

15 March 2017

# Bauxite Hills Bankable Feasibility Study Confirms Excellent Financial Returns

## Highlights



### Key Financial Results:

- Initial capital cost of A\$35.8 million (including 10% contingency);
- Average annual EBITDA of A\$145 million;
- After tax NPV<sub>10</sub> of A\$601 million;
- After tax IRR of 81%;
- Life of mine revenue of A\$5.7 billion and life of mine EBITDA of A\$2.5 billion.



17-year initial mine life with production to commence in April 2018 at an initial rate of 2Mtpa ramping up to a steady state 6Mtpa over the first four years.



Key benefits of an enlarged and integrated development made possible by the Gulf acquisition include:

- Construction of single infrastructure to minimise the environmental footprint;
- Use of existing infrastructure during development phase;
- Additional flexibility to blend from the larger reserve base;
- Existing environmental approval for Gulf tenements and mining lease to allow early works and facilitating commencement of construction in mid-2017;
- Enhanced Reserves of 92.2Mt and total Resources of 144.8Mt\*.

## Next Steps



Final environmental approvals are expected by mid-2017 with construction planned to commence shortly thereafter, subject to finance being in place. All construction is expected to be completed during the dry season of 2017.



Ordering of long lead time items will commence over the next two months.

## Summary

Metro Mining Limited (ASX:MMI) is pleased to announce completion of the Bankable Feasibility Study (BFS) for the Bauxite Hills Mine, confirming strong financial returns from the project and demonstrating the benefits from acquiring Gulf Alumina Limited (Gulf). The BFS was completed by MEC Mining, an independent and highly reputable Mining Consultancy firm, supported by a number of specialist consulting firms.

It is a significant milestone in Metro's strategy to become a leading independent bauxite producer. The BFS confirms the ability to complete construction during 2017 and commence bauxite production and sales exports in Q2 2018, as soon as possible after the end of the wet season.

The key financial results and underlying assumptions used are outlined in the following table:

Key Results & Assumptions	
Description	Result
NPV (10% DR, Real, after tax)	A\$601M
IRR	81%
Payback Period of Initial Capital	1.7 years
LOM Revenue	A\$5.6B
LOM EBITDA	A\$2.5B
LOM Average Annual EBITDA	A\$145M
LOM on-site Average OPEX	A\$16.42/t
LOM Average OPEX including Royalty	A\$23.00/t

Assumption	Result
Annual Production Rate (Steady State)	6.0Mt
LOM Production	92.2Mt
Mine Life	17 years
Bauxite Price (CIF) Range	US\$36.36-53.88/t
Exchange Rate (AUD/USD)	0.75
Discount Rate	10%
Initial Capital Expenditure	A\$35.8M
LOM Average Operating Margin	A\$26.69/t

Both the NPV and IRR have been calculated at the time mine development first commences. The NPV has been calculated using project related costs only and does not consider Metro's corporate costs. However, Metro has approximately A\$56.0M available in tax losses relating to the project which have been applied in the NPV calculation.

### The Operation Consists of:

-  A simple mining operation where free-dig bauxite is mined by front end loaders and hauled by truck to a port infrastructure area with a haul distance between 6 and 22km.
-  At the port, bauxite will be screened to a maximum product size of 100mm and then fed into a Barge Loading Facility (BLF) which will load awaiting barges.
-  Tugs will then tow the barges down the Skardon River and out to an anchorage point beyond the river mouth where awaiting freight vessels will be loaded with bauxite.

The mine plan is based on the integrated Metro/Gulf reserves of 92.2Mt giving a 17-year mine life. There is potential to extend the mine through conversion of the existing Bauxite Hills resources to reserves, as well as from possible exploration success in regional tenement holdings of 2,500km<sup>2</sup>.

The low initial capital requirements reflect the strategic intent of Metro to fast track first production with a four-year ramp-up to steady state production of 6Mtpa. The planned production ramp-up will require further capital expenditure in the early years of the operational phase. This primarily relates to systems that will provide operational efficiencies at higher production rates, including:

-  the introduction of offshore loading platforms to allow loading of larger ocean going vessels; and
-  additions to the BLF to reduce re-handling of material.

A range of options are available to fund these costs, including leasing and use of contractors, however the BFS has considered these on a capital expenditure basis, to be funded out of cash flows.

