



ASX: SVM

Equity Research

12th August 2024

SPECULATIVE BUY

Share Price **\$0.60**
Price Target **\$1.05**

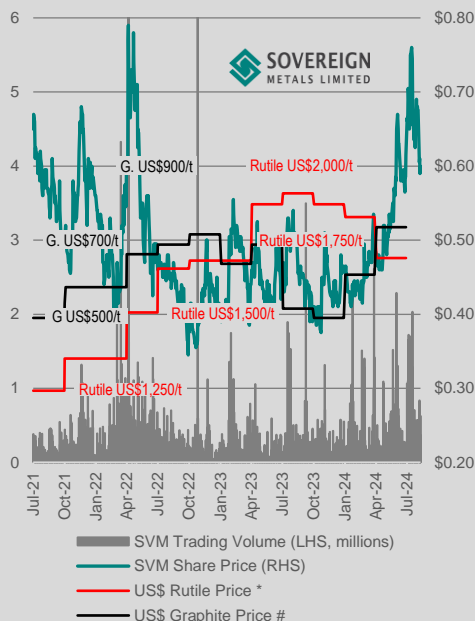
52-Week Range \$0.37 - \$0.80
SVM Shares Outstanding 597.6m
Performance Rights 17.9m
Market Capitalisation \$358.5m
Cash (as at 30th Jun 2024) \$31.6m
Conversion of options (July 2024) \$18.5m
Enterprise Value \$308.5m

Board & Management:

Ben Stoikovich Chairman
Frank Eager Managing Director
Ian Middlemas Non-Executive Director
Julian Stephens Non-Executive Director
Mark Pearce Non-Executive Director
Nigel Jones Non-Executive Director

Major Shareholders:

Rio Tinto 19.8%
Directors & Management 11%
Sprott Inc. 8%
Top 20 shareholders 79%



* Quarterly rutile price realised by Iluka Resources, source ILU

Quarterly graphite sale price realised by Syrah Resources, source SYR quarterly reports

Note the graphite price realised by SYR at the Balama mine (21% large flakes and above) is no indication of the price expected by SVM for the sale of Kasiya graphite (57% large, jumbo and superjumbo flakes). The graph is included to indicate relative price movements only.

Sovereign Metals Ltd (ASX: SVM) is a mineral resource company based in Australia focused on the development of the Kasiya rutile-graphite project in Malawi, the world's largest natural rutile deposit. In September 2023, Sovereign released a Pre-Feasibility Study confirming that Kasiya has the potential to be one of the world's largest and lowest cost producers of natural rutile and natural graphite while significantly contributing to the social and economic development of Malawi. In July 2024, Rio Tinto exercised its options to increase its interest in SVM to 19.76% bringing A\$18.5 million cash to Sovereign Metals.

Sovereign Metals Limited

A Strategic, Long-Life, Quality Asset Perfectly Suited to a Major Critical Raw Materials: both rutile and graphite are critical to the world economy as well as crucial to the energy transition and other targets set by policymakers. Titanium and natural graphite have been classified as critical raw materials by the US and EU due to a combination of their scarceness and China-controlled supply chains.

Exceptional World Class Deposit: Kasiya is the largest rutile deposit in the world with more than double the contained rutile of its nearest rutile peer, Sierra Rutile. Additionally, the graphite MRE at Kasiya places it as the second largest flake graphite deposit in the world.

Superior Metallurgical Performance: due to: coarse, highly crystalline rutile grains that are naturally well-liberated and largely free of inclusions or attachments; low chemical impurities in the rutile crystal lattices; simple HMC mineralogy with very little difficult to separate or near-density gangue minerals present; coarse, highly crystalline graphite being well liberated and pre-concentrating easily in the spiral gravity separation process.

Simple Processing: The rutile and graphite mineralisation at Kasiya is amenable to processing via conventional flowsheets using "off the shelf" processing equipment.

World Class Products Specification: SVM has already shared samples of rutile product with major end-users globally, all of which have confirmed its premium chemical and physical specifications will be suitable for use in their titanium metal, welding products and pigment processes. The specifications for the graphite product produced during the test work are also considered to be premium with the product naturally grading over 96%C with more than 57% in the large to super-jumbo fractions (+180µm).

Government Support and Permitting: The Government of Malawi strongly supports SVM and its development of the Kasiya project. Minister of Mines and Minerals, The Honourable Monica Chang'anamuno, recently publicly applauded the timely investment by Rio Tinto and marked it as a milestone towards realising the country's aspirations of growing the mining industry.

Rio Tinto Support: in July 2023, Rio Tinto (ASX: RIO, LSE: RIO) made an investment in Sovereign resulting in an initial 15% shareholding. In July 2024, Rio Tinto increased its interest to 19.76% with an additional A\$18.5m. Beyond the financial support, Rio Tinto is actively involved in project development.

Increased Valuation Catalysts: news flow includes DFS results, mining licence and permits approval and at any time a potential bid from Rio Tinto.

Kasiya Project Valuation: ① our NPV valuation examined a range of rutile and graphite pricing with our preferred value using rutile pricing close to current and graphite pricing as per the PFS. ② our NPV valuation range and preferred value is supported by market valuation using an EV/EBITDA multiple of 3.5x as currently observed for Iluka Resources (ASX: ILU). ③ finally, applying a 50% to 80% takeover premium to the current enterprise value of SVM gives a range of \$528m to \$634m.

Rutile Price	Graphite Price	NPV _{10%}	90% interest in A\$m	30% Risked	IRR
US\$1,200/t	US\$1,000/t	US\$680m	\$913m	\$274m	19%
US\$1,484/t	US\$1,290/t	US\$1,327m	\$1,783m	\$535m	26%
US\$1,700/t	US\$1,290/t	US\$1,560m	\$2,095m	\$629m	29%
US\$1,800/t	US\$1,350/t	US\$1,738m	\$2,335m	\$700m	30%

SVM valuation: our sum of the parts valuation considers the average of a risked NPV (30% risk factor multiplier) and a potential transaction value with a 65% takeover premium. Our preferred company valuation amounts to \$647 million or \$1.05 per share.

