

ASX Release / 27 April 2021

Simberi Sulphide Feasibility Study highlights robust project; Board approves pre-investment work

St Barbara Limited (ASX:SBM) (the “Company”) is pleased to announce the results of the Simberi Sulphide Feasibility Study which highlights a robust project with strong financial returns.

The Board has approved pre-investment work of US\$13 million, with a final investment decision targeted for March 2022. Key changes from the 2020 Pre-Feasibility Study (PFS) include an increase in nameplate capacity, with an option to expand to 3.7 Mtpa supported by an improved All-in Sustaining Cost (AISC) of ~3%.

The pre-investment work will enable a ramp-up in mining, ongoing drilling to further increase ore body knowledge and studies to de-risk the project. Early construction activities will commence upon approval of the Social and Environmental Impact Statement (SEIS) which has been submitted this month.

Study Highlights¹

- Life of mine average All-in Sustaining Costs (AISC) of US\$896 per ounce
- Life of mine average sulphide gold production of 160 koz per annum
- Initial capital expenditure of US\$170 million, including expansion capital
- Life of mine sustaining capital expenditure of US\$120 million
- Net Present Value of US\$220 million (post-tax) at a real discount rate of 8% per annum
- Internal Rate of Return of approximately 40% (post-tax)
- Mine life of ~11 years²
- The work completed during the FS identified additional oxide ore that will maintain the current operation to Q3 March FY24
- Payback period of ~3 years
- First ore ~2 years from environmental permitting and Mineral Resource Authority (MRA) amendment approval.

Key Changes from 2020 Pre-Feasibility Study

- Nameplate capacity of Sulphide plant increased from 2.7 to 3.0 Mtpa, with the option to expand to 3.7 Mtpa. Key pieces of process equipment have been selected to enable the expansion
- Improved AISC of ~3%
- Extensive marketing studies have been completed to establish net smelter returns with draft contracts already negotiated with a number of third parties
- Life of Mine capital expenditure has increased to include a power upgrade, closure costs and a full asset maintenance strategy

¹ All dollar figures are in real terms

² Includes oxide production in FY22 and FY23

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- A new wharf will be constructed to enable 11 kt concentrate shipments to Asian markets, resulting in significant operating cost savings.

Next steps

- Following the submission of the SEIS in April 2021, supporting site trials will be completed and submitted to Conservation & Environmental Protection Authority (CEPA)
- Updating Mineral Reserves for end of financial year reporting
- Complete reserve definition drilling program anticipated over the next three to six months
- Complete pre-investment activities prior to final Board investment approval (expected in March 2022).

Mr Craig Jetson, Managing Director & CEO, said:

“The future of the Simberi Sulphide Project has been endorsed by the Board, with a commitment to pre-investment work that will take place as we update mineral reserves, complete reserve definition with drilling and finalise all pre-investment activities. This vote of confidence in the Simberi Operations comes as we work closely with the PNG government, agencies and community as part of our ongoing consultation and engagement. This work is continuing despite the current challenges that COVID-19 presents in PNG and is a testament to the relationships we hold in PNG and the vision we have for the Simberi Operations.”

“The key changes from the Pre-Feasibility Study include an increase in nameplate capacity of the sulphide plant to 3.0Mtpa, with an option to expand. Extensive marketing studies have allowed us to establish net smelter returns, while we’ve negotiated draft contracts giving us confidence in the concentrate market. A new wharf will be constructed to enable 11 Kt concentrate shipments to Asian markets, which will result in significant cost savings. The fundamentals of this project are robust, with an anticipated mine life of around 11 years and a payback period of 3 years.”

Project overview

The Feasibility Study (FS) includes the results from the 2016 and 2020 Pre-Feasibility Studies, interpretation of additional data derived from drilling and metallurgical testwork. Consistent with the previous studies, the FS was scoped to focus on low capital expenditure solutions that utilised existing infrastructure to the extent possible.

The work completed during the FS identified additional oxide ore that will maintain the current operation to Q3 March FY24. The continuation of current oxide operations allows further de-risking activities to be completed.

The oxide operation is expected to maintain the current production level during the expansion of the mining fleet and construction of the sulphide plant. The expanded sulphide plant will enable processing of both oxide and sulphide ore and it is anticipated that oxide material will be processed as a batch operation to maintain and control stockpiles.

