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South32 Limited
(Incorporated in Australia under the *Corporations Act 2001* (Cth))
(ACN 093 732 597)
ASX / LSE / JSE Share Code: S32; ADR: SOUHY
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HERMOSA PROJECT UPDATE

South32 Limited (ASX / LSE / JSE: S32; ADR: SOUHY) (South32) is pleased to advise that our 100% owned Hermosa project located in Arizona, United States, has been confirmed by the US Federal Permitting Improvement Steering Council, an independent federal agency, as the first mining project added to the FAST-41 process.

To qualify for the FAST-41 process, critical infrastructure projects must meet rigorous criteria to demonstrate benefit to the nation. Our Hermosa project is currently the only advanced project in the United States that could supply two federally designated critical minerals, zinc and manganese.

Including the Hermosa project on the FAST-41 dashboard is expected to create a more efficient and transparent process, supporting the attainment of federal permits required for the later years of our proposed development of the Taylor and Clark deposits at Hermosa.

We now expect to complete the feasibility study for our Taylor zinc-lead-silver deposit in the second half of CY23, as we undertake additional engineering studies to align the mine development schedule for a federal permitting process under FAST-41 and incorporate current market cost estimates.

Separately, the current phase of study work for our Clark battery-grade manganese deposit has confirmed its potential to supply battery-grade material to the rapidly forming North American electric vehicle supply chain. Study work will now progress to a definition phase pre-feasibility study, including the provision of sample qualification product to potential customers with pilot plant production having commenced in recent weeks.

Further information on the completed study work for the Clark deposit is contained in this announcement.

South32 Chief Executive Officer Graham Kerr said: "The inclusion of Hermosa as the first mining project added to the FAST-41 process is an important milestone that recognises the project's potential to strengthen the domestic supply of critical minerals in the US.

"Hermosa presents a significant opportunity to sustainably produce commodities critical to a low-carbon future."

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FAST-41 PROCESS

We are pursuing an integrated permitting strategy for our Taylor and Clark deposits, which are both located on private lands, meaning construction and mine development can commence with approvals from the State of Arizona. Future development of supporting infrastructure located on unpatented lands will require both state and federal approvals. To date we have received all required permits to complete critical path dewatering activity, which will enable access to both the Taylor and Clark deposits. The second water treatment plant is progressing to schedule and budget, with commissioning expected in June 2023.

Hermosa's addition by the US Federal Permitting Improvement Steering Council, an independent federal agency, as the first mining project to be covered by the FAST-41 process underlines the project's potential to provide localised, sustainable supply of critical minerals. The US Government, working with Hermosa, will now create a comprehensive Coordinated Project Plan, providing a more efficient and transparent pathway for federal approvals.

CLARK SELECTION PHASE PRE-FEASIBILITY STUDY

A selection phase pre-feasibility study (PFS-S) for the Clark deposit has successfully defined the potential for an underground mining operation, integrated with Taylor, and a separate plant to produce high-purity manganese sulphate monohydrate (HPMSM) for the rapidly forming electric vehicle (EV) supply chain in North America.

The size of the Clark deposit's Mineral Resource provides the optionality to scale production to meet the future demand profile for the North American HPMSM market. The PFS-S has defined an option to produce ~60kt per annum of battery-grade manganese (~185kt of HPMSM), as well as zinc and silver, over a ~60-year period (refer Annexure 1). A portion of this targeted production is based on Inferred Mineral Resources. 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 the determination of Indicated Mineral Resources or that the production target itself will be realised. Development of the Clark deposit has the potential to deliver attractive returns and further increase our exposure towards the commodities critical for a low-carbon future.

Clark will now progress to further study phases alongside product qualification of our HPMSM material with potential customers. Pilot plant production of HPMSM has commenced and we are separately preparing to start decline works at Clark to enable access to ore for demonstration scale production. Our phased approach is expected to produce between 2 and 10kt per annum of HPMSM, initially, generating product volumes to facilitate ongoing product qualification, with the potential to scale volume to meet the needs of end-users. Decline access will also enable the completion of additional underground exploration activity to support further resource definition and study phases.

An integrated, small footprint underground mine design

Clark is a manganese-zinc-silver oxide deposit which is interpreted as the upper oxidised, manganese-rich portion of the mineralised system that hosts the Taylor deposit. The deposit is mineralised from near surface and extends to a depth of approximately 600 metres. The Mineral Resource for the Clark deposit is 55Mt, averaging 9.08% manganese, 2.31% zinc and 78 g/t silver (refer Annexure 2)¹.

