

## **Introducing Cobalt Blue (COB)**

### Our focus is on meeting future energy storage needs by:

- Developing a significant global cobalt resource, the Broken Hill Cobalt Project (BHCP):
  - □ Project Update 2020:
    - ↑ Increased Ore Reserve.
    - ↑ Longer Operating Life.
    - ↓ Capital Costs.
    - $\downarrow$  Operating Costs.
- Providing a reliable source of ethical cobalt.
- Commercialising process technologies via COB Partnerships.



## **BHCP** - strong investment fundamentals

#### Australia's largest cobalt sulphide deposit - a top 10 global cobalt mine

- Project life target is +20 years.
- Politically stable jurisdiction. Established infrastructure in a mining district.

#### Flexible, low cost production

- Cobalt sulphate production from MHP intermediate.
- Lowest quartile costs: cobalt C1 (US\$9.34/lb)\* & AISC (US\$12.13/lb)\*.

### Low capital intensity

All in pre-production capital A\$560m for 3,500+ tpa Co.
(incl. EPCM, process plant, infrastructure, water/power supply, mine development,

contingencies of A\$70m)

#### **Existing commercial partnerships**

☐ LG International, Mitsubishi Corporation, & Sojitz Corporation



<sup>\*</sup>Project Update 2020 - Value Engineering Study including nickel credits.



# BHCP – outstanding capital efficiency

### New global projects running at 3 to 4x COB capital intensity

Project	US\$ Capex	Cobalt (tpa)	By-products	Cobalt Payable (%LME)	Mine Life (years)	Capital Intensity (US\$/tpa Co)
Broken Hill Cobalt (Aust)	392	3,530	Sulphur	100%	17	112,000
Mount Thirsty (Aust)	260	1,600	NI	80%	12	163,000
Kabanga (Tanzania)	750	2,400	Ni	Low		313,000
Kalgoorlie Nickel Project (Aust)	918	2,150	Ni	100%	>25	427,000
Sunrise (Syerston) (Aust)	1,490	3,360	Ni/Sc	100%	>25	444,000
Weligreen Central (Canada)	450	1,000	Ni/Cu	Low	25	450,000
NiWest (Aust)	676	1,400	Ni	100%	>25	483,000
Dumont (Canada)	1030	2,000	Ni/Pt		20	515,000
NICO (Canada)	589	500	Bl/Au	100%	>20	1,178,000

Source: Company Announcements and CRU database as of 5 July 2020. All other global projects include nickel or copper as primary metals, with cobalt being a minor by product





## **BHCP** – Timeline

## The BHCP development timeline is shown below:

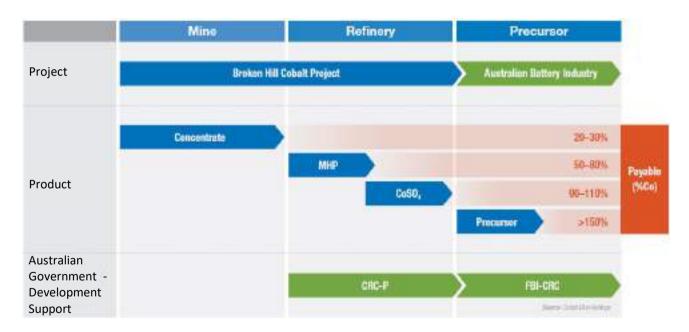
	2017	2018	2019	2020	2031	1011
Business Achievements	IPO	LGI — Coball First Mayer	Mitsubishi — Sucru Agreement 100% Project Ownership		Global cobalt sample program - Q1 2021	Final Investment Decision - Lafe 2022
Technical Studies	Resource upgrade DBig +6,000n Resource FFAM Scoping Study	Resource upgrade Dring +12,500m Resource 72M Pre Feasibility Study	Resource upgrade DWg +9500s Resource 111M	Project Update 2020 - July 2020		Feasibility Study and Approvals — Liste (KDZ)
Metallurgical Studies			Concentration – Plot Scale Testwork	Pliot Plant - 04 2000	Demonstration Plant - 04 2021	
Environmental Approvats			CPDP Submitted	Scoping Report - Jin 2020 SEARs Issued - Feb 2020	EIS Submission — H22021	SSD Determination - Mid 2022
	A.	CHIEVEMEN	TE		GGALE	





## BHCP in the global cobalt value chain

## **Cobalt Products & Payables:**





# A Globally Significant Australian Project

### Broken Hill Cobalt Project (BHCP) Overview:

- Targeted project life +20 years:
  - Mineral Resource 123 Mt for 81,400 t cobalt\*, with significant expansion potential via exploration and acquisition.
  - 3,500+ tpa of cobalt (as cobalt sulphate).
  - 300,000 tpa of elemental sulphur.

