 2041.

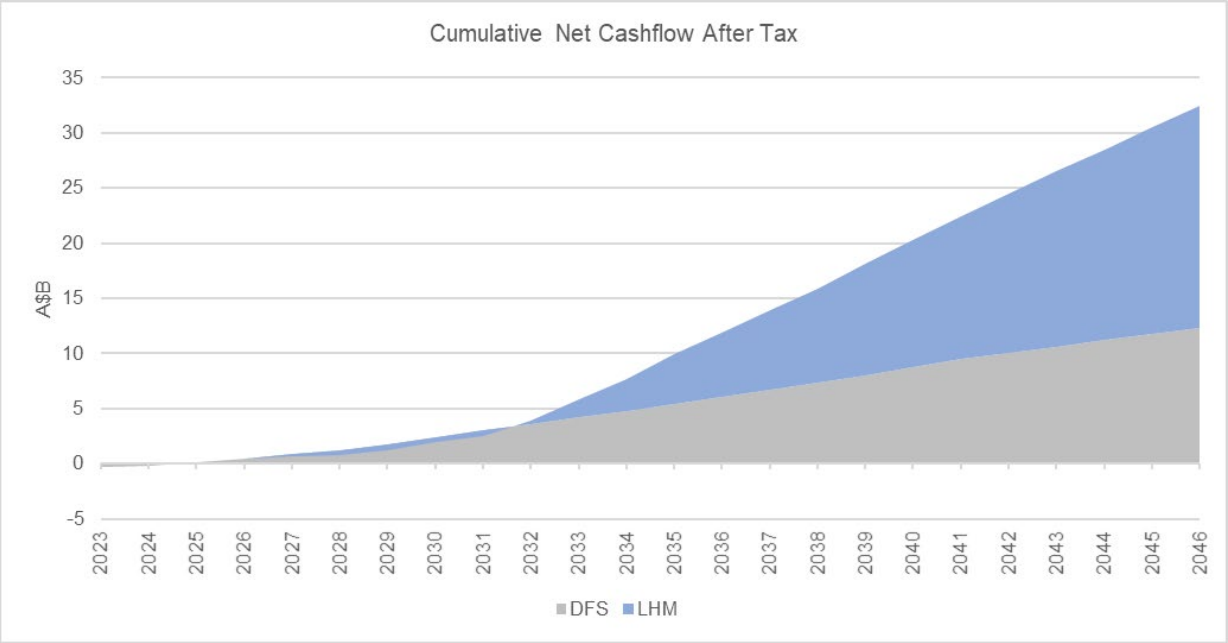
[8] SC6.0 Pricing per price per DFS 11th November 2021, ASX announcement "Kathleen Valley DFS confirms Tier-1 global lithium project with outstanding economics and sector-leading sustainability credentials".

[9] All SC6.0 concentrate metrics based on a normalised 6% concentrate basis.

[10] All Costs expressed in Australian $ unless noted otherwise.

[11] All In Sustaining Capital Costs (AISC), as referred to above, are cash operating costs including all mining, processing, site administration/ overhead costs, state and private royalties, tantalum credits and sustaining capital.

Figure 5: Integrated Project Cumulative Free Cash-Flow and Payback Period



The DSS is based on the material assumptions outlined in **Table 2** above. While the Company considers all the material assumptions to be based on reasonable grounds, there is no certainty that they will prove to be correct or that the range of outcomes indicated by the DSS will be achieved. Given the uncertainties involved, investors should not make any investment decisions based solely on the results of the DSS.

In accordance with ASX Listing Rules 5.16 and 5.17, the Company confirms the following in respect of the production targets and forecast financial information resulting from the DSS:

- *The production inventory and forecast financial information referred to in the DFS to produce SC6.0 comprise Proved Ore Reserves (3.3%), Probable Ore Reserves (79.5%) and Inferred Mineral Resources (17.2%). The Inferred material included in the inventory is 14.3Mt @ 1.11% Li_2O & 102ppm Ta_2O_5. The Inferred material has been scheduled such that less than 10% is mined in the first 10 years, with the remainder mined through to the end of the mine life.*
- *The Inferred material does not have a material effect on the technical and economic viability of the project. There is a low level of geological confidence associated with Inferred Mineral Resources and there is no certainty that further exploration work will result in the determination of Indicated Mineral Resources or that the production target itself will be realised.*

LHM Forecast Pricing

LHM is not currently sold on exchange traded markets and is largely transacted under contractual arrangements between the producer(s) and their customers.

Liontown has used the services of leading industry commodity forecasting experts Roskill for its price forecast assumptions for LHM as applied in the DSS.

Roskill has provided annual forecast pricing through to 2041 on a real, US$/dmt CIF China basis for "Spot" LHM prices (**Figure 6**).

