Market Update

CobaltBlue
green energy technology

05 June 2023

Cobalt Blue Holdings Limited

A Green Energy Exploration Company

ASX Code: **COB**

Commodity Exposure:

Cobalt & **Sulphur**

Directors & Management:

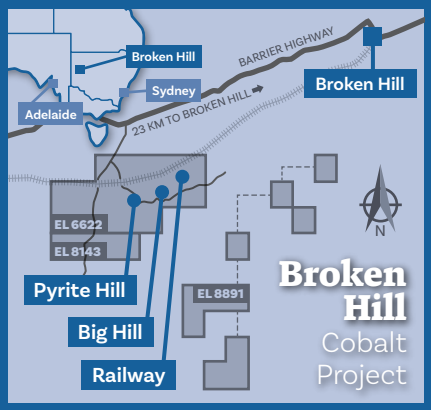
Robert Biancardi	Non-Exec Chairman
Hugh Keller	Non-Exec Director
Robert McDonald	Non-Exec Director
Joe Kaderavek	CEO & Exec Director
Danny Morgan	CFO & Company Secretary

Capital Structure:

Ordinary Shares at 05/06/2023:	**370.1m**
Unlisted options/rights:	**10.0m**
Market Cap (undiluted):	**$93m**

Share Price:

Share Price at 05/06/2023:	**$0.25**



Cobalt Blue Holdings Limited

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Highlights

Definitive Feasibility Study Update

KEY POINTS

- **Demonstration Plant:** Recent activities focused on processing larger volumes of concentrate through to Mixed Hydroxide Precipitate (MHP) circuit. Nickel/cobalt sulphate samples produced.
- **Permitting:** Environmental surveys complete. Environmental Impact Statement (EIS) in preparation.
- **Kwinana Refinery Project Update:** Refinery concept study has identified approximately A$70m in pre-production capital to fund a 3,000tpa standalone refinery. We are engaged with a potential partner that owns a suitable property in the Kwinana district where we expect to commence refinery construction next year. The potential partner is further determining an appropriate level of equity ownership in the Kwinana Refinery Project via a funding contribution.
- **Australian Government Support:** Critical Minerals Accelerator Initiative (CMAI) grant second instalment ($6m) expected in June 2023. The recently announced compact between the US and Australia further advances the prospects for Australian critical minerals projects.
- **Cobalt price review:** Cobalt supply/demand imbalance is expected to ease from 2024 as demand growth overtakes output for a sustained period with prices back toward long-term averages.
- **Additions to Management Team:** Cobalt Blue is proud to announce two new senior starters: Project Finance Manager and Project Acquisition Manager.

Commenting on recent achievements, Cobalt Blue Holdings (ASX:COB) Chief Executive Officer, Joe Kaderavek said: *"Our journey continues via positive steps. Both BHCP and Kwinana Refinery Project strategies are attracting substantial interest from Federal and State governments as well as numerous major industry players. We believe the evolution of an Allied Critical Materials Supply Chain further enhances the attractiveness of our cobalt projects."*

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Definitive Feasibility Study

COB is managing the delivery of the Broken Hill Cobalt Project (BHCP) Definitive Feasibility Study (DFS). Three engineering firms have been contracted to provide design and costings as per the following allocation of expertise:

- **Worley** are completing process plant design and review of the COB test work program (inclusive of the Demonstration Plant).
- **GHD** are designing the non-process plant infrastructure and tailings/mine waste management (co-disposal in integrated waste landforms). GHD are also preparing the EIS and associated permit applications.
- **SRK** are preparing the resource and reserve statements, based on the resource block model and mining studies.

COB is delivering all the other aspects of the DFS, and these are reported on in the subsequent sections below.

Demonstration Plant Update

Recent activities have focused on processing the concentrate produced in 2022 from the Pyrite Hill mine and beneficiation plant. See Demonstration Plant – High Grade Concentration Results (9 December 2022), for details.