The preferred mine design in the PFS-S is a small footprint, underground mining operation integrated with the Taylor deposit, with mine access from a single decline. The preferred mining method is longhole open stoping with paste backfill, which allows for a selective mining sequence. Crushed ore would be hauled to an off-site HPMSM production facility located in Santa Cruz County, Arizona.

Clark's co-located mining development would benefit from infrastructure that is shared with Taylor, including civil, power and water infrastructure. We also expect to realise operating and capital efficiencies across both underground mining operations, including the potential to use processed tailings from Taylor as paste backfill for Clark, further reducing surface tailings storage requirements.

¹ For further information, refer to "Hermosa Project - Mineral Resource Estimate Declaration" released on 12 May 2020, where this Mineral Resource estimate was first disclosed. South32 confirms that it is not aware of any new information or data that materially affects the information included in that announcement, and that all material assumptions and technical parameters underpinning the estimate continue to apply and have not materially changed.

Confirmed flow sheet to produce HPMSM

The PFS-S has confirmed a preferred flowsheet to produce HPMSM, which we consider to have wider market demand and increased payability compared to other forms of battery-grade manganese. The preferred flowsheet design was informed by detailed metallurgical test work, including diagnostic leach testing of more than 120 geometallurgical samples and supported by a mineralogy characterisation campaign of 260 variability samples.

The preferred process design in the PFS-S is a hydrometallurgical process that produces HPMSM utilising a reductive leach and series of purification stages prior to crystallisation, which also generates co-products of zinc sulphide and silver doré. The ore characteristics and low impurities of the Clark deposit make it highly amenable to leaching, which is expected to bring efficiency and operating cost benefits.

Pilot plant scale production of our HPMSM product has commenced to validate the PFS-S flowsheet and generate HPMSM for product feedback from customers. Nine PQ holes (core diameter of 85mm) were drilled to collect the bulk samples used as feedstock for the pilot plant, which will generate approximately one tonne of HPMSM.

Potential to generate substantial local economic benefits from the sustainable development of a new critical minerals project

Clark's proposed development is aligned with our purpose to make a difference by developing natural resources, improving people's lives now and for generations to come. It has the potential to strengthen the domestic supply of critical minerals and create many new jobs in Santa Cruz County, Arizona, where nearly 25 percent of its residents live below the poverty line. We are working proactively with Native American tribes that have cultural ties to the project area to preserve cultural heritage and deliver long-term opportunities.

Development of the Clark deposit has been designed to minimise its environmental impact, featuring a small footprint underground mine with efficient water use and dry-stack tailings. It will be designed applying low-carbon principles, with future study phases to evaluate options to access renewable energy supply. These low-carbon design principles, combined with low transport emissions due to Clark's proximity to future EV supply chains in North America, is expected to favourably position our HPMSM product with customers seeking to address greenhouse gas emissions throughout their supply chains.

Ideally positioned to supply the rapidly forming North American electric vehicle supply chain

Clark is currently the only advanced project in the US that has a visible pathway to produce battery-grade manganese for the domestic market from locally sourced ore.

Based on our projected EV battery demand and chemistry assumptions, we anticipate substantial growth in demand for battery-grade manganese in North America. Government policies that subsidise EVs are forecast to deliver a near six-fold increase in North American EV penetration levels by 2030. Demand for battery-grade manganese is anticipated to further benefit from the adoption of manganese-rich chemistries that provide EV users with substantial cost, performance and sustainable sourcing benefits.

Government policies are also incentivising the build out of battery EV supply chains in the US including the procurement of critical minerals from domestic sources. With the current available supply of battery-grade manganese to North America heavily reliant on Chinese producers, the potential development of Clark will provide a new domestic source of production to strengthen the US supply chain.

Phased approach to grow with the market

Following our initial pilot plant campaign, a demonstration scale facility is planned to enable production of our HPMSM product at scale for further customer qualification. This facility is expected to be constructed on private land in Santa Cruz County, with an initial capacity of approximately 2 to 10kt per annum of HPMSM.

We have commenced engineering design studies for the demonstration plant to evaluate the final capacity, location, and estimated capital costs. On our current project schedule, the demonstration plant could be commissioned in late CY25, subject to a final investment decision.

We are planning to construct a decline at Clark to provide access to the ore required to sustain production of HPMSM in the demonstration plant. We have received all major permits required for the decline, with construction expected to commence in late Q1 FY24, and completion targeted during CY25. Capital expenditure for the decline is expected to be approximately US\$60 million.