Sovereign Metals Ltd (ASX: SVM) Financial Summary

PFS Case: Rutile Price @ US\$1,484/t & Graphite Price @ US\$1,290/t

Key metrics

Market Information	Unit	Value
Number of Issued Shares	million	597.6
Performance Rights	million	17.9
Fully Diluted	million	615.4
Share Price	A\$	0.60
12 month High-Low	A\$	0.37 - 0.80
Market Capitalisation	A\$m	358.5
Cash (30 Jun 2024)	A\$m	31.6
Options Conversion (July 2024)	A\$m	18.5
Debt	A\$m	0.0
Entreprise Value	A\$m	308.5

Financing Assumptions	Unit	Value
Sale of 50% interest in Kasiya project in FY2026	A\$m	150.0
New Equity (85 million shares @ \$0.60) in FY2026	A\$m	51.0
Number of Issued Shares Post Financing	million	700.4
New Debt (A\$250m in FY2027, 1 year grace, 3 years maturity, repayments of \$100m in FY2028 and FY2029, plus \$50m in FY2030)		

Kasiya MRE	Million Tonnes	% Rutile	Rutile	%TGC Graphite	
Indicated	1,200	1.0%	12.2	1.50%	18.0
Inferred	609	0.9%	5.7	1.10%	6.5
Total	1,809	1.0%	17.9	1.4%	24.5

Kasiya Ore Reserve	Million Tonnes	% Rutile	Rutile	%TGC Graphite	
Proved	-	-	-	-	-
Probable	538	1.03%	5.5	1.66%	8.9
Total	538	1.03%	5.5	1.66%	8.9

Kasiya	Rutile Price	Graphite	NPV Post-Tax @10%	Risked NPV	IRR
	US\$1,200/t	US\$1,000/t	US\$566m	\$228m	19%
25-year model	US\$1,484/t	US\$1,290/t	US\$1,154m	\$465m	26%
	US\$1,700/t	US\$1,290/t	US\$1,363m	\$549m	29%
	US\$1,800/t	US\$1,350/t	US\$1,524m	\$614m	30%

in bold PFS price assumptions and results

Kasiya	Rutile Price	Graphite	NPV Post-Tax @10%	Risked NPV	IRR
	US\$1,200/t	US\$1,000/t	US\$680m	\$274m	19%
50-year model	US\$1,484/t	US\$1,290/t	US\$1,327m	\$535m	26%
	US\$1,700/t	US\$1,290/t	US\$1,560m	\$629m	29%
	US\$1,800/t	US\$1,350/t	US\$1,738m	\$700m	30%

in bold preferred price assumptions and results

Iluka Resources realised rutile price for the June 2024 quarter was US\$1,690/t, following four quarters averaging a rutile price of US\$1,870/t.

SVM Sum of the Parts Valuation	A\$m	Per Share
Kasiya Project (30% of NPV)	629.0	1.02
Kasiya Project (transaction value)	600.0	0.97
average	614.5	1.00
DFS Cost	(10.0)	(0.02)
Cash (30 Jun 2024)	31.6	0.05
Options Conversion (July 2024)	18.5	0.03
Corporate Costs	(7.8)	(0.01)
Base Case Valuation	646.8	1.05

Financial Statements June Financial Year End

Profit & Loss (A\$m)	DFS & construction				
	FY2023A	FY2024F	FY2025F	FY2026F	FY2027F
Revenue	0.1	0.0	0.0	0.0	0.0
Operating Costs	(10.6)	(10.4)	(10.0)	(5.0)	(5.0)
Royalties	0.0	0.0	0.0	0.0	0.0
Overhead Costs	(5.0)	(3.5)	(3.6)	(3.6)	(3.7)
Other Income/Costs	9.5	0.0	0.0	0.0	0.0
EBITDA	(6.1)	(13.9)	(13.6)	(8.6)	(8.7)
Depreciation	0.0	0.0	0.0	(8.1)	(16.0)
Net Interest	0.3	1.7	1.8	0.9	(25.0)
Tax/Other	(0.1)	0.0	0.0	0.0	0.0
Profit	(5.9)	(12.3)	(11.8)	(15.8)	(49.8)

Cash Flow (A\$m)	FY2023A	FY2024F	FY2025F	FY2026F	FY2027F
Net Profit	(5.9)	(12.3)	(11.8)	(15.8)	(49.8)
+/- Adjustments	0.3	(1.7)	(1.8)	7.2	41.0
+/- Working Capital	0.2	(1.8)	0.0	0.0	0.0
+/- Other	(7.5)	0.3	0.0	0.0	0.0
Cash Flow from Operations	(12.8)	(15.4)	(13.6)	(8.6)	(8.7)
Net Capital Expenditure	0.1	(0.7)	0.0	(223.9)	(221.8)
Cash Flow from Investing	0.1	(0.7)	0.0	(223.9)	(221.8)
Net proceeds from Debt	0.0	1.7	1.8	0.9	225.0
Changes in Share Capital	0.0	40.6	18.5	51.0	0.0
Dividends	0.0	0.0	0.0	0.0	0.0
Other Financing Cashflow	(0.6)	(0.3)	0.0	146.9	0.0
Cash Flow from Financing	(0.6)	42.0	20.3	198.8	225.0
Net Cash Change	(13.4)	25.8	6.7	(33.7)	(5.5)

Balance Sheet (A\$m)	FY2023A	FY2024F	FY2025F	FY2026F	FY2027F
Cash	5.6	31.4	38.1	4.4	(1.1)
Other Current Assets	0.7	0.9	0.8	0.4	0.4
Total Current Assets	6.3	32.3	38.9	4.9	(0.6)
Property, Plant & Equipment	0.5	1.3	1.3	217.1	422.8
Exploration, Evaluation & Dev.	5.1	5.1	5.1	5.1	5.1
Non-Current Assets	0.0	0.0	0.0	0.0	0.0
Total Non-Current Assets	5.6	6.4	6.4	222.2	427.9
Total Assets	11.9	38.6	45.3	227.0	427.3
Equity	74.5	114.9	133.3	331.3	331.3
Reserves	(3.3)	(3.3)	(3.3)	(3.3)	(3.3)
Retained Earnings	(61.5)	(73.8)	(85.5)	(101.3)	(151.1)
Total Equity	9.7	37.8	44.5	226.6	176.9
Current Debt	0.0	0.0	0.0	0.0	0.0
Account Payables	2.1	0.9	0.8	0.4	0.4
Other Liabilities	0.2	0.0	0.0	0.0	0.0
Total Current Liabilities	2.2	0.9	0.8	0.4	0.4
Lease Liabilities	0.0	0.0	0.0	0.0	0.0
Non-current Debt	0.0	0.0	0.0	0.0	250.0
Total Non-current Liabilities	0.0	0.0	0.0	0.0	250.0
Total Liabilities	2.2	0.9	0.8	0.4	250.4
Total Equity + Liabilities	11.9	38.6	45.3	227.0	427.3

Profitability Indicators	FY2023A	FY2024F	FY2025F	FY2026F	FY2027F
EBITDA margin	-	-	-	-	-
Liquidity	FY2023A	FY2024F	FY2025F	FY2026F	FY2027F
Quick Ratio	0.3	0.0	0.0	0.0	0.0
Current Ratio	0.3	1.0	1.0	1.0	1.0
Capital Structure	FY2023A	FY2024F	FY2025F	FY2026F	FY2027F
Equity Ratio	6.3	3.0	2.9	1.5	0.8
Debt / Assets	0.0	0.0	0.0	0.0	0.6
Debt / EBITDA	0.0	0.0	0.0	0.0	-28.7
DSCR	n/a	n/a	0.0	0.0	0.0

Source: Evolution Capital estimates

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All currencies are in Australian dollars unless otherwise specified.

