ASX AND MEDIA RELEASE
31 JULY 2019

BFS UPDATE MATERIALLY IMPROVES PROJECT ECONOMICS

HIGHLIGHTS

- **Ilmenite processing circuit removed, and target annual average zircon production increased by 39%[1]**
- **Stage 1 equity funding requirement materially reduced by A$108m to A$143m[2]**
- **Stage 1 total funding requirement reduced by A$101m to A$478m**
- **Stage 1 project capital requirement reduced by A$71m to A$392m**
- **Robust economic outcomes for Stage 1 and 2 Project includes:**
  - **Pre-finance and Pre-tax NPV_{10} of A$1.13B and IRR of 30.1%**
  - **Pre-finance and Post-tax NPV_8 of A$0.98B and IRR of 24.0%**
  - **EBITDA of A$6.87B over Life of Mine (LOM) with annual average EBITDA of A$195m[3]**
- **Strong cashflow targets debt carrying capacity of A$335m[2]**
  - **Stage 1 Taurus project financing of A$240m (7-year tenor)**
  - **Stage 1 NAIF infrastructure project financing of A$95m (15 and 20 year tenor)**
- **Revenue to Cost ratio of 2.3:1 measured over first 10 years of mine life**
- **100% of Stage 1 zircon and primary ilmenite revenues contracted under binding offtake agreements**
- **Updated Ore Reserve[4] of 748Mt at 11.2% HM supporting a 37 year mine life**
- **Globally significant average annual zircon production of 202kt for 37 years**
- **Thunderbird remains fully permitted with Mining Lease, Native Title Agreement and Environmental permits**
- **Process plant and infrastructure designed and costed by GR Engineering Services**

Sheffield Resources Limited ("Sheffield", "the Company") (ASX:SFX) is pleased to report outstanding results of the Bankable Feasibility Study Update (BFSU) for its 100% owned Thunderbird Mineral Sands Project (the Project or Thunderbird), in the northwest of Western Australia.

Key Results

The BFSU estimates a material reduction in Project capital requirements and execution risk, increases zircon production and Project revenue by more than 30%, substantially enhancing the Project financial metrics. The Low Temperature Roast (LTR) ilmenite circuit has been removed from the Project and unroasted Primary Ilmenite is forecast to be sold under a 7 year binding offtake agreement, significantly de-risking Project execution. The mining and processing rate has increased by 38% to 1,085 dry tph feed rate at the Wet Concentrate Plant (WCP) targeting an average annual zircon production of 202ktpa over the 37 year LOM, elevating Thunderbird into the top tier of global zircon producers. The strong demand for Thunderbird products has resulted in approximately 100% of the BFSU Stage 1 revenues contracted under binding offtake agreements, substantially reducing market and revenue risk.

The BFSU has set out to materially improve Project financial metrics by re-scoping the Project to reduce capital expenditure, increase zircon production to meet strong demand from consumers globally as the structural supply deficit widens and to supply Primary Ilmenite into the high growth chloride slag market. In particular, the growth in the chloride pigment sector and the projected supply shortages of high-grade titanium feedstocks have created a new market dynamic whereby chloride slag production and demand has continued to grow strongly. The changed market

[1] Based on average life of mine production
[2] Assumes debt capacity consistent with as ASX announcement of 14 November 2018 and near term AUD:USD FX 0.73:1
[3] Does not include the first and last years which are partial production years
[4] ASX Announcement dated 31 July 2019 titled "Thunderbird Ore Reserve Update"

conditions have enabled Sheffield to remove the LTR ilmenite circuit from the project scope and sell the Primary Ilmenite into the chloride slag sector.

Upscaling of the zircon circuit increases zircon production by 34% over the first 10 years of the Project and almost 40% over the life of the Project. This additional zircon production, in conjunction with the sale of the Primary Ilmenite, has had a transformational impact on Thunderbird economics.

Table 1: Key Variance to Previous Financial Metrics

Metric	2019 BFSU	Previous Disclosures	Change
Total Funding Requirement	**A$478m**	A$579m[1]	▼ A$101m (17%)
Equity Requirement	**A$143m**	A$251m[1]	▼ A$108m (43%)
Project Capital	**A$392m**	A$463m[1]	▼ A$71m (15%)
Project Revenue	**A$15.1B**	A$13.6B[2]	▲ A$1.57B (11%)
Project Operating Costs	**A$7.21B**	A$7.63B[2]	▼ A$0.42B (6%)
NPV_{10} pre-tax	**A$1.13B**	A$0.67B[2]	▲ A$0.46B (69%)
NPV_8 post-tax	**A$0.98B**	A$0.62B[2]	▲ A$0.36B (58%)
IRR pre-tax %	**30.1%**	24.9%[2]	▲ 5.2% (21%)
Zircon Production (average '000tpa)	**202**	145[2]	▲ 57 (39%)
Offtake	**~100%**	>75%	Full
LTR & Ilmenite Process Circuit	**Not Required**	Included in Stage 1[2]	▲ Removed
Process Rate (t/hr)	**1,085**	788[2]	▲ 297 (38%)
Mine Life	**37 years**	42 years[2]	▼ 5 years (12%)
Long Term Average FX Rate (A$/US$)	**0.75**	0.75[2]	No change
Long Term Zircon Price (TZMI)	**US$1,469**	US$1,387[2]	▲ US$82 (6%)

Reference:

1. ASX Announcement "Joint Kimberley-Pilbara Regional Forum" 11 June 2019
2. ASX Announcement "Thunderbird BFS Delivers Outstanding Results" 24 March 2017

Table 2: Thunderbird Project Key Financial Metrics (A$m)

A$m, Real 2019 Prices	Stage 1 FY 2022 – 2025	Stage 1 and 2 FY 2026 – 2031	LOM
Revenue	1,082	2,979	15,129
Royalties	(73)	(218)	(1,089)
Net Revenue	**1,009**	**2,760**	**14,040**
Opex: Mining	(137)	(405)	(2,522)
Opex: Processing	(186)	(497)	(2,764)
Opex: Logistics	(102)	(258)	(1,266)
Opex: Site G&A	(60)	(103)	(619)
Total Opex	**(485)**	**(1,262)**	**(7,170)**
EBITDA	**524**	**1,498**	**6,869**
A$ Site costs / tonne ore mined	11.34	9.28	9.58
A$ Revenue / tonne ore mined	25.31	21.91	20.21
Revenue to C1 Cost Ratio	2.2	2.4	2.1

The BFSU estimates a new Ore Reserve of 748 million tonnes at 11.2% HM, an increase of 68 million tonnes or approximately 10%[5]. This reflects changes in market product pricing and increased certainty in costs and revenue for Thunderbird. The Ore Reserve increases the period of mining higher grade ore from 7 years to 10 years and removes lower grade ore from the process plant feed during this period, increasing the in-situ zircon grade in the Proved Category to 1.02% zircon[6].

The staged development strategy has been implemented to materially reduce pre-development capital, lower construction risk and increase revenues by focusing on a substantial increase in zircon production:

- Stage 1: Single Mining Unit Plant (MUP) and processing plant underpinning a 10.4Mtpa mining operation
- Stage 2: Duplication in year 5 of Stage 1 mining and processing circuits underpinning a 20.8Mtpa mining operation

The BFSU delivers a pre-finance and pre-tax IRR of 30.1% and an NPV_{10} of A$1.13 Billion over the 37 year LOM. This approach targets negligible variation to current debt carrying capacity levels, reduces construction and commissioning risk and materially lowers equity funding requirements to A$143 million.

Table 3: Thunderbird Project Key Financial Metrics (A$m)

A$m, Real 2019 Prices	Stage 1 FY 2022 – 2025	Stage 1 and 2 FY 2026 – 2031	LOM
Revenue	1,082	2,979	15,129
C1 Operating Costs	(485)	(1,262)	(7,170)
EBITDA	**524**	**1,498**	**6,869**
Direct Capital Expenditure	392	237	725
Payback Period (Stage 1, years)	3.25		
Project NPV (10% WACC, Pre-tax)			1,129
Project IRR (%, Pre-Tax)			30.1%
Project NPV (8% WACC, Post-Tax)			982
Project IRR (% Post-Tax)			24.0%

Notes:
Excludes corporate overheads, sustaining capex and royalties
AUD:USD = 0.75:1.00. USD long term commodity prices are quoted as FOB terms, sourced from TZMI
Refer to accompanying presentation for detailed capital breakdown

[5] 10% based on ore tonnes and approximately 9% based on HM tonnes
[6] ASX Announcement dated 31 July 2019 titled *"Thunderbird Ore Reserve Update"*

Sheffield's Managing Director Bruce McFadzean described the outcomes as outstanding, confirming Thunderbird's status as a world class mineral sands project, at a time when consensus supports a structural supply deficit in zircon production for years to come.

"The removal of the LTR ilmenite circuit combined with a focus on increased zircon production delivers lower capital, lower construction risk and a technically stronger project, which is anticipated to generate improved and consistent financial returns over an exceptionally long mine life of 37 years," he said.

"The recent growth in the chloride slag market and Sheffield's strong relationship with existing ilmenite offtake partner Bengbu Zhongheng New Materials S&T Co., Ltd (Bengbu) has resulted in the signing of a binding 7 year offtake agreement plus a 3 year extension option for 100% of Thunderbird's Stage 1 unroasted Primary Ilmenite, further validating our decision to remove the LTR ilmenite circuit from the Project. There has been continued strong interest in our zircon products since Stage 1 zircon offtake agreements were executed in 2018. This was a further catalyst to re-scope Thunderbird and increase zircon production by almost 40%, most of which is now contracted with binding offtake agreements".

"Thunderbird is located in one of the most attractive mining investment jurisdictions and the enhanced Project scope remains fully permitted and shovel ready. Thunderbird holds a strong social license to operate with Kimberley and Aboriginal stakeholders, and with the Local, State and the Federal Governments, making it well placed to deliver long term benefits to all stakeholders through jobs, business opportunities, taxes and royalties".

"Completion of the BFSU demonstrates a transformational improvement in project economics and a significant reduction in the equity funding requirement. The Company expects to determine the optimal funding solution over the coming months, clearing the way for a final investment decision and the start of construction this year".

Table 4: Scheduled Production Tonnes

Sales Volume (Average tonnes per annum)	Stage 1 FY 2022 – 2025	Stage 1 and 2 FY 2026 – 2031	LOM
Premium Zircon	55,000	111,000	92,000
Zircon Concentrate	77,000	128,000	110,000
Primary Ilmenite	660,000	1,258,000	961,000

Bankable Feasibility Study Update: Assumptions Underpinning Production Targets and Forecast Financial Information

The Bankable Feasibility Study Update (BFSU) contains capital cost estimates, operating costs and revenue forecasts with significantly improved accuracy and confidence as a result of the execution and/or negotiation of construction, operation and offtake agreements since the completion of the March 2017 Bankable Feasibility Study (2017 BFS).

The BFSU follows a similar Project development strategy described in the 2017 BFS with the use of a conventional dozer trap mineral sand mining and processing operation, but with an increase in the Stage 1 mining rate from 8.5 million tonnes per annum (Mtpa) (single mining unit) to 10.4Mtpa (single mining unit). The duplication of a second mining unit and process stream in Year 5, takes the total mining rate to 20.8Mtpa, up from 17Mtpa in the 2017 BFS. The LTR ilmenite circuit has been removed and the Project is forecast to export unroasted Primary Ilmenite.

The recently announced offtake agreement with Bengbu has a 7 year initial term with a 3 year extension option and allows the Company time to assess the TiO_2 feedstock market and the future option of an LTR ilmenite circuit. Future ilmenite development and growth opportunities may also align with those of Bengbu, our highly supportive and skilled cornerstone primary ilmenite offtake partner, who are committed to expand and grow their chloride slag and pigment capacity.

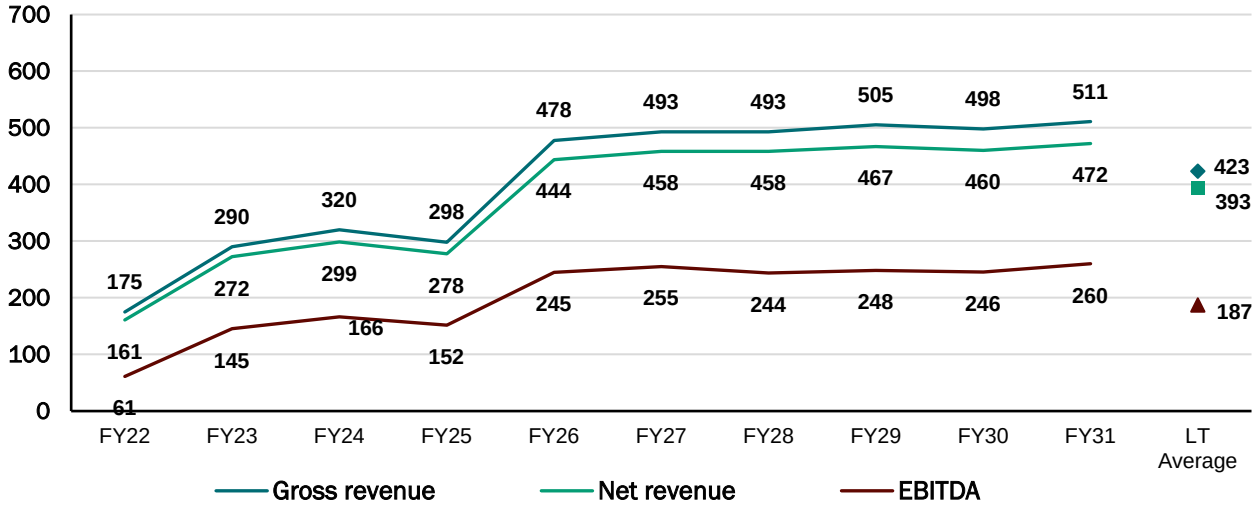
The material assumptions underpinning the pre-tax NPV_{10} of A$1.13B million and pre-tax IRR of 30.1% are described in Tables 1 – 4 of this document and the attached presentation. Other assumptions such as sale prices for mined products, plant recoveries, ore feed grade, mining costs, metallurgical factors, processing factors, infrastructure, and other macro-economic conditions are also reported within the body of this document. These assumptions also extend to factors relating to marketing, legal, environmental, social and Government factors.

Financial Analysis

The BFSU demonstrates a lower risk, technically stronger Project with robust financial metrics. The Project is estimated to produce ~240ktpa of zircon products in 2026 and generate an EBITDA of A$6.87 billion over a 37 year mine life. The key financial and physical outputs summarised in Table 1 to Table 4 above, underpins the strategic value of the Thunderbird Mineral Sands Project. The financial analysis is based on capital costs, operating costs and revenue assumptions informed by executed and negotiated contracts, supply tenders, industry expert and consensus product pricing and foreign exchange rates and a real discount rate of 10%.

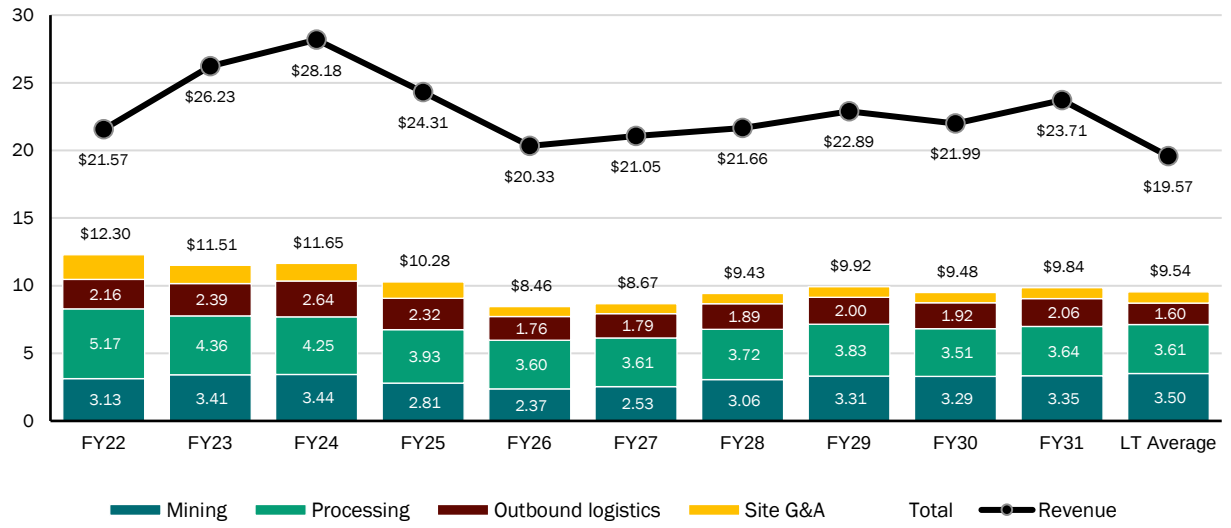
Please refer to the attached presentation for further details of the targeted robust Project financial metrics.

Graph 1: EBITDA, Gross and Net Revenue (A$m)



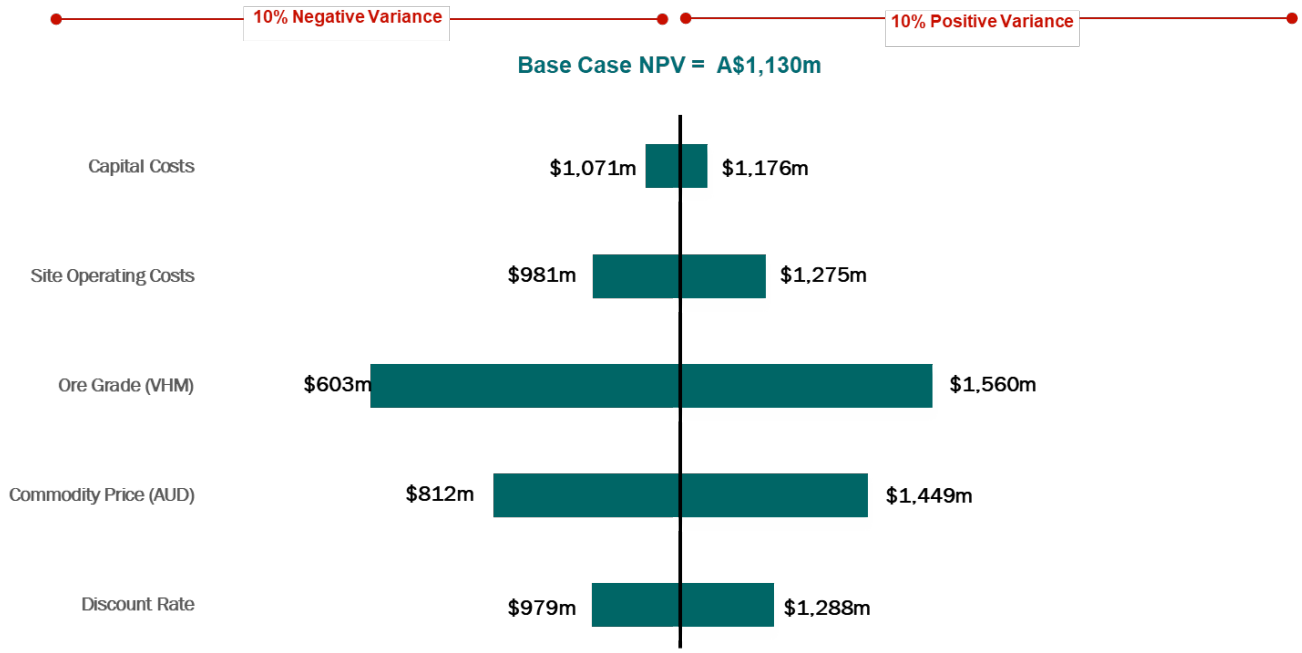
Graph 2 below describes the site cash operating costs per tonne of ore mined, relative to the revenue per tonne of ore mined. It is evident that for the life of mine, Thunderbird is expected to deliver strong cash margin at a ratio above 2:1, based upon the economic parameters assumed within the BFS Update.

Graph 2: Cash Operating Margin (A$ per ore tonne mined)



A sensitivity analysis is below and is also contained in the presentation attached to this document, illustrating the key drivers of the Project's economics are product prices, ore feed grade and costs. The Thunderbird NPV is less sensitive to capital due to the high cash flows generated over the effective discount period.

Graph 3: Pre-tax, Pre-finance NPV[10] Sensitivity Analysis



Updated Ore Reserve

The BFSU Ore Reserve of 748 million tonnes at 11.2% HM is an increase of 68 million tonnes or approximately 10% (based on ore tonnes) and approximately 9% (based on HM tonnes) and reflects updated cost, revenue and product assumptions. The 37 year mine schedule has been optimised to provide strong and consistent cash flows and includes detailed scheduling of land clearing, ore mining, waste mining, tailings storage and other ancillary activities on 200m by 100m ore blocks over the first 8 years of the schedule; after which larger scheduling blocks have been utilised. The Ore Reserve increases the period of mining, predominantly, the high grade ore from seven years to ten years and removes most of the lower grade ore from the process plant feed increasing the in-situ zircon grade in the Proved Category to 1.02% zircon. Detailed designs have been completed for the surface tailings storage facility and in-pit tailing storage requirements for the first 5 years of operations, after which, appropriate assumptions have been applied (refer ASX announcement 31 July 2019).

The Ore Reserve for Thunderbird, as at 31 July 2019, is outlined in the Table below:

Table 5: Thunderbird Ore Reserve June 2019

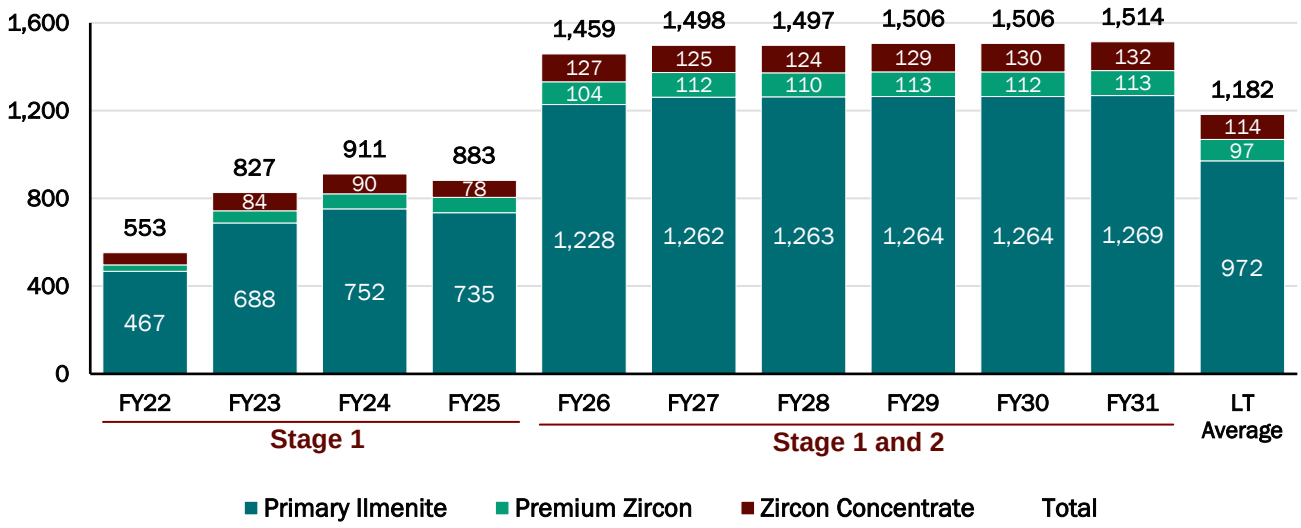
Ore Reserve			Valuable HM Grade (In-Situ)[1]					
Reserve Category	Material (Mt)	HM (%)	Zircon (%)	HiTi Leuc (%)	Leucoxene (%)	Ilmenite (%)	Oversize (%)	Slimes (%)
Proved	219	13.7	1.02	0.30	0.28	3.68	14.0	16.1
Probable	529	10.1	0.79	0.26	0.27	2.87	10.5	14.5
Total	**748**	**11.2**	**0.86**	**0.27**	**0.27**	**3.11**	**11.6**	**15.0**

[1]*The in-situ grade is determined by multiplying the percentage of HM by the percentage of each valuable heavy mineral within the heavy mineral assemblage at the resource block model scale. Tonnes and grades have been rounded to reflect the relative accuracy and confidence level of the estimate, thus the sum of columns may not equal.*

Mining and Processing

The dozer trap mining unit plant (MUP) is forecast to operate at an average feed rate of 1,470 dry tph, an increase of 38% from the 2017 BFS, but well within the MUP nameplate capacity of 1,800 dry tph. The MUP proposed by the preferred mining contractor for the 2017 BFS will require minor modifications to operate at the higher feed rate. The cost of these modifications have been estimated and the fixed and variable unit rates have been estimated as at 30 June 2019 cost basis. The cost for land clearing, waste mining, tailings storage and other ancillary activities have been estimated on a first principles basis by an external mining consultant as at 30 June 2019 cost basis.

Graph 4: Annual Production Schedule (kt)



The feed to the Wet Concentrate Plant (WCP) is forecast at a consistent rate of 1,085 dry tph of sand greater than 38µm and less than 2mm ore material, an increase of 38% from the 2017 BFS. The WCP and downstream zircon separation plant has maintained the same flow sheet and design criteria, with downstream separation equipment increased to process the higher heavy mineral concentrate (HMC) throughput, whilst still achieving the 2017 BFS recovery assumptions. The HiTi88 recovery circuit has been removed from the process design with the previously separated HiTi88 product, now reporting to the zircon concentrate. The value of the HiTi88 TiO_2 units in the concentrate is recognised within the existing binding Zircon Concentrate offtake agreements.

Within the proposed flowsheet, the removal of the LTR ilmenite circuit occurs after the Concentrate Upgrade Plant (CUP) and the Hot Acid Leach Plant (HAL). The HAL is to be fitted with electro-static separation equipment to provide an improved HAL magnetic-conductor stream to be blended with the CUP magnetic material which together will form the Primary Ilmenite product.

Process Plant Design

In late 2018, GR Engineering Services (GRES) completed the necessary work to finalise an EPC agreement with Sheffield. The agreement incorporated input from independent technical expert due diligence on behalf of project financiers. GRES has completed a re-scoped project design, layouts and mass balance calculations to inform the BFSU development strategy which has included updated pricing of key equipment packages with equipment suppliers in providing a cost estimate for the BFSU scope of work.

GRES provided an updated capital cost estimate of A$293 million for the process plant and process infrastructure, which has been used to inform the BFSU financial modelling. Discussions have commenced with GRES to convert the BFSU cost estimate into a fixed price lump sum EPC agreement utilising cost base as at 30 June 2019 and under the existing EPC agreement terms and conditions including agreed recovery and performance test guarantees.

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Owners and Early Works

The Owners Works activities have been reviewed for the BFSU development strategy and include pre-development activities completed in late 2018. The removal of the LTR ilmenite circuit results in a significant reduction in liquid natural gas (LNG) usage. The forecast increase in MUP throughput and resultant increase in zircon and Primary Ilmenite production results in increased power demand in the zircon circuit, offsetting the majority of the power reduction from the removal of the LTR ilmenite circuit. The forecast increased production rate requires an increase in bulk material handling and storage shed requirements at the Port of Derby. The reduced EPC contract scope of work is forecast to result in a shorter 21 month construction period and lower total construction accommodation requirements estimated at 450 rooms. The Owners Work capital costs for the BFSU have been estimated at A$99 million.

The BFSU development strategy and the shovel ready status of the Project benefits from the completion of planned Early Works and Project Infrastructure activities undertaken in accordance with the State Government approved Minor or Preliminary Works (MoPW). The Early Works included the installation and commissioning of the first stage of the accommodation village and associated infrastructure and the establishment of permanent road access.

A 328 room accommodation village was procured in late 2017. To date, the existing accommodation village works consists of 52 installed ensuite rooms, kitchen and messing facilities, laundry facilities, offices, communication towers and equipment, and waste-water treatment plant. The permanent road access involved the upgrading of the pastoralist's track accessing the Mt Jowlaenga Homestead to establish site access for construction activities and initial construction water pumping and storage.

The Project accommodation, communications and the site access road are construction ready enabling a rapid start of construction activities upon the completion of the funding process.

Figure 1: Existing accommodation village early works

Manning, Costs and Approvals

The Public Environmental Review community consultation and other stakeholder workshops conducted during 2017 and 2018, provided Sheffield with feedback from the community regarding the importance of the Kimberley lifestyle and the employee value proposition (EVP) regarding work-life balance, remuneration and the value of consistent and regular work across the wet and dry season cycle. On this basis the BFSU incorporates an assumed even time, 4 panel drive-in and drive-out roster from key Kimberley towns, with labour costs updated for 30 June 2019. The 2017 BFS assumed a two week on and one week off, three panel work roster with salaries based on 2016 labour cost survey. The change in work roster is forecast to result in lower individual salary levels but with increased operational workforce to circa 280 people in Stage 1 of operations and approximately 400 over the remaining LOM.

The operating and maintenance costs for the BFSU are forecast to materially reduce through the removal of the LTR ilmenite circuit, primarily due to the significant reduction in LNG usage, reductions in operational personnel and the

removal of the production of nitrogen gas. The operating costs per tonne processed is forecast to be lower due to additional units from the higher process plant throughput. The operating, maintenance and administration costs have been updated as at 30 June 2019.

The BFSU process has ensured the Stage 1 activities comply with the all existing Project approvals. The BFSU completed a detailed gap analysis of the BFSU activities with the current approvals and has developed a staged approach to updating future approvals required for later stages of development. Any changes associated with the BFSU are aligned with the current approvals strategy to ensure the Project is fully approved at all stages, but also maintaining flexibility in scope, timing and licencing and approval costs.

The assessment has considered existing key characteristics for the Ministerial Statement 1080 (State environmental approval) and the EPBC Act Approval 2016/7648 (Federal environmental approval). The increased level of activity in Stage 2 is expected to require a change of two key characteristics of the State environment approval being:

- A forecast increase in the area of land clearing of approximately 124 ha of the approved total of 1,635 ha, required due to the increase in Ore Reserve. This approval would not be required until approximately Year 30 of the Project.
- A proposed increase in the return truck movements for products on the public roads from Thunderbird to the Port of Derby. This approval would not be required until Year 5 of the Project, when Stage 2 moves into operation.

Both changes to the approved key characteristics are expected to be obtained using the provisions of Section 45C of the EP Act. This relates to non-significant changes where the changes are considered not likely to result in significantly different environmental impacts to what has already been assessed. Approval for such changes are typically able to be obtained in a three to six month timeframe, after submission of the application.

Amendments to secondary approvals being the Works Approval, Mining Proposal and the Groundwater Licence will be required over time as these approvals relate to details of Project design and implementation associated with the staged development of the Project and increases in mining and processing capacity.

Commodity Pricing

Table 6: Thunderbird Commodity Price Assumptions (US$ FOB) June 2019

Commodity Prices (US$ FOB)	Stage 1 FY 2022 – 2025	Stage 1 and 2 FY 2026 – 2031	LOM
Premium Zircon	1,520	1,469	1,472
Zircon Concentrate	689	718	723
Primary Ilmenite	102	94	95

Mineral sands market consensus indicates that zircon and titanium feed stocks are moving towards structural supply deficit. This is reflected in the TZMI pricing used to estimate Project revenues in the BFSU. The BFSU uses real FOB TZMI pricing for Premium Zircon of US$1,588 per tonne for FY2022 and US$1,547 per tonne in FY2023 and US$1,469 per tonne for the life of mine thereafter. This compares to an average 2017 BFS price of US$1,381 per tonne. The BFSU includes terms and conditions of current binding offtake agreements for the revenue assumptions. The agreements for Zircon Concentrate contain payment terms based on TiO_2 units and ZrO_2 units which deliver a long term real FOB price of US$723 per tonne for Zircon Concentrates. Primary Ilmenite is priced in accordance with the TZMI long term reference price of US$194 per tonne FOB, and proportionately reduced per existing offtake Agreements.

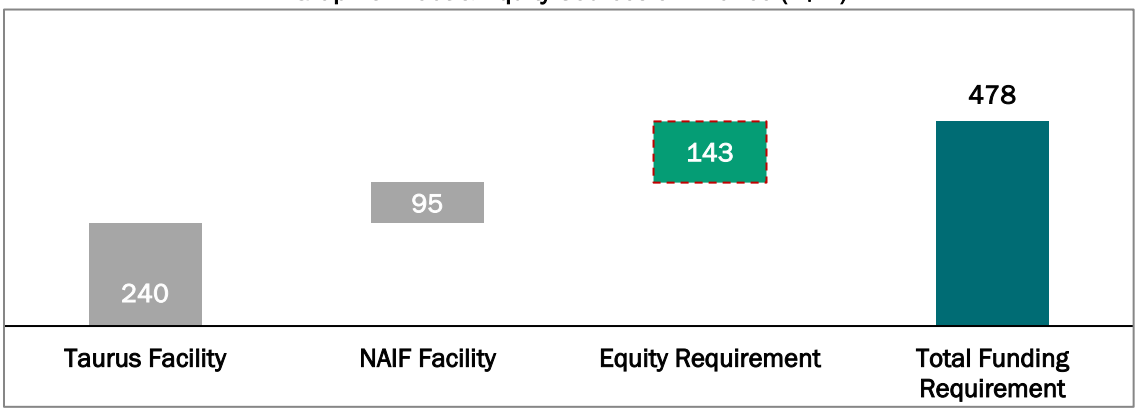
Project Financing

Initial BFSU debt financing technical due diligence has been initiated, and it is anticipated that revised Project financing agreements will be concluded in 2019. The Company is targeting existing debt capacity levels of A$335 million, reducing the equity funding requirement substantially to a level of A$143 million.