Processing Plant

The sulphide plant has been designed to process 3.0 Mtpa, with a robust flow sheet and use of common equipment. In addition key equipment has been identified to increase throughput to 3.7 Mtpa, whilst

maintaining the existing Semi-Autogenous Grinding (SAG) mill. The current capital estimate of US\$170 million includes expansion items.

Construction of the sulphide processing plant is designed to minimise disruption to the existing operation, with construction phases to be completed in isolated packages. The project plans to utilise the existing infrastructure on Simberi island including the airport, tailings management, accommodation village, power generation and administration facilities.

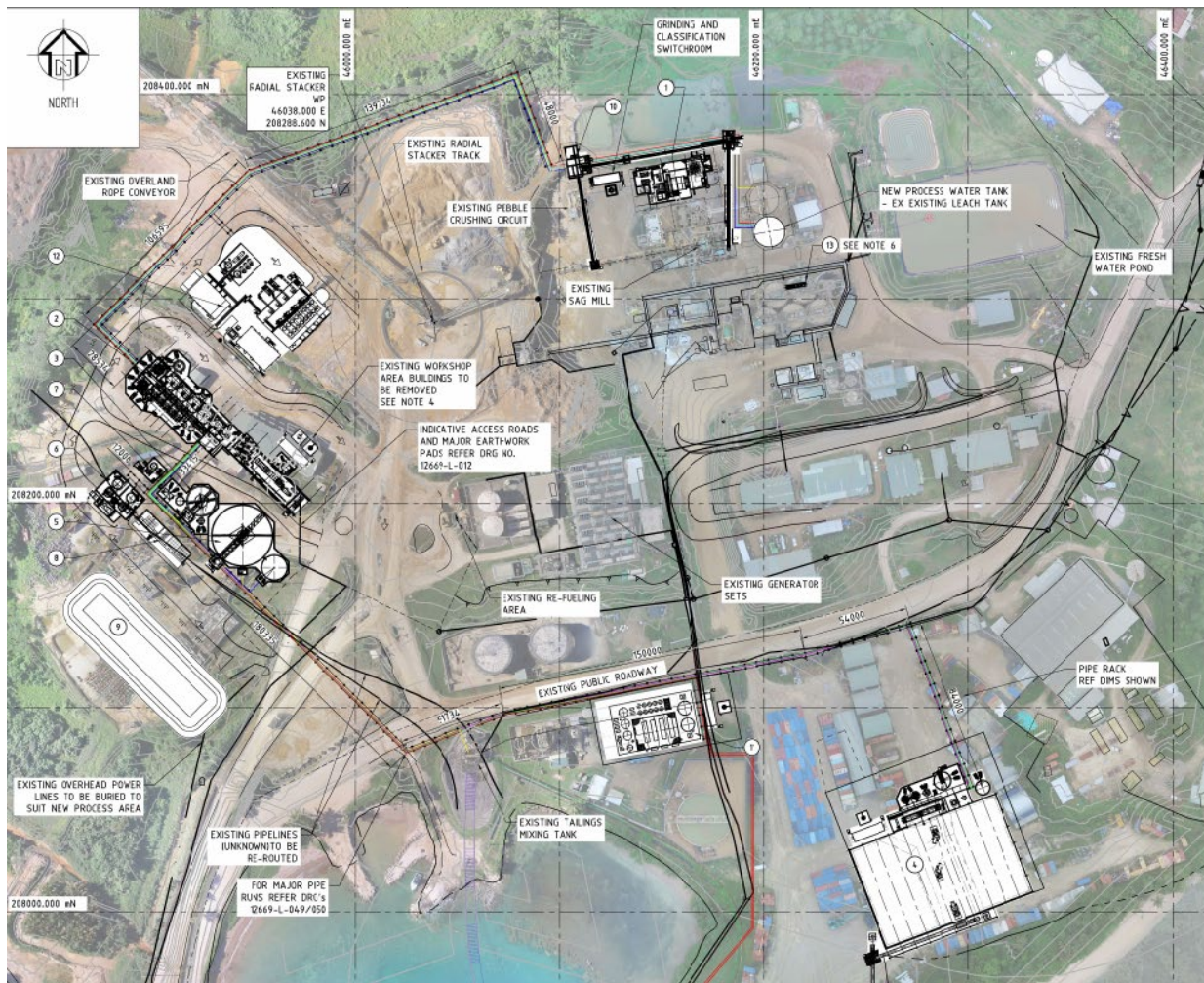


Figure 1: Planned site layout

Permitting

The SEIS has been submitted to CEPA seeking approval for the expanded mine and associated activities. Approval is expected in a timeframe of 9 -12 months.

