



EXPLORATION LICENCE  
EL66/2007  
GLADSTONE, NORTH EAST TASMANIA

FINAL REPORT  
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## **1 EXECUTIVE SUMMARY**

This report is being submitted as a Final Report for EL66/2007 prior to the completion of the second year of tenure.

EL66/07 forms part of Macquarie Harbour Mining Limited's (MHML) North East Tasmanian Project. Adjoining tenements EL2/2007 and EL3/2007 comprise the company's remaining licences in the Gladstone area.

Over the past 12 months, the focus of MHML's exploration in NE Tasmania has been examining the potential for near-surface economic gold resources within its tenements in this region. During the last reporting period, work by MHML involved review of previous exploration and a field inspection of the former mining localities by technical staff new to MHML.

A review of work undertaken by MHML (and the work of previous explorers) has determined that the main potential for economic gold mineralisation in this area lies within possible vertical extensions of the small vein-related deposits previously mined near-surface. It is considered that the type of gold deposit presented by this locality is not compatible with the shallow bulk-mineable targets being sought by MHML, and that therefore the tenement be surrendered.

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## 2 INTRODUCTION

This is the final report on EL66/2007 which is held in the name of Goldstock Mining Pty Ltd, a wholly owned subsidiary of Macquarie Harbour Mining ("MHM"). The tenement (see Fig.1) covers an area of 11 sq km and is bounded to the east and south by MHM's EL2/2007 and EL3/2007. There is also a common boundary with ML15M/2004 held by Van Dieman Mines Pty Ltd. (now in liquidation) which excises part of the tenement on its northern limb. Gladstone lies in the southern part of the licence.

Much of the land tenure is designated as "Regional Reserve" or "Proposed Regional Reserve", regarded as 'Special Management Areas" and requiring specific environmental conditions to be met in the course of exploration. The field work carried out by MHM was of minimal impact with no vehicles taken off existing roads or tracks and traverses on foot not requiring any clearing to be undertaken. Access into the licence is facilitated by the main roads which lead into Gladstone from Bridport, South Mt Cameron, Musselroe, and Cape Portland.

Surface geology (see Fig.2) comprises Quaternary stream, marsh and marine terrace deposits as well as Tertiary gravel, sand, silt and clay deposits in the north; Mathinna Beds in the central portion and mainly granite in the south of EL66/2007.

The Mathinna Group in the Gladstone area have been intruded by granitoids in three main phases. The oldest granitoid is a hornblende-biotite granodiorite forming the northern part of the Gardens pluton. This has been intruded by adamellite of the Poimena pluton, which in turn has been intruded immediately to the east and south of the town by granitoid described as granite/adamellite. This body contains cassiterite-bearing greisens which are found within EL66/2007. The Mathinna Beds have been thermally metamorphosed with resulting aureoles at Gladstone about 2 km wide.

Gold-bearing quartz veins occur in a zone trending NNE from Gladstone, the most southerly occurring in Fly by Night Creek close to the contact with the Poimena pluton and extending through Coarse Gold Creek northerly to Popes before passing into adjoining EL2/2007. They strike in a north westerly direction and are normally steeply dipping.

### 3 REVIEW OF PREVIOUS MINING AND EXPLORATION

#### Introduction

EL66/2007 has a history of both gold and tin mining, commencing around 1880 with the discovery of the Royal Tasman gold reef and "Fly by Night" tin deposit immediately south of Gladstone. By 1883 production of gold (from several reefs) had dwindled but further prospecting work was carried out in 1909, 1916 and 1931. Approximately 55kg of gold was produced of which more than 51kg came from Royal Tasman No.1 and No.2.

The main gold-bearing reefs are orientated in a NW-SE direction and lie parallel to the course of Fly by Night Creek, the Royal Mint on its southern side and Fleming's, Royal Tasman No.1, Royal Tasman No.2 (North Tasman) and Royal Standard to the north. Coarse Gold Creek is another parallel reef north of the township. Another gold deposit of interest known as Popes Prospect lies 3km to the north of Gladstone. The reefs to the south of Gladstone lie close to the granite contact and are known to contain small amounts of cassiterite.

The primary sources of the tin mineralisation in the district are cassiterite bearing greisenised granites confined to irregularities in the upper contact of younger muscovite-biotite granite with an older granite or sediment.

One such greisen, the Fly by Night tin mine is located 700m to the south east of the Royal Tasman workings. There are also several old Chinese alluvial tin workings in a subsidiary of Mt Cameron Creek to the west.

#### Gold Mining and Exploration

Twelvetrees (1916) describes in detail the mines of the Gladstone district. He refers to the three main line of reefs, the Royal Standard, Royal Tasman and Royal Mint as being in full swing in 1881 and 1882, with at least two batteries operating with very high assay returns obtained from the Royal Tasman No. 1 with average head grades in excess of 1oz/tonne. Grades dropped off at depth because much of the gold was contained in pyrite and unable to be effectively recovered. Twelvetrees states that "the characteristics of the reefing belt may be summed up shortly and in a general way by saying that the occurrences comprise numerous shoots of gold-bearing stone, frequently with high values; but that, on the whole the pay streaks are short. The shortness of the shoots may possibly be compensated for by their frequency."