The Demonstration Plant allows technical staff to monitor and de risk operations and scaling of the COB process, targeting operations in large commercial volumes. Two simple case studies are included below that are examples of multiple improvement studies being undertaken at the Demonstration Plant:

Kiln Circuit – Case Study

The off gas from the kiln contains elemental sulphur and calcine dust. A ceramic element filter has been installed to reduce the dust carry-over into the sulphur product. This ceramic filter is being trialled to assess performance at much higher throughput rates. Performance-based data including materials of construction, operability, functionality (efficiency of dust removal from sulphur stream) and maintenance cycles are being collated and factored into DFS engineering.

Approximately 500 kg of sulphur has been dispatched to Enersul (Canada) for purification and prilling test work. Initial results shown >99.97% purity has been achieved, using samples from the Demonstration Plant. Prills are the saleable form of sulphur being targeted.

A sulphur condenser has been installed and is progressing through commissioning. This will aid in the recovery of sulphur, and de-bottleneck operations by providing a continuous outlet for molten sulphur from the plant.

Figure 1 – **Pressure oxidation leach circuit**

Source: Cobalt Blue Holdings Limited

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Leach Circuit – Case Study

The autoclave circuit was built as a series of stirred tanks, as opposed to a single 'cigar' vessel. This design has been essential to providing the opportunity to readily adjust circuit volume (adjust vessel sizes, quantity), evaluate heat management per reactor, and modify agitation appropriate to each reactor duty. In recent months configurations have included testing total volumes of 300 L up to 450 L in 4 reactors, implementing process control via the Honeywell control system for heat management (via cooling water), and testing multiple agitator designs to minimise wear and maximise solids suspension.

Also, operations have focused on processing feed material at different particle size ranges. For example, wear of components and blockages within the slurry pumping system are being evaluated based on varying feed particle size ranges. Data from these operating campaigns is being provided to Worley Engineering and vendors. All of these parameters are linked to the design criteria being used in engineering studies as part of DFS work programs.

Samples of leach residue have been dispatched for testing alongside mine waste material, as part of the program on waste management conducted by GHD.

Permitting

Environmental Impact Statement

The mining and infrastructure footprint has been determined to ensure that all disturbance aspects of the BHCP are assessed in the Environmental Impact Statement. Ecology, Aboriginal heritage and soils surveys of the maximum disturbance footprint have been completed. Where it has been possible to do so, the Project has amended the site layout to avoid or minimise impacts to watercourses and sensitive ecological or cultural heritage attributes.

Comprehensive groundwater baseline data is being collected from a series of historical and new piezometers. Groundwater data collected to date demonstrates that the existing groundwater quality is poor with low pH and high dissolved cobalt near the mineral deposits with high salinity generally present across the BHCP site.

Australian Government Support

COB was awarded a grant of up to $15m through the **Critical Minerals Accelerator Initiative (CMAI)** for the BHCP by the Australian Government. In December 2022, COB received the initial grant instalment of $1.5m. We expect the next grant instalment of $6m in June 2023.

International Legislation

Australia's role in the emerging Allied Critical Materials Supply Chain

The enactments of the Inflation Reduction Act (IRA) in the US[1] and the Critical Raw Materials Act (CRMA) in the EU[2] are significantly impacting the global critical minerals supply chain by incentivising Allied Nation supply. These are strict requirements over geographic sourcing of raw materials that have prompted change in strategic and investment patterns among global EV and battery makers. The recent compact between the US and Australia (The Climate, Critical Minerals and Clean Energy Transformation Compact) advances the prospects for Australian critical minerals projects with greater availability of grants, loans, rebates, incentives and investments. Given Australia's relatively large reserves of all the major components in lithium-ion battery chemistry, these developments present significant opportunities for the domestic critical minerals industry.

First, a global race to secure IRA and CRMA-compliant supply is rapidly advancing the development of an Allied Nation critical materials supply chain. While COB's strategy to manufacture and export battery-grade cobalt was already addressing an emerging critical minerals shortfall, this recent evolution further enhances the attractiveness of our cobalt products.

