Sheffield Resources Ltd
ACN 125 811 083
14 Prowse Street West Perth WA

30 April 2013

QUARTERLY REPORT FOR PERIOD ENDING 31 MARCH 2013

HIGHLIGHTS

Dampier HMS project

- Outstanding metallurgical testwork results confirm world class status of Thunderbird HMS deposit
- High quality zircon, ilmenite, rutile and leucoxene products
- Primary zircon is expected to meet specifications of the premium market
- Scoping studies commenced

Red Bull Nickel project

- 3 strong bedrock conductors identified from Fixed Loop EM survey
- Aircore and diamond/RC drilling programmes scheduled for Q2 2013

Oxley Potash project

- Large new potash target associated with 32km strike of ultrapotassic microsyenite rock unit

Corporate

- Sale of South Pilbara Iron tenements to Brockman Mining Ltd
- Sale consideration includes upfront cash payment of $1 million, supplementary cash payment of $0.10 per JORC resource tonne and a production royalty
- Sale increases Sheffield's already strong cash position to advance world class Thunderbird HMS and Red Bull Nickel projects

Cash position

- Net increase in cash during quarter of approximately $170,000 due to exercise of options and R & D tax return

As at 31/03/13:

Issued Shares	**102.0M**	ASX Code	**SFX**	Closing Price	**$0.69**
Market Cap	**$70.4M**	Cash Reserves	**$6.2M**		

THUNDERBIRD METALLURGY OUTSTANDING

Outstanding results from initial metallurgical testwork on a 6 tonne bulk sample have substantially de-risked the Thunderbird deposit, confirming its world class status and triggering the commencement of scoping studies.

The metallurgical results demonstrate that Thunderbird has the potential to generate high quality, marketable products, including premium grade zircon, using conventional processing technology.

RED BULL "DRILL-READY"

Aircore drilling is set to commence on the Red Bull Nickel Project following completion of Fixed Loop EM, soil sampling and aboriginal heritage surveys. Diamond drilling is scheduled to commence in June.

No drilling was undertaken during the March quarter, with exploration expenditure estimated to be $1,011,000.

Figure 1: Location of Sheffield's Projects

DAMPIER HEAVY MINERAL SANDS

The Dampier HMS Project is located near Derby in the Canning Basin region of Western Australia and contains the large, high grade Thunderbird deposit and a second, underexplored HMS occurrence named Argo (Figure 2).

The Company previously announced a maiden mineral resource for Thunderbird (at 2% HM cut-off) of **1.37Bt @ 6.1% HM** (Indicated & Inferred) for 83Mt of contained HM. This resource includes 5.7Mt of zircon, 1.3Mt of rutile, 3.6Mt of leucoxene and 24Mt of ilmenite (Appendix 1).

Within the resource is a coherent high grade core (at 7.5% HM cut-off) of **517Mt @ 10.1% HM** (Indicated and Inferred) containing 3.6Mt of zircon, 0.8Mt of rutile, 2.2Mt of leucoxene and 15.2Mt of ilmenite. This zone, which averages 20m thickness, will be the focus of initial development studies.

During the quarter, the Company received outstanding results from initial metallurgical testwork at Thunderbird. The results indicate that Thunderbird has the potential to generate high quality, marketable products, including premium grade zircon, using conventional processing technology.

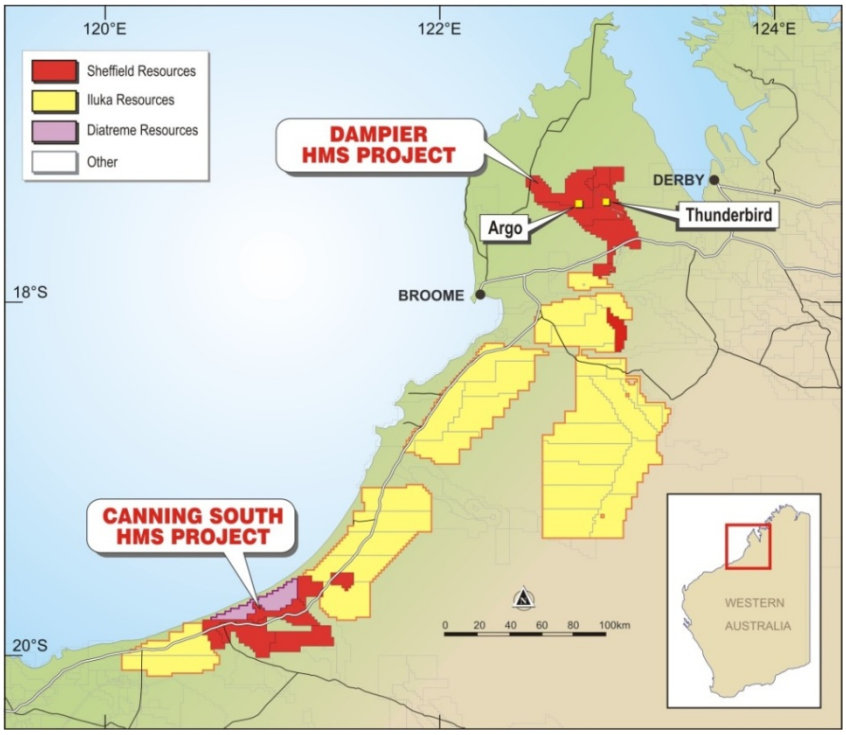


Figure 2: Location of Dampier Project

The metallurgical testwork was undertaken by Robbins Metallurgical Pty Ltd, Brisbane on a 6 tonne bulk sample composited from 31 aircore holes drilled at 60m spacing on a cross pattern near the central part of the deposit (Figure 3).

A high-quality primary zircon product containing 66.2% ZrO_2 was obtained, with specifications shown in Table 1. This product is expected to attract premium pricing.

Table 1: Primary Zircon Specifications

ZrO_2 %	Fe_2O_3 %	TiO_2%	Al_2O_3%	U ppm	Th ppm
66.2	0.05	0.06	0.10	320	221

A primary ilmenite product assaying 48.3% TiO_2 with low levels of contaminants was obtained at a high recovery using a typical magnetic/electrostatic separation circuit. An upgrading stage utilizing a low temperature roast to reduce iron oxides produced an ilmenite product containing 57.7% TiO_2, with chemistry comparable to existing sulphate ilmenite producers (Table 2).

