

# Completion of Stage 2 DFS

Metro Mining Limited (ASX:MMI) ("Metro") is pleased to provide the following update regarding the Stage 2 expansion of the Bauxite Hills Mine.

## Highlights

The Definitive Feasibility Study ("DFS") has been completed for the Stage 2 expansion of the Bauxite Hills Mine. The key outcomes are as follows:

- Confirmation of the significant economic benefits of expanding to an annualised rate of 6.0 Million Wet Metric Tonnes ("WMT");
- Reserves of 109.5Mt\* at Bauxite Hills and a mine life to 2037;
- Production target of 4M WMT in 2020, followed by 6M WMTpa thereafter;
- Significant reduction in unit operating costs by the use of a Floating Terminal ("FT") that can load larger, ungeared Ocean-Going Vessels (OGVs), including Cape Size vessels;
- Capital Costs of A\$51.4 Million (including 10% contingency);
  - The FT comprises approximately 85% of the total expansion capital;
  - Expansion of the accommodation camp, port area modifications and fleet additions (including mobilisation) makes up the remainder of the capital spend;
- Life of Mine unit operating costs are forecast to reduce by approximately 18% delivered to China when operating at the 6M WMTpa rate, which will increase operating margins. This will position Bauxite Hills in the lowest quartile of the global cash cost curve for bauxite producers, and;
- Project payback in less than 18 months;
- Metro has appointed Rocktree Consulting S.r.l. ("Rocktree Consulting") to complete the engineering, design and supplier quotation of the FT - expected to be completed in November;
- Negotiations with debt providers are well advanced;
- The final decision to proceed will follow finalisation of the funding package and completion of the detailed engineering and design work from Rocktree.



**Metro Managing Director and Chief Executive Officer Simon Finnis said,**

*"The completion of the feasibility study and selection of the preferred design for the FT is a key step to allow execution of the expansion at Bauxite Hills by 2021. It builds on the outstanding production performance and operating experience gained since the mine commenced production in April 2018. We have some further work to do on the final design, and we need to finalise the funding package, and then we will present to the board for their approval.*

*It is pleasing to see the DFS completed and we thank shareholders for their patience. The DFS clearly shows that the expansion confirms Bauxite Hills as one of the lowest cost and largest independent producers of bauxite in the market."*



## Summary

Metro is pleased to announce completion of the Definitive Feasibility Study (DFS) for the Stage 2 expansion of the Bauxite Hills Mine. Once completed, the expansion will reduce unit operating costs and increase production capacity to 6M WMT pa from 2021 onwards.

The key components of Stage 2 are:

- Construction and mobilisation to Skardon River of a FT with the ability to load 6M WMT pa of bauxite;
- Scale up of the current mining, haulage and transshipment fleets;
- Optimisation and upgrading of the existing port and barge loading facilities

Year	2018 (A)	2019 (E)	2020 (F)	2021 (F)	2022-2037(F)
Production (Million WMT)	2.02	3.3 – 3.5	4.0	6.0	6.0

With commissioning of the FT planned for Q1 2021 the production target for 2020 is 4.0M WMT. Metro will continue to look at optimisation alternatives with the potential to increase production levels in 2020.

The DFS was completed by MEC Mining, an independent and highly reputable Mining Consultancy firm who previously completed feasibility studies for Bauxite Hills. This was supported by a number of specialist consulting firms including:

- Rocktree Consulting, a global specialist builder and operator of transshipment vessels for dry bulk commodities such as bauxite.
- Braemar, a leading international Ship Broker which provided forward freight estimates.
- CM Group, a market leading bauxite industry specialist which supplied forward price decks specifically for Bauxite Hill' bauxite product specification.
- Wave Engineering a highly experienced engineering firm which was involved in the initial construction of the Bauxite Hills mine and previous feasibility studies.

The Bauxite Hills Mine has been operating for more than 18 months and has produced over 4.3M WMT of ore for sales to various Chinese refineries. This operating and sales experience has enabled Metro to improve the efficiency of the operation, build our customer base in China and determine the optimum way to maximise long-term returns from the project. Stage 2 is an integral part of this strategy.

Capital expenditure estimates have been undertaken to an accuracy of  $\pm 10\%$  and a 10% contingency has been applied across all costs. The table below details total expansion capital expenditure.

