Sheffield Resources LIMITED

ZIRCON INDUSTRY ASSOCIATION (ZIA) CONFERENCE

Bangkok

Date: September 2017

Presenter: David Archer

DISCLAIMER

PREVIOUSLY REPORTED INFORMATION

This presentation includes information extracted from Sheffield Resources Limited's ACN 125 811 083 ("the Company" or "Sheffield") previous ASX announcements, as follows:

"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
"THUNDERBIRD NATIVE TITLE UPDATE" 20 December 2017
"BINDING ZIRCON CONCENTRATE OFFTAKE AGREEMENT SIGNED" 12 December 2017
"COMMENCEMENT OF EARLY WORKS AND TRAINING PROGRAM" 4 December 2017
"SHEFFIELD TO IPO CARAWINE GOLD AND BASE METAL ASSETS" 19 October 2017
"SHEFFIELD ANNOUNCES EPC PREFERRED CONTRACTOR" 19 October 2017
"SHEFFIELD MANDATES TAURUS FOR US$200M DEBT FACILITY' 18 October 2017
"THUNDERBIRD NATIVE TITLE UPDATE " 12 October 2017
"EPA RECOMMENDS APPROVAL OF THUNDERBIRD " 9 October 2017
"SHEFFIELD SECURES SECOND BINDING OFFTAKE AGREEMENT " 25 September 2017
" NATIVE TITLE APPEAL DISMISSED" 22 September 2017
"SHEFFIELD SIGNS MAIDEN BINDING OFFTAKE AGREEMENT "12 September 2017
"THUNDERBIRD PERMITTING UPDATE" 30 August 2017
"SHEFFIELD LAUNCHES ABORIGINAL EMPLOYMENT PROGRAM" 17 August 2017
"NATIVE TITLE DETERMINATION " 15 June 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

This presentation also includes information that relates to Exploration Results, Mineral Resources, Ore Reserves, a Bankable Feasibility Study and other Technical Studies prepared and first disclosed under the JORC Code (2012). This information was extracted from Sheffield's previous ASX announcements as follows:

"QUARTERLY ACTIVITIES AND CASH FLOW REPORT" 16 July 2018
"THUNDERBIRD BFS DELIVERS OUTSTANDING RESULTS" 24 March, 2017
"THUNDERBIRD ORE RESERVE UPDATE" 16 March 2017
"THUNDERBIRD ILMENITE EXCEEDS PREMIUM SPECIFICATION" 13 March 2017
"OUTSTANDING IMPROVEMENTS IN RECOVERIES AND PRODUCT SPECIFICATIONS FROM THUNDERBIRD BFS" 12 October 2016
"SHEFFIELD DOUBLES MEASURED MINERAL RESOURCE AT THUNDERBIRD" 5 July 2016

These are available to view on Sheffield's website: **www.sheffieldresources.com.au**

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, Ore Reserves, the Bankable Feasibility Study and other Technical Study results, 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 relevant original market announcements.

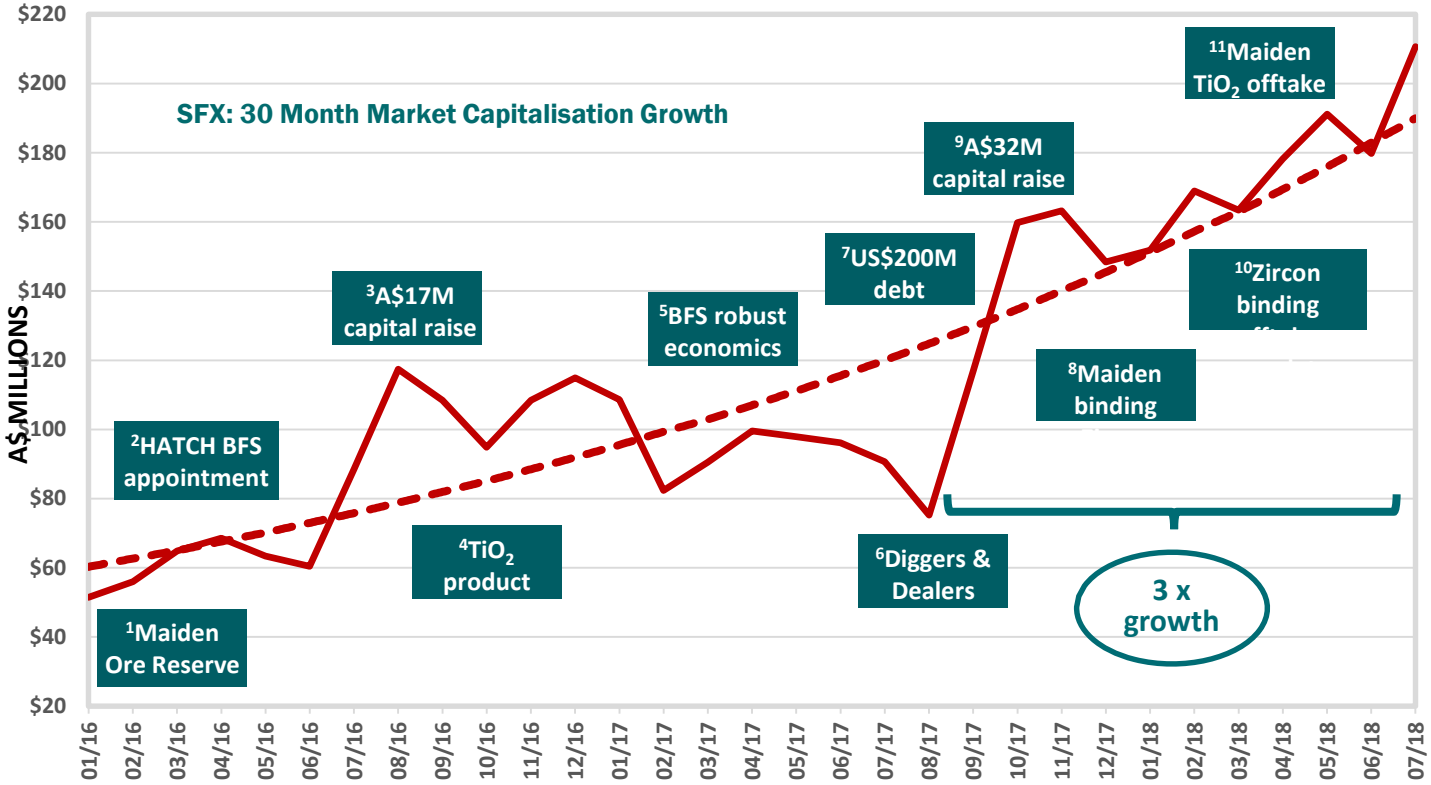
CAUTIONARY STATEMENTS AND RISK FACTORS

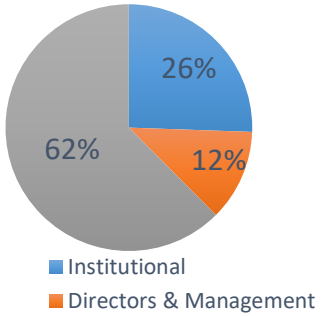
The contents of this presentation reflect various technical and economic conditions at the time of writing. Given the nature of the resources industry, these conditions can change significantly over relatively short periods of time. Consequently, actual results may vary from those contained in this presentation.

Some statements in this presentation 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 presentation 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. 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. So there can be no assurance that actual outcomes will not materially differ from these forward-looking statements.

CORPORATE SNAPSHOT

ASX CODE	ISSUED SHARES	SHARE RIGHTS & OPTIONS	SHARE PRICE (5 SEP 2018)	MARKET CAP	CASH (UNAUDITED)[1]	ENTERPRISE VALUE	TOP 20 SHARE HOLDERS
SFX	229.0M	15.4M[2]	A$0.97	A$222M	A$23M	A$199M	~52%





BlackRock	6%
Colonial First State	6%
Other Institutions	14%
Walter Yovich	6%

[1]24 January 2016
[2]12 March 2016
[3]24 August 2016
[4]12 October 2016
[5]24 March 2017
[6]7 August 2017
[7]18 October 2017
[8]12 December 2017
[9]12 March 2018
[10 11]21 June 2018

[1]as at 30 June 2018
[2]average option exercise price A$0.47c

OUR TEAM – EXPERIENCED AND SKILLED

BOARD

Will Burbury
Non-Executive Chairman

Bruce McFadzean
Managing Director

David Archer
Technical Director

Bruce McQuitty
Non-Executive Director

MANAGEMENT

Bruce McFadzean – Managing Director
Mining engineer with over 35 years experience leading the financing, development and operation of mines in Australia and overseas.

David Archer – Technical Director
Geologist with over 27 years experience Australian resources sector.

Stuart Pether – Chief Operating Officer
Mining engineer with over 25 years technical and operating experience in the resources industry, both in Australia and overseas.

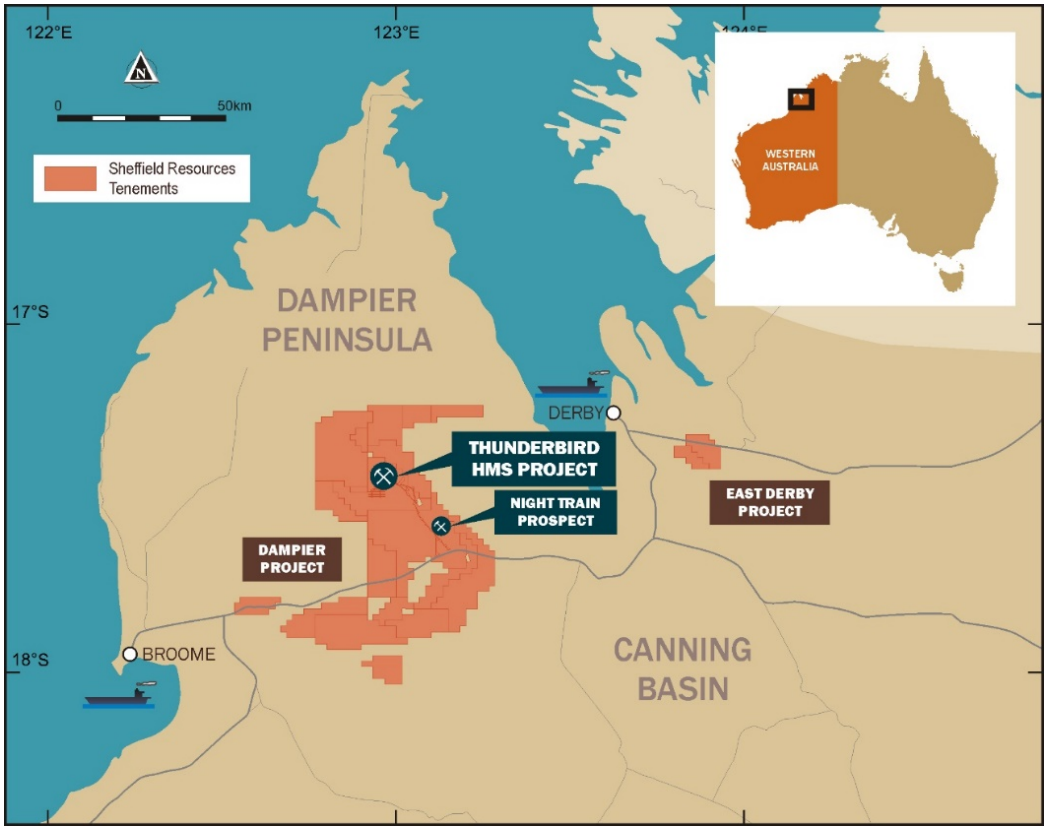
Mark Di Silvio – CFO/Company Secretary
CPA with over 25 years experience in the resources sector working across Africa and Australia.