Table 2: Ilmenite Product Specifications

TiO_2 %	FeO %	Fe_2O_3 %	SiO_2 %	Al_2O_3%	Cr_2O_3 %	MgO %	MnO %	ZrO_2 %	CaO %
57.7	24.2	14.3	0.9	0.4	0.08	0.2	1.7	0.08	0.0

Products of rutile at 94.9% TiO_2, leucoxene at 92.1% TiO_2, and a secondary ilmenite at 60.1% TiO_2 were prepared. These also contain low levels of contaminants.

Processing indicates the Thunderbird slimes have a low clay content and exhibit high settling rates at low flocculant dosage rates of 20-30 grams per tonne. XRD analyses indicate 72% of the slimes consist of quartz and 24% kaolin. No smectite or smectite-bearing clays are present.

Analysis of the bulk sample head resulted in a HM grade of 7.7% containing 8.6% zircon. This represents a 15% higher HM content and 36% higher zircon content than that indicated by corresponding drill hole intervals (6.7% HM, 6.3% zircon). This difference requires further investigation, but is regarded as positive, in that it indicates the current resource estimate is potentially underestimating HM and zircon grades achievable through mineral processing.

Whilst the testwork was optimised toward product quality, overall ZrO_2 and TiO_2 recoveries are considered acceptable, and further work will be directed at optimising recoveries.

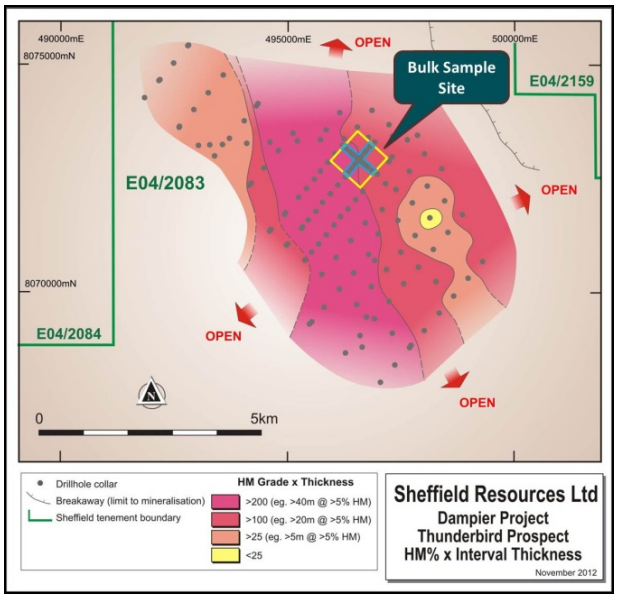


Figure 3: Location of bulk sample

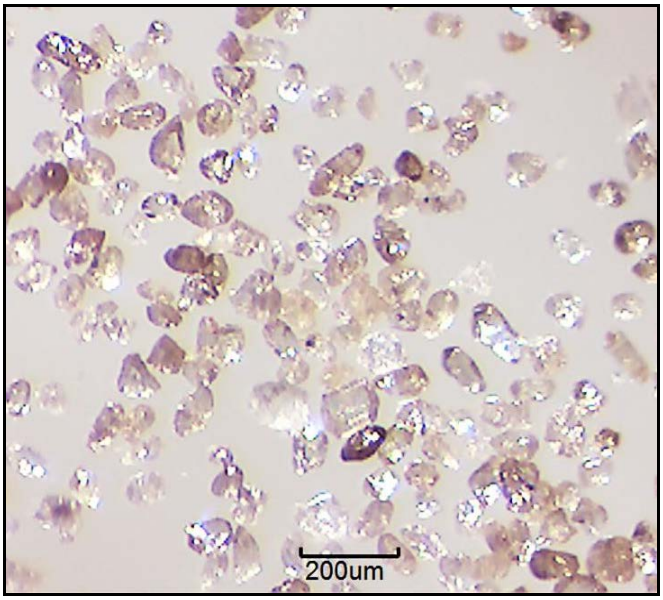


Figure 4: Thunderbird zircon product

Scoping studies have commenced and are expected to lead into pre-feasibility studies in Q3-Q4 2013. This work will include investigation of mining, infrastructure and marketing options. Additional metallurgical testwork is underway, aimed at optimising the processing flowsheet and evaluating the markets for potential products.

Level 2 baseline environmental survey work to support the environmental approvals process is underway and is expected to take 12 months to complete.

The next drilling programme, scheduled to commence late Q2 2013, will comprise infill and extension drilling at Thunderbird and an initial test of the Argo deposit, located 12km to the west. The infill drilling at Thunderbird is designed to increase the component of the deposit in the Indicated Resource category and to provide additional sample for metallurgical testing.

RED BULL NICKEL

The Red Bull project comprises two tenements with a total area of 525km^2 located 120km east of Norseman in WA. The northern tenement E69/3052 lies within 20km of Sirius Resources NL's (ASX:SIR) Nova and Bollinger Ni-Cu deposits and covers mafic and ultramafic rocks of the Fraser Complex which are prospective for Ni-Cu mineralisation of the Nova-style (Figure 5).

Initial targets comprise 3 strong bedrock conductors (RB VA1-3) and an 8km long Ni-Cu-Co anomalous trend in a layered mafic-ultramafic sequence in the northern project area (Figure 6).

