

26 April 2021

## **PT Merdeka Copper Gold Tbk (Merdeka) Announces Completion of Feasibility Study for the Acid Iron Metal (AIM) Project at Indonesia Morowali Industrial Park (IMIP)**

### **EXECUTIVE SUMMARY**

JAKARTA, INDONESIA – PT Merdeka Copper Gold Tbk (MDKA.JK) is pleased to announce the completion of the Feasibility Study (“FS” or the “Study”) for the AIM Project in Indonesia.

The Study was completed by DRA Pacific in March 2021 and was supported by specialist input from various other consultants, including Beijing General Research Institute of Mining and Metallurgy (“BGRIMM”), PT Lorax, Orewin, CRU and PT Hatch.

The Study has confirmed the technical, economic, and environmental feasibility of the AIM Project and supports the certification of a Class 3 Association for the Advancement of Cost Engineering (“AACE”) cost estimate. Based on project capital costs of US\$290m, the AIM Project yields a compelling net present value (“NPV”) of US\$407m at 8% discount rate with an internal rate of return (“IRR”) of 26%.

“We are pleased with the final results of the Study, which further confirm that the AIM Project is an exciting growth opportunity for Merdeka in terms of future Indonesian acid supply”, stated Simon Milroy, Merdeka Vice President Director and Chief Executive Officer.

### **BACKGROUND TO AIM JV**

- On 19 February 2020 Merdeka announced that Merdeka and Tsingshan had entered into a memorandum of understanding in relation to the development of the AIM Project
- During 2020, Merdeka conducted a Class 3 FS on the AIM Project
- On 3 February 2021 Merdeka announced the preliminary financial results of the FS
- On 11 February 2021 PT Batutua Pelita Investama (Merdeka) and Wealthy Source Holding Group Limited (Tsingshan) signed a joint venture agreement (“JV”) for the AIM Project
- On 19 March 2021 the parties established an Indonesian incorporated joint venture company, PT Merdeka Tsingshan Indonesia (“MTI”), to execute and operate the AIM Project. MTI is 80% held by Merdeka and 20% by Tsingshan.

### **OVERVIEW**

The AIM Project will purchase high-grade pyrite ( $\text{FeS}_2$ ) spent ore from Merdeka’s Wetar copper mine. The spent ore, which also contains copper, gold, silver and zinc, will be transported by barge from Wetar Island to IMIP.

The AIM plant will process the spent ore to produce metals such as iron ore (pellets), sponge copper, gold and silver dore as well as sulphuric acid and steam.

For the acid, Merdeka is in advanced negotiations to sell the sulphuric acid (on a take or pay basis) to a customer currently constructing a high-pressure acid leach (“HPAL”) plant at IMIP. These negotiations are expected to be concluded in the first half of 2021.

Significant growth in acid demand is expected as additional HPAL plants are planned to be constructed in Indonesia. The AIM Project will begin construction in Q2 2021 and is targeted to deliver first acid in Q4 2022.

## PROJECT ECONOMICS

The majority of the AIM Project’s revenue is attributable to the sale of acid, iron ore pellets and sponge copper.

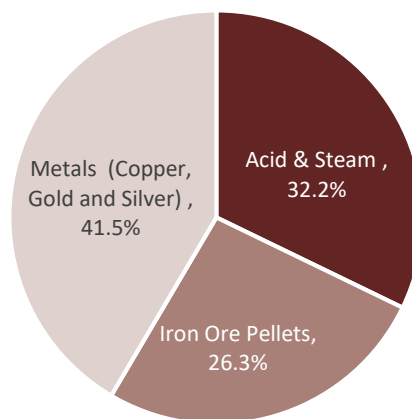
Pre-production capital costs are shown in the table below. At capital costs of US\$290m, the AIM Project delivers a compelling NPV of US\$407m with an IRR of 26%.