1. SVM Valuation

Kasiya Project NPV Valuation

We have modelled the Kasiya Project based on the pre-feasibility study released by Sovereign Metals Ltd on 28th September 2023 with the following key parameters:

- Ore reserve 538 million (30% of the total mineral resource)
- Throughput of 12 million tonnes per annum, increasing to 24 mtpa in year 6
- Production: 222,000 tpa rutile and 244,000 tpa graphite
- Initial capex: US\$597 million
- Expansion capital: US\$287 million (funded by cash flows)
- Plant relocation: US\$366 million (funded by cash flows)
- Mining cost: US\$2.09/t ore mined (hydro-mining)
- Processing cost - rutile: US\$1.90/t ore
- Processing cost - graphite: US\$0.95/t ore
- Tailings & rehabilitation cost: US\$1.25/t ore
- G & A cost: US\$0.42/t
- Logistics cost: US\$2.12/t
- Government royalty: 5%
- Community development fund royalty: 0.45%
- Vendor gross profit royalty 2%
- Corporate tax: 30%
- Rent Resources Tax (RRT): 15% after profit
- Discount rate: 10%
- Project modelled over 25 years

We have added sustaining capital expenditure representing 10% of opex.

On a pre-tax basis, our initial model results in an NPV of US\$1,913 million and an IRR of 35% compared to SVM published values of US\$1,818 million and IRR of 32%. On a post-tax basis, our model results in a post-tax NPV of US\$1,154 million and an IRR of 26%, compared to SVM published values of US\$1,205 million and IRR of 28%. The differences are within 5%, so further analysis and modeling can be undertaken based on our initial model.

Based on 25 years, the project delivers high profitability (NPV/Capex > 1.9x) and adequate return.

To reflect the likely extended life of the project (in excess of 70 years based on mineral resources), we extended our **financial model to 50 years**. Using the PFS price assumptions, this has the effect of increasing the pre-tax NPV by about US\$350 million and the post-tax NPV by US\$120 million, while the IRRs remain unchanged.

Using various rutile and graphite prices, Table 1.1 summarises the valuation of the Kasiya Project with 50 years modelled.

Table 1.1 – Kasiya Project NPV Valuation

Rutile Price	Graphite Price	NPV _{10%}	90% interest in A\$m	30% Risked	IRR
US\$1,200/t	US\$1,000/t	US\$680m	\$913m	\$274m	19%
US\$1,484/t	US\$1,290/t	US\$1,327m	\$1,783m	\$535m	26%
US\$1,700/t	US\$1,290/t	US\$1,560m	\$2,095m	\$629m	29%
US\$1,800/t	US\$1,350/t	US\$1,738m	\$2,335m	\$700m	30%

Source: Evolution Capital estimates. In bold PFS price assumptions

We see more upside in rutile prices than graphite prices. Iluka Resources (ASX: ILU) has realised strong natural rutile prices in excess of US\$1,800/t over four quarters up to March quarter 2024. The June quarter realised rutile price was lower at US\$1,690/t. On the other hand, Syrah Resources is experiencing relatively volatile graphite prices with no clear trend.

Under the Mines Act, the Government of Malawi has the right, but not the obligation, to acquire, directly or through a Government nominee, without cost, a free equity ownership interest of up to 10%. We conservatively assumed that the Government of Malawi will exercise that right.

Kasiya EV/EBITDA Valuation

Considering the long life (beyond the 50 years modelled) of the Kasiya project, an EV/EBITDA valuation approach is a useful comparison point.

Iluka Resources (ASX: ILU) operates various long life mineral sands assets in Australia. ILU has a market capitalisation of A\$2.5 billion and is currently trading at an EV/EBITDA of 3.4x.

Applying the same EV/EBITDA multiple to the average EBITDA of US\$409 million (from our model v US\$415m SVM value) generated by the Kasiya project gives a value of A\$2,161 million, which is in line and within the upper range of the NPV valuations estimated in the previous section.

Kasiya Transaction Valuation

Kasiya has most of the characteristics of an asset to be included in the portfolio of a major such as Rio Tinto:

- Long life: potentially in excess of 70 years
- Exceptional quality for both rutile and graphite
- Low cost thanks to the unique combination of both minerals, rutile and graphite
- In line with Rio Tinto's strategy of investments in battery materials

Malawi is not a Tier-1 jurisdiction, but the quality of its mineral resources' endowment is outstanding including rare earths with the Kangankunde project developed by Lindian Resources (ASX: LIN, A\$110 million market cap.) and uranium with the Kayelekera project developed by Lotus Resources (ASX: LOT, A\$500 million market cap). Malawi mining sector could increase its share of GDP from 1% to 10% in the coming years.

Applying a 50% to 80% takeover premium to the current Kasiya market value gives a value range of \$528 million to \$634 million. Such value range still gives Rio Tinto significant upside as it trades at an EV/EBITDA multiple of 5.9x and the possibility to increase its bid if required.

SVM Sum of the Parts Valuation

To derive our sum of the parts valuation, we have considered a mix of the valuation methods detailed above.

Table 1.2 summarises the sum of the parts valuation for SVM.

Table 1.2 – SVM Sum of the Parts Valuation

Asset	Value Range	Preferred	Per Share
Kasiya Project (30% of NPV)	\$274m – \$700m	\$629m	\$1.02
Kasiya Project (transaction value)	\$528m – \$634m	\$600m	\$0.97
	average	\$614.5m	\$1.00
DFS costs		(\$10m)	(\$0.02)
Cash (30 th June 2024)		\$31.6m	\$0.05
Options conversion (July 2024)		\$18.5m	\$0.03
Corporate costs		(\$7.8m)	(\$0.01)
Total		\$646.8m	\$1.05

Source: Evolution Capital estimates

Financial Statements

While we see a potential joint venture between SVM and RIO highly unlikely, we have assumed a 45/45/10 joint venture between Sovereign Metals, Rio Tinto and the Malawi Government (free carried) to derive a set of financial statements. Furthermore, we have assumed SVM selling half of the Kasiya project for A\$150 million in FY2026. Finally, to complement the project development funding, we have assumed an equity raising of A\$51 million (85 million shares at \$0.60) in FY2026 and a debt funding package of A\$250 million for four years from FY2027.

2. Company/Project Benchmarking

Mineral Resource

Kasiya is the largest rutile deposit in the world with more than double the contained rutile of its nearest rutile peer, Sierra Rutile (Figure 2.1). Additionally, the graphite MRE at Kasiya places it as the second largest flake graphite deposit in the world (Figure 2.2).