Probable Ore Reserve	71.8 Mt	710 ppm Co	7.6% S
Production Target	97.7 Mt	684 ppm Co	7.4% S

- Patented minerals processing technology for treating pyrite feedstocks:
  - 85-90% recovery of cobalt from ore to product.
  - Generation of stable leach residues minimal footprint.

<sup>\*</sup>The reported Mineral Resources are inclusive of the reported Ore Reserves.

# **BHCP** – Project Metrics

#### Financials\*

- Pre-Tax NPV<sub>7.5</sub> A\$861m (IRR 23%)
- Post Tax NPV<sub>7.5</sub> A\$554m (IRR 19%)
- Payback: 4.5 years
- EBITDA A\$3.05B generated LOM
   (Co: US\$27.5/lb, S US\$145/t,
   Ni US\$6.0/lb, FX A\$ \$0.70)



- ~3,500 tpa cobalt sulphate
- 300,000 tpa sulphur
- 17-year operations



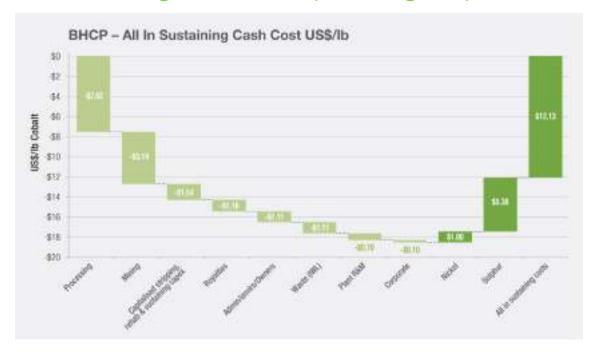
Life of Mine (Production Target)	Revenue (%)	Revenue (A\$m)
Cobalt	84%	4,972
Sulphur	16%	973

<sup>\*</sup>Project Update 2020 - Value Engineering Study including nickel credits.



# **BHCP** – Operating Costs

## All In Sustaining Costs - lowest quartile of global producers



<sup>\*</sup>Project Update 2020 - Value Engineering Study including nickel credits.





# BHCP – significant logistical advantages

Broken Hill - people, power, water, road and rail benefits.









Category	Mt	Со ррт	CoEq (ppm)	Fe (%)	S (%)	Pyrite (%)	Contained Co (t)	Py (M
Pyrite Hill   0	ut-off Grade	275 ppm CoE	4					
Measured	19	929	1094	10.7	9.9	19	17,100	3
indicated	B	700	827	9.6	7.6	14	5,800	1
Interned	7	811	957	10.4	8.7	16	5,700	1
Total	34	847	1000	10,4	9.1	17	29,700	6
Railway   Cur-	of Grade 27	Ti ppm CoEq						
Indicated	45	606	716	7.8	6.7	13	27,400	6
Interned	29	568	681	8.1	6.8	13	16,300	4
Total	74	591	704	7.9	6.7	13	43,700	9
Big Hill   Cut-o	of Grada 27	5 ppm CoEq.						
Indicated	-11	613	714	6.6	6.1	11	6.600	1
Inferred	- 5	517	605	6,0	5.2	10	2,400	0
Total	15	584	681	6.4	5.8	11	9,000	2
Total   Cut-of	Grade 275 p	ipm CoEq.						
Measured	19	929	1094	10.7	9.9	19	17,100	3
Indicated	64	619	731	7.8	6.7	13	39,900	-8
Interned	40	604	720	8.3	6.9	13	24,300	5
Total	123	660	782	8,4	7.3	14	81,400	17

The Affinian's Recovers unstruction for the EPTO\* deposits set a 270 pper DECy sp. of \$\pi\ single dayAffinian's Recovers deposition in (Cutty - Couper + 2 K \* 18,146). Note which recovering earlier may have accounted in compliation of this table.



## BHCP - MHP

## BHCP - Mixed Hydroxide Product (MHP)

- High Grade: 37% cobalt.
- Byproduct Credit: 7% nickel.
- Low trace metal impurities Cu, Fe, Mn.
- ☐ Trading terms minimum grade is 30% Co content.

Typical content from testwork:

Ca	Co	Cl	Cu	Fe	Mn	Ni	Zn
2.5 %	37 %	7 %	0.01 %	0.07 %	0.85 %	7 %	0.1 %

## MHP and Cobalt Sulphate Markets

<b>BHCP Product</b>	Payable % Co metal price	Purity	End Use Typical	Customers
Cobalt Sulphate	90-110%	Very High	Li ion batteries	Precursor/Cathode Makers
Mixed Hydroxide Product	50-80%	Low	Metallic cobalt & Li ion batteries	Commodity Trading Houses Mining Companies



## BHCP – Cobalt Sulphate Heptahydrate (CoSO<sub>4</sub>.7H<sub>2</sub>0)

- High Grade: 20.8% cobalt.
- Low trace metal impurities.