Jim Netterfield – Project General Manager
Mechanical engineer with a proven track record in successfully managing mineral development projects through to production.

Neil Patten-Williams – Marketing General Manager
Experienced mineral sands marketing and operations manager with over 18 years experience in the mineral sands industry.

Vanessa Hughes – General Manager People & Community
Qualified human resource executive with more than 25 years experience in Australia and Africa.

WORLD CLASS PROJECT



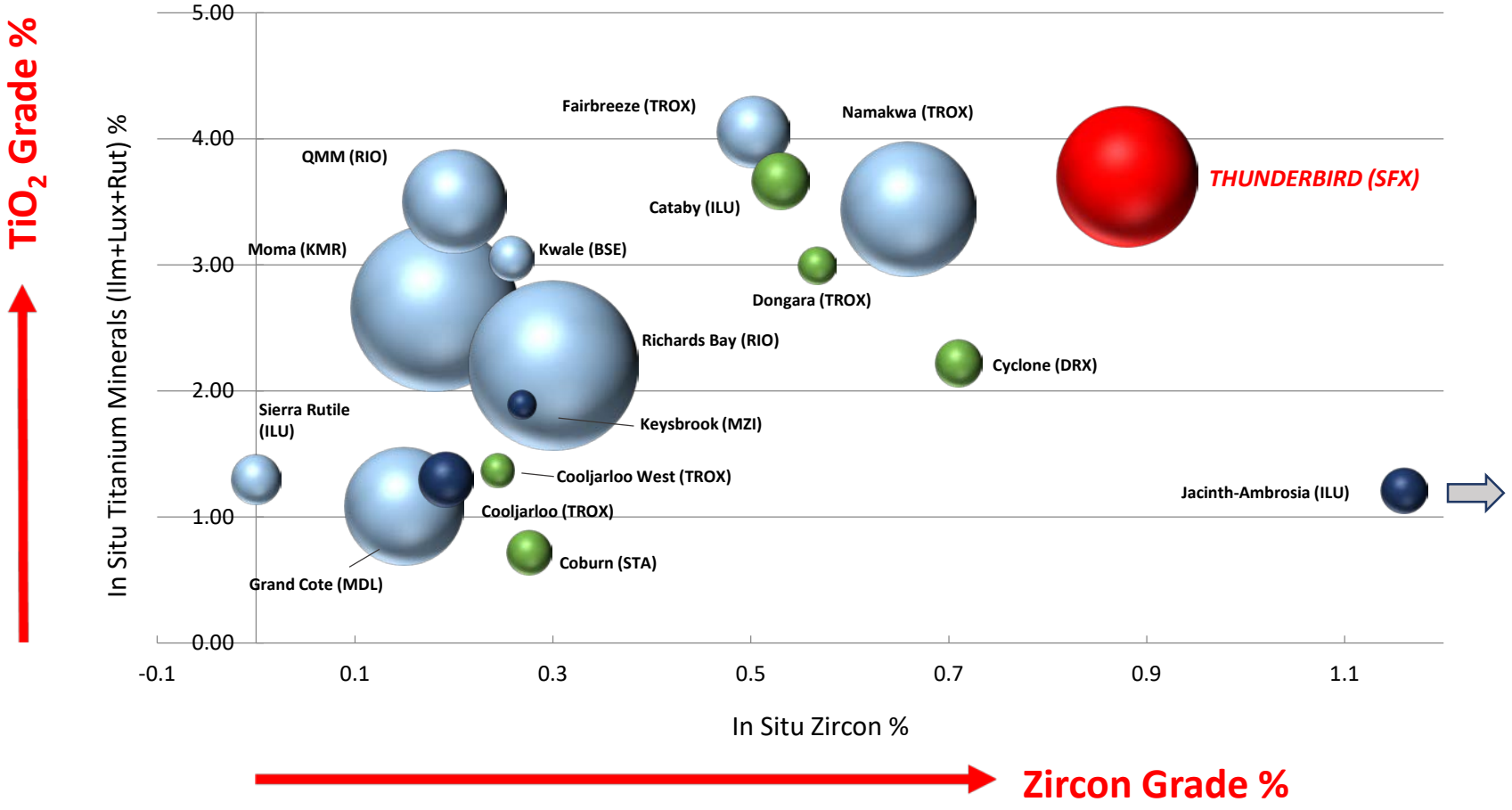
THUNDERBIRD

- Located in northern Western Australia
- Low risk mining jurisdiction
- Close to markets
- Excellent infrastructure
- Large scale, high grade and low cost project
- 42 year mine life[1]
- High grade, premium quality, zircon and TiO_2 products
- Exciting exploration upside
- Emerging as a new force in mineral sands

Discover → **Develop** → **Operate**

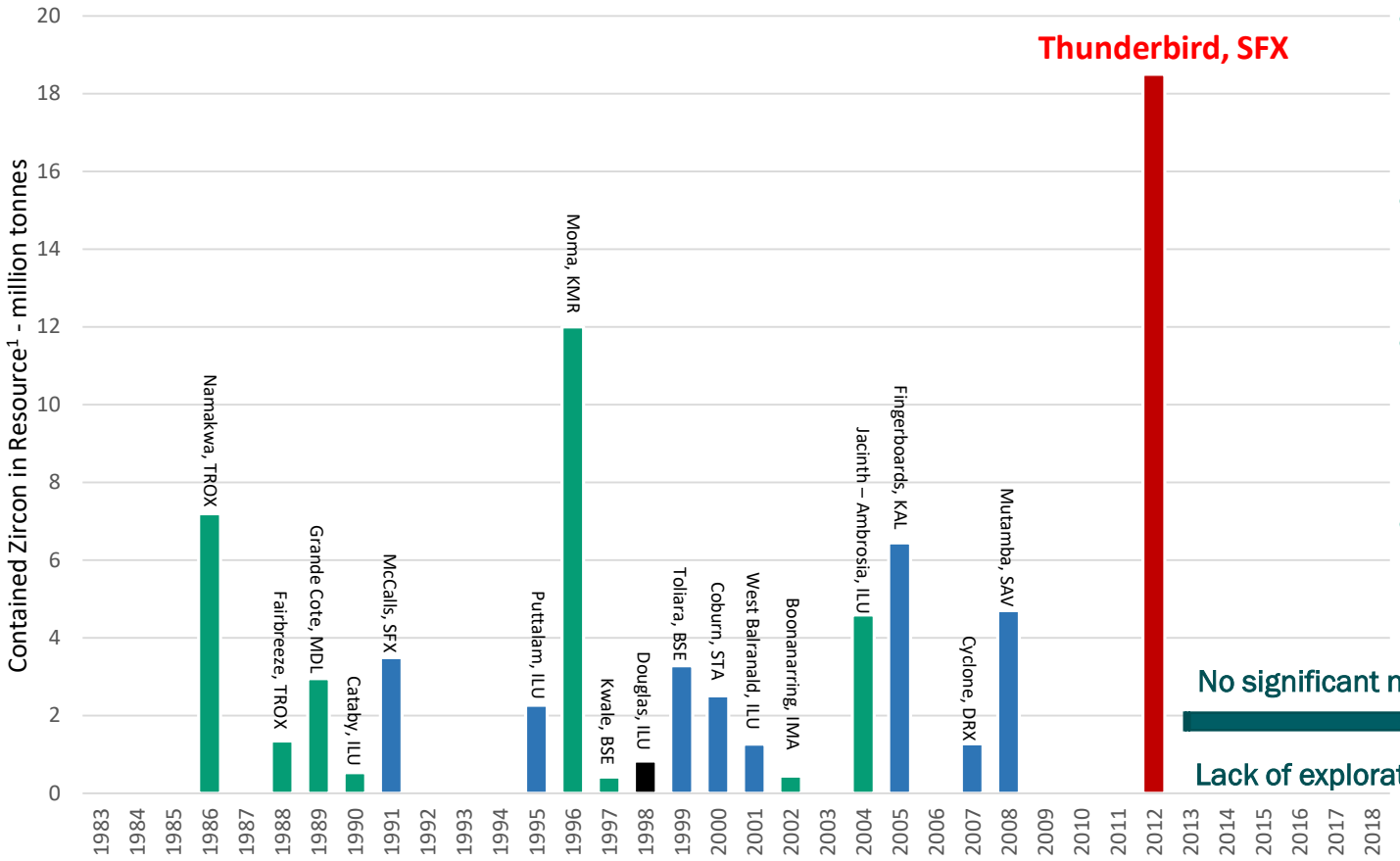
1. Thunderbird Ore Reserve as published on the ASX on 16 March 2017, Subject to permitting, offtake and financing

WORLD CLASS, HIGH GRADE ORE RESERVE



Thunderbird Ore Reserve as published on the ASX on 16 March 2017
Thunderbird Ore Reserves ranked against published Ore Reserves of current mineral sands operations and projects under investigation globally
Blue bubbles are operating mines, green bubbles are Ore Reserves reported but project is not operating. Light blue bubbles represent operating African mines' Ore Reserves
Bubble size proportional to tonnes of contained VHM. Only Ore Reserves > 1.2Mt contained VHM shown.
Data compiled by Sheffield from public sources. This analysis does not illustrate the variance in product value between rutile, leucoxene and ilmenite
[1] Fraser Institute survey of mining companies 2016

