



# Havilah Resources

**Kalkaroo Copper-Gold-Cobalt Project in South Australia**

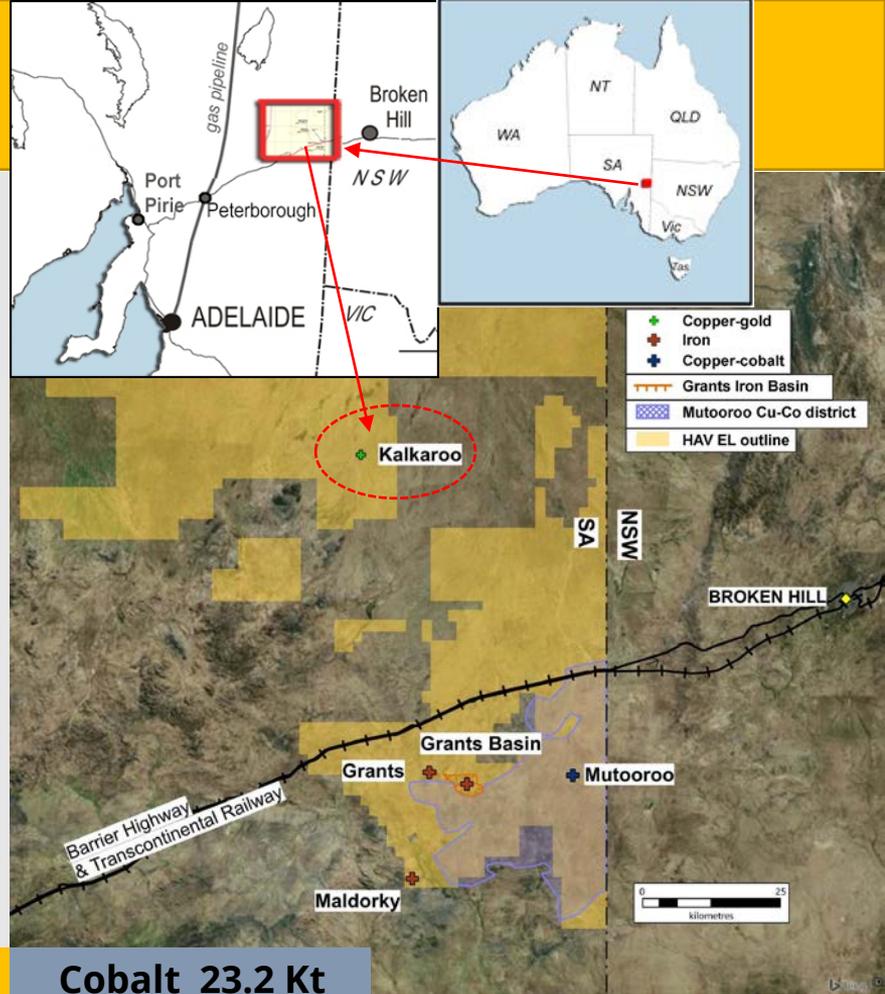


**A Low Sovereign Risk Copper-Gold-Cobalt Mining Development**

# Kalkaroo - Key Project Attributes\*

- ✓ **Substantially de-risked mining project** – completed pre-feasibility study (PFS), granted mining lease, ownership of surrounding land.
- ✓ **Located in South Australia** – a low sovereign risk jurisdiction, with a mining friendly government that actively encourages mineral development. World's best practice environmental, social and governance standards.
- ✓ **Favourable logistics and infrastructure** – close to the regional mining centre of Broken Hill with its skilled workforce and the main east-west railway line and highway.
- ✓ **Experienced technical team** – Havilah's current technical team has an exceptional track record of exploration success (including 8 JORC Mineral Resources at Havilah) and has developed and operated the Portia gold mine.
- ✓ **Associated conflict-free, strategic and critical minerals** – including copper, cobalt, molybdenum and potentially REE.