In January 2019, UBS was engaged to assist the Company in considering third party strategic partner interest for the funding and development of the Thunderbird Mineral Sands Project. A structured, formal process to identify the

introduction of a strategic party to assist the Company in achieving its objective of optimising the outcome to shareholders through Thunderbird's development is currently underway. The introduction of a strategic party to Thunderbird via this process could have the effect of reducing the residual equity funding requirement attributable to Sheffield, as the strategic partner would likely be responsible for their proportionate share of residual capital requirements in the case of a project level investment.

Graph 5: Debt & Equity Sources of Finance (A$m)

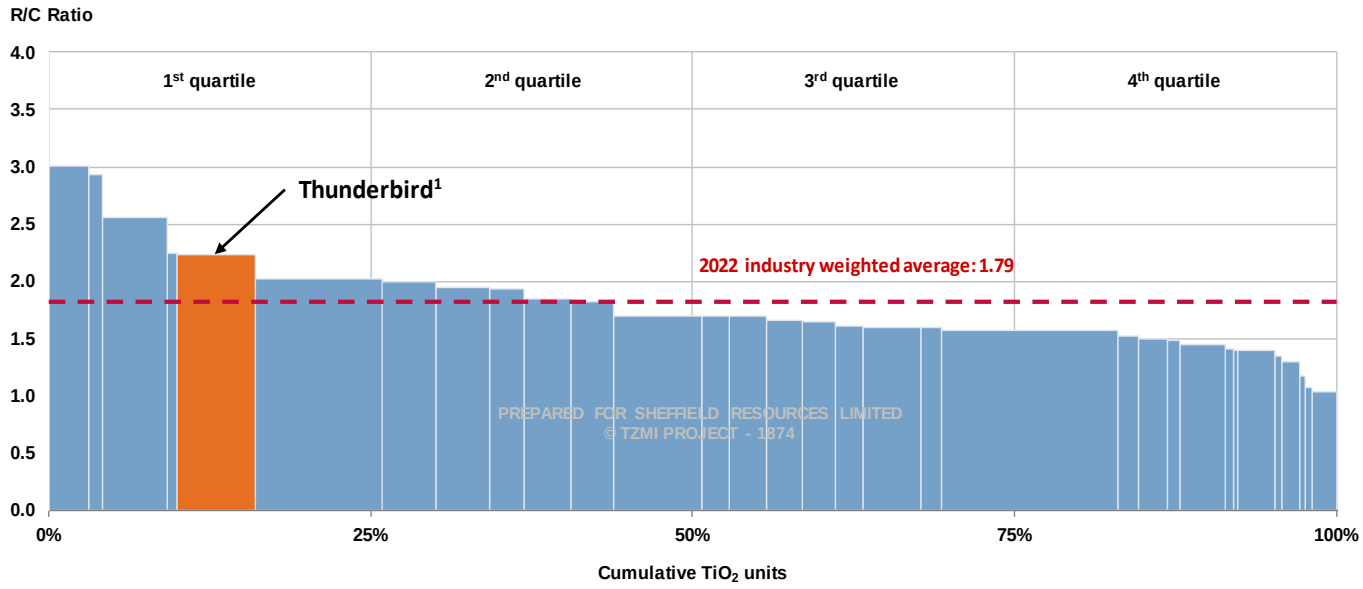


Globally Competitive

The Graph 6 depicts the Calendar Year 2022, independent TZMI revenue to cost (RC) ratio curve for the mineral sands industry. Thunderbird is represented within the first quartile producers, several of whom are vertically integrated and operate titanium feedstock beneficiation plants.

Thunderbird's position on an industry RC curve shows the Project is expected to be highly competitive and capable of operating through multiple commodity pricing cycles, underpinning the Project's global strategic value.

Graph 6: TZMI 2022 Industry Revenue to Cash Cost Curve



Thunderbird Products: Product Offtake Status: Mineral Sands Market Conditions:

Extensive test work and process design has informed the BFSU and earlier studies have enabled Sheffield to develop a suite of desirable mineral sands products with specifications suited to market requirements.

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Thunderbird Products

- *Premium Zircon* – high quality ceramic grade zircon, >66% ZrO_2 suitable for all zircon related applications.
- *Primary Ilmenite* – Market dynamics for TiO_2 feedstocks have developed in recent times with an increase in demand for chloride slag production making the Thunderbird Primary Ilmenite a suitable and sought after feedstock source for upgrading and producing high grade chloride slag.
- *Zircon Concentrate* – zircon and titanium rich concentrate (35% ZrO_2, 34% TiO_2) suited to a range of applications including the zirconium chemicals industry and as a blended feedstock for production of chloride pigment.

Products Offtake Status

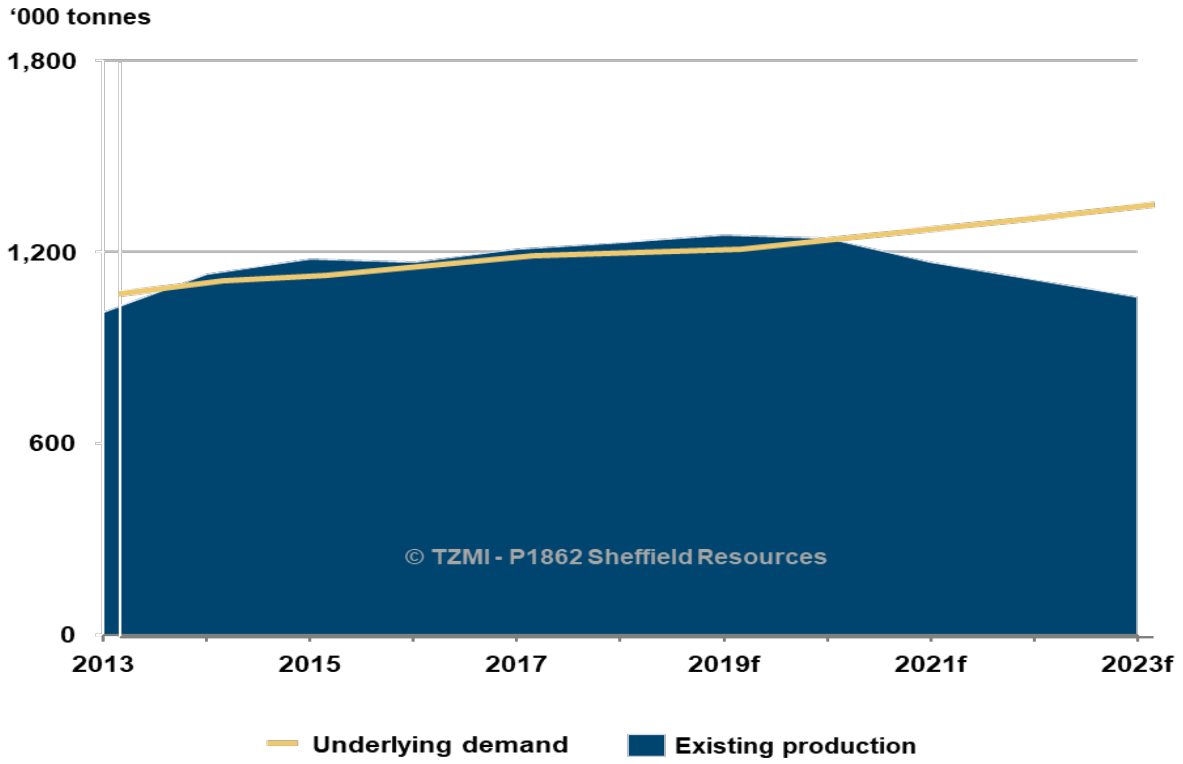
Within the BFSU, Sheffield is forecast to produce substantial volumes of both Premium Zircon and Zircon Concentrate as well as a Primary Ilmenite. Sheffield has been able to secure 100% of the additional volumes of zircon products in binding offtake agreements with a range of existing offtake partners. In addition to securing the full volume of the additional zircon material, Sheffield has also secured all of the available Primary Ilmenite volume in a binding offtake agreement for supply to a chloride slag and pigment producer.

Market Conditions

Within the mineral sands industry there are two major product streams, the zircon based (ZrO_2) material and the titanium (TiO_2) based material. Sheffield Resources is forecast to supply the market Premium Zircon, Zircon Concentrate (ZrO_2) and Primary Ilmenite (TiO_2) life of mine.

Zircon prices have significantly increased over the past 24 months and are expected to show steady incremental growth over the next 3-4 years. The price increases and steady market have been driven by the larger, more sophisticated producers who are managing the market supply balance. Forecast pricing is underpinned by a significant supply gap expected to emerge for zircon, and the consensus view supports the need for additional supply from 2020 onwards.

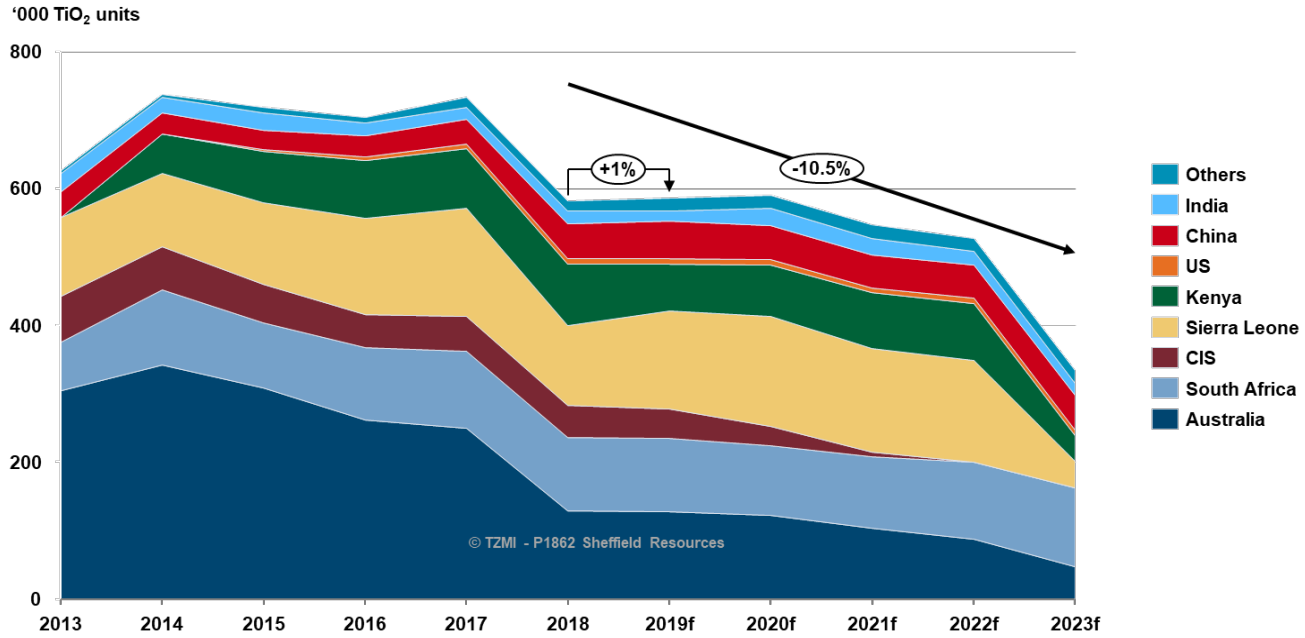
Graph 7: TZMI Zircon supply/demand to 2023



There is a range of TiO_2 based feedstocks in the market which are used predominantly to produce either sulfate or chloride pigment. To produce chloride pigment a higher quality direct feedstock is required however there is a

significant supply deficit of this type of feedstock. The market has positioned itself to fill this supply gap with chloride slag, a product produced from material such as Sheffield's Primary Ilmenite. The Chinese consumers are driving the growth of chloride slag production and this market has been identified as the major growth sector in the industry. Sheffield Resources is well positioned to supply feedstock for chloride slag production through their close relationship with offtake partner, Bengbu Zhongheng New Materials S&T Co (Bengbu). Bengbu has signed a binding offtake agreement for 650,000tpa over a 7 year period.

Graph 8: TZMI Global Rutile (High grade TiO_2) supply/demand to 2023



As illustrated in Graph 8 above, the significant estimated supply shortage in rutile (used extensively to produce chloride pigment) is driving the development and demand for chloride slag, particularly in China. China cannot supply suitable material to produce chloride slag and relies on imports of suitable feedstocks from overseas. The Thunderbird Project, located in the North West of Western Australia, is ideally positioned to deliver material into China.

Pathway to Production

The shovel ready status of the Project and the strong financial outcomes demonstrate a compelling case for final equity financing and development of the Project. The proposed Project timeline is described below.

Figure 2: Targeted Timeline to Production

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Engineering & Design	■	■	■	■	■	■	■	■	■	■	■	■												
Drafting	■	■	■	■	■	■	■	■	■	■	■	■	■	■										
Procurement		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■				
Construction																								
Mobilisation		■																						
Earthworks & General		■	■	■	■	■	■	■	■															
WCP and Water									■	■	■	■	■	■	■	■	■	■	■	■				
HAL & Zircon Plants									■	■	■	■	■	■	■	■	■	■	■	■				
Non Process Infrastructure						■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■			
Borefield											■	■	■	■	■									
Power station, LNG & HV										■	■	■	■	■										
Commisioning																			■	■	■	■	■	
First Products																						■	■	■

COMPLIANCE STATEMENTS

Information and documentation which forms the basis of the Thunderbird BFS in relation to Mineral Resources, Ore Reserves and metallurgy and process design has previously been reported as detailed below. The Company confirms that it is not aware of any new information or data that materially affects the information included in the relevant market announcements and, in the case of the July 2016 Thunderbird Mineral Resources and the July 2019 Thunderbird Ore Reserve, that all material assumptions and technical parameters underpinning the estimates in the relevant market announcement 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 market announcements.

PREVIOUSLY REPORTED INFORMATION

The Mineral Resources and Ore Reserves of Sheffield have been extracted from Sheffield's ASX releases;
"THUNDERBIRD ORE RESERVE UPDATE" 31 July 2019
"HIGH GRADE MAIDEN MINERAL RESOURCE AT NIGHT TRAIN" 31 January 2019
"MINERAL RESOURCE AND ORE RESERVE STATEMENT" 3 October 2018
"THUNDERBIRD ORE RESERVE UPDATE" 16 March 2017
"SHEFFIELD DOUBLES MEASURED MINERAL RESOURCE AT THUNDERBIRD" 5 July 2016

The exploration results have been extracted from Sheffield's ASX releases;
"NEW LARGE HIGH GRADE DISCOVERY SOUTH OF THUNDERBIRD" 13 November 2018
"EXCEPTIONAL RESULTS CONFIRM MAJOR DISCOVERY AT NIGHT TRAIN" 9 October 2018
A copy of these announcements is available at http://www.sheffieldresources.com.au/

Bankable Feasibility Study ("BFS")
This Information Memorandum contains information that relates to a Bankable Feasibility Study. This information was extracted from the following ASX releases by Sheffield:
"THUNDERBIRD BFS DELIVERS OUTSTANDING RESULTS" 24 March 2017

Other Extracted Information
In addition to those ASX releases referred to above, this Information Memorandum contains information extracted from the following ASX releases:
"SHEFFIELD SIGNS BINDING PRIMARY ILMENITE OFFTAKE AGREEMENT" 1 July 2019
"QUARTERLY ACTIVITIES REPORT" and "QUARTERLY CASHFLOW REPORT" 31 July 2019
"QUARTERLY ACTIVITIES REPORT" and "QUARTERLY CASHFLOW REPORT" 30 January 2019
"SHEFFIELD SECURES THUNDERBIRD LNG SUPPLY AGREEMENT" 22 January 2019
"SHEFFIELD SIGNS TAURUS DEBT FACILITY AND EPC CONTRACT" 12 November 2018
"NATIVE TITLE AGREEMENT SIGNED BY TRADITIONAL OWNERS" 1 November 2018
"FEDERAL ENVIRONMENTAL APPROVAL GRANTED FOR THUNDERBIRD" 28 September 2018
"MINING LEASE GRANTED OVER THUNDERBIRD MINERAL SANDS PROJECT" 26 September 2018
"NAIF APPROVES LOAN FACILITIES TOTALLING A$95M" 19 September 2018
"NATIVE TITLE UPDATE: SHEFFIELD SIGNS CO-EXISTENCE AGREEMENT" 10 September 2018
"FAVOURABLE NATIONAL NATIVE TITLE TRIBUNAL OUTCOME" 28 August 2018
"STATE MINISTER FOR ENVIRONMENT APPROVES THUNDERBIRD MINERAL SANDS PROJECT" 13 August 2018
"GRANT OF MISCELLANEOUS LICENCES" 27 June 2018
"MAIDEN BINDING ILMENITE OFFTAKE AGREEMENT" 21 June 2018
"ADDITIONAL BINDING OFFTAKE SIGNED" 1 February 2018
"BINDING OFFTAKE AGREEMENTS EXCEED 50% OF STG 1 REVENUE" 22 December 2017
"BINDING ZIRCON CONCENTRATE OFFTAKE AGREEMENT SIGNED" 12 December 2017
"COMMENCEMENT OF EARLY WORKS AND TRAINING PROGRAM" 4 December 2017
"SHEFFIELD ANNOUNCES EPC PREFERRED CONTRACTOR" 19 October 2017
"SHEFFIELD MANDATES TAURUS FOR US$200M DEBT FACILITY' 18 October 2017
"EPA RECOMMENDS APPROVAL OF THUNDERBIRD" 9 October 2017
"SHEFFIELD SECURES SECOND BINDING OFFTAKE AGREEMENT" 25 September 2017
"SHEFFIELD SIGNS MAIDEN BINDING OFFTAKE AGREEMENT" 12 September 2017
"SHEFFIELD LAUNCHES ABORIGINAL EMPLOYMENT PROGRAM" 17 August 2017
"SHEFFIELD SIGNS CORNERSTONE ILMENITE MOU" 29 May 2017
"SHEFFIELD SECURES FURTHER ZIRCON OFFTAKE MOUs" 26 April 2017
"ADDITIONAL ZIRCON OFFTAKE MOU SIGNED" 10 April, 2017
"THUNDERBIRD ILMENITE EXCEEDS PREMIUM SPECIFICATION" 13 March 2017

The Company confirms that it is not aware of any new information or data that materially affects the information included in the relevant market announcements and, in the case of estimates of Mineral Resources and Ore Reserves,

that all material assumptions and technical parameters underpinning the estimates in the relevant market announcement 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 market announcements.

FORWARD LOOKING AND CAUTIONARY STATEMENTS

The contents of this announcement reflect various technical and economic conditions at the time of writing. Given the nature of the resources industry, these conditions can change significantly over relatively short periods of time. Consequently, actual results may vary from those detailed in this announcement.

Some statements in this announcement regarding estimates or future events are forward-looking statements. They include indications of, and guidance on, future earnings, cash flow, costs and financial performance. Forward-looking statements include, but are not limited to, statements preceded by words such as "planned", "expected", "projected", "estimated", "may", "scheduled", "intends", "anticipates", "believes", "potential", "predict", "foresee", "proposed", "aim", "target", "opportunity", "could", "nominal", "conceptual" and similar expressions. Forward-looking statements, opinions and estimates included in this announcement are based on assumptions and contingencies which are subject to change without notice, as are statements about market and industry trends, which are based on interpretations of current market conditions. Please also refer to the additional risk factors described below on Pages 15 - 23.

Forward-looking statements are provided as a general guide only and should not be relied on as a guarantee of future performance. Forward-looking statements may be affected by a range of variables that could cause actual results to differ from estimated results, and may cause the Company's actual performance and financial results in future periods to materially differ from any projections of future performance or results expressed or implied by such forward-looking statements. There can be no assurance that actual outcomes will not materially differ from these forward-looking statements.

These statements are subject to significant risks and uncertainties that include but are not limited those inherent in mine development and production, geological, mining, metallurgical and processing technical problems, the inability to obtain and maintain mine licenses, permits and other regulatory approvals required in connection with mining and processing operations, competition for among other things, capital, acquisitions of reserves, undeveloped lands and skilled personnel, incorrect assessments of the value of projects and acquisitions, changes in commodity prices and exchange rate, currency and interest rate fluctuations and other adverse economic conditions, the potential inability to market and sell products, various events which could disrupt operations and/or the transportation of mineral products, including labour stoppages and severe weather conditions, the demand for and availability of transportation services, environmental, native title, heritage, taxation and other legal problems, the potential inability to secure adequate financing and management's potential inability to anticipate and manage the foregoing factors and risks. There can be no assurance that forward-looking statements will prove to be correct. Please refer to the section headed "Key Risks" in Appendix 1 of this announcement for further information.

Where the Company expresses or implies an expectation or belief as to future events or results, such expectation or belief is expressed in good faith and on a reasonable basis. No representation or warranty, express or implied, is made by the Company that the matters stated in this announcement will in fact be achieved or prove to be correct.

Except for statutory liability which cannot be excluded, the Company, its officers, employees and advisers expressly disclaim any responsibility for the accuracy or completeness of the material contained in this announcement and exclude all liability whatsoever (including in negligence) for any loss or damage which may be suffered by any person as a consequence of any information in this announcement or any error or omission there from.

This announcement does not take into account the individual investment objectives, financial or tax situation or particular needs of any person. It does not contain financial advice. You should consider seeking independent legal, financial and taxation advice in relation to the contents of this announcement.

Except as required by applicable law, the Company does not undertake any obligation to release publicly any revisions to any forward-looking statement to reflect events or circumstances after the date of this announcement, or to reflect the occurrence of unanticipated events, except as may be required under applicable securities laws.

APPENDIX 1: KEY RISKS

There are a number of risks, both specific to Sheffield and of a general nature, which may, either individually or in combination, affect the operational and financial performance of Sheffield, the industry in which Sheffield operates, and the value of Sheffield shares. This Appendix describes some, but not all, of the risks associated with an investment in Sheffield which prospective investors should consider together with publicly available information (including this announcement) about Sheffield before making any investment decisions.

1. RISKS SPECIFIC TO SHEFFIELD AND THE THUNDERBIRD PROJECT

1.1 Thunderbird Project

First production from the Project is expected in or around H2 of 2021, with the first full year of production and first significant financial contribution (from production) expected in 2022. Sheffield's performance is dependent on the successful completion of Stage 1 of the proposed Project, and thereafter, a future investment decision to enable Stage 2 development. The completion of both stages is subject to a number of risks and uncertainties. For Stage 1, such risks include, but are not limited to the following:

- Slippage in the Stage 1 completion schedule as a result of delays in obtaining, or a failure to obtain government permits or approvals, shortages of or delays in the procurement of materials, or other items necessary for the construction and operation of Stage 1 of the Project, or delays in the negotiation of key contracts or the engagement of personnel.
- Escalation in capital costs for the construction, commissioning, ramp up and development of Stage 1 of the Project.
- Failure to agree definitive debt financing agreements with the State of Western Australia under back-to-back loans from NAIF in respect of the proposed A$95 million NAIF Facilities. Any failure to access all of the debt funding the subject of the NAIF Facilities will require Sheffield to source alternate financing to complete the development of Stage 1 of the Project.
- Failure to agree satisfy conditions precedent to drawdown in respect of the US$175 million Taurus Mining Finance Facility Agreement (Facility Agreement) or successfully renegotiate a definitive debt financing agreement following this BFS Update. The conditions to drawdown under the Facility Agreement include (among others) Sheffield raising the required equity that would, in conjunction with the Facility Agreement and NAIF Facilities, allow the Company to fully fund the estimated construction costs of Stage 1.
- Entry into definitive agreements in respect of the NAIF Facilities is a condition precedent to drawdown under the Facility Agreement. As such, if Sheffield does not enter into such definitive agreements in respect of the NAIF Facilities, Sheffield will not be able to drawdown on the Facility Agreement unless alternate funding sources are secured.
- Failure to comply with environmental conditions placed on environmental approvals obtained by Sheffield in connection with mine development and operation.
- Inability to secure the development of Stage 1 of the Project within the timeframe and budget on which the Project's development model is predicated.
- Unforeseen geological, physical, environmental, engineering, construction or economic conditions or challenges that make completion of Stage 1 the Project impossible or economically unfeasible or unattractive.
- Unanticipated natural disasters, accidents, political opposition, litigation or other events associated with construction, development or operation of the Project.
- Lack of water, if the current source proves to be insufficient, and technical risks related to dewatering as mining commences and progresses.

Any of these risks or uncertainties could delay, or increase the costs associated with, Stage 1 of the Project or otherwise negatively impact the Project's development or operations, which, in turn, could have a material adverse effect of Sheffield's financial and operational performance.

In addition, any of the aforementioned risks or uncertainties in relation to Stage 1 of the Project may also give rise to an increase in the costs associated with, or delay, Stage 2 of the Project. No assurance can be given that the capital cost and development timeline estimates for Stage 1 or Stage 2 the Project will ultimately be achieved.

The scope, timing and estimated capital costs for Stage 2 of development of the Project are management estimates based on the BFS, BFS Update and the EPC Contract. The specific scope, timing and estimated capital costs for Stage 2 will be confirmed prior to any future investment decision being made. Accordingly, no assurances can be given in relation to those matters or in relation to the achievement of the currently indicated operating cost, revenue and production profile for Stage 2 that is included (for illustrative purposes) in this announcement.

1.2 Additional requirements for capital

Sheffield's capital requirements for Stage 1 of the Project depend on a number of factors.

Sheffield only expects to have sufficient funding for the development and ramp up of Stage 1 of the Project (during its two-year construction period) if the conditions precedent required to access funds under the NAIF Facilities (once definitive agreements have been entered into) and the Facility Agreement have all been satisfied; because only at that point in time would Sheffield have also satisfied the equity contribution condition, which is a condition to drawdown of those facilities. Accordingly, Sheffield will require further equity financing in the future to satisfy the equity contribution condition.

Sheffield is likely to require further financing in the future, including to fund Stage 2 of the Project, to fund other development or ongoing activities or because operating costs for the Project are different to those anticipated. Sheffield may be required to fund this expenditure or these requirements through asset divestitures, further equity issues, procuring additional debt funding from its financiers or a combination of each.

Sheffield has already entered into the Facility Agreement and has agreed certain non-binding terms in respect of the NAIF Facilities. The terms that debt financiers are willing to offer may vary from time to time depending on (among other things) macro-economic conditions, the performance of Sheffield and an assessment of the risks associated with the debt, including the intended use of funds. Any additional debt financing, if available, may involve restrictions on Sheffield, including its financing and operating activities, or its business strategy.

Any additional equity issues may dilute the holdings of existing shareholders and may be undertaken at lower prices than the current market price of Sheffield shares (or the price at which existing shareholders acquired some or all of their Sheffield shares).

1.3 Commodity price volatility

Following the commencement of production at the Project, Sheffield's financial performance will rely on the sale of its mineral sands products to customers under offtake agreements. Mineral sands prices may fluctuate as a result of a number of factors beyond Sheffield's control, including changes to global supply, demand, currency exchange rates, general economic conditions and other factors. For further details in respect of the supply risk and demand risk, refer to paragraphs 1.4 and 1.5 of this Appendix, respectively. Currency exchange rates are relevant because mineral sands prices are denominated in United States dollars and the income and expenditures of Sheffield are predominantly taken into account in Australian dollars. Therefore, Sheffield will be exposed to the fluctuations and volatility of the rate of exchange between the United States dollar and the Australian dollar as determined in international markets.

Sheffield already has in place a number of conditional offtake agreements with proposed customers. The price that Sheffield will receive for the supply of mineral sands products under those offtake agreements will be determined predominantly through periodic pricing negotiations. The offtake agreements have a fall-back position if the parties cannot agree on a negotiated price – in most instances, referring to industry prices as published or determined by TZ Minerals International Pty Ltd ("TZMI"). Accordingly, Sheffield's revenues are directly affected by fluctuations in price, and its ability to maintain its pricing position through those negotiations (including having regard to applicable developments in commodity prices generally). For the reasons mentioned above, Sheffield can give no assurances

as to the prices it will achieve for any of its mineral sands products in the future. Any extended or prolonged decrease in the prices for mineral sands (particularly zircon and ilmenite) could have a material adverse effect on the results of the Project's operations and could make the development or operation of the Project uneconomic.

1.4 Supply risk and competition

The mineral sands industry is a concentrated market with a relatively small number of large producers dominating the market, coupled with a variety of much smaller producers.

According to analysis undertaken by TZMI, the mineral sands industry is expected to see a sustained curtailment in supply, particularly within the zircon sector, for the foreseeable future. However, there is no certainty that such supply shortages will exist in the future.

Sheffield competes with other mineral sands producers on the basis of price, quality and reliability of delivery. Sheffield's main competitors include major international mineral exploration and mining companies, such as Richards Bay Minerals, Rio Tinto QIT Fer et Titane Inc, Tronox, Iluka and Lomon Billions. These competitors are well established and have significantly greater financial resources than Sheffield. In addition, consolidation among any of Sheffield's competitors could enhance their business, financial resources, competitive position or ability to bring resources from development projects to market faster than Sheffield.

Discoveries by others of large mineral sands deposits or the development or expansion of projects undertaken by Sheffield's competitors, including those capable of establishing very large projects or those capable of completing projects more quickly than Sheffield, could create a material increase or oversupply in the market and a significant market imbalance. In addition, Sheffield's own actions in developing the Project are expected to increase supply and may have an impact on prices. Sheffield can give no assurances that there will not be an oversupply of its products, particularly zircon and ilmenite. Any oversupply of mineral sands could have a material adverse effect on mineral sands prices and therefore the results of the Project's operations.

Sheffield also faces competition from smaller mineral sands producers that operate in countries where labour and other costs are lower than in Australia, such as Indonesia. If Sheffield is unable to successfully compete in the markets in which it operates or is unable to establish a competitive position, this could have a material adverse effect on its business, financial condition and results of its future operations.

1.5 Demand risk

A sustained reduction in demand for mineral sands would reduce Sheffield's market and adversely affect prices.

Sheffield can give no assurances that there will be sufficient demand for its mineral sands products following the commencement of production at the Project. In addition, it is possible that substitutes to Sheffield's mineral sands products could be developed. If technological change resulted in affordable alternatives to Sheffield's products and Sheffield's offtake partners and/or targeted future customers switched to use of the alternative, demand for Sheffield's products could fall. Any substantial or extended decrease in demand for Sheffield's mineral sands products could have a material adverse effect the Project's operations and could make the development or operation of the Project uneconomic.

1.6 Title risk

Interests in tenements in Australia are governed by applicable State-based legislation and are evidenced by the granting of licences or leases. Each licence or lease is for a specific term and carries with it annual expenditure and reporting commitments, as well as other terms and conditions. Consequently, there is a risk that Sheffield could lose title to or its interest in its tenements, including the tenements comprising the Project, if any conditions are not met or (for example) if insufficient funds are available to meet expenditure commitments.

All of the tenements in which Sheffield has or may (in the future) have an interest, including the tenements comprising the Project, will be subject to renewal in accordance with their terms of grant. Such renewals are or will be at the discretion of the relevant government bodies and ministries in the jurisdiction, and often depend on Sheffield being

successful in obtaining other required statutory approvals for its proposed activities. There is no assurance that such renewals or subsequent grants will be made, or that they will be granted or renewed without different or further conditions attached. If any of the tenements are not renewed for any reason, Sheffield may suffer loss (including through loss of opportunity to develop) and its financial position and performance may be materially adversely impacted as a result or otherwise.

1.7 Regulatory risk

The proposed operations of Sheffield at the Project will be subject to various Federal, State and local laws and policies, including (but not limited to) those relating to prospecting, development, mining, permit and licence requirements, industrial relations, environment, land use and access, royalties, water, native title and cultural heritage, mine safety and occupational health. Approvals, licences and permits required to comply with such laws and policies may, in some instances, be subject to the discretion of the applicable government or government officials, and, in some cases, the local community or other stakeholders. No assurance can be given that Sheffield will be successful in obtaining any or all of the various approvals, licences and permits or maintaining such authorisations in full force and effect without modification or revocation. To the extent such authorisations are required and not obtained or retained in a timely manner or at all, Sheffield may be curtailed or prohibited from continuing or proceeding with development, mining and/or exploration activities (at the Project or otherwise).

Mining development and operations can be subject to public and political opposition. Opposition may include legal challenges to exploration, development and mining permits, political and public advocacy, electoral strategies, ballot initiatives, media and public outreach campaigns and protest activity, all of which may delay or halt development, operations or expansion. For example, native title claimants (or determined native title holders) may oppose the validity or grant of existing or future tenements held by Sheffield in Australia, which may potentially impact Sheffield's future operations and plans. For tenements in Australia (that may be subject to registered native title claims or determinations) to be validly granted (or renewed), there are established statutory regimes that will need to be followed in connection with those grants (or renewals).

1.8 Contract and counterparty risk

As mentioned elsewhere in this announcement, Sheffield has contracts with various counterparties with respect to the sale of Stage 1 product from the Project. There is no guarantee that Sheffield will be able to reach agreement on terms satisfactory to it for the sale of product not presently contracted. If Sheffield cannot reach agreement on satisfactory terms, this may have an adverse effect on Sheffield's future revenues.