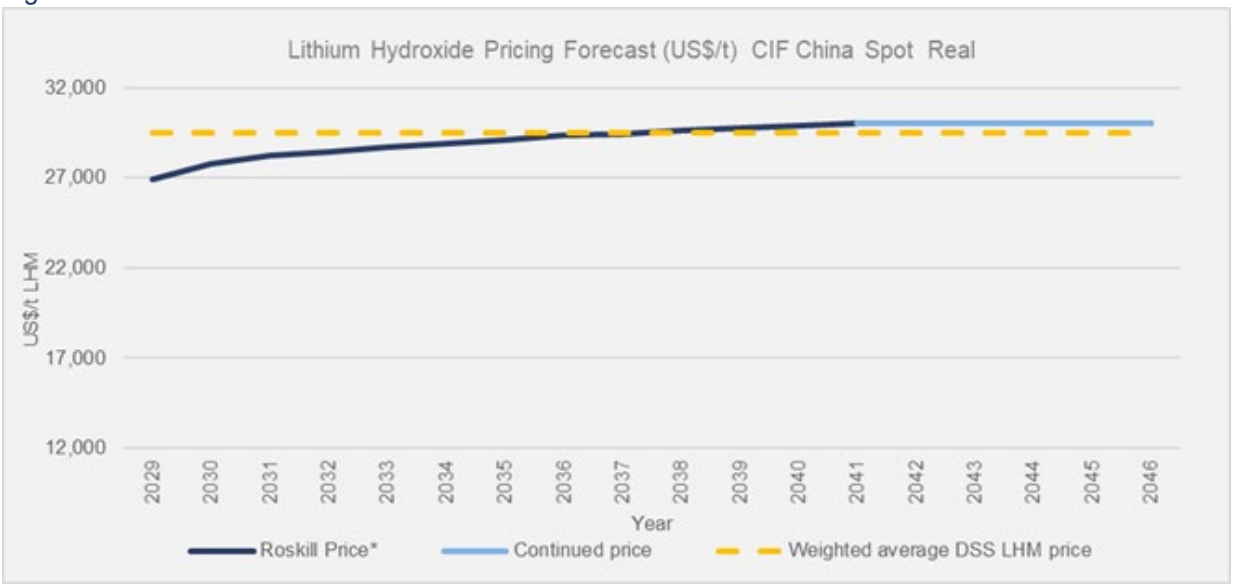
At this stage, future production from KV remains 100% uncommitted to maintain maximum flexibility and independence over funding and development options. For the purposes of the DSS, it has been assumed that Liontown will sell 100% of its downstream production at spot prices on a yearly basis.

Roskill has provided forecast LHM prices on a CIF China basis for the period 2029 - 2041 (noting that, while the DSS extends beyond Roskill's 2041 forecasts, Liontown has assumed it reasonable to use the same price as the basis from 2042 - 2046. The weighted average LHM selling price in the DSS considering the volume and timing of LHM sales is US$29,501/dmt CIF China. The current Fastmarkets spot price is US$29,000/dmt LHM CIF China.

Liontown has assumed that LHM will be bagged and exported via the Port of Fremantle.

Liontown has adjusted the average selling prices (CIF) to an FOB Fremantle price by deducting US$100 per tonne to reflect the estimated long-term costs of shipping in sea containers to China from Fremantle, as the ultimate destination of LHM produced from the Kathleen Valley Project is not known at this stage.

Figure 6: Roskill Forecast LHM Prices



**Source: Roskill Forecast Prices, November 2021 - China Spot Prices 2021 – 2041*

Further Work

The compelling economic upside to the DSS justifies Liontown commencing the Downstream PFS, which will refine the envisaged strategy of developing an integrated processing and LHM refining operation in distinct stages utilising the SC6.0 feedstock from Kathleen Valley.

This announcement has been authorised for release by the Board.

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11th November 2021

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Competent Person Statements

The Mineral Resource estimates referred to in this announcement were first reported in accordance with Listing Rule 5.8 in the Company's announcement of announcement "Strong progress with Kathleen Valley Definitive Feasibility Study as ongoing work identifies further key project enhancements" released on the 8th April 2021 which is available on www.ltresources.com.au. *The Company confirms that it is not aware of any new information or data that materially affects the information included in the previous announcement and that all material assumptions and technical parameters underpinning the estimates in the previous announcement continue to apply and have not materially changed.*

The Ore Reserve estimates referred to in this announcement were first reported in accordance with Listing Rule 5.9 in the Company's announcement of 11th November 2021 titled "Kathleen Valley DFS confirms Tier-1 global lithium project with outstanding economics and sector-leading sustainability credentials" which is available on www.ltresources.com.au. *The Company confirms that it is not aware of any new information or data that materially affects the information included in the previous announcement and that all material assumptions and technical parameters underpinning the estimates in the previous announcement continue to apply and have not materially changed.*

Table 4: Kathleen Valley Project – Ore Reserve Estimate (November 2021)

Category	Tonnage (Mt)	Li_2O (%)	Li_2O (T)	Ta_2O_5 (ppm)	Ta_2O_5 (T)
Underground					
Proved	-	-	-	-	-
Probable	65.4	1.34	878,966	119	7,799
Sub-Total	**65.4**	**1.34**	**878,966**	**119**	**7,799**
Open Pit					
Proved	2.7	1.30	33,581	141	374
Probable	0.5	0.93	4,696	148	75
Sub-Total	**3.2**	**1.21**	**38,277**	**142**	**449**
TOTAL	**68.5Mt**	**1.34%**	**917,243t**	**120ppm**	**8,247t**