[\\*click on this link to view the Kalkaroo project web page for more information](#)



JORC Resources:

Copper 1.1 Mt

Gold 3.1 Moz

Cobalt 23.2 Kt



Havilah Resources

# Positive independent PFS completed for Kalkaroo

One of Australia's largest undeveloped open pit copper deposits on a 0.89% CuEq\*\* Ore Reserve basis

## Key PFS outcomes:

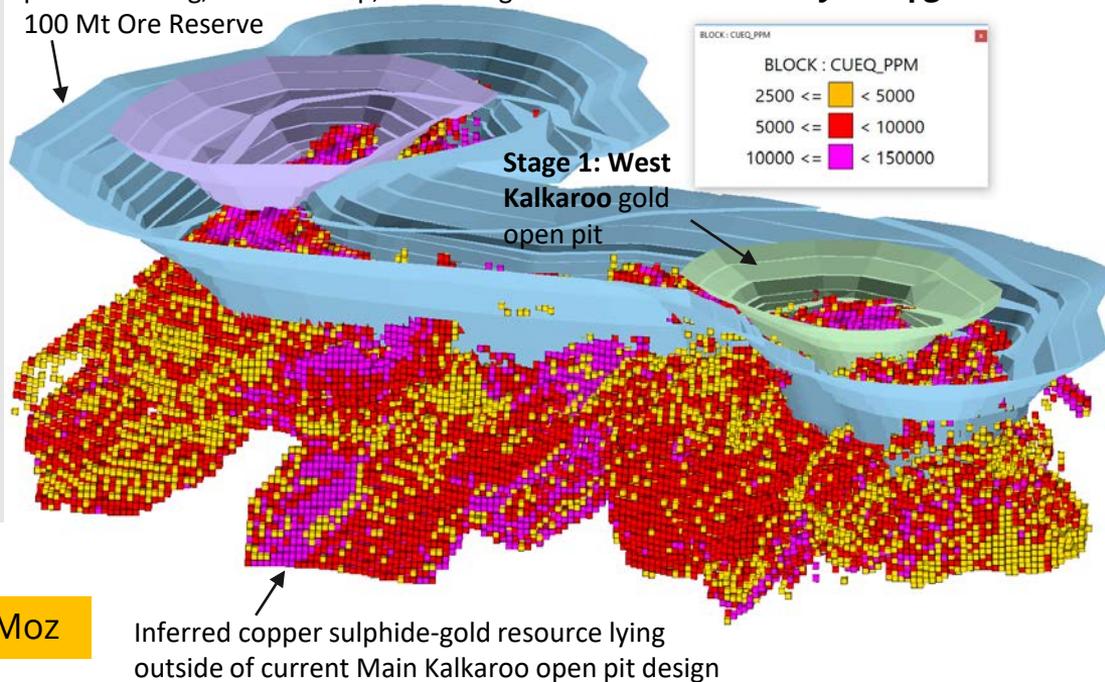
- Pre-tax NPV<sub>7.5%</sub> of A\$564 million & IRR 26%.\*
- Open pit Ore Reserve 100 Mt @ 0.89% CuEq (90% Proved) containing 474 Kt copper & 1.4 Moz gold
- Estimated average annual production of 30,000 t copper & 72,000 oz gold over a minimum 13 year production period.
- A\$332 million pre-production capex.
- JORC resources determined in Vulcan 3D mining software and independently verified several times by external parties.

## JORC mineral resources

Copper 1.1 Mt    Cobalt 23.2 Kt    Gold 3.1 Moz

Stage 2: Main Kalkaroo copper-gold open pit 3.5 km long, > 200m deep, containing 100 Mt Ore Reserve

Kalkaroo ore block model coloured by CuEq grade



Inferred copper sulphide-gold resource lying outside of current Main Kalkaroo open pit design

\*based on US\$6,380/t copper, US\$1,200/oz gold and AUD:USD 0.75 in RPM Global PFS as referred to in ASX release of [18 June 2019](#)

\*\* CuEq calculation is based on the formula:  $CuEq = Cu \text{ ore reserve grade} + (\text{value } 1g/t \text{ Au} / \text{value of } 1\% \text{ Cu} \times \text{Au ore reserve grade})$ . Assumptions: gold price USD1,900 /oz, copper price USD6,500/tonne, overall metallurgical recoveries for saleable gold and copper are the same based on Kalkaroo PFS, ore metal grades are from published Kalkaroo JORC Ore Reserve table.