Capital and operating costs used in the BFS are supported by estimates and commitments from suppliers, providing a high degree of confidence in the financial projections.

Further value engineering and continuous improvement studies are ongoing to identify strategies to further enhance project economic returns.

<b>Capital Cost Estimates</b>			
<b>Capital Cost Item</b>	<b>Amount</b>	<b>Capital Cost Item</b>	<b>Amount</b>
<b>Initial Capital</b>		<b>Expansion Capital (in years 2 and 3)</b>	
Site establishment and haul roads	A\$3.1M	Integrated Truck dump and screens and upgraded haul roads	A\$13.9M
Key infrastructure including BLF and camp	A\$25.8M	Transshipment upgrades	A\$19.5M
Other supporting infrastructure	A\$1.6M	Contingency @ 10%	A\$3.3M
Logistics and other owner's costs	A\$2.1M	<b>Expansion Capital Total</b>	<b>A\$36.7M</b>
Contingency @ 10%	A\$3.2M		
<b>Development Capital Total</b>	<b>A\$35.8M</b>		

Whilst the BFS has been completed for steady state production of 6Mtpa, environmental approvals will allow production of up to 10Mtpa. Metro will continue to evaluate the benefits of increasing production further as it moves through the pre-development and operational phases.

The operating costs displayed in the table below are LOM averages. During the initial ramp-up period, forecast operating costs will be higher, with the full benefit of economies of scale only realized when production reaches steady state of 6Mtpa.

<b>Operating Cost Estimates</b>	
<b>Operating Cost Item</b>	<b>BFS LOM Average</b>
Mining, haulage and operation of BLF	A\$7.07/t
Transshipment activities	A\$6.71/t
Site and administrative costs	A\$2.65/t
<b>Total Operating Costs (ex-royalties and ocean freight)</b>	<b>A\$16.42/t</b>
Royalties	A\$6.57/t
Ocean freight	A\$11.71/t
<b>Total Operating Costs</b>	<b>A\$34.70/t</b>

### **Bauxite Pricing**

Metro has previously announced a binding offtake agreement with Xinha Group, a leading Chinese company with extensive interests in alumina refineries and aluminum smelters. The offtake agreement covers 1Mtpa in the first year of operations, increasing to 2Mtpa for each of the following 3 years. The bauxite price payable by Xinha Group under this contract is linked to the underlying spot price of alumina in China, which is based on a Chinese spot price index.

To estimate the forward price of alumina, Metro has adopted forward price estimates provided by industry analysts.

For the balance of production, Metro has used forward price decks supplied by CM Group specifically for Bauxite Hills' bauxite product specification. CM Group is a reputable industry analyst with extensive experience in bauxite.

Extensive mineralogical assessment of the bauxite within the resource shows it is possible through mine scheduling, to produce bauxite suitable for both high temperature and low temperature alumina refineries. Importantly, this allows Metro to sell products to a broader range of refineries in China, and elsewhere.

### **Next Steps**

Metro now intends to increase its marketing and sales activities to broaden its customer base prior to mine commissioning.

Metro has commenced its financing activities to ensure sufficient funding through to receipt of first revenue expected during Q2 2018. Discussions have commenced with potential debt providers and current expectations are that financing will be sourced through a combination of debt and equity.

**Total funding requirements in addition to the initial capital costs will include:**

-  scheduled resource definition drilling and a broader regional exploration program
-  costs associated with financing including any hedging program, establishment and related fees and requirement for any minimum cash balance
-  environmental bonding requirements
-  repayment of the balance of any outstanding loans.
-  corporate and administrative costs

**Metro Managing Director Simon Finnis said,** *“The completion of the Bankable Feasibility Study is an enormous achievement for the Company and a testament to MEC, Metro’s project team and the quality of the project. The BFS also confirms the benefits of acquiring Gulf allowing one integrated development plan across both asset bases. We look forward to moving into the construction phase in mid-2017 once all environmental approvals have been received and funding secured.”*



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**FORWARD LOOKING STATEMENT**