Notes

I. Tonnages and grades are diluted and reported at Li_2O cut-off grade of 0.5% (open pit) and 0.7 -1.2% (Underground) and use a US$740/ dmt FOB SC6.0 pricing assumption;

II. Tonnages and grades have been rounded.

The information in this announcement that relates to the DSS is based on, and fairly represents, information compiled by Mr Alastair Holden who is an employee of Lycopodium Minerals Pty Ltd. Mr Holden is a Fellow of the Australasian Institute of Mining and Metallurgy and has sufficient experience relevant to the style of mineralisation and type of deposit under consideration, and to the activities undertaken, to qualify as a Competent Person as defined in the 2012 edition of the 'Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves'. Mr Holden consents to the inclusion in the report of the matters based on his information in the form and context in which the outcomes of the DSS and the supporting information are presented in this announcement.

The production targets and forecast financial information in this announcement that relates to the DFS were first reported in accordance with Listing Rule 5.16 and Listing Rule 5.17 in the Company's announcement of 11th November 2021 titled "Kathleen Valley DFS confirms Tier-1 global lithium project with outstanding economics and sector-leading sustainability credentials". The Company confirms that all material assumptions underpinning the production targets and forecast financial information derived from the production targets in the previous announcement continue to apply and have not materially changed.

Forward-looking statements

This report contains forward-looking statements which are identified by words such as 'may', 'could', 'believes', 'estimates', 'targets', 'expects', or 'intends' and other similar words that involve risks and uncertainties. These statements are based on an assessment of present economic and operating conditions, and on a number of assumptions regarding future events and actions that, as at the date of this report, are considered reasonable. Such forward-looking statements are not a guarantee of future performance and involve known and unknown risks, uncertainties, assumptions and other important factors, many of which are beyond the control of the Company, the Directors and the management. The Directors cannot and do not give any assurance that the results, performance or achievements expressed or implied by the forward-looking statements contained in this report will actually occur and investors are cautioned not to place undue reliance on these forward-looking statements. The Directors have no intention to update or revise forward-looking statements, or to publish prospective financial information in the future, regardless of whether new information, future events or any other factors affect the information contained in this report, except where required by law or the ASX listing rules.

Kathleen Valley 2021 Staged Integrated Project

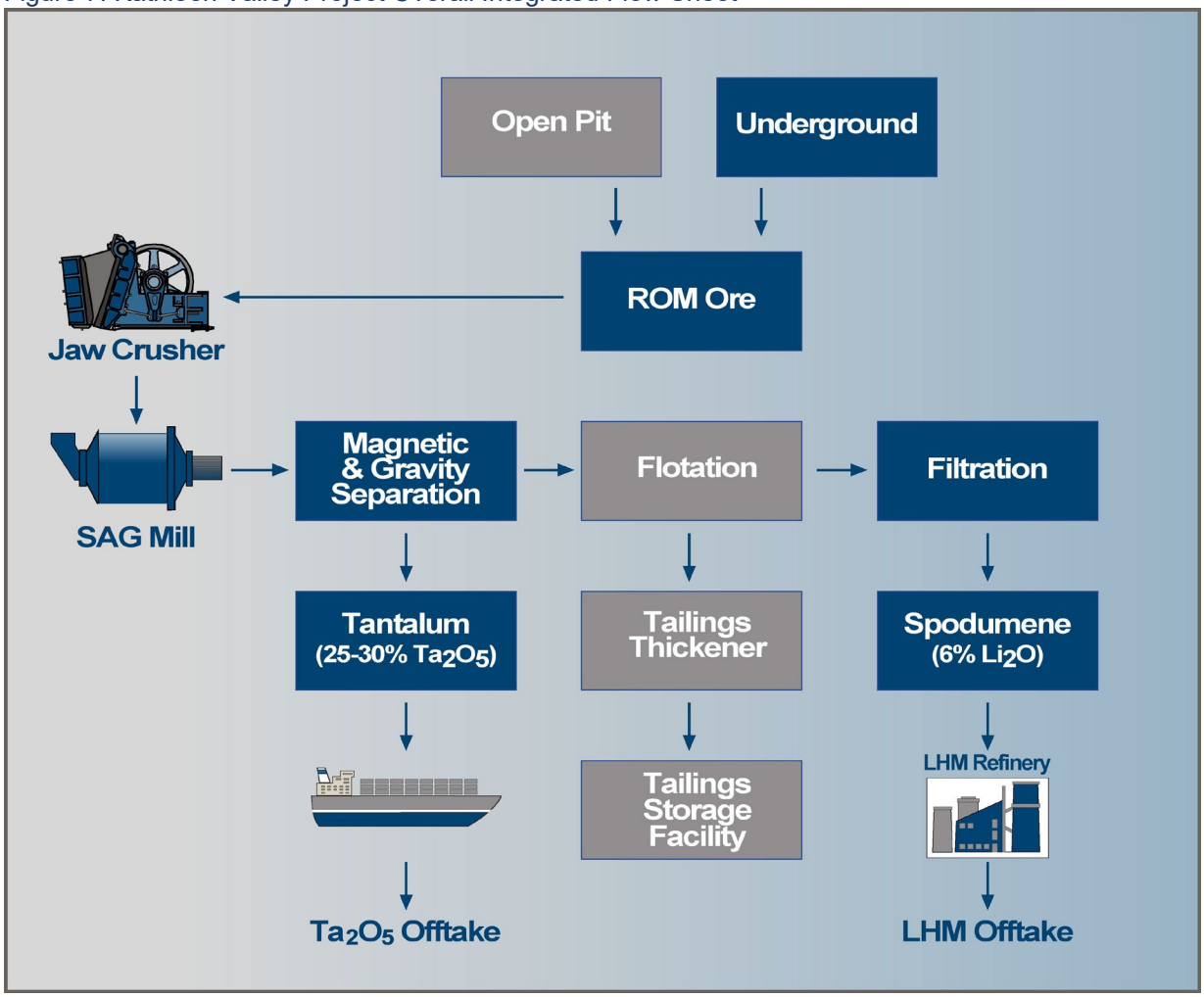
Material Assumptions and Additional Information