# Kalkaroo project valuation from PFS

February 2021

Copper price USD\$/lb & AUD\$/lb	USD	\$1,200	\$1,300	\$1,400	\$1,500	\$1,600	\$1,700	\$1,800	\$1,900	\$2,000	\$2,100	\$2,200
	AUD	\$1,600	\$1,733	\$1,867	\$2,000	\$2,133	\$2,267	\$2,400	\$2,533	\$2,667	\$2,800	\$2,933
2.89	3.85	\$564*	\$633	\$701	\$770*	\$839	\$907	\$976	\$1044*	\$1113	\$1182	\$1250
3.10	4.13	\$698	\$766	\$835	\$903	\$972	\$1040	\$1109	\$1178	\$1246	\$1315	\$1383
3.50	4.67	\$957	\$1026	\$1094	\$1163	\$1232	\$1300	\$1369	\$1437	\$1506	\$1575	\$1643
3.90	5.20	\$1217	\$1286	\$1354	\$1423	\$1491	\$1560	\$1629	\$1697	\$1766	\$1834	\$1903
4.30	5.73	\$1,476	\$1,545	\$1,614	\$1,683	\$1,751	\$1,820	\$1,888	\$1,957	\$2,026	\$2,094	\$2,163
4.70	6.27	\$1,737	\$1,805	\$1,874	\$1,943	\$2,011	\$2,080	\$2,148	\$2,217	\$2,285	\$2,354	\$2,423
5.10	6.80	\$1,996	\$2,065	\$2,134	\$2,202	\$2,271	\$2,340	\$2,408	\$2,477	\$2,545	\$2,614	\$2,682
5.50	7.33	\$2,256	\$2,325	\$2,394	\$2,462	\$2,530	\$2,599	\$2,668	\$2,737	\$2,805	\$2,874	\$2,942
5.90	7.87	\$2,516	\$2,385	\$2,654	\$2,722	\$2,790	\$2,859	\$2,928	\$2,997	\$2,065	\$3,134	\$3,202

\* [Pre-tax NPV<sub>7.5%</sub> from PFS \(green\)](#) compared with that at recent long-term forecast (orange) and spot metal prices (yellow), as calculated by the PFS financial model.

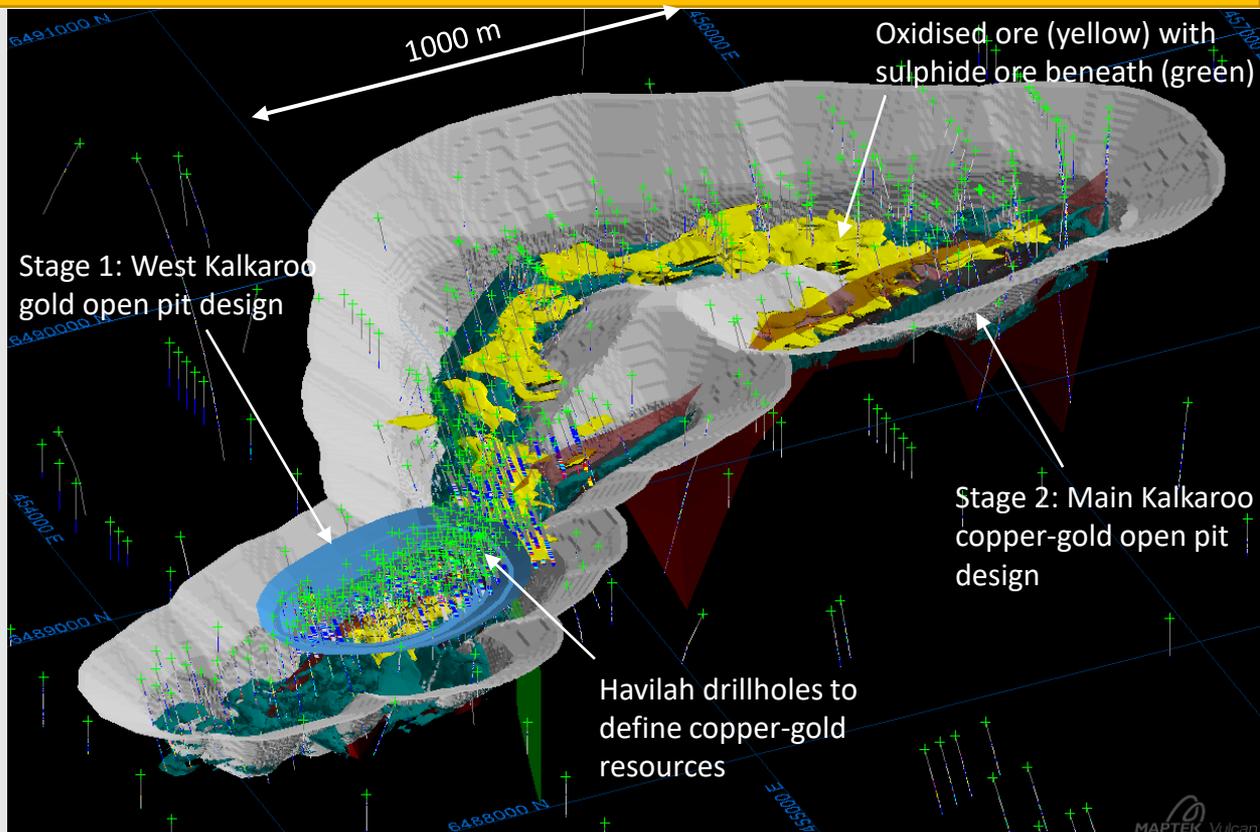
Note that the orange highlighted long term metal price, pre-tax NPV<sub>7.5%</sub> (A\$1163 million) in the table is conservative for Kalkaroo as no account has been taken of:

1. Improved gold recoveries in the oxidised ore types from 50% in the PFS to >90% based on recent metallurgical test work ([refer to ASX announcement of 9 May 2019](#)).
2. Potential revenue contribution from other by-product commodities such as cobalt, rare earth elements and molybdenum due to incomplete metallurgical test work.
3. Open pit optimisations have not been re-run for higher long-term forecast metal prices. On the basis that lower grades of ore can be profitably treated if metal prices are higher, it is reasonable to assume (based on constant cost inputs) that re-optimisation would result in a larger open pit and hence improved mining economics and a longer mine life. For the present exercise the published PFS open pit optimisation and RPM financial model have been used.

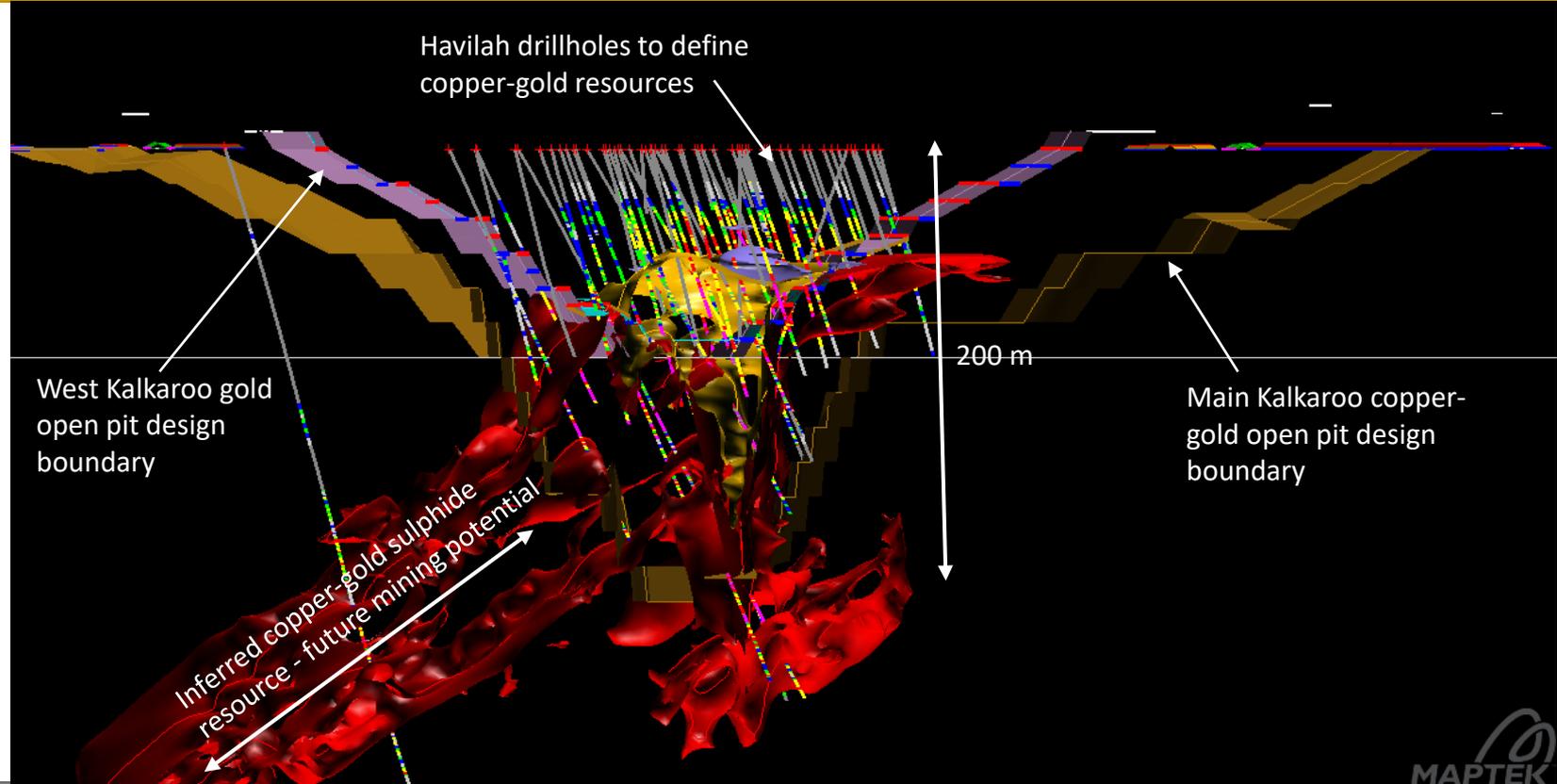
# Development Plan: Stage 1 West Kalkaroo gold open pit in oxidised ore