Statements and material contained in this ASX Announcement, particularly those regarding possible or assumed future performance, production levels or rates, commodity prices, resources or potential growth of Metro Mining Limited, industry growth or other trend projections are, or may be, forward looking statements. Such statements relate to future events and expectations and, as such, involve known and unknown risks and uncertainties. Graphs used in this ASX Announcement (including data used in the graphs) are sourced from third parties and Metro Mining has not independently verified the information. Metro Mining is at an early development stage and while it does not currently have an operating bauxite mine it is taking early and preliminary steps (such as but not limited to Prefeasibility studies etc.) that are intended to ultimately result in the building and construction of an operating mine at its project areas. Although reasonable care has been taken to ensure that the facts stated in this ASX Announcement are accurate and or that the opinions expressed are fair and reasonable, no reliance can be placed for any purpose whatsoever on the information contained in this document or on its completeness. Actual results and developments may differ materially from those expressed or implied by these forward looking statements depending on a variety of factors. Nothing in this ASX Announcement should be construed as either an offer to sell or a solicitation of an offer to buy or sell shares in any jurisdiction.

**COMPETENT PERSON'S STATEMENT**

The information in this report that relates to Exploration Results is based on information compiled by Neil McLean who is a consultant to Metro Mining and a Fellow of the Australian Institute of Mining and Metallurgy (F.AusIMM). Mr McLean has sufficient experience that is relevant to the style of mineralisation and type of deposit under consideration and to the activity being 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 McLean consents to the inclusion in the report of the matters based on information in the form and context in which it appears.

The information in this report to which this statement is attached that relates to the "Metro Mining – Bauxite Hills" Reserves is based on information compiled by MEC Mining and reviewed by Edward Bolton, a Competent Person who is a Member of the Australasian Institute of Mining and Metallurgy. Edward Bolton is a full-time employee of MEC Mining Pty Ltd. Edward Bolton has sufficient experience that is relevant to the style of mineralization, type of deposit under consideration and to the activity being 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'. Edward Bolton consents to the inclusion in the report of the matters based on his information in the form and context in which it appears.

# Annexure – BFS Detail

## Project

### Description

The Bauxite Hills Mine is located approximately 95km north of Weipa on western Cape York in North Queensland. Western Cape York is world-renowned for its deposits of high-quality, export-grade bauxite.

In December 2016, Metro completed the acquisition of Gulf Alumina Ltd and in doing so, added to its reserve and resource base, recently announcing updates to 92.2Mt and 144.8Mt respectively. The acquisition also consolidated tenement ownership in the region bringing Metro's total tenement holding to over 2,500 km<sup>2</sup>.

The forecast quality and nature of the bauxite makes it suitable for export as Direct Shipping Ore (DSO). Metro has signed a binding offtake agreement with the major Chinese aluminium producer Xinfu Group for the sale of 7Mt of DSO bauxite in the first 4 years of the Project (see ASX announcement 13/10/2016).

The ability to produce and sell a DSO bauxite product lends itself to a simple mining operation as considered in the BFS:

-  Clearing of trees and removal of topsoil and overburden;
-  Free-dig mining of bauxite ore (no drill and blast required);
-  Transport of bauxite ore by road trains to the Port Facility;
-  Screening of bauxite ore to a maximum size of 100mm;
-  Loading of barges via the Barge Loading Facility (BLF);
-  Transhipment of bauxite ore down the Skardon River by Tug and Barge fleet to awaiting international freight carrier ships.

The simple mining operation allows for a low capital and low operating cost project and facilitates a quick start-up from the commencement of project development. In addition, the environmental footprint is minimised and the mining pits will be rehabilitated throughout each operating year, with topsoil and overburden being replaced as part of the mining process.

The BFS considers an initial 17 year mining operation commencing at ~2Mtpa, and ramping up to ~6Mtpa by year 4, taking advantage of the larger reserve base. Mining operations are planned to be undertaken in the dry season only, which is notionally an 8 month period from April to November.