Second, new pricing mechanisms in the global cobalt market will likely develop to attract new production growth between the Allied Nation supply chain and EV makers and battery producers. In our commercial discussions, price negotiations for our products are focused not only on the relationship between hydroxide and sulphate, but also the premium consumers are willing to pay for IRA and CRMA-compliant material.

1 *The **United States Inflation Reduction Act (IRA)** boasts ~US$390Bn worth of spending/credits over the next 10 years - including consumer tax incentives to help reduce the dependence on imported battery raw materials and EV manufacturing. The IRA contains strict rules on sourcing and content requirements in order to trigger more battery investment and EV production that are aligned to US interests. Specifically, if batteries contain components or critical minerals extracted, processed or recycled by "Foreign Entities of Concern," the product will not qualify for the tax breaks (worth up to US$7,500).*

2 *The EU's **Critical Raw Materials Act (CRMA)** was formulated following COVID supply chain disruptions and the Russia-Ukraine war that exposed EU dependency on critical raw materials. Similar to the IRA, the CRMA provides incentives aimed at mitigating these dependencies and ultimately achieving greater levels of self-sufficiency objectives. Additionally, no more than 65% of critical materials demand per value chain step (extraction, concentration, and processing) should be met by a single country.*

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Kwinana Refinery Strategy Update

As outlined in our CEO's Letter to Shareholders (13 April), COB remains focused on an integrated BHCP flowsheet, but with two geographic locations:

1. **Broken Hill:** Mine-to-MHP; and
2. **Kwinana District in Western Australia:** Refining MHP to cobalt sulphate.

A concept study has now identified approximately A$70m in pre-production capital required to fund the building of a 3,000tpa refinery. These estimates will be updated as part of the upcoming integrated BHCP DFS delivery later in the year.

Why Kwinana?

There are three strategic reasons for this decision:

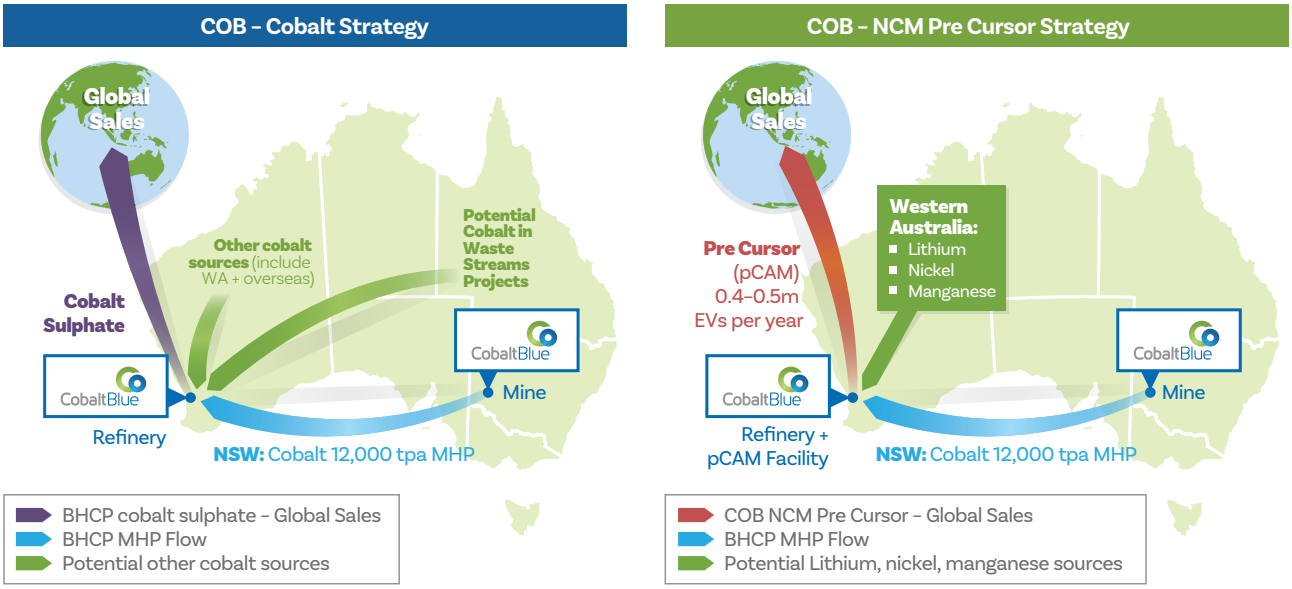
1. **Access to export markets:** Kwinana hosts a deep-water port and world-class export facilities.
2. **Cost advantage:** Kwinana is a major chemicals district. Approximately 60–70% of the costs associated with refining come from reagents/chemicals cost.
3. **Critical Minerals availability:** Australia is the only country that mines all four of the cathode elements in the most widely used lithium-ion battery chemistry in electric vehicle, Nickel Cobalt Manganese (NCM). This places the country in an advantageous position to invest further downstream in the global battery materials supply chain to produce and export Precursor Cathode Active Material (pCAM) and Cathode Active Material (CAM).