We are assessing opportunities to access grant funding from the U.S. Department of Defense and U.S. Department of Energy to advance our battery-grade manganese supply chain.

About us

South32 is a globally diversified mining and metals company. Our purpose is to make a difference by developing natural resources, improving people's lives now and for generations to come. We are trusted by our owners and partners to realise the potential of their resources. We produce commodities including bauxite, alumina, aluminium, copper, silver, lead, zinc, nickel, metallurgical coal and manganese from our operations in Australia, Southern Africa and South America. With a focus on growing our base metals exposure, we also have two development options in North America and several partnerships with junior explorers around the world.

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Approved for release to the market by Graham Kerr, Chief Executive Officer
JSE Sponsor: The Standard Bank of South Africa Limited
8 May 2023

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Mineral Resource Statement for the Clark deposit

The information in this announcement that relates to Mineral Resources for the Clark deposit is extracted from “Hermosa Project - Mineral Resource Estimate Declaration” released on 12 May 2020. South32 confirms that it is not aware of any new information or data that materially affects the information included in the original market announcement, and that all material assumptions and technical parameters underpinning the estimates in the relevant market announcement continue to apply and have not materially changed.

Production Target Cautionary Statement

The information in this announcement that refers to the Production Target is based on Indicated (69%) and Inferred (31%) Mineral Resources for the Clark Deposit. The Mineral Resources underpinning the Production Target is based on Mineral Resources disclosed in South32's FY22 Annual Report published on 9 September 2022 (www.south32.net) and is provided in Annexure 2. The Mineral Resource estimate and supporting documentation was prepared by a Competent Person in accordance with the requirement of the JORC Code. All material assumptions on which the Production Target is based is available in Annexure 1. There is low level of geological confidence associated with the Inferred Mineral Resources and there is no certainty that further exploration work will result in the determination of Indicated Mineral Resources or that the Production Target will be realised. The stated Production Target is based on South32's current expectations of future results or events and should not be solely relied upon by investors when making investment decisions. Further evaluation work and appropriate studies are required to establish sufficient confidence that this target will be met. South32 confirms that inclusion of 31% tonnage from Inferred Mineral Resources is not the determining factor of the project viability and the project forecasts a positive financial performance when using 69% tonnage from Indicated Mineral Resources. South32 is satisfied, therefore, that the use of Inferred Mineral Resources in the Production Target reporting is reasonable.

Forward-looking statements

This release contains forward-looking statements, including statements about trends in commodity prices and currency exchange rates; demand for commodities; production forecasts; plans, strategies and objectives of management; capital costs and scheduling; operating costs; anticipated productive lives of projects, mines and facilities; and provisions and contingent liabilities. These forward-looking statements reflect expectations at the date of this release, however they are not guarantees or predictions of future performance. They involve known and unknown risks, uncertainties and other factors, many of which are beyond our control, and which may cause actual results to differ materially from those expressed in the statements contained in this release. Readers are cautioned not to put undue reliance on forward-looking statements. Except as required by applicable laws or regulations, the South32 Group does not undertake to publicly update or review any forward-looking statements, whether as a result of new information or future events. Past performance cannot be relied on as a guide to future performance. South32 cautions against reliance on any forward-looking statements or guidance.

