TNT MINES LIMITED

ABN 67 107 244 039

EL17/2011

EAST RINGAROOMA BAY

FINAL REPORT
04/01/2013 to 23/04/2013

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ABSTRACT

TNT Mines acquired six exploration licences in Ringarooma Bay in north-east Tasmania to explore for offshore placer tin; T11MEL, T12MEL, T13MEL, EL4/2011, EL17/2011 and EL46/2011. Historical drilling and offshore geophysical work has indicated the presence of significant amounts of alluvial tin both on and at shallow depths beneath the sea floor.

A desktop scoping study showed that a cutter suction tin dredging operation on the current JORC Indicated Resource of 16Mm^3 at 0.227 kgm^3 tin would be marginal at a tin price of $20,000 per tonne. TNT Mines exploration proposals were to carry out a geophysical test work program comprised of sidescan sonar, pinger and boomer acoustic sub-bottom profiling, detailed bathymetry and marine gradiometer surveys to define higher grade strand lines or palaeochannels to be followed up by vibracore drill sampling. No field work was carried out on the tenement. An environmental plan for exploration was prepared by SEMF Pty Ltd and an EPBC referral was submitted.

TNT Mines has decided to surrender all six project licences. Although the licences in State waters were granted in early January 2012, the Commonwealth licences were not granted until late April and May in 2012 and the first geophysical field season (January-April) was lost. Funding difficulties associated with the general downturn in investment in exploration in Australia over the past 12 months has left the company in a position where it cannot effectively fund the project at the level required to achieve acceptable technical success.

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1.0 INTRODUCTION

The ancestral Ringarooma River has deposited alluvial tin and other heavy minerals into what is now Ringarooma Bay. Previous exploration work, predominantly in the late 1960s through to the 1980s has demonstrated the presence of potentially economic tin mineralisation within the palaeochannels and terraces associated with the submerged river. A previous explorer estimated a JORC Indicated Resource of 16Mm^3 at 227g/m^3 of tin and a larger Inferred Resource of 194Mm^3 at 150-250g/m^3. The resource lies within water depths in the bay of 5-25m and further into Bass Strait the tenements cover water depths of up to 40m.

Modern exploration drilling techniques can comfortably drill in these water depths using vibracoring techniques to obtain samples of the unconsolidated tin bearing sediments to allow TNT Mines to confirm the JORC resource and rapidly evaluate the potential for additional higher grade 'tin leads' in the offshore sediments. There is also prospectivity for zircons, sapphires, and other heavy minerals.

The alluvial mineralisation would be amenable to a cutter suction dredging operation using "off the shelf" equipment similar to that used in south-east Asian tin dredging operations

1.1 Location and tenure

Ringarooma Bay is located in the north eastern tip of Tasmania (Figure 1). It forms a broad semi-circular bay which faces broadly north towards Bass Strait. It is flanked to the east by Cape Portland and to the west by Waterhouse Point and Waterhouse Island. The bay is fringed predominantly by white sandy beaches, with several small intervening headlands, such as at Tomahawk on the western side of the bay.

Much of the land area surrounding the bay is managed by agricultural practices, with most coastal plains having been heavily modified by agriculture (grazing and dairy). The landforms consist of sandy floodplains, sand dunes, lagoons and wetlands. The latter occur along a line parallel to the shore. Several reserves and Ramsar wetlands occur near Ringarooma Bay.

Published bathymetric contours of Ringarooma Bay show that the bay consists of roughly even contours to depths of around 30 metres below mean sea level. Linear depressions occur which represent palaeochannels from the Ringarooma River.

The area around Ringarooma Bay is home to a small population occupied predominantly with farming-related activities (sheep, cattle, dairy, grain, etc). Tourism is also a significant seasonal input to the region, with between half to two thirds of the private dwellings not being permanently occupied, and having the potential to accommodate holidaying visitors.

EL17/2011 was granted on 04/01/2012 for Mineral Categories 1 and 5 and covers an area of 69 km^2. The tenement is one of six tenements that make up the Ringarooma Bay Project.