Why a Single Refinery?

Refining is fundamentally an economy of scale business. A single, larger refinery allows COB to process future material sourced from BHCP and (in future) other cobalt projects, rather than build out individual refineries at mine sites dispersed through Australia. The Kwinana Refinery Project will:

- **Support BHCP:** Producing ~12,000 tonnes of MHP per annum which equals ~ three rail wagons per week (~200 tonnes). The transcontinental railway line (linking Broken Hill with Kwinana) passes through our tenements.
- **Support new Australian mining projects:** There are several nickel/cobalt projects that wish to enter the battery production chain and are typically based in Western Australia.
- **Provide easy port access for globally sourced materials** which will likely qualify for significant US and EU financial incentives if processed via an approved country. These materials also likely include nickel/cobalt feedstocks.
- **Support Cobalt in Waste Streams Project/s (CWSP):** These potential projects will produce MHP which is easily transportable to Kwinana.

Figure 2 – **Cobalt Blue Sulphate Refinery and NCM Precursor Strategies**



Source: Cobalt Blue Holdings Limited

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Refinery Partner

COB is engaging with a potential partner for the Kwinana Refinery Project, that:

- is a leading Japanese multinational that specialises in the production and trading of commodities.
- has a global presence with subsidiaries and affiliates in several countries, with established partnerships and collaborations with companies worldwide, to further advance its expertise in technologies and explore new markets.
- has a large trading arm seeking to supply its Japanese partners in major global Electric Vehicle markets, including the United States.
- owns a suitable property in the Kwinana district that would support the operation of the cobalt/nickel Kwinana Refinery Project.

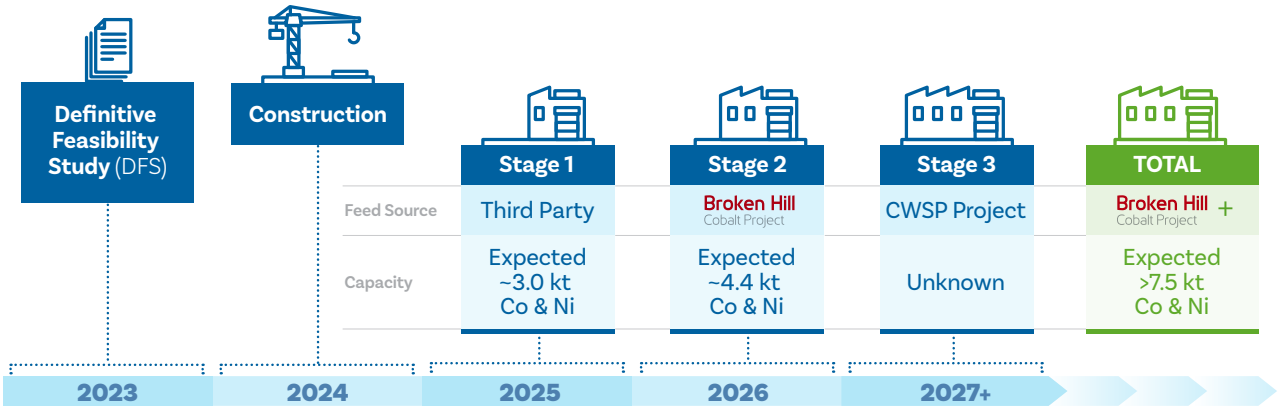
COB believes that partnering with an existing property owner would substantially reduce development time for the Kwinana Refinery Project. Our potential partner is currently considering proposing an appropriate level of equity ownership in the Kwinana Refinery Project via a funding contribution.