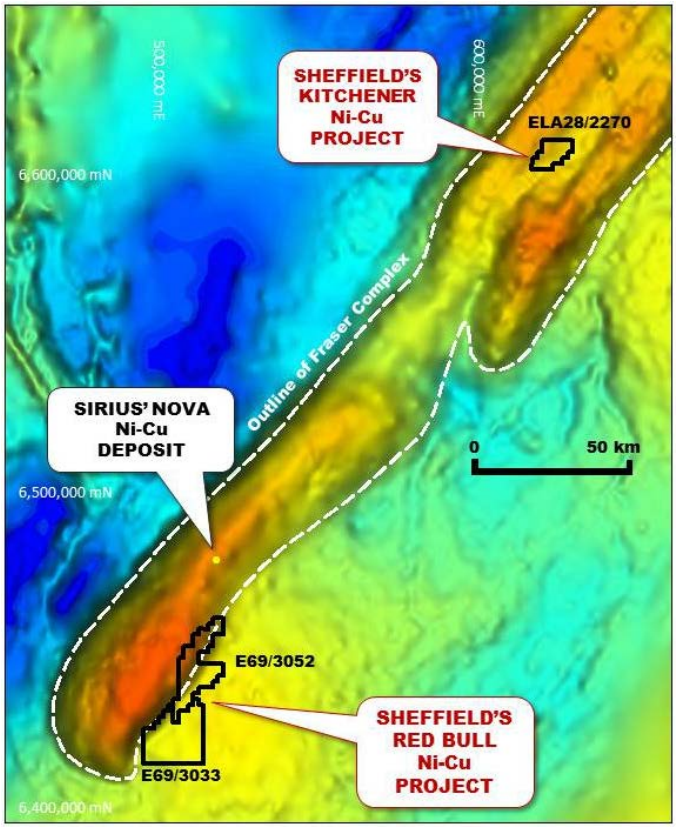


Figure 5: Location of Red Bull Project on a gravity image outlining the Fraser Complex

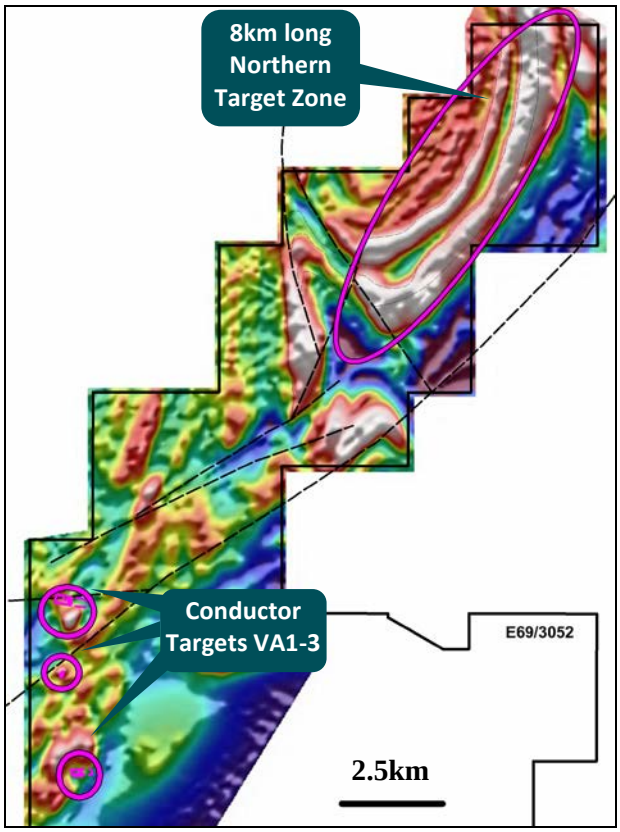


Figure 6: Target areas within Sheffield's tenement E69/3052, RTP aeromagnetic image

The three highest priority targets (RB_VA1-3) identified from Sheffield's VTEM survey flown in November 2012 have been defined in the follow-up Fixed Loop Transient Electromagnetic (FLTEM) survey as strong, localised bedrock conductors, consistent with the presence of massive to strongly developed sulphides (Figure 7).

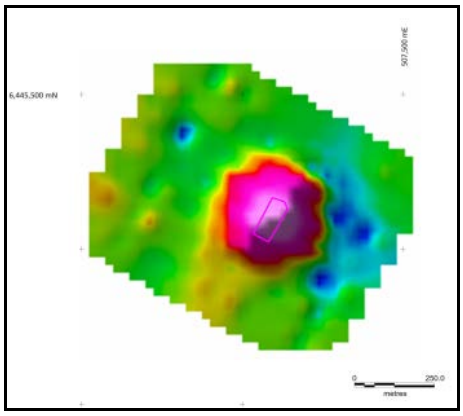
Southern Geoscience Consultants (SGC), who managed the FLTEM surveys have modelled all three anomalies with conductances comparable to, or greater than, the modelled conductance of Nova from Sirius Resources NL's initial moving loop EM survey (SIR ASX release 18 April 2012).

RB_VA1-3 also have coincident magnetic anomalies. The combination of EM conductors and magnetic anomalies is considered a strong indicator of mineralised systems.

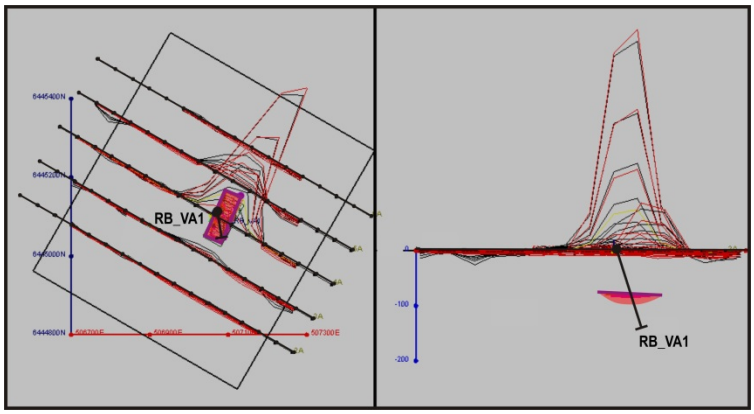
SGC have completed final processing of the second phase of FLTEM surveys which followed up moderate priority VTEM targets RB-VA4-8. No significant bedrock conductors were identified from these anomalies, further highlighting the unique characteristics of the three high priority anomalies RB VA1-3.

A soil sampling programme of 1,211 samples was completed over high priority targets in the northern half of E69/3052. A 1,500-sample regional auger soil sampling programme designed to provide extensive first-pass geochemical coverage across both Red Bull project tenements is nearing completion. Final results are expected during Q2 2013.

