Market Update

CobaltBlue
green energy technology

22 March 2023

Cobalt Blue Holdings Limited

A Green Energy Exploration Company

ASX Code: **COB**

Commodity Exposure:

Cobalt & **Sulphur**

Directors & Management:

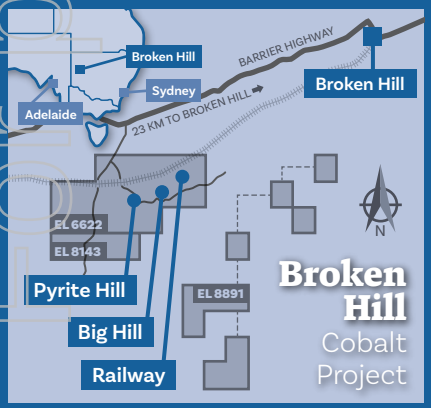
Robert Biancardi	Non-Exec Chairman
Hugh Keller	Non-Exec Director
Robert McDonald	Non-Exec Director
Joe Kaderavek	CEO & Exec Director
Danny Morgan	CFO & Company Secretary

Capital Structure:

Ordinary Shares at 22/03/2023:	**370.1m**
Unlisted options/rights:	**9.5m**
Market Cap (undiluted):	**$126m**

Share Price:

Share Price at 22/03/2023:	**$0.34**



Cobalt Blue Holdings Limited

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Highlights

Definitive Feasibility Study Update

KEY POINTS

- The Broken Hill Cobalt Project (BHCP) Definitive Feasibility Study (DFS) remains on track for completion by end-3Q.
- Demonstration Plant: The Concentrator Circuit has completed operations and the concentrate is being treated through the kiln to convert pyrite into pyrrhotite and elemental sulphur. The leaching circuit is now operational and first MHP production has been achieved. Large scale commercial samples (up to 100kgs each) will be released shortly.
- Mineralisation and waste rock studies: Resource definition, geotechnical and waste rock characterisation drilling programs were completed in February 2023.
- Permitting: Substantial progress has been made to assess the Project footprint, including soils and ecology.
- Commercial Partner Update: Partner discussions continue.
- Cobalt Market Update: Signs of price recovery have appeared amid improved liquidity as market transactions normalise following China's re-opening.

Commenting on recent achievements, Cobalt Blue's Chief Executive Officer, Joe Kaderavek said: *"We are proud of the achievements made by all the contributing teams into the DFS. The results from the Demonstration Plant have largely exceeded our expectations in terms of operations and outcomes, and we continue to optimise performance across the flow sheet. Overall technical studies continue to progress and de-risk the project, with initial independent engineering reviews now underway. These reviews are a key stepping stone to eventual project funding."*

Demonstration Plant Update

Concentrate

The Concentrator Circuit has now completed operations, with a total of 4200 t of ore processed to produce 680 t of wet concentrate (typical moisture 5-10%) concentrate (for more detail, see: ASX Announcement: Demonstration Plant Update: High Grade Concentrate Results, 9 December 2022).

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During optimum conditions, the total combined recovery from the demonstration gravity circuit and benchscale scavenger float tests on the gravity tails, was typically 93–95% cobalt into concentrate from the ore. This was inline with expectations from previous testing on drill core and RC chips, as reported in ASX announcement: Concentrate Circuit (Pilot Trial) Program Successfully Completed, 24 June 2019.

Figure 1 – **Bags of concentrate at the Broken Hill Cobalt Project awaiting transport to the Demonstration Plant in Broken Hill township.**

Pyrolysis circuit

The concentrate is being treated through the Demonstration Plant kiln to convert pyrite into pyrrhotite and elemental sulphur. The typical feed rate is approximately 150–300 kg/hr. Ongoing optimisation of the kiln parameters has included changing temperature, feed rate, nitrogen flowrate, and residence time. Analysis of the samples by x-ray diffraction, has confirmed conversion of pyrite to pyrrhotite across the particle size range. Elemental sulphur is being stored, ahead of bulk processing into commercial prill form later in the test campaign.