Annexure 1: Material Assumptions for the Production Target

Criteria	Commentary
<i>Mineral Resource estimate as a basis for production target</i>	<ul style="list-style-type: none"> The Production Target is based on 69% Indicated and 31% Inferred Mineral Resources. The Mineral Resource was prepared by a competent person in accordance with the requirements in Appendix 5A (JORC Code) and was declared as part of South32's Annual declaration of resources and reserves in the Annual Report published on 9 September 2022 (see Annexure 2 of this announcement). South32 confirms that the inclusion of 31% tonnage from Inferred Mineral Resources is not the determining factor of the project viability. The project forecasts a positive financial performance when using 69% tonnage from Indicated Mineral Resources. South32 is therefore satisfied that the use of Inferred Mineral Resources in the determination of the Production Target is reasonable.
<i>Study status</i>	<ul style="list-style-type: none"> A selection phase of the pre-feasibility study has been completed for the Clark Deposit in compliance with the Association for the Advancement of cost engineering (AACE) International Class 5 estimate standard within an accuracy range of +/- 35%. A technically achievable and economically viable mine plan has been determined by the study team. Material Modifying Factors have been considered and are included in this section of the report.
<i>Cut-off parameters</i>	<ul style="list-style-type: none"> Clark is a polymetallic deposit that uses an equivalent Net Smelter Return (NSR) value as a grade descriptor. NSR considers the remaining gross value of the in-situ revenue-generating elements once processing recoveries, royalties, concentrate transport, refining costs and other deductions have been considered. The elements of economic interest used for cut-off determination include manganese (Mn), silver (Ag) and zinc (Zn). The cut-off strategy employed at Clark is to optimise the NPV of the operation. An NSR cut-off grade of approximately US\$160/tonne was used in the development of mineable stope shapes.
<i>Mining factors or assumptions</i>	<ul style="list-style-type: none"> Primary access to the orebody will be through a single decline. Ventilation raises will be established to provide ventilation to the working areas. Paste backfill will be produced in a surface backfill plant and distributed underground via a backfill reticulation system. The mining method applied is longhole open stoping with paste backfill. This is the preferred mining method based on a combination of productivity, cost, resource recovery and risk of subsidence. The mining dilution is applied based on rock dilution or fill dilution dependent on the location of the stope being mined. Dilution factors are applied on a stope-by-stope basis using incremental dilution widths applied to the stope geometry. Geotechnical recommendations based on deposit geology have been used to develop the stope shape dimensions. Due to the continuous nature of the orebody the mining recovery factor in primary stopes is 105% to account for overbreak into ore in the adjacent secondary stopes. The mining recovery factor in the secondary stopes is 85%. Inferred Mineral Resources are incorporated into the stope designs and contribute to the overall weighted grades and NSR of the stope. Inferred Mineral Resources contribute approximately 31% of the total planned tonnes. Risk assessment was completed considering Inferred Mineral Resource as waste to ensure that the Production Target as stated can be achieved. Accordingly, the Company believes it has a reasonable basis for reporting a Production Target including those Inferred Mineral Resources. The proposed mining method with modifying factors applied supports a single-stage ramp-up to potential full-scale production rates of 450kt-800kt per annum.
<i>Metallurgical factors or assumptions</i>	<ul style="list-style-type: none"> Metallurgical test work has been conducted using samples covering the ore body vertically and horizontally. All metallurgical test work and the process design have been reviewed by independent consultants. Manganese is found to commonly occur as either cryptomelane or pyrolusite. Zinc is hosted as a binary oxide mineral with manganese. The Clark plant will consist of conventional mineral hydrometallurgical processing techniques. Primary crushing will be conducted on surface, and the crushed ore will be transported to the off-site facility. At the offsite facility grinding will be conducted by a single-stage semi-autogenous grinding (SAG) mill to a size suitable for leaching.

Criteria	Commentary
	<ul style="list-style-type: none"> Following the manganese and zinc extractive leach, the leach discharge will be washed and filtered. The leach tails, containing silver will advance to a conventional silver recovery circuit, producing silver doré. The silver plant final tails will be filtered and stored in a dry stack tailings facility. The manganese-zinc rich pregnant leach solution from the extractive leach will advance through sequential purification circuits. Zinc is recovered as a salable zinc sulphide product prior to manganese recovery. Manganese is recovered via crystallization producing a high purity manganese sulphate monohydrate (HPMSM) product. Metallurgical recovery is found to vary by geological domain and head grade. Recovery ranges are applied based on geologic formation and grade. Average process recoveries are: 95% for manganese to HPMSM product; 84% for zinc in zinc sulphide and 85% for silver.
<i>Environmental factors or assumptions</i>	<ul style="list-style-type: none"> The project consists of patented claims surrounded by the Coronado National Forest and unpatented claims located within the surrounding Coronado National Forest and managed by the United States Forest Service. A permitting schedule has been developed for obtaining state and federal approvals required for exploration, development and mining. Waste rock generated from surface and underground excavations is delineated into potentially acid generating (PAG) or non-acid generating (NAG) rock. All PAG material will report to a lined facility. NAG material will be managed in a designated rock stockpile or used for construction material. The tailings storage facilities have been designed in accordance with South32's internal Standard and consistent with the International Council on Mining and Metals (ICMM) Tailings Governance Framework, in addition to the Australian National Committee on Large Dams (ANCOLD) guidelines. Tailings from processing will be filtered and stored in purpose-built, lined, surface storage facilities or returned underground in the form of paste backfill.
<i>Infrastructure</i>	<ul style="list-style-type: none"> Opportunities for synergy have been identified, and common infrastructure, facilities, transport, and logistics required for Clark have been integrated with the overall Hermosa site and operations, where feasible. The current Hermosa site activity is supported by office buildings, core processing facilities, and a voluntary remediation program that includes an existing tailings storage facility, a water treatment plant, ponds, road networks, and laydown yards. Portions of the planned infrastructure and facilities for Clark are located at the Hermosa site and at offsite locations to support future operations. These will consist of: <ul style="list-style-type: none"> Mine portal Underground services and utilities Paste backfill plant Process comminution, hydrometallurgical circuits, and bagging plant Tailings filtration plant and dry stack tailings storage facility Dewatering wells, pipelines, and water treatment systems Surface shops, fuel bays, wash bays and office buildings Powerlines and substations Site layout plans, engineering deliverables, and project execution plans will support the infrastructure listed above.
<i>Costs</i>	<ul style="list-style-type: none"> The capital cost estimate is supported by sufficient engineering scope and definition for the preparation of a AACE International Class 5 estimate within an accuracy range of +/- 35%. The operating cost estimate was developed in accordance with industry standards and South32 project requirements. <ul style="list-style-type: none"> Mining costs were calculated primarily from first principles and substantiated by detailed labour rate calculations, vendor-provided equipment operating costs and budgetary quotations for materials and consumables. Processing costs account for plant consumables/reagents, labour, power and maintenance materials and tailings storage facility costs. General and administrative costs are based on current operating structures and optimised based on industry benchmarks and fit-for-purpose sizing. Permitting and environmental estimates are based on current permitting timelines.

