# QUARTERLY ACTIVITIES REPORT
# FOR THE PERIOD ENDED 31 DECEMBER 2019

31 January 2020

**ASX Code:**
SFX

**Directors:**

Mr Will Burbury
**Non-Executive Chairman**

Mr Bruce McFadzean
**Managing Director**

Mr David Archer
**Technical Director**

Mr Ian Macliver
**Non-Executive Director**

Mr John Richards
**Non-Executive Director**

**Registered Office:**

**Level 2, 41-47 Colin Street**
West Perth WA 6005

**Share Registry:**

**Link Market Services**
Level 12, QV1 Building
250 St Georges Terrace
Perth WA 6000

**Capital Structure:**

| | |
|---|---|
| Ordinary Shares: | 309.0M |
| Unlisted Options: | 7.8M |
| Unlisted Rights: | 9.3M |

**Market Capitalisation:**
A$90 million

**Cash Reserves:**
A$11.0 million
(as at 31 December 2020)

**Investor Relations:**

**Bruce McFadzean**
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## HIGHLIGHTS

*Strategic Partner Process*

- Sourcing of funding partners for the Thunderbird Mineral Sands Project continued throughout the quarter
- During the quarter the Company received expressions of interest and indicative and non-binding proposals from third parties
- The Company has not been able to conclude an acceptable equity funding solution at this stage
- Necessary measures to preserve cash and shareholder value are underway, ensuring Sheffield is able to take full advantage of longer-term supply shortages in the zircon market through its world class Thunderbird Project
- The Company shall continue to engage with these third parties, and remains open to pursuing a range of alternate funding strategies to support Thunderbird development

*Thunderbird Mineral Sands Project*

- Completed final artefact survey over 285 hectares of land required for construction activities with nominated monitors from Native Title Party
- Works Approval Amendment granted
- Site care and maintenance activity focussed upon asset protection in preparation for the 2019/2020 wet season

*Exploration*

- Completion and lodgement of Heritage Impact Assessment (HIA) Notices for the proposed 2020 aircore exploration drilling program at the Dampier Project
- Two new exploration tenements applied for within South Australia's eastern Eucla Basin, totalling 1350km$^2$
    - *"Camel": contains the Dromedary and Namib strandline heavy mineral (HM) prospects and the Gullivers palaeo-lagoonal style HM prospect*
    - *"Sleeper": includes the northern extent of the Immarna strandline HM prospect*

*Corporate Activities*

- Tranche 2 of A$18m Share Placement approved by shareholders
- Retirement of founding director Bruce McQuitty following 9 years' service

[1]ASX Announcement dated 31 July 2019 titled "BFS Update Materially Improves Project Economics".
[2]ASX Announcement dated 31 July 2019 titled "Thunderbird Ore Reserve Update"
[3]ASX Announcement dated 31 January 2019 titled "High Grade Maiden Mineral Resource at Night Train". Dampier Resources reported at 3.0% HM cut-off for Thunderbird and 1.2% HM cut-off for Night Train

## OPERATIONAL AND EXPLORATION SUMMARY

Sheffield Resources Limited ("Sheffield" or "the Company") continued to progress its fully permitted and construction ready, world class Thunderbird Mineral Sands Project (Thunderbird or Project), following the release of the completed Bankable Feasibility Study Update (BFSU) in late July (ASX Announcement "BFS Update Materially Improves Project Economics", 31 July 2019).

*Strategic Partnering Process*

The Company has actively pursued potential funding partners to support development of the Thunderbird Mineral Sands Project throughout the quarter. Expressions of interest and proposals were received date from credible third parties. The Company has been unable to conclude an acceptable equity funding solution at this time. Sheffield is continuing to engage with these third parties with a view to securing equity investment and also remains open to pursuing a range of alternate funding strategies to support Thunderbird's development. Whilst the strategic partnering process remains a key imperative, the Company is taking steps to preserve cash and shareholder value, ensuring Sheffield is able to take full advantage of consensus views for longer term supply shortages in the zircon and titanium pigment feedstocks market through its world class Thunderbird Project.

*Commercial, Exploration and Site Activities*

The Company refreshed commercial agreements with key suppliers and contractors, achieving positive outcomes in line with the BFSU strategy and key cost assumptions. A number of agreements are now ready to execute, subject to the financial investment decision for the Project.

Due diligence of the BFSU strategy continued with project financiers Taurus Mining Finance and the Northern Australia Infrastructure Facility, with the focus being on key changes between the 2019 BFSU and the 2017 BFS, in conjunction with updated product offtake agreements.

The site care and maintenance program focused upon asset protection in the December quarter with the onset of the 2019/2020 wet season. The assets at site remain in excellent condition in readiness for construction.

Heritage impact assessments were lodged with representative parties of Traditional Owners in regard to proposed future exploration drill programs on the Dampier Peninsula. Four exploration licences totalling 397km$^2$ were granted during the quarter - Judas South (E04/2540), South Sand (E04/2554), Parfix (E04/2571), and Jet (E04/2596). The Judas South and South Sand applications cover 358km$^2$ of the Runaway HM prospect located at the southern end of the Dampier Project.

Sheffield has applied for 1,350km$^2$ of new tenure within the Eucla basin of South Australia during the reporting period. The "Sleeper" tenement application was added to the Barton Project and contains the northern extent of the "Immarna" Heavy Mineral ("HM") occurrence, located 5km east of the Mudamuckla rail siding. The" Camel" tenement application comprises the Ceduna Project containing the "Dromedary, Namib and Gullivers" HM occurrences. The Company will continue to review additional exploration opportunities located within the Eucla Basin with a focus on mineralisation with a zircon rich mineral assemblage. Sheffield's tenement applications within the north-eastern and eastern Eucla Basin of South Australia comprises a total of 2,333 km$^2$.

Sheffield will continue to actively pursue and evaluate new mineral sands opportunities in Australia and overseas, with a focus on zircon rich deposits.

## THUNDERBIRD MINERAL SANDS PROJECT

Early Works Program

The on-site care and maintenance program's focus turned to asset protection in the December quarter with the onset of the 2019/2020 wet season. The onsite team completed various civil and general maintenance tasks throughout the site accommodation village. This, together with regular inspections and upkeep of key infrastructure, have maintained the site in excellent condition in readiness for construction.

Members of the site-based team participated in a GPS & Mapping Ranger Workshop facilitated by North Regional TAFE and Kimberley Land Council in November 2019. The workshop provided the team with navigation skills using GPS and topographic mapping techniques.

**Figure 1: Completed River Gravel between Accommodation units**

Engineering, Procurement and Construction

The Company updated agreements with key suppliers and contractors achieving positive commercial outcomes in align with the BFSU strategy and key cost assumptions. A number of agreements are now ready to execute, subject to the financial investment decision for the Project.

Aboriginal Engagement

The Company continues to positively engage with the Native Title Party through the Implementation Committee and initiatives to realise future employment and business engagement of Traditional Owners.

The Company completed final artefact checks over 285 hectares of land required for construction activities. The heritage monitors were selected by the Native Title Party and engaged by Sheffield as per the Co-existence Agreement.

The fieldwork demonstrated one of the many employment opportunities for Aboriginal people at Thunderbird and provided the opportunity for on country knowledge sharing between Traditional Owners and Thunderbird employees.

The Company participated in the annual Youth Job Exchange in Broome which seeks to create employment pathways for young Aboriginal people.

The Company continues to focus on Aboriginal and non-Aboriginal employment metrics with the current Kimberley workforce being 70% Aboriginal.

Figure 2: Heritage Monitors and Sheffield Graduates working on country.


Figure 3: Sheffield's Community Relations Superintendent at the Youth Job Exchange in Broome

**Figure 4: Implementation Committee meeting with Native Title Party representatives and Sheffield employees**

Sustainability

Annual environmental compliance reports were lodged for the Thunderbird Mineral Sands Project. Project compliance against tenement and ministerial conditions were reported to the Department of Mines, Industry Regulation and Safety (DMIRS) and the Department of Water and Environmental Regulation (DWER).

Sheffield participated in the Dampier Peninsula Fire Working Group. The final 2019 workshop considered fire management improvements across the Dampier Peninsula with improvements to fire monitoring, evaluation and reporting planned for 2020.

Marketing and Offtake

As highlighted in the BFSU, the Thunderbird Mineral Sands Project is expected to produce additional volumes of Premium Zircon, Zircon Concentrate and Primary Ilmenite. Sheffield has continued to communicate with all offtake partners on the progress of the Thunderbird Project. Sheffield has engaged IHC Robbins to prepare a large sample of Primary Ilmenite for a major offtake partner to advance final test work on determining the optimal upgrade process for chloride slag production.

The zircon sand market has seen some softening in demand during the latter part of 2019. The softening in demand has seen minor price erosion as suppliers look to maintain their market share. The industry sentiment is that the softening is due to a level of de-stocking and continued concerns related to trade tensions. Historically, the latter part of Q4 leading into the Chinese New Year (January 25th 2020) leads to a general softening in supply and demand and this trend continues until the after the Chinese return to normal work activities, although observations on import data indicated that 2019 will be in line or slightly lower than 2018.

Industry sentiment for the mid to long term zircon market has not altered, with the view that significant supply shortages will create strong demand in the industry. The global supply of zircon continues to decrease with many mature mines nearing the end of their deposits which impacts on costs, recoveries and quality. For these maturing mines, producing premium zircon becomes more difficult, applying more pressure to the higher end of the market. Social and community issues associated with dominant global zircon producing mines exacerbate the concern for long term supply certainty.

Thunderbird is a zircon rich, long life project which is well positioned in the market to take advantage of the predicted supply shortages in the coming years.

During the quarter pricing for titanium pigment feedstocks remained solid with major feedstock suppliers successfully implementing regular incremental price increases for the sulfate pigment producers. This is partly due to the lower than expected production volumes of titanium pigment feedstocks, which is expected to continue into the early part of 2020.

This is a positive outcome for feedstock suppliers due to a level of destocking during this period, reducing finished goods inventories with the pigment producers.

## EXPLORATION ACTIVITIES

Dampier Project

Sheffield carried out a heritage meeting with Nyamba Buru Yawuru regarding planning of heritage surveys for a proposed exploration drill programs within the Yawuru portion of the Dampier Project. Lodgement of Heritage Impact Assessment notices for proposed drilling programs have also been submitted to other native title group representatives within the Dampier Project.

Four exploration licences totalling 397km$^2$ were granted during the quarter, being Judas South, South Sand, Parfix and Jet. The 358km$^2$ Judas South (E04/2540) and South Sand (E04/2554) tenements, at the southern end of the Dampier Project contain the Runaway HM prospect. Parfix (E04/2571) and Jet (E04/2596) tenements are 39km$^2$ in area and near the Concorde and Bohemia prospects.