Sheffield will rely on a contracted customer base to generate its revenue. Such exposure will be increased if Sheffield markets to customers in developing countries. If key customers default, exercise termination rights, cease dealing with Sheffield or reduce their demand for Sheffield's product once it has commenced mining, the ability of Sheffield to generate revenue from the Project may be adversely impacted (unless Sheffield is able to find and agree terms with replacement customers), and there can be no guarantee that Sheffield would be able to recover the full amount of any loss through legal action.

However, Sheffield has commercial practices in place designed to ensure that contracts for the sale of products are entered into with customers with an appropriate credit history or rating – or that otherwise have provided guarantees in the form of irrevocable letters of credit or parent company guarantees from parent companies which have an appropriate credit rating.

Additionally, a number of material contracts, including a mining services agreement, a gas supply agreement, and certain downstream power and gas arrangements, are currently being negotiated between Sheffield and the applicable proposed counterparties. There is a risk that these contracts will not be agreed, or will be agreed only on terms that are less favourable to Sheffield than anticipated, which could have a material adverse effect on Sheffield's financial and operational performance.

1.9 Key contractors

Sheffield has appointed GRES as its EPC contractor, and is currently using, and will in the future use, other external contractors or service providers for many of its activities, including mining services. As such, the failure of any current or proposed contractors, subcontractors appointed by its current or proposed contractors or other service providers to perform their contractual obligations may negatively impact the business of Sheffield. Whilst Sheffield has selected its appointed key contractors carefully and with suitable regard to their performance and delivery track record,

Sheffield cannot guarantee that such parties will ultimately fulfil their contractual obligations and there is no guarantee that Sheffield would be successful in enforcing any of its contractual rights through legal action. Disagreements between Sheffield and key contractors or a failure of a key contractor to adequately manage a project poses a further risk of financial loss or legal or other disputes. Further, the insolvency or managerial failure by any such contractors or other service providers may pose a significant risk to Sheffield's future operating and financial performance and financial position.

1.10 Reliance on key personnel

Sheffield is dependent on the experience, skills and knowledge of its senior management team and key employees, including to manage the day-to-day requirements of its business. Such senior managers and key employees provide expertise and experience in the implementation of its strategy, and are important to Sheffield's ability to carry out its business and to attract and maintain key relationships. The loss of any of Sheffield's existing senior management or key employees, or the inability to recruit relevant staff, as needed, may cause a significant disruption to Sheffield and adversely affect Sheffield's business, cash flow, financial condition and results of its proposed operations at the Project.

In addition, Sheffield's proposed Project is located in a relatively remote area where lack of access to skilled labour could be an issue. Any inability by Sheffield or its key contractors to obtain skilled workers when required could have a material adverse effect on Sheffield's business, financial condition and future results of operations.

1.11 Interest rate risk

The interest on Sheffield's debt facilities includes fixed and floating interest rates.

Up to US$75 million of debt will have an interest rate based on LIBOR plus a margin. Accordingly, any significant or sustained increase in LIBOR may have a material adverse effect on Sheffield.

Up to US$100 million of debt will have a fixed interest rate. Subject to Sheffield and NAIF entering into definitive agreements in respect of the NAIF Facilities, up to A$95 million of debt will have a concessional interest rate at commencement, that may be subject to step-ups to bring it in line with commercial rates after a fixed period of time has elapsed or (if earlier) the Stage 1 development for the Project has completed if certain interest cover ratios hurdles are exceeded, or at any time if Sheffield materially breaches certain obligations.

1.12 Taurus royalty risk

If certain default events occur under the Taurus royalty deed (including, amongst others, non-payment or breach of other obligations by Sheffield under the royalty deed), each royalty holder has an option to terminate future royalty obligations that are owing to it and instead demand a termination payment from Sheffield. In order to constitute a trigger for a termination payment, such default event must also remain un-remedied for at least 6 months and the default event must be likely to have a material adverse effect on Sheffield or the value of the royalty or likely to cause material loss to the royalty holder.

If a termination payment is demanded, it will be calculated by reference to the projected value of the remaining royalty payments. The amount of any such termination payment may be significant and therefore any requirement for Sheffield to pay this amount may have a material adverse effect on Sheffield's financial position and performance, and Sheffield may be required to source additional debt or equity funding to meet its obligation to pay the termination payment, and there can be no assurance that any such funding would be available to Sheffield or that it would be available on terms that are acceptable to Sheffield.

1.13 Reserves and resources

Sheffield's JORC Code-compliant ore reserves ("Ore Reserves") and mineral resources ("Mineral Resources") for the Project are expressions of judgement based on industry practice, experience and knowledge and are estimates only. Estimates of Ore Reserves and Mineral Resources are necessarily imprecise and depend to some extent on interpretations which may prove inaccurate. No assurance can be given that the estimated Ore Reserves and Mineral Resources are accurate or that the indicated level of zircon, ilmenite or any other mineral will be produced. Such estimates are, in large part, based on interpretations of geological data obtained from drill holes, and geological testing and sampling techniques. Actual mineralisation or geological conditions may be different from those predicted. Furthermore, no assurance can be given that any or all of Sheffield's Mineral Resources constitute or will be converted into Ore Reserves.

Actual Ore Reserves and Mineral Resources may differ from those estimated, which could have a positive or negative effect on Sheffield's financial performance. Commodity price fluctuations as well as increased production and capital costs may render Sheffield's Ore Reserves unprofitable to develop at a particular site or sites for periods of time or may render Ore Reserves containing relatively lower grade mineralisation uneconomic. Estimated Ore Reserves may have to be recalculated based on actual production experience. Any of these factors may require Sheffield to reduce its respective Ore Reserves and Mineral Resources, which could have a negative impact on Sheffield's financial results and the expected operating life of the Project.

1.14 Operational risks

Sheffield's proposed operations at the Project following the commencement of production may be affected by various factors, including (but not limited to):

- failure to locate or identify mineral deposits;
- failure to achieve expected grades in exploration and mining;
- unanticipated operational and technical difficulties encountered in mining and production activities;
- difficulties in commissioning and operating plant and equipment;
- mechanical failure of operating plant and equipment;
- interruption or loss of power, fuel or spare parts;
- unanticipated metallurgical problems which may affect extraction costs;
- seasonal weather patterns, storms, heavy rains and floods, bushfires, high winds and cyclone activity and other natural disasters;
- industrial and environmental accidents, industrial disputes, work stoppages and other events;
- the level of experience of the workforce;
- unexpected shortages or increases in the costs of labour, consumables, spare parts, plant and equipment and certain commodities necessary to Sheffield's proposed mining process (such as water, fuel, gas and electricity);
- inability to obtain necessary consents or approvals;
- increased or unexpected reclamation and rehabilitation costs;
- health and safety risks; and
- changes to applicable laws and regulations.

The occurrence of any of these circumstances could result in Sheffield not realising its development, commissioning or operational plans, or such plans costing more than expected or taking longer to realise than expected. Any of these outcomes could have a material adverse effect on the Project's (and therefore Sheffield's) financial and future operational performance.

1.15 Infrastructure, transportation and remoteness of operations

The product from the Project will need to be to be transported to customers internationally. Each stage of the transportation process poses risks, including, as a result of the remoteness of the Project. Fuel costs, unexpected delays and accidents could materially impact Sheffield's financial position. Further, there are risks associated with the availability of adequate trucking and port facilities and the process for obtaining approvals to access these facilities (including the timing and conditions on which access may be granted). If Sheffield is not able to access the

required infrastructure within a certain time period or at a reasonable cost, this could adversely affect Sheffield's proposed operations and financial performance. The price of sea freight, smelting and refining charges are market driven and can vary throughout the life of the Project. These will also impact on the overall profitability of Sheffield.

1.16 Native title

In relation to tenements in which Sheffield has an interest or will in the future acquire such an interest (including through a tenement application and grant process), there may be areas over which native title rights exist, or are found to exist in the future. If native title rights do exist, the ability of Sheffield to gain access to tenements (through obtaining consent of any relevant landowner), or to progress from the exploration phase to the development and mining phases of operations may be adversely affected. Sheffield has entered into a native title agreement covering the grant of M04/459 and associated activities with the Mount Jowlaenga #2 People ("Mining Agreement"), and a separate native title agreement covering the grant of L04/82 and L04/83 and associated activities with the Walalakoo Aboriginal Corporation on behalf of the Nyikina Mangala People ("Infrastructure Agreement") (together, the "Agreements"). The Agreements cover future renewals or replacements of M04/459, L04/82 and L04/83, but do not otherwise cover the grant of other tenure.

Where native title rights may or do exist, Sheffield cannot do anything that may affect native title without first complying with the applicable procedural provision of the *Native Title Act 1993* (Cth) **(NTA)** (otherwise, the relevant "act" will be invalid as it affects native title (eg, the grant of a new tenement)). Where native title rights may or do exist, and Sheffield applies for the grant of new tenements by the State that may affect native title (eg mining leases, prospecting licences, miscellaneous licence), the State may be unable or unwilling to grant the tenure until the relevant NTA procedural requirement has been discharged. However, once the NTA procedural requirement has been discharged and the tenement validly granted to it, Sheffield can then exercise its rights pursuant to those tenements. Where Sheffield acquires (or already holds) an existing interest, that interest will only be valid (from an NTA perspective) if – when it was granted or last renewed, if applicable – the relevant NTA procedural requirement was complied with. Under the Agreements, the respective native title groups have agreed not to challenge the validity of M04/459, L04/82 and L04/83.

For various reasons, Sheffield may elect to negotiate and enter into an agreement with native title claimants or determined native title holders (such as the Agreements referred to above). Such agreements often go beyond native title consents, and can cover matters such as cultural heritage, environmental approvals, monitoring, the payment of compensation, etc. Should agreements be reached, those agreements may be extensive and costly to perform, depending on the outcome of negotiations.

The Agreements referred to above cover a number of significant matters aside from the grant of tenure, including among other things cultural heritage matters, environmental matters, employment and training opportunities, business development and contracting opportunities, and the payment of compensation.

Where Sheffield is entering into a contractual agreement with a native title claim group (that have not had their claim determined), there is always a risk that a competing native title claim may be filed that overlaps the existing claim. If that new/overlapping claim meets the NNTT's registration test (as set out in the NTA), the applicable procedural requirements of the NTA (eg for the grant of new tenure), would need to be discharged in respect of both claims. Where Sheffield has an agreement with one claim group, but not the other, Sheffield will not have the benefit of the contractual consents from the new/overlapping group, which may cause significant costs and delays (eg to the grant of the proposed tenement). This could potentially apply in relation to the Mining Agreement with the Mount Jowlaenga #2 People, although the grant of M04/459 has already been secured. This would not apply to the Infrastructure Agreement with the Walalakoo Aboriginal Corporation, as the relevant native title claim has already been determined.

1.17 Aboriginal heritage

In Western Australia, the *Aboriginal Heritage Act 1972* (WA) ("AHA") protects Aboriginal remains, relics and ethnographic sites from undue interference. The AHA makes it an offence for any person to excavate, destroy, damage, conceal or in any way alter any "Aboriginal site" without authorisation from the Registrar of Aboriginal Sites or the consent of the Minister for Aboriginal Affairs.

The *Aboriginal and Torres Strait Islander Heritage Protection Act 1984* (Cth) ("HPA") provides for the preservation and protection of "significant Aboriginal areas" and "significant Aboriginal objects" throughout Australia which are of particular significance to Aboriginal persons in accordance with Aboriginal custom. The HPA does not provide blanket protection to any area or object that meets the statutory requirements (unlike the AHA). Protection is instead afforded to an area or object when the Minister or an "authorised officer" makes a declaration in respect of that area or object upon an application by an Aboriginal person. Such a declaration has the effect of prohibiting injury to, or the desecration of, the relevant "area" or "object" specified in the declaration.

Although there is a State register of known Aboriginal sites maintained by the Department of Planning, Lands and Heritage, it is not comprehensive and Aboriginal sites are protected whether or not they have been identified on the register. Agreements negotiated with traditional owners in relation to heritage, and processes associated with identifying (and seeking statutory consents to impact, where available) Aboriginal heritage sites, could have a material adverse effect on Sheffield's business, financial condition or results of its future operations.
The Agreements contain processes for conducting heritage surveys for proposed activities, which are ultimately either 'cleared' or not 'cleared' by the relevant native title group. There are some carve-outs under the Agreements for certain activities conducted within certain areas which are taken to be cleared as a result of previous surveys.

In relation to the Project, there is some level of risk that the relevant native title groups may refuse to clear proposed activities on M04/459, L04/82 or L04/83 under the Agreements so that they cannot proceed. However, no Aboriginal sites are known to exist following extensive surveying spanning several years. This assists in reducing the likelihood of material heritage issues being raised including as part of surveys conducted under the Agreements.

1.18 Environmental risks

Mining and exploration can be potentially environmentally hazardous, giving rise to potentially substantial costs associated with environmental rehabilitation, damage control and other losses. Sheffield is subject to State and Federal environmental laws and regulations in connection with Sheffield's activities and intended operations at the Project. There is a risk of environmental damage arising from Sheffield's proposed operations, including through accident, which may give rise to liabilities and costs for Sheffield. As a result, Sheffield could be subject to liabilities and the potential for its proposed Project operations to be delayed, suspended or shut down due to risks inherent in its activities, including as a result of unforeseen circumstances or events.

Additionally, environmental laws and regulations are increasingly evolving to require stricter standards and enforcement behaviours, increased fines and penalties for non-compliance, more stringent environmental assessments of proposed projects and a heightened degree of responsibility (and liability) for companies and their officers, directors and employees. Changes in environmental laws and regulations deal with air quality, water and noise pollution and other discharges of materials into the environment, plant and wildlife protection, the reclamation and restoration of mining properties, greenhouse gas emissions, the storage, treatment and disposal of wastes, the effects of mining on the water table and groundwater quality. Changes in environmental legislation could increase the cost of Sheffield's exploration, development and mining activities or delay or preclude those activities altogether.

1.19 Water sources

Sheffield's proposed mining process will require significant amounts of water. Climate-related changes to precipitation patterns in Australia could exacerbate water stress in some areas and therefore potentially have a negative impact on Sheffield's ability to access fresh water and process ore at its Project.

Sheffield is seeking to extract water from bore fields within the Project site to access the Broome aquifer. Total extraction of the aquifer is immaterial relative to its size and hydrological structure. Notwithstanding this, where water shortages are present, the effects of changes in rainfall patterns, water allocations and storm patterns and intensities may adversely impact the cost, production and financial performance of Sheffield's future operations, as well as its ability to mine certain deposits in future.

2. GENERAL RISKS

2.1 Market conditions

There are general risks associated with investments in equity capital. The trading price of Sheffield shares may fluctuate with movements in equity capital markets in Australia and internationally and may also be influenced by a number of factors, some of which are specific to Sheffield and its proposed operations and some of which affect listed companies generally. Generally applicable factors which may affect the market price of shares include:

- general movements in Australian and international stock markets;
- changes in investor sentiment toward particular market sectors;
- general Australian and international economic conditions and outlook;
- changes in interest rates and the rate of inflation;
- the demand for, and supply of, capital;
- changes in government regulation and policies;
- announcement of new technologies; and
- geo-political instability, including international hostilities and acts of terrorism.

The market price of shares can fall as well as rise and may be subject to varied and unpredictable influences on the market for equities in general and resource stocks in particular.

2.2 Liquidity risk

There can be no guarantee that there will always be an active market for Sheffield's shares or that the price of Sheffield's shares will increase. There may be relatively few buyers or sellers of shares on ASX at any given time, and the demand for Sheffield shares specifically is subject to various factors, many of which are beyond Sheffield's control. This may affect the stability or volatility of the market price of Sheffield shares, and may also affect the prevailing market price at which Sheffield shareholders are able to sell their Sheffield shares at any given time.

2.3 Taxation

Future changes in taxation law, including changes in the interpretation or application of the law by the courts or taxation authorities, may affect taxation treatment of an investment in Sheffield shares or the holding and disposal of those shares. Further, changes in tax law, or changes in the way tax law is expected to be interpreted, in the various jurisdictions in which Sheffield operates, may impact the future tax liabilities and performance of Sheffield.

2.4 Litigation

As at the date of this announcement, Sheffield is not aware of any material disputes or litigation with respect to it or its activities. However, like any company operating in the resources sector, it is possible that Sheffield may be involved in disputes and litigation in the course of its future operations. There is a risk that any material or costly dispute or litigation (including any compensation or damages ultimately payable by Sheffield) could adversely impact the financial position or performance of Sheffield.

Thunderbird Mineral Sands Project

Bankable Feasibility Study Update

Summary Outcomes

31 July 2019

Notice and Disclaimer

IMPORTANT: You must read the following in conjunction with this Bankable Feasibility Study Update (BFSU).

Summary information in relation to Sheffield

This BFSU contains summary information about Sheffield Resources Limited (ACN 125 811 083) (Company or Sheffield), its subsidiaries and their activities which is current as at the date of this BFSU, unless otherwise indicated. The information in this BFSU remains subject to change without notice, and Sheffield is not responsible for updating, nor does it undertake to update, it. This BFSU should be read in conjunction with Sheffield's periodic and continuous disclosure announcements lodged with the Australian Securities Exchange (ASX), which are available at http://www.sheffieldresources.com.au/irm/content/asx-announcements1.aspx?RID=398 or www.asx.com.au.

This BFSU should also be read in conjunction with the risks disclosed in Sheffield's ASX announcement released on 10 December 2018.

Industry data

Certain market and industry data used in connection with or referenced in this BFSU, including in relation to other companies in Sheffield's peer group, may have been obtained from public filings, research, surveys or studies made or conducted by third parties, including as published in industry-specific or general publications. Neither Sheffield or their respective representatives have independently verified any such market or industry data.

Compliance Statements

Information and documentation which forms the basis of the Thunderbird BFS and BFSU in relation to Mineral Resources, Ore Reserves and metallurgy and process design has previously been reported as detailed below. The Company confirms that it is not aware of any new information or data that materially affects the information included in the relevant market announcements and, in the case of the July 2016 Thunderbird Mineral Resources and the July 2019 Thunderbird Ore Reserve, that all material assumptions and technical parameters underpinning the estimates in the relevant market announcement continue to apply and have not materially changed. In the case of the announcement entitled "BFS Update Materially Improves Project Economics" dated 31 July 2019, the Company confirms that all material assumptions underpinning any production target and any forecast financial information derived from any production target that is disclosed in this announcement continue to apply and have not materially changed. The Company confirms that the form and context of the Competent Person's findings are presented and have not been materially modified from the original market announcements.

Estimates of Mineral Resources and Ore Reserves and exploration results

This BFSU contains estimates of Sheffield's Ore Reserve and Mineral Resources and information that relates to exploration results.

The Mineral Resources and Ore Reserves of Sheffield have been extracted from Sheffield's ASX releases;

"BFS UPDATE MATERIALLY IMPROVES PROJECT ECONOMICS" 31 July 2019

"THUNDERBIRD ORE RESERVE UPDATE" 31 July 2019

"HIGH GRADE MAIDEN MINERAL RESOURCE AT NIGHT TRAIN" 31 January 2019

"MINERAL RESOURCE AND ORE RESERVE STATEMENT" 3 October 2018

"THUNDERBIRD ORE RESERVE UPDATE" 16 March 2017

"SHEFFIELD DOUBLES MEASURED MINERAL RESOURCE AT THUNDERBIRD" 5 July 2016

The exploration results have been extracted from Sheffield's ASX releases;

"NEW LARGE HIGH GRADE DISCOVERY SOUTH OF THUNDERBIRD" 13 November 2018

"EXCEPTIONAL RESULTS CONFIRM MAJOR DISCOVERY AT NIGHT TRAIN" 9 October 2018

A copy of these announcements is available at http://www.sheffieldresources.com.au/irm/content/asx-announcements1.aspx?RID=398 or www.asx.com.au.

Bankable Feasibility Study ("BFS")

This BFSU contains information that relates to a Bankable Feasibility Study. This information was extracted from the following ASX releases by Sheffield:

THUNDERBIRD BFS DELIVERS OUTSTANDING RESULTS" 24 March, 2017

Other Extracted Information

In addition to those ASX releases referred to above, this BFSU contains information extracted from the following ASX releases:

"SHEFFIELD SIGNS BINDING PRIMARY ILMENITE OFFTAKE AGREEMENT" 1 July 2019

"ADDITIONAL BINDING ZIRCON CONCENTRATE OFFTAKE AGREEMENT SIGNED" 22 July 2019"

"SHEFFIELD SECURES THUNDERBIRD LNG SUPPLY AGREEMENT" 22 January 2019

"SHEFFIELD SIGNS TAURUS DEBT FACILITY AND EPC CONTRACT" 12 November 2018

"FEDERAL ENVIRONMENTAL APPROVAL GRANTED FOR THUNDERBIRD" 28 September 2018

"NAIF APPROVES LOAN FACILITIES TOTALLING A$95M" 19 September 2018

"FAVOURABLE NATIONAL NATIVE TITLE TRIBUNAL OUTCOME" 28 August 2018

"GRANT OF MISCELLANEOUS LICENCES" 27 June 2018

"ADDITIONAL BINDING OFFTAKE SIGNED" 1 February 2018

"BINDING ZIRCON CONCENTRATE OFFTAKE AGREEMENT SIGNED" 12 December 2017

"SHEFFIELD ANNOUNCES EPC PREFERRED CONTRACTOR" 19 October 2017

"EPA RECOMMENDS APPROVAL OF THUNDERBIRD" 9 October 2017

"SHEFFIELD SIGNS MAIDEN BINDING OFFTAKE AGREEMENT" 12 September 2017

"SHEFFIELD SIGNS CORNERSTONE ILMENITE MOU" 29 May 2017

"ADDITIONAL ZIRCON OFFTAKE MOU SIGNED" 10 April, 2017

"QUARTERLY ACTIVITIES REPORT" and "QUARTERLY CASHFLOW REPORT" 30 April 2019

"QUARTERLY ACTIVITIES REPORT" and "QUARTERLY CASHFLOW REPORT" 31 July 2019

"NATIVE TITLE AGREEMENT SIGNED BY TRADITIONAL OWNERS" 1 November 2018

"MINING LEASE GRANTED OVER THUNDERBIRD MINERAL SANDS PROJECT" 26 September 2018

"NATIVE TITLE UPDATE: SHEFFIELD SIGNS CO-EXISTENCE AGREEMENT" 10 September 2018

"STATE MINISTER FOR ENVIRONMENT APPROVES THUNDERBIRD MINERAL SANDS PROJECT" 13 August 2018

"MAIDEN BINDING ILMENITE OFFTAKE AGREEMENT" 21 June 2018

"BINDING OFFTAKE AGREEMENTS EXCEED 50% OF STG 1 REVENUE" 22 December 2017

"COMMENCEMENT OF EARLY WORKS AND TRAINING PROGRAM" 4 December 2017

"SHEFFIELD MANDATES TAURUS FOR US$200M DEBT FACILITY' 18 October 2017

"SHEFFIELD SECURES SECOND BINDING OFFTAKE AGREEMENT" 25 September 2017

"SHEFFIELD LAUNCHES ABORIGINAL EMPLOYMENT PROGRAM" 17 August 2017

"SHEFFIELD SECURES FURTHER ZIRCON OFFTAKE MOUs" 26 April 2017

"THUNDERBIRD ILMENITE EXCEEDS PREMIUM SPECIFICATION" 13 March 2017

The Company confirms that it is not aware of any new information or data that materially affects the information included in the relevant market announcements and, in the case of estimates of Mineral Resources and Ore Reserves, that all material assumptions and technical parameters underpinning the estimates in the relevant market announcement 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 market announcements.

Notice and Disclaimer

Not financial product advice

This Bankable Feasibility Study Update (BFSU), and the information provided in it, does not constitute, and is not intended to constitute, investment or financial product advice (nor tax, accounting or legal advice). This BFSU should not be relied upon as advice to investors or potential investors and has been prepared without taking account of any person's individual investment objectives, financial situation or particular needs. Any investment decision should be made based solely upon appropriate due diligence. Before making an investment decision, prospective investors should consider the appropriateness of the information having regard to their own investment objectives, financial situation and needs and seek legal, accounting and taxation advice appropriate to their jurisdiction. Recipients of this BFSU are advised to consult their own professional advisers. An investment in any listed company, including Sheffield, is subject to significant risks, both known and unknown and including (without limitation) risks of loss of income and capital. A number of risks are beyond the control of Sheffield.

Effect of rounding

A number of figures, amounts, percentages, estimates, calculations of value and fractions in this BFSU are subject to the effect of rounding. Accordingly, the actual calculation of these figures may differ from the figures set out in this BFSU.

Financial data

All currency amounts are in Australian Dollars ($ or A$) unless otherwise stated.

Future performance, forward-looking statements and key risks

This document is to be read in conjunction with the information contained in Appendices and the the BFSU announcement and the Ore Reserve announcement of 31 July 2019.

This BFSU contains certain "forward-looking statements". Forward-looking statements can generally be identified by the use of forward looking words such as "forecast", "likely", "believe", "future", "project", "opinion", "guidance", "should", "could", "target", "propose", "to be", "foresee", "aim", "may", "will", "expect", "intend", "plan", "estimate", "anticipate", "continue", "indicative" and "guidance", and other similar words and expressions, which may include, without limitation, statements regarding plans, strategies and objectives of management, anticipated production dates, expected costs or production outputs for the Company, based on (among other things) its estimates of future production of the Thunderbird Project and the future operation of Sheffield and the Thunderbird Project.

To the extent that this BFSU contains forward-looking information (including forward-looking statements, opinions or estimates), the forward-looking information is subject to a number of risk factors, including those generally associated with the mineral sands industry. Any such forward-looking statement also inherently involves known and unknown risks, uncertainties and other factors that may cause actual results, performance and achievements to be materially greater or less than estimated. These factors may include, but are not limited to, changes in commodity prices, foreign exchange fluctuations, general economic and share market conditions, increased costs and demand for production inputs, the speculative nature of exploration and project development (including the risks of obtaining necessary licenses and permits and diminishing quantities or grades of reserves), changes to the regulatory framework within which the Company operates or may in the future operate, environmental conditions including extreme weather conditions, geological and geotechnical events, and environmental issues, and the recruitment and retention of key personnel.

Any forward-looking statements are also based on assumptions and contingencies which are subject to change without notice and which may ultimately prove to be materially incorrect, as are statements about market and industry trends, which are based on interpretations of current market conditions. Investors should consider the forward-looking statements contained in this BFSU in light of those disclosures and not place reliance on such statements. The forward-looking statements in this BFSU are not guarantees or predictions of future performance and may involve significant elements of subjective judgment, assumptions as to future events that may not be correct, known and unknown risks, uncertainties and other factors, many of which are outside the control of Sheffield. As a result, there can be no assurance that actual outcomes will not materially differ from these forward-looking statements. The forward-looking statements are based on information available to Sheffield as at the date of this BFSU. Except as required by law or regulation, Sheffield undertakes no obligation to provide any additional or updated information or update any forward-looking statements, whether as a result of new information, future events or results or otherwise.

Indications of, and guidance on, future performance are also forward-looking statements, and include statements in this BFSU regarding anticipated mine life, expected or indicative costs, indicative revenues, indicative production outputs and anticipated production dates. To the maximum extent permitted by law, Sheffield, and its respective directors, officers, employees, advisers, agents and intermediaries (together, "Relevant Parties") disclaim any obligation or undertaking to release any updates or revisions to the information to reflect any change in expectations or assumptions, or any change in events, conditions or circumstances on which any such information or statement is based. Nothing in this BFSU will, under any circumstances (including by reason of this BFSU remaining available and not being superseded or replaced by any other BFSU or publication with respect to Sheffield or the subject matter of this BFSU), create an implication that there has been no change in the affairs of Sheffield since the date of this BFSU.

To the maximum extent permitted by law, the Relevant Parties make no representation or warranty (express or implied) as to the fairness, accuracy, reliability, currency, reasonableness or completeness of the contents of this BFSU or any other information (whether written or verbal) that the Relevant Parties otherwise provide to the recipient. The recipient may not rely on the contents of the BFSU or any information in it in making any decision to invest or acquire an interest in the Thunderbird Project. To the maximum extent permitted by law, the Relevant Parties are not liable for any direct, indirect or consequential loss or damage suffered (whether foreseeable or not) by any person (whether arising from negligence or otherwise) as a result of relying on this BFSU or the information in it, any errors therein or omissions therefrom, or any other written or oral communications transmitted to the recipient in the course of its evaluation of the Thunderbird Project, or otherwise in connection with this BFSU or the information in it.

Investment risk

As noted above, an investment in Sheffield securities is subject to investment and other known and unknown risks, a number of which are beyond the control of Sheffield. Sheffield (nor its related bodies corporate) does not guarantee any particular rate of return or the performance of the Company or the Thunderbird Project, nor does it guarantee the repayment of capital from Sheffield or any particular tax treatment. Prospective investors should make their own enquiries and investigations regarding all information in this BFSU, including but not limited to the assumptions, uncertainties and contingencies which may affect future operations of Sheffield and the Thunderbird Project and the impact that different future outcomes may have on Sheffield and the Thunderbird Project.

Not an Offer

This BFSU is for information purposes only and does not constitute or form any part of any offer or invitation to sell or issue, or any solicitation of any offer to purchase or subscribe for, any securities in the Company in any jurisdiction. This BFSU and its contents must not be distributed, transmitted or viewed by any person in any jurisdiction where the distribution, transmission or viewing of this document would be unlawful under the securities or other laws of that or any other jurisdiction.

SECTION I

Summary Key BFS Update Outcomes

Thunderbird Bankable Feasibility Study Update

Clear set of objectives - zircon focus, reduce capital, increase production and revenue to deliver meaningful improvements to project financial metrics with reduced risk

Bankable Feasibility Study Update (BFSU) Objectives	• Reduce Stage 1 capital costs • Reduce equity funding gap and maintain approved project debt • Enhance revenue through increased zircon production and binding offtake for 100% of product volume • Deliver meaningful improvement in Project NPV and IRR • Inform operating and financial assumptions with executed and negotiated agreements • Significantly reduce execution risk of construction, commissioning and ramp up • Maintain shovel ready approval status • Engage with key project Stakeholders
Project Shovel Ready Status Since January 2019	• Mining Lease granted and Native Title Agreement executed • State and Federal Environmental Approvals granted • Works Approval received • Executed gas supply agreement with Woodside and EDL • Negotiated key agreements for Catering and Mining Services • Early work completed initial Village accommodation, site communications and access road from highway well advanced • Tier 1 mining jurisdiction

BFS Update Partners.