1. Flowsheet

The Kathleen Valley Integrated Project is proposed to consist of a spodumene Concentrator with associated services (as outlined in the DFS) and a separate downstream refinery (**Figure 7**). The overall facilities include:

- *Two-stage crushing;*
- *SAG-milling;*
- *Low and high intensity magnetic separation combined with sequential gravity separation to produce a tantalum concentrate (also removes ferrous impurities);*
- *Flotation thickening and filtration to produce SC6.0;*
- *LHM Refinery; and*
- *Tailings disposal.*

Figure 7: Kathleen Valley Project Overall Integrated Flow Sheet

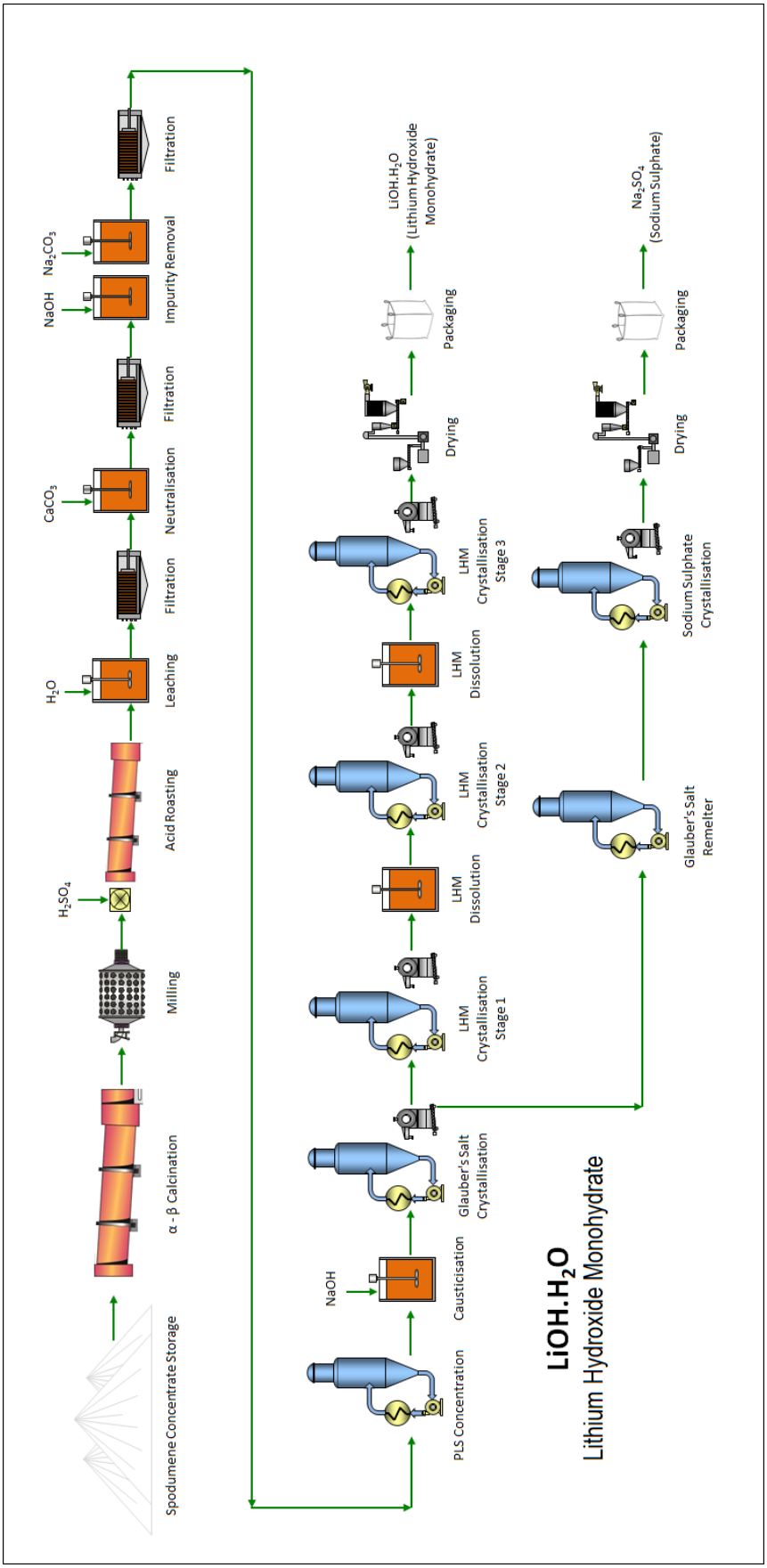


Note: Ta_2O_5 grade includes offsite 3rd party upgrade

The proposed LHM refinery at Kathleen Valley (**Figure 8**) includes:

- *Calcination (α-β)*
- *Acid Roasting*
- *Leaching & Filtration*
- *Neutralisation & Filtration*
- *Impurity Removal & Filtration*
- *PLS Concentration*
- *Waste Disposal*
- *Causticisation & Filtration*
- *Glauber's Salt Crystallisation & Melting*
- *Sodium Sulphate Crystallisation*
- *Sodium Sulphate Drying & Packaging*
- *LHM Crystallisation (3 stages)*
- LHM Drying & Packaging
- *Reagents and Services*

Figure 8: Kathleen Valley Refinery Flow Sheet (LHM)



2. Process Description

It is proposed that the LHM processing facility will comprise three identical processing trains for treating the concentrate produced from the 4Mtpa spodumene concentrator. A de-risked staged approach to the construction of the processing trains has been adopted in the Company's analysis with the commissioning of a single train envisaged to commence six years after the commencement of SC6.0 production, followed by a further two trains three years after commissioning of the first train.

The following narrative provides a description of the process for one processing train unless otherwise noted.

Feed Receipt and Handling

Spodumene concentrate will be delivered onto a stockpile within a concentrate storage shed using a conveyor from the spodumene concentrator. The concentrate will be fed into individual feed hoppers dedicated to each processing train, which in turn will discharge to the pre-heat section of the calcination circuit.

Calcination

The objective of the calcination process is to convert the SC6.0 from the natural monoclinic α-form to the tetragonal β-form, thereby improving lithium solubility.

The calcination kiln will operate at 1,100°C and provide an approximate 3-hour total residence time to maximise conversion to the β-spodumene form. The cooled β-spodumene will be delivered to a dry milling circuit to yield a product target particle size P_{80} of 75µm. Milled solids will be transferred to an intermediate storage silo and thereafter to acid roasting.