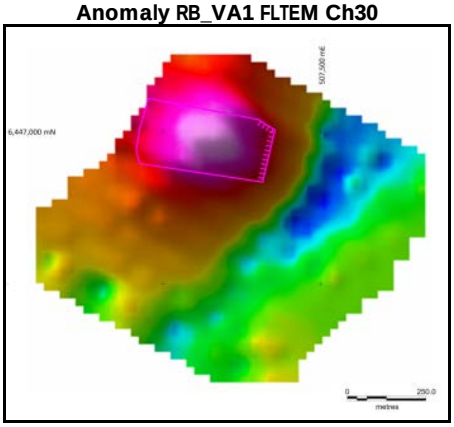
Heritage surveys were also completed ahead of aircore and diamond drilling programmes scheduled for Q2 2013.



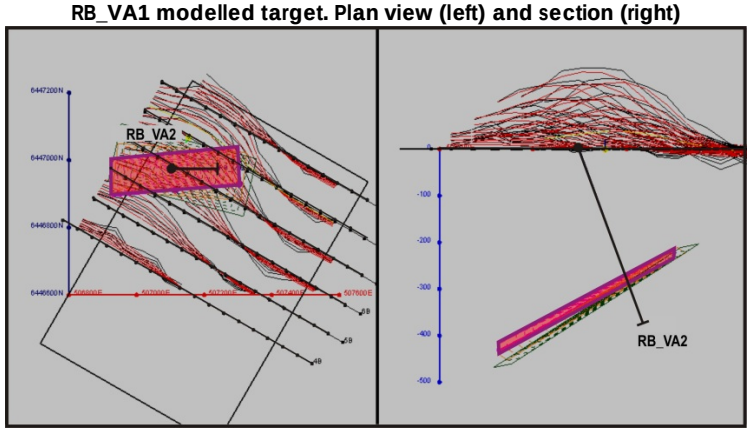
Anomaly RB_VA1 FLTEM Ch30



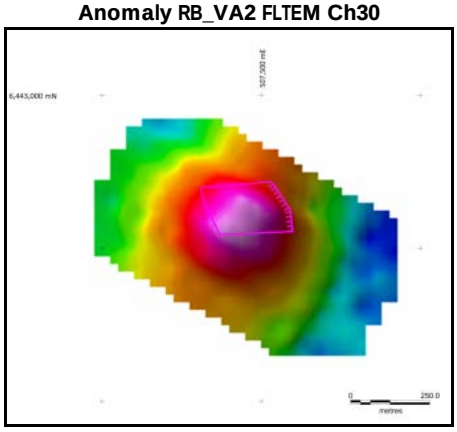
RB_VA1 modelled target. Plan view (left) and section (right)



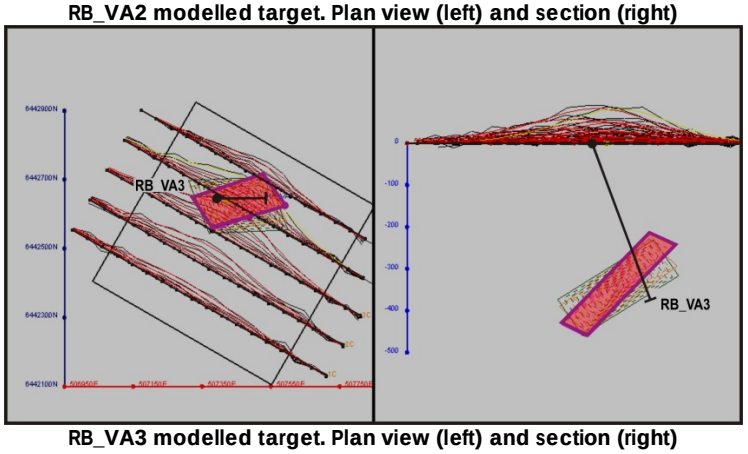
Anomaly RB_VA2 FLTEM Ch30



RB_VA2 modelled target. Plan view (left) and section (right)



Anomaly RB_VA3 FLTEM Ch30



RB_VA3 modelled target. Plan view (left) and section (right)

Figure 7: Anomalies RB_VA1-3 modelled conductors and proposed drill holes to test each target

ENEABBA HEAVY MINERAL SANDS

Sheffield's Eneabba HMS Project contains six advanced exploration prospects: West Mine North, Ellengail, Yandanooka, Durack, Drummond Crossing and Irwin (Figure 8). Sheffield's strategy is to develop multiple HMS deposits capable of supporting a sequential mining operation.

During the quarter, work was undertaken on the Irwin and Drummond Crossing prospects.