Due to COVID-19 various trials could not be completed, and as a result, CEPA has allowed post submission addendums. Further trials and testing of waste rock management and the DSTP footprint will form the basis of addendums to the SEIS in July and August 2021.

The Simberi mine has a mining lease current until December 2028. St Barbara continues to engage with all stakeholders in PNG to ensure legislative certainty prior to making a final investment decision.

Concentrate marketing

The gold concentrate will be shipped in up to 11 kt shipments to the Asian market, utilising a newly constructed wharf, concentrate storage shed and handling facility.

St Barbara has reached an agreement in principle with a number of global trading companies for the majority of life of mine concentrate sold at an average payable of approximately 86%.

Additional Drilling

An extensive RC and diamond drill program to target and define additional oxide mineralisation within the mine corridor was developed as part of the FY21 strategy. Drilling at Simberi commenced in September 2020 and is ongoing.

Further resource definition drilling is being planned to compliment and convert unclassified and Inferred mineralisation as a part of the overall drilling strategy.

Drilling results will be released in the June quarter FY21 on the completion of drill programs.

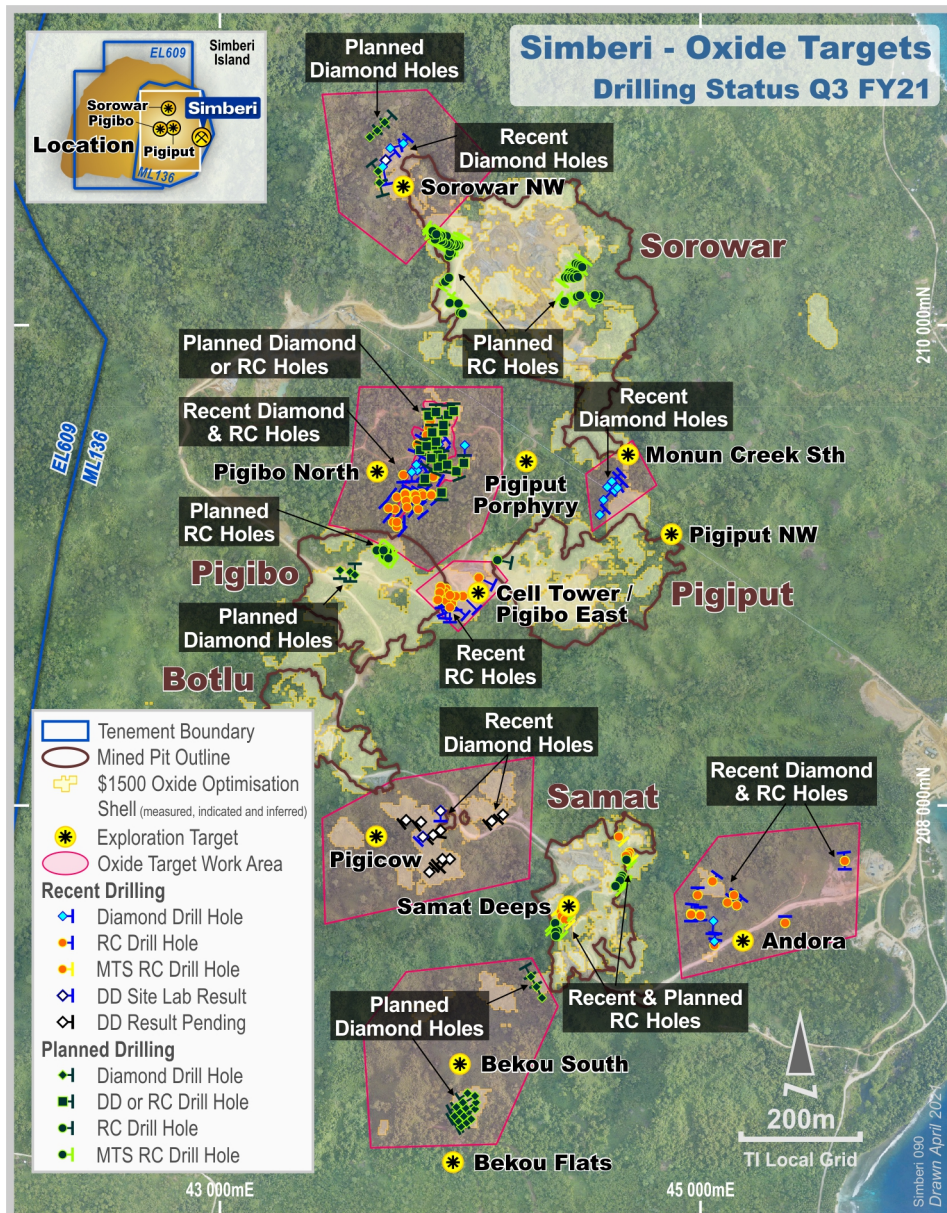


Figure 2: Simberi oxide drilling targets



Figure 3: Indicative Timeline to Final Investment Decision³

Gold production and material movement

The life of mine (LoM) production profile is shown below, with sulphide production commencing in FY24. Average sulphide gold production from FY24 to FY32 is ~160 koz per annum.