Acid Roasting

The purpose of the acid roasting stage is to generate a soluble lithium sulphate product, which will be leached in water. The pregnant leach solution will then be separated from the bulk of the gangue minerals (unaffected by acid roasting) in a subsequent solid/liquid separation step.

Milled solids from the storage silo will be mixed with concentrated sulphuric acid and fed into an acid roaster kiln. Roaster solids will be cooled and discharged into the acid leach repulp tank.

Leaching

Slurry from the acid leach repulp tank will be diluted with water and leached in agitated tanks. Leach discharge slurry will then be delivered to a series of filter presses to effect separation of the un-leached solids from the leach liquor. The solids will be washed before being disposed of in a Tailings Storage Facility (TSF).

Neutralisation

Acidic filtrate from the acid leach filtration stage will be contacted with limestone slurry to neutralise residual acid, precipitating the bulk of the soluble iron and aluminium as hydroxides. Neutralisation discharge slurry will then be filtered, and the resulting solids washed, back-loaded into trucks and returned to the concentrator plant for blending with flotation tailings prior to disposal in a TSF.

Impurity Removal

Filtrate from neutralisation filtration will be indirectly pre-heated using hot condensate and steam in a series of heat exchangers, before reporting to the first of two mechanically agitated impurity removal tanks.

Sodium hydroxide solution will be dosed into the first tank to neutralise residual acid and to remove magnesium via precipitation of magnesium hydroxide. The slurry will then flow to the second tank and sodium carbonate solution will be added to precipitate calcium. The impurity removal discharge slurry will be filtered, and the solids recycled to the neutralisation stage, while the clarified filtrate will advance to Pregnant Leach Solution (PLS) evaporation.

PLS Concentration

Filtrate from the impurity removal circuit will comprise a pure PLS of predominantly lithium sulphate and sodium sulphate. Prior to the subsequent production of LHM, it will be required to pre-concentrate the PLS in an evaporator.

The PLS will be introduced to the recirculating liquor stream of an evaporator while a stream of concentrated PLS will be continuously withdrawn from the evaporator via a heat exchanger to a surge tank. Process condensate from the PLS evaporator will report to a process water tank.