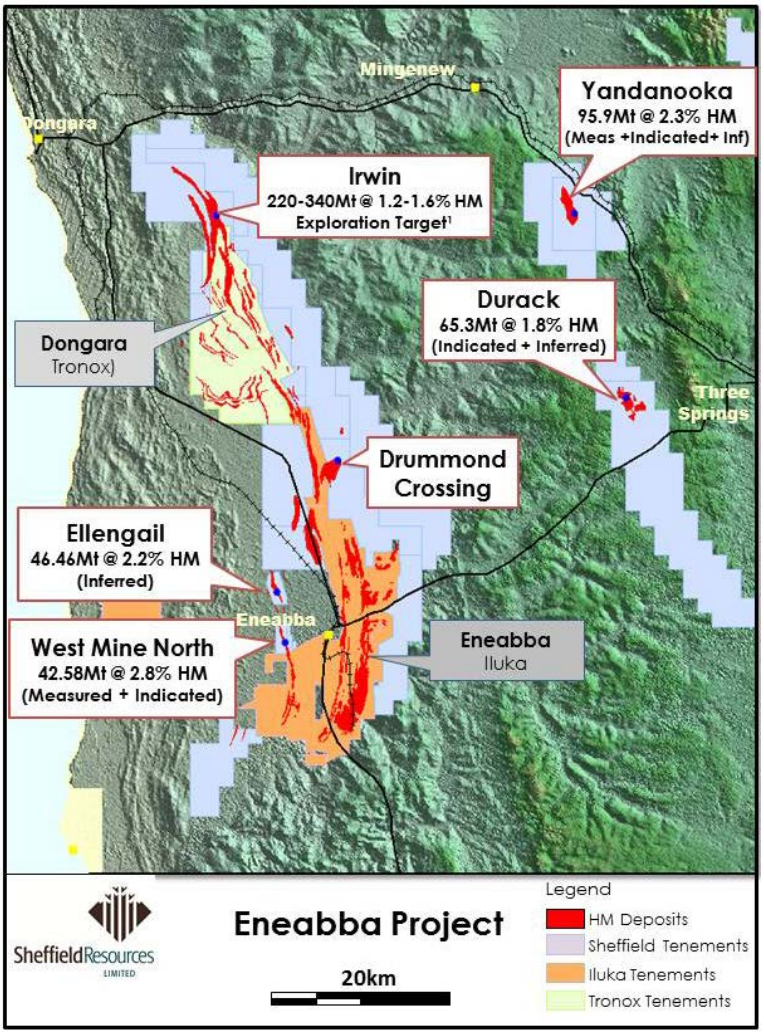


Figure 8: Location of Sheffield's HMS deposits in the Eneabba region

Irwin

Sheffield has previously outlined an Exploration Target[1] of 220Mt-340Mt @ 1.2%–1.6% HM at Irwin. The mineralisation has a very low slimes component (average 5.8% <53µm), and low oversize (average 3.6% >1mm) and is being evaluated as a potential dredging target.

Results were received from 19 QEMSCAN mineral assemblage determinations on samples from drilling undertaken during Q2 2012.

The latest mineral assemblage results include 3 composite samples from within the Exploration Target which averaged 9.3% zircon 7.1% rutile, 1.5% leucoxene and 63.6% ilmenite (total 81.5% VHM). These results are comparable with the previously reported mineral assemblage (based on 4 composite samples) of 10.0% zircon, 7.4% rutile, 2.3% leucoxene and 58.7% ilmenite (total 78.4% VHM).

Whilst drilling has shown that mineralisation extends to the north of the Exploration Target area, the mineral assemblage in this region includes a high garnet content (average 25.1% garnet from 16 composite samples). Accordingly, future investigations will focus on the Exploration Target area.

[1]Sheffield Resources has not yet reported Mineral Resources for Irwin and any discussion in relation to targets and Mineral Resources is conceptual in nature. There has been insufficient exploration to define a Mineral Resource and it is uncertain if further exploration will result in the determination of a Mineral Resource.

Drummond Crossing

The maiden resource estimate for the Drummond Crossing deposit is nearing completion. During the quarter, field reconnaissance work was conducted on dunal HMS targets along the Gingin Scarp and hinterland to the north of Drummond Crossing. The results are currently being interpreted and will be reported during Q2 2013.

MCCALLS HEAVY MINERAL SANDS

The McCalls project, located 110km north of Perth, has an Inferred Resource of **4.4Bt @ 1.2% HM** containing **53Mt of HM**. Of this, 43 million tonnes is chloride grade ilmenite ranking it as one of the largest accumulations of this type of ilmenite in the world. The deposit also contains approximately 3.5 million tonnes of zircon and 1 million tonnes of rutile.

Assay results from 71 aircore drill holes completed during Q2 2012 remain outstanding and are expected to be received during Q2 2013.

Planned work for the next quarter includes preparation of a heavy mineral concentrate and evaluation of an ilmenite product sample.

OXLEY POTASH

Subsequent to the end of the quarter, the Company commenced drilling a large new potash target at its Oxley Project near Three Springs in Western Australia's Mid-west region (Figure 9).

The Oxley potash target is an unconventional, hard rock style of mineralisation, hosted by a unique series of ultrapotassic microsyenite lava flows which contain over 90% sanidine (potash) feldspar. Sheffield has pegged the entire 32km strike extent of this prospective horizon within the northern portion of the Moora Basin (Figure 10). Regional mapping indicates that the highly potassic target sequence has a strike length of 32km and may be between 10m and 40m thick.

An initial rock chip sampling program returned consistently high potassium oxide grades over an 8km strike extent of the target horizon (Figure 11). A total of 59 samples of fresh to slightly weathered microsyenite averaged 10.6% K_2O, equivalent to 16.7% KCl[1] (refer to ASX announcement dated 24 April 2013 for full details). The horizon also contains significant amounts of titanium, iron and aluminium (Table 3).

Table 3: Average assay results from 59 rock chip samples of microsyenite horizon

Sample Type	K_2O %	TiO_2 %	Fe_2O_3 %	Al_2O_3 %	LOI %
Fresh to slightly weathered microsyenite	**10.6**	2.0	12.8	15.6	2.0

Two drill rigs will undertake an initial test of an 8km segment of the target horizon. The aim of the 2,500m program is to determine the thickness, continuity and grade of the potassium rich horizon and to obtain samples for metallurgical testwork. Assay results are expected in Q3 2013.

Sheffield was successful in obtaining State Government EIS co-funding of up to $150,000 for the direct drilling cost component of the program.

Sheffield intends to evaluate the Oxley Project for its potential to produce muriate of potash (MOP, KCl) or sulphate of potash (SOP, K_2SO_4) products for use in the fertilizer market. Due to the unique composition of the microsyenite host rock, new metallurgical processes may need to be developed to produce these target commodities and possible byproducts of iron, aluminium and titanium.

The Oxley project has many similarities to Verde Potash's (TSX: NPK) Cerrado Verde hard rock potash project located in Brazil, which has a current NI43-101 mineral resource estimate comprising 71Mt @ 9.22% K_2O (Indicated) and 2,763Mt @ 8.91% K_2O (Inferred). The potash mineralisation at Cerrado Verde is associated with metamorphosed sedimentary rocks composed of quartz, chlorite, muscovite, and microcline feldspar.

[1] K_2O is commonly expressed as KCl according to the formula (KCl = K_2O/0.6317).