Metal	Units	COB	AVG 9 producers
Co	95	>20.8%	>20.5
Al	ppm	2	<10
As	ppm	<1	<5
Ca	ppm	<0.01	<10 (can be up to 100)
Cd	ppm	< 0.001	<10
Cr	ppm	< 0.01	<5
Cu	ppm	1	<10
Fe	ppm	c)	<10
K	ppm	0.6	<5 (can be up to 100)
Mg	ppm	27	<20 (can be up to 100)
Mn	ppm	5	<10 (can be up to 100)
Na	ppm	128	<20 (can be up to 100)
Ni	ppm	<10	<10 (can be up to 100)
Pb	ppm	< 0.05	<10
Si	ppm	<0.5	<20
Zn	ppm	<2	<10





## **BHCP - Elemental Sulphur**

- >99% purity (max 0.2% Fe, 0.5% SiO<sub>2</sub>)
- ☐ Physical Form: Prills (2 5 mm)
- Australia: 1mtpa deficit market:
  - fertiliser feedstock (55%)
  - metallurgical consumption (43%)

a father a	Al Al	600	ppm
Sandy State	Ca	160	ppm
THE PROPERTY OF THE PARTY OF TH	Co	<20	ppm
CONTRACTOR DE	Fe Fe	0.10	%
POT THE RESIDENCE	Mg Mg	60	ppm
33334-0200-440	Na Na	100	ppm
Property of the Control of the Contr	SiO <sub>2</sub>	0.45	96
	s s	99.3	% by difference





# **BHCP** – Scale of Metallurgical Testwork

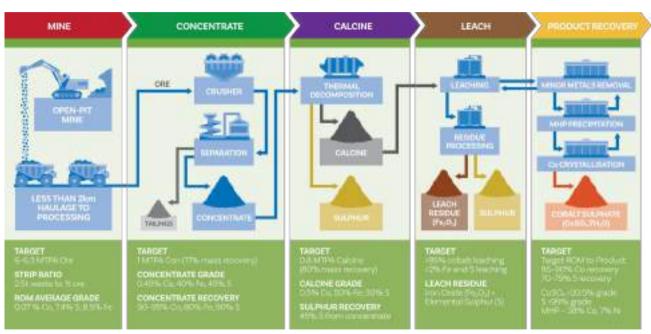
### Scaling testwork - growing confidence in the COB Process

Study Level	Period	Concentrate Circuit		Pyroly	sis Circuit	Leaching/Purification	
Scoping Study	FY2017	20-30 kg	Lab scale	1 kg	Lab scale	1 kg	Lab scale
Pre-Feasibility Study	FY2018	820 kg	Bulk trial in batch mode	100 kg	2-3 kg batches	30 kg	0.2-1 kg batches
Current Work to date	FY2019	45 tonne	Continuous pilot circuit 2-3 t/hr	150 kg	Continuous pilot circuit 4-8 kg/hr	20 kg	1-3 kg batches
Planned Work	Future	45-50 t	Full circuit	Up to 20 t	Commercial sized furnace	Up to 20 t	Pilot equipment
Ore Pyrite/Albit	Concent		cine Eleme	THE RESERVE OF THE PERSON NAMED IN COLUMN TWO IS NOT THE PERSON NAMED IN COLUMN TWO IS NOT THE PERSON NAMED IN		ii Mixed Co	obalt Sulphate





## **BHCP** - Cobalt Sulphate Production Flowsheet





# **Processing – Global Operations**

CONCENTRATE CALCINE LEACH MINE Comminution and Concentration via flotation Newcrest - 10mtpa pyrite ore via milling and flotation (Lihir Island - PNG) OZ Limited - 10mtpa copper ore milling, flotation of concentrate (Prominent Hill - Australia) **Concentration via spirals** Illuka Resources - 600ktpa heavy mineral concentrate (Jacinth Ambrosia - Australia) **Pyrolysis** Kinross Gold - Tasiat Project (Mauritania) PT Agincourt - Martabe Gold Project (Indonesia) Oututec – (1950-1970) pyrite reduction to elemental sulphur (Finland) Leaching Vale S.A. - POX plant copper concentrates (Carajas region - Brazil) Flin Flon - Hudson Bay Mining & Smelting (Canada)