Project Statistics	Unit	Value
<b>Financial Results @ US\$290m Capex</b>		
NPV @ 8%	US\$m	407
IRR	%	26%
Payback from First Production	Years	3.33
<b>Pre-Production Funding Requirements <sup>1</sup></b>		
Concentrator	US\$m	24
Refinery	US\$m	239
<b>Sub-Total</b>	<b>US\$m</b>	<b>263</b>
Contingency	US\$m	26
<b>Total</b>	<b>US\$m</b>	<b>290</b>
<b>Key Assumptions</b>		
<b>General</b>		
Life	Years	22
<b>Production</b>		
Acid	Million tonnes	21
Steam	Million tonnes	23
Iron Ore Pellets	Million tonnes	9.3
Sponge Copper	Tonnes	147,000
Gold in Dore	Oz	252,000

<sup>1</sup> Excluding pre-production working capital of US\$20m

Silver in Dore	Million oz	6.2
Lead-Zinc Product	Tonnes	70,000
<b>Pyrite</b>		
Pyrite Feed	Million tonnes	17.3
<b>Long Term Pricing</b>		
Acid	US\$/tonne	43
Steam	US\$/tonne	15
Iron Ore Pellets	US\$/tonne	109
Copper	US\$/tonne	7,614
Gold	US\$/oz Au	1,602
Silver	US\$/oz Ag	20
Lead-Zinc Product	US\$/tonne	786
<b>Revenue and Cash Costs</b>		
Average Annual Revenue (Project Life)	US\$ million	170
Average Annual Operating Costs	US\$ million	92