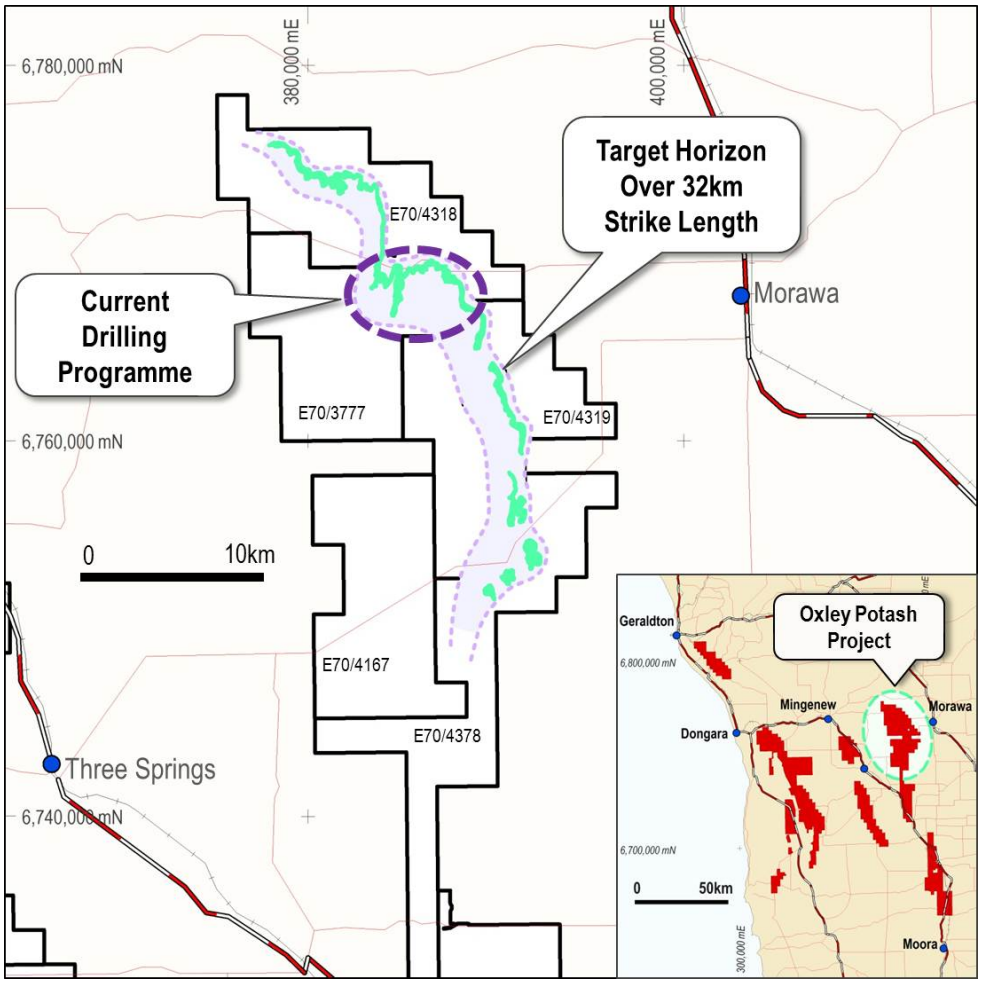


Figure 9: Oxley potash project location plan.

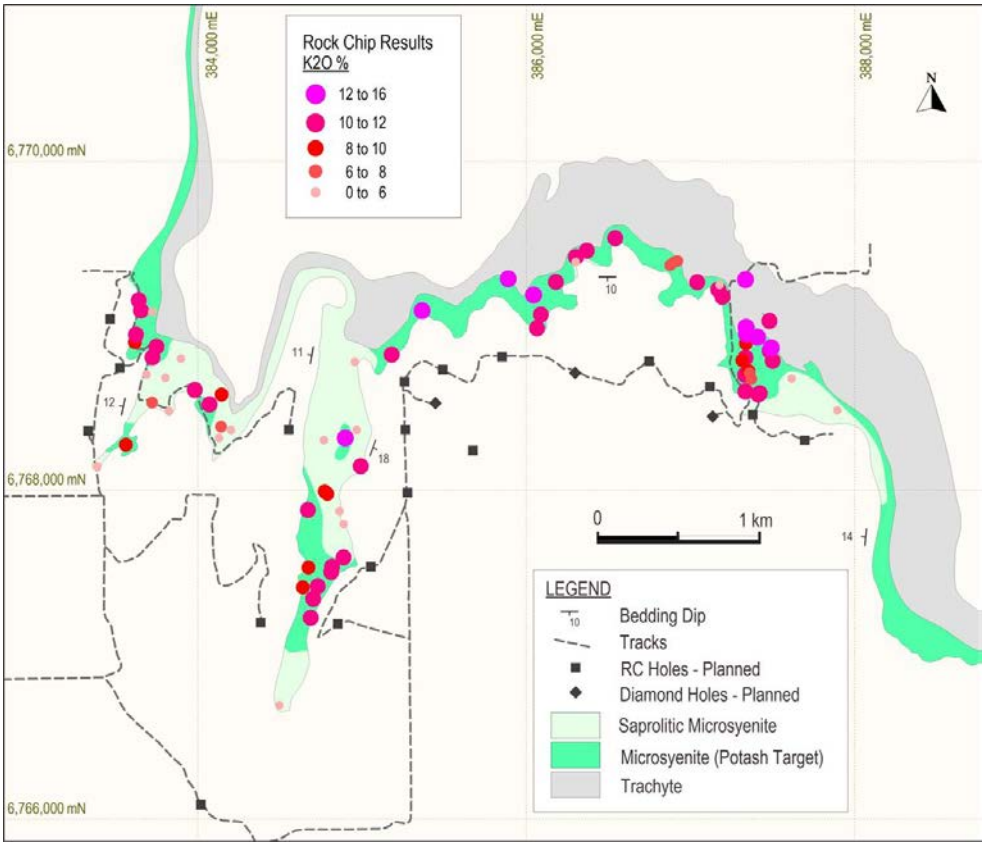


Figure 10: Oxley potash project rock chip sample results and planned drill hole location plan

PILBARA IRON

Subsequent to the end of the quarter, Sheffield announced the sale of its South Pilbara Iron tenements (E47/2280, E47/2291 and exploration licence application E47/2594) to Brockman Mining Limited (ASX:BCK, SEHK:159).