GR	• Process and non process infrastructure design CAPEX and OPEX cost
Optiro	• Resource Estimation
entech.	• Mining Studies, Mining Cost Estimates and JORC Ore Reserve
ATC Williams	• Tailings Management
IMC ROBBINS	• Bulk Metallurgical test work and analysis
MBS ENVIRONMENTAL	• Environmental Approval and assessments

Thunderbird Bankable Feasibility Study Update

Comparative analysis - BFSU outcomes compared to prior assumptions

Metric	2019 BFSU	Previous Disclosures	Change
Total Funding Requirement	**A$478m**	A$579m[1]	▼ A$101m (17%)
Equity Requirement	**A$143m**	A$251m[1]	▼ A$108m (43%)
Project Capital	**A$392m**	A$463m[1]	▼ A$71m (15%)
Project Revenue	**A$15.1B**	A$13.6B[2]	▲ A$1.57B (11%)
Project operating costs	**A$7.21B**	A$7.63B[2]	▼ A$0.42B (6%)
NPV_{10} pre-tax	**A$1.13B**	A$0.67B[2]	▲ A$0.46B (69%)
NPV_8 post-tax	**A$0.98B**	A$0.62B[2]	▲ A$0.36B (58%)
IRR pre-tax %	**30.1%**	24.9%[2]	▲ 5.2% (21%)
Zircon production (average '000tpa)	**202**	145[2]	▲ 57 (39%)
Offtake	**~100%**	>75%	▲ Full
LTR & Ilmenite Process Circuit	**Not Required**	Included in Stage 1[2]	Removed
Process Rate (t/hr)	**1,085**	788[2]	▲ 297 (38%)
Mine Life	**37 years**	42 years[2]	▼ 5 years (12%)
Long Term Average FX Rate (A$/US$)	**0.75**	0.75[2]	No change
Long Term Zircon Price - FOB (TZMI)	**US$1,469**	US$1,387[2]	▲ US$82 (6%)

- Reduced Stage 1 capital costs
- Reduced remaining equity requirement
- Strong cashflows targeting similar debt capacity
- Roasting and ilmenite circuit removed
- 38% increase to plant capacity and throughput
- 10% increase in Ore Reserve
- Lower unit costs from increased plant throughput
- Shorter mine life & reduced gas consumption from LTR removal
- Offtake secured for ~100% of product revenue Stage 1
- Robust pricing - structural supply shortage for zircon and TiO_2 feedstocks

Reference:
1. ASX Announcement "*Joint Kimberley-Pilbara Regional Forum*" 11 June 2019
2. ASX Announcement "*Thunderbird BFS Delivers Outstanding Results" 24 March 2017*

Staged Approach to Project Development

Staged development to minimise initial capital costs and delivery risk

- The large scale of Thunderbird's ore body allows for multiple stages of development, with shared infrastructure from Stage 1
- As a result, the current execution strategy is planned in two stages of development with the purpose of minimising up front capital and delivery risk whilst still ensuring material scale in Stage 1
- Stage 1 – Single line mining, concentrator and zircon processing process plant and all associated site and port infrastructure
- Stage 2 – Scaled down version of Stage 1 with incremental increase in associated site infrastructure

	Stage 1	Stage 2 (year 5 of operations)
Timing	• Construction ready • First production expected in H2 2021	• Following full ramp up of Stage 1 • First production expected in year 5
Scope	• Mining Unit Plant (MUP), Wet Concentrator Plant (WCP), Zircon Processing Plant (ZPP) • Power, gas storage, port, road and non-process related infrastructure • Accommodation village • All other logistics systems and infrastructure necessary	• Duplication of Stage 1 Mining and Processing Scope • Power station and gas storage increase • Accommodation increase
Total development capital	**A$392m**[1] • Stage 1 direct capital expenditure • Includes long tenor infrastructure and improvement capex supported by NAIF funding	**A$237m** • Sheffield's estimate based on BFS Stage 1 To be confirmed prior to Stage 2 investment decision and implementation • May be funded from internal cash flow and/or refinancing of Stage 1 debt

1. Excludes project finance related funding requirements (cost overrun provision, interest charges during construction and financing fees) of A$86m and corporate overhead costs of $13m during construction

Thunderbird Bankable Feasibility Study Update

Zircon focus, reduce capital, increased revenue and reduced risk

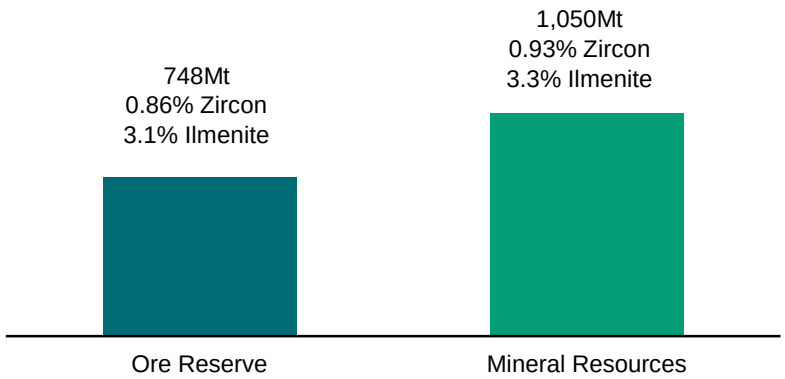
World Class, High Grade Mineral Sands Deposit

- Ore Reserve[1] of 748Mt @ 11.2% HM and >1,050Mt Mineral Resources[1] (>80% in the Measured & Indicated category)
- **Conservative** revenue factor of 0.70 applied to guide the Ore Reserve economic boundary, drives high revenue to cost ratio
- **Among the world's largest and highest grade, zircon rich mineral sand deposits**
- 97% of the first 8 years mining is sourced from the high confidence **Proved** Ore Reserve category
- Mineralisation extends from surface to a maximum known depth of 155m over an area at least 11km by 7km, open at depth

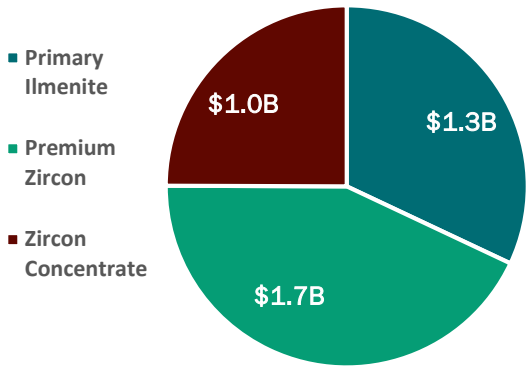
Strong Project Economics and Ratios

- Pre-tax NPV_{10} A$1.13B[2] and IRR 30.1%[2]
- Post-tax NPV_8 A$0.98B[4] and IRR 24.0%[4]
- Stage 1 CAPEX[3] of A$392m
- Stage 2 CAPEX of A$237m
- Strong forecast annual average EBITDA
  - Stage 1 (Year 1 – 4): A$131m
  - Stage 1 and 2 (Year 5 – 10): A$250m
- High confidence average revenue to cost ratio
  - Stage 1 (Year 1 – 4): 2.2:1
  - Stage 1 and 2 (Year 5 – 10): 2.4:1
- Life of Mine forecast revenue = $15.1B
- Assumed Long Term FX Rate (USD:AUD) = 0.75

Thunderbird Ore Reserve and Mineral Resources[1]



Estimated A$ Revenue by Product Stage 1 and 2 (Years 1 – 10)



Commodity Prices ($US FOB)	Stage 1 FY 2022 – 2025	Stage 1 and 2 FY 2026 – 2031	LOM
Premium Zircon	1,520	1,469	1,472
Zircon Concentrate	689	718	723
Primary Ilmenite	102	94	95

1. ASX Announcement dated 31 July 2019 titled *"Thunderbird Ore Reserve Update"* and 5 July 2016 titled *"Sheffield doubles measured Mineral Resource at Thunderbird"*
2. Pre-tax & pre-finance NPV based on 10% WACC. NPV and IRR based project cashflows only (i.e. excludes Sheffield's other project finance related funding requirements)
3. Capex depicts direct capital expenditure only. Excludes other project financing related costs of $86m
4. Post-tax & pre-finance NPV based on 8% WACC. NPV and IRR based project cashflows only (i.e. excludes Sheffield's other project finance related funding requirements)

Thunderbird Bankable Feasibility Study Update

Zircon focus, reduce capital, increased revenue and reduced risk

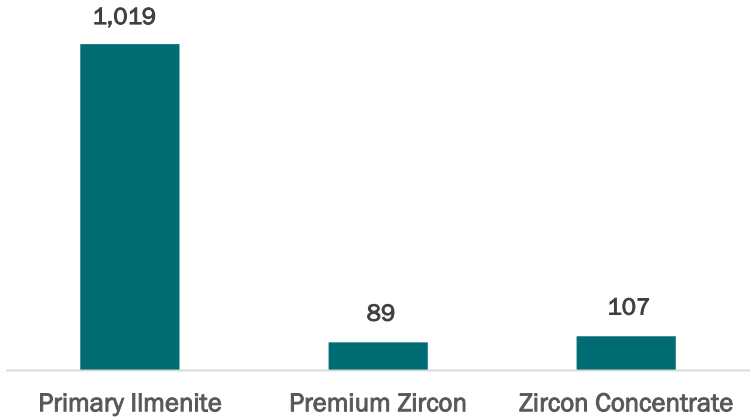
Globally significant Outputs and Project Physicals

- Sheffield aims to be a globally significant **zircon** producer with estimated average production of:
  - Stage 1 (Year 1- 4): 132ktpa
  - Stage 2 (Year 5- 10) 238ktpa
  - LOM Average: 202ktpa
- Dry ore mining and WCP capacity
  - Stage 1 MUP @ 10.4Mtpa and WCP @ 1,085 dry tph
  - Stage 2 MUP @ 20.8Mtpa and WCP @ 2,170 dry tph
- Very low Waste : Ore strip ratio of 0.85:1.0
- Topsoil, waste, over size rehandle and in pit tailing construction by truck and excavator. Total estimated average annual movement:
  - Year 1 – 4 = 7.9Mt waste materials
  - Year 5 - 10 = 21.6Mt waste materials

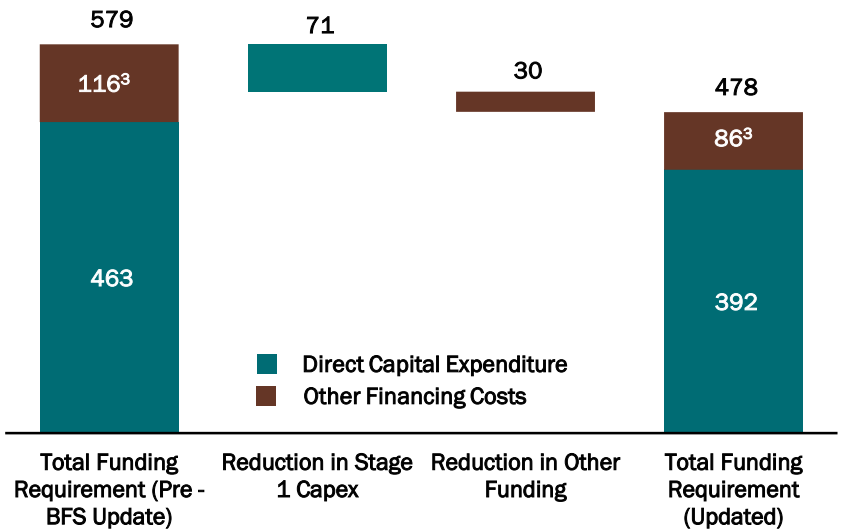
Funding and Pathway to Production

- Total funding requirement reduced by A$101m
- Stage 1 direct project Capex cost of A$392m
- Available debt facilties[1] of US$175m (A$240m[2]) and NAIF facility A$95m
- Estimated remaining equity requirement of A$143m
- Strategic Partner Process continues
- Lender due diligence scheduled for Q3/Q4 2019
- Construction Schedule – 21 months from notice to proceed
- Commissioning – single processing stream, 3 products only, reduced risk
- Targeted First Products – H2 2021

Thunderbird Annual Average Production Years 1 to 10 (ktpa)[2]



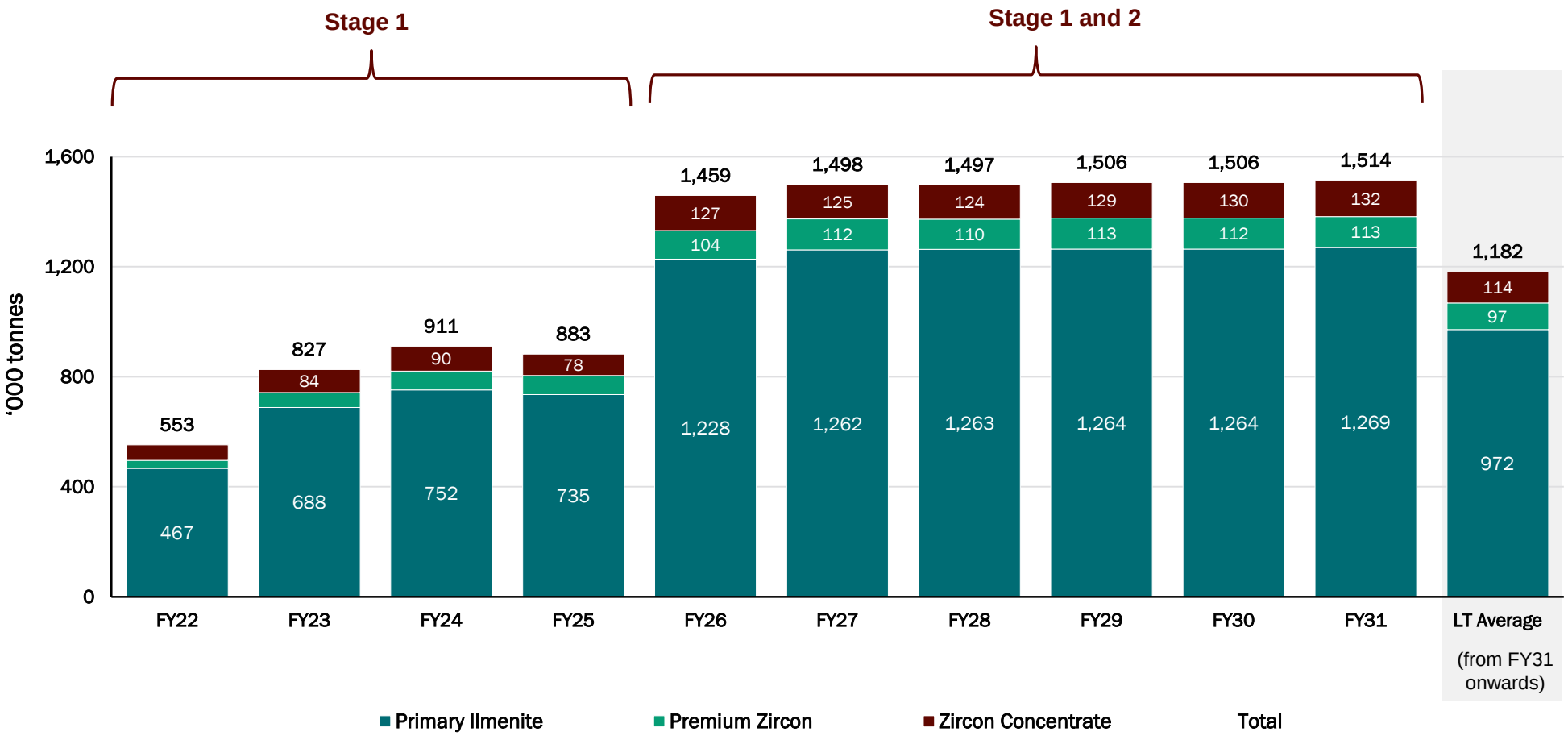
Funding Requirement A$m



1. Subject to financing completion
2. USD:AUD average exchange rate of 0.73
3. Includes cost overrun, interest, working capital, fees, etc

Indicative Mine Schedule

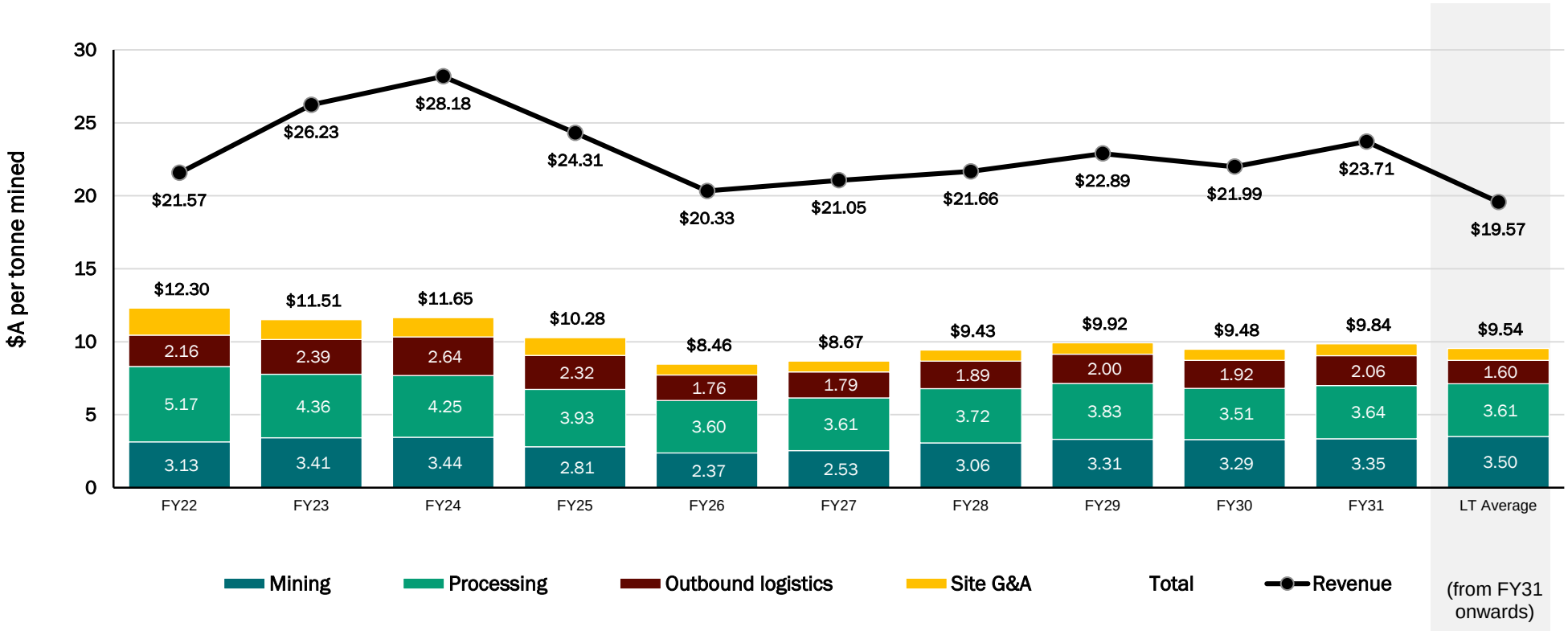
LOM plan to deliver 202ktpa zircon and 961ktpa ilmenite on average over a 37 year mine life



Note:
This page sets out production profile information for Stage 1 and Stage 2 of the Thunderbird Project. Such information is derived from the financial model prepared by Sheffield for Stage 1 and Stage 2 of the Thunderbird Project. The financial model for Stage 2 is based on current Sheffield management estimates, which will be confirmed prior to a Stage 2 investment decision and its implementation. Such estimates are based on, among other things, a detailed mine plan prepared as part of the BFS Update for the life of mine (including Stage 2) and other BFS Update assumptions for Stage 2, which, where relevant, have been adjusted to reflect contractual outcomes and the results of due diligence on Stage 1. Actual volumes produced will be subject to a number of risks and uncertainties and therefore may vary from this current, indicative profile

A Strong Cash Operating Margin

Revenue and Site Cash Costs A$ per tonne of Ore Mined (Production Years)



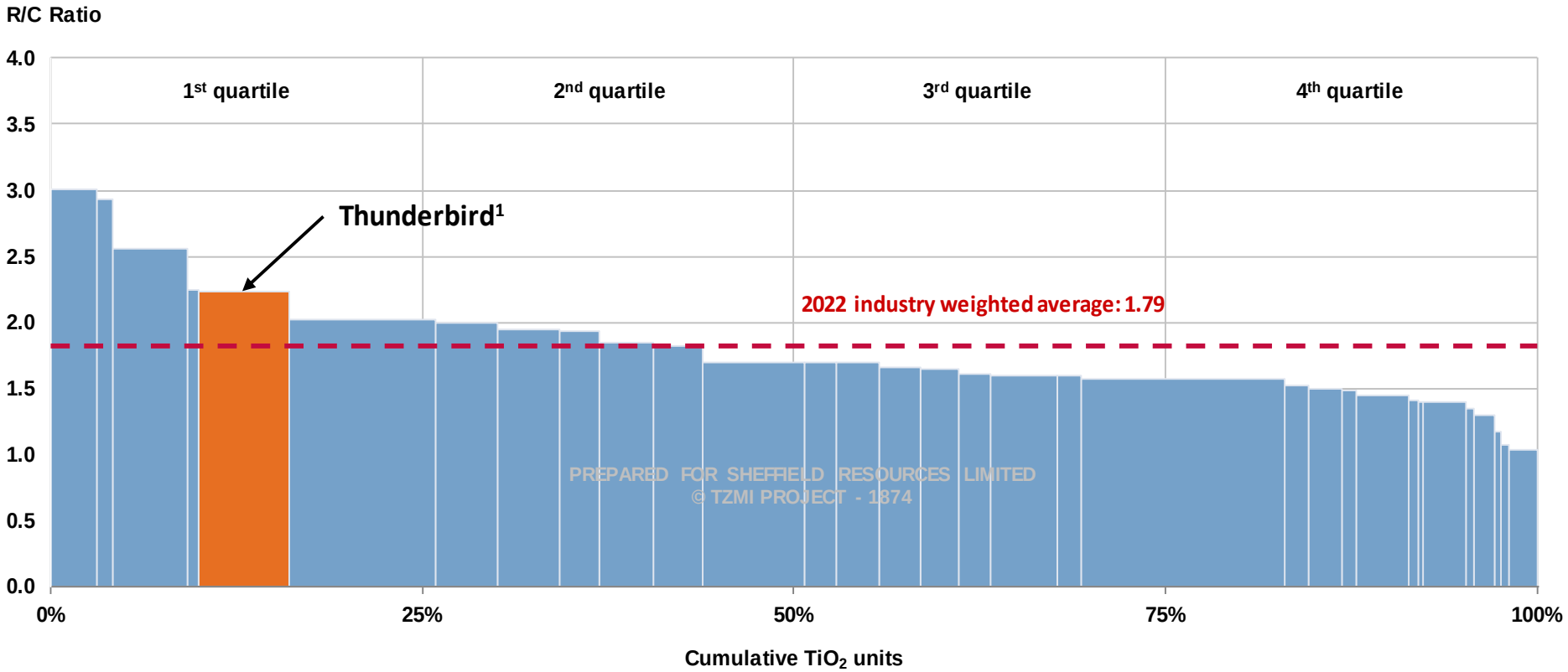
- Very strong cash margin with revenue to cost ratio well above 2:1
- Strongly leveraged to zircon production
- Stage 2 expected to deliver significantly reduced unit costs

Note:
This page sets out the unit cash operating costs and revenues for the first 10 years of the Thunderbird Project. Such information is derived from the financial model prepared by Sheffield. Such estimates are based on, among other things, a detailed mine plan, negotiated contracts with key suppliers. Actual outcomes will be subject to a number of risks and uncertainties and therefore may vary from this current, indicative profile

One of the Highest Margin Projects Globally

Thunderbird is in the first quartile - one of the highest margin projects globally

Independent TZMI Feedstock Cost Study for CY 2022 (Published 2018)

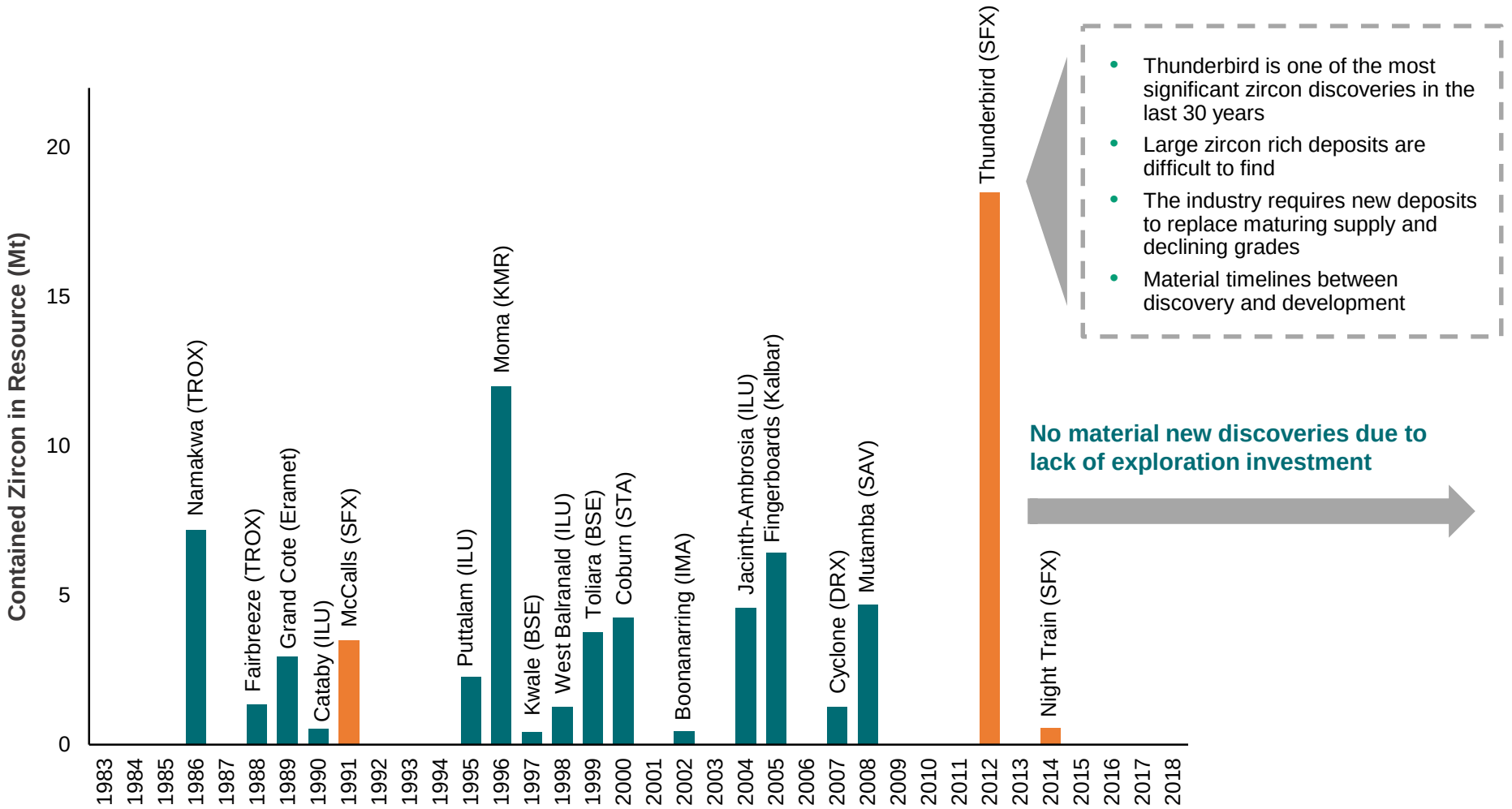


Note:
1. Period represented for Thunderbird is the 4 year period post ramp up, equalling CY 2024 to 2027 inclusive. RC ratio is based on the TZMI 2018 feedstock cost study using long-term pricing and forecast exchange rate. The R/C ratio for Thunderbird has was determined using standard TZMI methodology with production, cost and product pricing assumptions provided by Sheffield Resources. The industry curve was determined by TZMI using TZMI estimates. Accordingly, the information set out on this page is not and should not be interpreted as a forecast. Sheffield does not have sufficient certainty (and therefore does not yet have a reasonable basis) in order to issue any cost or revenue forecasts.

A Globally Significant Zircon Discovery

Only opportunity to secure a large scale greenfield zircon project

Globally significant zircon discoveries over the past 30 years based on published pre-production resources[1]



Note:

1. Thunderbird Mineral Resource as published on the ASX on 5 July 2016. Thunderbird Mineral Resource ranked against published pre-production Mineral Resources of current mineral sands operations and projects > 2M tonnes contained zircon plus selected deposits < 2Mt contained zircon under investigation globally. Data compiled by Sheffield from public sources

SECTION II

Thunderbird Project Overview

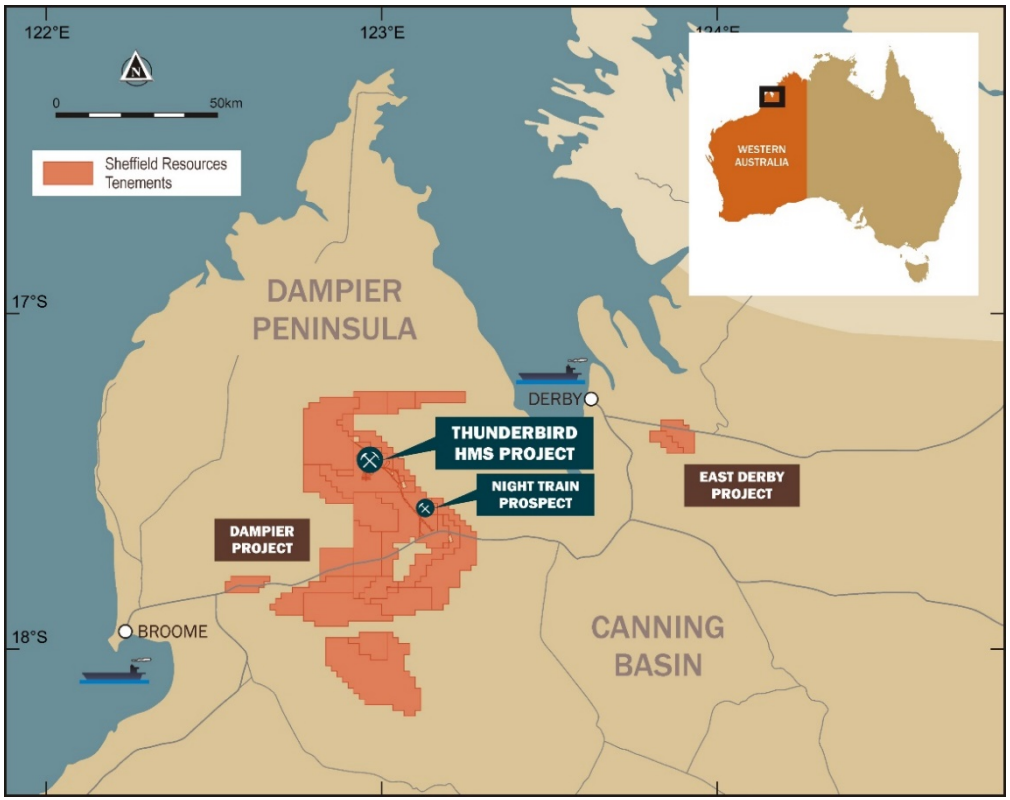
Thunderbird Location Jurisdiction Overview

Thunderbird is a large scale, high grade zircon focused project in a Tier 1 mining jurisdiction

Western Australia is a Tier 1 Jurisdiction

- Located on the Dampier Peninsula in northern Western Australia
- Environmental low risk location on existing pastoral property and away from river water sheds
- Large-scale, high grade, zircon focused mineral sands project
- New underexplored Mineral Sand Provence in which Sheffield has large dominant land tenure positioned along 160km highly mineralised trend[1]
- One of the best mining jurisdictions in the world with a history of mining and existing skilled workforce[2]
- Existing infrastructure supporting Project development
  - 148km from Broome, international airport, Port facilities and support services
  - 146km from Derby, domestic airport, Port facilities with existing ship loader and mining industry support services
- Thunderbird is connected to both ports via the sealed major national highway
- Close proximity to offtake partners provides competitive shipping costs

Location



1. Refer to ASX announcement 31 January 2019 titled *"High Grade Maiden Mineral Resource at Night Train"*
2. *Fraser Institute Survey of Mining Companies, 2016*

History of Thunderbird

A greenfield project rapidly progressed by Sheffield from the grassroots exploration stage in 8.5 years

Key milestones pre BFS release

Dec 2010: Exploration Licence application

Applied for Exploration Licence E04/2083, covering the Thunderbird deposit

Sep 2011: Tenement Grant

For the area surrounding and including Thunderbird

2012: Maiden Resource

Commenced first drilling program and released maiden Mineral Resource for Thunderbird

2013: Industry recognition

Awarded the "Digger and Dealers Mining Forum Best Emerging Company Award" and the "Australian Mining Prospect Awards Explorer of the Year"

2014: Resource expansion, Scoping Study

Significant increase in total Mineral Resources and released scoping study results

Mar 2015: Coordinated project

Thunderbird designated a Level 2 Lead Agency Project Proposal by the Western Australia Department of Mines and Petroleum

Oct 2015: Increase in scale

Released an update to the PFS modelling indicating a substantial increase to scale

Mar 2017: BFS release

Released BFS study

Mar 2017: Thunderbird Ore Reserve Update

Ore Reserve of 680.5Mt at 11.3% HM

Key milestones post 2017 BFS release

May 2018: Port

Signed 20 year Derby Port Access Agreement for long term access to an existing bulk handling facility and associated infrastructure

Oct 2017: Taurus debt

Mandated Taurus as lead arrangers and underwriters for a US$175m debt finance facility

Sep 2018: Permits

Mining Lease, State and Federal environmental approvals granted, finalising key permits for development

Sep 2018: NAIF debt

NAIF approves loan facilities totalling A$95m

Nov 2018: EPC contract

Signed fixed price, lump sum, EPC contract with GR Engineering Services

Nov 2018: Native Title

Native Title Agreement signed with Traditional Owners

BFSU release

Jul 2019: Bankable Feasibility Study Update

BFSU release with reduced capital, updated Ore Reserve and significantly improved Project returns

Jan 2019: Strategic Partner Process

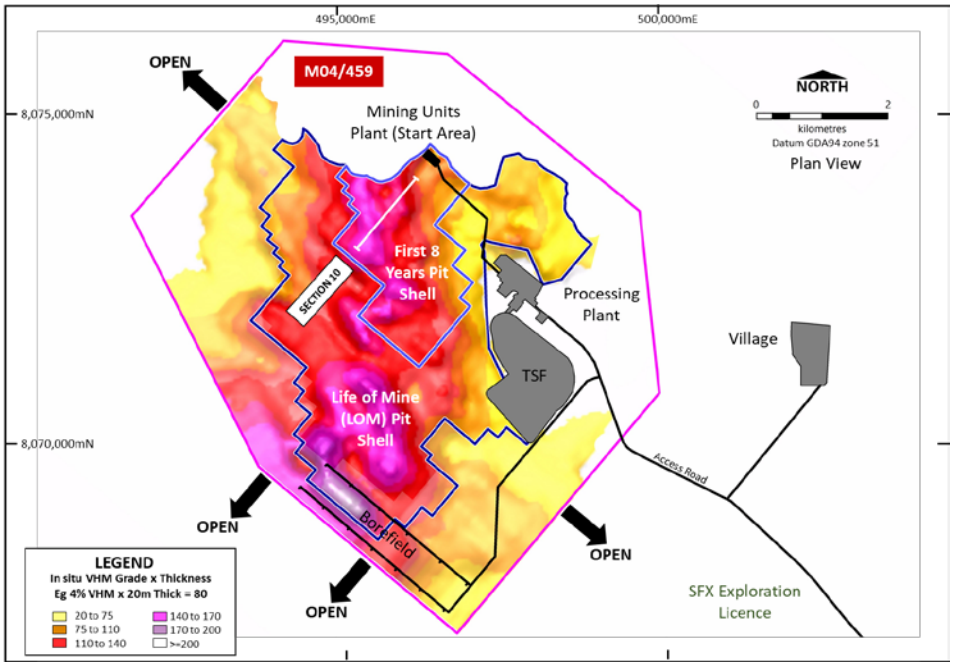
UBS led process to assess opportunities to introduce strategic partner to advance Project