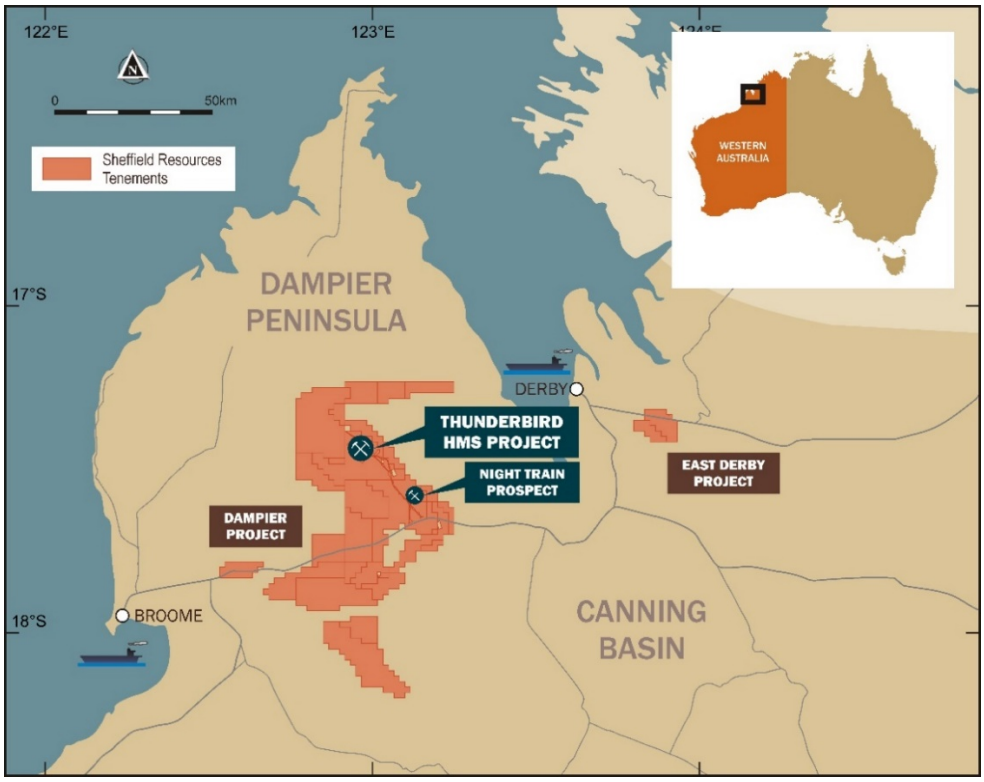


Figure 5: Location of Sheffield's Dampier Mineral Sands Projects

Barton Project

Sheffield applied for the Sleeper tenement (ELA2019/0152) which covers an area of 426km$^2$ located approximately 5kms east of the Ooldea rail siding and 45kms to the north of Iluka's Jacinth-Ambrosia mine. This tenement has been incorporated into the Barton Project which now covers 1,409 km$^2$. The addition of this tenement has enabled Sheffield's Barton Project to include HM occurrences beneath the Barton, Paling and Ooldea Ranges, situated within the northeast Eucla Basin of South Australia.

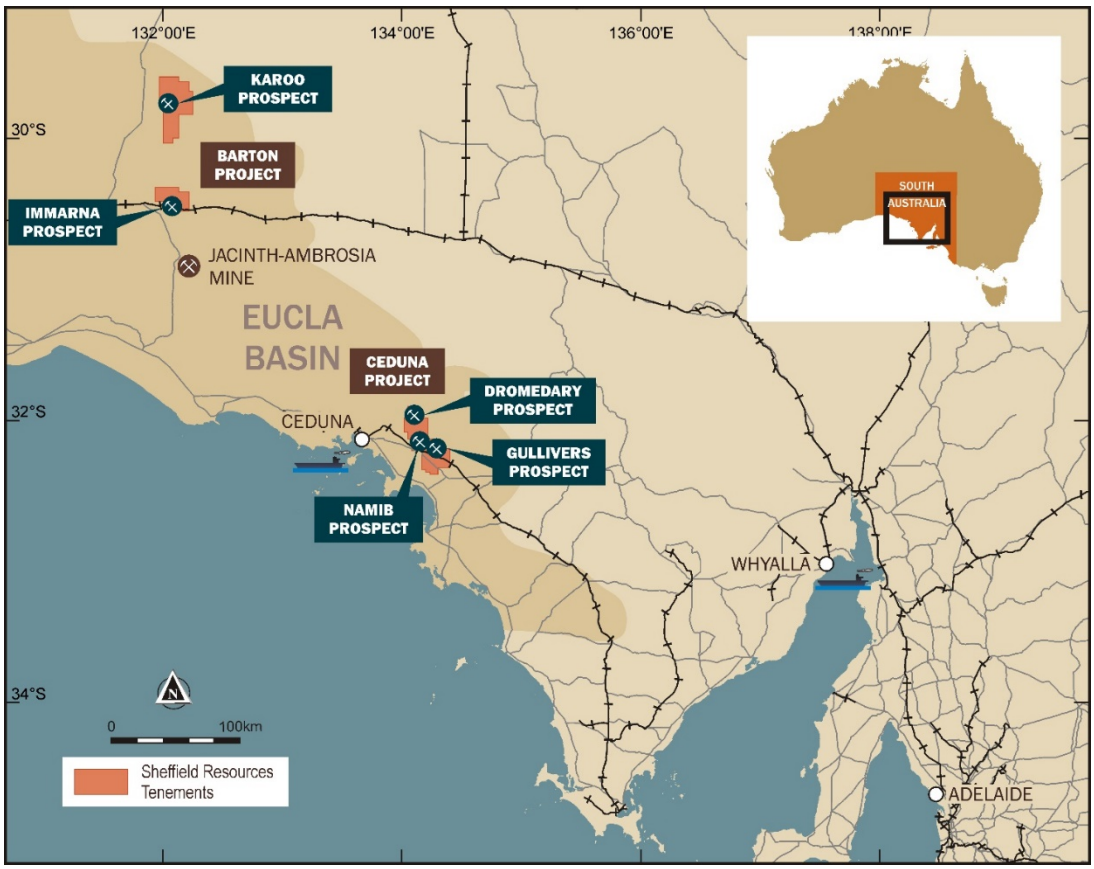


Figure 6: Location of Sheffield's South Australian mineral sands projects

Mineralisation within the Sleeper tenement was first discovered by BHP Mineral Exploration from regional drilling along existing tracks between 1986 and 1989 and is hosted within fine to medium light brown sands deposited by mid-Eocene coastal barrier systems that follow a discontinuous arcuate north-northwest trend.

The Sleeper tenement application, contains a northern extent of the "Immarna" prospect, and was first drilled by the Northern Mining joint venture with National Mineral Sands, during the mid to late 1990's. From 2002 to 2018, Iluka undertook aircore drilling to test for mineralisation along the Jacinth-Ambrosia and Atacama stratigraphic positions on the Ooldea Range on the Sleeper tenement.

A review of regional historic company reports for the Sleeper tenement is expected to be completed in Q1 2020.

Ceduna Project

Sheffield applied for the Camel tenement (ELA2019/0145) which covers an area of 924km$^2$ located 5km east of the Mudamuckla rail siding and 45km east of Ceduna in South Australia's eastern Eucla Basin. This tenement has been placed in the newly formed Ceduna Project.

The tenement contains the Dromedary, Namib and Gullivers HM prospects. The three mineral sand prospects were historically identified within the Camel tenement application, two of which are host to

strandline style mineralisation (Namib and Dromedary) and the other palaeo-lagoonal style of mineralisation located in an embayment (Gullivers).

The Dromedary Prospect is of Miocene age and composed of fine to medium grained mineralised beach sands within a palaeo-shoreline J-shaped trap formed by a granitic headland situated to the south of the mineral occurrence. Mineralisation at Dromedary trends in a north-northeast direction with the occurrence raised and situated on an erosional basal granitic platform.

The Namib Prospect is positioned north of the Narlaby paleochannel delta. The mineralisation is strandline style HM and hosted within a foreshore setting which has been eroded in part by re-working from the Narlaby palaeo-drainage system.

The Gullivers prospect is located within a Miocene palaeo-lagoon at the mouth of the Narlaby channel at an elevation of approximately 50 metres, where HM has been deposited along the palaeo shoreline and concentrated during spring tides in storm or wash-over events. HM concentrations are controlled by subtle basement highs.

A review of regional historic company reports from the Camel tenement is scheduled for completion in Q1 2020.

The Company will continue to review additional exploration opportunities located within the Eucla Basin with a focus on mineralisation with a zircon rich mineral assemblage. Sheffield's tenement applications within the north-eastern and eastern Eucla Basin of South Australia total 2,333 km$^2$. See Figure 8 below.

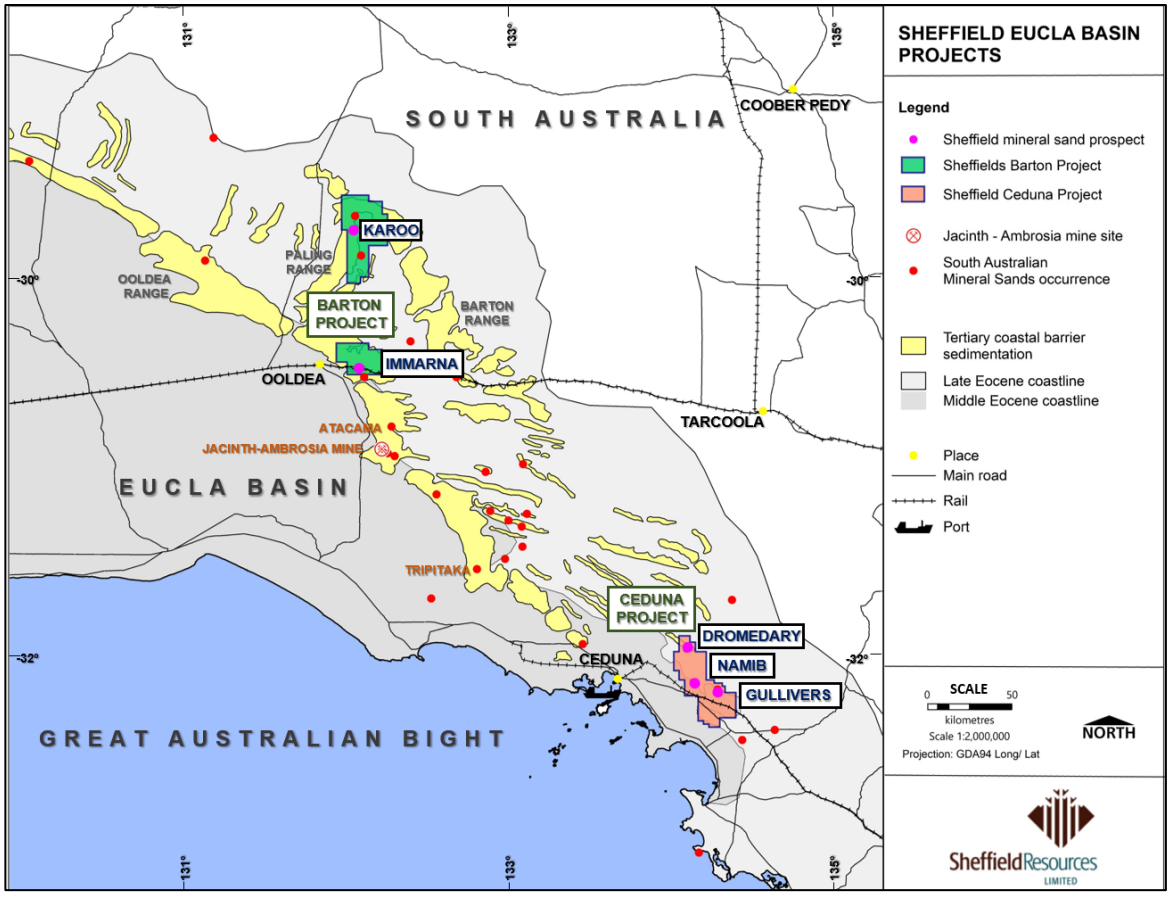


Figure 7: Eucla Basin Geological setting of the Barton and Ceduna Projects

Eneabba Project

Sheffield's 100% owned Eneabba Project is located about 110km north of Perth in Western Australia's Midwest region. No work was undertaken during the reporting period.