GLOBALLY SIGNIFICANT ZIRCON DISCOVERY – 30 YEARS

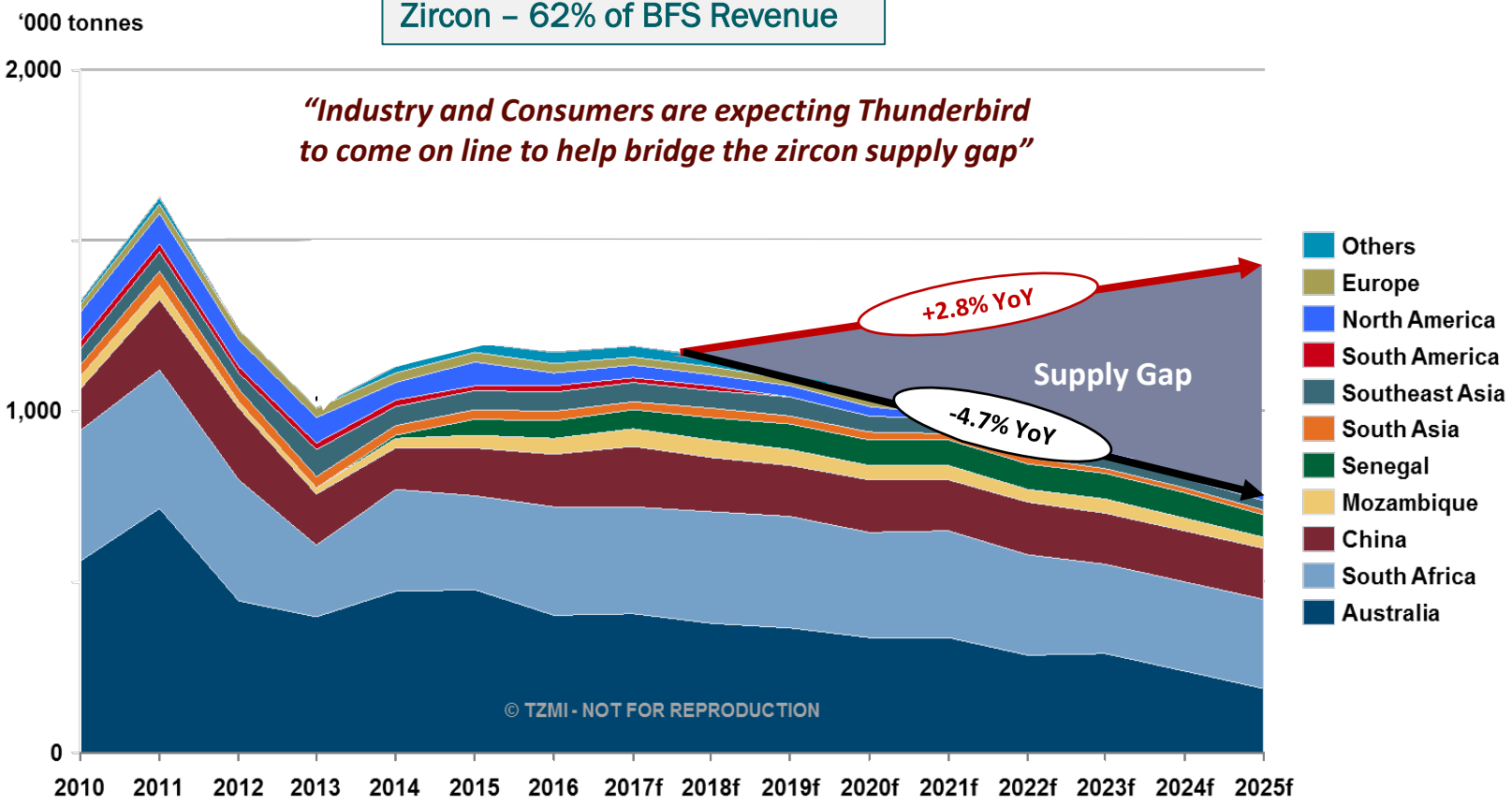


- Thunderbird is the most significant zircon discovery in the last 30 years
- Large zircon rich deposits are not discovered often
- The industry needs significant new deposits to replace maturing supply
- Increasing timelines between discovery and development

[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. BLUE– projects yet to be developed, GREEN – projects in development/production, BLACK – projects mined out, RED - Thunderbird

ZIRCON - SIGNIFICANT SUPPLY SHORTFALL PREDICTED

Zircon – 62% of BFS Revenue



- Global zircon supply is declining
- Demand modest 2.8% per annum to 2026
- Supply decline of 4.7% per annum to 2026
- Mature mine and declining grades
- Limited recent exploration succes

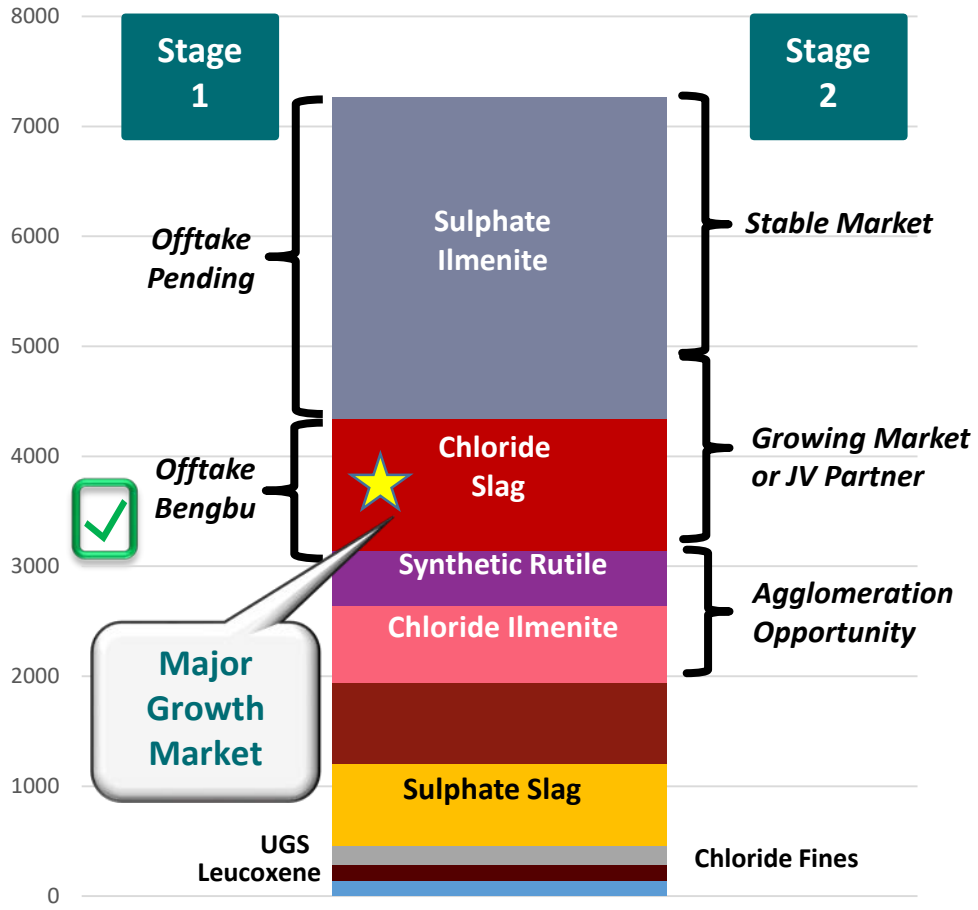
Sourced from TZMI December quarter 2017 and March quarter 2018

SIGNIFICANT GROWTH IN CHLORIDE SLAG PREDICTED

Titanium Feedstocks – 29% of BFS Revenue

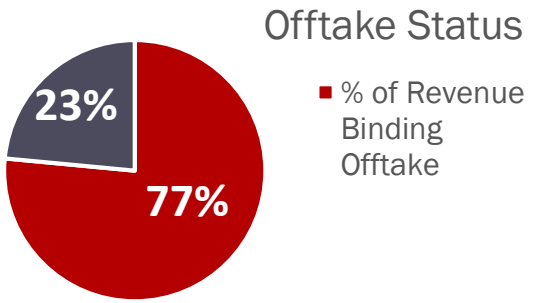
- Chloride supply to grow faster than sulphate
- Chloride slag is set for supply growth as industry particularly in China expands chloride pigment production
- Net sulfate ilmenite supply will decline as more product is used to produce chloride slag
- Existing operations reliant on captive feedstock
- RBM, RTFT, Tronox, Iluka and Lomon Billions will need to **bring on or acquire** new ilmenite mines to supplement their declining resources
- Thunderbird ideally positioned to target this market opportunity

Large Market Opportunity

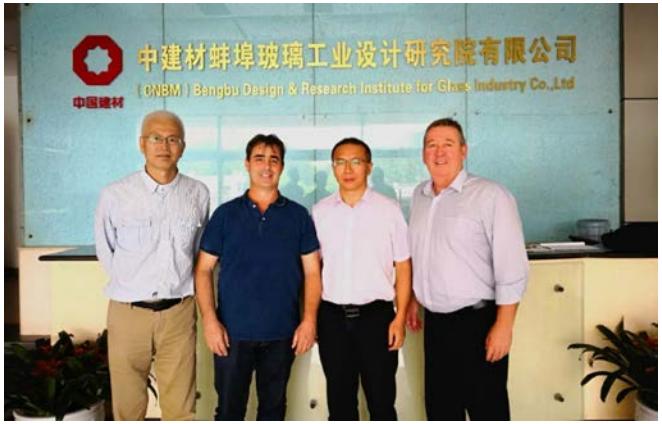


BINDING OFFTAKE COMPLETE

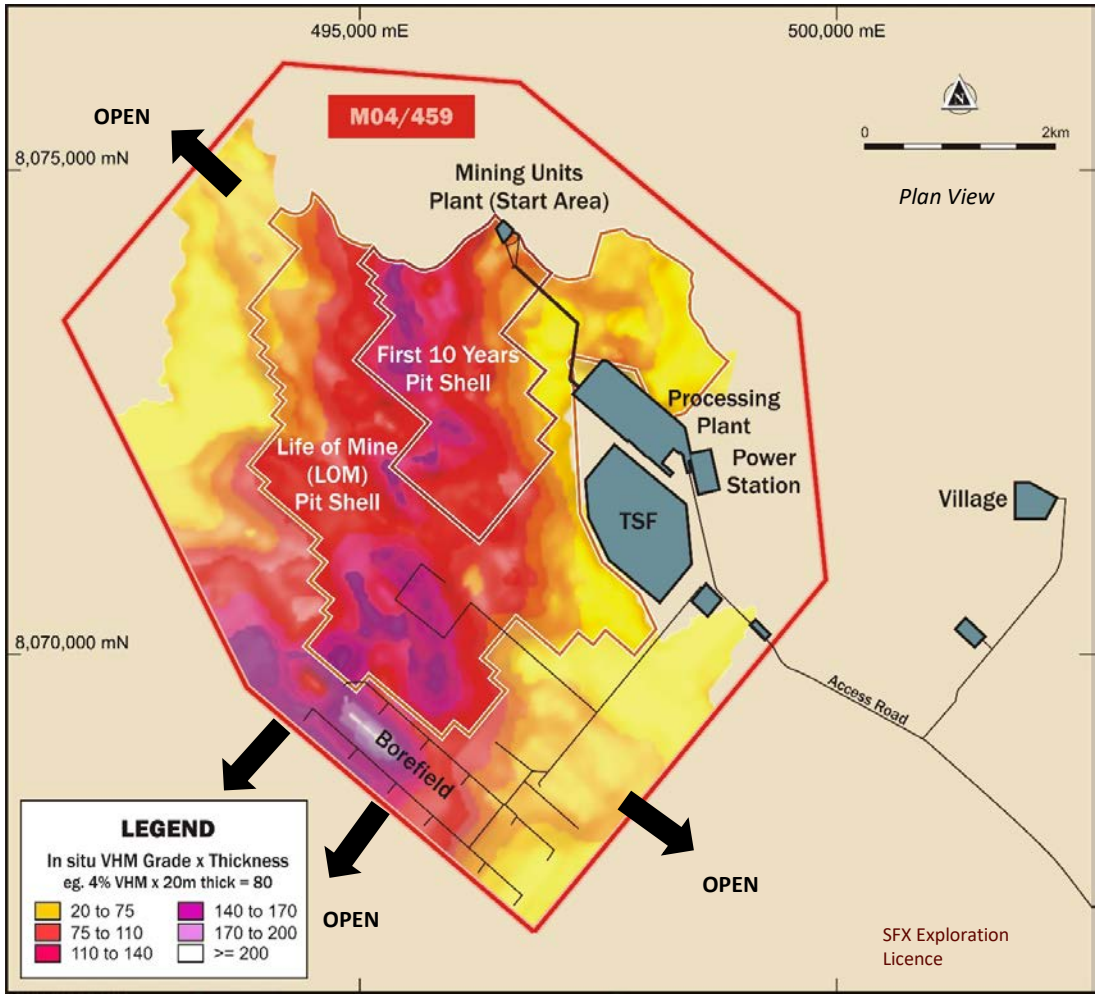
- Thunderbird will deliver a secure supply of high quality products
- Consistent supply over a 42 year mine life
- Sourced from a low risk jurisdiction proximal to the largest emerging market
- Binding offtake meets condition precedent contemplated for debt financing