*Table 1: Preliminary Project Economics and Key Assumptions*



*Figure 1: Breakdown of Project Revenue*

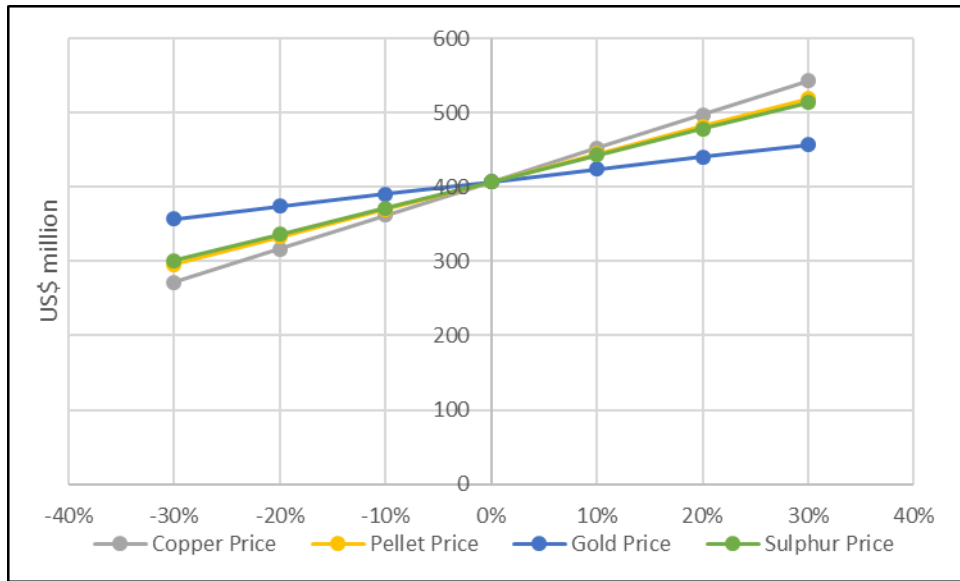


Figure 2: NPV@8%, Sensitivity to Sales Price Change

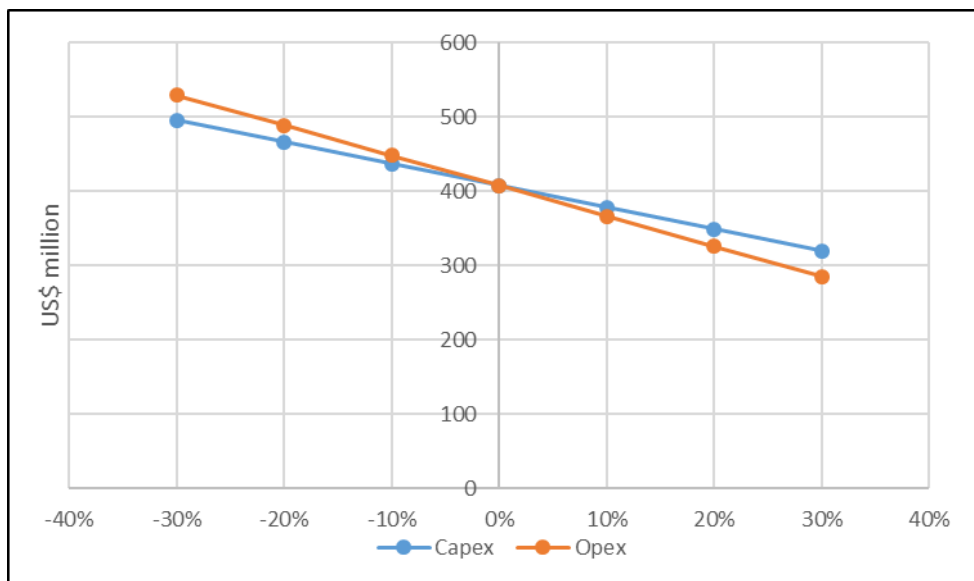


Figure 3: NPV@8%, Sensitivity to Capital and Operating Cost Changes

## **METALLURGY**

A substantial body of testwork has been carried out that supports the process design of the AIM Project. Historically, comminution and metallurgical testing on various Wetar samples was performed by ALS (Perth, Australia). In 2019, BGRIMM performed flotation testing on Wetar ore (pre and post heap leaching), and in 2020 and 2021 further testwork was carried out by ALS. The testwork included beneficiation, flotation, roasting, chlorinated roasting and leaching.

Concentrate mass pull was high to very high, ranging from 53.7% to 90.3%, with an average of 81.5%. Concentrate mass pull is directly proportional to feed iron grade (and to feed sulphide sulphur grade), because of the high pyrite content in feed.

Precious metals (gold and silver) are effectively co-recovered with pyrite and other base metal sulphides during bulk sulphide flotation at a grind of P80 75 µm. Test results for gold showed consistently high to very high recovery ranging from 80.2% to 99.6%, with an average of 94.1%. Results for silver showed consistently high to very high recovery ranging from 80.1% to 99.9%, with an average of 92.9%.

Copper recovery was consistently high to very high, ranging from 79.7% to 99.8%, with an average of 94.0%. Test results for lead were inconsistent with recovery ranging from 39.5% to 93.8%, with an average of 68.7%. Test results for zinc showed consistently very high recovery ranging from 94.9% to 99.9%, with an average of 99.0%.

## **RECLAIM STRATEGY AND SHIPPING**

The spent ore feed for the AIM Project will be sourced from:

1. High pyrite spent copper material placed, or to be placed, on Wetar's three leach pads
2. Low-grade copper ore stockpiles
3. Mining of future sulphide ore

These feed sources are estimated to have similar levels of sulphide minerals, particularly pyrite. The AIM feed strategy will prioritise the higher copper feed sources to generate higher early cash flow and maximise project value.

The spent ore will be loaded into trucks and hauled to the new Wetar barge jetty and directly loaded onto tugged barges for transport to IMIP.