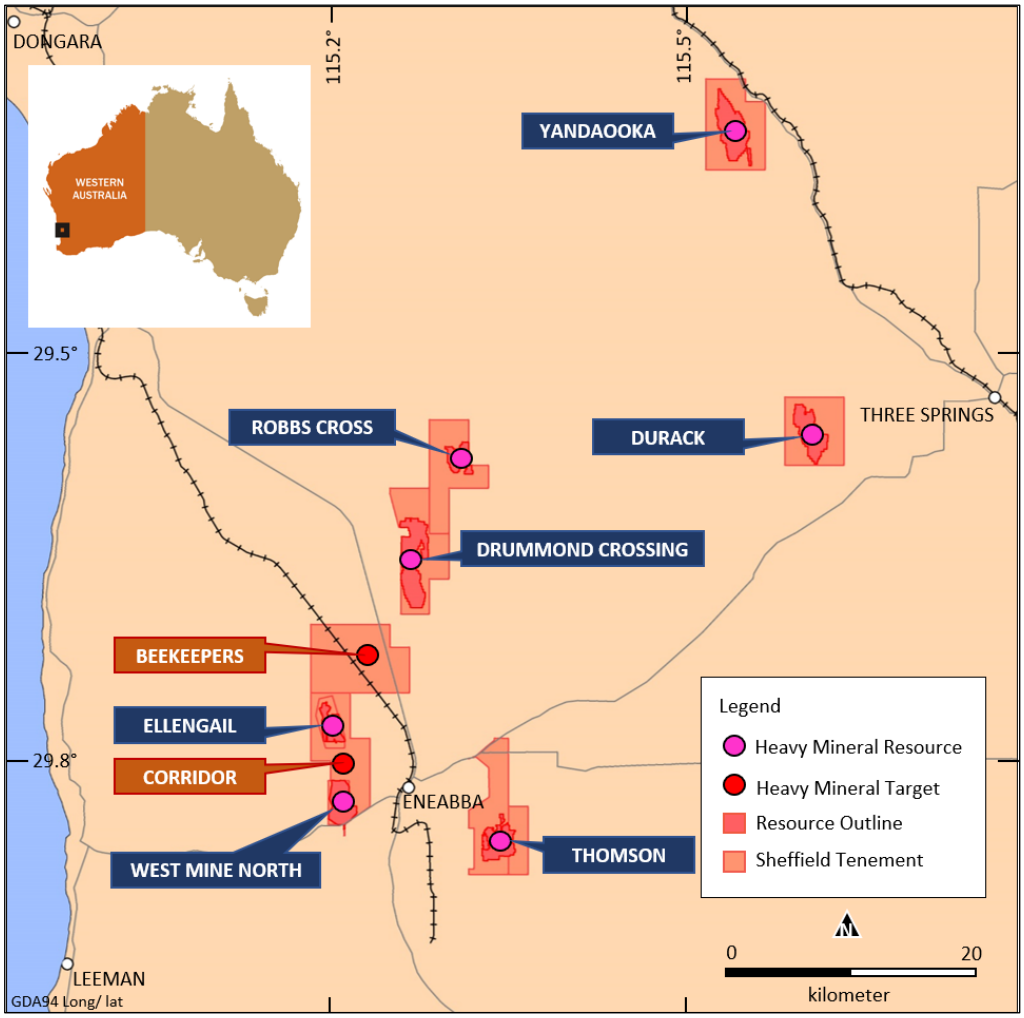


Figure 8: Eneabba Project location plan

McCalls Project

The McCalls Mineral Sand Project (McCalls), located 110km to the north of Perth near the town of Gingin. All of the McCalls Project Mineral Resources now have retention status. No work was undertaken during the reporting period.

Derby East Project

The Derby East Project comprises a large occurrence of construction quality sand, located 24km east of the Port of Derby. No work was undertaken during the reporting period.

## CORPORATE ACTIVITIES

*Strategic Partnering Process*

The Company has actively pursued potential funding partners to support development of the Thunderbird Mineral Sands Project throughout the quarter. Expressions of interest and proposals were received date from credible third parties. The Company has been unable to conclude an acceptable equity funding solution at this time. Sheffield is continuing to engage with these third parties with a view to securing

equity investment and also remains open to pursuing a range of alternate funding strategies to support Thunderbird's development.

Whilst the strategic partnering process remains a key imperative, the Company is taking appropriate and measured steps to preserve cash and shareholder value, ensuring Sheffield is able to take full advantage of consensus views for longer term supply shortages in the zircon and titanium pigment feedstocks market through its world class Thunderbird Project.

*Other Business*

The Company announced that it had successfully completed Tranche 2 of a share placement following receipt of shareholder approval on 22 October 2019. Completion of Tranche 2 completed the raising of a total of $18.0 million (before costs) through the issue of 46.2 million fully paid ordinary shares at an issue price of 39 cents per shares.

The Company farewelled Mr Bruce McQuitty, a founding Director of Sheffield Resources Limited. Mr McQuitty retired from the Company after almost 10 years of service.

As at 31 December 2019, Sheffield held cash reserves of approximately A$11.0 million (unaudited).

Mr Bruce McFadzean
Managing Director
31 January 2020

## Schedule 1: Interests in Mining Tenements at the end of the quarter as required under ASX Listing Rule 5.3.3

| Project | Tenement | Holder | Interest | Location | Status |
|---|---|---|---|---|---|
| Mineral Sands | E04/2081[2] | Thunderbird Operations Pty Ltd | 100% | Canning Basin | Granted |
| Mineral Sands | E04/2083[2] | Thunderbird Operations Pty Ltd | 100% | Canning Basin | Granted |
| Mineral Sands | E04/2084[2] | Thunderbird Operations Pty Ltd | 100% | Canning Basin | Granted |
| Mineral Sands | E04/2159[2] | Thunderbird Operations Pty Ltd | 100% | Canning Basin | Granted |
| Mineral Sands | E04/2171[2] | Thunderbird Operations Pty Ltd | 100% | Canning Basin | Granted |
| Mineral Sands | E04/2192[2] | Thunderbird Operations Pty Ltd | 100% | Canning Basin | Granted |
| Mineral Sands | E04/2193[2] | Thunderbird Operations Pty Ltd | 100% | Canning Basin | Granted |
| Mineral Sands | E04/2194[2] | Thunderbird Operations Pty Ltd | 100% | Canning Basin | Granted |
| Mineral Sands | E04/2348[2] | Thunderbird Operations Pty Ltd | 100% | Canning Basin | Granted |
| Mineral Sands | E04/2349[2] | Thunderbird Operations Pty Ltd | 100% | Canning Basin | Granted |
| Mineral Sands | E04/2350[2] | Thunderbird Operations Pty Ltd | 100% | Canning Basin | Granted |
| Mineral Sands | E04/2390[2] | Thunderbird Operations Pty Ltd | 100% | Canning Basin | Granted |
| Mineral Sands | E04/2399[2] | Thunderbird Operations Pty Ltd | 100% | Canning Basin | Granted |
| Mineral Sands | E04/2400[2] | Thunderbird Operations Pty Ltd | 100% | Canning Basin | Granted |
| Mineral Sands | E04/2494[2] | Thunderbird Operations Pty Ltd | 100% | Canning Basin | Granted |
| Mineral Sands | E04/2554[2] | Thunderbird Operations Pty Ltd | 100% | Canning Basin | Granted |
| Mineral Sands | E04/2571[2] | Thunderbird Operations Pty Ltd | 100% | Canning Basin | Granted |
| Mineral Sands | E04/2509[2] | Thunderbird Operations Pty Ltd | 100% | Canning Basin | Granted |
| Mineral Sands | E04/2510[2] | Thunderbird Operations Pty Ltd | 100% | Canning Basin | Granted |
| Mineral Sands | E04/2540[2] | Thunderbird Operations Pty Ltd | 100% | Canning Basin | Granted |
| Mineral Sands | E04/2554[2] | Thunderbird Operations Pty Ltd | 100% | Canning Basin | Granted |
| Mineral Sands | E04/2596[2] | Thunderbird Operations Pty Ltd | 100% | Canning Basin | Granted |
| Mineral Sands | E04/2597[2] | Thunderbird Operations Pty Ltd | 100% | Canning Basin | Pending |
| Mineral Sands | E04/2642[2] | Thunderbird Operations Pty Ltd | 100% | Canning Basin | Pending |
| Mineral Sands | E04/2643[2] | Thunderbird Operations Pty Ltd | 100% | Canning Basin | Pending |
| Mineral Sands | E04/2644[2] | Thunderbird Operations Pty Ltd | 100% | Canning Basin | Pending |
| Mineral Sands | E04/2645[2] | Thunderbird Operations Pty Ltd | 100% | Canning Basin | Pending |
| Mineral Sands | L04/82[2] | Thunderbird Operations Pty Ltd | 100% | Canning Basin | Granted |
| Mineral Sands | L04/83[2] | Thunderbird Operations Pty Ltd | 100% | Canning Basin | Granted |
| Mineral Sands | L04/84[2] | Thunderbird Operations Pty Ltd | 100% | Canning Basin | Granted |
| Mineral Sands | L04/85[2] | Thunderbird Operations Pty Ltd | 100% | Canning Basin | Granted |
| Mineral Sands | L04/86[2] | Thunderbird Operations Pty Ltd | 100% | Canning Basin | Granted |
| Mineral Sands | L04/92[2] | Thunderbird Operations Pty Ltd | 100% | Canning Basin | Granted |
| Mineral Sands | L04/93[2] | Thunderbird Operations Pty Ltd | 100% | Canning Basin | Granted |
| Mineral Sands | M04/459[2] | Thunderbird Operations Pty Ltd | 100% | Canning Basin | Granted |
| Mineral Sands | E04/2455 | Sheffield Resources Ltd | 100% | Canning Basin | Granted |
| Mineral Sands | E04/2456 | Sheffield Resources Ltd | 100% | Canning Basin | Granted |
| Mineral Sands | E04/2478 | Sheffield Resources Ltd | 100% | Canning Basin | Granted |
| Mineral Sands | E70/3762 | Sheffield Resources Ltd | 100% | Perth Basin | Granted |
| Mineral Sands | E70/3813 | Sheffield Resources Ltd | 100% | Perth Basin | Granted |
| Mineral Sands | E70/3814 | Sheffield Resources Ltd | 100% | Perth Basin | Granted |
| Mineral Sands | E70/3859 | Sheffield Resources Ltd | 100% | Perth Basin | Pending |
| Mineral Sands | E70/3929 | Sheffield Resources Ltd | 100% | Perth Basin | Granted |
| Mineral Sands | E70/3967 | Sheffield Resources Ltd | 100% | Perth Basin | Granted |
| Mineral Sands | E70/4190 | Sheffield Resources Ltd | 100% | Perth Basin | Granted |
| Mineral Sands | E70/4292 | Sheffield Resources Ltd | 100% | Perth Basin | Granted |
| Mineral Sands | E70/4584 | Sheffield Resources Ltd | 100% | Perth Basin | Granted |
| Mineral Sands | E70/4719 | Sheffield Resources Ltd | 100% | Perth Basin | Granted |
| Mineral Sands | E70/4747 | Sheffield Resources Ltd | 100% | Perth Basin | Granted |
| Mineral Sands | E70/4922 | Sheffield Resources Ltd | 100% | Perth Basin | Granted |
| Mineral Sands | M70/872[1] | Sheffield Resources Ltd | 100% | Perth Basin | Granted |
| Mineral Sands | M70/965[1] | Sheffield Resources Ltd | 100% | Perth Basin | Granted |
| Mineral Sands | M70/1153[1] | Sheffield Resources Ltd | 100% | Perth Basin | Granted |
| Mineral Sands | R70/35[1] | Sheffield Resources Ltd | 100% | Perth Basin | Granted |
| Mineral Sands | ELA 2018-00046[3] | Moora Talc Pty Ltd | 100% | Eucla Basin (SA) | Pending |
| Mineral Sands | ELA2019-00145[3] | Moora Talc Pty Ltd | 100% | Eucla Basin (SA) | Pending |
| Mineral Sands | ELA2019-00152[3] | Moora Talc Pty Ltd | 100% | Eucla Basin (SA) | Pending |

Notes:
[1]Iluka Resources Ltd (ASX: ILU) retains a gross sales royalty of 1.5% in respect to tenements R70/35, M70/872, M70/965 & M70/1153.
[2]Thunderbird Operations Pty Ltd and [3]Moora Talc Pty Ltd are wholly owned subsidiaries of Sheffield Resources Ltd.