Figure 2.1 – Company / Project Benchmarking of Peers

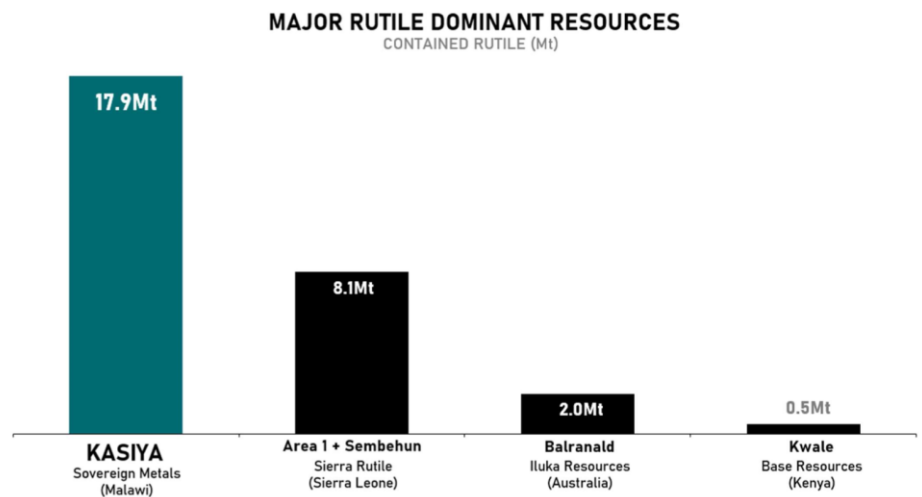


Figure 12: Major rutile dominant resources by contained rutile (Tonnages inclusive of Ore Reserves)

Source: SVM

Figure 2.2 – Company / Project Benchmarking of Peers

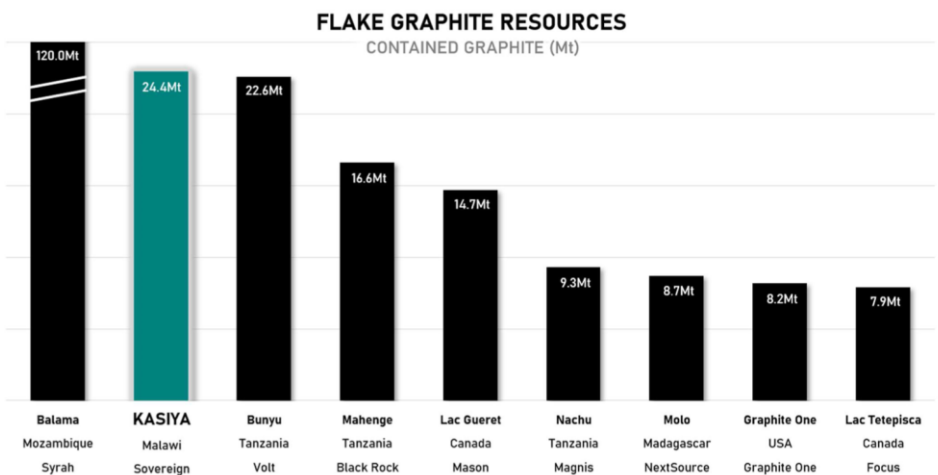


Figure 13: Major listed global flake graphite resources by contained flake graphite (Tonnages inclusive of Ore Reserves)

Source: SVM

3. Investment by Rio Tinto (ASX: RIO, LSE: RIO)

Initial Investment

In July 2023, Rio Tinto made an investment in Sovereign resulting in an initial 15% shareholding. Under the Investment Agreement, Rio Tinto provides assistance and advice on technical and marketing aspects of Kasiya including with respect to Sovereign's graphite co-product, with a primary focus on spherical purified graphite for the lithium-ion battery anode market.

The Company is planning to commence optimisation phase prior to advancing to the DFS. Sovereign is soon to establish a Technical Committee and commence the working relationship with Rio Tinto after the publication of this Study.

Exercise of Options

On 3rd July 2024, SVM announced that Rio Tinto exercised its options: 34,549,598 share options converted to the same number of new fully paid ordinary shares in SVM at A\$0.535 per share for proceeds of A\$18,484,035.

Rio Tinto's interest in SVM now stands at 19.76%.

Operatorship and Marketing Rights

Under the Investment Agreement, Rio Tinto has the option to become the operator of Kasiya on commercial arm's-length terms.

In the event, Rio Tinto elect to be the operator of the Project and for so long as Rio Tinto remain the operator, Rio Tinto shall have exclusive marketing rights to market 40% of the annual production of all products from the Project as identified in the DFS on arm's-length terms.

Rio Tinto's option over operatorship and 40% marketing rights lapse if not exercised by the earlier of (i) 90 days after SVM announces its DFS results or 180 days after the announcement of the DFS if Rio Tinto's advises it needs additional time to consider the exercise of the Rio Tinto's Option or (ii) Rio Tinto ceasing to hold voting power in SVM of at least 10%.

Potential Takeover

Rio Tinto's development of its lithium projects in Argentina and Serbia and the acquisition of the Burra scandium project in New South Wales indicates that the company is keen to invest in "minor" metals and minerals. The addition of rutile and graphite with one of the best assets globally appears as a highly probable transaction. We note also that Rio Tinto has set up a battery materials business in 2021, including setting up a battery testing plant in Melbourne, Australia in June 2023.

Project Development Funding

Should RIO elect not to takeover SVM, RIO is likely to assist with development funding. To complement such funding, off-takers such as Mitsui, Chemours and Hascor, who have already expressed interest in the rutile product are likely to assist project development funding in the form of pre-payments for example.

4. Rutile market

Mineral Characteristics and Uses

Rutile, anatase, leucosene and ilmenite are naturally occurring titanium dioxide (TiO₂) minerals, whose main uses are 90% for pigments, 5% production of titanium metal and 5% welding. Rutile is the purest, highest-grade natural form of TiO₂ and is the preferred feedstock in manufacturing titanium pigment and producing titanium metal.

Finely powdered rutile is a brilliant white pigment and is used in paints, plastics, paper, foods, and other applications that call for a bright white colour. It has also been widely used in the production of glass, porcelain, and ceramics, as it is a valuable colouring agent. It can also be used to add colour to steels and copper alloys.

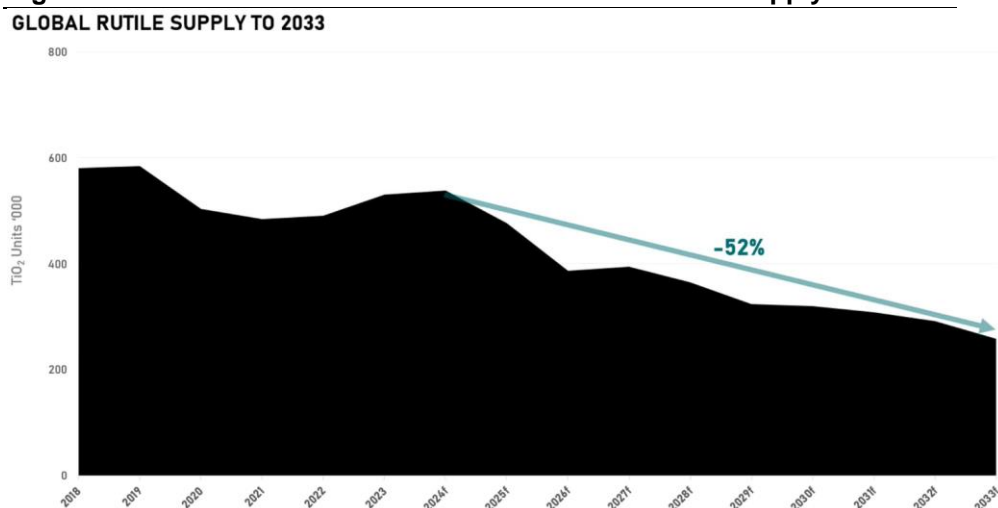
Titanium also has specialty uses including in welding, aerospace and military applications.

Supply

Current sources of natural rutile are in decline as several operations' reserves are depleting concurrently with declining ore grades. These include Sierra Rutile's (SRL) Mine Area 1 in Sierra Leone and Base Resources' Kwale operations in Kenya.