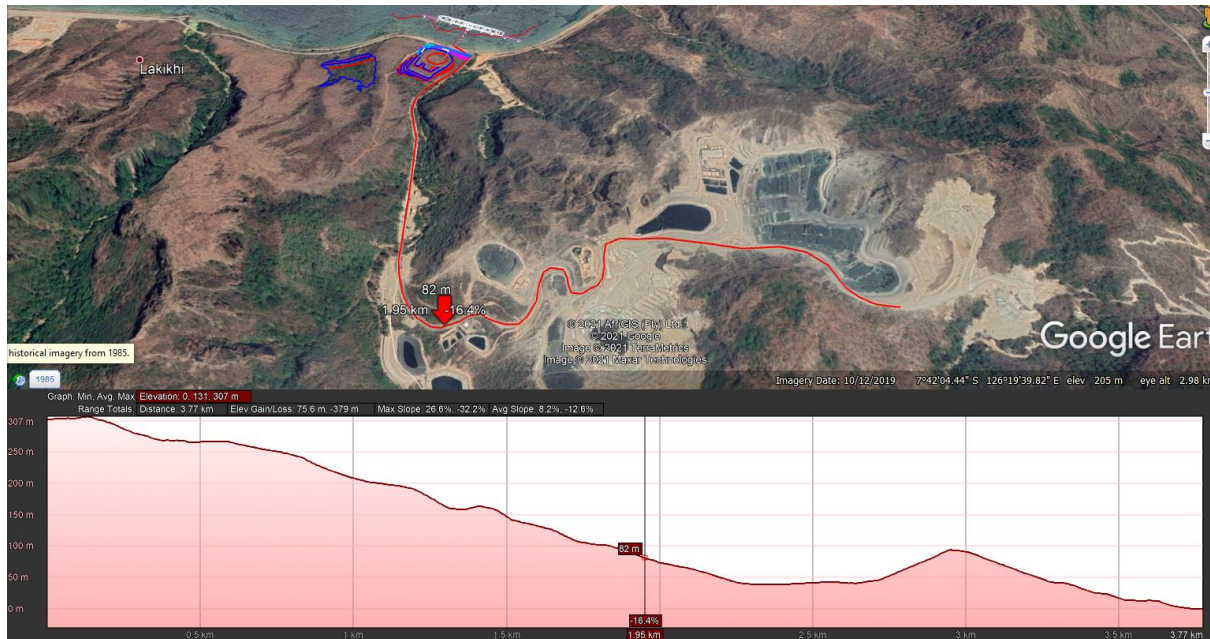


Figure 4: Satellite Image of Haulage from Wetar Heap Leach Pads to Barge Jetty

The spent ore will then be transported in open barges from Wetar to the IMIP port, a distance of approximately 700 km. The return journey is expected to take 7–8 days. A new barge loading jetty will be developed at the Wetar site to allow trucks to offload spent ore directly onto the barges. Dumb barges have been selected and range in size from 7,500 DWT to 15,500 DWT. The barges will be loaded at a rate of 8,000 tonnes per day, resulting in a loading and unloading time of 1–2 days.



Figure 5: Shipping from Wetar to IMIP

The IMIP port barge unloading facilities are located approximately 1-2 km from the plant, depending on whether the existing or planned future port is used. The roads between the port and the plant are fully sealed, all weather roads. Transport of the spent ore from the port to the concentrator is via trucks. The trucks will deliver the spent ore to a stockpile located at the concentrator, where it will be stored prior to being fed to the concentrator.

## PROCESSING

The AIM Project is designed to treat spent ore and low-grade pyrite ore from Merdeka’s existing operations at Wetar at a nominal rate of 950,000 tonnes per year. The plant will produce sulphuric acid, saturated steam iron ore pellets, copper sponge, lead-zinc hydroxides, gold doré silver. Life of mine production figures are shown in Table 1.

The concentrator will treat the pyrite ore to make a pyrite concentrate for further processing in the downstream plant that consists of two trains of pyrite roasters, two trains of waste heat recovery systems, two trains of sulphuric acid plants, base and precious metal recovery processes, and a chloride gas recovery treatment system. The process design and flowsheet development was carried out by BGRIMM and is based on their proven iron chloride roast technology for metal recovery.