Details of tenements and/or beneficial interests acquired/disposed of during the quarter are provided in Section 10 of the Company's accompanying Appendix 5B notice.

Appendix 1

ORE RESERVES AND MINERAL RESOURCES

SHEFFIELD HM ORE RESERVE AS OF 31 DECEMBER 2019

## DAMPIER PROJECT ORE RESERVES

### SHEFFIELD ORE RESERVE FOR DAMPIER PROJECT AT 31 DECEMBER 2019 (in-situ assemblage)

| Summary of Ore Reserve[1,2,3,4] | | | | | Valuable HM Assemblage (in-situ)[5] | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Deposit | Ore Reserve Category | Material (Million Tonnes) | In-situ Total HM[7] (Million Tonnes) | Total HM Grade (%) | Zircon (%) | HiTi Leuc (%) | Leuco -xene (%) | Ilmenite (%) | Oversize (%) | Slimes (%) |
| **Thunderbird** | 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 | 0.26 | 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** |

### SHEFFIELD ORE RESERVE FOR DAMPIER PROJECT AT 31 DECEMBER 2019 (HM assemblage)

| Summary of Ore Reserve[1,2,3,4] | | | | | Valuable HM Assemblage[6] | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Deposit | Ore Reserve Category | Material (Million Tonnes) | In-situ Total HM[7] (Million Tonnes) | Total HM Grade (%) | Zircon (%) | HiTi Leuc (%) | Leuco -xene (%) | Ilmenite (%) | Oversize (%) | Slimes (%) |
| **Thunderbird** | 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** |

[1]The Ore Reserves are presented with in-situ HM grade, and 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. This Ore Reserve reported for the Dampier Project was prepared and first disclosed under the JORC Code (2012) in the announcement 31 July 2019 Titled "Thunderbird 10% Ore Reserve Increase". The Ore Reserve is reported to a design overburden surface with appropriate consideration for modifying factors, costs, mineral assemblage, process recoveries and product pricing
[2].Ore Reserve is a sub-set of Mineral Resource
[3]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.
[4]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.
[5]The in-situ assemblage 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.
[6]Mineral Assemblage is reported as a percentage of HM Grade, it is derived by dividing the in-situ grade by the HM grade.
[7] The contained in-situ tonnes derived from HM and material tonnes from information in the Mineral Resource tables

The Ore Reserve estimate was prepared by Entech Pty Ltd, an experienced and prominent mining engineering consultancy with appropriate mineral sands experience in accordance with the JORC Code (2012 Edition). The Ore Reserve was estimated using all available geological and relevant drill hole and assay data, including mineralogical sampling and test work on mineral recoveries and final product qualities. The Company is not aware of any new information or data that materially affects the information included in the Ore Reserve estimate and confirms that all material assumptions and technical parameters underpinning the estimate continue to apply and have not materially changed. The Ore Reserve estimate is based on the current, July 2016 Thunderbird Mineral Resource estimate, announced to the ASX on 5 July 2016. Measured and Indicated Mineral Resources were converted too Proved and Probable Ore Reserves respectively, subject to mine design, modifying factors and economic evaluation.

## SHEFFIELD HM MINERAL RESOURCE

## 1) DAMPIER PROJECT MINERAL RESOURCES

### SHEFFIELD MINERAL RESOURCE FOR DAMPIER PROJECT AT 31 DECEMBER 2019 (in-situ assemblage)

| Summary of Mineral Resource[1,2,3] | | | | | | In-situ Assemblage[4, 5] | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Deposit | Mineral Resource Category | Cut off (Total HM%) | Material (Million Tonnes) | In-situ Total HM[6] (Million Tonnes) | Total HM Grade (%) | Zircon (%) | HiTi Leuc (%) | Leuco-xene (%) | Ilmenite (%) | Over size (%) | Slimes (%) |
| Thunderbird (low-grade) | Measured | 3.0 | 510 | 45 | 8.9 | 0.71 | 0.20 | 0.19 | 2.4 | 12 | 18 |
| | Indicated | 3.0 | 2,120 | 140 | 6.6 | 0.55 | 0.18 | 0.20 | 1.8 | 9 | 16 |
| | Inferred | 3.0 | 600 | 38 | 6.3 | 0.53 | 0.17 | 0.20 | 1.7 | 8 | 15 |
| | **Total** | 3.0 | 3,230 | 223 | 6.9 | 0.57 | 0.18 | 0.20 | 1.9 | 9 | 16 |
| **Night Train** (low-grade) | Inferred | 1.2 | 130 | 4.2 | 3.3 | 0.45 | 0.18 | 1.5 | 0.71 | 2.2 | 8.7 |
| | **Total** | 1.2 | 130 | 4.2 | 3.3 | 0.45 | 0.18 | 1.5 | 0.71 | 2.2 | 8.7 |
| **All Dampier Project** (low grade cut-off) | Measured | 3.0 | 510 | 45 | 8.9 | 0.71 | 0.20 | 0.19 | 2.4 | 12 | 18 |
| | Indicated | 3.0 | 2,120 | 140 | 6.6 | 0.55 | 0.18 | 0.20 | 1.8 | 9 | 16 |
| | Inferred | Various | 730 | 42 | 5.8 | 0.51 | 0.17 | 0.43 | 1.6 | 7.2 | 13 |
| | **Total** | **Various** | **3,360** | **227** | **6.8** | **0.57** | **0.18** | **0.25** | **1.9** | **8.7** | **15** |
| **Thunderbird** (high-grade) | Measured | 7.5 | 220 | 32 | 14.5 | 1.07 | 0.31 | 0.27 | 3.9 | 15 | 16 |
| | Indicated | 7.5 | 640 | 76 | 11.8 | 0.90 | 0.28 | 0.25 | 3.3 | 11 | 14 |
| | Inferred | 7.5 | 180 | 20 | 10.8 | 0.87 | 0.27 | 0.26 | 3.0 | 9 | 13 |
| | **Total** | 7.5 | 1,050 | 127 | 12.2 | 0.93 | 0.28 | 0.26 | 3.3 | 11 | 15 |
| **Night Train** (high-grade) | Inferred | 2.0 | 50 | 3.0 | 5.9 | 0.82 | 0.33 | 2.9 | 1.06 | 2.2 | 10.2 |
| | **Total** | 2.0 | 50 | 3.0 | 5.9 | 0.82 | 0.33 | 2.9 | 1.06 | 2.2 | 10.2 |
| **All Dampier Project** (high grade cut-off) | Measured | 7.5 | 220 | 32 | 14.5 | 1.07 | 0.31 | 0.27 | 3.9 | 15 | 16 |
| | Indicated | 7.5 | 640 | 76 | 11.8 | 0.90 | 0.28 | 0.25 | 3.3 | 11 | 14 |
| | Inferred | Various | 230 | 23 | 9.7 | 0.85 | 0.28 | 0.83 | 2.6 | 7.2 | 12 |
| | **Total** | **Various** | **1,090** | **130** | **11.9** | **0.92** | **0.29** | **0.38** | **3.2** | **11** | **14** |

[1] Night Train: The Mineral Resource estimate was prepared by Optiro Pty Ltd and first disclosed under the JORC Code (2012) refer to ASX announcement 31 January 2019 for further details including Table 1. The Mineral Resource reported above 1.2% heavy mineral (HM) cut-off is inclusive of (not additional to) the Mineral Resource reported above 2.0% HM cut-off. Thunderbird: The Mineral Resource estimate was prepared by Optiro Pty Ltd and first disclosed under the JORC Code (2012) refer to ASX announcement 5 July 2016 for further details including Table 1. The Dampier Project Mineral Resources are reported inclusive of (not additional to) Ore Reserves. The Mineral Resource reported above 3.0% HM cut-off is inclusive of (not additional to) the Mineral Resource reported above 7.5% HM cut-off.

[2]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.

[3]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.

[4] Night Train: Estimates of Mineral Assemblage are presented as percentages of the Heavy Mineral (HM) component of the deposit, as determined by magnetic separation, QEMSCAN™ and XRF for one of 12 composite samples. Magnetic fractions were analysed by QEMSCAN™ 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 90% $TiO_2$ >90% 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: ZrO2+Hf02/0.667 and HiTi leucoxene: $TiO_2$/0.94. HM assemblage determination was by the QEMSCAN™ 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% $TiO_2$, HiTi leucoxene and rutile > 90%, Screening of the heavy mineral was not required. Thunderbird: estimates of Mineral Assemblage are presented as percentages of the HM component of the deposit, as determined by magnetic separation, QEMSCAN™ and XRF. Magnetic fractions were analysed by QEMSCAN™ for mineral determination as follows: Ilmenite: 40-70% $TiO_2$ >90% Liberation; leucoxene: 70-94% $TiO_2$ >90% Liberation; HiTi leucoxene: >94% $TiO_2$ >90% 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 HiTi leucoxene: $TiO_2$/0.94.

[5]In-situ assemblage 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.

[6] The contained in-situ tonnes derived from HM and material tonnes from information in the Mineral Resource tables.

## SHEFFIELD MINERAL RESOURCES FOR DAMPIER PROJECT AT 31 DECEMBER 2019 (HM assemblage)

| Summary of Mineral Resource[1,2,3] | | | | | | HM Assemblage[4] | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Deposit | Mineral Resource Category | Cut off (Total HM%) | Material (Million Tonnes) | In-situ Total HM[6] (Million Tonnes) | Total HM Grade (%) | Zircon (%) | HiTi Leuc[5] (%) | Leuco-xene (%) | Ilmenite (%) | Over size (%) | Slimes (%) |
| Thunderbird (low-grade) | Measured | 3.0 | 510 | 45 | 8.9 | 8.0 | 2.3 | 2.2 | 27 | 12 | 18 |
| | Indicated | 3.0 | 2,120 | 140 | 6.6 | 8.4 | 2.7 | 3.1 | 28 | 9 | 16 |
| | Inferred | 3.0 | 600 | 38 | 6.3 | 8.4 | 2.6 | 3.2 | 28 | 8 | 15 |
| | **Total** | 3.0 | 3,230 | 223 | 6.9 | 8.3 | 2.6 | 2.9 | 28 | 9 | 16 |
| **Night Train** | Inferred | 1.2 | 130 | 4.2 | 3.3 | 14 | 5.4 | 46 | 22 | 2.2 | 8.7 |
| (low-grade) | **Total** | 1.2 | 130 | 4.2 | 3.3 | 14 | 5.4 | 46 | 22 | 2.2 | 8.7 |
| **All Dampier Project** | Measured | 3.0 | 510 | 45 | 8.9 | 8.0 | 2.3 | 2.2 | 27 | 12 | 18 |
| | Indicated | 3.0 | 2,120 | 140 | 6.6 | 8.4 | 2.7 | 3.1 | 28 | 9 | 16 |
| (low grade cut-off) | Inferred | Various | 730 | 42 | 5.8 | 8.9 | 2.9 | 7.5 | 27 | 7.2 | 13 |
| | **Total** | **Various** | **3,360** | **227** | **6.8** | **8.4** | **2.7** | **3.7** | **28** | **8.7** | **15** |
| Thunderbird (high-grade) | Measured | 7.5 | 220 | 32 | 14.5 | 7.4 | 2.1 | 1.9 | 27 | 15 | 16 |
| | Indicated | 7.5 | 640 | 76 | 11.8 | 7.6 | 2.4 | 2.1 | 28 | 11 | 14 |
| | Inferred | 7.5 | 180 | 20 | 10.8 | 8.0 | 2.5 | 2.4 | 28 | 9 | 13 |
| | **Total** | 7.5 | 1,050 | 127 | 12.2 | 7.6 | 2.3 | 2.1 | 27 | 11 | 15 |
| **Night Train** | Inferred | 2.0 | 50 | 3.0 | 5.9 | 14 | 5.6 | 49 | 18 | 2.2 | 10.2 |
| (high-grade) | **Total** | 2.0 | 50 | 3.0 | 5.9 | 14 | 5.6 | 49 | 18 | 2.2 | 10.2 |
| **All Dampier Project** | Measured | 7.5 | 220 | 32 | 14.5 | 7.4 | 2.1 | 1.9 | 27 | 15 | 16 |
| | Indicated | 7.5 | 640 | 76 | 11.8 | 7.6 | 2.4 | 2.1 | 28 | 11 | 14 |
| (high grade cut-off) | Inferred | Various | 230 | 23 | 9.7 | 8.8 | 2.9 | 8.6 | 27 | 7.2 | 12 |
| | **Total** | **Various** | **1,090** | **130** | **11.9** | **7.8** | **2.4** | **3.2** | **27** | **11** | **14** |