The material terms of the agreement are as follows:

- An upfront cash payment of $1 million,
- A supplementary payment of $0.10/tonne for all JORC compliant Mineral Resources (Measured, Indicated and Inferred categories) defined on any or all of the tenements, using a lower cut-off grade of 54% Fe, and
- A royalty of 1% FOB of all iron ore produced from the tenements. In addition, a price participation royalty of 5% would be applicable for all revenues received over $120/tonne FOB (CPI indexed) for iron ore sales from the tenements (i.e. an additional 4% on the amount by which the indexed FOB price exceeds $120/tonne).

Brockman are to use best endeavours to complete a resource drill programme and a resource estimate within 12 months.

The sale tenements are adjacent to Brockman Mining's Opthalmia Project which has combined Mineral Resources of 290Mt @ 59.1% Fe (BCK ASX release 19 April 2013).

Sheffield has previously outlined an Exploration Target[1] of 20-60Mt @ 56-60% Fe (see ASX release 1 December 2011) on the sale tenements and identified further iron mineralisation as outlined in the ASX release dated 28 January 2013.

Sheffield retains four granted exploration licences situated in the North Pilbara region (Figure 11). The tenements are all located near existing iron ore mine sites or major development projects and within potential trucking distance of Port Hedland. The Company will continue to unlock value on its remaining Pilbara iron tenements through consolidation and/or further exploration.

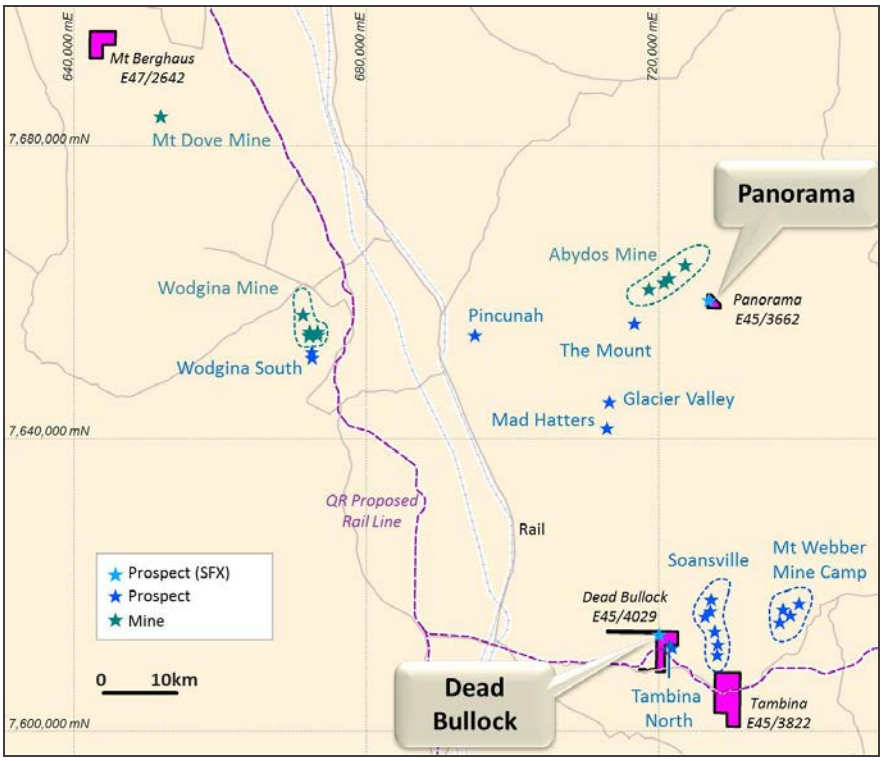


Figure 11: Location of Sheffield's remaining iron tenements in the North Pilbara

[1]Sheffield Resources has not yet reported Mineral Resources for Three Pools and any discussion in relation to targets and Mineral Resources is conceptual in nature. There has been insufficient exploration to define a Mineral Resource and it is uncertain if further exploration will result in the determination of a Mineral Resource.

MOORA TALC

During the Quarter, Sheffield reduced its tenure position over the Moora Talc Belt from 1,152km^2 to 553km^2, as part of the Company's strategy of focusing its exploration on "clusters" of known talc deposits.

CASH POSITION

As at 31 March 2013, the Company had cash reserves of approximately $6.2 million.

The Company received a refund from its 2012 tax return of $683,000 relating to research and development activities.

During the quarter, $665,000 was raised from the exercise of options.

The above cash amounts are exclusive of $1 million to be received from the sale of the South Pilbara Iron Project and approximately $3.2 million from the exercise of in-the-money options which expire on 30 June 2013.

Bruce McQuitty
Managing Director
30 April 2013

COMPETENT PERSONS' STATEMENT – EXPLORATION RESULTS

The information in this announcement that relates to exploration results is based on information compiled by David Boyd. Mr Boyd is a full time employee of the Company. Mr Boyd is a Member of the Australasian Institute of Geoscientists and has sufficient experience which is relevant to the style of mineralisation and type of deposit under consideration and the activity to which they are undertaking to qualify as Competent Person as defined in the 2004 Edition of the 'Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves ("JORC Code")'. Mr Boyd consents to the inclusion in the report of the matters based on their information in the form and context in which it appears.

COMPETENT PERSONS' STATEMENT – RESOURCE ESTIMATES

The information in this announcement that relates to resource estimation is based on information compiled by Mr Trent Strickland. Mr Strickland is a full time employee of Quantitative Group (QG) and a Member of the Australasian Institute of Mining and Metallurgy (AusIMM). Mr Strickland has sufficient experience in the minerals industry to satisfy the requirements to act as the competent person for this estimate as defined in the 2004 Edition of the Australasian Code for Reporting of Mineral Resources and Ore Reserves. Mr Strickland consents to the inclusion in this report of the Durack Mineral Sands resource estimate.