Causticisation

Concentrated PLS will be pumped from the evaporator product tank to a series of lithium hydroxide reactors. Sodium hydroxide solution will be dosed into the reactors to effect conversion of the lithium sulphate to a solution of lithium hydroxide and sodium sulphate at elevated temperature (~100°C). Any residual will be removed by precipitation of calcium hydroxide.

Glauber's Salt Crystallisation

The intention of the Glauber's salt crystallisation circuit is to take advantage of the different solubilities of lithium hydroxide and sodium sulphate to effect preferential crystallisation of the sodium sulphate as Glauber's salt.

The process feed liquor stream, containing predominantly dissolved salts of lithium hydroxide and sodium sulphate, will be pumped from the causticisation circuit to the Glauber's salt feed tank. Thereafter the solution will be delivered via a series of heat exchangers to the first of two Glauber's salt crystallisers.

The first stage will cool the feed such that the liquor is just saturated with respect to sodium sulphate, and a small quantity of Glauber's salt will begin to crystallise. The dilute slurry will then be pumped to the second stage where it will be cooled further, resulting in crystallisation of the balance of the Glauber's salt. The resulting magma will then be centrifuged to separate the Glauber's salt crystals from the liquor, providing a natural 'break' between the lithium hydroxide and sodium sulphate circuits.

Sodium Sulphate Crystallisation

Glauber's salt from the centrifuge will be fed to a melter to produce a dilute slurry of anhydrous sodium sulphate, which will then feed a sodium sulphate crystalliser. Slurry will be extracted from the wash leg of the crystalliser and centrifuged to yield anhydrous sodium sulphate crystals.

By-product Sodium Sulphate Drying and Packaging

Anhydrous sodium sulphate crystals from the centrifuge will be dried in a fluid bed dryer to remove residual moisture, cooled, and packaged into bulk bags for potential sale/export.

LHM Crystallisation

Three stages of LHM crystallisation, with intermediate centrifugation and crystal dissolution, will be used to sequentially enhance the purity of the LHM product. Pre-heated centrate from the Glauber's salt centrifuge will be delivered to the first stage LHM crystalliser to produce a crude LHM crystal which will be recovered on a centrifuge. Hot process condensate will then be used to dissolve the crystal solids and the resulting solution will be pumped to the second stage LHM crystalliser.

Redissolved crude LHM crystals, together with the purge stream from the third stage LHM crystalliser, will be pumped to the second stage LHM crystalliser. Hot process condensate will again be used to dissolve the crystals recovered from a centrifuge, and the resulting solution will be pumped to the third stage crystalliser.

Redissolved LHM crystals from the second stage centrifuge will be pumped to the third and final LHM crystalliser, while a continuous purge liquor stream will be recycled to the feed of the second stage LHM crystalliser.

Lithium Hydroxide Drying and Packaging

The pure LHM crystal product from the centrifuge of the third crystallisation stage will discharge to a low temperature dryer to remove residual moisture, before being packaged into bags in a clean-room environment and despatched for export.

3. Site Infrastructure

The proposed refinery layout will comprise three identical processing trains, with shared reagents, services, and utilities. It is proposed to locate the processing plant at Kathleen Valley adjacent to the proposed spodumene processing plant and to the west of the Goldfields Highway. This proposed site is relatively flat and within the Company's exploration lease boundary (**Figure 3**).

Site infrastructure is previously detailed as part of the DFS which will be supplemented as follows:

Site Development and Access Roads

The sealed Goldfields Highway is ~0.5km east of the proposed refinery site and will provide the main access to the Project. A new sealed access road will connect the plant-site to the highway.

Power Supply

It has been assumed that the power supply to the refinery will be from an expanded version of the site Hybrid PowerStation proposed for the spodumene processing plant. A separate main switchyard will be provided for the refinery and emergency power will also be provided.

A connection to the nearby gas pipeline will be included in project infrastructure upgrades for the supply of gas to the calcination kilns and expanded Power Station.

Services

The bore-field developed as part of the spodumene processing plant will be supplemented by additional bores on current Company Tenements.

Dedicated potable and demineralised water treatment plants for the refinery will be installed.

Saturated steam used for various heating duties throughout the refinery will be generated on site in a natural gas-fired boiler. Natural gas will be accessed from the nearby gas pipeline.

All surplus process water will be collected and treated through a dedicated wastewater treatment plant.

Accommodation & Buildings

An allowance has been included to increase the accommodation village size currently proposed as part of the DFS.

Several plant buildings have been allowed for the refinery including administration office, clinic/First Aid, plant office, ablutions, crib room, maintenance workshop, warehouse, reagent store, laboratory, emergency response and control room.

Final Products Transportation and Shipping

Kathleen Valley is located adjacent to the Goldfields Highway allowing for the transport of LHM on sealed roads to the Port of Fremantle and subsequent export overseas.

Covered storage for all products will be provided on site with offsite storage to be provided by contractor/s.

4. Financial Information

A staged integrated financial evaluation was completed using the Base Case Production inventory of 82.7Mt of potential mill feed at an average process plant feed grade of 1.30% Li_2O (per the DFS). Per **Table 2** anticipated design refinery feed is based on the 4 Mtpa spodumene processing plant combined with three LHM trains to process 570 ktpa of SC6.0 annually.