Criteria	Commentary
	<ul style="list-style-type: none"> Commodity price forecasts for manganese, silver, and zinc and foreign exchange are supplied by South32 Marketing. Price assumptions reflect South32's view on demand, supply, volume forecasts and competitor analysis. Price protocols will not be detailed as the information is commercially sensitive. Transportation charges have been estimated using information on trucking costs, rail costs, export locations, transload capabilities and transit time associated with moving product from site to market. Treatment and Refining Charges used for the valuation are supplied by South32 Marketing and reflect South32's view on demand, supply, volume forecasts and competitor analysis. Applicable royalties and property fees have been applied using current US federal and state rates.
<i>Revenue factors</i>	<ul style="list-style-type: none"> The life of operation plan derived from the pre-feasibility select study provides the mining and processing physicals such as volume, tonnes and grades to support the valuation. Revenue is calculated by applying forecast metal prices and foreign exchange (when applicable) rates to the scheduled payable metal. Metal payabilities are based on contracted payability terms, typical for zinc and silver. Battery grade manganese product revenue is based on internal price forecasts.
<i>Market assessment</i>	<ul style="list-style-type: none"> Internal price protocols reflect South32's view on demand, supply, and stock situations including customer analysis, competitor analysis and identification of major market windows and volume forecasts.
<i>Economic</i>	<ul style="list-style-type: none"> Economic inputs are described in the cost, revenue and metallurgical factors commentary. Sensitivity analyses have been completed on metal prices, metallurgical recoveries, mine operating costs, growth capital costs and use of Inferred Mineral Resources to understand the value drivers and impact on the valuation. The selection phase of the pre-feasibility study evaluated alternate cases to assess the impact of alternative approaches such as: changes in capital spend profiles, mining methods, operating costs, etc.
<i>Social</i>	<ul style="list-style-type: none"> South32 maintains relationships with stakeholders in its host communities through structured and meaningful engagement activities including: community forums, industry involvement, employee participation, local procurement and local employment. A Stakeholder Engagement Plan has been developed in accordance with the South32 Social Performance Standard and includes baseline studies, community surveys, risk assessments, stakeholder identification, engagement plans, cultural heritage considerations, community investment plans, and closure and rehabilitation plans.
<i>Other</i>	<ul style="list-style-type: none"> Hermosa has developed a comprehensive risk register and risk management system to address foreseeable risks that could impact the project and future operations. The project does not pose any significant natural risks, nor is it subject to any significant legal agreements or marketing arrangements.

Annexure 2: Mineral Resource Statement for the Clark deposit as at 30 June 2022

Ore Type	Indicated Mineral Resource				Inferred Mineral Resource				Total Mineral Resource			
	Mt	%	%	g/t	Mt	%	%	g/t	Mt	%	%	g/t
		Zn	Mn	Ag		Zn	Mn	Ag		Zn	Mn	Ag
UG Oxide	33	2.49	9.39	57	22	2.04	8.64	110	55	2.31	9.08	78
Total	33	2.49	9.39	57	22	2.04	8.64	110	55	2.31	9.08	78

Notes:

1. Cut-off grade: NSR of US\$175/t.
2. Mt- Million Tonnes; Zn- Zinc; Mn- Manganese; Ag- Silver.

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