Material movement assumes an increase in the mining rate from current levels of 14 Mtpa to 20 Mtpa over the next three years, as the sulphide pits are developed. The increase in mining fleet and ancillary equipment to achieve the higher mining rate has been reflected in the sustaining capital.

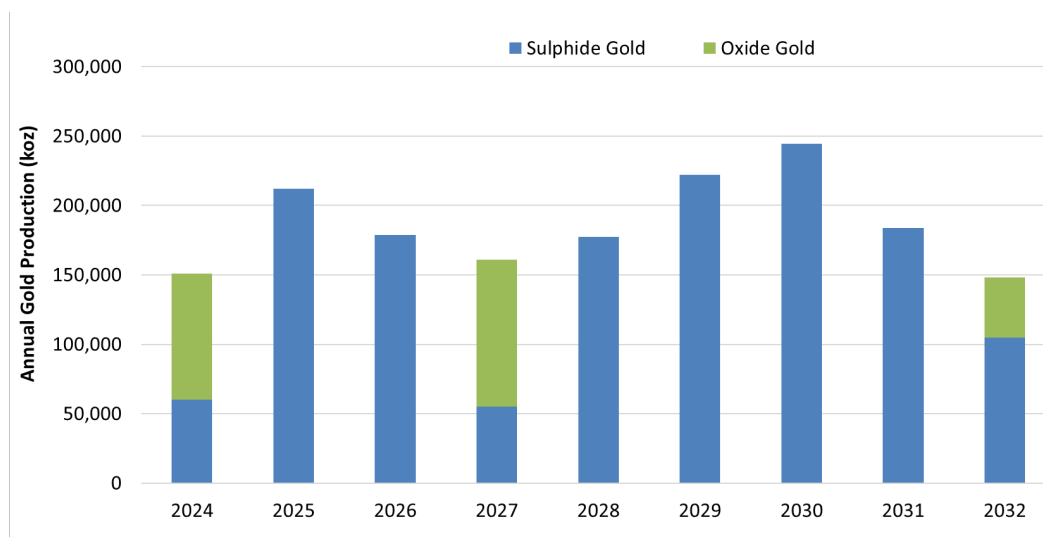


Figure 4: Gold production profile from commencement of sulphide processing

The sulphide project generates positive cashflow from the first full year of sulphide ore production in FY25 until FY32, with a pay back of three years. Maximum cashflow is expected in FY29 and FY30, which align with the full production from the Pigput open pit. Further pit optimisations are underway to bring forward these ounces and provide a higher NPV and faster payback.

³ Simberi has a mining lease current until December 2028

Key parameters from the 2021 Simberi Sulphide Project FS (compared with 2020 PFS)

Parameter	Unit ⁴	2021 Feasibility Study	2020 Pre-Feasibility Study
Life of Mine (LoM)	Years	11	15
First sulphide ore	Year	2024	2023
Strip ratio	x	3.4	2.9
Mill throughput	Mtpa	3.0	2.7
Oxide ore mined	Mt	11	13
Transition ore mined	Mt	3	3
Sulphide ore mined	Mt	22	24
Waste mined	Mt	118	116
Average annual sulphide gold production	koz	160	160
Sulphide Gold recovery	%	83	80
Concentrate tonnes LoM	Mt	1.5	1.7
Concentrate gold grade	g/t Au	27	30
Average All-In Sustaining Costs (AISC)	US\$ per ounce	896	920
Concentrate Payable	%	~86	Up to 90
Project capital	US\$ M	160 to 170	130 to 150
Sustaining capital	US\$ M	110 to 120	45 to 50
Gold price	US\$/oz	1,500	1,350
AUD / USD exchange rate	cents	0.73	0.70
Discount rate	%	8.0%	10.4%
Net Present Value (pre -tax)	US\$ M	320	233
Net Present Value (post-tax)	US\$ M	220	161
Internal Rate of Return (pre-tax)	%	52	63
Internal Rate of Return (post-tax)	%	40	53
Payback period (pre-tax)	Years	<2.5	2
Payback period (post-tax)	Years	3	2