Table 5 - Table 7 summarise the results.

Life of Mine Financials

Table 5: Integrated Project Life of Mine Cash-Flows

Description		LHM Cash-flow (A$B)
Project Revenues		
	- SC6.0	9.39
	- LHM	52.93
Operating costs (excludes royalties, net of Tantalum credits)		
	- SC6.0 production and transport	(5.61)
	- LHM conversion and transport	(5.95)
Capital expenditure	- Initial & Pre-production	(0.47)
	- Ongoing & expansion CAPEX	(0.07)
	- DSS refinery CAPEX	(1.50)
	- Sustaining	(0.45)
Royalties (State & Private)		(2.03)
Corporate tax		(13.87)
Life of Mine Project Free Cash-flow (A$B, after tax)		32.37

Integrated Project Capital Expenditure

The Integrated Project capital cost estimate was compiled by Lycopodium and reflects the assumptions and parameters outlined in both the DFS and the DSS (**Table 6**).

Table 6: Integrated Project Capital Cost Estimate Summary (A$M, 4Mtpa Spodumene plant throughput)

Main Area	LHM Capital (A$M)
Spodumene Plant & Mine Development [2]	
Spodumene Processing plant & Mine Pre-production (**4Mtpa** Per DFS, costs exclude Contingency)	507
DSS Refinery and Associated Infrastructure (x3 LHM processing trains) [1]	
Plant Site and Bulk Earthworks	9
Treatment Plant	735
Reagents and Plant Services	52
Infrastructure	49
Contractor Distributables	132
Pre-production Costs and Spares	71
Mobile Equipment	9
Subtotal	**1,057**
EPCM Management Costs (DSS)	147
Owners Costs (DSS)	37
Subtotal	**184**
Total Contingency (DSS +DFS)	289
Project Total (A$M) [1][2]	**2,037**

[1] *DFS capital estimate to +/- 15% accuracy, DSS to +/-30% accuracy*
[2] *Capital cost excludes working capital, finance costs, sustaining capital and corporate costs associated with project development*

Integrated Project Operating Cost Estimate

The Project has an estimated LHM cash cost, FOB (inclusive of royalties) as detailed in **Table 7** below. This includes credits for tantalum concentrate produced as part of the production of SC6.0 consumed by the downstream refinery trains. SC6.0 not used for the prosecution of LHM will be sold into the spot market per DFS pricing assumptions.

Table 7: Integrated Project Operating Cost - LHM

LHM Operating Cost	Total Cost US$/dmt
Average SC6.0 feed cost based on 6.6 tonnes of SC6.0 per tonne LHM (derived from DFS including net Tantalum credit and Royalties) [1] [2]	**2,561**
Average LHM Upgrade costs:	
Consumables	2,032
Power	366
Labour	354
Maintenance	365
Laboratory	52
G&A	64
Transport	70
Total Average LHM Cash Operating Cost (US$/dmt LHM)	**5,864**

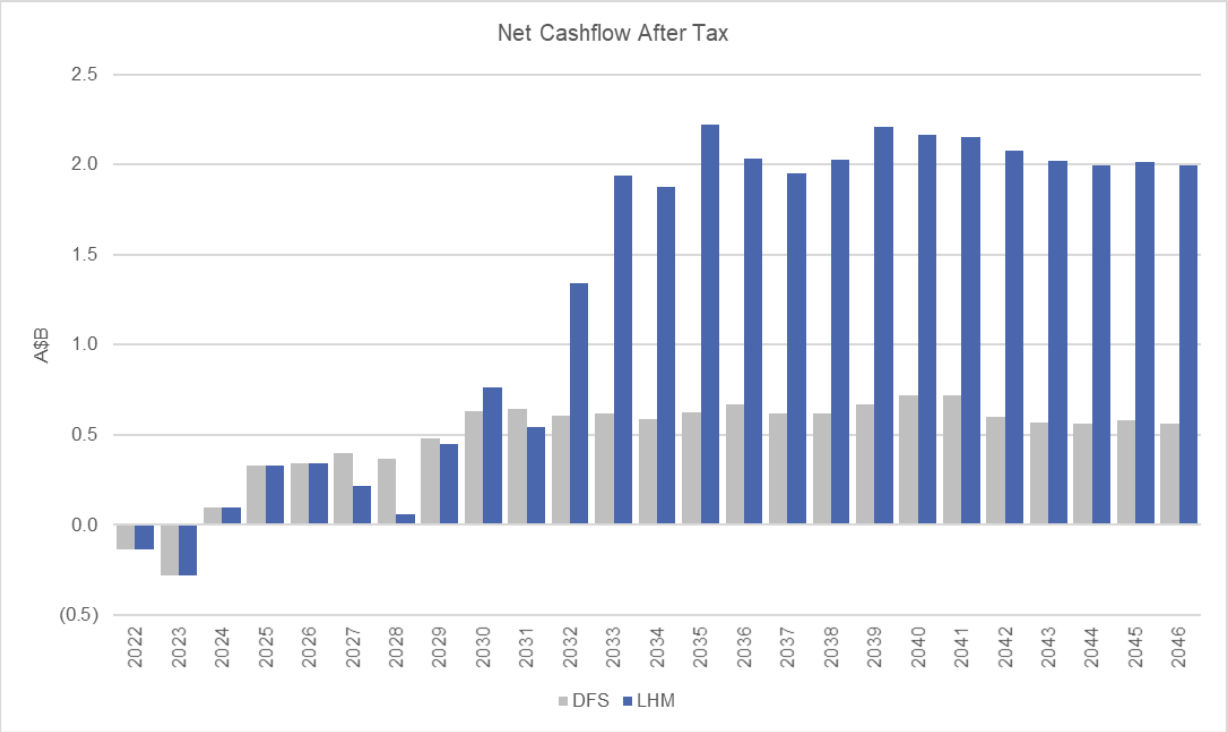
[1] *Includes 6.6 tonnes of SC 6.0 per ton LHM. All concentrate metrics based on a normalised 6% concentrate basis.*