Figure 2 – **Demonstration Plant Kiln to convert pyrite into pyrrhotite and elemental sulphur.**

Figure 3 – **Comparison of BHCP dry concentrate (grey) and magnetic fraction of the calcine (black).**

Figure 4 – **Elemental sulphur produced from the calcining of concentrate in the kiln.**

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Leaching and MHP production

Approximately 5 t of kiln calcine was leached as part of circuit commissioning. The pilot plant leach size has been significantly upgraded from 200 L to 450 L, and thereby increasing the throughput rate from 35 kg/hr to 100 kg/hr. Additional upgrades included modifications to the feed pumping system, and the flash let down system to improve reliability and continuity of operations. The circuit is now being geared to complete dedicated trials for the DFS detailed engineering requirements.

Figure 5 – **Horizontal vacuum filter belt and Pressure oxidation leach circuit.**

The leach liquor is treated for iron removal, ahead of cobalt and nickel recovery as a mixed hydroxide precipitate (MHP). The first large scale MHP production has recently been achieved from the Demonstration Plant. Expected production rates are approximately 100kg/48 hours (based on 100 kg/hr leach feed rate).

Figure 6 – **First batches of Mixed Hydroxide Precipitate (MHP) from the BHCP Demonstration Plant**

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Resource Definition, Geotechnical and Waste Rock Characterisation Drilling

A resource definition, geotechnical and waste rock characterisation drilling program was completed in February 2023. The program included:

- Dedicated geotechnical drilling to inform pit slope stability analysis for mine design and optimisation at the Big Hill and Railway deposits;
- Investigation of zones of potential resource extension at the Big Hill and Railway deposits;
- Infill drilling targeting improved resource classification at the Big Hill deposit; and
- Drilling for waste rock characterisation at the Pyrite Hill, Big Hill and Railway deposits, to inform detailed design criteria for the Integrated Waste Landforms.

A total of seventy-eight (78) drill holes were completed for 12,281.25m inclusive of 8,738m reverse circulation and 3,543.25m diamond core. Sample processing is continuing with final assays expected to be received during April for the commencement of geological modelling and resource estimation.

Figure 7 – **Reverse circulation drilling operations.**

About Integrated Waste Landforms

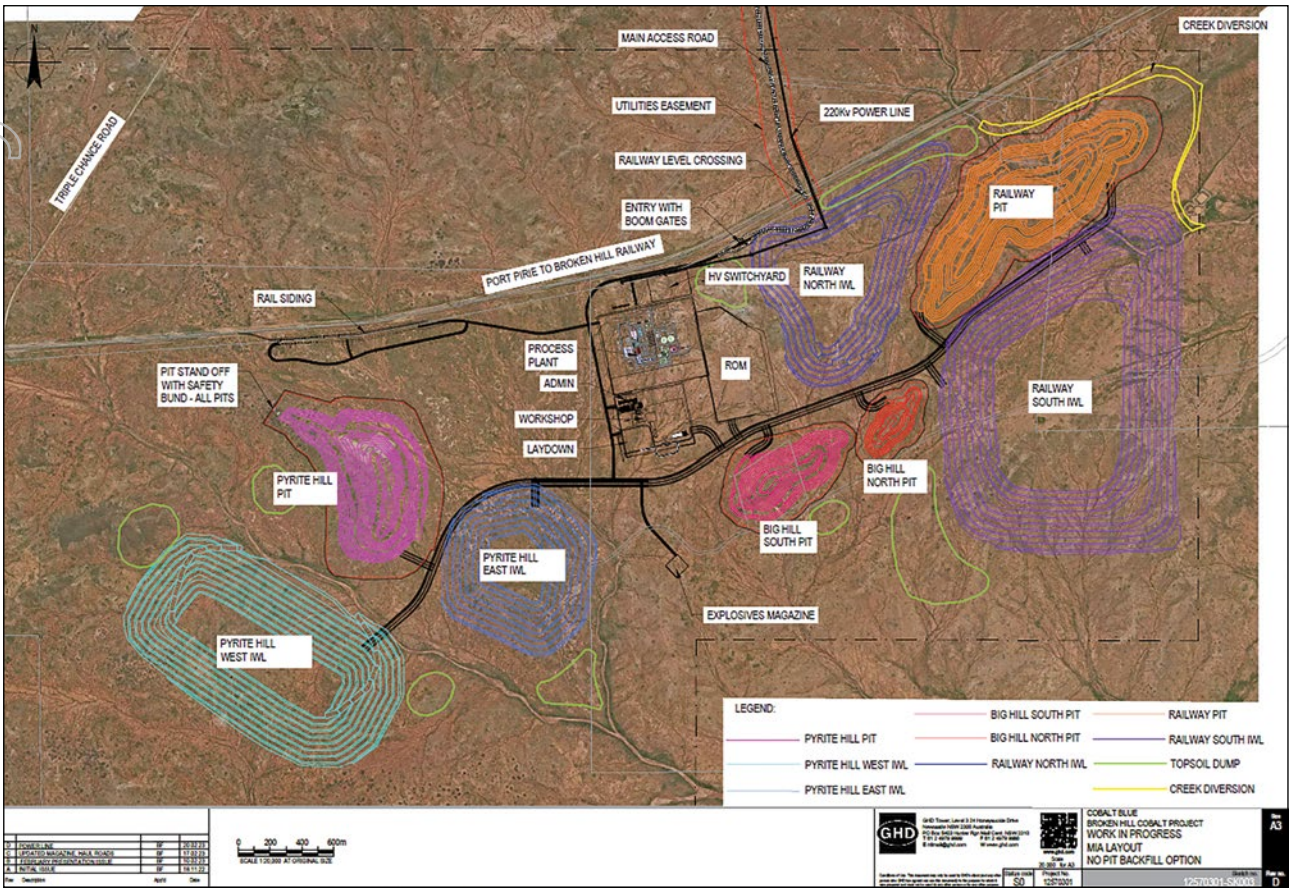
The mine waste management strategy for the Project considers the progressive development of several Integrated Waste Landforms (IWLs) where both mine waste rock and process plant tailings are combined in a single facility for establishment of long-term physically and chemically stable landforms.