Global rutile supply is projected to decline sharply beyond 2023, following the scheduled closures of Base Resource's Kwale and SRL operations unless mine life extension is approved (Source: TZ Minerals International Pty Ltd (TZMI)). There are limited new deposits forecast to come online, and hence supply of natural rutile is likely to remain in structural deficit for the long term, even with Kasiya at full production.

Figure 4.1 – Historical and Forecast Global Natural Rutile Supply 2018-33



Rutile Prices

The rutile market fundamentals continue to be robust with current and forecast pricing remaining very strong. According to TZMI, demand for natural rutile is projected to change over the short-term from being primarily driven by pigment to one that is dominated by the welding end-use.

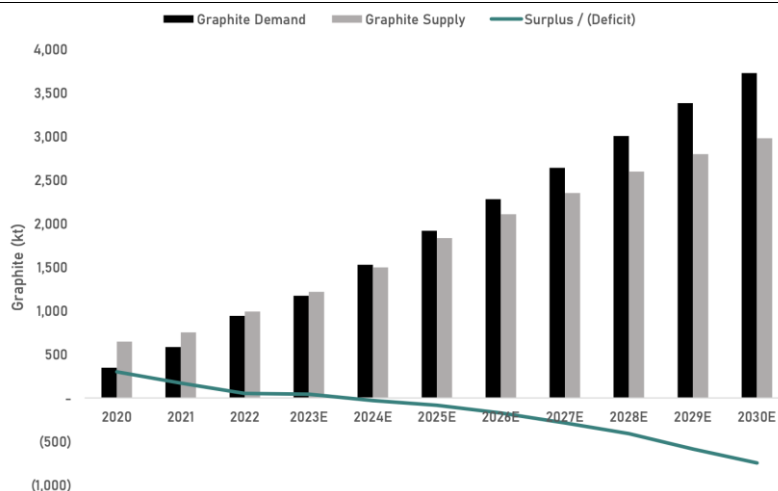
After four quarters of realised rutile prices averaging US\$1,870/t, Iluka Resources (ASX: ILU) reported a rutile price of US\$1,690/t for the June 2024 quarter. Our preferred valuation assumes a price US\$1,700/t for natural rutile.

5. Graphite market

Supply

The lithium-ion battery sector is the main emerging market for flake graphite (Figure 5.1). Greater capacity batteries, such as those required for EVs, are expected to drive significant demand for graphite over the coming years. It is forecast the battery sector will become the largest graphite market segment by 2028. Per Benchmark Mineral Intelligence, the demand for anodes grew by 46% in 2022 compared to only 14% growth in natural flake graphite supply.

Figure 5.1 – Graphite demand/supply



Source: Macquarie Research – March 2023, SVM

SVM Marketing Strategy

Sovereign has built a strong understanding of the graphite market and developed a number of well-established relationships with potential off-takers.

A major component to graphite sales agreements is customer qualification, and this is a key reason for initiating the graphite bulk sample program and scaling up in-country facilities in order to continuously produce bulk sample over the coming quarters. The graphite produced from this program will be shared with prospective end-users and is an important next step for Sovereign to qualify the Kasiya graphite product.

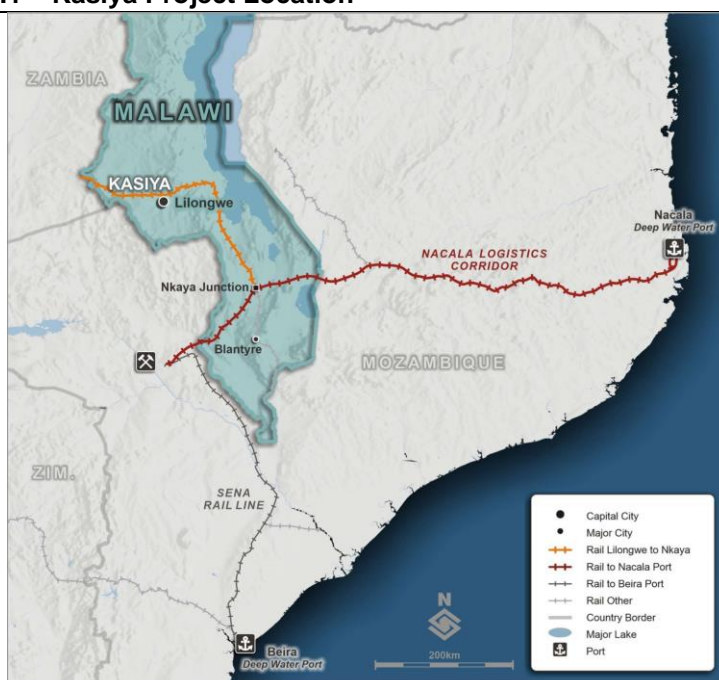
6. Kasiya Rutile-Graphite Project

Location and Logistics

The Kasiya Project directly benefits from the exceptional existing infrastructure in central Malawi. The Nacala Rail Corridor (NLC) which runs through the Kasiya project area offers the preferred logistics route to the deep-water Indian Ocean port of Nacala for export of mineral products to global markets.

This established and operation-ready logistics infrastructure will provide significant capital and operating cost savings to the Kasiya Project. To access the NLC, Sovereign plans to construct its exclusive 6km rail spur to connect directly with the plant. This will significantly reduce the environmental impact of the project, significantly reduce road traffic and increases efficiencies for handling inbound and outbound freight compared to any road alternative.

Figure 6.1 – Kasiya Project Location



Source: SVM

Geology and Mineralisation

The Kasiya Rutile-Graphite deposit is in an area northwest of Malawi's capital of Lilongwe called the Lilongwe Plain. The topography is flat to gently undulating and the underlying geology is dominated by paragneiss with pelitic, psammitic and calcareous units.

A particular paragneiss unit rich in rutile and graphite is the primary source of both minerals. The high-grade rutile deposit at Kasiya is best described as a residual placer. It is formed by weathering of the primary paragneiss host rock and concentration in place of the heavy minerals such as rutile, as opposed to the high-energy transport and concentration of heavy minerals in a traditional placer.

Rutile mineralisation lies in laterally extensive, near surface, flat "blanket" style bodies in areas where the weathering profile is preserved and not significantly eroded. Kasiya shows widespread, high-grade mineralisation commonly grading 1.2% to 2.0% rutile in the top 3-5m from surface. Moderate grade mineralisation generally grading 0.5% to 1.2% rutile commonly extends from 5m to the base of the soft saprolite unit to generally 20-25m depth where it terminates on the hard saprock basement.

Graphite generally occurs in broad association with rutile. However, it is depleted in the top 3-5m and therefore can often show an inverse grade relationship with rutile in the near-surface zones. At depths generally greater than 5m a more consistent rutile-graphite grade relationship exists.

Mineral Resource

The Kasiya Mineral Resource Estimate (MRE) has been prepared by independent consultants, Placer Consulting Pty Ltd (Placer), and is reported in accordance with the JORC Code 2012 (Table 5.1).