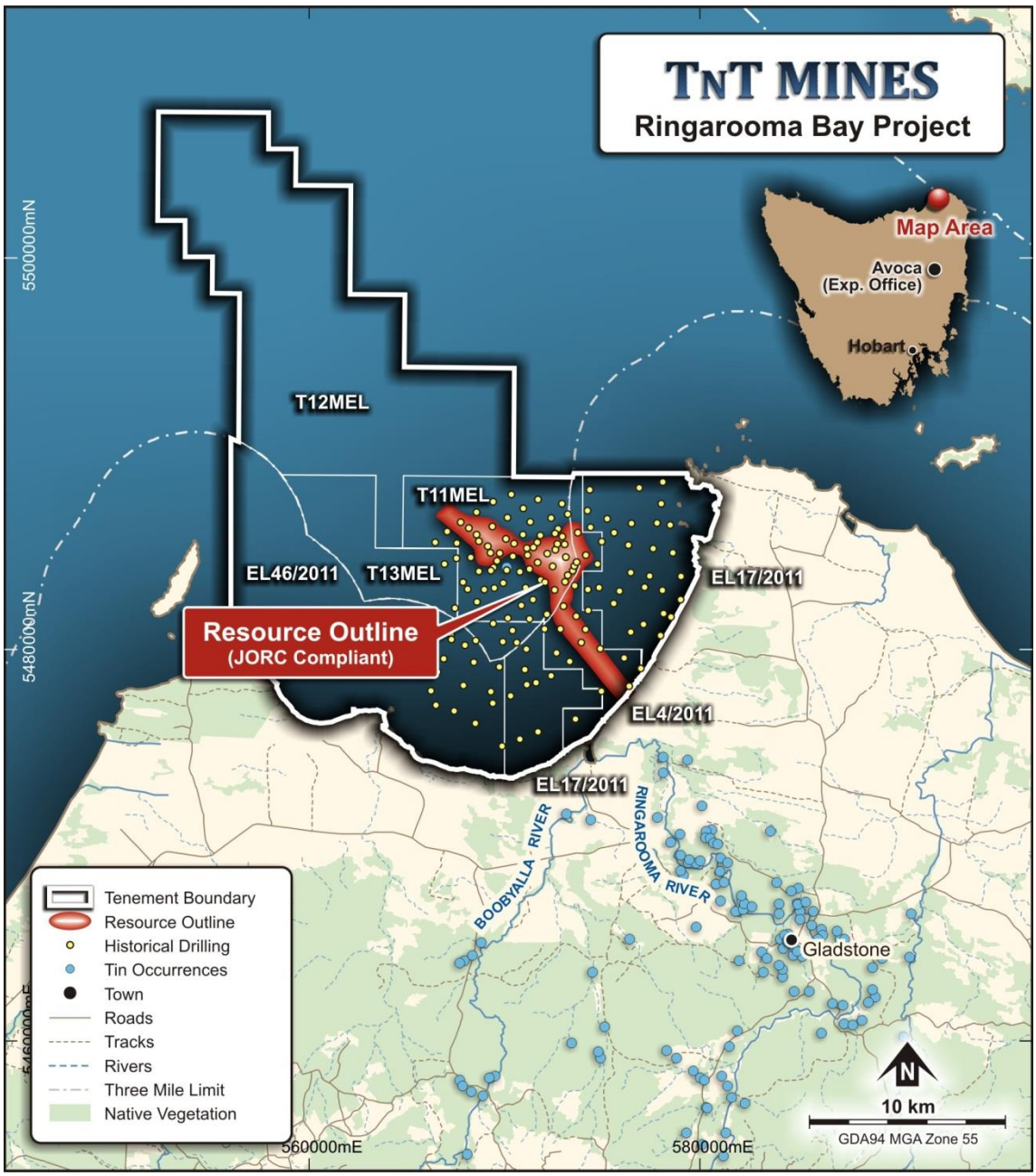

Figure 1: Location plan of Ringarooma Project tenements

1.2 Exploration Philosophy

There has been a significant body of work done over several decades on potential mineral deposits within Ringarooma Bay. Tin resources are known for the bay. Furthermore, the bay also hosts other minerals of commercial value. One of the main reasons the resources have not already been mined, or have not been defined in more detail, is because of high upfront costs of carrying out the work in a marine environment.