Permitting

Environmental Impact Statement

Substantial progress has been made in defining the disturbance footprint for the Project. Our DFS mining consultant, SRK, has completed the "Approvals Case" mining study which in turn has largely determined the scope and scale of the Project. A map of the Project layout is shown below, with the location of open cut pits, Integrated Waste Landforms, processing plant and non-process infrastructure all having been determined.

Figure 8 – **Project layout.**



Additional site based surveys continue, assessing the Project footprint, including soils, ecology and Aboriginal heritage surveys.

Figure 9 – **Soils Scientist undertaking a detailed soil profile description in the new access road.**

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The additional surveys include the lands associated with the access road to the site from the Barrier Highway, the utilities corridor from Broken Hill to the site, and revised locations of site infrastructure and Integrated Waste Landforms.

As discussed above, a significant drilling campaign has been successfully completed to provide samples of waste rock for the determining of acid and metal leachate generation characteristics of the waste rock and tailings, as well as the installation of 19 new piezometers to measure groundwater characteristics at the site. These results will be used to design the Integrated Waste Landforms (and in-pit backfill options) and to assess the potential groundwater impacts of both the open cut pit and waste management strategies.

Figure 10 – **BHCP geologist undertaking groundwater measurements.**

A site inspection with officers from a number of NSW Government departments and Broken Hill City Council was held on 21 February 2023. The inspection included a comprehensive tour of the BHCP site as well as the Demonstration Plant. This inspection provided the opportunity for government agencies to gain a first-hand appreciation of the scope and scale of the Project, as well as the environmental, social and economic aspects of the Project.

Figure 11 – **Officers from the NSW Government and Broken Hill City Council with the BHCP Approvals Manager.**

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Cobalt in Waste Streams Project (CWSP) update

COB has previously executed a Memorandum of Understanding with the State of Queensland, acting through the Department of Resources, to assess opportunities for the recovery of cobalt (and any coexisting base and precious metals) from mine waste.

Testing of the first sample from the Queensland Department of Resources was finalised in 3Q22. A second sample test work with a private company is currently in process. Ongoing commercial discussions supporting the development of CWSP opportunities continue with prospective partners. CWSP represents a significant commercial option for our business with test work to date supportive of the potential to commercialise large mine waste deposits.

Commercial Partner Update

Multiple project partner and offtake discussions continue with the BHCP seen as both commercially attractive and compliant with the respective Inflation Reduction Act (US) and Critical Raw Material (CRM) Acts (EU). The (very) recent market guidance from US Treasury and EU Commission respectively (delivered March 2023) is highly supportive of Australian extracted and processed cobalt.