Product (% BFS Revenue)	Binding Agreement (% of Stage 1 output)	Offtake Parties
Premium Zircon (43%)	100%	Sukaso, Ruby Ceramics, RZI, Qingyuan Jinsheng, Minchem, CFM, Others
Zircon Concentrate (19%)	100%	Hainan Wensheng, RZI
LTR Ilmenite (29%)	50%	Bengbu, Others
HiTi-88 (5%)	In Progress	
Titano-magnetite (4%)	In Progress	



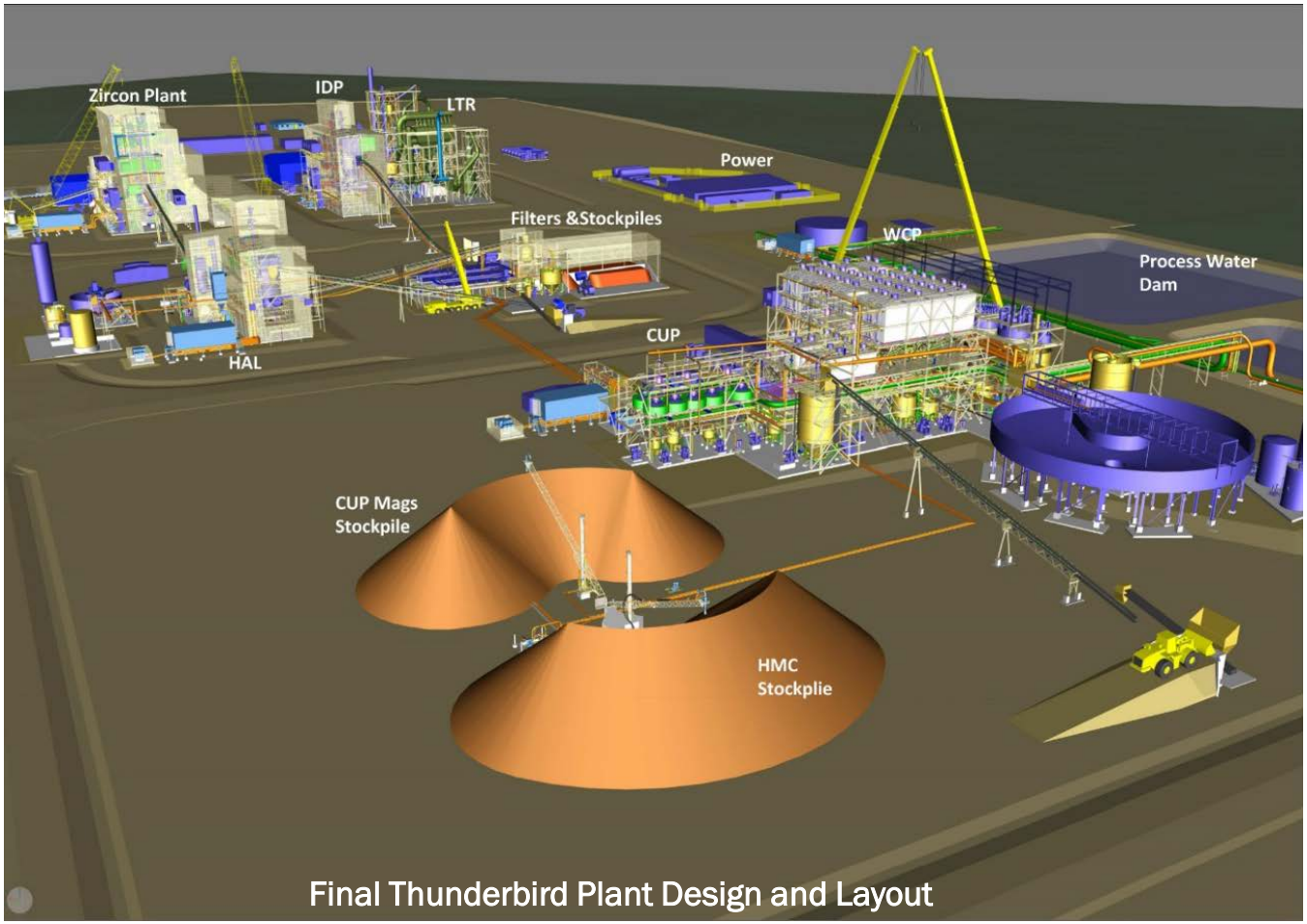
HIGH GRADE CONTINUITY x DEPOSIT THICKNESS = VALUE



- Continuous HG Zone up to 46m thickness
- Strong continuity and very high VHM grades
- Near-surface HG targeted early
- HG Zone remains open, growth likely
- Regional exploration upside
- Build Resource base and extend mine life to greater than 50 years

1. VHM = Ilmenite, zircon, rutile and Leucoxene
2. Mine schedule derived from Ore Reserve ASX release 16 March 2017

CONVENTIONAL PROCESSING

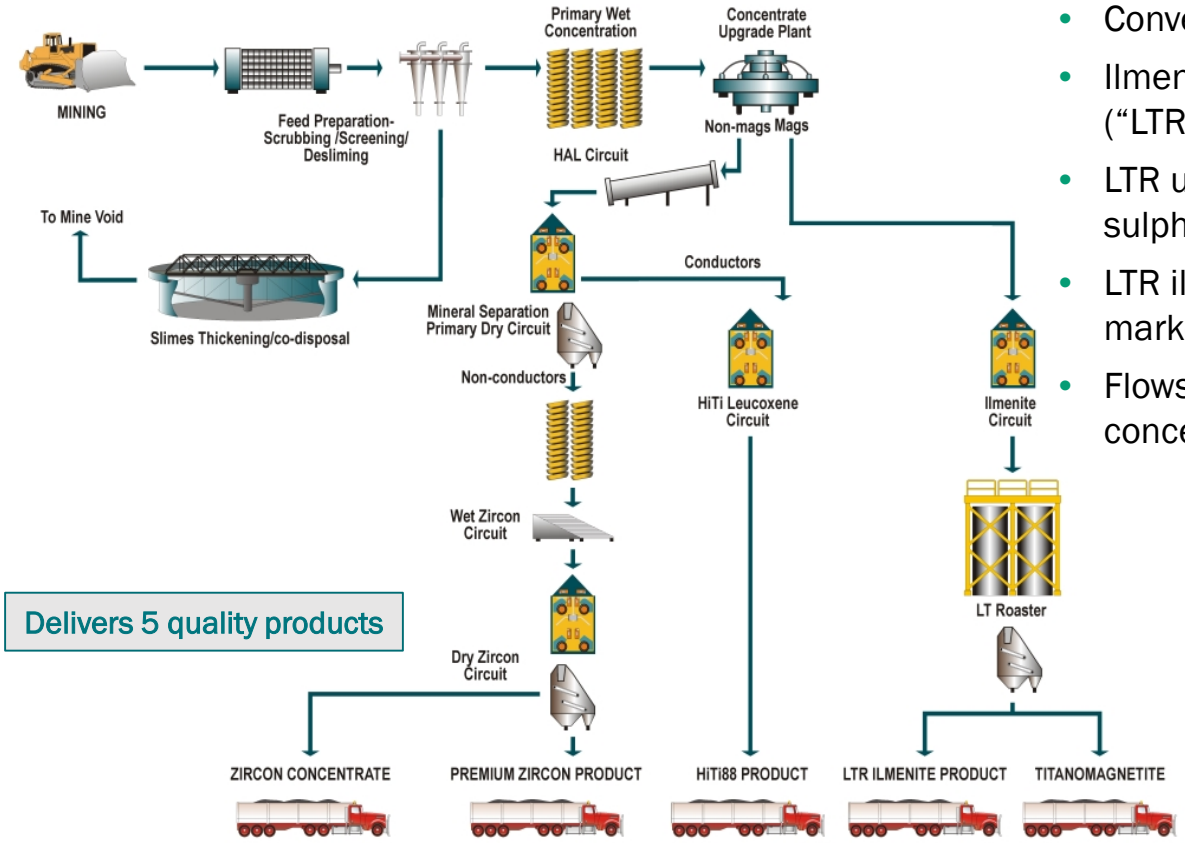


Final Thunderbird Plant Design and Layout

- GR Engineering Services (ASX:GNG) – experienced preferred tenderer
- Early Works Agreement and Key Term Sheet signed
- 30% engineering complete
- Lump sum EPC contract
- New 7.5Mt/yr plant Stage 1
- 2 year construction and commissioning schedule