## Stage 2 Main Kalkaroo large scale copper-gold mine in sulphide ore

- ✓ **Stage 1 West Kalkaroo gold open pit** mines the shallowest and lowest cost oxidised gold ore with approximately 90,000 ounces of gold and 5,000 tonnes of copper production over 3 years, to be recovered in a combined gravity and cyanide leach gold and native copper 1 Mtpa processing plant.
- ✓ **Stage 2 Main Kalkaroo copper-gold mine** will exploit the large sulphide orebody exposed in the West Kalkaroo pit floor to be processed at the expected rate of 6-7Mtpa in a copper concentrator. The remaining oxidised ore will be processed in the West Kalkaroo plant, that is expanded to 2 Mtpa.
- ✓ Havilah's previous experience at the Portia gold mine (which it successfully financed, developed and operated) regarding geotechnical aspects, dewatering, mining methods and oversight, materials handling and processing plant design and operation can be directly applied for Kalkaroo's benefit.

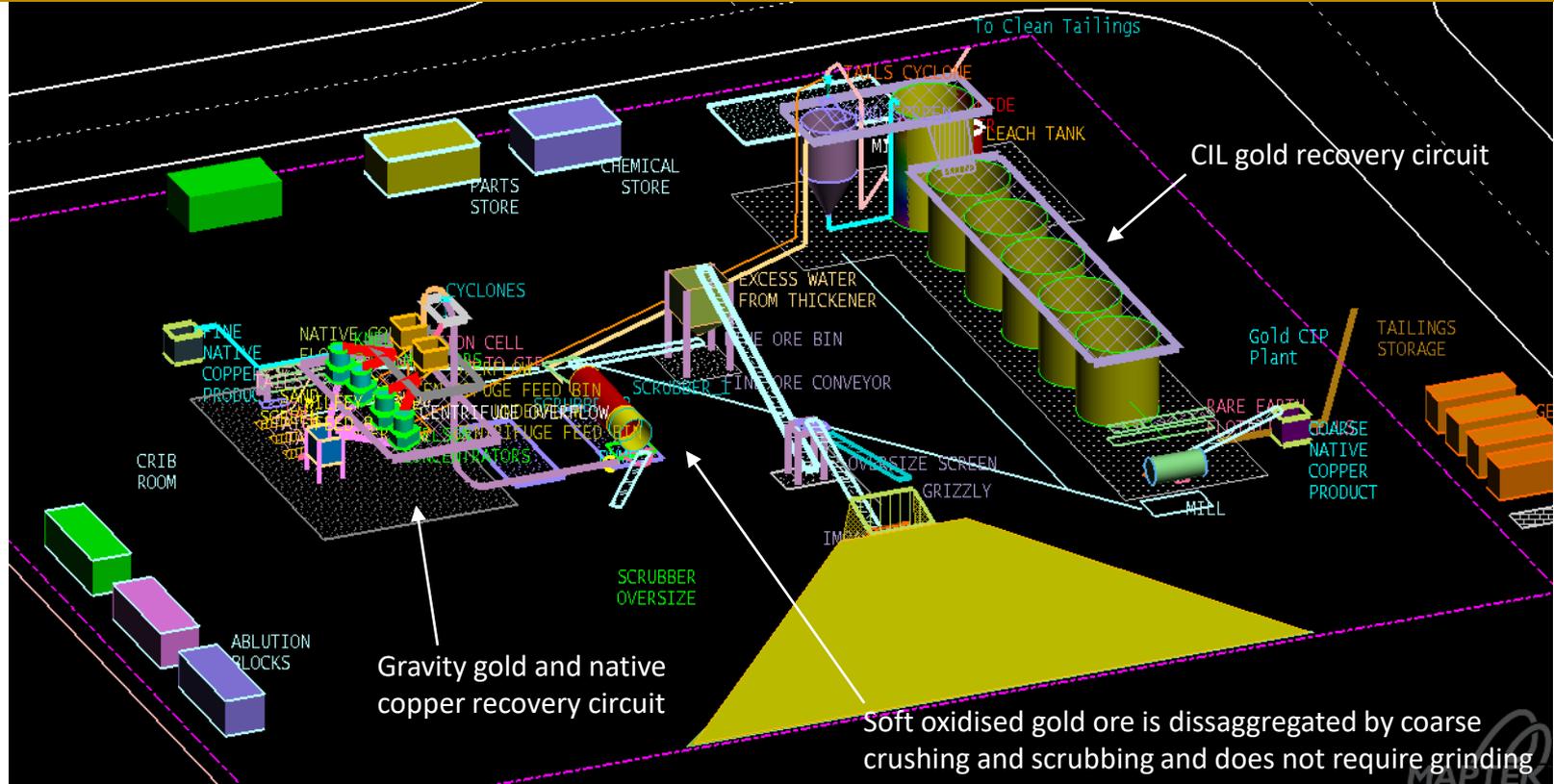


# Cross section through Kalkaroo orebody





# Stage 1 West Kalkaroo oxidised ore proposed processing plant layout for recovery of gold and native copper



# Stage 2 Main Kalkaroo sulphide ore processing to produce copper sulphide concentrates plus roasting of pyrite concentrate