The sheer commercial and financial scale of these US and EU focussed global policies will likely shape significant industry responses. It remains our belief that geopolitical legalisation backed by strong financial incentives will build out entire integrated and sustainable production chains, including critical minerals extracted and processed in Australia. Whilst the battery industry digests these recent guidelines, we expect project partner negotiations to continue into Q2.

Funding

- During December 2022 COB executed the **Critical Minerals Accelerator Initiative (CMAI)** grant agreement for the BHCP with the Australian Government. The grant totals $15m and is payable over time – instalments are to be made between December 2022 and March 2025. In December 2022, COB received the initial grant instalment of $1.5m and a $6m progress payment is anticipated to be received in June 2023. The CMAI funding will enable COB to accelerate the development of the BHCP by expanding the scope of the DFS, bring forward infrastructure and services work packages, and decrease start-up commissioning risks.
- The BHCP was further awarded $0.5m through the **Critical Minerals Activation Fund (CMAF)** provided by the NSW Government. The funding agreement was executed in February 2023. The CMAF funding will be used for the environmental studies required in the Environmental Impact Statement. This grant is payable in instalments, with the first instalment of $0.25m paid in March 2023, with the balance expected to be paid in Q3 and Q4 2023.
- COB has also been awarded $20,000 from **Austrade's Export Market Development Grant,** a program that helps Australian businesses grow their exports in international markets.

COB Timeline

The expected development schedule for the Broken Hill Cobalt Project ('BHCP') is shown below.

Figure 12 – **BHCP expected development schedule.**

	PRE-2021	2021	2022	2023	2024	2025
Business Achievements	100% Project Ownership CRC-P Grant	Global Cobalt Sample Program Major Project Status and CMAI grant	Cobalt Qualification Program – 2022 Major Project Status and CMAI Grant	Partner/Offtake discussions Final Investment Decision	Construction Period Mine Development EPC Renewable Power Contracts	Refinery Commissioning First Commercial Production
Technical Studies	Project Update 2020 PFS 2018	Feasibility Study	Feasibility Study	Definitive Feasibility Study and Approvals		
Process Testing	Pilot Scale Testwork	Pilot Plant – 30 Tier 1 Partners Offtake Contract Negotiations (begin)	Larger Scale (24/7) Operations Bulk Sample	Larger Scale (24/7) Operations continue Commercial Qualification Samples		First On Specification Production
Environmental Approvals		EIS Field Studies	EIS Field Studies	EIS Submission SSD Determination	ESG/CO_2 Reporting	ESG/CO_2 Reporting Operating Permits (approved)
	PRE-2023			MILESTONES		

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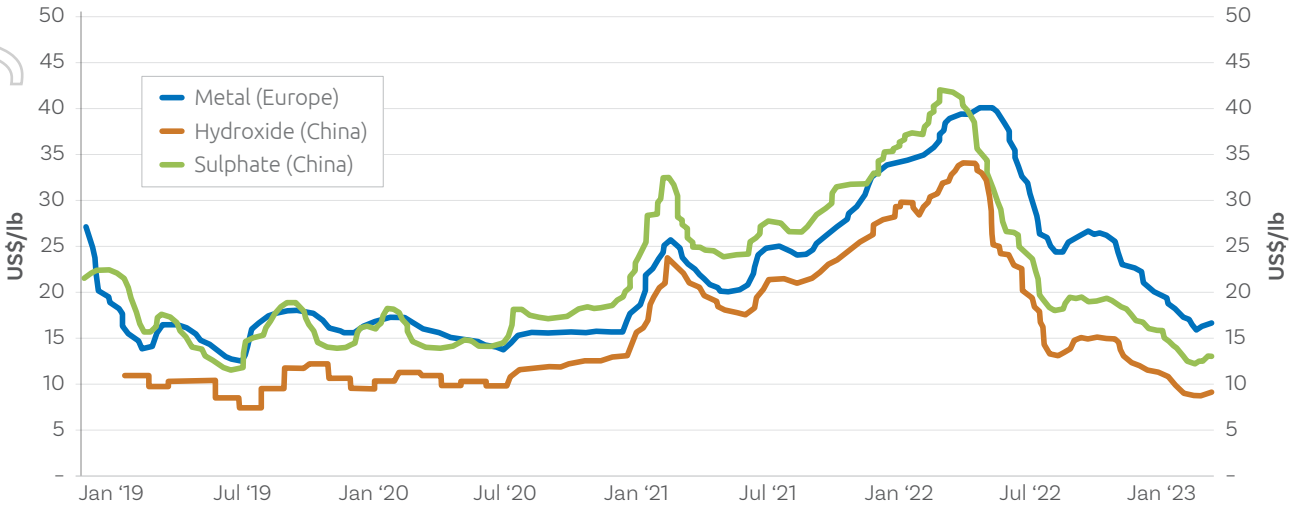
Cobalt Market Update