CONVENTIONAL PROCESSING

Flowsheet Producing High Grade Products



Delivers 5 quality products

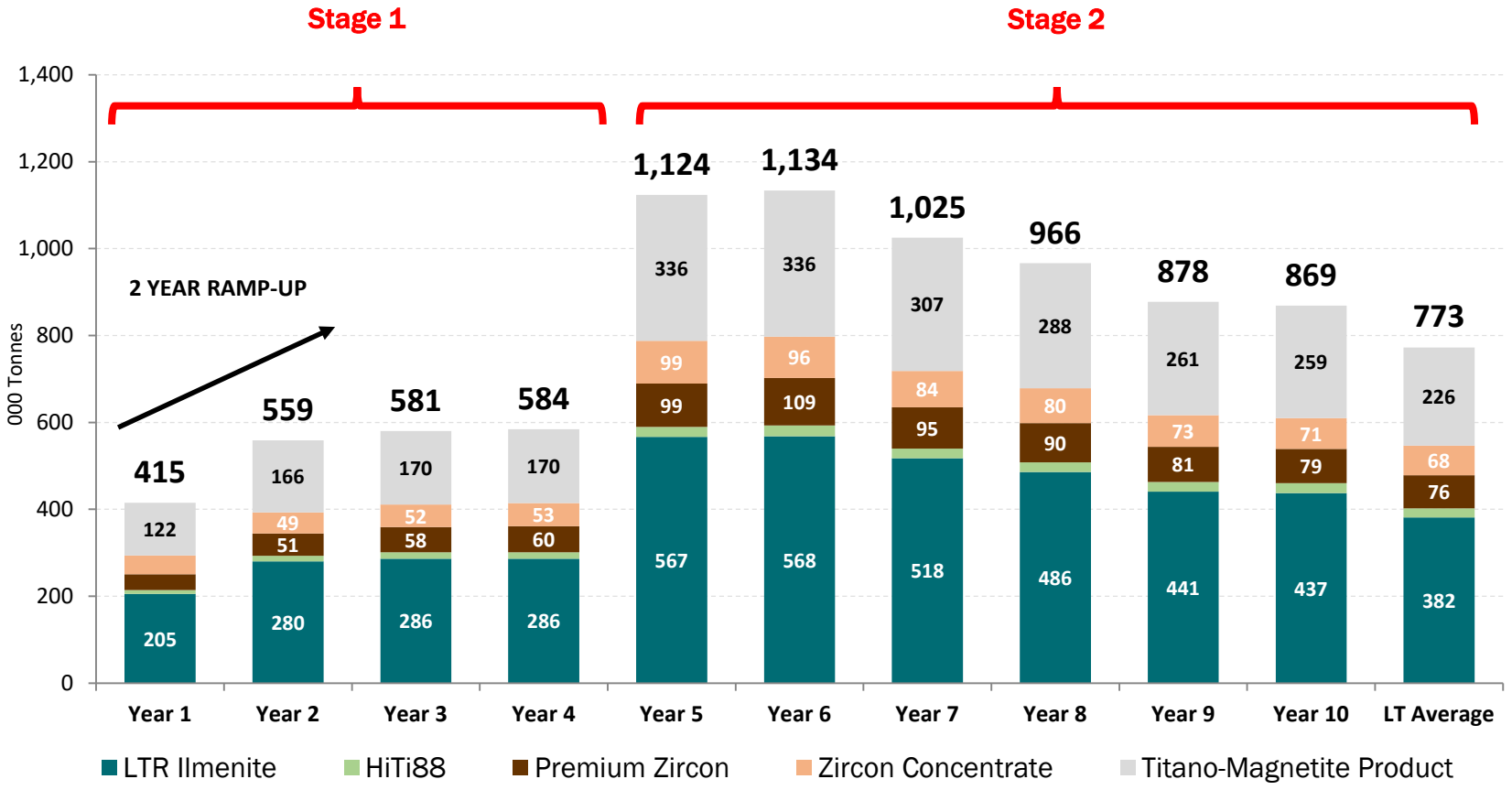
- Conventional HM sands processing circuit[1]
- Ilmenite upgrade via low temperature roast ("LTR")
- LTR upgrades to >56% TiO_2 producing premium sulphate ilmenite, and chloride slag feed
- LTR ilmenite is low in chrome and alkalis with market-leading acid solubility
- Flowsheet produces premium zircon and zircon concentrate

Recoveries[3]	BFS Test work
LTR Ilmenite	71.0%
Zircon Premium (66% ZrO_2)	56.1%
Zircon Concentrate (44% ZrO_2)	33.0%
Hi-Ti88 Leucoxene	35.3%

Total recovery to products from BFS metallurgical test work.[3]

[1] Process design by Hatch and Robbins Engineering, based on metallurgical testwork carried out on a 40t bulk sample using full scale & scalable equipment
[2] Estimated from preliminary modelling to be finalised at BFS completion in early 2017
[3] Refer ASX announcement 12 October 2016

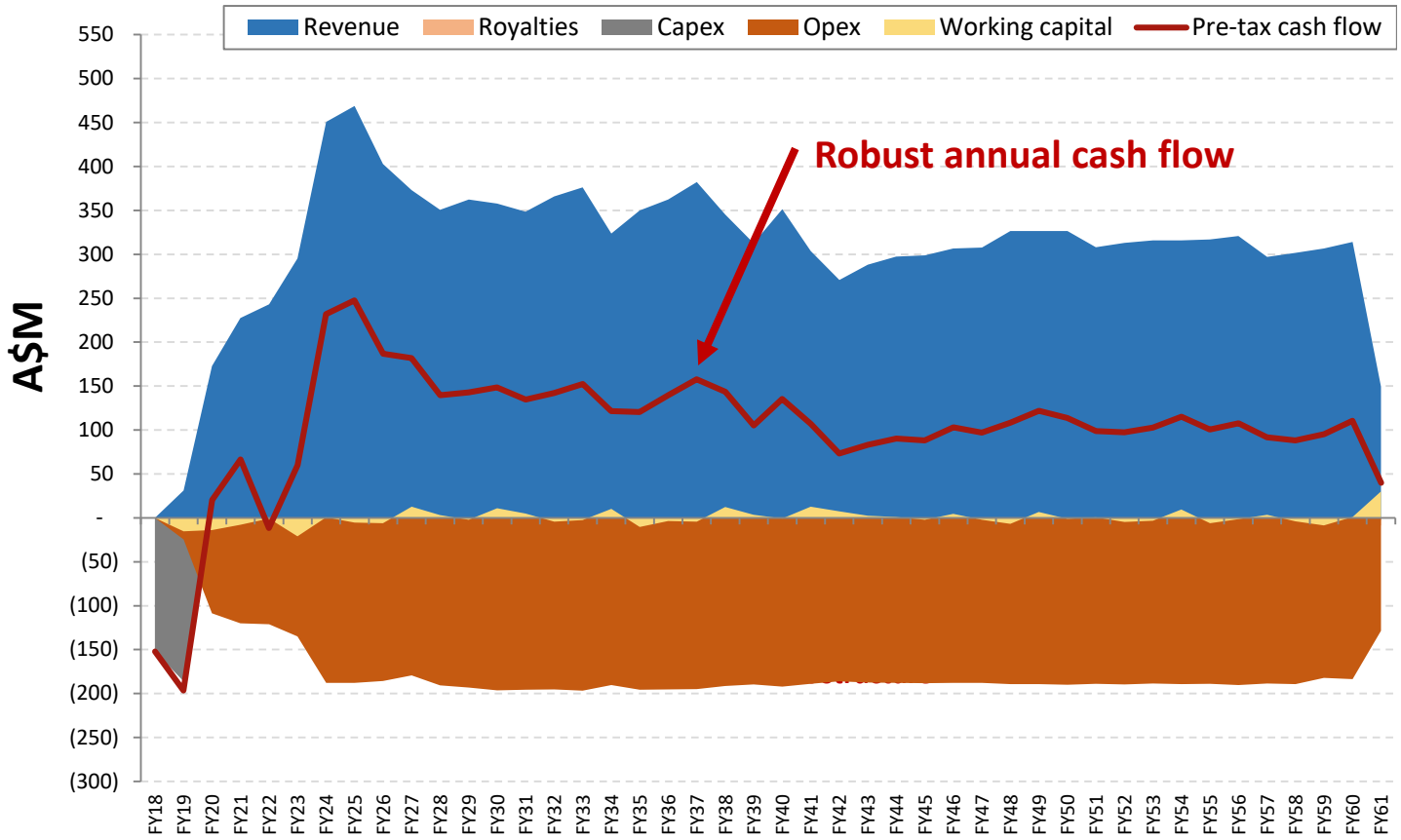
BFS PRODUCT VOLUMES

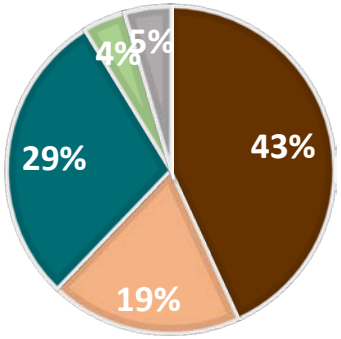


- Stage 1 single process train
- Stage 2 duplicate stage 1
- Globally significant zircon and ilmenite producer

Source: BFS model

STRONG REVENUE – FLAT LOM COST STRUCTURE (BFS)