[2] *Excludes spodumene DFS transport costs and other costs which are not applicable when spodumene is being further processed on site at Kathleen Valley. Based on allocation of SC6.0 feed tonnes and cost for periods and volumes required for LHM production.*

Integrated Project Life of Mine Cash Flows

Figure 9 illustrates the net cash flows after tax per annum associated with the Integrated Project and the DFS.

Figure 9: Integrated Project Net Cashflow After Tax



Foreign Exchange

A long-term FX value of A$1=US$0.73 was used in converting USD to AUD.

Commodity Pricing

See discussion in main body of report.

Funding

As disclosed in **Table 6,** funding in the order of A$2B (excluding working capital, finance costs, sustaining capital and corporate costs associated with project development) is required to achieve the SC6.0 plant and the three-train integrated production examined as part of the updated DSS.

Based on the strong financial metrics presented as part of the DSS Integrated Project results, there are reasonable grounds to believe that the Integrated Project can be financed in future.

For the SC6.0 plant and DFS CAPEX, it is most likely that any financing would be undertaken via a combination of debt and equity, like several recent projects in Western Australia which have been funded in the past five years. Current funding conditions for both equity and debt sources of funding are positive, however there is no guarantee these conditions will continue in the future. The current estimated project cashflows illustrate that the refinery project capital could be funded, in part or potentially fully, from project cashflows.

At this point, all future production from KV remains 100% uncommitted to maintain maximum flexibility over funding and development options. At present, lithium concentrates are typically sold via specific agreements between producer and customer rather than a liquid metals exchange as with some other commodities (e.g. gold and copper).

As part of its current marketing strategy, Liontown intends to put in place foundation off-take agreements with customers to underpin future sales of SC6.0 and help support financing options being considered, with an aim of delivering diversification by geography and stage in value chain.

It is anticipated that off-take agreements would commence as spodumene only, with the potential to shift to lithium hydroxide in the future as the Company further advances its downstream processing strategy as that capability is developed.

Potential offtakes for the KV tantalum production are currently being explored with customers as part of the initial KV project to produce spodumene. In the Integrated Project stage, these agreements will continue subject to the normal ongoing commercial customer supplier discussions.

There are several factors that will influence the ability of Liontown to secure funding for the downstream portion of the Integrated Project including (but not limited to) a requirement to have "bankable" lithium off-take agreements and favourable prevailing market conditions (being both the lithium market and the wider equity and debt market). There is a reasonable possibility that the Company could have an offtake partner invest in the Integrated Project to bring technical and financial capability to the Project.

The DSS financial, economic, and marketing metrics are robust and the resource base at Kathleen Valley has the potential to deliver a multi-decade production opportunity. In addition, the Project's location is within a mature, low sovereign risk mining jurisdiction which is also very attractive to these interested parties.

The Company has a market capitalisation of approximately A$3.6B (as at the date of this announcement), a simple ownership structure, a "clean" capital structure and does not carry material debt on its balance sheet. All these factors are expected to be attractive to potential strategic partners and provide flexibility with potential debt funding structures.

The Company has formed the view that there are reasonable grounds to assume that a combination of off-take finance, debt, equity, and project cashflows (for at least part of the refinery capex) will likely be successfully arranged and be sufficient to cover the estimated capital and working capital costs as and when required. However, investors should note that there is no certainty that the Company will be able to raise the amount of funding required when needed.

Importantly, Liontown's decision to proceed with the downstream component of the Integrated Project will follow the initial development of the Kathleen Valley Project outlined in the 11th November 2021 DFS. As such, it retains flexibility as and when development of any downstream project is commenced (having regard to factors such as financing availability, the lithium market and economics conditions more generally).

It is possible that funding may be dilutive to, or otherwise affect the value of the Company's existing shares. It is also possible that the Company could pursue other strategies to provide alternative funding options including undertaking a corporate transaction, seeking a joint venture partner or asset sales.