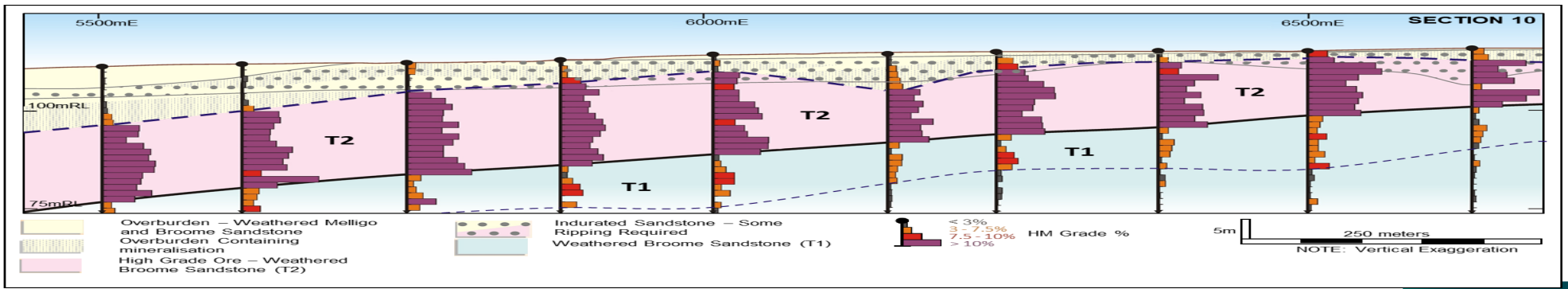
Thunderbird is a High Grade, Thick Deposit

Deposit exhibits strong continuity and high Valuable Heavy Mineral ("VHM") grades

- Thunderbird is the first significant mineral sand deposit to be discovered in the Canning Basin and is typical of an off-shore, sub-wave base style deposit
- Valuable heavy minerals ("VHM") contained within the deposit include ilmenite, zircon, leucoxene and rutile
- Mineralisation occurs as a flat, thick, broad sheet-like body striking northwest and dipping shallowly under cover at c. 4 degrees to the SW
  - Contains a continuous high grade zone up to 43m in thickness
  - Extends from surface to a maximum known depth of 155m over an area at least 11km by 7km
- The Mineral Resource estimate of **1,050Mt at 12.2% HM, 0.93% zircon and 3.3% Ilmenite**[1] is based on drill hole data collected by Sheffield from 2012 to 2015 comprising:
  - 670 holes drilled for a total of 37,076m with 24,388 samples assayed for HM, slimes and oversize
  - 20 sonic core holes and 5 Bauer bulk sample holes
  - The heavy mineral is fine to medium grained with a zircon D_{50} of 57 microns and titanium minerals D_{50} of 67 microns
- High grade zone remains open in multiple directions

Thunderbird Site Layout Over Image of VHM Grade x Thickness (>7.5% HM)





1. ASX Announcement dated 5 July 2016 titled *"Sheffield doubles measured Mineral Resource at Thunderbird"*

Thunderbird JORC Compliant Ore Reserve

Greater than 70% conversion of Mineral Resource in Ore Reserve demonstrates high quality of Thunderbird Deposit

- Ore Reserve[1] estimate was prepared by Entech Pty Ltd, an experienced and prominent mining engineering consultancy with appropriate mineral sands experience and industry knowledge. Based on the 5 July 2016 Thunderbird Mineral Resource estimate[2]

- Modifying factors applied to convert to Proved and Probable Ore Reserve including:
  - Price based on TMZI long term forecast
  - 98% mining recovery, no additional dilution or minimum mining widths due to the bulk nature of the deposit
  - Cut off strategy being applied for first 10 years of open pit design
  - Bulk mining techniques, including dozer trap mining and waste mining via truck and excavator
  - Geotechnical analysis form basis of pit designs including:
  - Excavatability and trafficability inform 3 x Dozer Test Costeans
  - 40 deg pit slope wall angles including batter and berm
  - Mineral processing based on well understood and conventional mineral sands processing techniques

Thunderbird Deposit Ore Reserves[1]

Pit Stage		Ore							
		Tonnes (Mt)	HM %	OS %	SL %	In-situ ZIR %	In-situ HITI %	In-situ LEU %	In-situ ILM %
Starter Void	Proved	0.2	11.7	17.6	19.9	1.08	0.30	0.25	3.56
	Probable	-	-	-	-	-	-	-	-
	Inferred	-	-	-	-	-	-	-	-
	Total	*0.2*	*11.7*	*17.6*	*19.9*	*1.08*	*0.30*	*0.25*	*3.56*
Interim Pit	Proved	128.1	15.4	13.8	16.1	1.12	0.32	0.29	4.15
	Probable	3.8	14.7	11.2	14.8	1.09	0.31	0.30	4.07
	Inferred	-	-	-	-	-	-	-	-
	Total	*131.9*	*15.4*	*13.8*	*16.0*	*1.12*	*0.32*	*0.29*	*4.14*
Rest-of-Mine Pit	Proved	91.2	11.4	14.3	16.3	0.89	0.27	0.26	3.02
	Probable	524.8	10.1	10.5	14.5	0.78	0.26	0.27	2.86
	Inferred	0.2	12.8	21.0	14.2	0.86	0.27	0.26	3.19
	Total	*616.2*	*10.2*	*11.1*	*14.8*	*0.80*	*0.26*	*0.27*	*2.88*
Grand Total	**Total**	**748.3**	**11.2**	**11.6**	**15.0**	**0.86**	**0.27**	**0.27**	**3.11**

  - CAPEX and OPEX cost informed on executed or negotiated final agreements, industry sources or in-house estimation and expertise

- Open pit optimisation using CAE NPV Scheduler software to generate Lerch-Grossman shells and a 70% revenue factor pit shell was selected based on mine life and cost revenue. Strategic scheduling zones were defined by Whittle Consulting optimisation software

- A detailed scheduling of land clearing, ore mining, waste mining, tailings storage and other ancillary activities on 200m by 100m ore blocks were completed over the first 8 years of the schedule; after which larger scheduling blocks have been utilized

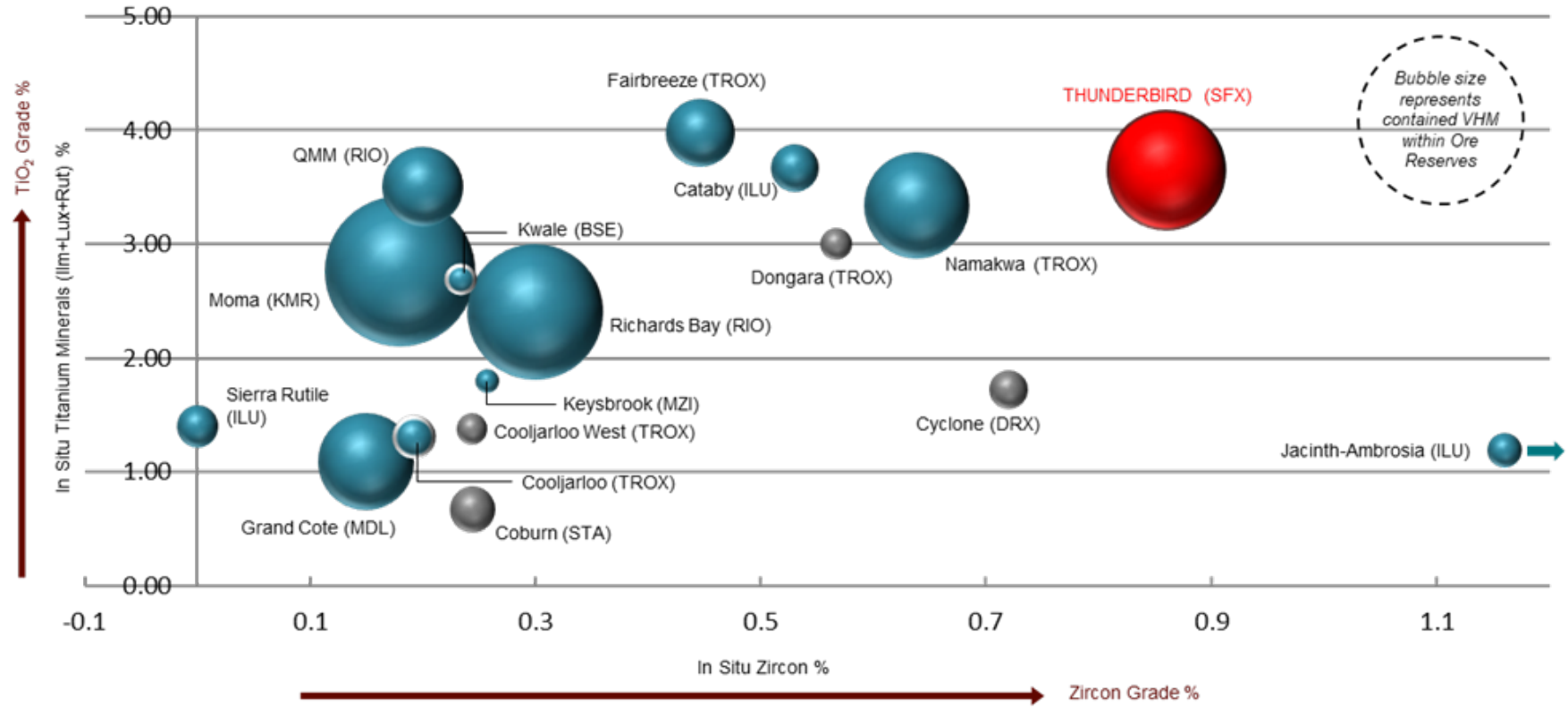
- Life-of-mine average strip ratio (waste: ore) of 0.85 : 1.00

1. ASX Announcement dated 31 July 2019 titled *"Thunderbird Ore Reserve Update"*
2. ASX Announcement dated 5 July 2016 titled *"Sheffield doubles measured Mineral Resource at Thunderbird"*

One of the Largest, Highest Grade Ore Reserves Globally

Comparison of Ore Reserves and grade between the key large mineral sands deposits globally[1,2,3]

- Large, mature mineral sands deposits globally are typically showing a strong trend of accelerating grade depletion with each new published Ore Reserve update
- The highest grade and most significant zircon producing mine, Jacinth-Ambrosia is now entering the back end of its mine life
- Increasing throughput and production rates at mature operations are accelerating the depletion of Ore Reserves and mine life



Notes:
1. Thunderbird Ore Reserve as published on the ASX on 31 July 2019. Thunderbird Ore Reserves ranked against latest published Ore Reserves of current mineral sands operations and projects under investigation globally. Accordingly, for the operating projects, no account is made for any volumes of product already produced
2. Blue bubbles are operating mines, grey bubbles are Ore Reserves reported but the project is not operating. Only Ore Reserves > 1.2Mt contained VHM shown
3. Data compiled by Sheffield from public sources. This analysis does not illustrate the variance in product value between rutile, leucoxene and ilmenite

Conventional and Well Tested Mining Techniques

Thunderbird will use conventional and well tested dry mining techniques and equipment currently employed in existing and similar mineral sands operations globally

Mining method

- Dry mining via conventional dozer trap mineral sand mining using bulk mining techniques and in-pit feed preparation units
- Topsoil and overburden excavated and transported using truck and excavators
- Oversize material rejected from in-pit Mine Unit Plant ("MUP") will be rehandled by loader to mine void
- Ore will be slurried and pumped to a nearby Wet Concentration Plant ("WCP")
- Mine production rates vary to provide constant target feed rates to the WCP after removal of oversize and slimes
- Sheffield may engage contractors for mining operations and equipment maintenance
- Entech Pty Ltd completed all mine design and scheduling
- Pit design is based on the geotechnical analysis undertaken by independent consultants
- The dozer trap mining method and costs have been applied to the whole LOM schedule

Summary of LOM material type by Pit Stage[1]

	Ore (Mt)	Waste (Mt)	
Pit Stage	Material	Topsoil	Waste
Starter Void	0.2	0.1	0.0
10 Year Pit	131.9	1.64	61.0
Rest of Mine Pit	616.2	5.38	577.0
Total	**748.3**	**7.04**	**638.0**

Vegetation and Topsoil Removal

Removal of Overburden

Dozer Push Mining Unit Plant - Ore

1. Sourced from the Bankable Feasibility Study Update 31 July 2019

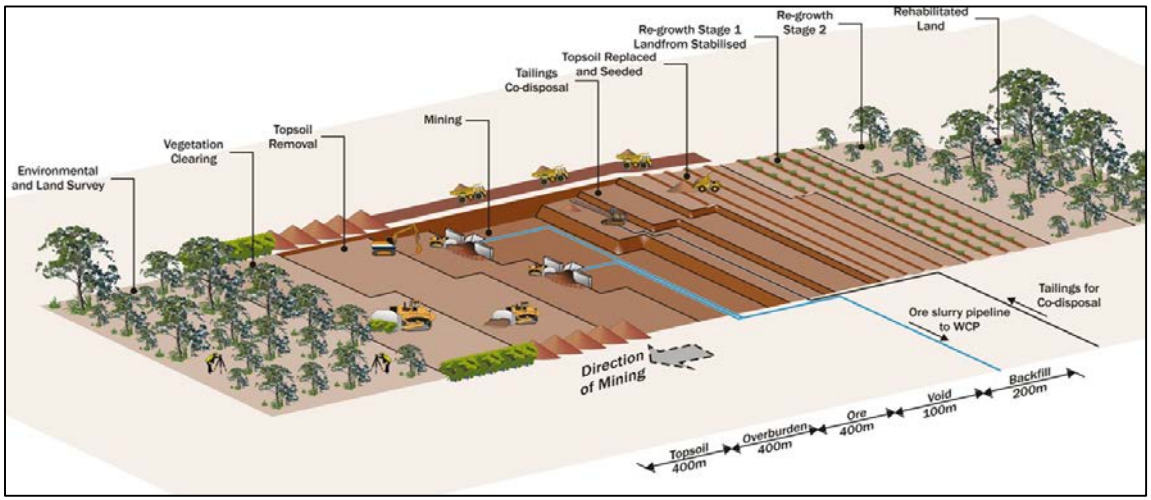
Conventional and Well Tested Mining Techniques

Thunderbird will use conventional and well tested dry mining techniques and equipment currently employed in existing and similar mineral sands operations globally

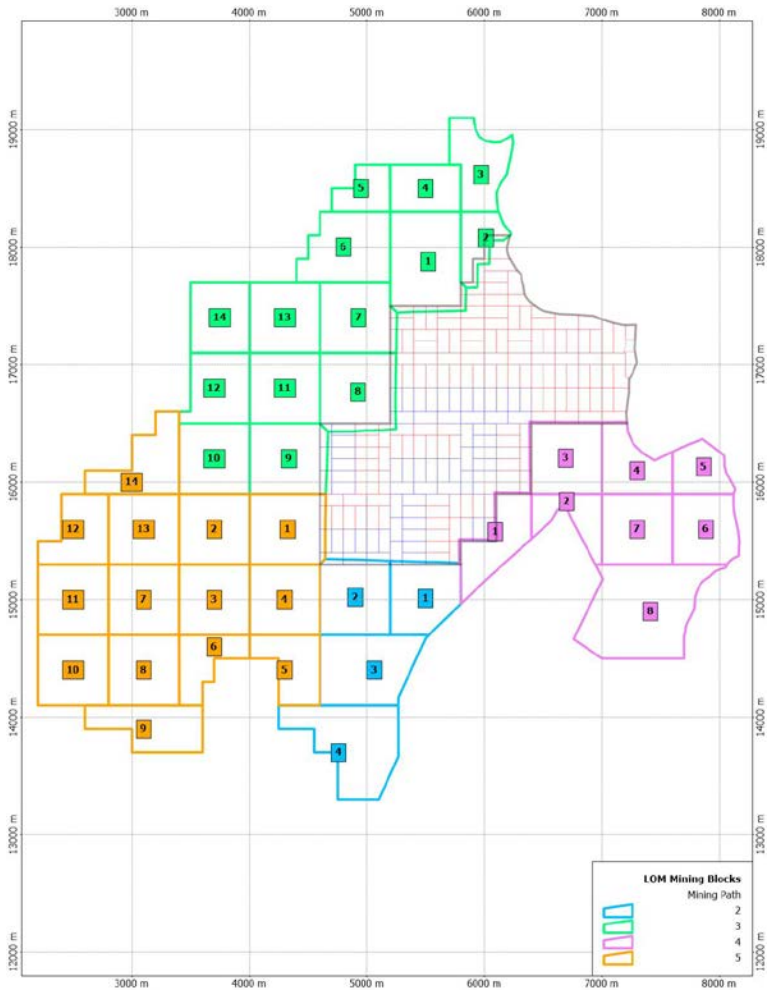
Major mining equipment to be utilised[1]

Class	Description	Max utilisation (hrs/month)	Equipment utilised (#) Year 1 – 4	Year 5 – 10	Year 11 - 43
70t Excavator	Hitachi ZX690LC-5	500	1	1	1
120t Excavator	Komatsu PC1250SP-8R	500	1	1	1
200t Excavator	Komatsu PC2000-8	500	0	3	3
100t Loader	CAT 992k	500	1	1	1
100t Truck	CAT 777G	500	4	7	13
100t Bulldozer	CAT D11T CD	450	3	6	6
65t Bulldozer	CAT D10T	500	2	3	4
Grader	CAT 16M	500	1	2	2
Water Cart	CAT 745	500	1	2	3
Service Truck	CAT 745	500	1	1	1

Schematic diagram showing mining method



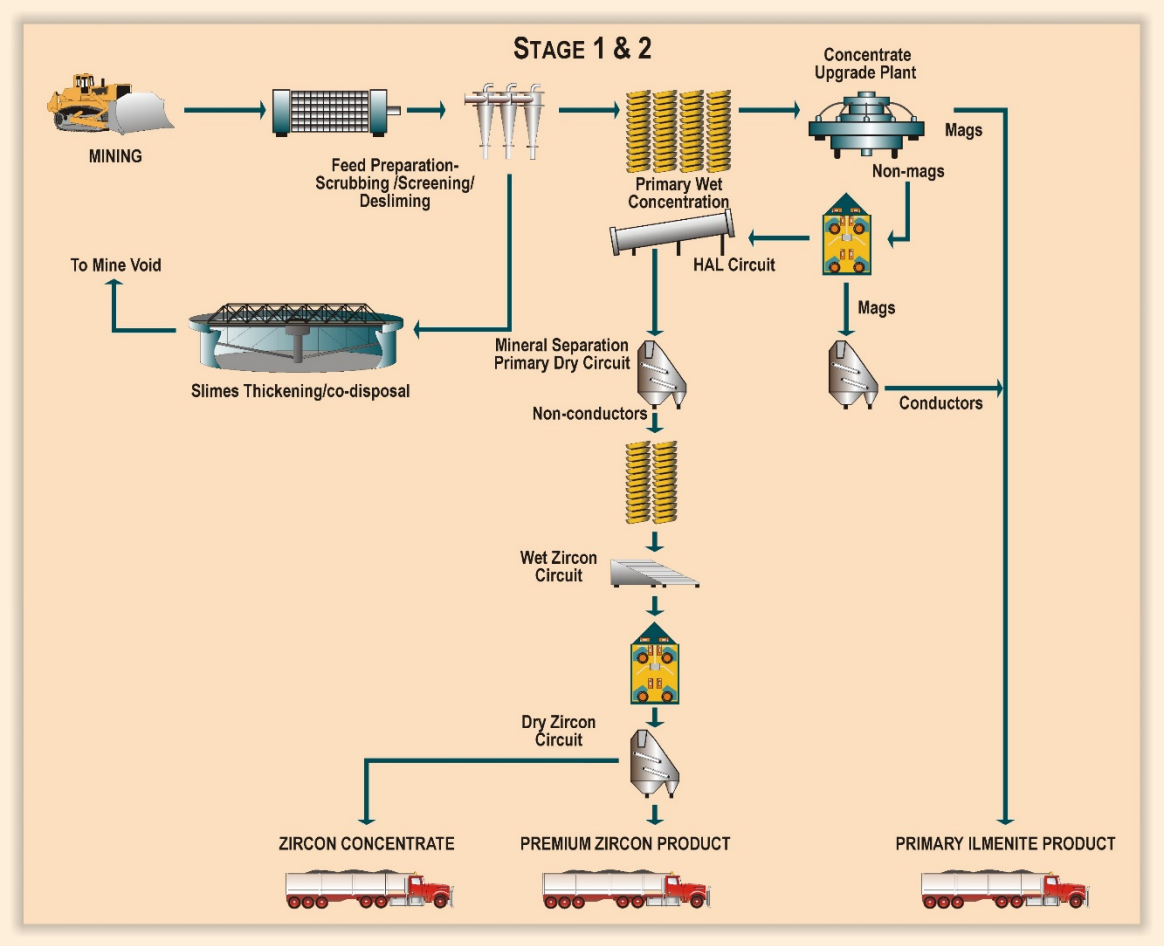
LOM mining blocks[1]



1. Sourced from the Bankable Feasibility Study Update 31 July 2019

Simple and Conventional Processing Circuit

Simplified conventional flowsheet producing three quality products for LOM



Stages 1 & 2

- Same flow sheet as 2017 BFS with removal of LTR
- Stage 2 is a simple duplication of Stage 1 mining and processing
- Dry mining via conventional dozer trap mineral sand mining
- Simple and well tested conventional mineral separation flowsheet
- Only three finished products
- Premium zircon, zircon concentrate and Primary Ilmenite

Recovery (%)[1]	Stage 1	Stage 2	LOM
Zircon to Premium Zircon	43.9	53.0	53.3
Zircon to Zircon Concentrate	36.0	33.3	33.6
Ilmenite to Ilmenite Products	76.7	77.7	78.7

Notes:
1. Based on metallurgical test work carried out on a 40t bulk sample using full scale & scalable equipment and sourced from the BFSU Financial Model

Well Positioned Near Existing Port Infrastructure

Thunderbird is conveniently located between two existing ports

- Thunderbird is located in close proximity to two existing ports
  - Port of Broome is 148km away, including 115km of major national highway
  - Port of Derby is 146km away, including 113km of major national highway
- Products proposed to be trucked from mine to port
- Port of Derby has been selected for exporting bulk products
  - Has existing bulk loading facilities (conveyor and shiploader)
  - Existing shiploader and conveyor requires minimal commissioning costs
  - Access agreement in place for port storage, wharf and bulk handling facility
  - Bulk products stored in a purpose-built 100kt facility (Stage 1) at the port and loaded by conveyor onto barges, increased to 150kt (Stage 2)
  - transhipped 20-30kms to meet a moored ocean-going vessel where products will be transferred
  - Barging & transhipment of bulk products has been successfully operated by previous users at 500ktpa
- Port of Broome is more suitable for packaged products due to availability of warehousing and existing stevedoring services
- Both ports offer the potential for packaged and bulk shipment, thus minimising shipping risk

Product Shipment Details

Product	Port	Method	Sale basis
Premium zircon	Broome	FIBC[1] Bulk Bags	CIF
Primary ilmenite	Derby	Bulk Shipment	CIF
Zircon concentrate	Derby	Bulk Shipment	CIF

1. Flexible Intermediate Bulk Container

Port of Broome

Port of Derby

Supporting Site Infrastructure

Construction of accommodation village, road access, energy and water facilities underway

Significant progress to date:

- Main access road to Thunderbird established off the Great Northern Highway mid-way between the towns of Broome and Derby
- 328 person accommodation village procured
- Site facilities operational - 52 rooms, large-scale kitchen/dining, potable water supply, waste water treatment plant, communications

Final infrastructure typical of mineral industry to be established:

- Internal roads to the mine pit area, increased village accommodation
- Mine and process plant workshops, offices and warehouse buildings
- 18MW gas-fired power station
- LNG storage infrastructure storage for 10 days operation
- Initial surface Tailings Storage Facility (TSF) for process tailings until year 3; then tailings to pit void
- Process water from bore field adjacent to mining void for first 15 years
- Mine dewatering bore field required after approximately year 15
- Expected dewatering volumes exceed process water needs from approximately year 30 onwards with excess water discharged via aquifer injection

Accommodation village at Thunderbird

Aerial photo of Thunderbird accommodation village

SECTION III

Financial Information

Each of the slides in Section IX should be read together with, and are subject to, each of the assumptions contained in the Company's Thunderbird Financial Model.

Stage 1 Total Funding Requirement

The total Stage 1 funding requirement is estimated at approximately A$478 million

Stage 1 upfront capex

Description	Amount (A$m)
Wet Concentrator Plant	52.9
Concentrate Upgrade Plant	22.0
Hot Acid Leaching Plant	36.3
Zircon Processing Plant	52.3
Process Water Systems	11.4
Processing	**174.9**
Engineering & Project Management	22.8
Site Construction, Commissioning, Mobilisation	70.2
Power Reticulation & Other Non-Process Infrastructure	24.4
Infrastructure	**117.4**
Power Station & Storage, Village & Port Facilities	66.5
Ops Readiness, Tailings Dams, Bore Field & Other	32.9
Owners Costs	**99.4**
Stage 1 Upfront Capex	**391.7**

Total funding requirement

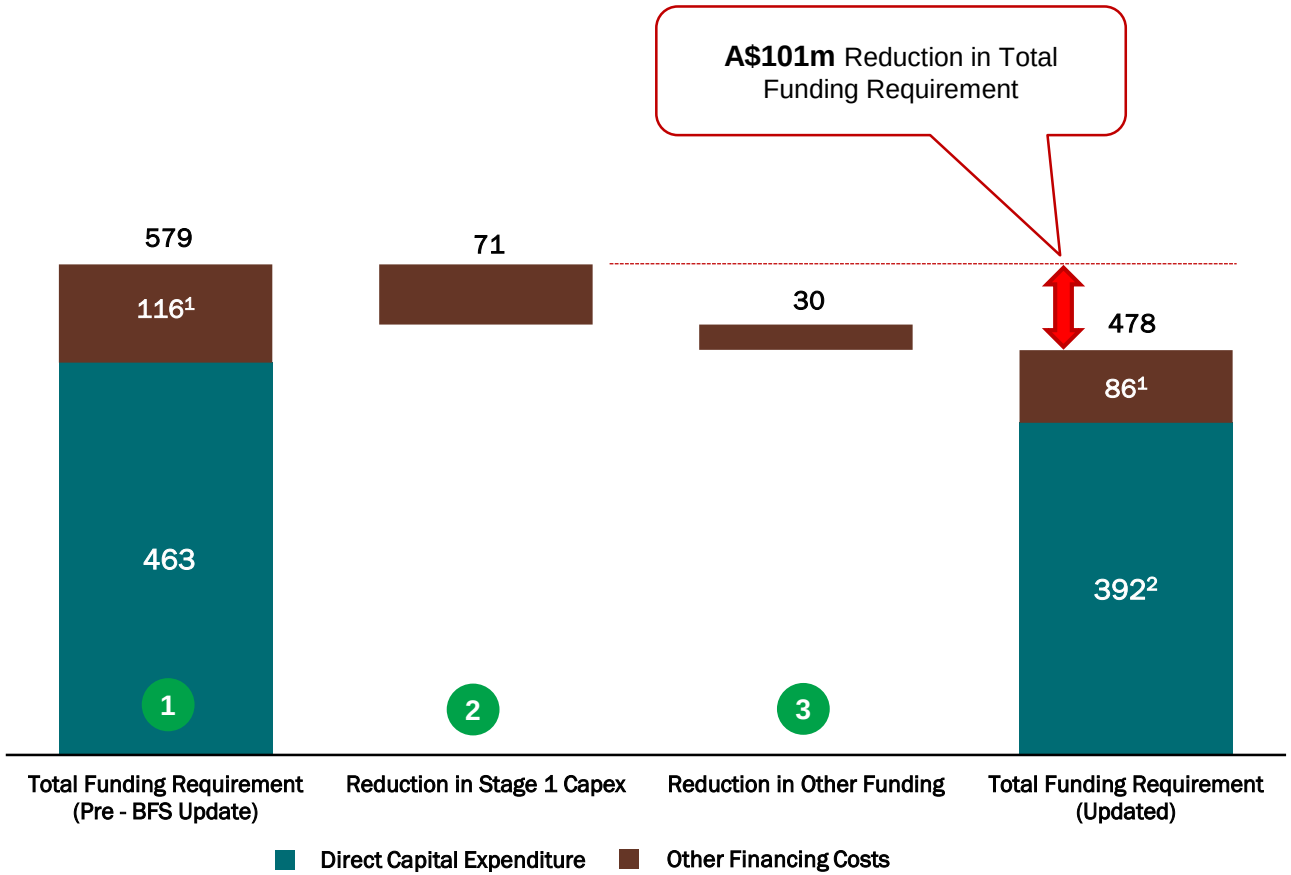
Description	Amount (A$m)	Comments
Processing	174.9	
Infrastructure	117.4	
Owners Costs	99.4	• Power and gas EPC contract (funded by NAIF) • Roads, village, port, other
Stage 1 Upfront Capex	**391.7**	• Includes contingencies of 7.5%
Pre-operations Net Working Capital	1.5	• Net operating cash flows during construction period
Financing Costs	17.3	• Includes debt commitment, upfront fees, debt services reserve accounts, advisory & legal fees, independent technical expert costs
Cost Overrun Facility	40.0	• c. 10% provision on Stage 1 upfront capex (as required by lenders)
Interest During Construction	26.9	• LIBOR + facility margin (over construction period)
Total Other Funding Requirements	**85.7**	
Total Uses	**477.4**	

Note:
1. GRES EPC scope encapsulates the A$174.9m of processing costs and A$117.4m of infrastructure costs
2. Total uses excludes Sheffield's corporate overheads estimated to be $13m over the pre-production period.
3. Totals may not add to the rows above due to rounding

Revised Stage 1 Capital Expenditure

c. 80% of the revised Stage 1 upfront capex is subject to a fixed price EPC contracts with GRES & others

Bridge From BFS Stage 1 Upfront Capex to Revised Funding Requirement (A$m)



1. Original BFS Stage 1 upfront capex of A$348m, with Sheffield opting to invest a further A$115m in Infrastructure and Improvement Capex to lower the operating cost base. In addition to Stage 1 upfront capex, c. A$116m in other project finance related funding required to commence operations at Thunderbird (see previous page for detail)

2. Removal of LTR and related ilmenite circuit capital, offset by a 38% increase in WCP capacity and other downstream equipment

3. Proportionate reduction in other financing costs relative to direct capital expenditure (e.g. cost overrun facility, fees and reduced working capital due to schedule improvement)

Note:
This page sets out the change in project funding requirements for Stage 1 of the Thunderbird Project. Such information is derived from the financial model prepared by Sheffield for Stage 1 of the Thunderbird Project. Such estimates are based on, among other things, a detailed mine plan, negotiated contracts with EPC contractors and project financiers. Actual outcomes will be subject to a number of risks and uncertainties and therefore may vary from this current, indicative profile

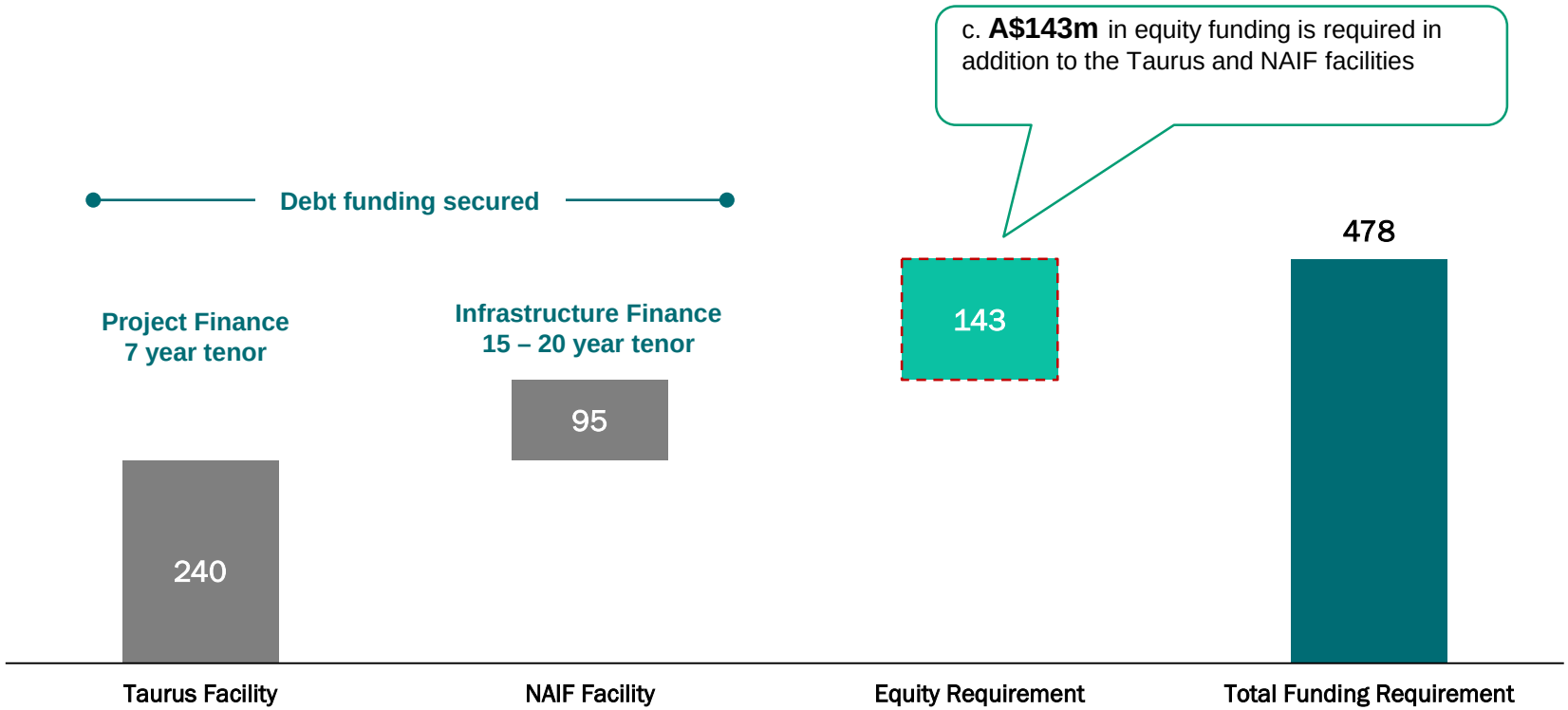
1 Includes cost overrun, interest, working capital, fees, etc