Exploration drilling activities were carried out predominantly between 1966 and 1968 and this sampling formed the basis for the estimation of a JORC Inferred Resource in 2000. The resource is estimated to comprise approximately 194Mm^3 with a concentration of 150-250g/m^3 of tin (with approximately 29,100 – 48,500t of contained). The Indicated Resource is in the order of 16Mm^3 at 227g/m^3 of tin. The resource area (see Figure 1) also contains

zircon, ilmenite, rutile, and other potential commodity minerals. The extent and locations of past exploration drilling is also shown in Figure 1.

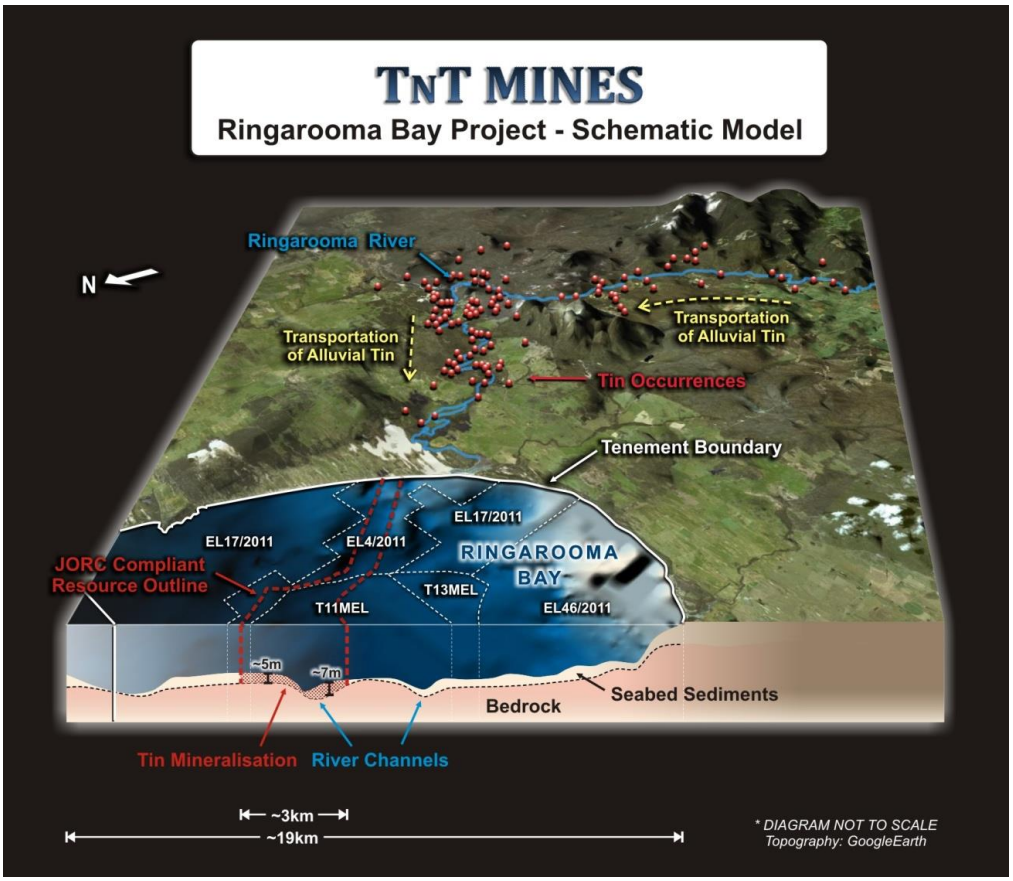

Figure 2: Schematic model – Ringarooma Bay

Although past exploration results were encouraging, additional information was required on the resource in order to develop the project. In particular, it was necessary to better evaluate the resource from an economic, metallurgical, and mining feasibility perspective. To this end, TNT Mines proposed to carry out geophysical and sediment sampling surveys for the purpose of better defining the extent and characteristics of alluvial tin and heavy minerals resources within Ringarooma Bay.