Figure 13 – **Cobalt Prices.**



Source: S&P Global Commodity Insights, Cobalt Blue

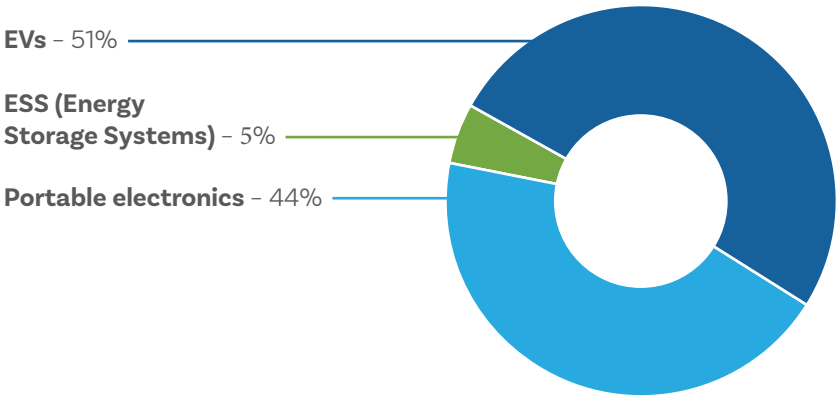
Prices bottoming: After peaking in 2Q22 around US$40/lb (US$88,000/t), the cobalt metal price steadily declined to a trough ~US$15/lb. However, since the end of February, the price has recovered above US$17/lb amid improved liquidity as market transactions normalise following China's re-opening. By contrast, the 30 year average price of cobalt ($2022 real) is US$25/lb.

Supply outpacing demand growth: We consider the recent cobalt price fall likely reflects strong supply growth at a time of weaker than expected demand growth. Cobalt supply grew at a CAGR of ~15% in the 3-year period 2020–2022 while demand was less than 10% over the same period. This elevated supply has largely come on the back of a simultaneous ramp up of four large projects and several small to medium-sized projects in the Democratic Republic of Congo (DRC). Between 2020–2022, the DRC added +43kt to global cobalt supply while the rest of the world added just +13kt.

Meanwhile on the demand side, while EV sales remained strong in 2022, rising 54% to 10.2m, the consumer electronics segment of lithium-ion batteries declined 4%. This rare year of negative growth in electronics sales likely due to a combination of suppressed portable electronics sales post the 2020/21 Covid-driven boom and poor sales in China amid the restrictive Covid-zero policy.

Outlook improving: It is expected demand growth from the electronics segment will recover from this year as consumer patterns normalise. Importantly, EV sales are forecast to remain very healthy, with energy transition analyst Rho Motion anticipating 4.1 million more EV sales in 2023 (39% YoY) growth vs last year's 3.8 million sales.