2 Project capital for process plant and infrastructure

Stage 1 Funding Sources

With c. A$335m of debt funding secured through the Taurus and NAIF facilities.
A$143m of equity funding is required to commence construction of Thunderbird Stage 1

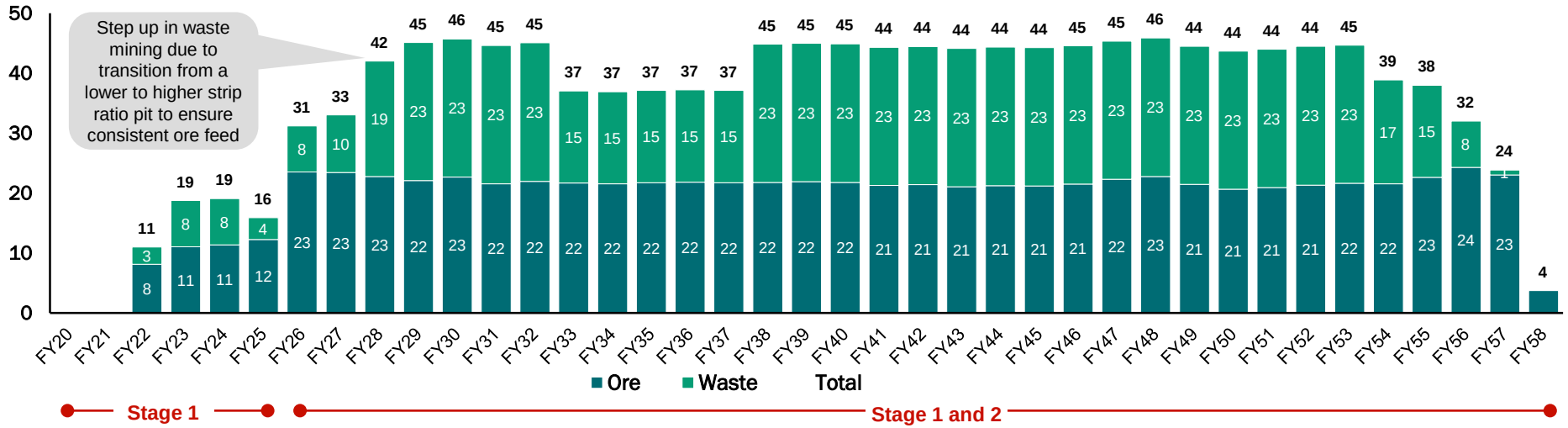
Stage 1 Funding (A$m)[1]



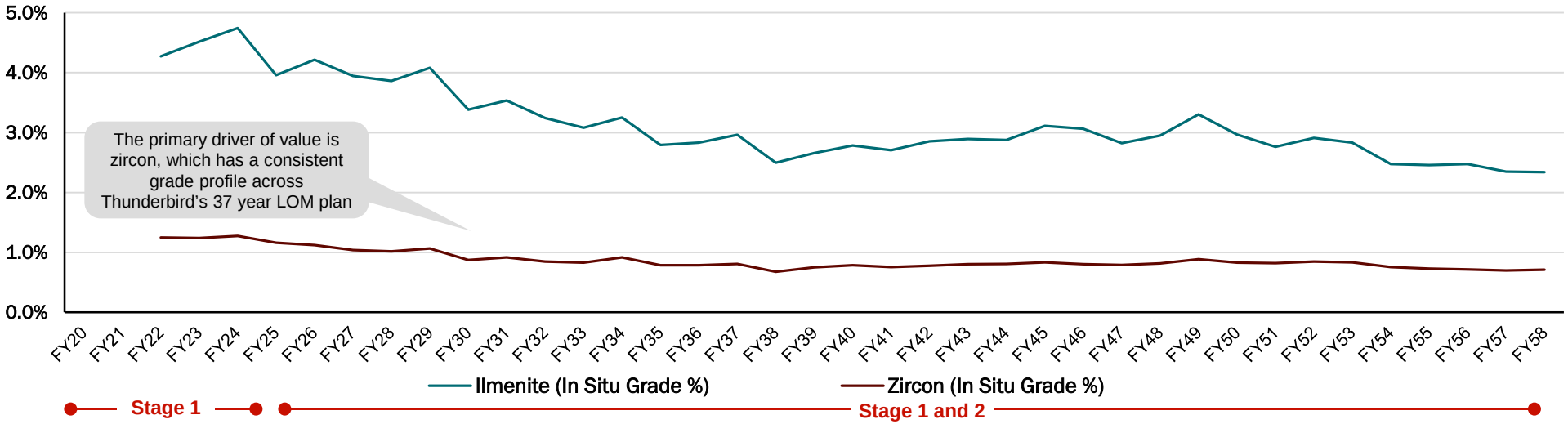
Note:
1. Tenor and other terms for the NAIF facilities are non-binding and subject to definitive documentation. Assumes the US$175m Taurus debt facility is converted to A$ using an A$/US$ exchange ratio of 0.73 during the expected drawdown period
2. Includes A$86m of Sheffield's other project finance related funding requirements. Excludes Sheffield's corporate overheads estimated to be A$13m

Material Mined and Grade Profile

Material Mined – Ore & Waste (Mt)



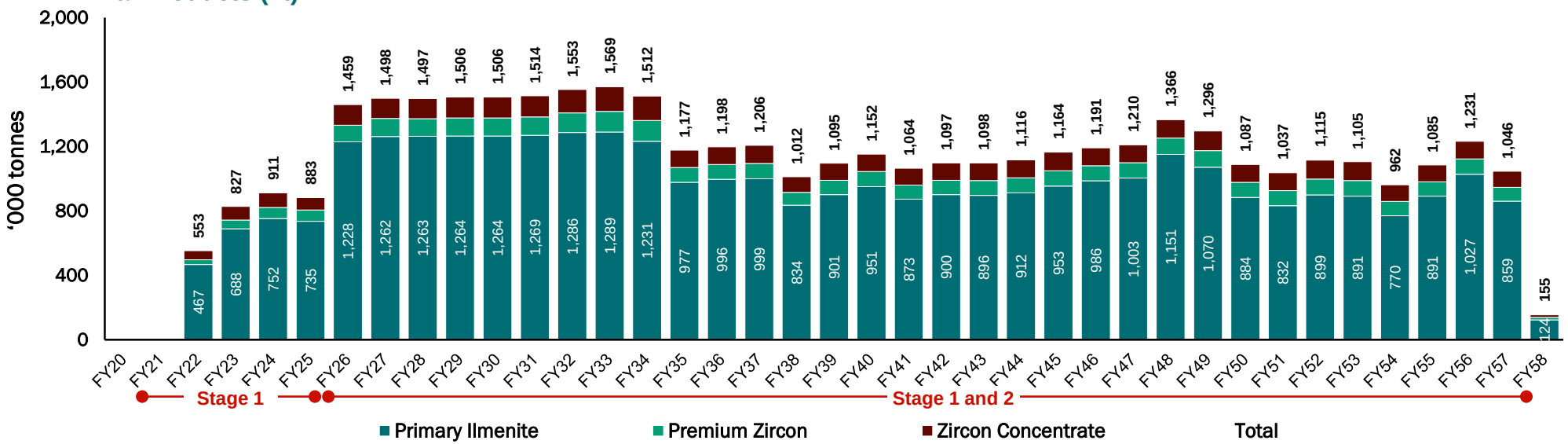
Insitu Grade (as % of Ore Mined)[1]



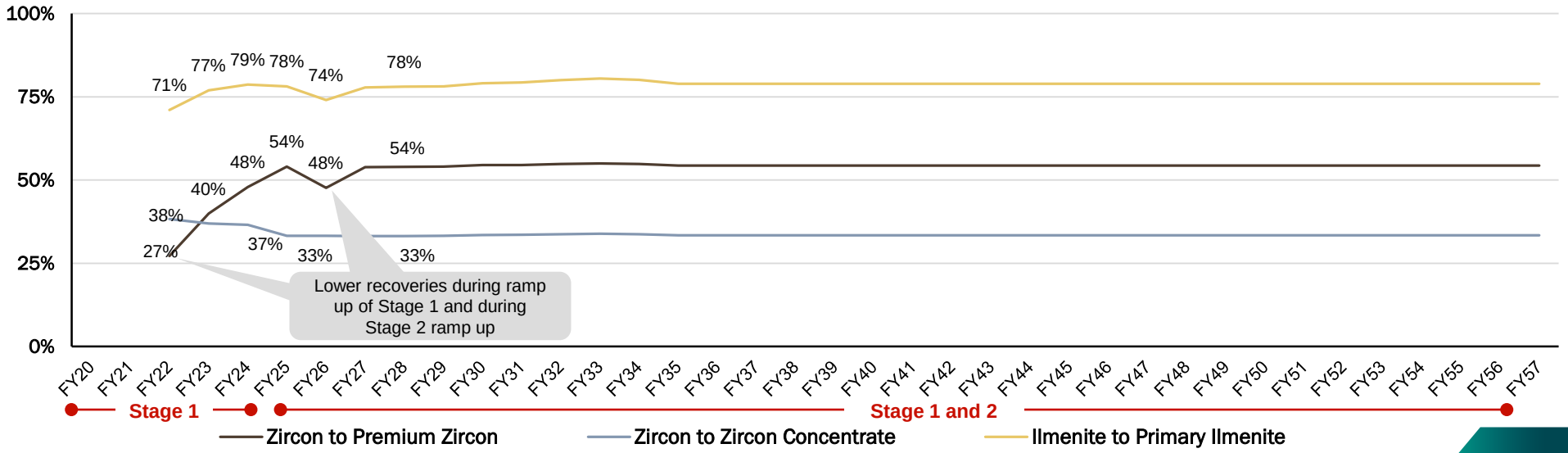
Note:
1. Insitu grade is calculated as the product of HM grade and the percentage of ilmenite, zircon or leucoxene contained within the HM

Production and Recoveries

Final Products (kt)

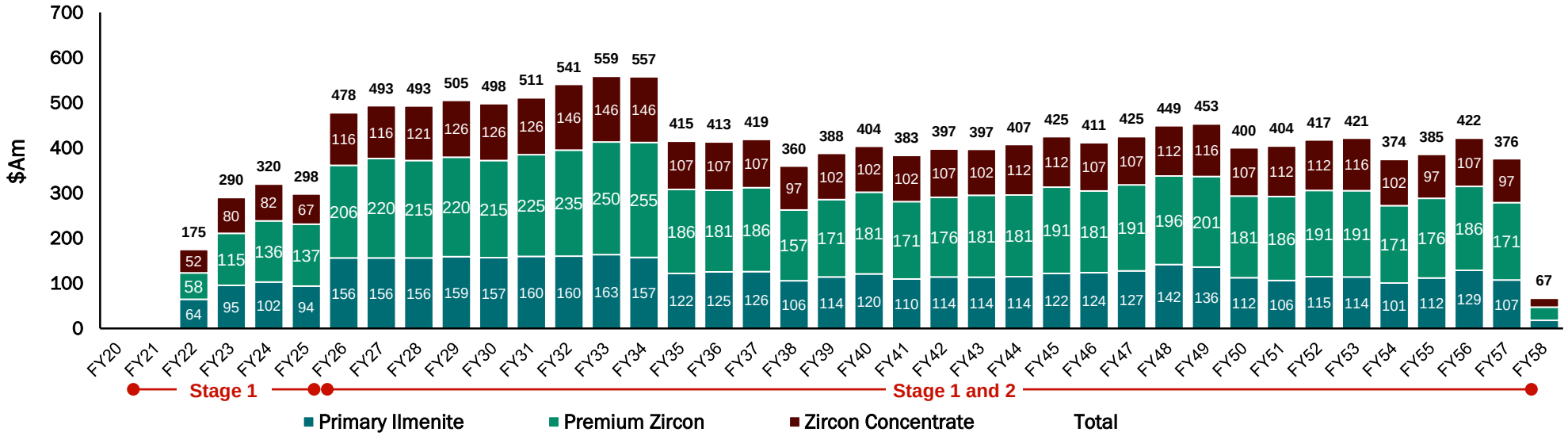


Overall Recoveries (%)

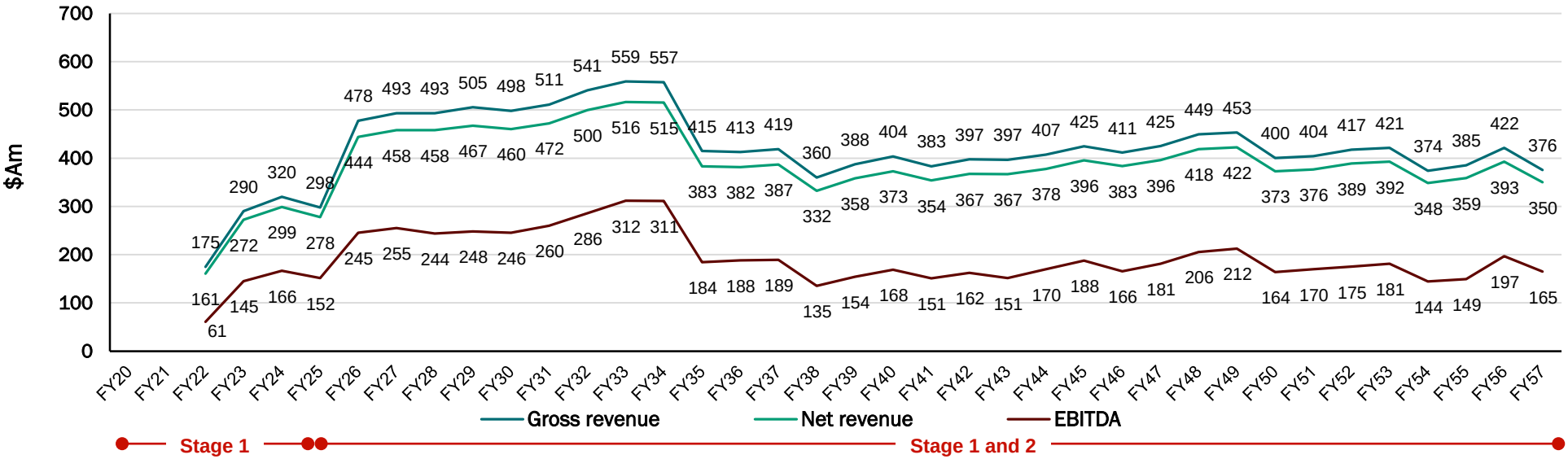


Revenue and EBITDA

Total Gross Revenue by Product (A$m)



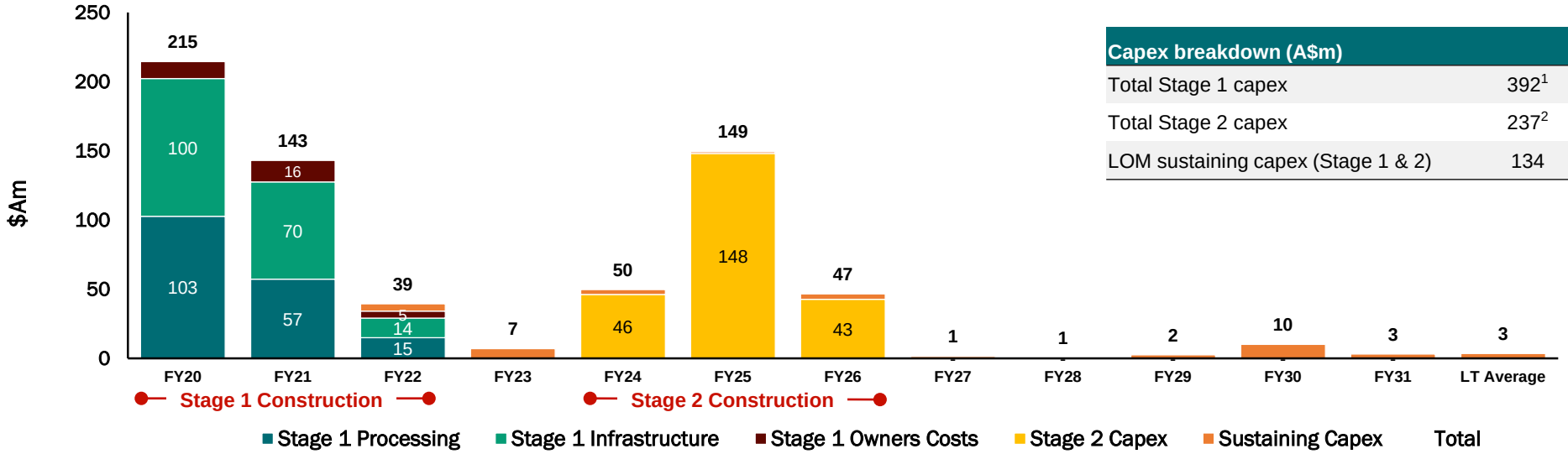
Revenue and EBITDA (A$m)[1,2]



Notes:
1. Net revenue calculated as gross revenue less royalties
2. EBITDA does not include corporate overheads

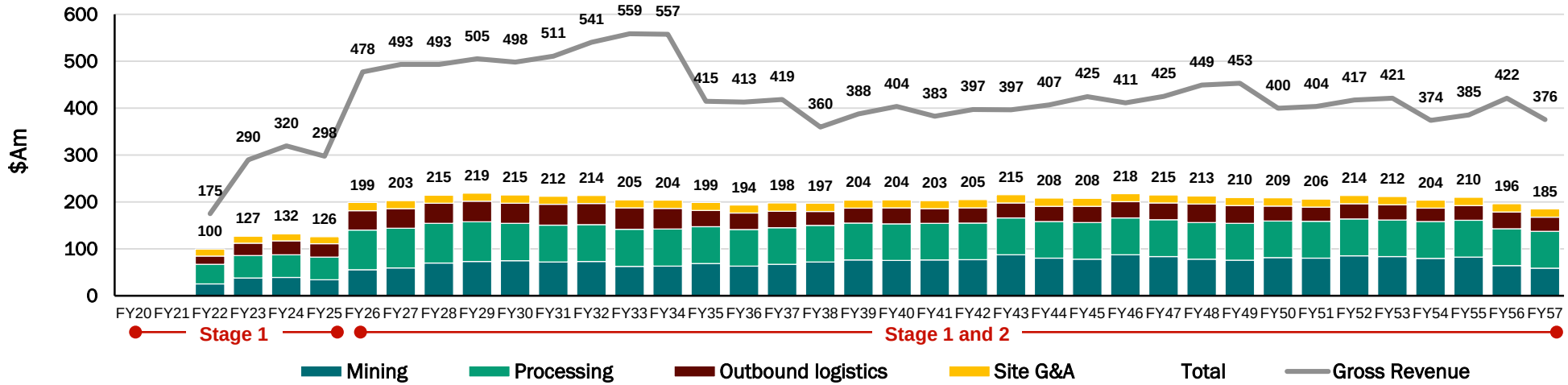
Capex and Operating Margins

Capex by category (A$m)



Capex breakdown (A$m)	
Total Stage 1 capex	392[1]
Total Stage 2 capex	237[2]
LOM sustaining capex (Stage 1 & 2)	134

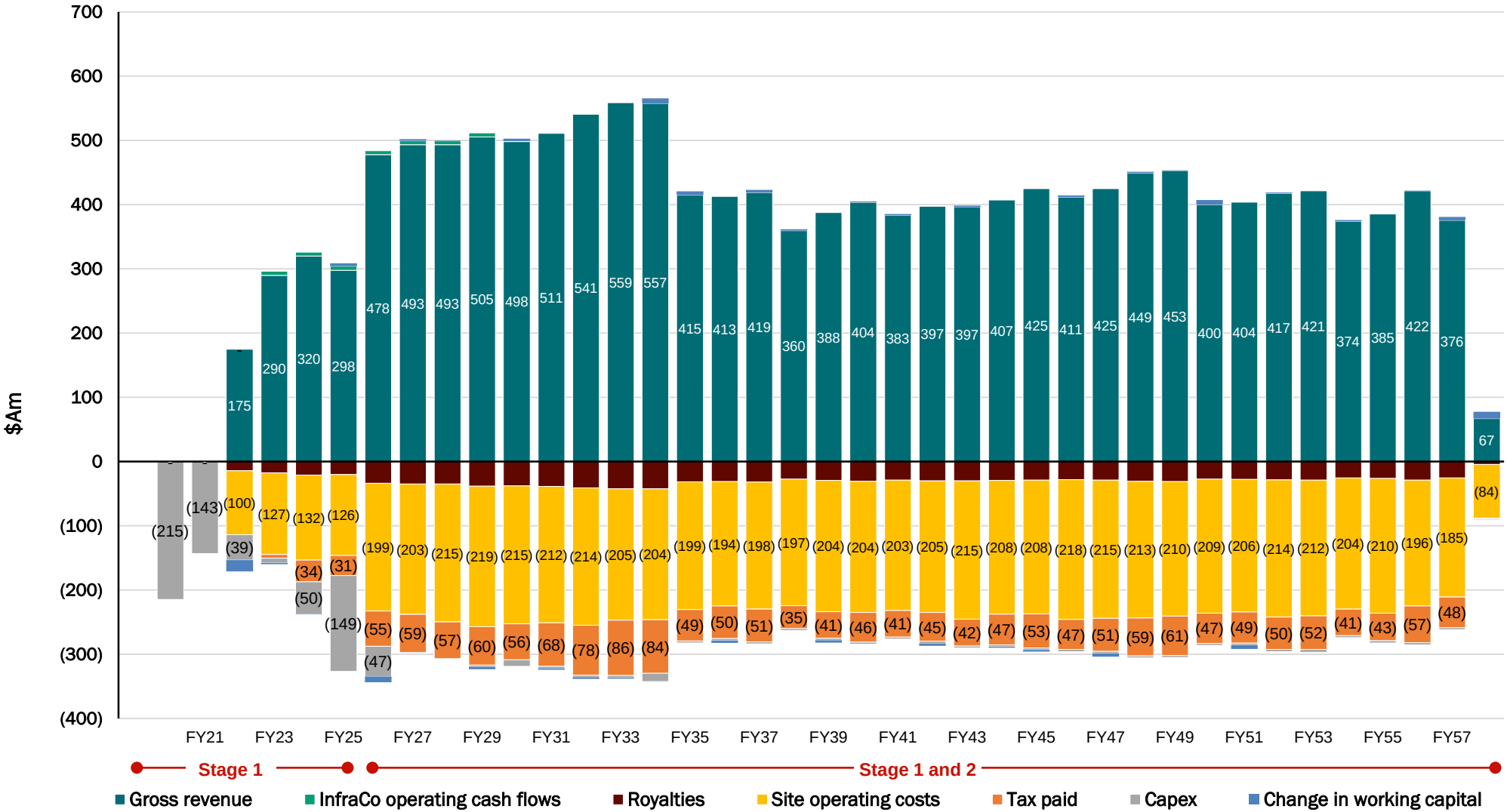
Site Operating Costs & Revenues ($Am)



Note:
1. Excludes Sheffield's other project finance related funding requirements of A$86m
2. Based on management estimate using BFS Stage 1 capex

Free Cash Flow

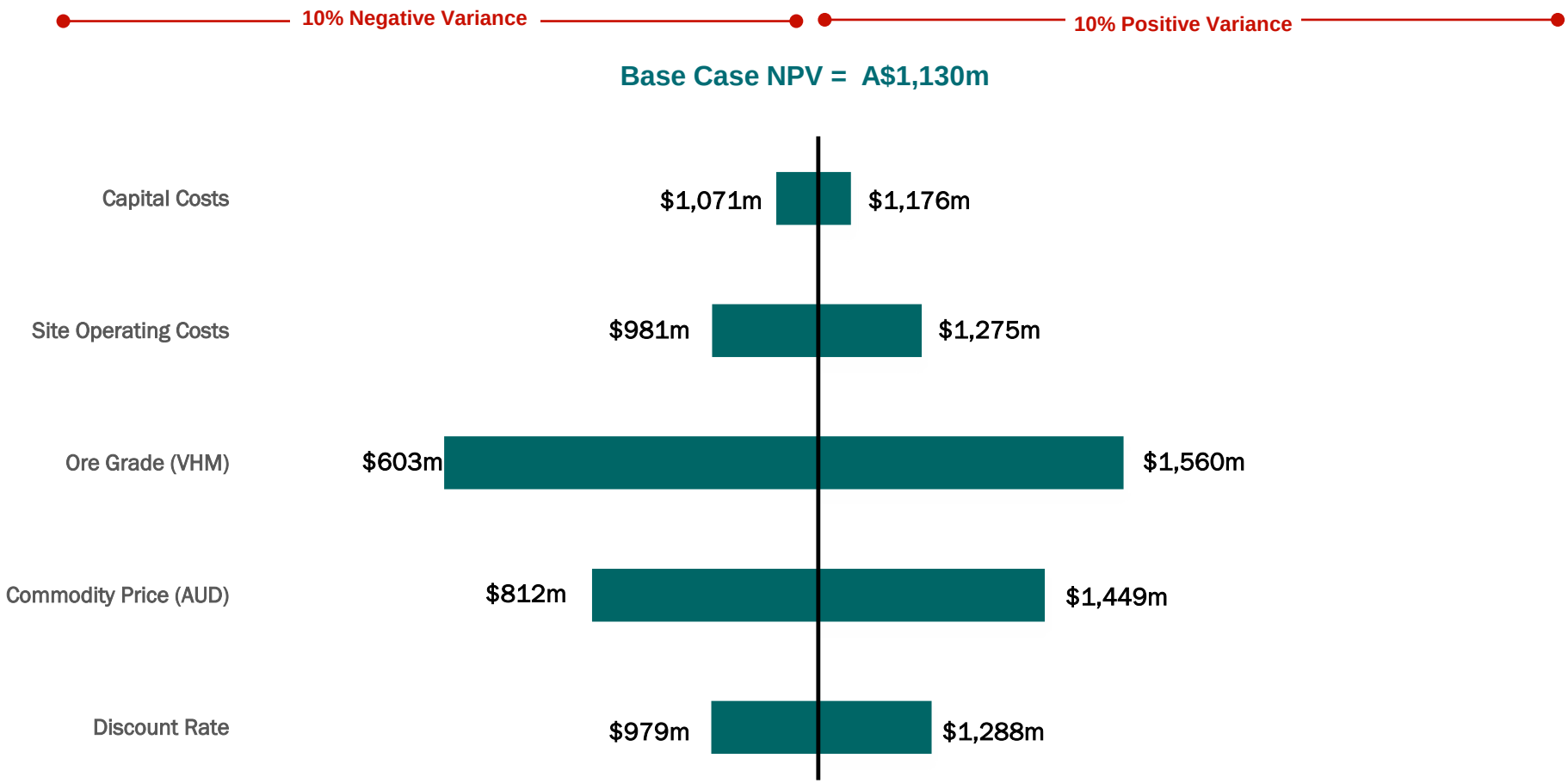
Post-Tax Cash Flow (excluding Corporate Overheads)[1] (A$m)



Note:
1. Free cash flow calculated as gross revenue plus InfraCo operating cash flows, less royalties, site operating costs, tax paid, capex, change in working capital & other working capital related items. Excludes corporate overheads

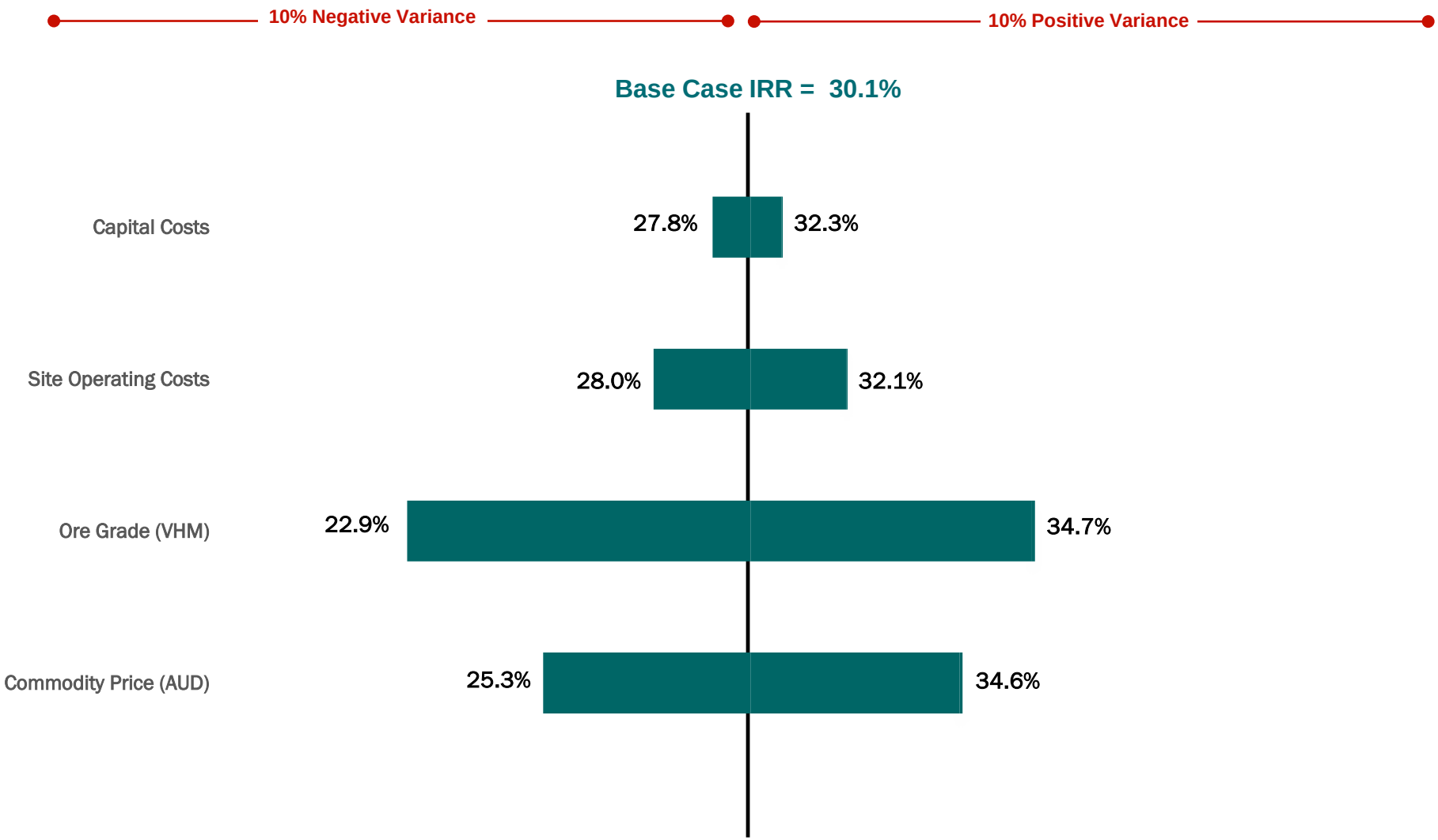
Sensitivity Analysis – NPV Outcomes (A$m)

Base Case Pre-finance, pre-tax NPV_{10} of A$1.13B compared to 10% shifts in commodity price, discount rate, costs and ore grade



Sensitivity Analysis – IRR Outcomes (%)

Base Case Pre-finance, pre-tax IRR of 30.1% compared to 10% shifts in commodity price, costs and ore grade



Operating Assumptions

Key physical and cost assumptions which underpin the BFSU Financial Model

Physical assumptions overview

	Stage 1[1]	Stage 2[2]	LOM[3]
Volume			
Ore Mined (Mt)	42.8	136	748
Strip Ratio (W:O)	0.51	0.78	0.85
Mine life (years)		37	
Grade (% of ore mined)			
HM	15.6	14.5	11.2
Ilmenite	4.4	3.8	3.11
HiTi Leucoxene	0.35	0.30	0.27
Zircon	1.23	1.01	0.86
Leucoxene	0.32	0.27	0.27
Recovery (%)			
Zircon to Premium Zircon	43.9	53.0	53.3
Zircon to Zircon Concentrate	36.0	33.3	33.6
Ilmenite to Ilmenite Products	76.7	77.7	78.7

Operating cost breakdown

A$/t ore mined	Stage 1[1]	Stage 2[2]	LOM[3]
Mining	3.19	2.98	3.37
Processing	4.36	3.65	3.69
Outbound logistics	2.39	1.90	1.69
Site G&A	1.40	0.76	0.83
Total	**11.34**	**9.28**	**9.58**

Capex breakdown

	A$m
Stage 1	
Processing	175
Non-Processing & Infrastructure	117
Owner Costs	99
Total Stage 1 development capex	**392[4]**
Stage 2	
Total Stage 2 development capex	**237[5]**
Sustaining capex	
Stage 1 (Year 0 - 4)	17
Stage 1 & 2 (Year 5+)	114
Total LOM sustaining capex	**131**

Source: BFSU Financial Model

Notes:
1. Refers to the financial year from 1 July 2021 to 30 June 2025
2. Refers to the period from 1 July 2025 to 30 June 2031
3. LOM (Life of Mine) refers to the period from year 0 to year 37
4. Excludes Sheffield's other project finance related funding requirements of A$86m
5. Based on management estimate using BFS Update Stage 2 capex

Royalty Regime and Fiscal Assumptions

Key royalty and fiscal arrangements are outlined below

	Arrangement or Calculation
State government royalty	• WA State government royalty of **5% of Total Sales Revenue**
Taurus royalty	• Royalty for years 1 to 4, starting on first sale, of **0.5% of Total Sales Revenue** on FOB basis or equivalent • Royalty for year 5 onwards, for a period of 22.5 years, of **0.75% of Total Sales Revenue** on FOB basis or equivalent
Native title royalty & Miscellaneous Licence Access	• Calculated as a percentage of Total Sales Revenue (**confidential terms – in line with market standard range**)
Company tax	• Australian corporate tax rate of 30% applies • Sheffield has a future tax benefit of approximately A$20m as at 30 June 2019 arising from available tax losses

US$175m Taurus facility summary

Sheffield expects to conclude similar debt package with an experienced metals & mining specialist private equity fund

Taurus Overview

- Experienced specialist global investor based in Australia, targeting small to mid-sized metals & mining companies
- Provides bespoke financing across the capital structure including project and acquisition finance debt, equity and convertible notes
- Experienced in providing project finance facilities to fund project developments
- Previous mining investments include:
  - Base Resources, Heemskirk Consolidated (equity and loan)
  - Teranga Gold, Talisman Mining, Toro Gold (project finance facility)
  - Stanmore Coal (acquisition finance and brownfields mine development)
  - Whitehaven Coal, Asanko Gold, Hot Chili, Aquila Resources, AMC (equity)

Debt Facility Overview – Tranches A and B

- Lender: Taurus Mining Finance Fund and Taurus Mining Finance Annex Fund
- Syndicated facility agreement has been executed, with the debt facility to be underwritten by Taurus, and subsequently expected to be syndicated
- Revenue royalty of 0.50% (Years 1 – 4) and 0.75% (Years 5 – 22.5)
- Upfront fee is customary for a facility of this nature (50% due upon signing and the balance due on satisfaction of certain conditions precedent to drawdown of the facility)
- Sheffield will agree a minimum equity requirement with lenders as a conditions precedent to drawdown
- Conditions precedent to drawdown are customary for a facility of this nature including (but not limited to) final due diligence

Tranche A Key Terms

Facility type	Senior secured[1]
Borrower	Thunderbird Operations Pty Ltd (“TOPL”)
Amount	US$75m
Interest rate	USD LIBOR + 4.5% p.a.
Commitment fees	2.0% p.a. (on undrawn amount)
Tenor	7 years
Repayable	Between Year 3.5 and Year 7

Tranche B Key Terms

Facility type	Senior secured[1]
Borrower	TOPL
Amount	US$100m
Interest rate	8.5% p.a.
Commitment fees	2.0% p.a. (on undrawn amount)
Tenor	7 years
Repayable	End of Year 7

Note:
1. Tranches A, B and C are senior secured over TOPL assets and rank pari passu between themselves. They have a second ranking security over InfraCo assets. Tranche D is senior secured over InfraCo assets and has second ranking over TOPL assets. See next page for information on Tranches C and D

A$95m NAIF Loan Facility Summary

Sheffield expects to conclude debt financing with Government support to provide very long tenor financing demonstrates conviction and support for Thunderbird

NAIF Overview

- Northern Australia Infrastructure Fund ("NAIF") is a corporate Commonwealth entity that was established under the NAIF Act 2016 to provide assistance for the construction of infrastructure to benefit Northern Australia
- NAIF and Sheffield have agreed non-binding term sheets for the NAIF facilities
- Subject to definitive documentation being entered into and customary conditions precedent (including State of WA approval), the NAIF facilities will include:
  - A$30m Project Development Facility (“Tranche C”)
  - A$65m Infrastructure Development Facility (“Tranche D”)
- Commercial terms confidential, but based on customary market rates
- Represents the single largest NAIF investment decision to date
- Federal Minister consent obtained. Sheffield is now working through the State of WA approval process – Sheffield expects to complete definitive documentation in relation to the NAIF facility in H2 2019

Purpose of the NAIF Facilities

- The NAIF facility enables Sheffield to build and own key infrastructure (power generation, gas storage, road, port storage facilities and accommodation), rather than having a third party build, own and operate (BOO) the infrastructure and lease it to Sheffield. This will have the effect of reducing operating costs.