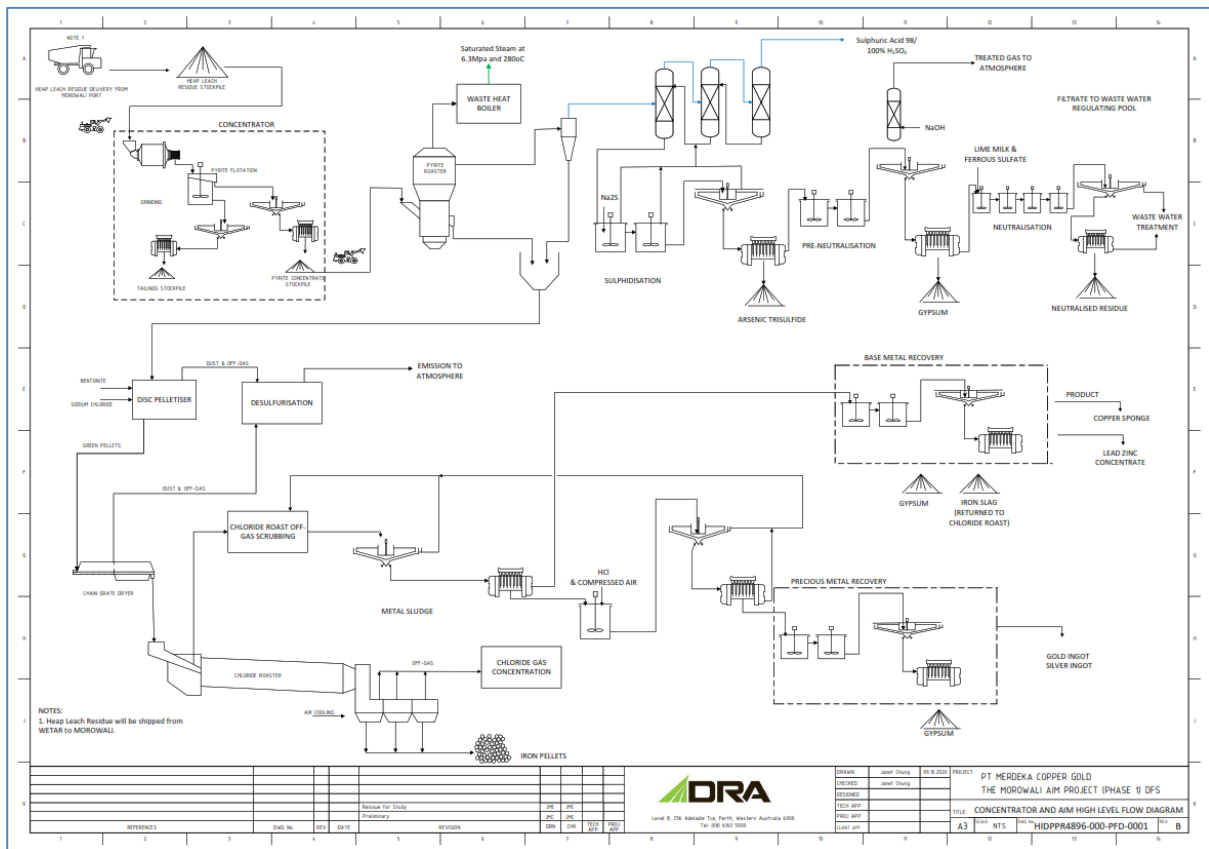


Figure 6: AIM Project High Level Block Flow Diagram

### **Concentrator**

The main unit processes in the concentrator are milling, pyrite flotation, concentrate thickening and filtration and tailings thickening and filtration.

### **Pyrite Roaster**

This section comprises two roasters, two waste heat boilers and gas-handling equipment. The roasters produce sulphur dioxide gas for the acid plant and the waste heat boiler produces steam for sale to other customers at IMIP. The calcine from the roasters is fed to the chloride roaster.

### **Sulphuric Acid Plants**

Two sulphuric acid plants convert the sulphur dioxide gas to 98% sulphuric acid for sale to IMIP customers.

### **Chloride Roaster**

Pyrite roast calcine will be blended with calcium chloride and bentonite in a ball mill prior to being pelletised on disc pelletisers, screened and dried in a chain grate dryer. Dry pellets will be fed to the roaster where chlorination and volatilization of the base and precious metals will take place leaving the iron ore pellets in the solid phase. The pellets will be cooled and stored in a shed prior to being loaded by front-end loaders into trucks for transport to market.

### **Chloride Gas Treatment**

Base and precious metals will be recovered from the gas stream exiting the chloride roaster and will be further processed to produce copper sponge, lead-zinc product and gold and silver doré.



## CONSTRUCTION

The AIM Project will begin construction in Q2 2021 and is targeted to deliver first acid in Q4 2022. BGRIMM commenced with detail engineering and design in April 2021.

The AIM processing plant will be located adjacent to the future acid and steam off-takers. The layout has been optimized to ensure capital and operational savings over the life of the project. The processing facilities are shown in the Figure 7.