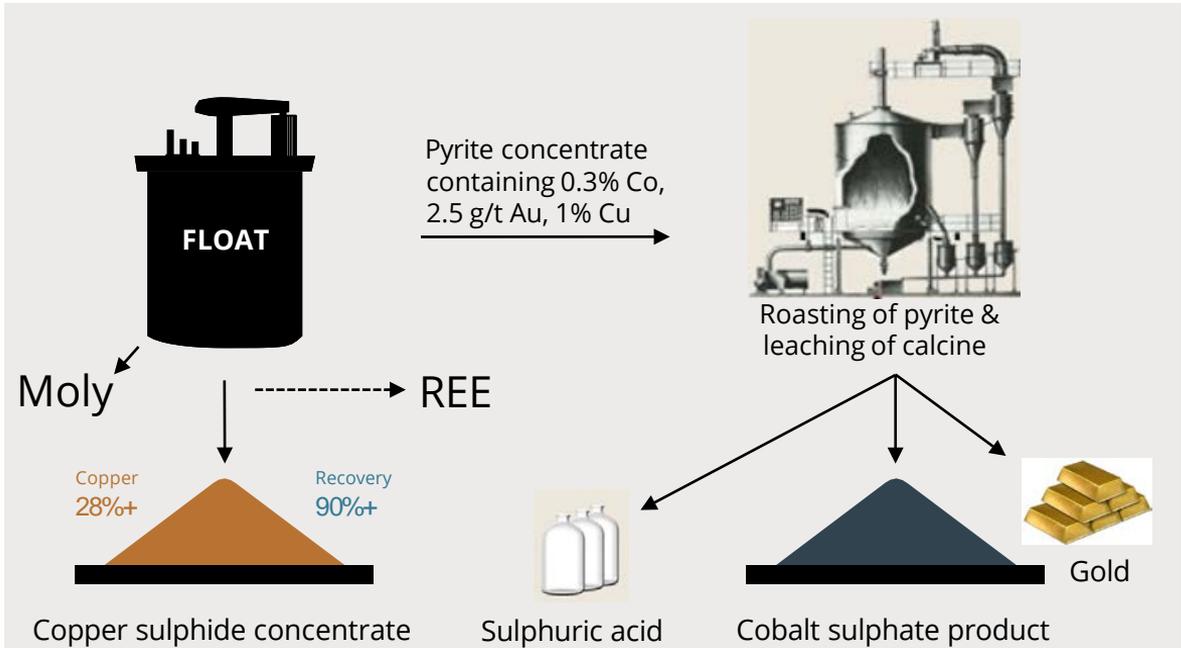
## 1 Open pit mining



## 2 Ore crushing / grinding



## 3 Processing of Kalkaroo sulphide ore



**Established copper sulphide and pyrite concentrate processing technology**

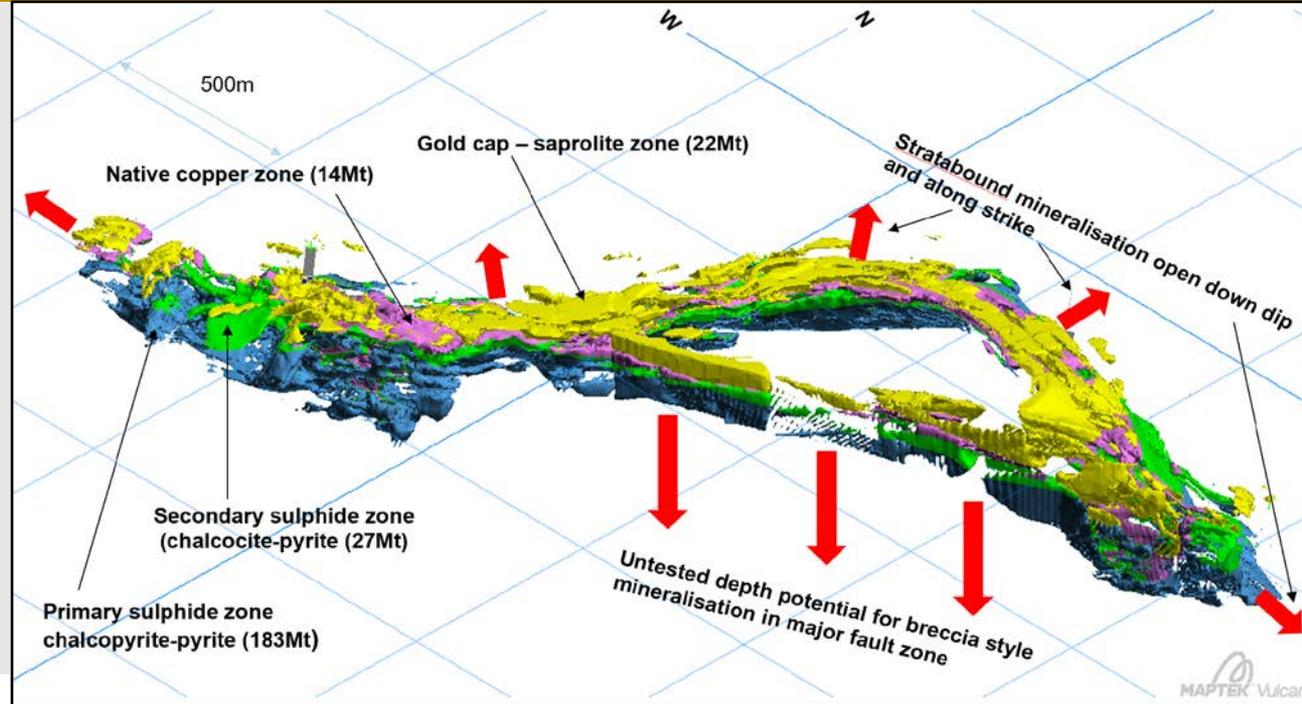
# Indicative project implementation timetable

Milestone	Completed	2Q 2021	3Q 2021	4Q 2021	1H 2022	2H 2022	2023	2024	2025	2026	→
Resource											
Metallurgy testing											
PFS											
Mining Lease											
Land purchase											
PEPR lodgement											
PEPR approval											
Financing finalisation											
Mining contractor selection											
Plant contractor selection											
<b>Stage 1 West Kalkaroo</b>											
Siteworks											
Plant construction - oxide ore											
Overburden removal											
Processing gold ore											
<b>Stage 2 Main Kalkaroo</b>											
Building copper concentrator											
Processing copper sulphide ore											

Note all dates are indicative only and are dependent on timely receipt of all approvals and negotiation of contracts and financing. They are not intended as firm estimates at this stage.

# Kalkaroo expansion and upside potential

- Kalkaroo orebody is open at depth and along strike, with excellent potential to expand the existing resources in these areas. There is very little drilling below 200 m depth.
- Potential for by-product cobalt, molybdenum and REE concentrate production for little extra processing cost.
- Pyrite concentrate, to be produced along with the copper concentrate contains on average 0.3% cobalt, 2.5 g/t gold and 1% copper (potential value is not included in the economic model).



# Additional value drivers for Kalkaroo project (not presently accounted for in economic model)

## 1. Other metals

- Pyrite concentrate contains substantial cobalt and gold (slide 10).
- REE occur in the non-radioactive mineral bastnasite, which contains >40% of the high value magnet metals (Nd, Pr, Dy and Tb). Bastnasite can potentially be recovered magnetically for low cost from the tailings stream.
- Molybdenite can potentially be recovered from the flotation plant as a separate product.
- Copper concentrates are low in uranium, arsenic and cadmium making it environmentally acceptable and avoiding the need for pre-treatment to remove contaminants.

## 2. Extended mine life

- At current metal prices much of the Inferred Resource outside of the open pit is likely to be converted to Ore Reserves, thus extending the mine life to potentially >20 years.
- Considerable potential for resource expansion with further drilling as mineralisation is open in all directions.