Table 5.1 – Kasiya Mineral Resource Estimate

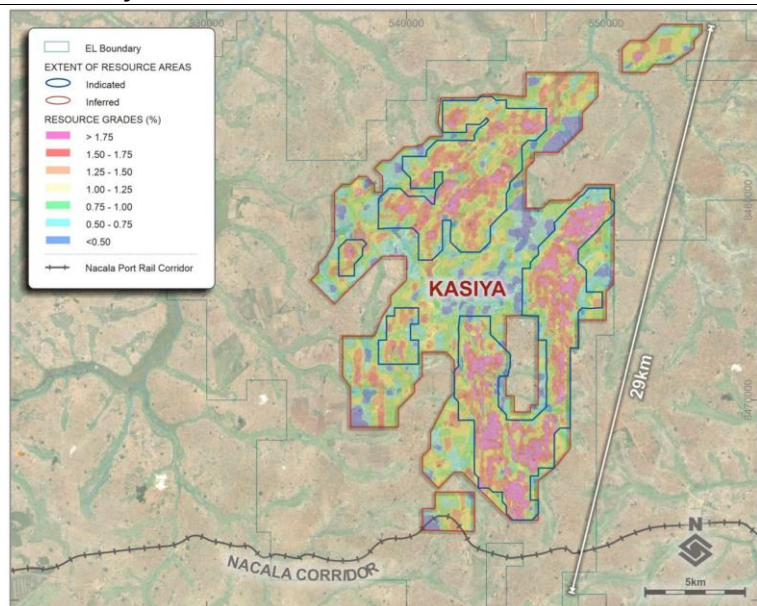
Table 2: Kasiya Mineral Resource Estimate at 0.7% Rutile Cut-off (inclusive of Ore Reserves)						
Mineral Resource Category	Material Tonnes (millions)	Rutile (%)	Rutile Tonnes (millions)	Graphite (TGC%)	Graphite Tonnes (millions)	RutEq. Grade* (%)
Indicated	1,200	1.0%	12.2	1.5%	18.0	1.9%
Inferred	609	0.9%	5.7	1.1%	6.5	1.6%
Total	1,809	1.0%	17.9	1.4%	24.4	1.8%

* RutEq. Formula: Rutile Grade x Recovery (100%) x Rutile Price (US\$1,484/t) + Graphite Grade x Recovery (67.5%) x Graphite Price (US\$1,290/t) / Rutile Price (US\$1,484/t). All assumptions are taken from this Study ** Any minor summation inconsistencies are due to rounding

Source: SVM

The MRE has defined very broad and contiguous zones of high-grade rutile and graphite which occur across a very large area of over 201km².

Figure 5.2 – Kasiya Mineral Resource



Source: SVM

Ore Reserve

Based on the Modifying factors outlined in the PFS, a maiden Ore Reserve of 538Mt has been declared as summarised in Table 3 below.

Table 5.1 – Kasiya Ore Reserve Estimate

Classification	Tonnes (Mt)	Rutile Grade (%)	Contained Rutile (Mt)	Graphite Grade (TGC) (%)	Contained Graphite (Mt)	RutEq. Grade* (%)
Proved	-	-	-	-	-	-
Probable	538	1.03%	5.5	1.66%	8.9	2.00%
Total	538	1.03%	5.5	1.66%	8.9	2.00%

* RutEq. Formula: Rutile Grade x Recovery (100%) x Rutile Price (US\$1,484/t) + Graphite Grade x Recovery (67.5%) x Graphite Price (US\$1,290/t) / Rutile Price (US\$1,484/t). All assumptions are taken from this Study ** Any minor summation inconsistencies are due to rounding

Source: SVM

Mining

The Project will utilise hydro mining as the primary mining methodology for extraction of the Ore Reserve. Hydro mining uses high-pressure jets of water to dislodge loose, friable material types such as the pedolith and saprolite at Kasiya. The resulting slurry is then transported to the processing facility via a network of pipelines/pumps designed by Paterson and Cooke.

Figure 5.3 – Hydro-Mining Example



*Semi-autonomous track mounted hydro-mining mining unit, top-down mining method
Source: Fraser Alexander, SVM*

The preference for hydro mining at Kasiya is due to the consistent particle size distribution through the Ore Reserve, favourable operating and capital costs, low carbon footprint and air pollution (low dust and no diesel emissions) as well as the support infrastructure and water availability in the project area.

Hydro mining is a proven technology and has been successfully applied on heavy mineral sand operations in Africa including at Base Resources' Kwale project in Kenya and Tronox's Fairbreeze and Hillendale projects in South Africa.

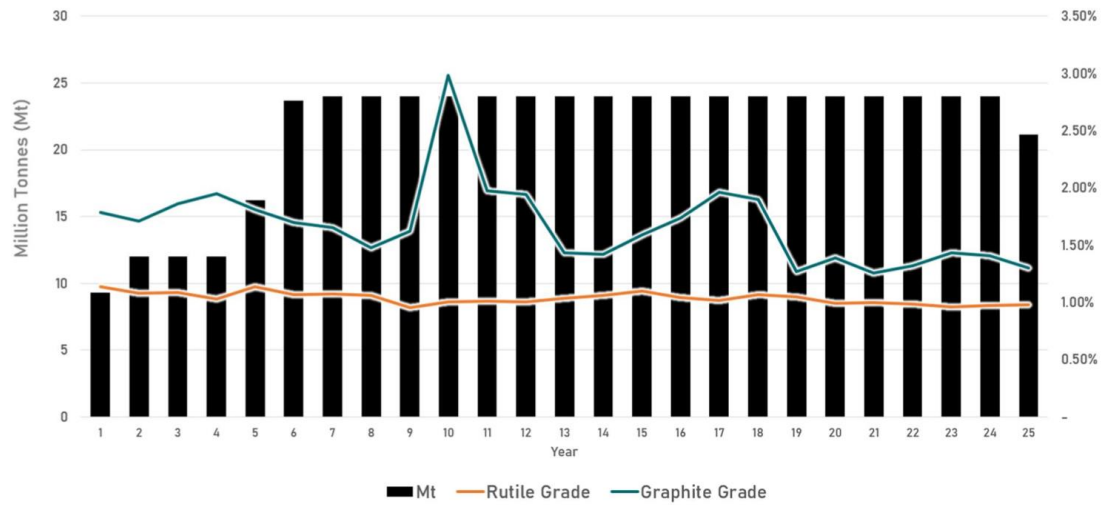
The pedolith and saprolite-hosted mineralisation at Kasiya is largely homogenous and has relatively consistent physical properties throughout the MRE and contained Ore Reserve. The material competence is described as loose and friable, soft and well weathered with no cemented particles or dense clay layers. The particle size distribution (PSD) is favourable for hydro-mining due to its high content of $-45\mu\text{m}$ fines. The material is conducive to hydro-mining as the fines effectively increase the viscosity of the slurry created, which enhances the slurry's ability to carry sand and heavy mineral particles.