Advances in both geophysical and soft sediment sampling techniques have been substantial since the early exploration of Ringarooma Bay 40 years ago. In particular, the availability of low energy sub-bottom acoustic profiling techniques such as pinger and boomer, side-scan sonar, marine magnetometry and differential GPS accuracy make it possible to construct accurate profiles of the soft sediment stratigraphy and maps of seafloor bathymetry that are vastly more detailed and accurate. The delineation of high grade strand lines and palaeochannel deposits was considered crucial to the success of TNT Mines venture.

The physical hosting environment and known mode of occurrence of mineralisation is summarised below, extracted from TNT Mines' environmental plan for exploration.

> **Seabed Composition (from Keserue-Ponte, 2012)**
> *The near-shore bathymetry of Ringarooma Bay has been mapped as part of the Seamap Tasmania – Mapping the Gaps Project (Lucieer et al. 2009). The project included mapping the seabed composition, within 1.5km of the shore, including distribution of cobble, reef, sand and seagrass. The report (Lucieer et al. 2009) notes*

that their acoustic mapping method made it difficult to distinguish between cobble and seagrass, particularly due to the intermixed nature of these habitats at the 1:25,000 mapping scale used, as such, it was 'impossible' to cartographically represent these habitats using linear boundaries.

The following can be noted:

- *reef and cobble dominate the 1.5km zone at either end of Ringarooma Bay, i.e. from Foster Islands and Cape Portland to Baynes Island, at the eastern end, and the area west, northwest, and northeast of Waterhouse Island, at the western end, with sand occurring only in restricted patches;*
- *a small reef area occurs around Petal Point;*
- *the eastern half of the Bay between Petal Point and Boobyalla Inlet is dominated almost exclusively by sand in the 1.5km zone from the coast; this also included the Ringarooma River lower floodplain with the RAMSAR site;*
- *from Boobyalla Inlet, west to Waterhouse Point, the seafloor is dominated by sand and seagrass, with some cobble areas and a range of small isolated reefs, including west of Murdoch's Beach (west of the Boobyalla Inlet), and at Tomahawk Point.*

The sand has been characterised as 'fine sand' (Lucieer et al. 2009). The reefs in the area were reported as predominantly 'low profile'.

Mineral Deposits (from Keserue-Ponte, 2012)

The following offshore minerals deposits summary is based on Mason (2000).

TIN

- *the tin wash commonly lies directly on the seabed or with less than 2 m of cover;*
- *MHA has defined an area of 4 sq. km containing shallow alluvials with high concentrations of tin up to a maximum of 694 g/t of tin, using 100 g/t cut off – this area is interpreted to correspond to reworked placers which have formed a thin and wide blanket perpendicular to the palaeochannel and parallel to the shore, likely along an old strand line;*
- *Less frequently, tin wash occurs under up to 10m of cover; this is more common deeper in the bay;*
- *The best grades are in medium to coarse sands to fine gravels, often with well-rounded granules or pebbles to 75mm diameter. Many of the richest intersections are underlain by a sticky silt/clay bottom. This may correspond to the onshore "Marine Bottom" or may be a false bottom.*
- *In comparison with most alluvials where the grade decreases away from sources the tenor of the offshore tin wash, of 150 to 250 g/cu.m, is not significantly different from the onshore sheet wash.*

SAPPHIRE

Sapphire concentrations in the offshore environment are uncertain, but it is considered that the main channel could contain high quality stones as they are potentially extensions of the known concentrations in the onshore areas.