[1] Night Train: The Mineral Resource estimate was prepared by Optiro Pty Ltd and first disclosed under the JORC Code (2012) refer to ASX announcement 31 January 2019 for further details including Table 1. The Night Train Mineral Resource reported above 1.2% heavy mineral (HM) cut-off is inclusive of (not additional to) the Mineral Resource reported above 2.0% HM cut-off. Thunderbird: The Mineral Resource estimate was prepared by Optiro Pty Ltd and first disclosed under the JORC Code (2012) refer to ASX announcement 5 July 2016 for further details including Table 1. The Dampier Project Mineral Resources are reported inclusive of (not additional to) Ore Reserves. Thunderbird: The Mineral Resource reported above 3.0% HM cut-off is inclusive of (not additional to) the Mineral Resource reported above 7.5% HM cut-off.

[2] 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.

[3] 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.

[4] Night Train: Estimates of Mineral Assemblage are presented as percentages of the HM component of the deposit, as determined by magnetic separation, QEMSCAN™ and XRF for one of 12 composite samples. Magnetic fractions were analysed by QEMSCAN™ 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 90% $TiO_2$ >90% 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: ZrO2+HfO2/0.667 and HiTi leucoxene: $TiO_2$/0.94. HM assemblage determination- was by the QEMSCAN™ 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% $TiO_2$, HiTi leucoxene and rutile > 90%, Screening of the heavy mineral was not required. Thunderbird: estimates of Mineral Assemblage are presented as percentages of the HM component of the deposit, as determined by magnetic separation, QEMSCAN™ and XRF. Magnetic fractions were analysed by QEMSCAN™ for mineral determination as follows: Ilmenite: 40-70% $TiO_2$ >90% Liberation; leucoxene: 70-94% $TiO_2$ >90% Liberation; HiTi leucoxene: >94% $TiO_2$ >90% 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 HiTi leucoxene: $TiO_2$/0.94.

[5] HiTi leucoxene and rutile (%) combined for Night Train at a >90% $TiO_2$ (as one assemblage sample utilised=> 90% rutile and HiTi leucoxene), HiTi leucoxene for Thunderbird > 94% $TiO_2$

[6] The contained in-situ tonnes derived from HM and material tonnes from information in the Mineral Resource tables.

## SHEFFIELD MINERAL RESOURCE FOR DAMPIER PROJECT AT 31 DECEMBER 2019 (in-situ tonnes)

| Summary of Mineral Resource[1,2,3] | | | | In-situ Tonnes[4] | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Deposit | Mineral Resource Category | Cut off (Total HM%) | Material (Million Tonnes) | In-situ Total HM[6] (Million Tonnes) | Zircon (Thousand Tonnes) | HiTi Leuc[5] (Thousand Tonnes) | Leucoxene (Thousand Tonnes) | Ilmenite (Thousand Tonnes) | Total VHM (Thousand Tonnes) |
| Thunderbird (low-grade) | Measured | 3.0 | 510 | 45 | 3,600 | 1,000 | 1,000 | 12,000 | 17,700 |
| | Indicated | 3.0 | 2,120 | 140 | 11,800 | 3,800 | 4,300 | 39,100 | 59,000 |
| | Inferred | 3.0 | 600 | 38 | 3,200 | 1,000 | 1,200 | 10,500 | 15,900 |
| | **Total** | 3.0 | 3,230 | 223 | 18,600 | 5,900 | 6,500 | 61,700 | 92,600 |
| Night Train (low-grade) | Inferred | 1.2 | 130 | 4.2 | 560 | 220 | 1,900 | 900 | 3,590 |
| | **Total** | 1.2 | 130 | 4.2 | 560 | 220 | 1,900 | 900 | 3,590 |
| All Dampier Project (low grade cut-off) | Measured | 3.0 | 510 | 45 | 3,600 | 1,000 | 1000 | 12,000 | 17,700 |
| | Indicated | 3.0 | 2,120 | 140 | 11,800 | 3,800 | 4,300 | 39,100 | 59,000 |
| | Inferred | Various | 730 | 42 | 3,760 | 1,220 | 3,100 | 11,400 | 19,490 |
| | **Total** | **Various** | **3,360** | **227** | **19,160** | **6,020** | **8,400** | **62,600** | **96,190** |
| Thunderbird (high-grade) | Measured | 7.5 | 220 | 32 | 2,300 | 700 | 600 | 8,400 | 12,000 |
| | Indicated | 7.5 | 640 | 76 | 5,800 | 1,800 | 1,600 | 21,000 | 30,200 |
| | Inferred | 7.5 | 180 | 20 | 1,600 | 500 | 500 | 5,600 | 8,200 |
| | **Total** | 7.5 | 1,050 | 127 | 9,700 | 3,000 | 2,700 | 35,000 | 50,400 |
| Night Train (high-grade) | Inferred | 2.0 | 50 | 3.0 | 420 | 170 | 1,500 | 540 | 2,600 |
| | **Total** | 2.0 | 50 | 3.0 | 420 | 170 | 1,500 | 540 | 2,600 |
| All Dampier Project (high grade cut-off) | Measured | 7.5 | 220 | 32 | 2,300 | 700 | 600 | 8,400 | 12,000 |
| | Indicated | 7.5 | 640 | 76 | 5,800 | 1,800 | 1,600 | 21,000 | 30,200 |
| | Inferred | Various | 230 | 23 | 2,020 | 670 | 2,000 | 6,140 | 10,800 |
| | **Total** | **Various** | **1,090** | **130** | **10,120** | **3,170** | **4,200** | **35,540** | **53,000** |

[1] Night Train: The Mineral Resource estimate was prepared by Optiro Pty Ltd and first disclosed under the JORC Code (2012) refer to ASX announcement 31 January 2019 for further details including Table 1. The Night Train Mineral Resource reported above 1.2% heavy mineral (HM) cut-off is inclusive of (not additional to) the Mineral Resource reported above 2.0% HM cut-off. Thunderbird: The Mineral Resource estimate was prepared by Optiro Pty Ltd and first disclosed under the JORC Code (2012) refer to ASX announcement 5 July 2016 for further details including Table 1. The Dampier Project Mineral Resources are reported inclusive of (not additional to) Ore Reserves. Thunderbird: The Mineral Resource reported above 3.0% HM cut-off is inclusive of (not additional to) the Mineral Resource reported above 7.5% HM cut-off.

[2] 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.

[3] 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.

[4] The contained in-situ tonnes for the valuable heavy minerals were derived from information from the Mineral Resource tables. The in-situ assemblage 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.

[5] HiTi leucoxene and rutile (%) combined for Night Train at a >90% $TiO_2$ (as one assemblage sample utilised=> 90% Rutile and HiTi leucoxene), HiTi leucoxene for Thunderbird > 94% $TiO_2$

[6] The contained in-situ tonnes derived from HM and material tonnes from information in the Mineral Resource tables

## 2) ENEABBA PROJECT MINERAL RESOURCES

### SHEFFIELD MINERAL RESOURCES FOR THE ENEABBA PROJECT AT 31 DECEMBER 2019 (in-situ assemblage)

| Summary of Mineral Resource[1,2] | | | | | | In-situ Assemblage[11] | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Deposit | Mineral Resource Category | Cut off (Total HM%) | Material (Million Tonnes) | In-situ Total HM[12] (Thousand Tonnes) | Total HM Grade (%) | Zircon (%) | Rutile (%) | Leuco-xene (%) | Ilmenite (%) | Over size (%) | Slimes (%) |
| Yandanooka[4,6,8] | Measured | 1.4 | 2.6 | 112 | 4.3 | 0.44 | 0.09 | 0.10 | 3.08 | 11.3 | 15 |
| | Indicated | 1.4 | 57.7 | 1,726 | 3.0 | 0.37 | 0.11 | 0.11 | 2.08 | 11.4 | 15 |
| | Inferred | 1.4 | 0.4 | 7 | 1.5 | 0.16 | 0.05 | 0.07 | 1.01 | 21.9 | 20 |
| | **Total** | 1.4 | 60.8 | 1,845 | 3.0 | 0.37 | 0.11 | 0.11 | 2.11 | 11.5 | 15 |
| Durack[4,6,7,8] | Indicated | 1.4 | 20.7 | 600 | 2.9 | 0.40 | 0.09 | 0.11 | 2.07 | 14.7 | 14 |
| | Inferred | 1.4 | 5.6 | 148 | 2.6 | 0.37 | 0.07 | 0.19 | 1.68 | 18.3 | 16 |
| | **Total** | 1.4 | 26.3 | 748 | 2.8 | 0.39 | 0.08 | 0.13 | 1.99 | 15.5 | 14 |
| Drummond Crossing[3,4,6,8] | Indicated | 1.4 | 35.5 | 838 | 2.4 | 0.33 | 0.24 | 0.08 | 1.26 | 7.7 | 14 |
| | Inferred | 1.4 | 3.3 | 77 | 2.3 | 0.26 | 0.21 | 0.06 | 1.31 | 7.2 | 12 |
| | **Total** | 1.4 | 38.8 | 915 | 2.4 | 0.33 | 0.24 | 0.08 | 1.26 | 7.7 | 14 |
| Robbs Cross[5,6,8] | Indicated | 1.4 | 14.0 | 261 | 1.9 | 0.27 | 0.24 | 0.09 | 0.88 | 6.2 | 6 |
| | Inferred | 1.4 | 3.8 | 77 | 2.0 | 0.29 | 0.22 | 0.08 | 1.02 | 8.1 | 6 |
| | **Total** | 1.4 | 17.8 | 338 | 1.9 | 0.28 | 0.23 | 0.09 | 0.91 | 6.6 | 6 |
| Thomson[5,8,] | Inferred | 1.4 | 26 | 516 | 2.0 | 0.38 | 0.28 | 0.11 | 0.85 | 6.9 | 18 |
| | **Total** | 1.4 | 26 | 516 | 2.0 | 0.38 | 0.28 | 0.11 | 0.85 | 6.9 | 18 |
| West Mine North[3,4,6,9] | Indicated | 2.0 | 10.2 | 748 | 7.3 | 0.43 | 0.48 | 0.13 | 3.51 | 2.3 | 11 |
| | Inferred | 2.0 | 1.8 | 48 | 2.7 | 0.25 | 0.23 | 0.06 | 1.31 | 3.0 | 17 |
| | **Total** | 2.0 | 12.0 | 796 | 6.6 | 0.40 | 0.44 | 0.12 | 3.18 | 2.4 | 12 |
| Ellengail[3,4,9,10] | Indicated | 2.0 | 6.5 | 346 | 5.3 | 0.53 | 0.43 | 0.55 | 3.49 | 3.2 | 15 |
| | Inferred | 2.0 | 5.3 | 218 | 4.1 | 0.41 | 0.34 | 0.35 | 2.55 | 2.5 | 15 |
| | **Total** | 2.0 | 11.8 | 565 | 4.8 | 0.47 | 0.39 | 0.46 | 3.07 | 2.9 | 15 |
| Total | Measured | 1.4 | 2.6 | 112 | 4.3 | 0.44 | 0.09 | 0.10 | 3.08 | 11 | 15 |
| | Indicated | Various | 144.6 | 4,519 | 3.1 | 0.37 | 0.19 | 0.12 | 1.92 | 9 | 14 |
| | Inferred | Various | 46.0 | 1,091 | 2.4 | 0.36 | 0.24 | 0.14 | 1.21 | 8 | 16 |
| | **Total** | **Various** | **193.3** | **5,723** | **3.0** | **0.36** | **0.20** | **0.13** | **1.77** | **9** | **14** |