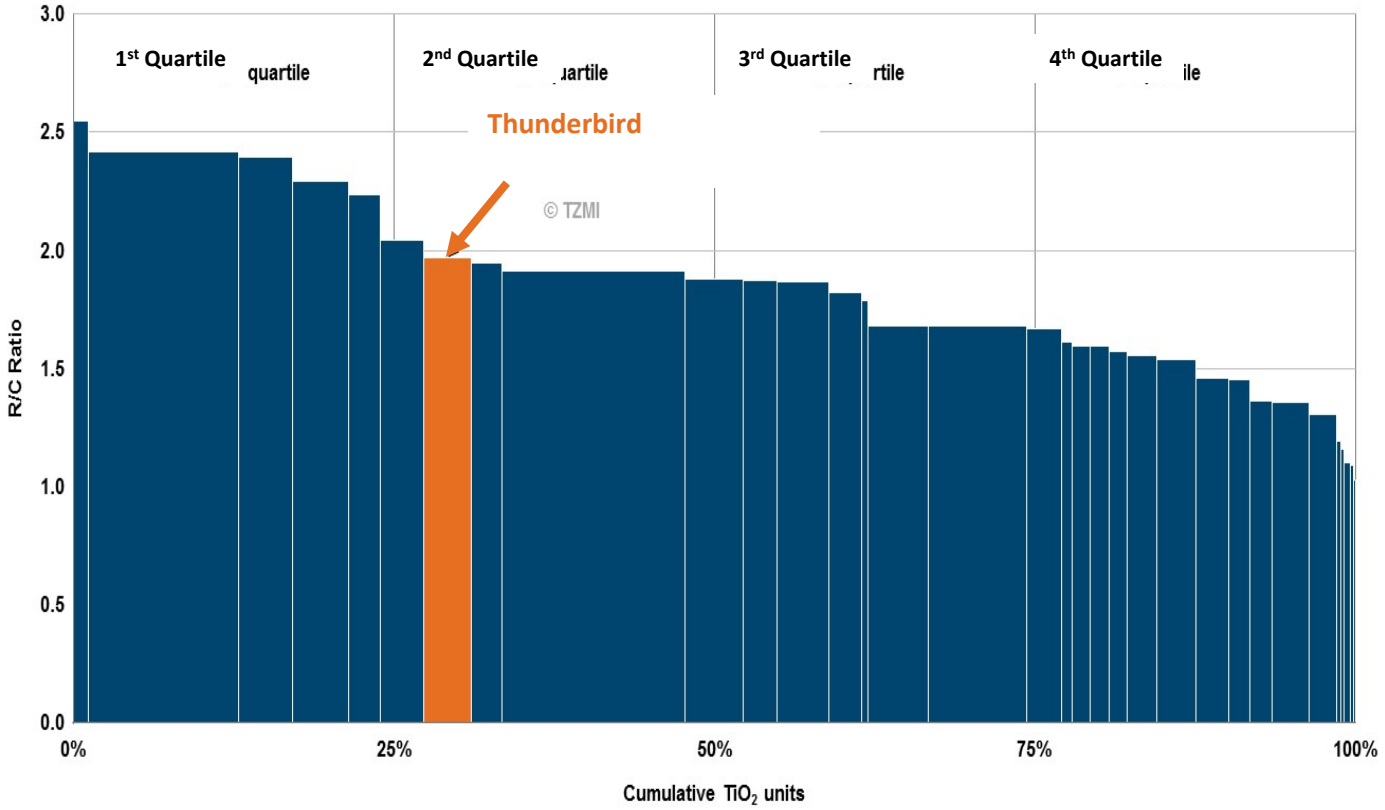


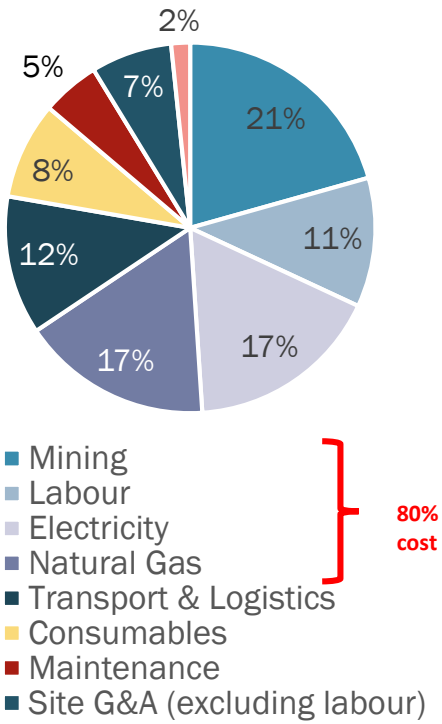
REVENUE SPLIT

- Premium Zircon
- Zircon Concentrate
- LTR Ilmenite
- Hi-Ti88
- Titano-magnetite

Source: BFS model

COMPETITIVE REVENUE TO COST RATIO





1. 4 Year production period following Stage 1 ramp-up (Year 3 to Year 7 of operation)
2. 2020 Cost Curve as presented by TZMI
3. Note that several of the competitors presented here are integrated producers of downstream feedstock and associated by products

Source: TZMI

DEBT STRUCTURE - US$200M UNDERWRITTEN SENIOR DEBT

- Finance provider - Taurus Mining Finance Fund and Taurus Mining Finance Annex Fund ("Taurus")
- Attractive funding terms:
  - Average cost of funds of ~7.6% across several tranches and the CI Facility[1]
  - A revenue royalty of 0.5% (years 1 - 4) and 0.75% (years 5 - 22.5)
  - No equity dilution, customary upfront fees
  - 7 year term with a repayment profile that is sculpted to match the cashflows using a conservative mineral sands price deck with US$100 million due at maturity
  - Facilities fully underwritten
- Taurus a strong partner for Sheffield:
  - Global debt fund manager focussed on emerging mining project and acquisition finance
  - Experienced in mineral sands projects with a strong technical team
- Strong pathway to project debt funding:
  - no market risk of syndication
  - US$200m will provide a strong contribution to Sheffield's total funding requirement
  - DD and documentation is well advanced

1. Weighted average interest cost across multiple tranches, including issuance fees payable on the CI Facility

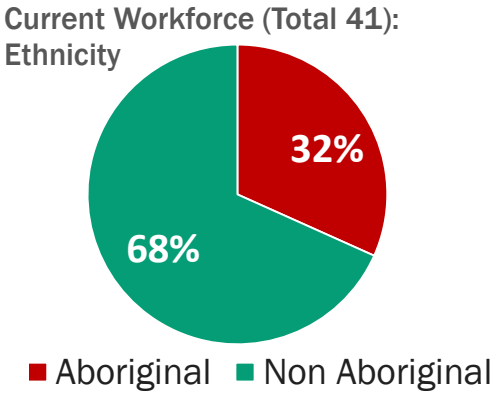
SHEFFIELD COMMUNITY INVESTMENT

Our Pledge to the Kimberley Community

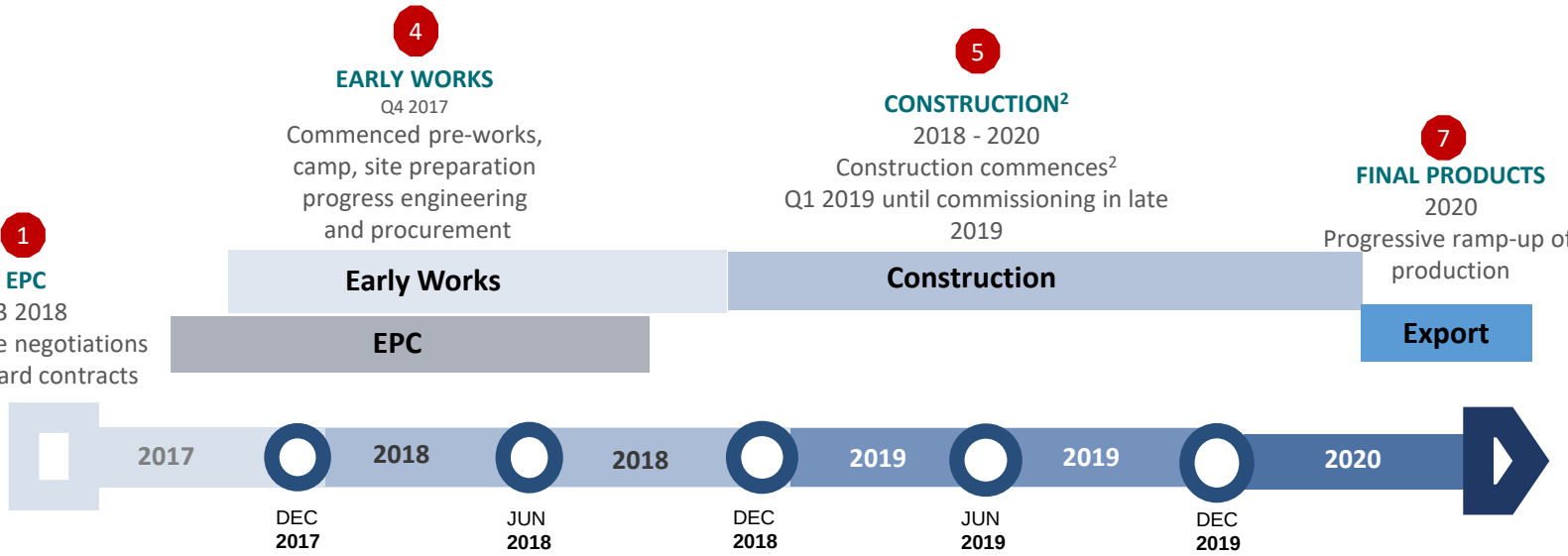
- Local Content Employment– 280 DIDO Jobs
- Intergenerational Employment over 42 years
- 40% Aboriginal Employment by year 8
- Aboriginal Training Fund
- Aboriginal Business - $5m/year from year 5

Our Current Social Licence To Operate

- Creating positive change through engagement with Aboriginal People
- Partnerships with Local Communities
- High standards in safeguarding the environment, water, diversity and Aboriginal heritage
- Cash Royalties to Traditional Owners estimated $100m over 42 years



TIMELINE – KEY TARGETS TO PRODUCTION[1]



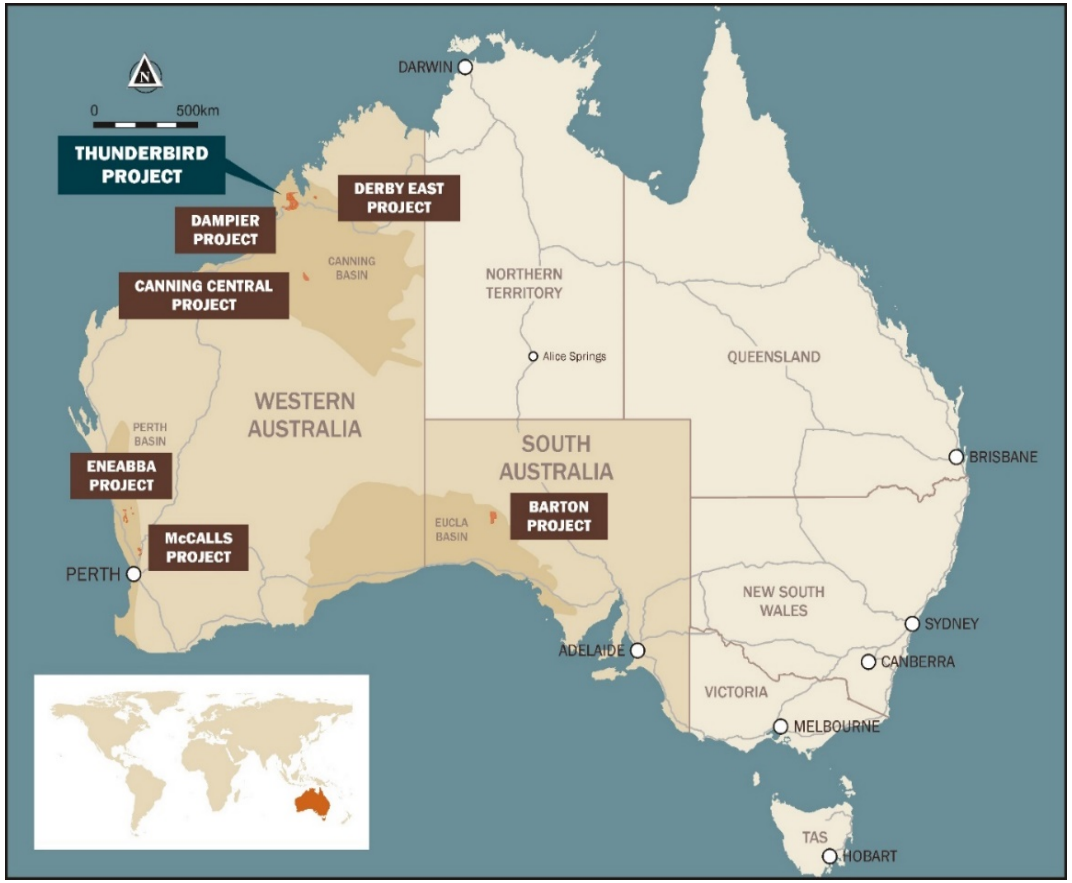
1 There is no guarantee that these targets and steps will be achieved
2 Subject to permitting, offtake and funding
3 Commissioning is anticipated to commence in late 2019

EXPLORATION TARGETING LARGE ZIRCON RICH DEPOSITS

- Strategy to grow a globally significant Resource and Reserve base
- Focus on zircon rich deposits with premium zircon products
- Target Tier 1 stable mining jurisdiction