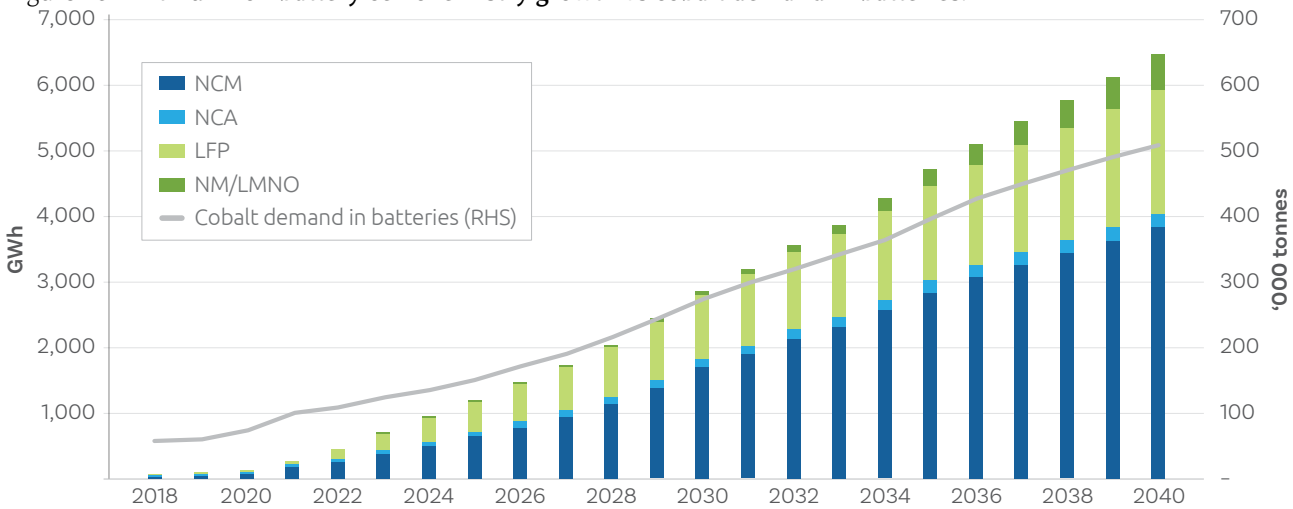
Figure 14 – **Cobalt's battery segment end use, 2022.**



Source: Wood Mackenzie, Cobalt Blue

Growing Lithium iron Phosphate (LFP) share is not seen as a threat to long term cobalt pricing: This view is shared by energy tran-sition analyst Rho Motion. LFP batteries have taken a growing share of the global EV market, rising to 30% in 2022. However, this has been almost exclusively in the Chinese auto market where consumers are less sensitive toward vehicle range. In sharp contrast, western automakers remain dedicated towards chemistries that include nickel and cobalt for superior power efficiency. There are numerous long-term supply deals between cathode and EV makers implying nickel/cobalt chemistries will remain dominate for years to come. It is expected that car makers will diversify their chemistries, especially by geography, population densities and consumer preference. The chart below demonstrates that despite the rise in LFP market share, strong demand for cobalt will continue.

Figure 15 – **Lithium-ion battery cell chemistry growth vs cobalt demand in batteries.**



Source: Rho Motion, Benchmark Minerals, Cobalt Blue

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 63km^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 will be a significant employer in Regional NSW with around 400 full-time jobs generated. COB will become a global top 10 producer of cobalt, a critical mineral that is integral in the global journey to decarbonize via electrification.

The expected timeline for the BHCP is subject to various risks, some of which are outside the control of the Company, and which include successful and timely completion of project milestones, funding availability, government and other third-party approvals.

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

- 31 January 2023: December 2022 Quarterly Activities Report
- 09 December 2022: Demonstration Plant Update: High Grade Concentrate Results
- 06 October 2022: Demonstration Plant – Ore Processing Update
- 01 September 2022: Demonstration Plant – Ore Extraction Completed
- 26 July 2022: Demonstration Plant Transitioning to Operations
- 20 June 2022: Demonstration Plant – Ore Extraction Underway, Commissioning Continues
- 12 May 2022: COB advances Demonstration Plant Commissioning
- 23 March 2022: COB commences underground development to support Demonstration Plant
- 10 September 2021: Premium cobalt samples finalised
- 05 July 2021: Transition to Demonstration Plant
- 17 May 2021: Pilot Plant Operations Commence
- 24 June 2019: Concentrate Circuit (Pilot Trial) Program Successfully Completed

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.

Forward Looking Statements

This ASX announcement 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 Announcement are expected to take place. Such forward-looking statements are not guarantees 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 management. We cannot and do not give any assurance that the results, performance, or achievements expressed or implied by the forward-looking statements contained in this ASX Announcement will actually occur and recipients are cautioned not to place undue reliance on these forward-looking statements. We have no intention to update or revise forward-looking statements in the future, regardless of whether new information, future events or any other factors affect the information contained in this announcement except where required under applicable law or the ASX Listing Rules.