HEAVY MINERALS

- *Ilmenite and rutile: recent offshore exploration by Mineral Holdings Australia (MHA) has defined a zone of higher concentrations of heavy mineral sands associated with the "Near Shore Sediment" build-up. This represents a palaeo shore line, 500m to 2km from the present shore.*
- *Zircon concentrations are more wide spread than ilmenite, and are associated with both the tin and the other heavy mineral sand concentrations.*

Duncan et al (2002) associated the tin placers in Ringarooma Bay with the palaeochannel of the Ringarooma River and considered the plateau structure in Ringarooma Bay, which hosts most of the indicated resource, to be an ancient strand line formed at a time of stable sea level by reworking of the palaeochannel deposits, which have formed an east-west trending resource.

2.0 REVIEW OF PREVIOUS WORK

2.1 Prior to TNT Mines tenure

Tin-rich minerals have also been transported by river over millions of years from the tin-bearing rocks surrounding Ringarooma Bay and upstream of the Ringarooma River. Tin-rich alluvial sediments transported by the Ringarooma River settled within the Pleistocene course of the river which is now partly submerged beneath Ringarooma Bay. Tin-bearing minerals also occur along buried or submerged strandlines within the bay, parallel to the current coastline.

A number of exploration companies have carried out mineral exploration activities in Ringarooma Bay since 1966. A summary of this work is provided below, extracted from Bucci et al (2012).

- Between 1966-1968, Tasmanian Offshore Exploration Company (TOEC) conducted a regional bathymetric, seismic and sampling programme, followed by a 138-hole drilling programme in the areas of interest. Of these holes, TOEC considered that 27 holes yielded encouraging mineralised intervals. Sixteen of the holes had "*grades over their total depths*" above a cut-off grade of 75 g/m^3 Sn. The grades of the 192 analysed samples ranged from 37 to 815 g/m^3 Sn (Featherstone 2011 and references therein);
- In 1968, Utah Development Corporation together with BHP drilled 15 holes to 18 m water depth up to 4.3 km offshore. The best intervals included 2 holes that were drilled within 600m of shores and contained averaged grades of 50 to 85 g/m^3 Sn (Featherstone 2011 and references therein);
- In 1981-1982, Hellyer Mining and Exploration Pty Ltd (Hellyer) completed a programme of bathymetric, seismic and magnetic surveys and a review of works completed by TOEC;
- In 1983, Conzinc Riotinto of Australia Exploration Pty Ltd (CRAE) undertook a review of the works completed by the previous owners and concluded that the quantum of mineralisation in the area ranged 14-21 MCM @ 175 – 200 g/m^3 (Mason 2000 and references therein);
- In 1995, Mineral Holdings Australia Pty Ltd completed a "pre-feasibility review" of the historic works (Macarthur 1995). In 2000, the review was updated by Mason (2000). Based on the historic drilling data by TOEC, and geophysical surveys undertaken by Hellyer, Mason (2000) re-estimated the quantum of mineralisation in the Project area and concluded that the major palaeo-channel and four other prospects together host up to 199 MCM @150-250g/m^3 Sn of "*inferred materials*", which included 16 MCM @ 227g/m^3 Sn of "*indicated Resource*". In addition to the potential tin mineralisation, Mineral Holdings considered the Project area might have potential of containing gemstone quality sapphire, and economic concentrations of rutile, zircon and ilmenite. Mason (2000) concluded that the area is prospective for a large scale dredging operation.

2.2 During TNT Mines tenure

2.2.1 Environmental

2.2.1.1 Environmental plan for exploration

A comprehensive environmental plan for exploration was prepared by SEMF Pty Ltd (SEMF) with input from TNT Mines. The plan was submitted with the final report for licence T11MEL.

2.2.1.2 EPBC referral

SEMF advised TNT Mines that it would be prudent to lodge an EPBC referral (under the *Environment Protection and Biodiversity Protection Act* 1999 (EPBC Act)) with the Commonwealth for proposed exploration work in Ringarooma Bay. The referral was recommended on the basis of potential impacts on Matters of National Environmental Significance (MNES).