Mine Scheduling

Based on the mining inventory a schedule by area was developed based on the following criteria:

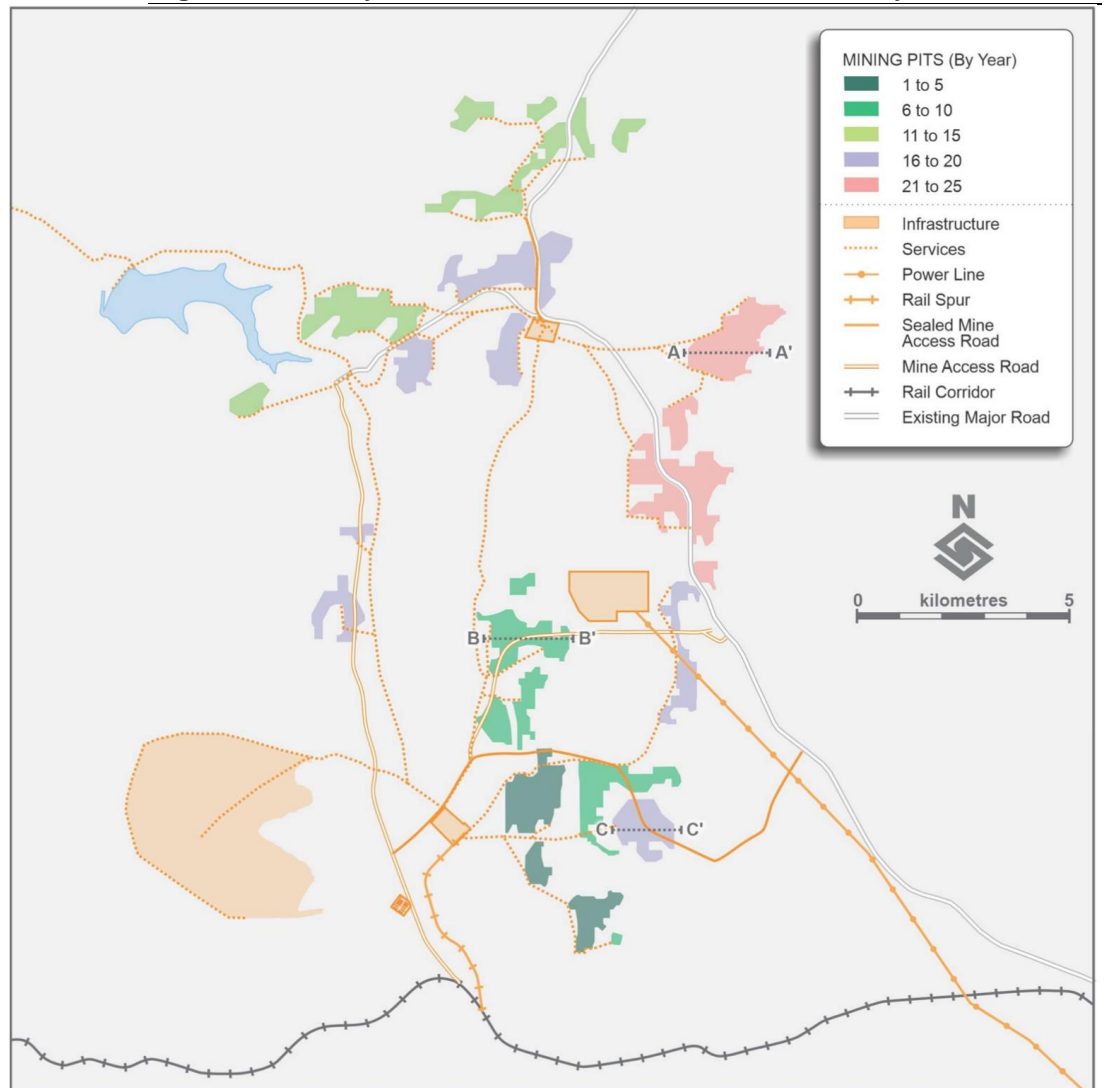
- Production to start in the southern domain.
- Mining of up to 4 pits simultaneously utilising the flexibility of hydro mining.
- Ramp up in Year 1 of production to a plant throughput a 12 Mtpa. A subsequent ramp-up to 24 Mtpa in Year 5 to Year 7, maintaining 24 Mtpa throughput for the remaining 25-year operation

Figure 5.4 – Throughput Tonnage and Grade Profiles



Source: SVM

Figure 5.5 – Kasiya PFS Pits and Planned Infrastructure Layout



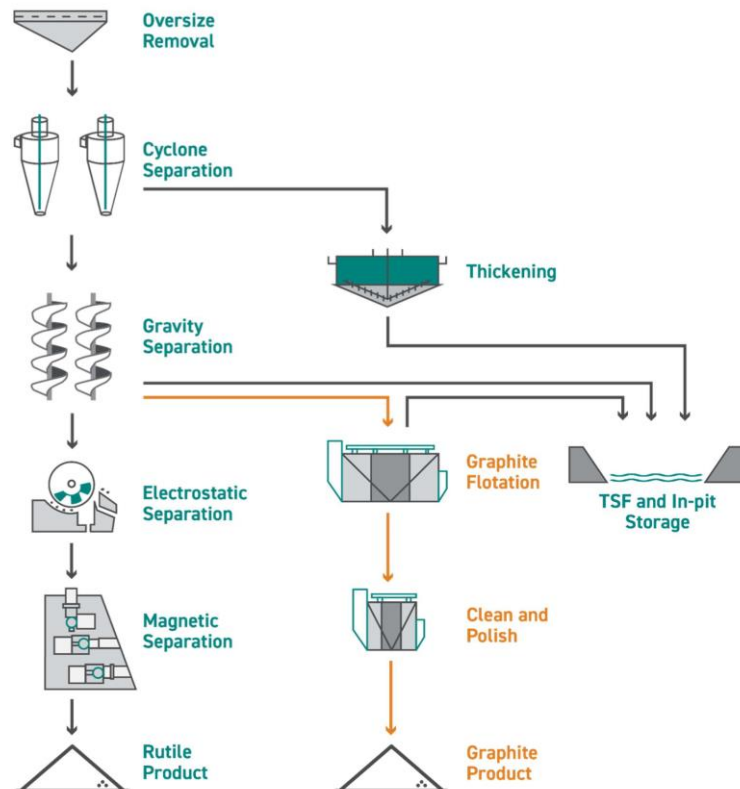
Source: SVM

Metallurgy and Process Design

Sovereign has conducted extensive metallurgical test-work to support the process design and flowsheet development for Kasiya.

Test work programs have been designed to produce premium specification rutile and highly crystalline, high purity flake graphite products. To date, all test work has been very successful and has resulted in conventional flowsheets proving highly effective for producing premium quality rutile and graphite products (Figure 5.6).

Figure 5.6 – High-Level Process Flowsheet



Source: SVM

The process is separated into four distinct processing areas listed below. The wet plant receives material pumped from the mining pit which has been pre-screened at 2mm to remove oversize.

The process flowsheet developed is described as follows:

Wet Plant:

- Receives <2mm material from the pits.
- Removes fine particles (nominally <45 μm) using cyclones and up-current classifiers (UCC).
- Recovers a heavy mineral concentrate (HMC) via coarse and fine spiral circuits.
- Produces separate coarse and fine gravity tailings streams enriched in graphite
- Produces a coarse tailings (nominally <2 mm and >45 μm) low in rutile and graphite.