The information in this web page that relates to reporting of resource and exploration results is based on information compiled under the guidance of Mark Teakle. Mr Teakle is an employee of the Company. Mr Teakle is a Member of the Australasian Institute of Geoscientists and the Australasian Institute of Mining and Metallurgy and has sufficient experience which is relevant to the style of mineralisation and type of deposit under consideration and the activity to which they are undertaking to qualify as Competent Person as defined in the 2004 Edition of the 'Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves ("JORC Code")'. Mr Teakle consents to the inclusion in the report of the matters based on their information in the form and context in which it appears.

FORWARD LOOKING AND EXPLORATION TARGET STATEMENTS

Some statements in this report regarding estimates or future events are forward-looking statements. They involve risk and uncertainties that could cause actual results to differ from estimated results. Forward-looking statements include, but are not limited to, statements concerning the Company's exploration programme, outlook, target sizes and mineralised material estimates. They include statements preceded by words such as "seek", "expected", "target", "scheduled", "intends", "potential", "prospective" and similar expressions.

The terms "Target" and "Exploration Target", where used in this report, should not be misunderstood or misconstrued as an estimate of Mineral Resources and Reserves as defined by the JORC Code (2004), and therefore the terms have not been used in this context. Exploration Targets are conceptual in nature and it is uncertain if further exploration or feasibility study will result in the determination of a Mineral Resource or Reserve.

APPENDIX 1: MINERAL RESOURCES

Table 1: Sheffield's contained Valuable HM (VHM) Resource inventory[1] at 30 January 2013

Deposit	Resource Category	Zircon (kt)*	Rutile (kt)*	Leuc. (kt)*	Ilmenite (kt)*	**Total VHM (kt)***
Thunderbird	Indicated	1,483	344	924	6,256	**9,007**
Thunderbird	Inferred	4,270	990	2,661	18,007	**25,927**
Yandanooka	Measured	13	2	3	87	**105**
Yandanooka	Indicated	240	81	83	1,439	**1,843**
Yandanooka	Inferred	4	1.3	2	23	**29**
Durack	Indicated	144	29	52	703	**928**
Durack	Inferred	26	4.6	13	121	**164**
Ellengail	Inferred	92	90	20	658	**860**
West Mine North	Measured	18	33	42	200	**293**
West Mine North	Indicated	71	87	46	506	**709**
McCalls	Inferred	3,491	1,063	2,576	42,911	**50,041**
Total	Measured	31	35	45	287	**398**
Total	Indicated	1,938	540	1,104	8,904	**12,487**
Total	Inferred	7,882	2,149	5,271	61,718	**77,021**
Total	**All**	**9,851**	**2,725**	**6,421**	**70,910**	**89,906**

* Tonnes have been rounded to reflect the relative uncertainty of the estimates. [1] The contained HM tonnages shown in the Table above are sourced from Table 2, below.

Table 2: Sheffield's HMS Mineral Resource[2] Inventory at 30 January 2013

Project	Deposit	Resource Category	Cut-off (% HM)[4]	Material (Mt)*	Bulk Density	HM %	Slimes %[4]	Osize %	Insitu HM (Mt)*	Mineral Assemblage[3] Zircon %	Rutile %	Leuc. %	Ilm. %
Dampier	Thunderbird	Indicated	2.0	299	2.1	7.2	19	14	21.5	6.9	1.6	4.3	29
	Thunderbird	Inferred	2.0	1,075	2.1	5.8	17	16	61.9	6.9	1.6	4.3	29
	Total Dampier	**All**	**2.0**	**1,374**	**2.1**	**6.1**	**17**	**15**	83.4	**6.9**	**1.6**	**4.3**	**29**
Eneabba	Yandanooka	Measured	0.9	2.9	2.0	4.1	15	14	0.12	10.6	1.9	2.2	72
	Yandanooka	Indicated	0.9	90.1	2.0	2.3	16	15	2.09	11.5	3.9	3.9	69
	Yandanooka	Inferred	0.9	2.8	2.0	1.2	18	21	0.03	11.2	3.9	4.6	68
	Yandanooka	All	0.9	95.9	2.0	2.3	16	15	2.24	11.4	3.8	3.9	69
	Durack	Indicated	0.9	50.3	2.0	2.0	15	21	1.02	14	2.8	5.1	69
	Durack	Inferred	0.9	15.0	1.9	1.2	14	17	0.18	14	2.5	7.2	66
	Durack	All	0.9	65.3	2.0	1.8	15	20	1.20	14	2.8	5.6	68
	Ellengail	Inferred	0.9	46.45	2.0	2.2	15.6	2.1	1.04	8.9	8.7	1.9	63.5
	Ellengail	All	0.9	46.45	2.0	2.2	15.6	2.1	1.04	8.9	8.7	1.9	63.5
	West Mine North	Measured	0.9	6.47	2.0	5.6	14.8	1.2	0.36	4.9	9.1	11.6	54.9
	West Mine North	Indicated	0.9	36.11	1.9	2.3	13.1	2.8	0.84	8.4	10.3	5.4	60.0
	West Mine North	All	0.9	42.58	1.9	2.8	13.4	2.5	1.21	7.9	10.1	6.4	59.2
	Total Eneabba	Measured	0.9	9.4	2.0	5.2	15	5	0.48	6.7	6.8	8.7	60
	Total Eneabba	Indicated	0.9	176.6	2.0	2.2	15	14	3.96	11.6	4.9	4.6	67
	Total Eneabba	Inferred	0.9	64.2	2.0	1.9	15	6	1.25	10.2	7.1	3.3	64
	Total Eneabba	**All**	**0.9**	**250**	**2.0**	**2.3**	**15**	**12**	**5.69**	**11.1**	**5.5**	**4.4**	**66**
McCalls	McCalls	Inferred	0.9	4,431	2.3	1.2	26.5	1.4	53	6.6	2.0	4.9	80.8
	Total McCalls	**All**	**0.9**	**4,431**	**2.3**	**1.2**	**26.5**	**1.4**	**53**	**6.6**	**2.0**	**4.9**	**80.8**