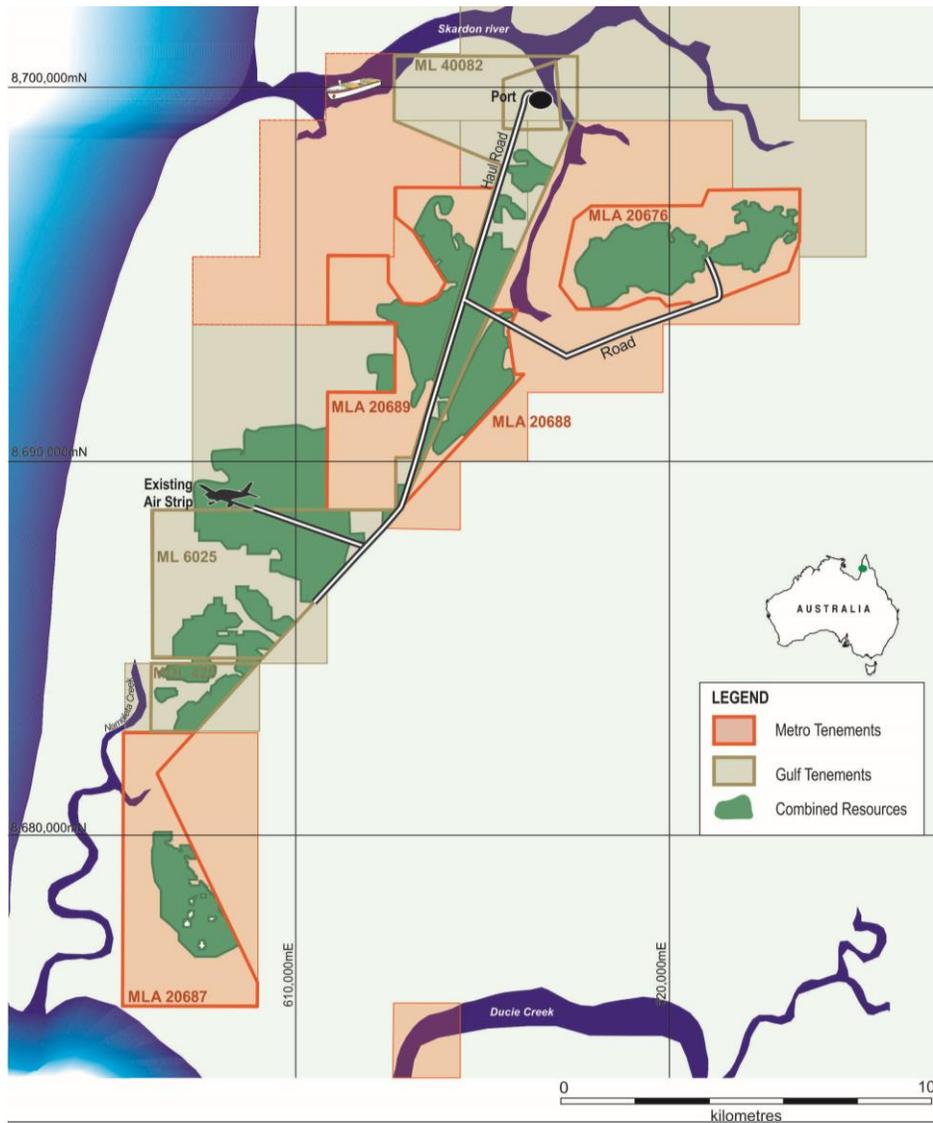


Figure: Bauxite Hills Mine Site layout and resource outline

## Project & Development Timetable

The table below outlines the development timeline under the BFS:

Event	Expected Timeline
Pre-Commitments on Long Lead Capital Items	April 2017
Mining Lease Renewal – Gulf Alumina acquired tenements	May 2017
Site clearing works	May 2017
Mining Lease Grant – Incumbent Bauxite Hills tenements	June 2017
Infrastructure construction	July – December 2017
Commence Mining	April 2018

## Development Works

Project development involves the following:

-  Site preparation works;
-  Marine support works including construction of BLF and installation of navigational aids and cyclone moorings;
-  Civil works to construct infrastructure including haul roads and accommodation camp;
-  Construction of supporting infrastructure such as fuel storage and communications network;
-  Mobilisation of all required plant and equipment;
-  Pre-strip of initial mining areas.

## Reserves and Resources

The mine plan compiled as part of the BFS was based on the JORC reserves detailed below (see ASX announcement 14 March 2017).