Tranche C Key Terms[2]

Facility type	Senior secured (project development facility)[2]
Borrower	TOPL
Amount	A$30m
Interest rate	Commences at 3.5% p.a. and increases over time
Tenor	15 years
Amortisation	Straight line between Years 9-15

Tranche D Key Terms[2]

Facility type	Senior secured (infrastructure development facility)[2]
Borrower	Thunderbird InfraCo Pty Ltd
Amount	A$65m
Interest rate	Commences at 3.5% p.a. and increases over time
Tenor	20 years
Amortisation	Credit foncier repayment profile, payable semi-annually
Purpose	To be used for constructing on-site infrastructure, upgrading mine site roads, etc.

Notes:
1. Tenor and other terms for the NAIF facilities are subject to completion of definitive documentation, which Sheffield expects to complete in H2 2019. The key terms summarised above are non-binding. As such, any legally binding terms that may ultimately be agreed between Sheffield and NAIF in respect of the NAIF facilities may be different to the terms summarised above
2. Tranches A, B and C are senior secured over TOPL assets and rank pari passu between themselves. They have a second ranking security over InfraCo assets. Tranche D is senior secured over InfraCo assets and has second ranking over TOPL assets. See previous page for information on Tranches A and B

SECTION IV

Thunderbird Development Strategy

Stage 1 Execution Strategy

Sheffield expects to convert BFSU cost estimate into an EPC contract[1] with GRES that will deliver the process plant and associated infrastructure on a fixed price, turnkey basis

1 Owners Works (A$99m)

- Sheffield to manage various contracts via a combination of **EPC, fixed price or unit price works** to deliver non process plant project infrastructure and associated works
  - **Approximately 50% of owners works capital will be executed under EPC contracts**
  - Mine access road – construction commenced
  - Village – purchased and installation commenced
  - Power, gas, mining & village services contracts
  - Mine plan updated
  - Customer off-take
  - Other (Derby storage shed, bore field, trial mining pits, communications, etc.)

2 EPC Design and Engineering

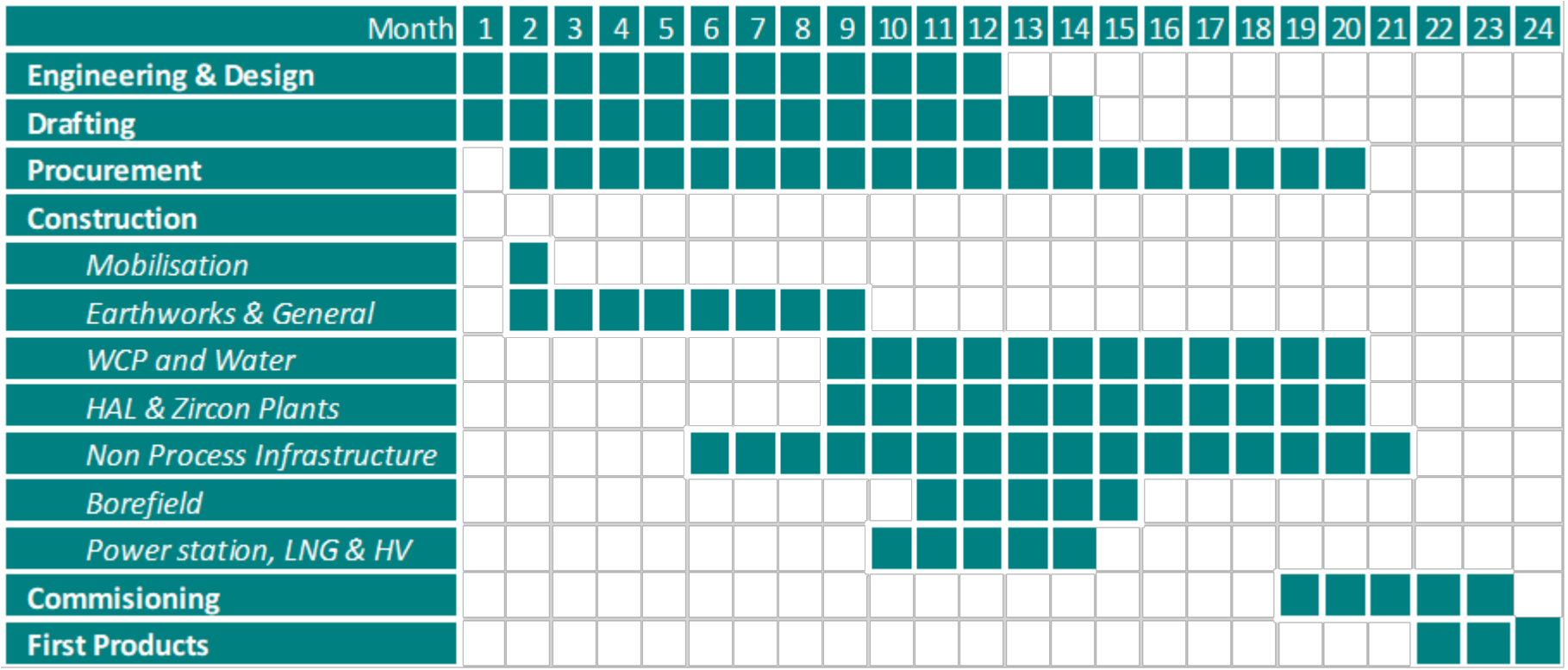
- GR Engineering Services ("GRES"), an ASX listed specialist contractor, to deliver a process plant and associated infrastructure on a fixed price, **turnkey basis**
  - GRES has extensive experience in successfully delivering mineral sands projects and has relevant Australian and global industry experience
  - Due-Diligence process with debt providers completed late 2018 examining technical, commercial and contractual arrangements
  - Fixed price lump sum EPC contract executed with GRES (November 2018)
  - EPC contract covers approximately 75% of Stage 1 upfront capital expenditure, with significant performance responsibility assumed by GRES, including:
    - **Individual 72-hour throughput tests for sections of the plant**
    - **Full plant 7-day throughput test**
    - **Metallurgical test for zircon recovery**
    - **Metallurgical test for ilmenite recovery**
    - **Metallurgical and technical support for performance testing and ramp up for 6 months after practical completion**

3 Construction (A$293m)

Notes:
1. The Company entered into an EPC contract with GR Engineering in November 2018 and expects to review terms and conditions to enable consistency with this BFS Update.

Stage 1 Development & Commissioning Timeline

The proposed timetable takes into account all foreseeable seasonal events, such as the wet season. Early works have already commenced



Source: Stage 1 development schedule based on Sheffield's current development plan as per GRES as at July 2019

Note: This timetable is subject to obtaining FID. Continuing further construction on early works is also subject to FID

SECTION V

Products, Offtake and Markets

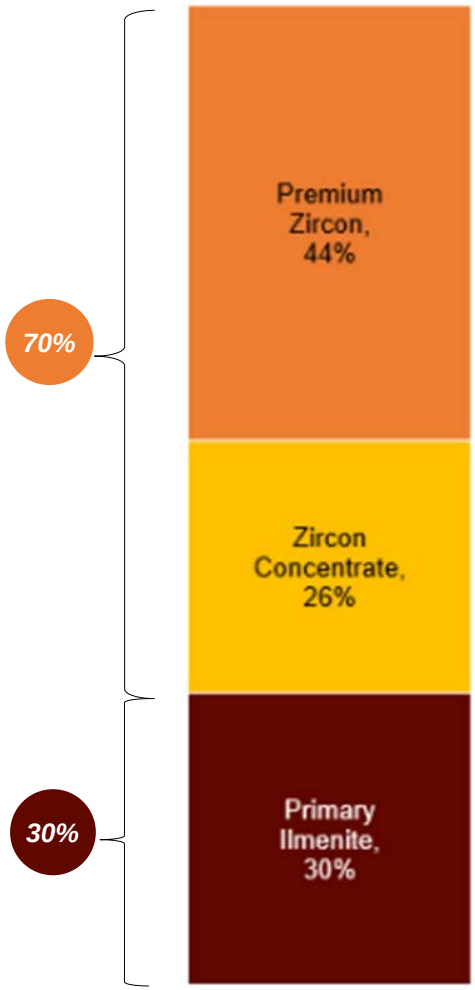
Premium Quality Products

Production of high quality zircon products and ilmenite suited to chloride slag production

Thunderbird produces three high quality finished products comprising:

- **Premium Zircon**
  - Product has high ZrO_2 (> 66% ZrO_2 + HfO_2) and very low contaminant trace elements (low in TiO_2, Fe_2O_3, Al_2O_3), making it suitable for all zircon applications
  - Suited to ceramics, zirconium chemicals and fused products industry, foundry, investment castings and other specialty markets
- **Zircon Concentrate**
  - Zircon concentrate provides value through high levels of contained valuable minerals.
  - Material to offer a ZrO_2 rich (c. 35% ZrO_2) and TiO_2 rich (c. 34% TiO_2) concentrate to customers for further process upgrading
  - Suited to ceramics (as a blended product), zirconium chemicals industry, foundry and investment castings
- **Primary Ilmenite**
  - Material suited for upgrading as feedstock for TiO_2 slag production (both chloride and sulfate slag)
  - Low in key contaminants
  - Option to produce LTR ilmenite later in the mine life if market dynamics are favourable. The LTR process can produce a premium high-grade product that is capable of feeding both the chloride slag market (53.0% TiO_2) and the sulfate pigment market (57.0% TiO_2)

% Revenue[1] over Stage1&2



Stage 1 offtake summary

Product	Binding Agreement (% of Stage 1)	Offtake Parties
Premium zircon	**100%**	Sukaso, Ruby Ceramics, RZI, Qingyuan Jinsheng, Minchem, CFM, Others
Zircon Concentrate	**100%**	Hainan Wensheng, RZI
Primary Ilmenite[2]	**~100%**	Bengbu

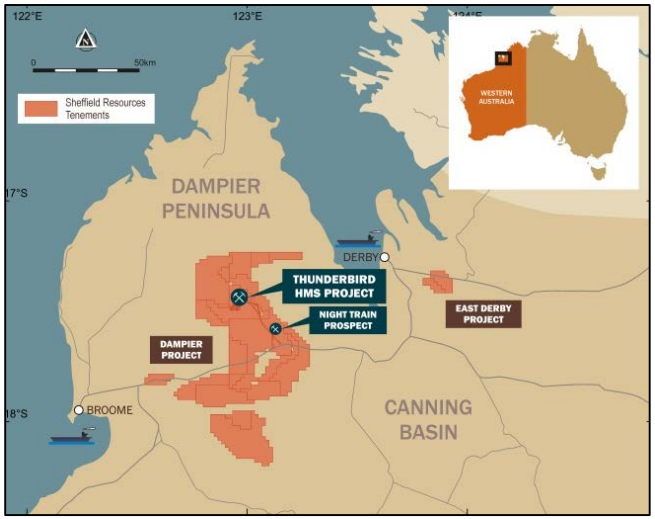
Note:
1. Based on the Thunderbird Financial Model
2. Based on Primary Ilmenite (CUP Mags only) volumes for Stage 1

Optimally Positioned to Supply Key End Markets

Sheffield has a clear competitive advantage in supplying the Asian markets

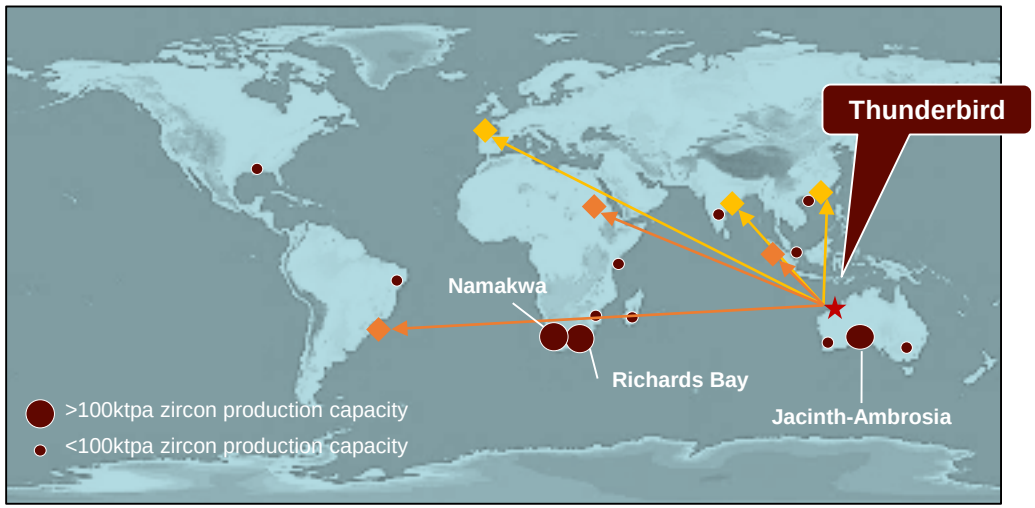
Close proximity to port and other key infrastructure

- Thunderbird is located in a low risk jurisdiction with minimal chance of supply disruption
- Simple mine to market logistics with two ports in close proximity of Thunderbird. Connected to both ports via the major highway in the region
  - Seaport and airports including Broome international airport, Curtin domestic airport, Derby Airport, Port of Broome and Port of Derby
  - Significant physical assets at the ports including storage sheds, transport and lifting equipment and lay down areas
  - Access to industrial services such as mechanical, electrical, civil and building, road construction and earthwork
  - Civil/community resources including hospitals, medical centres, housing and recreation facilities



Strategically positioned for the high growth Asian markets

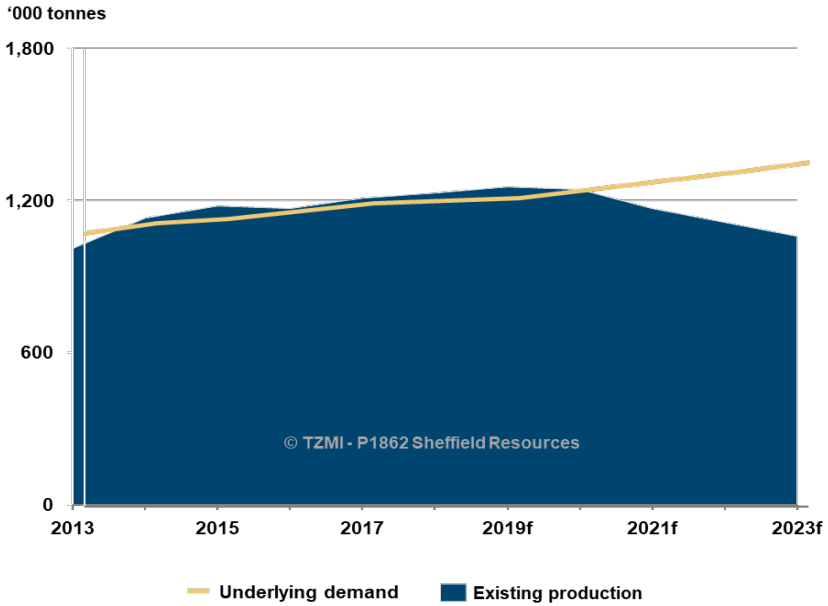
- Thunderbird is significantly closer in proximity to the Asian markets compared to other mineral sands producers
  - Key market given China consumes c. 50% of global zircon and ilmenite feedstocks
- The majority of global zircon production is sourced from mature operations in South Africa (Richards Bay, Fairbreeze, Namakwa) and Southern Australia (Jacinth-Ambrosia)
  - Other minor production predominantly from Australia, South Africa, Mozambique, Kenya, Madagascar, Asia, USA and Brazil
- Thunderbird has a competitive advantage given it is located c. 4,500km from China, compared to c. 6,500km for Jacinth-Ambrosia and >10,000km for Richards Bay



A Substantial Supply Gap in the Zircon Market is Emerging

Thunderbird ideally positioned to help bridge the expected supply gap

Significant zircon supply gap expected[1]



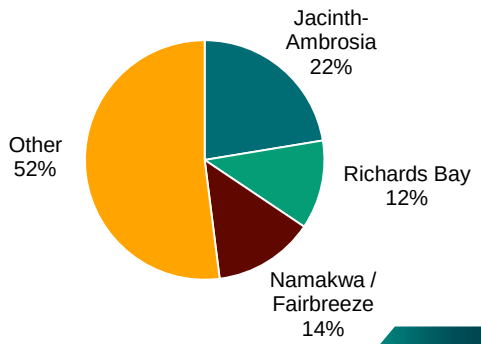
Key observations

- Supply decline of 2.9% p.a. expected up to 2023
  - Supply is dominated by Australia and Sub-Saharan Africa – material supply deficit expected to emerge from 2019 due to Ore Reserve depletion, jurisdictional risks and limited exploration success
  - Ore Reserves expected to diminish at the mature, larger scale assets such as Jacinth-Ambrosia and Richards Bay
  - Zircon supply deficit to increase from 2022 as demand outpaces supply growth (even with the onset of new projects)
  - Mine closures at North Stradbroke Island (Australia) in 2019 and Mataraca (Brazil) due in 2020
- **Supply gap is primarily driven by an expected decline in supply, rather than a forecast increase in demand**
- Thrifting and substitution have reached logical limits
- Reserve depletion of existing projects and jurisdictional risks associated with new projects are expected to tighten supply, supporting zircon's robust price outlook

Zircon supply at risk with c. 50% of global zircon production concentrated in three mature assets

- c. 50% of global zircon production sourced from 3 mature operations:
  - Jacinth-Ambrosia (c. 280ktpa, 10+ years old, Australia)
  - Richards Bay (c. 150ktpa, 40+ years old, South Africa)
  - Namakwa / Fairbreeze (c. 170ktpa, 30+ years old, South Africa)
- Declining grade and ore reserves at these 3 operations will exacerbate the supply deficit
- Additional jurisdictional and geopolitical risk given 2 of the assets are located in South Africa
- Australia's overall zircon output from existing operations is expected to decline substantially to c. 200ktpa by 2026

Split of Global Zircon Production[2]



Note:
1. Sourced from TZMI
2. Sourced published Company reports and total from TZMI

Steady Zircon Demand Growth With Supply Deficit Pending

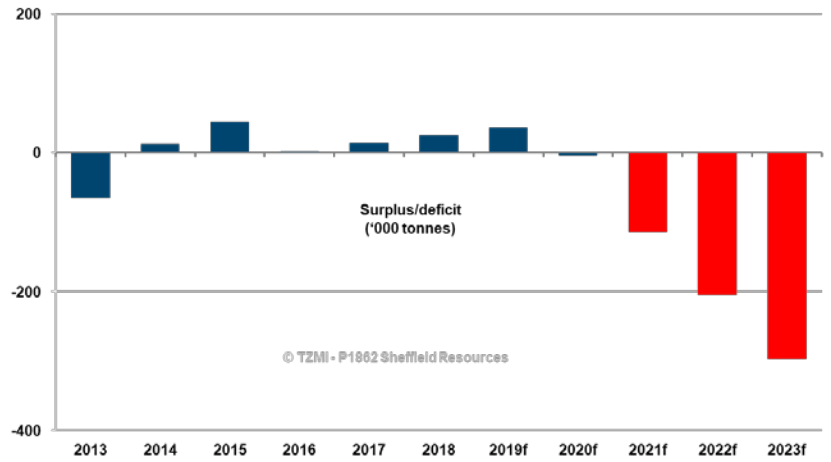
A strong baseline of demand growth coupled with a substantial supply gap supports a robust price outlook for zircon

- Global demand expected to grow at 2.3% p.a. to 2023, in line with global GDP growth
- Significant demand growth from India expected due to mass urbanization
- Stable ceramics growth of 2.6% p.a. through to 2023
- Ceramics industry to dominate growth market in terms of volume accounting for 54% of total growth through to 2023
- Zirconia and zirconium chemicals expected to be the highest growth sector at 2.9% p.a.
- Foundry and refractories both forecast to grow at a conservative 1.8% p.a. by 2023

Key observations

- 1.2Mtpa global market, expected to grow at 2.4% p.a. to 2023, in line with global GDP growth – primarily driven by demand for ceramics
  - Underpinned by improved offtake in China after some capacity rationalisation and drawdown of excess finished product inventory
  - Expanding markets in India putting pressure on supply with India expected to be 10% of total demand by 2023
- China and Europe represent 47% and 21% of global demand, respectively, driven by urbanisation, industrialisation and demand for ceramics
- Demand for ceramics represents c. 50% of end-market usage, driven by demand for floor tiles in developing economies (which have the highest proportionate use of floor tiling and sanitary products)

Zircon supply deficit without new supply[1]

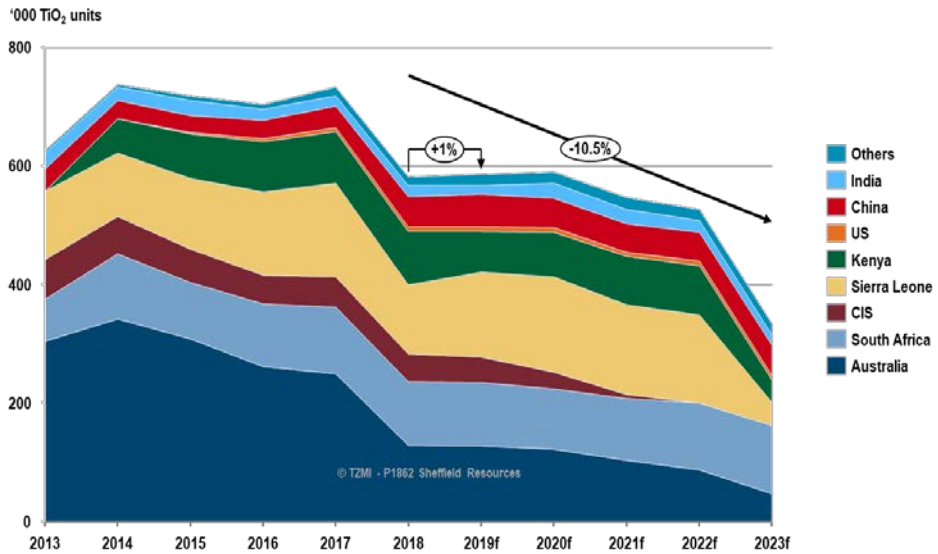


Note:
1. Sourced from TZMI

Substantial Supply Gap in the Titanium Market is Emerging

Thunderbird ideally positioned to help bridge the expected supply gap

Significant supply gap for high TiO_2 feedstocks on the horizon[1]



Key observations

Rutile supply decline of **10.5%** p.a. expected up to 2023

- Supply volume declines by 330,000 TiO_2 units by 2023
- Steep decline in supply due mainly to depletion of existing resources.
- Demand continuing to exceed supply
- Alternative feedstocks required to fill demand void.

Opportunities

Production of Chloride Slag to fill void

- Demand for TiO_2 feedstocks globally predicted to reach 8.49 million TiO_2 units by 2023 (Currently 7.5 million TiO_2 units).
- Major growth area to meet demand identified as Chloride Slag.
- Chinese processors developing chloride slag technology to fill supply void.
- Sheffield has binding offtake agreement for 100% of available primary ilmenite with Chinese Chloride Slag producer

Pigment production continues to be dominant consumption of TiO_2 feedstocks

Approximately 90% of global demand for TiO_2 feedstocks is for production of pigments with other key markets being titanium metal and welding rod production

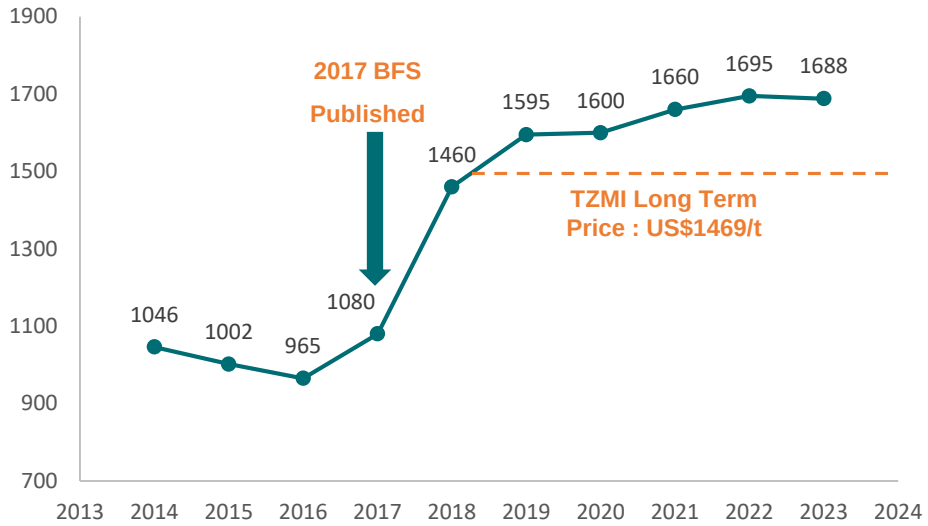
- High grade TiO_2 feedstocks in tight supply (rutile, synthetic rutile, chloride ilmenite, leucoxene) putting pressure on pigment producers.
- Sulfate and Chloride Pigment production evenly split at 50/50 of the total pigment sector.
- Unless new supply is brought on line current projections indicate growth in underlying demand to significantly outpace supply
- Without new supply the annual deficit position is predicted to be 1.2 million TiO_2 units by 2023

Note:
1. Sourced from TZMI

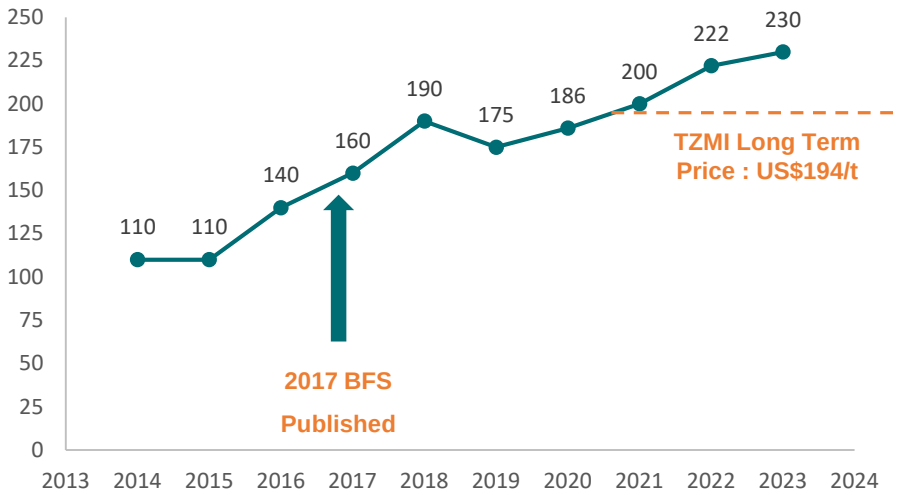
Expected Improvement in Zircon and Ilmenite Prices

Robust price outlook for both zircon and ilmenite going forward

TZMI Historical and Forecast Zircon Prices (US$/t FOB)[1]



TZMI Historical and Forecast Sulfate Ilmenite Prices (US$/t FOB)[1,2]



- Zircon prices have significantly increased over the past 24 months and are expected to show steady incremental growth over the next 3-4 years
  - Driven by the larger, more sophisticated producers
- Forecast pricing underpinned by a significant supply gap expected to emerge for zircon (see next page)
- The consensus view supports the need for additional supply from 2020 onwards

- Ilmenite prices started to increase from Q4 2016 and continued to rise throughout 2017 and 2018
  - Pigment demand expected to increase during 2019 as de-stocking nears completion
  - Chloride slag market identified as a major growth sector in coming years
- Long-term consensus forecasts anticipate a supply deficit from 2020
- Ilmenite pricing varies greatly based on different feed stocks and product quality

Notes:
1. Forecasts based on the June 2019 TZMI Market Study Report. Historical data based on TZMI and Sheffield estimates
2. Ilmenite pricing varies based on the feedstock quality. As a result, the historical pricing in this chart is based on an average of several different feed stocks, and has been sourced from TZMI

SECTION VI

Legal, Commercial and Social Licence to Operate

Primary Approvals, Leases & Agreements in Place

Thunderbird is fully permitted and construction ready

Party	Topic	Scope	Date Complete	In Place
Dept of Environment & Energy (Cwth)	*Environmental Approval*	Federal Government environmental approval for project	Sep 2018	☑
Department of Water & Environmental Regulation (WA)	*Environmental Approval*	State Government environmental approval for project	Aug 2018	☑
	Works Approvals	Minor or preliminary works (MoPW) – trial mining pits	Sep 2017	☑
		Approval for mining, processing, sewage facility and waste	Aug 2018	☑
	Licence to Take Water	Groundwater licence for project construction and operations	Oct 2018	☑
Department of Mines, Industrial Regulation & Safety (WA)	*Mining Lease*	• Mining Proposal (Village and Road) • Tenure for mining and processing • Mining Proposal Stage 1 – submitted and under assessment	Sep 2017 Sept 2018 Expect Aug 2019	☑ ☑
	Miscellaneous Licences	Tenure for infrastructure, roads and accommodation	Jun 2018	☑
Shire of Derby & West Kimberley	*Port of Derby Lease*	Tenure for facilities at Port of Derby	May 2018	☑
Native Title Claimants	*Aboriginal Heritage Agreements*	Heritage protocols for exploration tenure	Nov 2015	☑
	Native Title Agreements	Agreed terms and conditions for project operations	Oct 2018	☑