Thunderbird regional drilling commenced Q3 2018

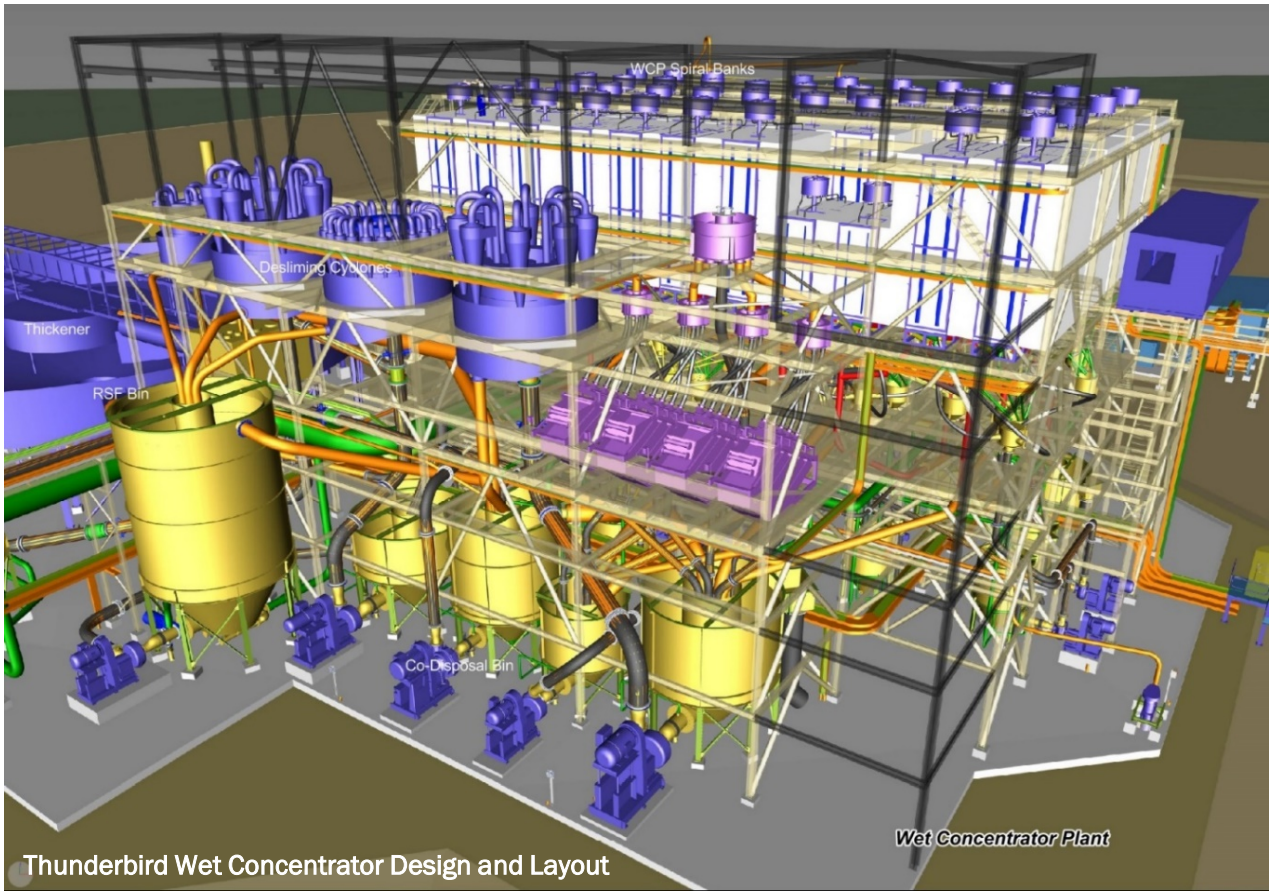
New projects currently under review



Sheffield expands exploration footprint in Canning Basin

Barton Project large ex Rio Tinto project located in the Eucla Basin

THUNDERBIRD IS A WORLD CLASS MINERAL SANDS PROJECT



Thunderbird Wet Concentrator Design and Layout

- 42 year mine life
- 100% owned
- Outstanding economics
- World's best mining jurisdiction
- US$200m debt mandated on attractive terms
- Binding zircon offtake complete, TiO_2 50% complete
- Engaging with potential strategic equity partners
- Targeting initial production in 2020

AUSTRALIAN PERMITTING PROCESS

Mining laws in Australia are managed by the States resulting in each State having separate legislation for the exploration and or extraction of those minerals from the ground.

Environmental Process

- Environmental approvals are required for all mining operations
- Approvals include public comment and consultation
- State Governments control this process
- Federal Government approval is required for Thunderbird
- Environmental approval processes are rigid
- Thunderbird's approvals have taken almost 3 years

Native Title Process

- Native Title recognises rights and interests over lands with Traditional Owners
- Federal and State Governments protect indigenous cultural heritage
- The Native Title Act requires negotiation with Traditional Owners
- Sheffield is committed to Traditional Owner jobs and business opportunities at Thunderbird

Permitting for mines in Australia will become more difficult and take more time in the future

MINERAL SANDS – EVERYONE, EVERYDAY


Two Distinct Product Streams



ZIRCON - BFS 62% Revenue

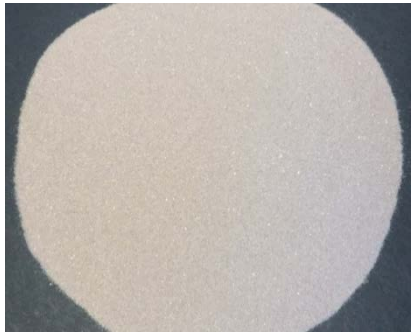
- 1.1 million tonne global p.a.
- >50% is used in the ceramics industry (tiles, crockery, etc.)
- Flat demand from 2012-2016
- 5 year growth 3% per annum in line with global GDP
- China now represents 45%, Europe around 20% of global demand
- Supply dominated by Australia (~50%) and Southern Africa (35-40%)
- Global production is predicted to decline from 2018
- Mature mines and jurisdiction risk impacts to production
- Industry consultants TZMI forecast a supply deficit from 2019

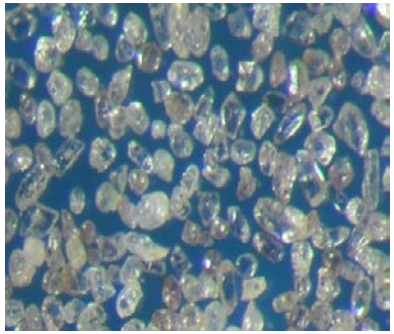
TITANIUM FEEDSTOCKS - BFS 29% Revenue

- 6.5-7.0 million tonne p.a. global market (TiO_2 units)
- Global ilmenite 52-58% TiO_2, rutile 95-97% TiO_2 and slag 85-95% TiO_2
- ~90% of TiO_2 feedstocks are used in manufacture of TiO_2 pigment
- TiO_2 pigment imparts whiteness, brightness and opacity to paper, plastics, sunscreen, etc.
- TiO_2 pigment is manufactured by either the sulfate or chloride processing route, each with specific feed requirements
- Demand forecast to grow at 3% p.a. in line with global GDP
- Sulfatable ilmenite predicted to be in deficit as strong demand emerged from China in 2016

ZIRCON - PREMIUM PRODUCT

- Ceramic Grade Zircon
- > 66% ZrO_2
- Low Fe_2O_3
- Low TiO_2
- Very Low Al_2O_3
- Moderate U+Th
- Good Opacity
- Off-take 100% complete





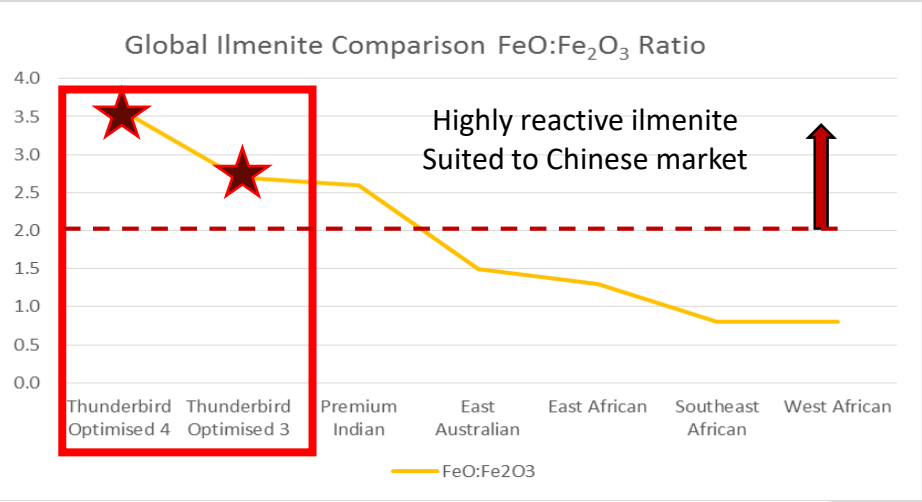
Composition (%)		Premium Zircon	Typical[1]
ZrO_2+HfO_2	%	66.2 – 66.6	66.30
TiO_2	%	0.09 – 0.18	0.14
Fe_2O_3	%	0.06 – 0.08	0.08
SiO_2	%	32.5 – 33.5	32.5
Al_2O_3	%	0.10 - 0.15	0.15

- 100% of Stage 1 premium zircon and zircon concentrate under binding contracts
- Stage 2 premium zircon and zircon concentrate production unallocated from 2024