**Table 2: Bauxite Hills – DSO Mineral and Ore Reserve estimates**

Area	Category	DSO <sup>2</sup> Tonnes (Mt) <sup>1</sup>	DSO Bauxite Qualities (Dry Basis)	
			Total Al <sub>2</sub> O <sub>3</sub> (%)	Total SiO <sub>2</sub> (%)
BH1 & BH6	Measured Resource (Dry <i>In-situ</i> )	54.7	50.0	11.9
BH1, BH2 & BH6	Indicated Resource (Dry <i>In-situ</i> )	66.4	49.2	14.5
BH1 & BH6	Inferred Resource (Dry <i>In-situ</i> )	23.7	47.4	16.0
<b>TOTAL RESOURCE</b>		<b>144.8</b>	<b>49.2</b>	<b>13.9</b>
BH1 & BH6	Proved Reserve <sup>3</sup> (ROM @ 10% Moisture)	48.3	49.8	12.0
BH1 & BH6	Probable Reserve <sup>4</sup> (ROM @ 10% Moisture)	43.9	49.0	14.6
<b>TOTAL MARKETABLE ORE RESERVES</b>		<b>92.2</b>	<b>49.4</b>	<b>13.2</b>

<sup>1</sup> For BH1 and BH6 the tonnages are calculated using the following default bulk densities determined from a program of sonic drilling; 1.6g/cm<sup>3</sup> for BH1, 1.92 g/cm<sup>3</sup> for BH2 and 2g/cm<sup>3</sup> for BH6. Actual values are used where measurements have been taken

<sup>2</sup> DSO or "Direct shipping ore" is defined as bauxite that can be exported directly with minimal processing and beneficiation.

<sup>3</sup> Proved Reserve - the proved reserve is included in the BH1 & BH6 Measured resource

<sup>4</sup> Probable Reserve - the probable reserve is included in the BH1 & BH6 Indicated resource

# Mining and Haulage

## Mining Operation

Mining will commence as day-shift only, and as production increases, night shift operations will be added. The life of mine production is shown below.

Year	2018	2019	2020	2021	2022-2033	2034
Production (Mt)	2.0	3.0	4.9	6.2	~6.0	3.9

Initially, topsoil and vegetation will be removed by clear and grub activities. Dozers will then be used to remove overburden, which will be stockpiled for ongoing rehabilitation throughout the year. The average overburden thickness across the Project is only 0.5 metres, resulting in a very low strip ratio of 1:3.

The removal of the overburden exposes the bauxite DSO ore, which is free-dig in nature meaning no drill or blast is required. Front end loaders will be used to mine the bauxite and load directly into road trains which will transport the bauxite to a screening plant located at the port area.

Screening of the bauxite ore will be to a maximum size of 100mm, resulting in a product suitable for export. Any oversize material will be collected, stockpiled and campaign crushed when appropriate.



Figure: Mining operations

## Grade Control

Grade control is critical to delivering a consistent product to customers. As part of the BFS, Metro has developed detailed grade control procedures to ensure that mining results in a suitable product for sale. Grade control actions include:

- Pre-mining grade control drilling;
- Geological team working ahead of the mining face using a portable XRF to analyse the geochemical composition of the bauxite ore;
- Mobile lab for on-site analysis;
- Gamma ray on-belt analyser for additional checks;

## Haulage

Bauxite ore will be loaded into road trains for haulage to the port area. Initially, road trains will dump to a stockpile, which will be fed by a front end loader into a screening plant. Once the bauxite is screened, it will be stockpiled adjacent to the BLF for barge loading.

After the commencement of production, Metro will undertake further studies to investigate and develop fixed truck dump and screening plant infrastructure which will directly feed the BLF. This will allow Metro to efficiently expand its production profile and reduce operating costs by reducing rehandle costs.

## Transshipment Operations

### Barge Loading Facility

The BLF has been designed and will be constructed to achieve a minimum operating capacity of 1,500tph, which will allow Metro to meet its growing production profile without further capital investment. The BLF will be a conveyor system situated on a jetty spanning 125m. The conveyor system will feed a stacker located on a floating pontoon which will be used to load awaiting flat topped barges.

### Tug and Barge Operations

Metro will use a fleet of tugs to tow barges on the Skardon River and position them for loading /unloading.

Initially the fleet will consist of:

-  2 towing tugs;
-  2 support tugs;
-  4 flat topped dumb barges with approximately ~3,500t capacity each.

The barges will be towed to an anchorage point situated beyond the Skardon river mouth. The distance from BLF to anchorage point is approximately 15 nautical miles. At the anchorage point, barges will be positioned alongside an awaiting freight vessel for loading of bauxite.

In years 1 and 2, Metro plans to charter vessels that come equipped with cranes and grabs suitable for unloading bauxite from the barges. From year 3 when production increases to 5Mtpa, Metro plans to upgrade the transshipment fleet:

-  Upgrade to towing tugs with greater horsepower;
-  Mobilise larger flat topped dumb barges with capacity of 7,000-10,000t each;
-  Mobilise offshore floating crane platform.