⁴ All dollar figures are in real terms

The current Simberi ore reserves as reported at 30 June 2020⁵ comprise:

- Sulphide 22.6Mt @ 2.4g/t for 1,765 koz
- Oxide 8.4Mt @ 1.1g/t for 305koz⁶

Consistent with the current LoM plan and the approach taken in the PFS study, the FS schedule and economic evaluation includes some Inferred Resources⁷ sitting within Measured, Indicated and Inferred pit shells comprising oxide, transitional and sulphide ore of 6.3Mt @ 1.4g/t for 293koz.

Disclaimer

St Barbara Limited ("Company") has prepared this announcement. The material contained in this announcement is for information purposes only. This release is not an offer or invitation for subscription or purchase of, or a recommendation in relation to, securities in the Company and neither this release nor anything contained in it shall form the basis of any contract or commitment.

This announcement contains forward-looking statements that are subject to risk factors associated with exploring for, developing, mining, processing and the sale of gold. Forward-looking statements include those containing such words as anticipate, estimates, forecasts, indicative, should, will, would, expects, plans or similar expressions. 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, and which could cause actual results or trends to differ materially from those expressed in this announcement. Actual results may vary from the information in this announcement. The Company does not make, and this announcement should not be relied upon as, any representation or warranty as to the accuracy, or reasonableness, of such statements or assumptions. Investors are cautioned not to place undue reliance on such statements.

This announcement has been prepared by the Company based on information available to it, including information from third parties, and has not been independently verified. No representation or warranty, express or implied, is made as to the fairness, accuracy or completeness of the information or opinions contained in this announcement.

The Company estimates its reserves and resources in accordance with the Australasian Code for Reporting of Identified Mineral Resources and Ore Reserves 2012 Edition ("JORC Code"), which governs such disclosures by companies listed on the Australian Securities Exchange.

Competent Persons Statement

Mineral Resource and Ore Reserve Estimates

The information in this report that relates to Mineral Resources or Ore Reserves is extracted from the report titled 'Ore Reserves and Mineral Resources Statements 30 June 2020' released to the Australian Securities Exchange (ASX) on 24 August 2020 and the report titled 'Ore Reserves and Mineral Resources Statements for Simberi Gold Mine as at 31 December 2019' released to the ASX on 2 March 2020. The reports are available to view at www.stbarbara.com.au and for which Competent Persons' consents were obtained. Each Competent Person's consent remain in place for subsequent releases by the Company of the same information in the same form and context, until the consent is withdrawn or replaced by a subsequent report and accompanying consent.

The Company confirms that it is not aware of any new information or data that materially affects the information included in the original ASX announcements released on 24 August 2020 and 2 March 2020 and, in the case of estimates of Mineral Resources or Ore Reserves, that all material assumptions and technical parameters underpinning the estimates in the original ASX announcements continue to apply and have not materially changed. The Company confirms that the form and context in which the Competent Person's findings are presented have not been materially modified from the original ASX announcements.

Full details are contained in the ASX releases dated 24 August 2020 'Ore Reserves and Mineral Resources Statements 30 June 2020' and 2 March 2020 'Ore Reserves and Mineral Resources Statements for Simberi Gold Mine as at 31 December 2019' available at www.stbarbara.com.au.

⁵ Refer to ASX release 24 August '30 June 2020 Ore Reserves and Mineral Resources Statements'

⁶ Parts of the existing oxide reserve are contained within the Sulphide Project pit shell, and are subject to optimisation of the existing oxide operation

⁷ Inferred Resources per Ore Reserves and Mineral Resources Statements for Simberi as at 30 June 2020 released 24 August 2020. There is a low level of geological confidence associated with inferred mineral resources and there is no certainty that further exploration work will result in determination of indicated mineral resources or that the production targets will be realised