SEMF lodged an EPBC referral with the Commonwealth on the 14th August outlining the proposed work programs.

On the 10th September, the Commonwealth implemented a "stop the clock" on the referral process and requested the following additional information:

- *An assessment of the potential impacts of the action to any Indigenous heritage values of the Commonwealth marine environment, as defined under Section 528 of the EPBC Act; and*
- *Any proposed mitigation measures to manage identified impacts to the indigenous heritage values of the Commonwealth marine environment.*

Subsequently, TNT Mines began a process of consultation with the Tasmanian Aboriginal Sea and Land Council. Following provision of relevant information to Colin Hughes from TASLC all subsequent attempts to communicate with him have been unsuccessful. TNT Mines understands that there may be a boycott on heritage clearance work imposed by the Tasmanian Aboriginal community and that the Ringarooma Bay process may be subject to this.

The Commonwealth had indicated that there were no other issues with the EPBC Referral.

2.2.2 High level scoping

A basic desktop study with indicative CAPEX and OPEX for Ringarooma Bay was prepared by Roger Bastone of Vanston Pty Ltd in August. Roger has extensive experience in alluvial tin operations in south-east Asia including working for PT Koba Tin in Indonesia. The report was included in the 2013 annual report (Fulton, 2013). The study suggested that a cutter suction dredging operation would be the best option but would be marginal at the current resource grades.

2.2.3 Acoustic test work

TNT Mines selected Marine GeoSolutions to carry out the bathymetric and geophysical survey work in Ringarooma Bay. The survey was planned to be run off the Dell Richey II, a fishing vessel out of Devonport owned by Richey Fishing Company. Because the vessel is not set up for surveying it was deemed necessary for some test work to be carried out to determine if there would be any acoustic interference that might compromise the survey work and that the vessel and crew were suitable. Dr Peter Ramsay from Marine GeoSolutions travelled to Tasmania from Perth in the first week of December 2011 and conducted a successful assessment. The summary report was submitted with the final report for tenement T11MEL.

3.0 WORK COMPLETED DURING THE REPORTING PERIOD

No further work was undertaken in the final reporting period.

4.0 DISCUSSION OF RESULTS

There are no results to discuss for the final reporting period.

5.0 CONCLUSIONS AND FUTURE WORK

TNT Mines has decided to surrender all six Ringarooma Bay licences and there are several reasons for this decision. The State licences were granted in early January 2012 but the Commonwealth licences were not granted until late April and May 2012. Geophysical exploration is only really possible in the period January- April, so a complete field season was lost due the lengthy period taken by the Commonwealth to grant exploration licences. TNT Mines was reasonably well funded in early 2012 and had the means to carry out at least some of the proposed work. By early 2013 however, TNT Mines was experiencing difficult financial circumstances and that, combined with delays in the EPBC referral process which may relate to political circumstances beyond the companies control, led TNT Mines to a position where it needed to rationalise its tenement position. Although still keen on the concept of exploration in Ringarooma Bay the company has regretfully decided to relinquish the project.

In regard to the potential for exploiting a mineral deposit in the bay, TNT Mines believes that the exploration model is sound. Dredging operations in south-east Asia are low margin operations and the grade of Indonesian alluvial production is predicted to fall from 350g/m^3 to 200g/m^3 within a decade or sooner. This near halving of grade is predicted to nearly double the mining costs. Rising fuel prices are a major issue as fuel costs account for up to 50% of the cost of alluvial production, compared to 10% for hard rock mining. Given that 200g/m^3 is the average grade of the current Inferred resource in Ringarooma Bay and that production rates are likely to be lower and have higher costs compared to an Indonesian operation, the target grade probably needs to be around 400g/m^3. The best way to achieve this would be through the detailed geophysical surveys and targeted drilling proposed, to define high grade strandlines and gutters.

6.0 ENVIRONMENT

No field work was carried out in the reporting period.

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