Likely Development Costs and Timetable.

COB has completed a concept study of a 3,000tpa cobalt/nickel refinery in the Kwinana district. This study will be followed by a Definitive Feasibility Study (DFS) to be delivered later in 2023 (it was already part of the existing BHCP DFS). A more complete timeline is shown later in this announcement.

The concept study shows a Kwinana Refinery Project ~A$70m pre-production capital cost which assumes the refinery is fitted into an existing industrial land parcel. The capital amount will likely be shared between Kwinana Refinery Project partners. Domestic and international government interest is also being examined.

Figure 3 – **Cobalt Blue Sulphate Refinery – multiple feedstock sourcing**



Source: Cobalt Blue Holdings Limited

BHCP Impact – Kwinana Refinery Project

COB believes that a WA-based refinery will not impact BHCP efficiency as there is no common equipment shared by mine-to-MHP processing and MHP to cobalt sulphate processing. In addition, MHP produced at the Broken Hill based mine is not challenging to store and transport long distances. Since the final product after refining, cobalt sulphate, is delicate (temperature sensitive and hygroscopic) a port location is more ideal for the Refinery Project.

COB believes that a Kwinana refinery will result in a slight increase to previously guided capex for BHCP. The initial refinery plan was to build capacity to refine BHCP output (~3.5ktpa Co equivalent). A Kwinana refinery will be on a larger scale, in order to treat BHCP and 3rd party feedstock, thus providing an economy of scale build-out and reducing operating costs. COB is targeting an existing Kwinana footprint that will lower site/construction costs as well as equipment delivery costs (vs building the refinery in Broken Hill).

Finally, it is COB's expectation that transporting MHP to WA will likely reduce operating costs. The initial strategy was to refine MHP to sulphate in Broken Hill and transport sulphate to port. The cost of transporting MHP to Kwinana is less than that of sulphate given sulphate's delicate nature. Furthermore, refining costs are expected to be lower than initially planned due to the availability of reagents and chemicals in the Kwinana district.

COB is targeting commencing Kwinana Refinery Project operations in 2025, likely before the BHCP commences full-scale operations in 2026. We are evaluating multiple options for feedstock for the **Kwinana Refinery Project.**