Refer ASX announcement 12 October 2016

LTR ILMENITE - PREMIUM PRODUCT

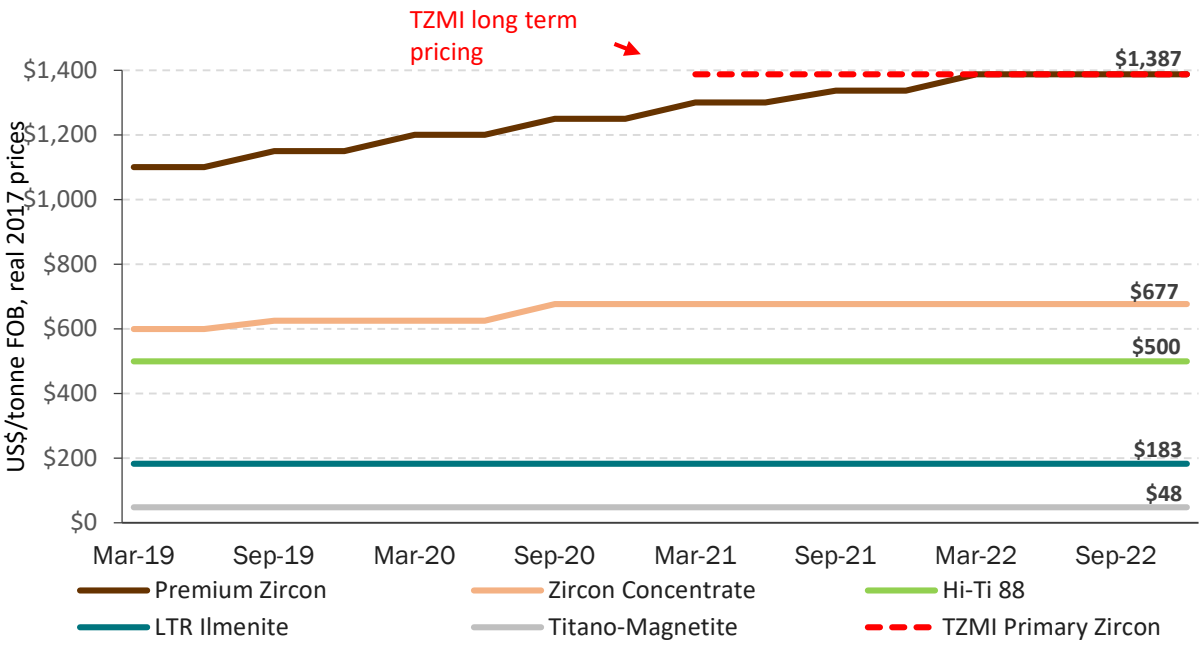
- Exceptional Grade
- 56 – 58% TiO_2
- Outstanding FeO:Fe_2O_3 ratio
- Low Fe_2O_3 (<13%)
- Low Levels of Cr_2O_3
- High Acid Solubility
- Good reactivity rate
- Market Leading quality
- Very low CaO and MgO
- Suitable for chloride slagging
- Results in lower waste streams



Composition (%)	Thunderbird Optimise 4 ilmenite	Thunderbird Optimise 3 ilmenite	Premium Indian ilmenite	East Australian ilmenite	East African ilmenite	Southeast African ilmenite	West African ilmenite
TiO_2	58.5	57.9	51.5	50.7	48.2	52.4	53.2
FeO	29.9	28.1	33.5	25-29	25.5	21.4	18.9
Fe_2O_3	8.4	10.3	13	16-19	20	27.9	23.3
FeO:Fe_2O_3	3.6	2.7	2.6	1.5	1.3	0.8	0.8
Cr_2O_3	0.05	0.05	0.04	0.3	0.09	0.09	0.16

Refer ASX announcement 13 March 2017

BFS PRODUCT PRICE ASSUMPTIONS[1]



- Sheffield has conservatively applied independent industry experts TZMI and Ruidow long-term US$ pricing recommendations (in Q4 2016) for the life of mine
  - From first production for Ilmenite, Hi-Ti88 and Titano-magnetite,
  - From 2020 and 2022 for Zircon Concentrate and Premium Zircon respectively

1. Real 2017 prices and FOB.

SUMMARY BFS OUTPUTS

A$m, Real 2017 Prices	STAGE 1 Financial Year 2019 – 2023[5] (4 years)	STAGE 2 Financial Year 2024 – 2033[6] (10 years)	LOM[7] (42 years)
Ore Mined (Mt)	32.8	173.8	680.6
Strip Ratio (W:O)	**0.52**	**0.58**	**0.77**
VHM Grade (%)	6.41	5.10	4.49
Revenue	**854**	**3,875**	**13,560**
Royalties	(50)	(223)	(781)
Net Revenue	**803**	**3,652**	**12,779**
Opex: Mining	(104)	(421)	(1,828)
Opex: Processing	(228)	(1,024)	(4,093)
Opex: Logistics	(73)	(288)	(1,005)
Opex: Site G&A	(59)	(172)	(707)
Total Opex[1]	**(464)**	**(1,905)**	**(7,633)**
EBITDA	**339**	**1,746**	**5,146**
A$ site costs[2] / tonne ore mined	14.65	11.11	11.40
A$ revenue / tonne ore mined	25.99	22.29	19.92
US$ site costs[2] / tonne Premium Zircon eq.[3,4]	721	692	790
US$ revenue / tonne Premium Zircon eq.[3,4]	1,278	1,387	1,381

Low LOM strip ratio supports consistent and predictable LOM cost structure

Equates to an average EBITDA of A$175/yr for 1st 10 yrs of stage 2

1. Excludes corporate overheads.
2. Includes sustaining capex, excludes corporate overheads and royalties.
3. Premium zircon equivalent tonnes calculated as total revenues across all products/premium zircon price
4. AUD:USD = 0.75:1.00
5. Stage 1 time period depicted as Q4 FY2019 to Q3 FY2023 inclusive
6. Stage 2 first 10 years depicted as Q4 FY2023 to Q3 FY2033 inclusive
7. LOM (Life of Mine) describes the period 2018 to 2061.

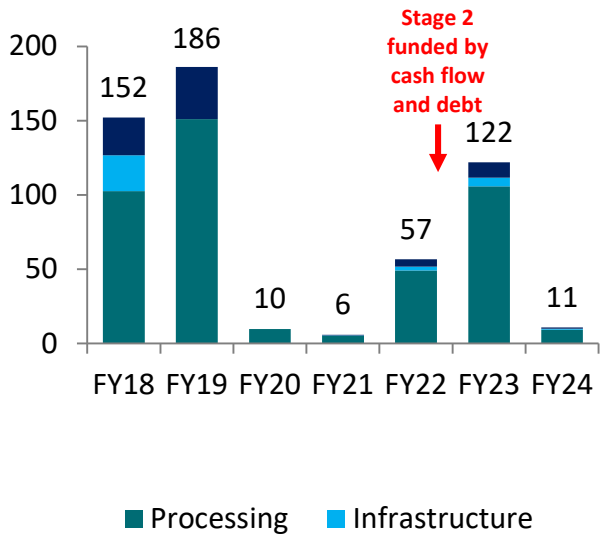
CAPITAL EXPENDITURE

Description	US$M	A$M
Processing – Stage 1		
Plant Area Civils & Process Water Systems	19.0	25.3
Wet Concentrator Plant	43.5	58.0
Concentrate Upgrade Plant	25.7	34.3
Zircon Processing Plant	59.2	78.9
Ilmenite Processing Plant	22.7	30.2
Low Temperature Roast	32.6	43.4
Sub-Total	**202.6**	**270.1**
Infrastructure / Owners – Stage 1		
Site Preparation, Roads & Access	5.0	6.7
Dams, Bore field & HV Infrastructure	12.0	16.0
Derby Port	5.0	6.6
Labour & Operational Readiness	6.7	8.9
Mining Services & Infrastructure	4.6	6.1
Accommodation Village	3.9	5.2
Administration & Services	3.2	4.2
Sub-Total	**40.3**	**53.7**
Contingency	**18.0**	**24.2**
Total Stage 1 Capital Cost	**260.9**	**347.9**

EPC

1. EPC capital cost derived from tendered costs to be finalised in present negotiations
2. Stage 2 capital timing to be finalised during production ramp-up

Source: BFS model, refer ASX announcement 24 March 2017



- EPC-based process plant capital for Stage 1
- Stage 1 contingency 7.5%
- Stage 2 capital A$195m (US$146m) excluding contingency
- Our expectation is that Stage 2 capital will be funded from cash flow and debt

ORE RESERVES

THUNDERBIRD DEPOSIT ORE RESERVES[1,4]

Valuable Heavy Mineral (VHM) In-situ grade

Ore Reserve Category	Ore Tonnes (millions)	In-situ HM Tonnes (millions)	HM Grade (%)	Valuable HM Grade (In-situ)[2]				Slimes (%)	Osize (%)
				Zircon %	HiTi Leuc %	Leuc %	Ilmenite %		
Proved	235.8	31.4	13.3	1.00	0.29	0.26	3.55	16.5	13.7
Probable	444.8	45.4	10.2	0.80	0.26	0.26	2.85	15.2	11.0
Total	**680.5**	76.8	**11.3**	**0.87**	**0.27**	**0.26**	**3.10**	**15.7**	**12.0**

Mineral assemblage as percentage of HM grade

Ore Reserve Category	Ore Tonnes (millions)	In-situ HM Tonnes (millions)	HM Grade (%)	Mineral Assemblage[3]				Slimes (%)	Osize (%)
				Zircon (%)	HiTi Leuc (%)	Leuc (%)	Ilmenite (%)		
Proved	235.8	31.4	13.3	7.5	2.2	1.9	26.7	16.5	13.7
Probable	444.8	45.4	10.2	7.8	2.5	2.6	28.0	15.2	11.0
Total	**680.5**	76.8	**11.3**	**7.7**	**2.4**	**2.3**	**27.4**	**15.7**	**12.0**

1) Ore Reserves are presented both in terms of in-situ VHM grade, and HM 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 Reserve is reported to a design overburden surface with appropriate consideration of 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.
4) Ore Reserves reported for the Dampier Project were prepared and first disclosed under the JORC Code (2012), refer to Sheffield's ASX announcement dated 16 March 2017 for further detail.

THUNDERBIRD DEPOSIT MINERAL RESOURCE[1,2,7]

Cut-off (HM%)	Mineral Resource Category	Material Tonnes (millions)	In-situ HM Tonnes (millions)	HM Grade[3] (%)	Valuable HM Grade (In-situ)[4] Zircon (%)	HiTi Leuc (%)	Leuc (%)	Ilmenite (%)	Slimes (%)	Osize (%)
> 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**

Cut-off (HM%)	Mineral Resource Category	Material Tonnes (millions)	In-situ HM Tonnes (millions)	HM Grade (%)	Mineral Assemblage[5] Zircon (%)	HiTi Leuc (%)	Leuc (%)	Ilmenite (%)	Slimes (%)	Osize (%)
> 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**

THUNDERBIRD DEPOSIT CONTAINED VALUABLE HM (VHM) IN MINERAL RESOURCES[1,2,6]

Cut-off (HM%)	Mineral Resource Category	Zircon Tonnes (thousands)	HiTi Leucoxene Tonnes (thousands)	Leucoxene Tonnes (thousands)	Ilmenite Tonnes (thousands)	**Total VHM Tonnes (thousands)**
>3% HM	Measured	3,600	1,000	1,000	12,000	17,700
	Indicated	11,800	3,800	4,300	39,100	59,000
	Inferred	3,200	1,000	1,200	10,500	15,900
	Total	**18,600**	**5,900**	**6,500**	**61,700**	**92,600**
>7.5% HM	Measured	2,300	700	600	8,400	12,000
	Indicated	5,800	1,800	1,600	21,000	30,200
	Inferred	1,600	500	500	5,600	8,200
	Total	**9,700**	**3,000**	**2,700**	**35,000**	**50,400**

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. 2) 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. 3) Total heavy minerals (HM) is within the 38µm to 1mm size fraction and has been reported as a percentage of the total material quantity. 4) 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. 5) 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 and; 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. 6) The VHM inventory is derived from information in the Mineral Resource tables. 7) The Mineral Resource estimate was prepared and first disclosed under the JORC Code (2012), refer to Sheffield's ASX announcement dated 5 July 2016 for further detail.