## 3. Environmental

- Saline process water and renewable energy sources (sun and wind) are available in abundance.
- No known environmental or social impediments to project development due to low regional conservation value.

# Kalkaroo JORC Ore Reserve and Mineral Resources

## Kalkaroo JORC Ore Reserves as at 31 July 2020 from Havilah 2020 Annual Report

Project	Classification	Tonnes (Mt)	Copper %	Gold g/t	Copper tonnes (Kt)	Gold ounces (Koz)
Kalkaroo <sup>1</sup>	Proved	90.2	0.48	0.44	430	1,282
	Probable	9.9	0.45	0.39	44	125
	<b>Total</b>	<b>100.1</b>	<b>0.47</b>	<b>0.44</b>	<b>474</b>	<b>1,407</b>

## Kalkaroo JORC Mineral Resources as at 31 July 2020 from Havilah 2020 Annual Report

Project	Classification	Resource Category	Tonnes	Copper %	Cobalt %	Gold g/t	Copper tonnes	Cobalt tonnes	Gold ounces
Kalkaroo <sup>2</sup>	Measured	Oxide Gold Cap	12,000,000			0.82			
	Indicated	Oxide Gold Cap	6,970,000			0.62			
	Inferred	Oxide Gold Cap	2,710,000			0.68			
	<b>Total</b>	<b>Oxide Gold Cap</b>	<b>21,680,000</b>			<b>0.74</b>			<b>514,500</b>
	Measured	Sulphide Copper-Gold	85,600,000	0.57		0.42			
	Indicated	Sulphide Copper-Gold	27,900,000	0.49		0.36			
	Inferred	Sulphide Copper-Gold	110,300,000	0.43		0.32			
	<b>Total</b>	<b>Sulphide Copper-Gold</b>	<b>223,800,000</b>	<b>0.49</b>		<b>0.36</b>	<b>1,096,600</b>		<b>2,590,300</b>
		<b>Total Kalkaroo</b>	<b>245,480,000</b>				<b>1,096,600</b>		<b>3,104,800</b>
		Inferred	Cobalt Sulphide <sup>3</sup>	193,000,000		0.012			23,200

Numbers in above tables are rounded.

## Footnotes to 2020 JORC Ore Reserve and Mineral Resource Tables

<sup>1</sup> Details released to the ASX: 18 June 2018 (Kalkaroo)

<sup>2</sup> Details released to the ASX: 30 January 2018 and 7 March 2018 (Kalkaroo)

<sup>3</sup> Note that the Kalkaroo cobalt Inferred Resource is not added to the total tonnage

# Cautionary and Competent Person's Statements

## Cautionary Statement

The information contained in this presentation is not financial product advice and does not constitute an offer. The presentation is for information purposes and is of a general and summary nature only. Neither Havilah Resources Limited (Havilah) nor any member of the Havilah Group of companies, gives no warranties in relation to the statements and information in this presentation. Investors should seek appropriate advice on their own objectives, financial situation and needs.

It is not recommended that any person makes any investment decision in relation to Havilah or the Kalkaroo project based on this presentation. This presentation should be read in conjunction with the latest Annual Report together with any announcements made by Havilah in accordance with its continuous disclosure obligations arising under the *Corporations Act 2001*.

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Given the ongoing uncertainty relating to the duration and extent of the global COVID-19 pandemic, and the impact it may have on the demand and price for commodities, on our suppliers and workforce, and on global financial markets, the Company continues to face uncertainties that may impact its operating and financing activities.

## Competent Person's Statement

The information in this presentation that relates to Exploration Results, Mineral Resources and Ore Reserves is based on data compiled by geologist Dr Chris Giles, a Competent Person who is a member of The Australian Institute of Geoscientists. Dr Giles is Technical Director of the Company, a full-time employee and is a substantial shareholder. Dr Giles has sufficient experience, which is relevant to the style of mineralisation and type of deposit and activities described herein to qualify as a Competent Person as defined in the 2012 Edition of *'Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves'*. Dr Giles consents to the inclusion in the presentation of the matters based on his information in the form and context in which it appears.

Information for the Kalkaroo Ore Reserve & Mineral Resource complies with the JORC Code 2012. Havilah confirms that all material assumptions and technical parameters underpinning the reserves and resources continue to apply and have not materially changed. Except where explicitly stated, this presentation contains references to prior exploration results and JORC Mineral Resources, all of which have been cross-referenced to previous ASX announcements made by Havilah. The Company confirms that it is not aware of any new information or data that materially affects the information included in the relevant ASX announcements.