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Timetable

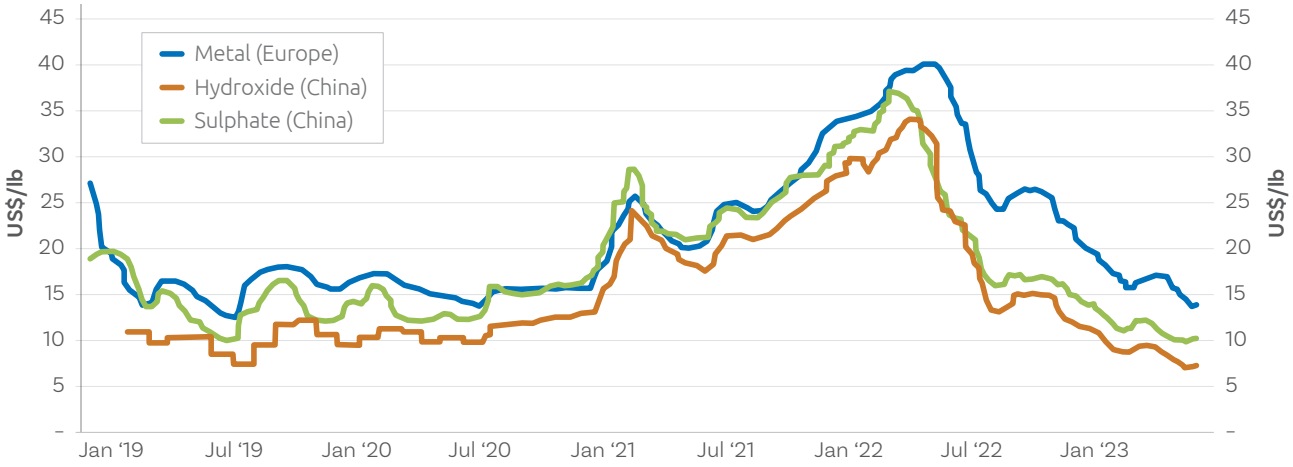
COB now expects delivery of the BHCP DFS and subsequent ASX release during Q4 2023. Our corporate timeline, including new guidance for the Kwinana Refinery Project is shown below.

Figure 4 – **Estimated Development Schedule**

Broken Hill Cobalt Project	PRE-2021	2021	2022	2023	2024	2025
Business Achievements	100% Project Ownership CRC-P Grant	Global Cobalt Sample Program	Global Cobalt Sample Program Major Project Status CMAI Grant	Partner/Offtake discussions	Completion of financing EPC Renewable Power Contracts Commence construction	Finalise Construction
Technical Studies	Project Update 2020 PFS 2018	Definitive Feasibility Study	Definitive Feasibility Study	Definitive Feasibility Study	Detailed Engineering	
Process Testing	Pilot Scale Testwork	Pilot Plant – 30 Tier 1 Partners Offtake Contract Negotiations (begin)	Demonstration Plant – Bulk Sample & Concentrate	Demonstration Plant – Larger Scale (24/7) Operations Commercial Qualification Samples		
Environmental Approvals		EIS Field Studies	EIS Field Studies		EIS Submission SSD Determination Operating Permits	ESG/CO_2 Reporting
Refinery Project Milestones				WA Refinery Announced Definitive Feasibility Study	Completion of financing Operating Permits Commence Construction	Complete Construction Commence Operations
	PRE-2023			MILESTONES		

Cobalt Price Review

Figure 5 – **Cobalt price comparison (100% Cobalt basis)**



Source: Fastmarkets, Cobalt Blue Holdings Limited

Cyclical lows: After staging a small rally through mid-April, cobalt prices have seen further weakening in the June 2023 quarter. Based on market commentary and feedback, the most recent declines in the price are related to concerns over large volumes of inventory across the supply chain. This accumulation began last year because of strong supply growth (+27%) amid softness in the global consumer electronics sector (~30% global cobalt demand). While demand in the EV sector remains strong, consumer electronics has continued to struggle. According to technology analyst International Data Corporation (IDC), worldwide tablet shipments in 1Q23 were down 19% YoY and global smartphone shipments were down 15% over the same period. Meanwhile, news of the impending release of stockpiled hydroxide at the Tenke Fungurume mine in the DRC has further deteriorated market sentiment.

Elevated inventory levels are a source of unease for market participants because it means that even while we are seeing healthy consumption patterns, it will take time for the inventory to be absorbed in a market that has been producing more supply than demand requirements. However, this trend is certainly cyclical as growth in mine output is set to normalise while consumption growth remains strong on the back of global EV sales and a recovering industrial sector.

In its May review, **the IDC suggested that with signs of global economic recovery, including easing inflation, the second half of 2023 may witness some improvements in tablet and smartphone shipments.** On the supply side, Fastmarkets reported in May that there are production cuts totalling at least 16,000 tonnes announced this year from various mines in the DRC, including artisanal mining.