<b>Capital Cost Estimates (Assumed exchange rate of A\$/US\$0.70)</b>	
Category	Cost (A\$M)
<b>Floating Terminal</b>	
Direct Cost	38.0
EPCM Contract	2.0
Contingency (10%)	3.9
<b>Cost of Floating Terminal</b>	<b>43.9</b>
Camp Modifications & Expansion	1.0
Upgrade Port and Barge Loading Facility	4.8
Mobilisation Costs	1.0
Other Contingency (10%)	0.7
<b>Total Estimated Cost</b>	<b>51.4</b>



## Floating Terminal

The largest component of expanding Bauxite Hills is the construction and mobilisation to Skardon River of a Shiploader or Floating Terminal. Rocktree Consulting was retained to determine which FT design was best suited to Bauxite Hills, its expanded production rate and the prevailing loading conditions at Skardon River. Several alternative designs were assessed as part of the feasibility work. Rocktree Consulting's team members have been involved in the design, engineering and construction of more than 20 floating terminals over the past two decades, including the Apollo FT pictured below.

The preferred FT design consists of a 100m barge, equipped with two cranes and a materials handling conveyor and stacker system that will have the ability to load up to 40,000tpd of bauxite. The FT will be able to load different sized OGVs, allowing Metro to take advantage of chartering Cape Size vessels to realise significant freight savings, whilst maintaining customer flexibility with the ability to still load smaller OGVs. The 2017 DFS contemplated a floating crane without any conveyor systems that could achieve approximately 26,000tpd. Whilst this may be sufficient to achieve Metro's target production of 6M WMTpa, this DFS, coupled with Metro's operating experience, determined that the incremental capital expenditure for the conveyor system was prudent. The benefits of the increased loading rate include ensuring excess capacity will be available to overcome any unforeseen operational issues and also allow further expansion beyond 6M WMTpa without changing any shiploading infrastructure.

Rocktree Consulting is now tendering key work packages of the FT that will allow accurate supplier and construction quotations and a more definitive schedule to be developed. This process is expected to take 1-2 more months and will include finalisation of the cost of all the equipment, identification of a high-quality shipyard for construction, finalisation of the schedule and construction methodology and, of course, plan for mobilisation to Skardon River.

Asenco has been retained by Metro to provide Project Management services to assist in overseeing the tendering of equipment and construction of the FT. **Key Components Include:**

- A barge, providing the platform for the loading equipment;
- Two heavy duty cargo cranes, designed specifically for maritime use, each with grabs to facilitate loading bauxite from the current dumb barges;
- Two large hoppers with feeder belts and conveyors to transport bauxite to the point of loading;
- A telescopic ship loader for loading bauxite into the OGV holding compartments;
- Buffer storage capacity;
- Workshops, accommodation, power generation and other required items of on-board infrastructure



The cost estimate provided by Rocktree as part of the Feasibility Study is below. This will be confirmed by the tender process that is currently underway.

<b>Capital Cost Estimates – Floating Terminal</b>		
<b>Category</b>	<b>Cost (US\$M)</b>	<b>Cost (A\$M)*</b>
Total Component Parts	12.5	17.9
Shipyards Costs	8.7	12.4
Other Services	1.9	2.7
<b>Costs ex Shipyards</b>	<b>23.1</b>	<b>33.0</b>
Mobilisation to Skardon River	2.6	3.7
Start-up and Commissioning	0.9	1.3
<b>Total Direct Costs</b>	<b>26.6</b>	<b>38.0</b>
EPCM Costs	1.4	2.0
Contingency	2.7	3.9
<b>Total Estimated Costs (US\$M)</b>	<b>30.7</b>	<b>43.9</b>

\*A\$/US \$0.70 Exchange Rate

<b>Technical Specifications</b>	
Length	100 Metres
Breadth	30 Metres
Maximum Draft	5.5 Metres
Cranes	Two heavy duty four rope cranes
Grabs type	Two scissor type
Buffer Storage	8,000 tonnes
Conveyor System	3,000 tonnes per hour
Hoppers	Two units designed to suit DSO material

This selected design is a significant improvement over the FT anticipated in the original BFS for Bauxite Hills. Whilst this has resulted in a higher capital cost the benefits include:

- >50% higher loading rate providing surge capacity and flexibility to respond to weather related and other disruptions to loading that may occur during the operating season
- Enhanced operating efficiencies thereby reducing unit costs
- Greater loading reach to assist loading into larger OGV's such as Cape Size vessels



## Land & Water Activities

The production and logistics chain at Bauxite Hills will be supplemented to ensure mining and transshipment rates can match the increased loading capacity of the FT.