[1]The Mineral Resource estimates were prepared by Optiro Pty Ltd and first disclosed under the JORC Code (2012) refer 03 October 2018 ASX announcement for Yandanooka, Durack, Drummond Crossing, West Mine North and Ellengail. Refer to December 2017 Quarterly Activities Report for Robbs Cross and Thomson deposits for further details
[2]All tonnages and grades have been rounded to reflect the relative uncertainty of the estimate, thus the sums of columns may not equal.
[3]Total heavy mineral (HM) %: Samples from 1989 and 1996 (Drummond Crossing, Ellengail and West Mine North) were analysed using a -75 µm slimes / +2 mm oversize screen. Separation of HM% was by heavy liquid TBE (density 2.84 g/ml) from the -710µm+75µm fraction.
[4]Total HM %: RGC samples from 1998 and Iluka samples (Drummond Crossing, Durack, Ellengail, West Mine North and Yandanooka) were analysed using a -53 µm slimes / +2 mm oversize screen. Separation of total HM% was by heavy liquid TBE (density 2.90 g/ml) from the -710µm+53µm fraction.
[5]Total HM %: Samples from Robbs Cross and Thomson analysed by Diamantina Laboratories in Perth using a -45 µm slimes / +1 mm oversize screen (method DIA_HLS_45µm_1mm). Separation of total HM% was by heavy liquid TBE (density 2.96g/ml) from the -45 µm+1mm fraction.
[6]Total HM %: Samples from Drummond Crossing, Durack, West Mine North and Yandanooka were analysed by Western Geolabs in Perth using a -53 µm slimes / +1 mm oversize screen. Separation of total HM% was by heavy liquid TBE (density 2.96 g/ml) from the +53µm-1mm fraction.
[7]Reported below an upper cut-off grade of 35% slimes.
[8]Estimates of mineral assemblage are presented as percentages of the total HM component of the deposit, as determined by QEMSCAN™ analysis. For the $TiO_2$ minerals specific breakpoints are used to distinguish between rutile (>95% $TiO_2$), leucoxene (85-95% $TiO_2$) and ilmenite (<55-85% $TiO_2$).
[9]At West Mine North and Ellengail mineral assemblage data determined by Iluka using Method 4 (HM concentrate is separated into magnetics and non-magnetics) was used with the Sheffield QEMSCAN™ data
[10]At Ellengail mineral assemblage data determined by Iluka using Method 3 (magnetic separation and XRF) was used with the Sheffield QEMSCAN™ data and Iluka Method 4
[11]The in-situ assemblage 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.
[12] The contained in-situ tonnes derived from HM and material tonnes from information in the Mineral Resource tables

## SHEFFIELD MINERAL RESOURCE FOR ENEABBA PROJECT AT 31 DECEMBER 2019 (HM assemblage)

| Summary of Mineral Resource[1,2] | | | | | | HM Assemblage[8,9,10] | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Deposit | Mineral Resource Category | Cut off (Total HM%) | Material (Million Tonnes) | In-situ Total HM[11] (Thousand Tonnes) | Total HM Grade (%) | Zircon (%) | Rutile (%) | Leuco-xene (%) | Ilmenite (%) | Over size (%) | Slimes (%) |
| Yandanooka[4,6,8] | Measured | 1.4 | 2.6 | 112 | 4.3 | 10 | 2.1 | 2.3 | 72 | 11.3 | 15 |
| | Indicated | 1.4 | 57.7 | 1,726 | 3.0 | 12 | 3.6 | 3.7 | 69 | 11.4 | 15 |
| | Inferred | 1.4 | 0.4 | 7 | 1.5 | 11 | 3.0 | 4.4 | 68 | 21.9 | 20 |
| | **Total** | 1.4 | 60.8 | 1,845 | 3.0 | 12 | 3.5 | 3.6 | 70 | 11.5 | 15 |
| Durack[4,6,7,8] | Indicated | 1.4 | 20.7 | 600 | 2.9 | 14 | 2.9 | 3.7 | 71 | 14.7 | 14 |
| | Inferred | 1.4 | 5.6 | 148 | 2.6 | 14 | 2.6 | 7.4 | 64 | 18.3 | 16 |
| | **Total** | 1.4 | 26.3 | 748 | 2.8 | 14 | 2.9 | 4.4 | 70 | 15.5 | 14 |
| Drummond Crossing[3,4,6,8] | Indicated | 1.4 | 35.5 | 838 | 2.4 | 14 | 10.3 | 3.4 | 53 | 7.7 | 14 |
| | Inferred | 1.4 | 3.3 | 77 | 2.3 | 11 | 9.0 | 2.7 | 56 | 7.2 | 12 |
| | **Total** | 1.4 | 38.8 | 915 | 2.4 | 14 | 10.2 | 3.4 | 54 | 7.7 | 14 |
| Robbs Cross[5,6,8] | Indicated | 1.4 | 14.0 | 261 | 1.9 | 15 | 12.7 | 5.0 | 47 | 6.2 | 6 |
| | Inferred | 1.4 | 3.8 | 77 | 2.0 | 14 | 10.9 | 4.1 | 50 | 8.1 | 6 |
| | **Total** | 1.4 | 17.8 | 338 | 1.9 | 15 | 12.3 | 4.8 | 48 | 6.6 | 6 |
| Thomson[5,8,] | Inferred | 1.4 | 26 | 516 | 2.0 | 19 | 13.8 | 5.4 | 42 | 6.9 | 18 |
| | **Total** | 1.4 | 26 | 516 | 2.0 | 19 | 13.8 | 5.4 | 42 | 6.9 | 18 |
| West Mine North[3,4,6,9,] | Indicated | 2.0 | 10.2 | 748 | 7.3 | 6 | 6.5 | 1.8 | 48 | 2.3 | 11 |
| | Inferred | 2.0 | 1.8 | 48 | 2.7 | 9 | 8.6 | 2.1 | 50 | 3.0 | 17 |
| | **Total** | 2.0 | 12.0 | 796 | 6.6 | 6 | 6.6 | 1.8 | 48 | 2.4 | 12 |
| Ellengail[3,4,9,10] | Indicated | 2.0 | 6.5 | 346 | 5.3 | 10 | 8.0 | 10.4 | 66 | 3.2 | 15 |
| | Inferred | 2.0 | 5.3 | 218 | 4.1 | 10 | 8.2 | 8.4 | 62 | 2.5 | 15 |
| | **Total** | 2.0 | 11.8 | 565 | 4.8 | 10 | 8.1 | 9.6 | 64 | 2.9 | 15 |
| Total | Measured | 1.4 | 2.6 | 112 | 4.3 | 10 | 2.1 | 2.3 | 72 | 11 | 15 |
| | Indicated | Various | 144.6 | 4,519 | 3.1 | 12 | 6.1 | 3.9 | 62 | 9 | 14 |
| | Inferred | Various | 46.0 | 1,091 | 2.4 | 15 | 10.3 | 5.8 | 51 | 8 | 16 |
| | **Total** | **Various** | **193.3** | **5,723** | **3.0** | **12** | **6.8** | **4.2** | **60** | **9** | **14** |

[1] The Mineral Resource estimates were prepared by Optiro Pty Ltd and first disclosed under the JORC Code (2012) refer 03 October 2018 ASX announcement for Yandanooka, Durack, Drummond Crossing, West Mine North and Ellengail. Refer to December 2017 Quarterly Activities Report for Robbs Cross and Thomson deposits for further details
[2]All tonnages and grades have been rounded to reflect the relative uncertainty of the estimate, thus the sums of columns may not equal.
[3]Total heavy mineral (HM) %: Samples from 1989 and 1996 (Drummond Crossing, Ellengail and West Mine North) were analysed using a -75µm slimes / +2 mm oversize screen. Separation of HM% was by heavy liquid TBE (density 2.84 g/ml) from the -710µm+75µm fraction.
[4]Total HM %: RGC samples from 1998 and Iluka samples (Drummond Crossing, Durack, Ellengail, West Mine North and Yandanooka) were analysed using a -53 µm slimes / +2 mm oversize screen. Separation of total HM% was by heavy liquid TBE (density 2.90 g/ml) from the -710µm+53µm fraction.
[5]Total HM %: Samples from Robbs Cross and Thomson analysed by Diamantina Laboratories in Perth using a -45µm slimes / +1mm oversize screen (method DIA_HLS_45µm_1mm). Separation of total HM% was by heavy liquid TBE (density 2.96g/ml) from the -45 µm+1mm fraction.
[6]Total HM %: Samples from Drummond Crossing, Durack, West Mine North and Yandanooka were analysed by Western Geolabs in Perth using a -53 µm slimes / +1 mm oversize screen. Separation of total HM% was by heavy liquid TBE (density 2.96g/ml) from the +53µm-1mm fraction.
[7]Reported below an upper cut-off grade of 35% slimes.
[8]Estimates of mineral assemblage are presented as percentages of the total HM component of the deposit, as determined by QEMSCAN™ analysis. For the $TiO_2$ minerals specific breakpoints are used to distinguish between rutile (>95% $TiO_2$), leucoxene (85-95% $TiO_2$) and ilmenite (<55-85% $TiO_2$).
[9]At West Mine North and Ellengail mineral assemblage data determined by Iluka using Method 4 (HM concentrate is separated into magnetics and non-magnetics) was used with the Sheffield QEMSCAN™ data
[10]At Ellengail mineral assemblage data determined by Iluka using Method 3 (magnetic separation and XRF analysis) was used with the Sheffield QEMSCAN™ data and Iluka Method 4 data
[11] The contained in-situ tonnes derived from HM and material tonnes from information in the Mineral Resource tables