In summary, the current supply/demand imbalance is expected to ease from 2024 as consumption growth will overtake output for a sustained period and support prices back toward long-term averages.

Human Resources Update

We have made two recent key hires that further validate our commitment to our business strategy.

Project Finance Manager

Jan Fuchter. Jan has over 20 years' financing experience in various regions including the project financing of mining projects in Africa, Asia and Latin America. He also played a leading role in several recent financings of Australian critical minerals projects. In his previous roles at Export Finance Australia and investments and institutional banks, he originated and executed project finance transactions globally. He has worked with a diverse range of stakeholders in multiple countries on the finance and development of projects, including several notable project financings in the metals and mining sector.

In his role with Cobalt Blue, Jan will lead the company through the multifaceted avenues of mining project finance both domestically and internationally.

Project Acquisition Manager

Helen Degeling. Helen is a PhD qualified geologist with over 18 years' experience in industry, academia and government. She has worked as an exploration geologist and Exploration Manager in gold and base metals throughout Western Australia, New South Wales and Queensland, as well as consulting to a variety of mineral explorers and producers both domestically and abroad. As the former Director, Minerals Geoscience for the Geological Survey of Queensland she initiated the Queensland Government's Circular Economy, Secondary Prospectivity, traceability and Sustainable REE processing programs. Helen is a passionate advocate for the growth and evolution of the minerals sector in line with the demands of a just transition towards decarbonisation and adoption of ESG standards globally.

In her role with Cobalt Blue, Helen aims to realise the opportunities for green metal extraction from mine waste to support the energy transition.

Cobalt Blue Background

Cobalt Blue (ASX: COB) is a mining and mineral processing company focussed on the development of the Broken Hill Cobalt Project in New South Wales, Australia. The portfolio of three granted tenements in a total area of 49 km^2 containing large-tonnage cobalt-bearing pyrite deposits are located 23 km west of Broken Hill. COB has developed a patented minerals processing technology for treating pyrite feedstocks targeting 85–95% recovery of cobalt from ore to product (as Mixed Hydroxide Precipitate or Cobalt Sulphate). The Broken Hill Cobalt Project has a targeted project life of +20 years and is expected to be a significant employer in Regional NSW, with around 400 full-time jobs generated. COB will become a global top 5 supplier of battery-grade cobalt (ex-China).

This announcement contains "forward-looking statements". All statements other than those of historical facts included in this announcement are forward-looking statements. Where the Company expresses or implies an expectation or belief as to future events or results, such expectation or belief is expressed in good faith and believed to have a reasonable basis. However, forward-looking statements are subject to risks, uncertainties and other factors, which could cause actual results to differ materially from future results expressed, projected or implied by such forward-looking statements. Such risks include but are not limited to cobalt metal price volatility, timely completion of project milestones, funding availability, government and other third-party approvals. Readers should not place undue reliance on forward-looking statements. The Company does not undertake any obligation to release publicly any revisions to any "forward-looking statement".

Looking forward, we would like our shareholders to keep in touch with COB updates and related news items, which we will post on our website, the ASX announcements platform, as well as social media such as Facebook (f) and LinkedIn (in). Please don't hesitate to join the 'COB friends' on social media and to join our newsletter mailing list at our website.

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This announcement was approved by the Board of Directors.

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Released Information

This ASX announcement refers to information extracted from the following reports, which are available for viewing on COB's website http://www.cobaltblueholdings.com

- 13 April 2023: CEO's Letter to Shareholders
- 22 March 2023: Definitive Feasibility Study Update
- 09 December 2022: Demonstration Plant Update: High Grade Concentrate Results
- 06 October 2022: Demonstration Plant – Ore Processing Update

COB confirms it is not aware of any new information or data that materially affects the information included in the original market announcement, and, in the case of estimates of Mineral Resources, that all material assumptions and technical parameters underpinning the estimates in the relevant market announcements continue to apply and have not materially changed. COB confirms that the form and context in which the Competent Person's findings presented have not been materially modified from the original market announcement.

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