Environment

All necessary State and Federal environmental approvals received

- Sheffield's strong social licence to operate is supported by full State and Federal environmental approvals following a 3 year Public Environmental Review ("PER")
- The PER process required Sheffield to assess the environmental impact of the project development and included detailed public consultation and identification of key environmental concerns for the community. The key issues identified by the PER process were:
  - Impact on the Greater Bilby
  - Impact on ground water resources
  - Haulage of mineral sands products through Derby
  - Impact of ocean going vessels on marine animals
- The Environmental Protection Authority ("EPA") conducted a detailed review, including a site visit by the EPA Board and 2 periods of public comment
- All environmental approvals were received with the following conclusions and/or conditions:
  - PER concluded all risks can be adequately managed
  - Approvals contain standard industry conditions and controls
  - Specific Greater Bilby management plans in place
  - Environmental offset fund established
  - Restrictions on speeds and travel times for haulage of products to Port of Derby

Thunderbird personnel receive training in Bilby management as part of our Bilby Management Program (2018)

Native Title Agreement

Native Title agreement signed and is irrevocably binding on both Sheffield and the Traditional Owners

- Sheffield signed the Co-existence Agreement (Native Title Agreement) for Thunderbird on 31 October 2018
- The Traditional Owners for the Mt Jowlaenga Polygon #2 Native Title Claimant Application authorised the Named Applicants to sign the Co-existence Agreement for Thunderbird, making it binding on both Sheffield and the Traditional Owners
- Details of the Co-existence Agreement are confidential, however the final agreement is in line with Sheffield's pledge to the community and contains:
  - Royalty payments to the Traditional Owners
  - Local and Aboriginal employment and business commitments
  - Protection for Aboriginal heritage and the environment
- The Co-existence Agreement establishes the framework by which the Company can work with the Traditional Owners to protect Aboriginal heritage and the environment while delivering sustainable employment and business outcomes for Traditional Owners and the wider Aboriginal community

Sheffield, Arma Legal and Traditional Owner representatives with signed Co-Existence Agreement (October 2018)

Sheffield's Aboriginal Employment Strategy

- Sheffield has been successful in building a strong locally based workforce particularly in the area of Aboriginal employment (10 out of its current 13 Kimberley based personnel are Aboriginal people)
- Strong commitment to training and development which results in ongoing employment
- In addition, Sheffield has pledged:
  - To achieve 40% Aboriginal employment by year 8 of operations
  - To commit to Aboriginal businesses during construction and operations

APPENDIX A

Ore Reserves, Mineral Resources and Exploration

Thunderbird Ore Reserves

Thunderbird Ore Reserves: Valuable Heavy Mineral in-situ grade[1]

Ore Reserve Category	Ore Tonnes (Mt)	In-situ HM Tonnes (Mt)	HM Grade (%)	Valuable Heavy Mineral Grade (In-situ)[2]				Oversize (%)	Slimes (%)
				Zircon (%)	HiTi Leucoxene (%)	Leucoxene (%)	Ilmenite (%)		
Proved	219	30.0	13.7	1.02	0.30	0.28	3.68	14.0	16.1
Probable	529	53.4	10.1	0.79	0.27	0.27	2.87	10.5	14.5
Total	**748**	**83.8**	**11.2**	**0.86**	**0.27**	**0.27**	**3.11**	**11.6**	**15.0**

Thunderbird Ore Reserves: Mineral assemblage as percentage of HM grade[1]

Ore Reserve Category	Ore Tonnes (Mt)	In-situ HM Tonnes (Mt)	HM Grade (%)	Mineral Assemblage[3]				Oversize (%)	Slimes (%)
				Zircon (%)	HiTi Leucoxene (%)	Leucoxene (%)	Ilmenite (%)		
Proved	219	30.0	13.7	7.4	2.2	2.0	26.9	14.0	16.1
Probable	529	53.4	10.1	7.8	2.6	2.7	28.4	10.5	14.5
Total	**748**	**83.8**	**11.2**	**7.7**	**2.4**	**2.4**	**27.8**	**11.6**	**15.0**

Notes:
1. Ore Reserves are presented both in terms of in-situ VHM grade, and HM mineral assemblage. Tonnes and grades have been rounded to reflect the relative accuracy and confidence level of the estimate, thus the sum of columns may not equal. Ore Reserves reported for the Dampier Project were prepared and first disclosed under the JORC Code (2012). Refer to Sheffield's ASX Announcement dated 31 July 2019 titled "Thunderbird Ore Reserve Update" for further detail. Ore Reserve is reported to a design overburden surface with appropriate consideration for modifying factors, costs, mineral assemblage, process recoveries and product pricing
2. The in-situ grade is determined by multiplying the HM Grade by the percentage of each valuable heavy mineral within the heavy mineral assemblage
3. Mineral Assemblage is reported as a percentage of HM Grade. It is derived by dividing the in-situ grade by the HM grade

Thunderbird Mineral Resources

Thunderbird Mineral Resources: Valuable Heavy Mineral in-situ grade[1]

Cut-off (HM%)	Mineral Resource Category	Ore Tonnes (Mt)	In-situ HM Tonnes (Mt)	HM Grade[2] (%)	Valuable Heavy Mineral Grade (In-situ)[3]				Slimes (%)	Oversize (%)
					Zircon (%)	HiTi Leucoxene (%)	Leucoxene (%)	Ilmenite (%)		
> 3% HM	Measured	510	45	8.9	0.71	0.20	0.19	2.4	18	12
	Indicated	2,120	140	6.6	0.55	0.18	0.20	1.8	16	9
	Inferred	600	38	6.3	0.53	0.17	0.20	1.7	15	8
	Total	**3,230**	**223**	**6.9**	**0.57**	**0.18**	**0.20**	**1.9**	**16**	**9**
>7.5% HM	Measured	220	32	14.5	1.07	0.31	0.27	3.9	16	15
	Indicated	640	76	11.8	0.90	0.28	0.25	3.3	14	11
	Inferred	180	20	10.8	0.87	0.27	0.26	3.0	13	9
	Total	**1,050**	**127**	**12.2**	**0.93**	**0.28**	**0.26**	**3.3**	**15**	**11**

Thunderbird Mineral Resources: Mineral assemblage as percentage of HM grade[1]

Cut-off (HM%)	Mineral Resource Category	Ore Tonnes (Mt)	In-situ HM Tonnes (Mt)	HM Grade[2] (%)	Mineral Assemblage[4]				Slimes (%)	Oversize (%)
					Zircon (%)	HiTi Leucoxene (%)	Leucoxene (%)	Ilmenite (%)		
> 3% HM	Measured	510	45	8.9	8.0	2.3	2.2	27	18	12
	Indicated	2,120	140	6.6	8.4	2.7	3.1	28	16	9
	Inferred	600	38	6.3	8.4	2.6	3.2	28	15	8
	Total	**3,230**	**223**	**6.9**	**8.3**	**2.6**	**2.9**	**28**	**16**	**9**
>7.5% HM	Measured	220	32	14.5	7.4	2.1	1.9	27	16	15
	Indicated	640	76	11.8	7.6	2.4	2.1	28	14	11
	Inferred	180	20	10.8	8.0	2.5	2.4	28	13	9
	Total	**1,050**	**127**	**12.2**	**7.6**	**2.3**	**2.1**	**27**	**15**	**11**

Notes:

1. The Thunderbird Mineral Resources are reported inclusive of (not additional to) Ore Reserves. The Mineral Resource reported above 3% HM cut-off is inclusive of (not additional to) the Mineral Resource reported above 7.5% HM cut-off. All tonnages and grades have been rounded to reflect the relative accuracy and confidence level of the estimate and to maintain consistency throughout the table, therefore the sum of columns may not equal. The Mineral Resource estimate was prepared and first disclosed under the JORC Code (2012). Refer to Sheffield's ASX announcement dated 5 July 2016 titled *"Sheffield Doubles Thunderbird Measured Mineral Resource"* for further detail
2. Total heavy minerals (HM) is within the 38µm to 1mm size fraction and has been reported as a percentage of the total material quantity
3. The Valuable HM in-situ grade is reported as a percentage of the total material quantity and is determined by multiplying the percentage of total HM by the percentage of each valuable heavy mineral within the HM assemblage at the resource block model scale
4. The Mineral Assemblage is represented as the percentage of HM grade. Estimates of mineral assemblage are determined by screening and magnetic separation. Magnetic fractions were analysed by QEMSCAN for mineral determination as follows: >90% liberation; ilmenite 40-70% TiO_2; leucoxene 70-94% TiO_2; high titanium leucoxene (HiTi Leucoxene) >94% TiO_2 and zircon 66.7% ZrO_2+HfO_2. The non-magnetic fraction was analysed by XRF and minerals determined as follows: Zircon ZrO_2+HfO_2/0.667 and HiTi Leucoxene TiO_2/0.94

Night Train Mineral Resources

Night Train Mineral Resources: Valuable Heavy Mineral in-situ grade[1]

Mineral Resource Category	Cut off (HM%)	Ore Tonnes (Mt)	HM Grade (%)	Valuable Heavy Mineral Grade (In-situ)[2,3]					
				Zircon (%)	HiTi Leucoxene & Rutile (%)	Leucoxene (%)	Ilmenite (%)	Slimes (%)	Oversize (%)
Inferred	1.2	130	3.3	0.45	0.18	1.5	0.71	8.7	2.2
Inferred	2.0	50	5.9	0.82	0.33	2.9	1.06	10.2	2.2

Night Train Mineral Resources: In-Situ Tonnes[1]

Mineral Resource Category	Cut off (HM%)	HM Tonnes (Mt)	In-situ Tonnes[4]				
			Zircon (kt)	HiTi Leucoxene & Rutile (kt)	Leucoxene (kt)	Ilmenite (kt)	Total VHM (kt)
Inferred	1.2	4.2	560	220	1,900	900	3,590
Inferred	2.0	3.0	420	170	1,500	540	2,600

Notes:

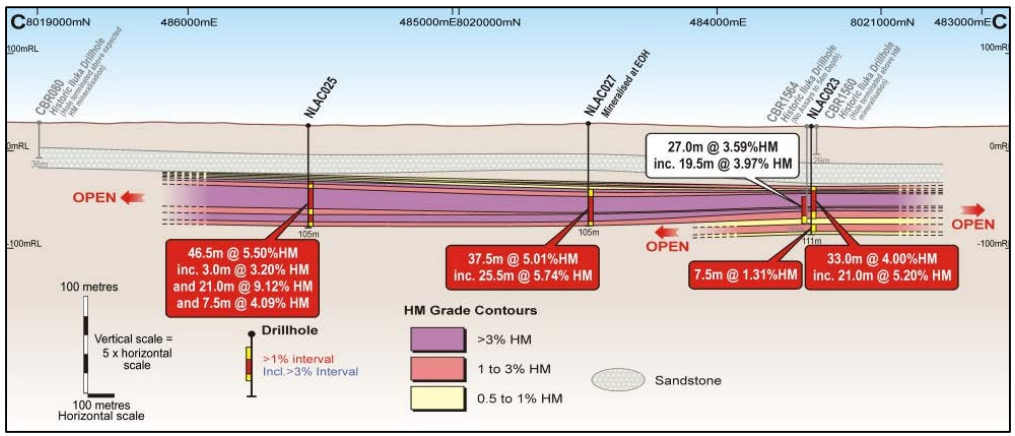
1. Refer to ASX Announcement on 31 January 2019 titled *"High Grade Maiden Mineral Resource at Night Train"* for further information, explanations and qualifications. The Mineral Resource estimate was prepared by Optiro Pty Ltd and disclosed under the JORC Code (2012). Total HM is within the 38µm to 1mm size fraction and reported as a percentage of the total material, slimes is the -38µm fraction and oversize is the +1mm fraction. Tonnes and grades have been rounded to reflect the relative accuracy and confidence level of the estimate, thus the sum of columns may not equal
2. In-situ assemblage grade is determined by multiplying the percentage of total HM by the percentage of each valuable heavy mineral within the heavy mineral assemblage at the resource block model scale
3. Estimates of Mineral Assemblage are presented as percentages of the Total Heavy Mineral (THM) component of the deposit, as determined by magnetic separation, QEMSCANTM and XRF for one of 12 composite samples. Magnetic fractions were analysed by QEMSCANTM for mineral determination as follows: ilmenite: 40-70% TiO_2 >90% liberation; leucoxene: 70-90% TiO_2 >90% liberation; high titanium leucoxene (HiTi leucoxene) and rutile combined > 90% TiO_2 liberation, and zircon: 66.7% ZrO_2+HfO_2 >90% liberation. The non-magnetic fraction was submitted for XRF analysis and minerals determined as follows: zircon: ZrO_2+HfO_2/0.667 and high titanium leucoxene (HiTi leucoxene): TiO_2/0.94. HM assemblage determination was by the QEMSCANTM process for 11 of 12 composite samples which uses observed mass and chemistry to classify particles according to their average chemistry, and then report mineral abundance by dominant % mass in particle. For the TiO_2 minerals the following breakpoints were used to distinguish between ilmenite 40% to 70% TiO_2, leucoxene 70% to 90% TiO_2, high TiO_2 leucoxene and rutile > 90%
4. The contained in-situ tonnes for the valuable heavy minerals were derived from information from the in-situ grades and tonnes of the Mineral Resource

Significant Regional Exploration Upside

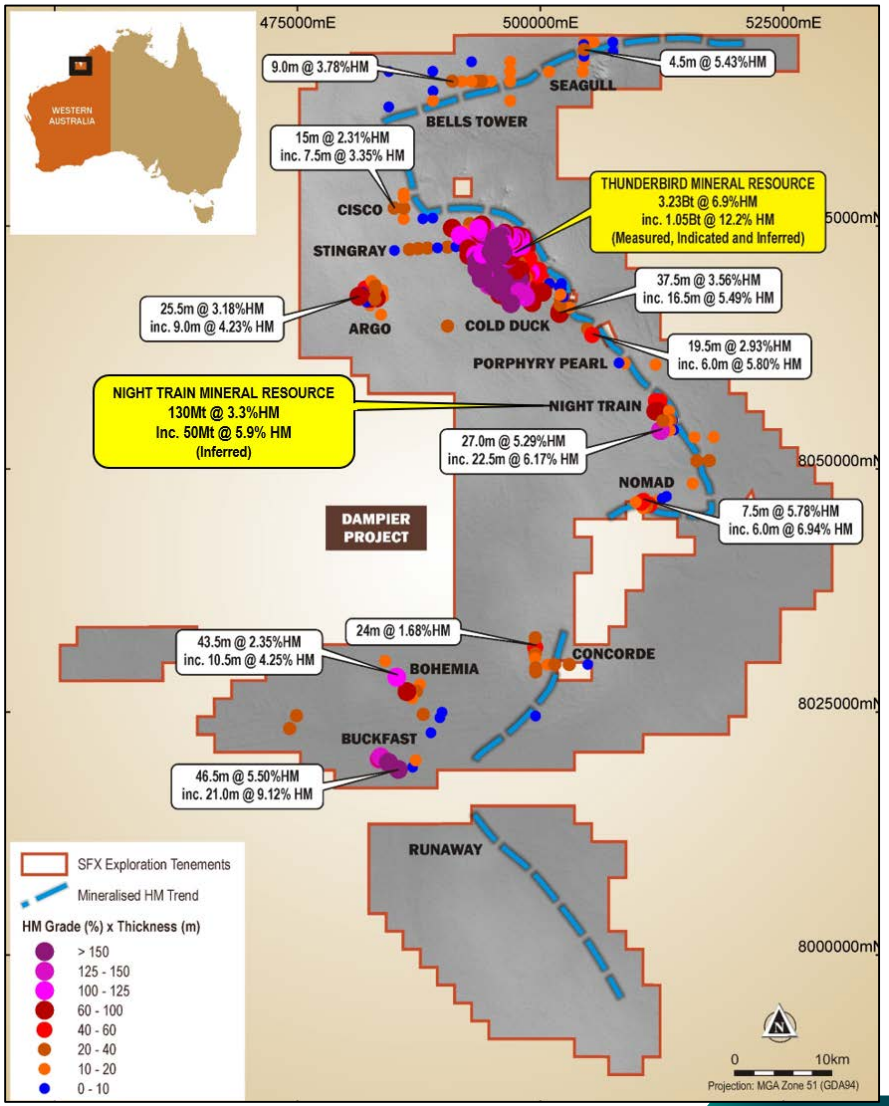
Strategic value demonstrated through multiple discoveries made along a 160km long trend

- Exploration has delineated 14 zones of significant mineralisation along a 160km long highly mineralised trend which extends from Seagull in the north to Runaway in the south[1]
- Maiden high grade Mineral Resource[1] outlined at Night Train
- Three substantial new mineral sands discoveries have been outlined at Buckfast, Bohemia and Concorde
  - Characterised by broad sheet-like geometries, thick intersections
  - Mineral assemblages with high proportions of VHM dominated by leucoxene, altered ilmenite and zircon with low to moderate levels of trash
- Opens up a new 60km long highly prospective corridor south of Thunderbird
- Thick high grade intervals[2] have been intersected, including;
  - 46.5m @ 5.50% HM from 57.0m (NLAC025), including 21.0m @ 9.12% HM from 64.5m (Buckfast)
  - 37.5m @ 5.01% HM from 67.5m (NLAC027), including 25.5m @ 5.74% HM from 75m (Buckfast)
- **Numerous zircon-rich targets identified for follow-up drilling**

Buckfast – Cross Section[2]



Dampier Project – Regional Plan[1]



Notes:
1. Refer to ASX announcement 31 January 2019 titled *"High Grade Maiden Mineral Resource at Night Train"*
2. Refer to ASX announcement 13 November 2018 titled *"New Large High Grade Discovery South of Thunderbird"*

APPENDIX B

Product Specifications

Product quality

Premium quality zircon, zircon concentrate and primary ilmenite products with extensive testing conducted by offtake partners

Zircon Product Properties[1]

- Meets premium classification for use in the ceramics sector
- Approved globally after extensive testing by offtake partners and other consumer groups
- Approved for investment casting applications
- Low levels of impurities (particularly Al_2O_3)

Composition	Premium Zircon (%)	Typical (%)
$ZrO_2 + HfO_2$	66.2 – 66.6	66.30
TiO_2	0.09 – 0.20	0.14
Fe_2O_3	0.06 – 0.10	0.08
SiO_2	32.5 – 33.5	32.5
Al_2O_3	0.10 - 0.15	0.15

- 100% Binding Offtake in Place
- Offtake partners in key locations and regions in Europe, India and China
- Material suited to all zircon applications

Zircon Concentrate Product Properties

- Highly sought after concentrate material
- High ZrO_2 and TiO_2 grade
- (c. 35% ZrO_2, & 34% TiO_2)
- Value for both the ZrO_2 and TiO_2 units

Composition	Zircon Concentrate (%)	Typical (%)
$ZrO_2 + HfO_2$	32.0 – 37.0	35.20
TiO_2	32.0 – 37.0	34.40
Fe_2O_3	1.00 – 1.50	1.30
SiO_2	18.0 – 22.0	19.2
Al_2O_3	1.00 - 1.50	1.30

- 100% Binding Offtake in Place
- Offtake partners in key locations within China
- Material well suited to processing and upgrading

Primary Ilmenite Product Properties[2]

- Low technical risk
- Suitable for chloride slag production
- Produces valuable co-product in High Purity Pig Iron (HPPI)
- Low levels of Cr_2O_3, very low CaO and MgO
- Fine to medium grained.

Composition	Primary Ilmenite (%)	Typical (%)
TiO_2	35.0 – 45.0	38.5
$TiO_2 + Fe_2O_3 + FeO$	92.5	91.0 – 95.0
Cr_2O_3	0.05	0.04 - 0.06
CaO	0.02	<0.01 – 0.03
MgO	0.20	0.15 – 0.25

- 100% Binding Offtake in Place
- Offtake partner to be integrated
- Will produce chloride slag and chloride pigment

Notes:
1. Based on the ASX announcement released on 12 October 2016 *"Thunderbird BFS Delivers Outstanding Product Improvements"*
2. Based on the ASX announcement released on 1 July 2019 titled *"Sheffield Signs Binding Primary Ilmenite Offtake Agreement"*

APPENDIX C

Corporate Overview, Board and Senior Management

Sheffield Resources Corporate Overview

Sheffield Resources is an ASX listed mineral sands developer which owns 100% of the large scale shovel ready Thunderbird Mineral Sands Project

- Sheffield Resources Limited ("Sheffield" or the "Company") is an ASX listed mineral sands developer and explorer based in Perth, Western Australia (ASX:SFX)
- Sheffield is focused on the development of the 100% owned Thunderbird Mineral Sands Project ("Thunderbird" or the "Project") located on the Dampier Peninsula in Northern Western Australia.
- Thunderbird has been developed as a greenfield project by Sheffield since discovery in 2012 and is one of the largest and highest grade zircon rich discoveries in the last 30 years and is one of a few greenfield mineral sands deposits globally in a secure jurisdiction
- Experienced and skilled Board and management (>150 years' collective experience) with strong in-house intellectual property and knowledge and capable of developing, delivering and operating Thunderbird
- Sheffield has a portfolio of mineral sands assets in Australia with a focus on zircon rich assemblages which includes:
  - Thunderbird with Ore Reserve of 748Mt @11.2%HM[2]
  - Night Train deposit, 20km to the east of Thunderbird and with an Inferred Mineral Resource[3] of 130Mt @ 3.3% HM, containing 3.6Mt of VHM
  - Dampier Project has delineated 14 zones of significant mineralisation along a 160km long highly mineralised trend[4]

Capital structure[1]

Item	Unit	Value
Ordinary Shares Outstanding (as at 30 July 2019)	*#m*	261
Share Price (as at 29 July 2019)[1]	*A$/sh*	0.73
Market Capitalisation	***A$m***	**190.5**
Cash Balance (30 June 2019)	*A$m*	2.7
Debt Balance (30 June 2019)	*A$m*	-
Enterprise Value	***A$m***	**187.8**

Share price chart – Since BFS release[1]

1. Market data as at 29 July 2019 and sourced from ASX market based data and reports published by Sheffield Resources
2. Refer to ASX announcement 31 July 2019 titled "Thunderbird Ore Reserve Update"
3. Refer to ASX announcement 31 January 2019 titled *"High Grade Maiden Mineral Resource at Night Train"*
4. Refer to ASX announcement 13 November 2018 titled *"New Large High Grade Discovery South of Thunderbird*

Board of Directors

Will Burbury — *Non-Executive Chairman*

- Practised as a corporate lawyer with a leading Australian law firm prior to entering the mining and exploration industry in 2003
- Actively involved in the identification and financing of many Australian and African resources projects
- Held senior management positions and served on the boards of several private and publicly listed companies
- Previously Chairman of Warwick Resources Limited prior to its merger with Atlas Iron Limited in 2009. Formerly a director of Lonrho Mining Limited (ASX: LOM) and an executive of Nkwe Platinum Ltd (ASX: NKP)

David Archer — *Technical Director*

- Geologist with over 30 years' experience in exploration and mining in Australia
- Held senior positions with major Australian mining companies, including Renison Goldfields Consolidated Limited and 10 years as a director of Archer Geological Consulting
- Consultant to Atlas Iron Limited and Warwick Resources Limited and was responsible for significant iron ore discoveries for both companies in the Pilbara region
- Other major West Australian discoveries include the Raleigh and Paradigm gold mines and the Magellan lead mine

Bruce McFadzean — *Managing Director*

- Over 40 years' mining experience leading financing, development and operation of several new mines in the global resources industry
- Professional career includes 15 years with BHP Billiton and Rio Tinto in a variety of positions globally and 4 years as Managing Director of successful Western Australia gold miner Catalpa Resources Limited (ASX:CAH) which he subsequently merged into Evolution Mining (ASX:EVN)
- Raised in excess of A$700 million in debt and equity from Australian and overseas markets and has built and operated mines globally
- Initiated and completed several successful merger transactions

Bruce McQuitty — *Non-Executive Director*

- 35 years' experience in the mining and civil construction industries
- Managing Director of Warwick Resources Limited prior to its merger with Atlas Iron Limited in 2009
- Held senior positions with Consolidated Minerals Limited, Renison Goldfields Consolidated Limited and Gympie Gold Limited
- Significant technical expertise in exploration, project generation, feasibility, underground mining and engineering geology and has managed exploration teams in Australia and overseas

Executive Management Team

Stuart Pether — *Chief Operating Officer*

- Mining professional with over 25 years' experience in the resources industry
- Experience includes project development, technical studies, mine operations and corporate management
- Most recently, CEO of Kula Gold Limited, and previously was the Vice President, Project Development for Evolution Mining and Chief Operating Officer for Catalpa Resources
- Holds a Bachelor of Engineering (Mining) from the Western Australian School of Mines and is a member of the Australasian Institute of Mining and Metallurgy

Mark Di Silvio — *CFO / Company Secretary*

- CPA and MBA qualified finance professional with over 25 years' resources industry experience
- Professional career includes gold operations and project development experience in both Australia and overseas, senior finance roles with Woodside Petroleum Limited in Australia and Africa
- Most recently CFO for TSX listed Mawson West Limited, and was also previously CFO of Centamin Plc (TSX, LSE listed)
- Significant experience in financial management, debt and offtake funding and product offtake agreements

Jim Netterfield — *General Manager, Process & Engineering*

- More than 20 years' experience in the resources industry with a proven track record in successfully managing mineral development projects through to production
- Professional career includes 11 years with BHP Billiton and Rio Tinto in a variety of senior operations roles, including Vice President – Railway & Ports, Vice President, Operations - Dampier
- Served as acting CEO and Operations Director at Oakajee Port & Rail Pty Ltd for 4 years, where Jim led the feasibility studies for Mitsubishi's $10 billion magnetite iron ore project

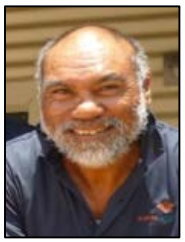
Neil Patten-Williams — *General Manager, Marketing*

- Over 18 years' experience in the resources industry, including 5 years as Sales and Marketing Manager for established mineral sands producer Doral Group, where Neil was responsible for marketing, logistics and sales globally
- Prior to his appointment as Sales and Marketing Manager at Doral, Neil was Operations Manager of the Doral Fused Materials Plant in WA for 5 years, where he was responsible for all aspects of safety, operations and maintenance. He was also the company's Zirconia Operations Manager for 5 years
- Strong background in both zircon and titanium mineral products

Executive Management Team & Key Personnel

Geoff Williams — *General Manager, Thunderbird Operations*

- Mining engineer with over 25 years' mining experience and more than 15 years' in senior operational and corporate executive roles
- Previously COO at Kimberley Diamond Company, General Manager at Consolidated Minerals and Mining Manager at Wiluna Gold Operations
- Track record of delivering agreed outcomes and maximising business capability, profit and efficiency
- Based in Broome



Justin King — *Community Relations Superintendent*

- A trusted community leader in the Kimberley region with experience as Aboriginal Liaison Officer within the mining sector and an abiding commitment to Aboriginal people
- Based in Broome

Sebastian Grey — *Principal Exploration Geologist*

- Over 15 years' resources experience with a BSc(Hons) Geology
- Well versed in Sheffield's projects after joining the Company in March 2013

Vanessa Hughes — *General Manager, People & Community*

- Qualified human resources executive with more than 25 years' experience, 15 years of which have been in senior management roles
- Prior appointments have included General Manager People, Culture and Information at Resolute Mining, General Manager People and Culture at Millennium Minerals and HR Manager at Integra Mining
- Demonstrated expertise in employee relations, indigenous engagement, people development, optimising workplace cultures and corporate social responsibility

Mark Teakle — *Technical Manager*

- Over 35 years' experience with a BSc(Hons) Geology
- Mineral sands technical expert
- Joined Sheffield in April 2012

Brad Horsman — *Contracts and Commercial Superintendent*

- Over 10 years' experience in commercial construction and contract administration
- Based in Broome

APPENDIX D

Glossary

Glossary

Term	Definition
2015 PFS	Thunderbird Pre-Feasibility Study released on 14 May 2015
A$/t	Australian dollars per metric tonne
A$m	Australian million dollars
Al_2O_3	Aluminium oxide
ASX: CAH	Catalpa Resources Limited
ASX: EVN	Evolution Mining Limited
ASX: LOM	Lonrho Mining Limited
ASX: NKP	Nkwe Platinum Limited
AUD	Australian dollars
Bankable Feasibility Study or BFS	Thunderbird Bankable Feasibility Study released on 24 March 2017
BBSY	Bank Bill Swap Bid Rate
BOO	Build, Own and Operate
BSE	Base Resources Limited
c.	Circa
CAGR	Compound annual growth rate
CaO	Calcium oxide
Capex	Capital expenditure
CFM	CFM Minerals company
CIF/FOB	Cost insurance freight / free on board
Company	Sheffield Resources Limited
CPI	Consumer price index
Cr_2O_3	Chromium(III) oxide
CUP	Concentrate upgrade plant
Cwth	Commonwealth
CY	Calendar year
Derby Port Access Agreement	Agreement with Sheffield for minimum 20 year exclusive access to the Derby Port
DMIRS	Department of Mines, Industrial Regulation and Safety
DRX	Diatreme
E04/2083	Exploration licence covering the Thunderbird deposit
EBITDA	Earnings before interest, tax, depreciation and amortisation
EDL	Energy Developments
EPA	Environmental Protection Authority

Term	Definition
EPC	Engineering, procurement and construction
EPC Contract	Engineering, procurement and construction contract
eq	Equivalent
Fe_2O_3	Iron(III) oxide or ferric oxide
FeO	Iron(II) oxide or ferrous oxide
FIBC	Flexible intermediate bulk container
FID	Final investment decision
FY	Financial year
G&A	General and administrative
GDP	Gross domestic product
GRES, GR Engineering or GR Engineering Services	GR Engineering Services Limited
HAL	Hot acid leach
HfO_2	Hafnium oxide
Hi-Ti	High titanium leucoxene
Hi-Ti88	High titanium leucoxene (88%)
HM	Heavy minerals
HMC	Heavy mineral concentrate
HMS	Heavy mineral sand
IDP	Ilmenite dry plant
ILU	Iluka Resources Limited
IMA	Image Resources, Inc.
In-situ grade	Grade determined by multiplying the percentage of the total HM by the percentage of each valuable heavy mineral assemblage at the resource block model scale
IRR	Internal rate of return
JORC Code (2012)	The Australian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves, 2012
JSA	Job safety analysis
JV	Joint venture
kL	Kilolitre
km	Kilometre
KMR	Kenmare Resources plc
kt	Thousand tonnes

Glossary

Term	Definition
ktpa	Thousand tonnes per annum
LIBOR	London Inter-bank Offered Rate
LIMS	Low intensity magnetic separation
LNG	Liquified natural gas
LOM	Life of mine
LTR	Low temperature roast
LTR Ilmenite	Low temperature roast ilmenite
MFU	Mining feed unit
MgO	Magnesium oxide
Mineral Resources	Mineral resources deemed to be in compliance with the JORC Code (2012)
Mining Lease	Approval to mine and process minerals granted by the Department of Mines
MoPW	Minor or preliminary works
MSP	Mineral separation plant
Mt	Million tonnes
Mtpa	Million tonners per annum
MUP	Mining unit plant
MVA	Mega volt amp
MW	Megawatt
MZI	MZI Resources Limited
NAIF	Northern Australia Infrastructure Fund
Native Title	Native Title agreement
NPV	Net present value
Opex	Operating expenses
Ore Reserve	Ore reserves deemed to be in compliance with the JORC Code (2012)
p.a.	Per annum
PER	Public environmental review
PFS	Thunderbird Pre-feasibility Study released on 14 October 2015
PP&E or PPE	Property, plant and equipment
QEMSCAN	Quantitative evaluation of materials by scanning electron microscopy

Term	Definition
QMM	QIT Madagascar Minerals
RIO	Rio Tinto
ROM	Run of mine
SAV	Savannah Resources plc
Sheffield or SFX	Sheffield Resources Limited
SiO_2	Silicon dioxide
SLTO	Social license to operate
SPP	Share purchase plan
SR	Synthetic rutile
STA	Strandline Resources Limited
t	Metric tonne
Thunderbird	Thunderbird Mineral Sands Project
TiO_2	Titanium dioxide
TJ	Terajoule
TOPL	Thunderbird Operations Pty Ltd
tph	Metric tonnes per hour
Traditional Owners	The Traditional Owners for the Mt Jowlaenga Polygon #2 Native Title Claimant Application
TROX	Tronox Limited
TZMI	TZ Minerals International Pty Ltd
UBS	UBS AG, Australia branch
US$/t	U.S. dollars per metric tonne
US$m	U.S. million dollars
VDR	Virtual data room
VHM	Valuable heavy minerals
W:O	Ratio of waste to ore
WA	Western Australia
WACC	Weighted average cost of capital
WCP	Wet concentration plant
WHIMS	Wet high intensity magnetic separation
WWTP	Wastewater treatment plant
ZrO_2	Zirconium dioxide
ZSP	Zirconium sponge plant