## SHEFFIELD MINERAL RESOURCE FOR ENEABBA PROJECT AT 31 DECEMBER 2019 (in-situ tonnes)

| Summary of Mineral Resource[1,2,3] | | | | In-situ Tonnes | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Deposit | Mineral Resource Category | Cut off (Total HM%) | Material (Million Tonnes) | In-situ Total HM[11] (Thousand Tonnes) | Zircon (Thousand Tonnes) | Rutile (Thousand Tonnes) | Leuco-xene (Thousand Tonnes) | Ilmenite (Thousand Tonnes) | Total VHM (Thousand Tonnes) |
| Yandanooka[4,6,8] | Measured | 1.4 | 2.6 | 112 | 12 | 2 | 3 | 81 | 98 |
| | Indicated | 1.4 | 57.7 | 1,726 | 212 | 63 | 63 | 1,197 | 1,535 |
| | Inferred | 1.4 | 0.4 | 7 | 1 | 0.2 | 0.3 | 4 | 6 |
| | **Total** | 1.4 | 60.8 | 1,845 | 224 | 65 | 66 | 1,283 | 1,639 |
| Durack[4,6,7,8] | Indicated | 1.4 | 20.7 | 600 | 82 | 18 | 22 | 429 | 551 |
| | Inferred | 1.4 | 5.6 | 148 | 21 | 4 | 11 | 95 | 130 |
| | **Total** | 1.4 | 26.3 | 748 | 104 | 21 | 33 | 523 | 681 |
| Drummond Crossing[3,4, 6,8] | Indicated | 1.4 | 35.5 | 838 | 118 | 86 | 29 | 447 | 680 |
| | Inferred | 1.4 | 3.3 | 77 | 9 | 7 | 2 | 43 | 61 |
| | **Total** | 1.4 | 38.8 | 915 | 127 | 93 | 31 | 490 | 741 |
| Robbs Cross[5,6,8] | Indicated | 1.4 | 14.0 | 261 | 38 | 33 | 13 | 123 | 208 |
| | Inferred | 1.4 | 3.8 | 77 | 11 | 8 | 3 | 39 | 61 |
| | **Total** | 1.4 | 17.8 | 338 | 50 | 41 | 16 | 162 | 269 |
| Thomson[5,8,] | Inferred | 1.4 | 26 | 516 | 97 | 71 | 28 | 219 | 415 |
| | **Total** | 1.4 | 26 | 516 | 97 | 71 | 28 | 219 | 415 |
| West Mine North[3,4,6,9,] | Indicated | 2.0 | 10.2 | 748 | 44 | 49 | 13 | 359 | 465 |
| | Inferred | 2.0 | 1.8 | 48 | 5 | 4 | 1 | 24 | 34 |
| | **Total** | 2.0 | 12.0 | 796 | 48 | 53 | 14 | 383 | 498 |
| Ellengail[3,4,9,10] | Indicated | 2.0 | 6.5 | 346 | 34 | 28 | 36 | 227 | 325 |
| | Inferred | 2.0 | 5.3 | 218 | 22 | 18 | 18 | 136 | 193 |
| | **Total** | 2.0 | 11.8 | 565 | 56 | 46 | 54 | 363 | 519 |
| Total | Measured | 1.4 | 2.6 | 112 | 12 | 2 | 3 | 81 | 98 |
| | Indicated | Various | 144.6 | 4,519 | 529 | 276 | 176 | 2,782 | 3,764 |
| | Inferred | Various | 46.0 | 1,091 | 165 | 113 | 64 | 559 | 900 |
| | **Total** | **Various** | **193.3** | **5,723** | **705** | **392** | **242** | **3,423** | **4,762** |

[1] The Mineral Resource estimates were prepared by Optiro Pty Ltd and first disclosed under the JORC Code (2012) refer 03 October 2018 ASX announcement for Yandanooka, Durack, Drummond Crossing, West Mine North and Ellengail. Refer to December 2017 Quarterly Activities Report for Robbs Cross and Thomson deposits for further details

[2]All tonnages and grades have been rounded to reflect the relative uncertainty of the estimate, thus the sums of columns may not equal.

[3]Total heavy mineral (HM) %: Samples from 1989 and 1996 (Drummond Crossing, Ellengail and West Mine North) were analysed using a -75µm slimes / +2mm oversize screen. Separation of HM% was by heavy liquid TBE (density 2.84 g/ml) from the -710µm+75µm fraction.

[4]Total HM %: RGC samples from 1998 and Iluka samples (Drummond Crossing, Durack, Ellengail, West Mine North and Yandanooka) were analysed using a -53 µm slimes / +2 mm oversize screen. Separation of total HM% was by heavy liquid TBE (density 2.90 g/ml) from the -710µm+53µm fraction.

[5]Total HM %: Samples from Robbs Cross and Thomson analysed by Diamantina Laboratories in Perth using a -45 µm slimes / +1 mm oversize screen (method DIA_HLS_45µm_1mm). Separation of total HM% was by heavy liquid TBE (density 2.96g/ml) from the -45 µm+1mm fraction.

[6]Total HM %: Samples from Drummond Crossing, Durack, West Mine North and Yandanooka were analysed by Western Geolabs in Perth using a -53µm slimes / +1mm oversize screen. Separation of total HM% was by heavy liquid TBE (density 2.96 g/ml) from the +53µm-1mm fraction.

[7]Reported below an upper cut-off grade of 35% slimes.

[8]Estimates of mineral assemblage are presented as percentages of the total HM) component of the deposit, as determined by QEMSCAN™ analysis. For the $TiO_2$ minerals specific breakpoints are used to distinguish between rutile (>95% $TiO_2$), leucoxene (85-95% $TiO_2$) and ilmenite (<55-85% $TiO_2$).

[9]At West Mine North and Ellengail mineral assemblage data determined by Iluka using Method 4 (HM concentrate is separated into magnetics and non-magnetics) was used with the Sheffield QEMSCAN™ data

[10]At Ellengail mineral assemblage data determined by Iluka using Method 3 (magnetic separation and XRF analysis) was used with the Sheffield QEMSCAN™ data and Iluka Method 4 data

[11] The contained in-situ tonnes derived from HM and material tonnes from information in the Mineral Resource tables

## 3) McCALLS PROJECT MINERAL RESOURCES

### SHEFFIELD MINERAL RESOURCES FOR McCALLS PROJECT AT 31 DECEMBER 2019 (in-situ assemblage)

| Summary of Mineral Resources[1,2,3,4] | | | | | | In-situ Assemblage[5, 6] | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Deposit | Mineral Resource | Cut off | Material | In-situ Total HM[6] | Total HM Grade | Zircon | Rutile | Leuco-xene | Ilmenite | Over size | Slimes |
| | Category | (Total HM%) | (Million Tonnes) | (Million Tonnes) | (%) | (%) | (%) | (%) | (%) | (%) | (%) |
| McCalls | Indicated | 1.1 | 1,630 | 23.3 | 1.4 | 0.07 | 0.05 | 0.04 | 1.10 | 1.1 | 21 |
| | Inferred | 1.1 | 1,980 | 24.4 | 1.2 | 0.06 | 0.05 | 0.04 | 1.00 | 1.1 | 26 |
| | Total | 1.1 | 3,600 | 47.7 | 1.3 | 0.07 | 0.05 | 0.04 | 1.05 | 1.1 | 24 |
| Mindarra Springs[7] | Inferred | 1.1 | 2,200 | 36.3 | 1.6 | 0.07 | 0.01 | 0.05 | 1.32 | 5.1 | 20 |
| | Total | 1.1 | 2,200 | 36.3 | 1.6 | 0.07 | 0.01 | 0.05 | 1.32 | 5.1 | 20 |
| Total | Indicated | 1.1 | 1,630 | 23.3 | 1.4 | 0.07 | 0.05 | 0.04 | 1.10 | 1.1 | 21 |
| | Inferred | 1.1 | 4,180 | 60.7 | 1.5 | 0.07 | 0.03 | 0.05 | 1.17 | 3.2 | 23 |
| | **Total** | **1.1** | **5,800** | **84.0** | **1.4** | **0.07** | **0.03** | **0.04** | **1.15** | **2.6** | **22** |

### SHEFFIELD MINERAL RESOURCES FOR McCALLS PROJECT AT 30 SEPTEMBER 2019 (HM assemblage)

| Summary of Mineral Resources[1,2,3,4,7] | | | | | | HM Assemblage[5, 6] | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Deposit | Mineral Resource | Cut off | Material | In-situ Total HM[6] | Total HM Grade | Zircon | Rutile | Leuco-xene | Ilmenite | Over size | Slimes |
| | Category | (Total HM%) | (Million Tonnes) | (Million Tonnes) | (%) | (%) | (%) | (%) | (%) | (%) | (%) |
| McCalls | Indicated | 1.1 | 1,630 | 23.3 | 1.4 | 5.2 | 3.3 | 2.8 | 77 | 1.1 | 21 |
| | Inferred | 1.1 | 1,980 | 24.4 | 1.2 | 5.0 | 3.8 | 3.2 | 81 | 1.1 | 26 |
| | Total | 1.1 | 3,600 | 47.7 | 1.3 | 5.1 | 3.6 | 3.0 | 79 | 1.1 | 24 |
| Mindarra Springs[7] | Inferred | 1.1 | 2,200 | 36.3 | 1.6 | 4.2 | 0.9 | 3.1 | 80 | 5.1 | 20 |
| | Total | 1.1 | 2,200 | 36.3 | 1.6 | 4.2 | 0.9 | 3.1 | 80 | 5.1 | 20 |
| Total | Indicated | 1.1 | 1,630 | 23.3 | 1.4 | 5.2 | 3.3 | 2.8 | 77 | 1.1 | 21 |
| | Inferred | 1.1 | 4,180 | 60.7 | 1.5 | 4.5 | 2.1 | 3.2 | 81 | 3.2 | 23 |
| | **Total** | **1.1** | **5,800** | **84.0** | **1.4** | **4.7** | **2.4** | **3.1** | **79** | **2.6** | **22** |

[1]The Mineral Resource estimates for McCalls and Mindarra Springs were prepared by Optiro Pty Ltd and first disclosed under the JORC Code (2012) refer to ASX announcement 03 October 2018

[2]All tonnages and grades have been rounded to reflect the relative uncertainty of the estimate, thus the sums of columns may not equal

[3]Total heavy mineral (HM) is within the 45µm to 1mm size fraction and reported as a percentage of the total material, slimes is the -45µm fraction and oversize is the +1mm fraction

[4]Reported below an upper cut-off grade of 35% slimes

[5]Estimates of mineral assemblage (Sheffield) are presented as percentages of the total HM) component of the deposit, as determined by QEMSCAN™ analysis. For the $TiO_2$ minerals specific breakpoints are used to distinguish between rutile (>95% $TiO_2$), leucoxene (85-95% $TiO_2$) and ilmenite (<55-85% $TiO_2$). Estimates of mineral assemblage (BHP) HM assemblage determination was by magnetic separation and observation (grain-counting)

[6] The contained in-situ tonnes derived from HM and material tonnes from information in the Mineral Resource tables

[7]Excludes Mineral Resources within the Mogumber Nature Reserve

## SHEFFIELD MINERAL RESOURCES FOR McCALLS PROJECT AT 31 DECEMBER 2019 (in-situ tonnes)

| Summary of Mineral Resources[1,2,3,4] | | | | In-situ Tonnes | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Deposit | Mineral Resource Category | Cut off (Total HM%) | Material (Million Tonnes) | In-situ Total HM[7] (Million Tonnes) | Zircon (Thousand Tonnes) | Rutile (Thousand Tonnes) | Leuco-xene (Thousand Tonnes) | Ilmenite (Thousand Tonnes) | Total VHM (Thousand Tonnes) |
| McCalls | Indicated | 1.1 | 1,630 | 23.3 | 1,210 | 770 | 650 | 17,940 | 20,570 |
| | Inferred | 1.1 | 1,980 | 24.4 | 1,210 | 930 | 790 | 19,790 | 22,720 |
| | **Total** | 1.1 | 3,600 | 47.7 | 2,430 | 1,700 | 1,430 | 37,730 | 43,290 |
| Mindarra Springs[8] | Inferred | 1.1 | 2,200 | 36.3 | 1,520 | 320 | 1,130 | 29,080 | 32,050 |
| | **Total** | 1.1 | 2,200 | 36.3 | 1,520 | 320 | 1,130 | 29,080 | 32,050 |
| Total | Indicated | 1.1 | 1,630 | 23.3 | 1,210 | 770 | 650 | 17,940 | 20,570 |
| | Inferred | 1.1 | 4,180 | 60.7 | 2,740 | 1,250 | 1,920 | 48,860 | 54,770 |
| | **Total** | **1.1** | **5,800** | **84.0** | **3,950** | **2,020** | **2,570** | **66,810** | **75,340** |