The offshore floating crane platform offers Metro a number of advantages which will reduce the unit ocean freight costs:

-  Faster loading of bauxite onto vessels;
-  Allows loading of larger, ungeared vessels.

There are several options available for acquiring the floating crane platform including outright purchase, as well as lease and service style arrangements. These will be considered at the appropriate time when implementation of the floating crane is required.

Bauxite Hills is ideally located for export to China and will have good exposure to the spot freight market given the volume of ocean traffic in proximity to the project. In addition, Bauxite Hills enjoys a significant competitive freight advantage against other key bauxite export locations such as Guinea, Brazil and Jamaica.



**Figure: Tug and barge operations**

## Capital and Operating Expenditure

### Capital Expenditure

Capital expenditure estimates have been undertaken to an accuracy of  $\pm 10\%$  and are supported by detailed design engineering and direct industry quotes. The capital expenditure estimate includes a 10% contingency applied across all costs. The table below details total development capital expenditure:

Item	Amount
<b>Development Capital Expenditure</b>	
Site establishment and haul roads	\$3.1M
Key infrastructure including BLF and camp	\$25.8M
Other supporting infrastructure	\$1.6M
Logistics and other owner's costs	\$2.1M
<b>Total excluding contingency</b>	<b>A\$32.6M</b>
Contingency @ 10%	\$3.2M
<b>Total including contingency</b>	<b>\$35.8M</b>
<b>Expansion Capital Expenditure (in years 2 and 3)</b>	
Integrated Truck dump and screens and upgraded haul roads	A\$13.9M
Transshipment upgrades	A\$19.5M
<b>Total excluding contingency</b>	<b>A\$33.4M</b>
Contingency @ 10%	\$3.3M
<b>Total including contingency</b>	<b>\$36.7M</b>

### Operating Expenditure

Operating expenditure estimates have been undertaken to an accuracy of  $\pm 10\%$  and are supported by first principles engineering estimates and direct industry quotes. The table below details average life of mine operating expenditure:

Item	Amount
Mining, haulage and operation of BLF	A\$7.07/t
Transshipment activities	A\$6.71/t
Site and administrative costs	A\$2.65/t
<b>Total Operating Costs (ex-royalties and ocean freight)</b>	<b>A\$16.42/t</b>
Royalties	A\$6.57/t
Ocean freight	A\$11.71/t
<b>Total Operating Costs</b>	<b>A\$34.70/t</b>

# Bauxite Market Overview

## Bauxite Overview

Bauxite is the main raw material used in the commercial production of alumina ( $\text{Al}_2\text{O}_3$ ) and subsequently aluminium metal. Bauxite is a heterogeneous, naturally occurring material of varying composition that is relatively rich in aluminium.

To produce aluminium, bauxite is crushed and purified through the Bayer process. This is a heavily energy intensive process and is therefore most economically carried out in regions where energy costs are the lowest.

## Supply and Demand Factors

In the past decade, the global seaborne bauxite market has emerged and grown rapidly. As China's aluminium consumption grew, the country remained largely self-sufficient in aluminium and alumina production. This brought about the emergence of new alumina refineries, with many being constructed in the coastal Shandong province to process exclusively imported bauxite. Declining quality and quantity of domestic bauxite reserves has also contributed to the increasing reliance of imported bauxite.

As Chinese demand for imported bauxite grew, new bauxite operations were established first in Indonesia and then Malaysia. Sudden export bans in both countries led to significant supply disruption to Chinese alumina refineries. Bauxite exports have recently resumed in both Indonesia and Malaysia, albeit under much stricter and regulated conditions, and as such tonnages remain relatively low. The supply void left by these countries has been replaced by new projects in Guinea and other existing bauxite mines.

Located in a politically stable jurisdiction, Metro believes Bauxite Hills will be an attractive option for Chinese customers seeking a long term, reliable supply of bauxite.

## Bauxite Hills DSO Product Marketability

Through blending of its bauxite mined from various deposits in the Project, Metro plans to produce 3 products tailored specifically to both high temperature and low temperature alumina refineries.

As part of the BFS and its ongoing product marketing strategy, Metro has engaged external bauxite consultants to analyse typical specifications of these products and their suitability to Chinese customers. The conclusion of this work is that Metro's products will be suitable to Chinese refineries and be competitive with other bauxite already being exported to China.