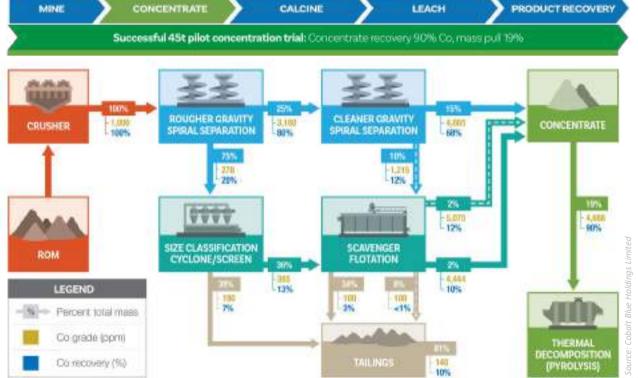
#### **Product Recovery**

- Sepon SX Copper at 75ktpa (Laos)
- ☐ CoSO<sub>4</sub> crystallisation (Democratic Republic of Congo)





## **BHCP** - Concentrate Circuit Pilot Trial





# **Strategic Partners**

**Existing Partnerships - LG International and Mitsubishi Corporation.** 



Source: Cobalt Blue Holdings Limited

Cobalt products assessment includes Sojitz Corporation + others (under NDA).



# **COB Partnerships**

### **Commercialising the COB Process:**

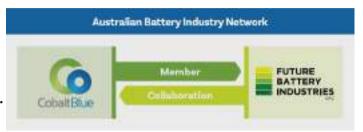
- COB Process (technology) is a patented asset.
- Short-term:
  - understanding market size proving the COB Process works for different styles of mineralisation.
  - consulting fees.
- Long-term:
  - project participation.
  - joint marketing of cobalt products.
- ☐ Three testwork partners to date:
  - Broken Hill District (Mutooroo),
  - South Australia (Carrapeteena OZ Minerals (ASX:OZL)
  - Queensland (Millennium Project Global Energy Metals)



## **Australian Critical Minerals**

### Assisting in the development of Australia's battery capabilities

Participating with Australian industry and researchers to develop processing pathways for refined battery raw materials.



A\$1.57m grant awarded from CRC-Project Program Round 8. COB led consortium for pilot scale optimisation of the recovery of cobalt from pyrite.







## **Cobalt Blue Holdings – ASX listed**

#### **ASX: COB**

Cobalt exploration & development company.

#### **Commodities:**

Cobalt and Sulphur

### **Capital Structure:**

Ordinary Shares at 15/02/2021: 248.2m

Options (unlisted):

Promissory Note1 (5yr to 2025): \$3.0m

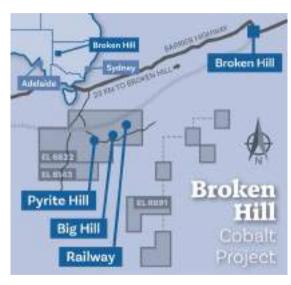
Market Cap (undiluted): \$87m

#### **Share Price:**

Share Price at 15/02/2021: \$0.44

#### Cash:

Cash On Hand \$7.0m



Source: Cobalt Blue Holdings Limited

8.8m



<sup>&</sup>lt;sup>1</sup> 3 years interest free, then 6% interest, paid annually in arrears. Can be repaid anytime in whole or in part without penalty

## The Cobalt Blue Team

"Extensive expertise - mineral development, investment management, corporate law and energy storage."

#### Independent Chairman - Robert Biancardi

- IBM, Citibank, Westpac and Evolution Healthcare (senior management and director).
- Numerous directorships of private companies including Rockridge Private Equity and Hutchisons Child Care (successful ASX listing).

#### Independent Director – Hugh Keller

- Partner Blake Dawson (now Ashurst) and its predecessor firms for 35 years until retirement from full time legal practice in 2010.
- Non-executive director of ASX listed Thakral Holdings Limited and of LJ Hooker Limited.

#### Independent Director - Rob McDonald

- 40 years of international mining sector experience.
- Investment banking/private equity investment management.

#### Chief Executive Officer – Joe Kaderavek

- Deutsche Bank, Head of Resources, equities / investment management, resources and energy storage technology focus.
- PwC, Operational reviews and strategic assessments mining, minerals processing, and infrastructure in Australia, North America and Europe; seconded to BHPB and Rio Tinto.

#### Executive Manager - Dr Andrew Tong

- Metallurgist with over 15 years experience in project development, operating mining and processing activities, and patenting innovative minerals processing technology.
- Managing Director of Northern Territories Resources Pty Limited.

#### Chief Financial Officer - Danny Morgan

- Chartered Accountant with over 25 years' professional financial and commercial experience including IPO's, M&A, Project Financing, JV's and Project Developments.
- Wide experience across private and publicly listed resource companies including Donaldson Coal, Oil Search and Roc Oil.



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