[1]The Mineral Resource estimates for McCalls and Mindarra Springs were prepared by Optiro Pty Ltd and first disclosed under the JORC Code (2012) refer to ASX announcement 03 October 2018

[2]All tonnages and grades have been rounded to reflect the relative uncertainty of the estimate, thus the sums of columns may not equal

[3]Total heavy mineral (HM) is within the 45µm to 1mm size fraction and reported as a percentage of the total material, slimes is the -45µm fraction and oversize is the +1mm fraction

[4]Reported below an upper cut-off grade of 35% slimes

[5]Estimates of mineral assemblage (Sheffield) are presented as percentages of the total HM component of the deposit, as determined by QEMSCAN™ analysis. For the $TiO_2$ minerals specific breakpoints are used to distinguish between rutile (>95% $TiO_2$), leucoxene (85-95% $TiO_2$) and ilmenite (<55-85% $TiO_2$). Estimates of mineral assemblage (BHP) HM assemblage determination was by magnetic separation and observation (grain-counting)

[6]The in-situ assemblage 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

[7]The contained in-situ tonnes derived from HM and material tonnes from information in the Mineral Resource tables

[8]Excludes mineralisation within the Mogumber Nature Reserve

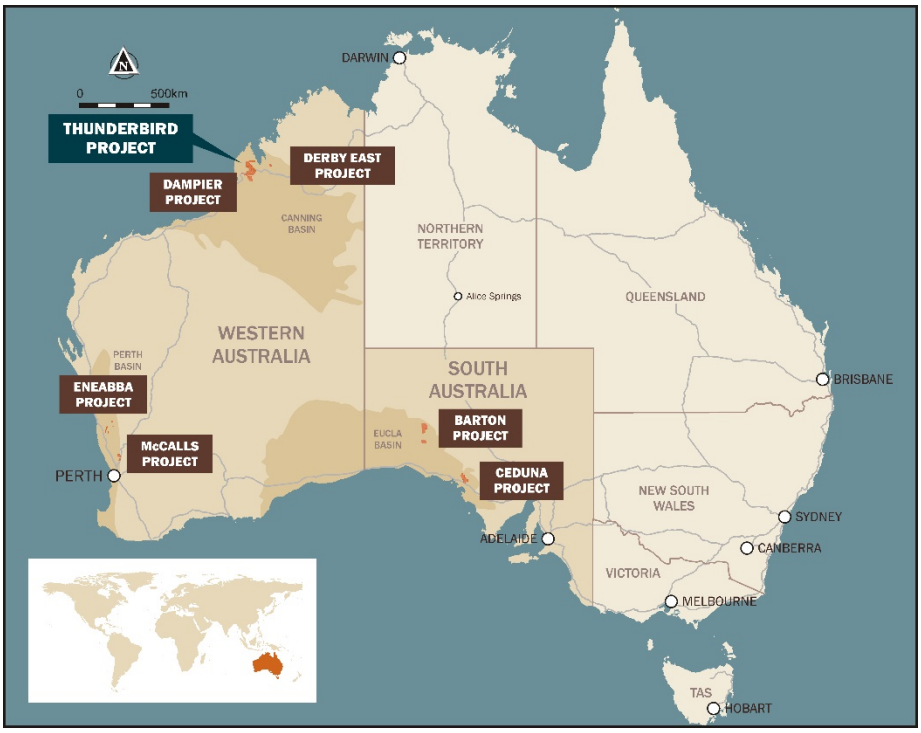


Figure 9: Location of Sheffield's Mineral Sands Projects

## GOVERNANCE AND INTERNAL CONTROLS

Mineral Resource and Ore Reserve are compiled by qualified Sheffield personnel and/or independent consultants following industry standard methodology and techniques. The underlying data, methodology, techniques and assumptions on which estimates are prepared are subject to internal peer review by senior Company personnel, as is JORC compliance. Where deemed necessary or appropriate, estimates are reviewed by independent consultants. Competent Persons named by the Company are members of the Australasian Institute of Mining and Metallurgy and/or the Australian Institute of Geoscientists and qualify as Competent Persons as defined in the JORC Code 2012.

## COMPETENT PERSONS AND COMPLIANCE STATEMENTS

The information in this report that relates to Exploration Results is based on information compiled by Mr Seb Gray, a Competent Person who is a Member of Australian Institute of Geoscientists (AIG). Mr Gray is a full-time employee of Sheffield Resources Ltd and has sufficient experience that is relevant to the style of mineralisation and type of deposit under consideration and to the activity being undertaken to qualify as a Competent Person as defined in the 2012 Edition of the 'Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves'. Mr Gray consents to the inclusion in the report of the matters based on his information in the form and context in which it appears.

The Company's Ore Reserves and Mineral Resources Statement is based on information first reported in previous ASX announcements by the Company. These announcements are listed below and are available to view on Sheffield's website www.sheffieldresources.com.au. Mineral Resources and Ore Reserves reported for the Dampier Project and Mineral Resources reported for the Eneabba and McCalls Projects, are prepared and disclosed under the JORC Code 2012. The Company confirms that it is not aware of any new information or data that materially affects the information included in the relevant original market announcements and that all material assumptions and technical parameters underpinning the estimates in the relevant original market announcement continue to apply and have not materially changed.

The information in this report that relates to the estimation of the Ore Reserve is based on information compiled by Mr Per Scrimshaw, a Competent Person who is a Member of The Australasian Institute of Mining and Metallurgy. Mr Scrimshaw is employed by Entech Pty Ltd and has sufficient experience that is relevant to the style of mineralisation and type of deposit under consideration and to the activity being undertaken to qualify as a Competent Person as defined in the 2012 Edition of the 'Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves'. Mr Scrimshaw consents to the inclusion in the report of the matters based on his information in the form and context in which it appears.

The information in this report that relates to the estimation of the Mineral Resources is based on information compiled by Mrs Christine Standing, a Competent Person who is a Member of the Australian Institute of Geoscientists (AIG) and the Australasian Institute of Mining and Metallurgy (AusIMM). Mrs Standing is a full-time employee of Optiro Pty Ltd and has sufficient experience which is relevant to the style of mineralisation and type of deposit under consideration and to the activity which she is undertaking to qualify as a Competent Person as defined in the 2012 Edition of the 'Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves'. Mrs Standing consents to the inclusion in this report of the matters based on her information in the form and context in which it appears.

The information in this report that relates to the Thunderbird Mineral Resource is based on information compiled under the guidance of Mr Mark Teakle, a Competent Person who is a Member of the Australian Institute of Geoscientists (AIG) and the Australasian Institute of Mining and Metallurgy (AusIMM). Mr Teakle is a full-time employee of Sheffield Resources Ltd and has sufficient experience that is relevant to the style of mineralisation and type of deposit under consideration and to the activity being undertaken to qualify as a Competent Person as defined in the 2012 Edition of the 'Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves'. Mr Teakle consents to the inclusion in the report of the matters based on his information in the form and context in which it appears.

The Competent Persons for reporting of Mineral Resources and Ore Reserves in the relevant original market announcements are listed below. The Company confirms that the form and context in which the Competent Persons' findings are presented have not been materially modified from the relevant original market announcement.

Ore Reserves and Mineral Resources prepared and first disclosed under the JORC Code 2012):

| Item | Report title | Report Date | Competent Person(s) |
|---|---|---|---|
| Thunderbird Ore Reserve | Thunderbird 10% Ore Reserve Increase | 31 July 2019 | P. Scrimshaw |
| Thunderbird Mineral Resource | Sheffield Doubles Measured Mineral Resource at Thunderbird | 05 July 2016 | M. Teakle, C. Standing |
| Night Train Mineral Resource | High Grade Maiden Mineral Resource at Night Train | 31 January 2019 | C. Standing |
| Robbs Cross Mineral Resource | Quarterly Activities Report for The Period Ended 31 December 2017 | 30 January 2018 | C. Standing |
| Thomson Mineral Resource | Quarterly Activities Report for The Period Ended 31 December 2017 | 30 January 2018 | C. Standing |
| Yandanooka Mineral Resource | Mineral Resource and Ore Reserve Statement | 03 October 2018 | C. Standing |
| Durack Mineral Resource | Mineral Resource and Ore Reserve Statement | 03 October 2018 | C. Standing |
| Drummond Crossing Mineral Resource | Mineral Resource and Ore Reserve Statement | 03 October 2018 | C. Standing |
| West Mine North Mineral Resource | Mineral Resource and Ore Reserve Statement | 03 October 2018 | C. Standing |
| Ellengail Mineral Resource | Mineral Resource and Ore Reserve Statement | 03 October 2018 | C. Standing |
| McCalls Mineral Resource | Mineral Resource and Ore Reserve Statement | 03 October 2018 | C. Standing |
| Mindarra Springs Mineral Resource | Mineral Resource and Ore Reserve Statement | 03 October 2018 | C. Standing |

| Item | Name | Company | Professional Affiliation |
|---|---|---|---|
| Exploration Results | Mr Seb Gray | Sheffield Resources | MAIG |
| Mineral Resource Reporting | Mr Mark Teakle | Sheffield Resources | MAIG, MAusIMM |
| Mineral Resource Estimation | Mrs Christine Standing | Optiro | MAIG, MAusIMM |
| Ore Reserve | Mr Per Scrimshaw | Entech | MAusIMM |

## SUPPORTING INFORMATION REQUIRED UNDER ASX LISTING RULES, CHAPTER 5

The supporting information below is required, under Chapter 5 of the ASX Listing Rules, to be included in market announcements reporting estimates of Mineral Resources and Ore Reserves.

## PREVIOUSLY REPORTED INFORMATION

This report includes information that relates to Exploration Results, Mineral Resources and Ore Reserves prepared and first disclosed under the JORC Code 2012 and a Bankable Feasibility Study. The information was extracted from the Company's previous ASX announcements as follows:

- Mineral Resource and Ore Reserve Statement: "MINERAL RESOURCE AND ORE RESERVE STATEMENT" 24 September 2019
- Quarterly Activities Report June 30 2019 "QUARTERLY ACTIVITIES REPORT FOR THE PERIOD ENDED 30 JUNE 2019" 31 July 2019
- Thunderbird Ore Reserve Update: "THUNDERBIRD ORE RESERVE UPDATE" 31 July 2019
- Thunderbird BFS Update: "BFS UPDATE MATERIALLY REDUCES CAPITAL", 31 July 2019
- Night Train Inferred Resource and Mineral Assemblage results "*HIGH GRADE MAIDEN MINERAL RESOURCE AT NIGHT TRAIN*" 31 January 2019
- Yandanooka, Durack, Drummond Crossing, West Mine North, Ellengail, McCalls and Mindarra Springs Resource Estimates and including Mineral Resource and Ore Statement "*MINERAL RESOURCE AND RESERVE STATEMENT*" 03 October, 2018
- Thomson and Robbs Cross Mineral Resources: "QUARTERLY ACTIVITIES REPORT FOR THE PERIOD ENDED 31 DECEMBER 2017" 30 January, 2018
- Thunderbird Mineral Resource: *"SHEFFIELD DOUBLES MEASURED MINERAL RESOURCE AT THUNDERBIRD"* 5 July, 2016
- Night Train metallurgical test work: "*PREMIUM ZIRCON AT NIGHT TRAIN"* 14 April, 2016

These announcements 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 and the Bankable Feasibility Study, 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 Persons' findings are presented have not been materially modified from the relevant original market announcements.

## FORWARD LOOKING AND CAUTIONARY STATEMENTS

The contents of this report 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 report.

Some statements in this report 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 report 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.