The key components of these upgrades include:

- Supplement the mining and haulage fleets and move to 24-hour operations for rehabilitation.
- Replace the remaining smaller 3,500t barges with larger 7,000t barges. Two additional barges will be required generating significant economies of scale for transshipment. Whilst it is anticipated the barges will be supplied by the current Transshipment contractor, Metro will incur the mobilisation costs to site.

Further modifications will be required at the port area to ensure the capacity to load at the required rate, namely:

- Upgrading feeder system to provide additional screening capacity;
- Modifications to the Barge Loading Facility to increase capacity to ~2,000 tph;
- Increased ROM stockpile area to allow larger stockpiles to be maintained during the operating season.

Additional accommodation units will be installed and camp facilities expanded to manage the larger workforce.

## Operating Costs

Unit operating costs are forecast to fall by approximately 18% once Stage 2 is fully commissioned.

Operating expenditure estimates have been completed and include a 5% contingency applied across all costs. They are supported by existing operating data from Bauxite Hills and where needed by first principles engineering estimates and direct industry quotes.

Once the expansion is completed and production is at the 6M WMT pa rate, Bauxite Hills will move to the lowest cost quartile of global cash costs of production for the bauxite industry.

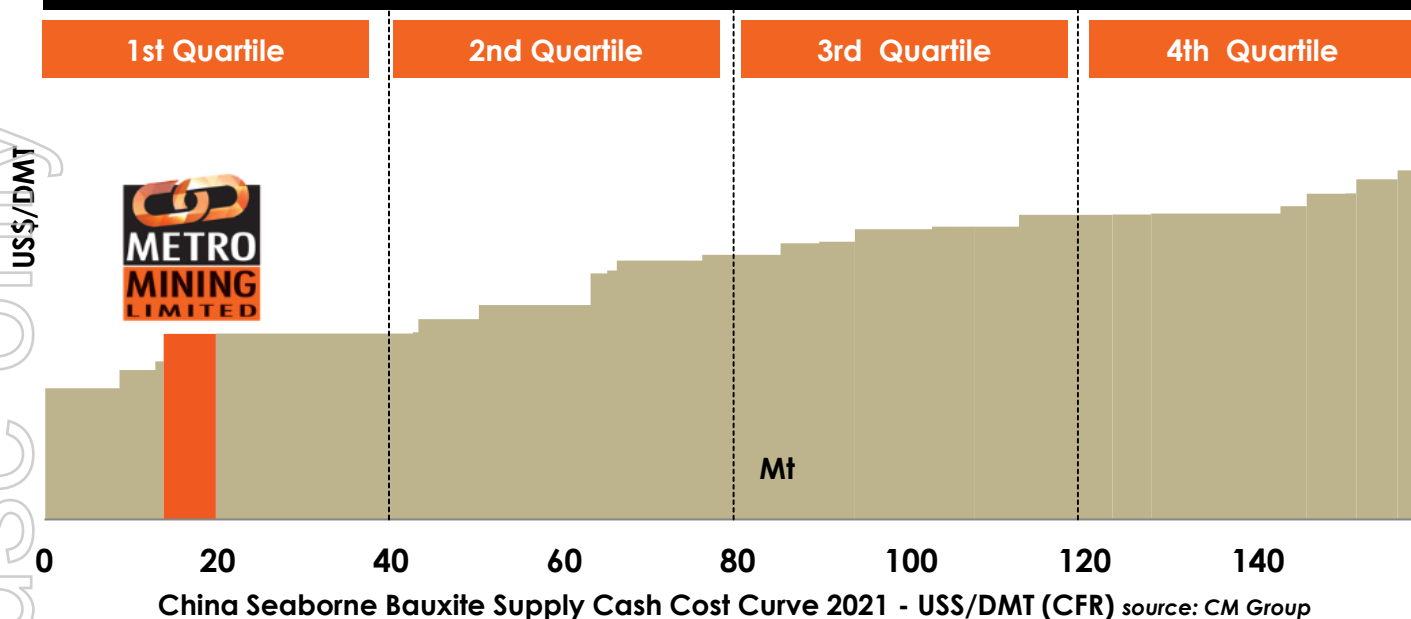
## Financing

Stage 2 capital expenditure will be incurred over 15-18 months from approximately late 2019 to end of Q1 2021. Financing is planned to come from a combination of both internal (e.g.: operational cashflow) and external sources.

Discussions with existing and new debt financiers have occurred in parallel with the DFS and are now at an advanced stage. This relates to both restructuring the existing facilities to better align with the production ramp up and provide new financing for the FT.



## China Seaborne Bauxite Supply Cash Cost Curve 2021 - US\$/DMT (CFR)



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