The range of products will increase the number of potential refineries that can be targeted for sales. Bauxite is a highly variable product and refineries consist of a number of parallel production lines that are configured to process a certain bauxite specification. Having 3 products will assist in diversifying sales risk.

Historically, the Chinese major alumina producers have typically purchased bauxite on short term offtake agreements or spot sales. Metro is confident of selling its uncontracted production into future offtake agreements and the spot market.

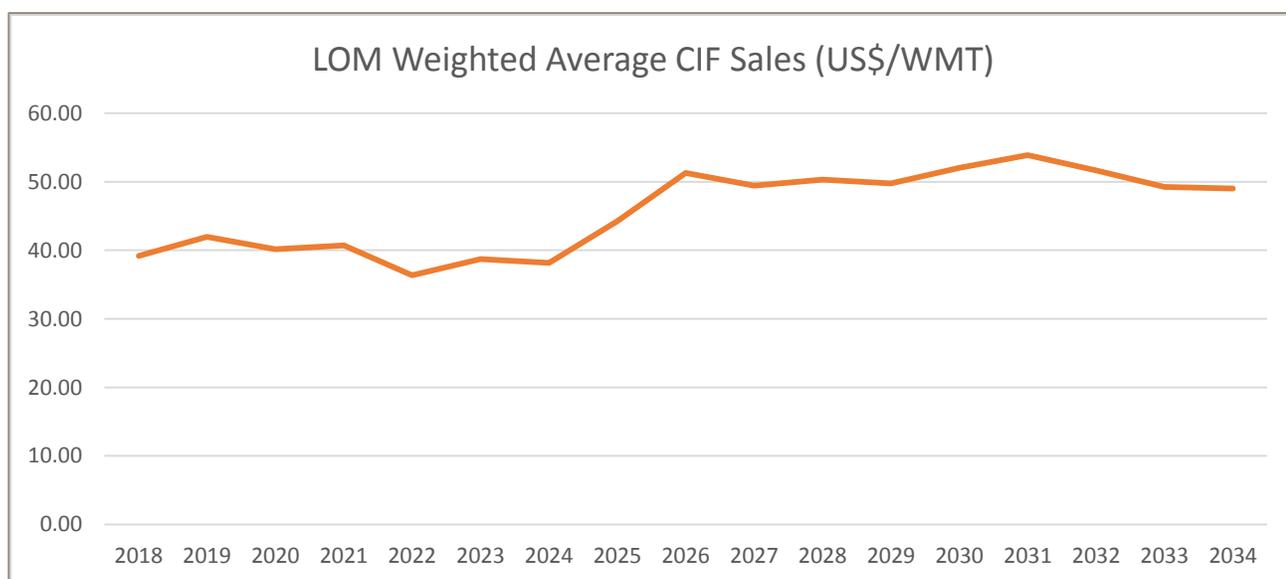
## Price Forecasting

Metro has previously announced a binding offtake agreement with Xinha Group, a leading Chinese company with extensive interests in alumina refineries and aluminum smelters. The offtake agreement covers 1Mtpa in the first year of operations, increasing to 2Mtpa over each of the following 3 years. The bauxite price payable by Xinha Group under this contract is linked to the underlying spot price of alumina in China, based on a Chinese spot price index.

To estimate the forward price of alumina, Metro has adopted forward price estimates provided by industry analysts.

For the balance of production, Metro has used forward price decks supplied by CM Group specifically for Bauxite Hills' bauxite product specification.

The following chart illustrates the blended bauxite price forecast to be received by Metro across all product streams.



## Sensitivity Analysis

As part of the BFS, sensitivity analyses were undertaken, and those for the key assumptions are presented below:

Exchange Rate (AUD/USD)	0.65	0.70	0.75	0.80	0.85	0.90
NPV	A\$774M	A\$681M	A\$601M	A\$531M	A\$469M	A\$414M
Revenue	-30%	-20%	-10%	+10%	+20%	+30%
NPV	A\$172M	A\$316M	A\$459M	A\$745M	A\$886M	A\$1,026M
Operating Expenditure (ex-royalties and ocean freight)	-30%	-20%	-10%	+10%	+20%	+30%
NPV	A\$718M	A\$679M	A\$640M	A\$562M	A\$523M	A\$484M