Mineral Separation Plant (MSP):

- Electrostatic separation to separate the HMC into conductive rutile and ilmenite and a non-conductive concentrate.
- Magnetic separation to separate the conductive non-magnetic rutile and magnetic ilmenite concentrates.

- Bagging of rutile products for sale.
- Stockpiling of MSP tails.

Graphite Plant:

- Recovery of graphite from combined gravity separation tailings by froth flotation, inclusive of polishing and stirred media mills.
- Graphite concentrate thickening, filtration, drying, screening and bagging for sale.

Tailings Functions:

- Thickening of fine tailings in a high-compression thickener.
- Fine tailings will be pumped to the TSF
- Sand tailings will be pumped to the TSF to be used for TSF wall building, via stacking cyclones. Stacking cyclone overflow will report to the TSF impoundment.
- Fine and coarse tailings will be co-deposited in mined out pits. Fine and coarse streams will be pumped separately from the WCP to the pits where they will be combined with flocculent and deposited.

Product Recoveries

Rutile

The recovery to saleable premium rutile product is determined by dividing the percentage weight of the product at requisite product specification by the percentage weight rutile contained in the feed. The feed assay is determined by the Sovereign Lilongwe Laboratory Method (SLLM) - the same assay method used to populate the drill-hole database and inform the MRE and Ore Reserve.

In bulk metallurgical testwork, recovery to product is increased over and above the SLLM grade due to inclusion of slightly magnetic high TiO₂ mineral species not able to be measured by the SLLM. The non-magnetic fraction produced in metallurgical bulk sample processing routinely assays in the order of 97%-98% TiO₂, well above the 95% TiO₂ necessary for market, allowing inclusion of some of the additional slightly magnetic high TiO₂ components and explaining why recovery to product in bulk testwork is routinely greater than 100% of the SLLM grade. The product recovery relationship to SLLM assays is robust and repeatable over six separate bulk samples processed at AML. For the purposes of the PFS, a conservative 100% recovery to product is used.

Graphite

The total metallurgical recovery for graphite used in the PFS is 67.5%. This is generally lower than traditional graphite projects because the ore is processed through deslime and gravity stages prior to entering the graphite flotation plant. Losses of finer graphite occur in both of these pre-flotation stages.

7. Directors & Management Team

Ben Stoikovich, Chairman

Mr Stoikovich is an experienced mining executive and corporate finance professional residing in London. Mr Stoikovich is currently the Chief Executive Officer (CEO) of GreenX Metals Limited (ASX: GRX) and was formerly a Director of the Mining and Metals Corporate Finance Division of Standard Chartered Bank in London, with extensive experience in financing the development of African mining projects and exposure to the mineral sands sector.

Mr Stoikovich started his career as a mining engineer with BHP Billiton in Australia, gaining broad experience across mine operations management and qualifying as a mine manager. He holds a post graduate degree in Environmental Engineering and UK professional designation as a Chartered Environmentalist (CEnv) with wide ranging experience of managing the environmental, social and sustainability aspects of mining projects across the life-cycle and the Environmental, Social and Governance (ESG) requirements of the investment community.

Frank Eagar, Managing Director

Mr Eagar has over 20 years' experience in the financing, permitting, development and operation of mining projects with a strong focus in southern Africa.

Mr Eagar is a Chartered Accountant who has gained extensive corporate, commercial and technical experience in the mining sector throughout his career. Mr Eagar has previously held a number of senior executive positions in the resources sector, more recently with African mining focused private equity firm AMED Funds.

Ian Middlemas, Non-Executive Director

Mr Middlemas is a Chartered Accountant, a member of the Financial Services Institute of Australasia and holds a Bachelor of Commerce degree. He worked for a large international Chartered Accounting firm before joining the Normandy Mining Group where he was a senior group executive for approximately 10 years. He has had extensive corporate and management experience and is currently a director with a number of publicly listed companies in the resources sector.

Julian Stephens, Non-Executive Director

Dr Stephens is a Geologist with extensive experience in the resources sector having spent in excess of 20 years in board, executive management, senior operational and economic geology research roles for a number of companies. He has spent in 12 of those years working on African projects including 9 years on projects in Malawi. Dr Stephens holds a PhD from James Cook University, Queensland and is a member of the Australian Institute of Geoscientists. Dr Stephens led the team that discovered the Malawi Flake Graphite Projects.

Dr Stephens was Managing Director from June 2016 to October 2023.

Mark Pearce, Non-Executive Director

Mr Pearce is a Chartered Accountant and is currently a director of several listed companies that operate in the resources sector. He has had considerable experience in the formation and development of listed resource companies and has worked for several large international Chartered Accounting firms. Mr Pearce is also a Fellow of the Institute of Chartered Secretaries and the Financial Services Institute of Australasia.

Nigel Jones, Non-Executive Director

Mr Jones has over 30 years of mining industry experience with 22 years in a number of senior roles at Rio Tinto Group, where most recently, Mr Jones was Managing Director of Rio Tinto's Simandou iron ore project, one of the world's largest proposed mining developments.

In this role, he was accountable for all aspects of the project's development, including its complex environmental, social and governance (ESG) strategy. Such aspects included impacts on natural ecosystems, biodiversity, and community and government relations.

Mr Jones was also a member of the senior leadership team of the Energy and Minerals product group, which incorporated Rio Tinto's titanium dioxide feedstock businesses in Canada and southern Africa. Prior roles in Rio Tinto included Head of Business Development, Head of Business Evaluation and Managing Director of the group's Marine operations.

8. Investment Risks

SVM is exposed to a number of risks including:

- **Geological risk:** the actual characteristics of an ore deposit may differ significantly from initial interpretations.
- **Resource risk:** all resource estimates are expressions of judgement based on knowledge, experience and industry practice. Estimates, which were valid when originally calculated may alter significantly when new information or techniques become available. In addition, by their very nature, resource estimates are imprecise and depend to some extent on interpretations, which may prove to be inaccurate.
- **Commodity price risk:** the revenues SVM will derive mainly through the sale of rutile and graphite products exposing the potential income to commodity price risk. The price of rutile and graphite products fluctuates and is affected by many factors beyond the control of SVM. Such factors include supply and demand fluctuations, technological advancements and macro-economic factors.
- **Exchange Rate risk:** The revenue SVM derives from the sale of rutile and graphite products exposes the potential income to exchange rate risk. International prices of rutile and graphite are denominated in United States dollars, whereas the financial reporting currency of SVM is the Australian dollar, exposing the company to the fluctuations and volatility of the rate of exchange between the USD and the AUD as determined by international markets.
- **Mining risk:** A reduction in mine production would result in reduced revenue.
- **Processing risks:** A reduction in plant throughput would result in reduced revenue. In all processing plants, some metal is lost rather than reporting to the valuable product. If the recovery of metal is less than forecast, then revenue will be reduced.
- **Operational cost risk:** an increase in operating costs will reduce the profitability and free cash generation of the project.
- **Management and labour risk:** an experienced and skilled management team is essential to the successful development and operation of mining projects.

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