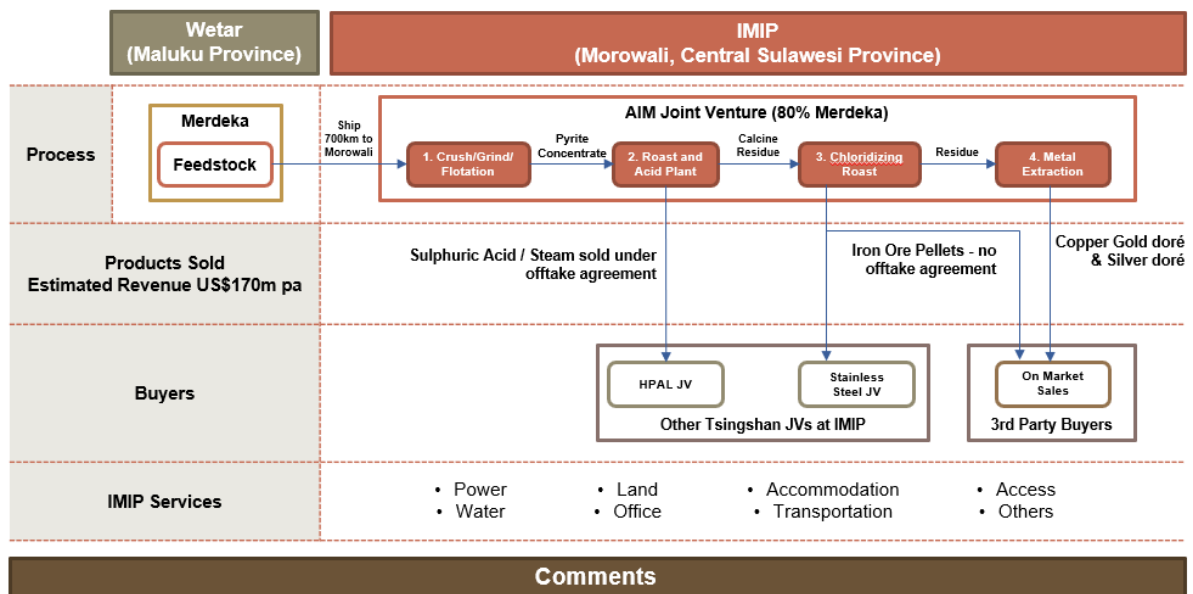


Figure 7: AIM Project High Level Block Flow Diagram

## IMIP INFRASTRUCTURE

Since its establishment in 2013, IMIP has had billions of dollars invested into the facility. IMIP is now a significant facility integrating nickel refining with the production of stainless steel and high quality ferrochrome steel. Currently, there are two nickel laterite processing plants under construction at the facility. IMIP covers hundreds of hectares, and is well served by established infrastructure. IMIP's facilities are summarised below and these are provided at very competitive rates, due to the economies of scale:

- Substantial break bulk port and barge unloading facilities
- Electrical generation capacity of approximately 2.9 GW via various coal fired power plants
- Supply of coal gas
- Telecommunications
- Fuel depot
- Accommodation for construction and permanent employees
- Airstrip
- On-site construction companies with extensive construction experience at IMIP
- Landfill sites



*Figure 8: Aerial view of IMIP*

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For further information please contact:

David Fowler (Director)  
PT Merdeka Copper Gold Tbk  
The Convergence Indonesia 20th Floor  
Jl. H.R. Rasuna Said, Karet Kuningan, Setiabudi  
Jakarta 12940 - Indonesia  
T: +62 21 2988 0393  
E: [investor.relations@merdekacoppergold.com](mailto:investor.relations@merdekacoppergold.com)

### **About PT Merdeka Copper Gold Tbk.**

PT Merdeka Copper Gold Tbk (“Merdeka”), a holding company with operating subsidiaries engaging in mining business activities, encompassing: (i) exploration; (ii) production of gold, silver, copper (and other related minerals); and (iii) mining services. The subsidiaries are: (i) PT Bumi Suksesindo (“BSI”) as the holder of the operation production mining business license for the Tujuh Bukit mine; (ii) PT Damai Suksesindo (“DSI”) which holds the adjacent exploration permit; (iii) PT Batutua Tembaga Raya (“BTR”) as the holder of operation production mining business license specifically for processing and refining; (iv) PT Batutua Kharisma Permai (“BKP”) as the holder of the operation production mining business license for the Wetar Copper mine; (v) PT Merdeka Mining Servis (“MMS”) as the holder of mining services business license; (vi) PT Pani Bersama Tambang (“PBT”), as the holder of an operation production mining business license specifically for processing and refining; and (vii) PT Puncak Emas Tani Sejahtera (“PETS”), as the holder of an operation production mining business license for Pani Gold Project.

The company’s major assets, in order of management’s assessment of future value, are the: (i) Tujuh Bukit Copper Project; (ii) Pani Joint Venture; (iii) Wetar / Morowali Acid Iron Metal Project; (iv) Tujuh Bukit Gold Mine and; (v) Wetar Copper Mine.

The Tujuh Bukit Copper Project deposit is one of the world’s top ranked undeveloped copper and gold mineral resources, containing approximately 8.7 million tonnes of copper and 28 million ounces of gold.

As a world-class Indonesian mining company, Merdeka is owned by prominent Indonesian shareholders including: PT Saratoga Investama Sedaya Tbk., PT Provident Capital Indonesia and Mr. Garibaldi Thohir. Merdeka’s three major shareholders have exceptional track records in successfully identifying, building and operating multiple publicly listed companies in Indonesia.

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Refer to the Annual Statements of Mineral Resources and Ore Reserves on [www.merdekacoppergold.com](http://www.merdekacoppergold.com)