A summary of each of the main gold reefs in the Fly by Night area is shown below:

North Tasman (584 700m E, 5464 450m N): 1.8m wide, 14g/t Au, max. depth worked 33m, outcropping strike length of 40m; workings consist of a vertical shaft to 33m with levels at 11m, 20m and 33m (the latter being an adit which runs approximately northwards from Fly by Night Creek for more than 100m). Stopping occurred along lengths of 18-24m down to the 20m level. The higher grades are found in fine grained "marble-like" quartz, sometimes with limonitic fractures; Anglo-Australian (1996) returned assays from three mullock samples of 82.5g/t Au, 16.6g/t Au and 28.2g/t Au. The reef appears to be cut off by faulting at 30m and thrown to the north by 3.6m, having a dip of 60-70 degrees west. It has been suggested that the North Tasman Reef may be a faulted extension of the Royal Tasman but Nye (1932) felt this to be unlikely.

Royal Tasman No.1 (584 750m E, 5464 680m N): 0.6m wide, 17.3g/t Au, vertical, max. depth worked 22m, outcropping strike length of 73m. Workings consist of stoping to 76m to the 9m level and for 45m above the 22 level. Grades at surface were up to 612g/t Au falling at depth to 4.5g/t Au but as the returns did not include the gold content of the sulphides this may not have been so great. Thureau (1881) suggested that the old workings may not have located offset portions of the reef. Drilling of two diamond holes (46m and 47m) underneath the Tasman No.1 workings by Anglo Australian (1996) intersected the main reef at about 40m and a second zone of quartz veining at a shallower depth. Only some portions of the core were analysed but assays in all cases were below 0.05g/t Au.

Royal Mint (584 680m E, 5464 580m N): 1.2m wide in places much narrower in others, max. depth 20m, length unknown but possibly >250m if satellite workings (faulted offsets?) included, two cross veins 27m apart cut the reef, one being 0.45m thick and vertical. Both of these appear to have contained payable gold. Mine worked by the Royal Mint G.M. Co. 1881-83, Dreadnought G.M. Co. 1909 and Victory G.M. Co. 1931.

Royal Standard (584 750m E, 5464 900m N): Width varies from 0.9m to 6.7m but averages about 4.5m, length 300m, dip steep northerly?, max depth 30m. Visible gold with accessory cassiterite, arsenopyrite and chalcopyrite. The so-called "Wolfram Lode" crosscuts the reef near its northern end and contains cassiterite, wolfram and minor gold. Royal Standard was worked in the 1880's and 1930's. Nye (1932) refers to the possibility of faulting displacing the high grade surface portion of the reef at depth.

A number of other smaller reefs were opened up but many were abandoned at the prospecting stage because they did not appear to contain any appreciable quantity of gold. It is worthwhile however mentioning Fleming's Reef immediately south of Royal Tasman, which has coarse arsenopyrite associated with gold and silver. Nye (1932) states that high assays from Fleming's (>20oz/tonne) indicate that although no free gold is visible arsenopyrite is probably not the principal source. Tests from two samples proved that practically all could be extracted with mercury and all of it is soluble in a cyanide solution.

Recent exploration for gold has comprised two programmes; one by Santos Ltd. (1981-83) and the other by Anglo Australian Resources NL (1995-96).

The Santos work included geological mapping and geochemical sampling at 50m intervals using a hand auger. Of 208 samples assayed, 16 returned significant (>0.3g/t Au) values including six samples in the range 2.5 -5.6g/t. These anomalous samples are clustered adjacent to a granite-sediment interface south of the main workings. Follow-up work involved a programme of infill geochemical sampling, geological mapping and trenching.

The trenching comprised three long (100m +) trenches across the trend of the old workings as well as three shorter (approx. 50m) trenches to investigate isolated high soil gold anomalies.

Trench 1 (length 280m): Located to cut the Royal Standard and North Tasman Lodes.

The results were disappointing with the highest gold assay over a 2 metre interval being 0.85g/t Au. This was associated with a zone of close-spaced quartz veining trending 290

degrees and dipping 80 degrees south. Values of 0.18g/t Au and 0.73g/t Au were also associated with a Tertiary gutter which masked the underlying bedrock. Arsenic, silver, copper, lead and zinc were also very low.

Trench 2 (length 134m): This is located in the area where the Royal Mint workings are shown in the MRT Deposits Database but referred to by Santos as "West Tasman".

Gold assays again "disappointingly low considering the intensity of alteration and quartz veining over a substantial width". Low grade gold (0.05-0.15g/t) over at least 50m. The highest assay recorded was 0.57g/t Au over 2 metres and was associated with a 20cm wide shallow (65 degrees) quartz greisen vein dipping to the SW. Arsenic was anomalous (+500ppm) over a 10m zone 20m west of the line of shafts but there was no direct correlation with gold values. The highest arsenic assay (2250ppm As) was associated with the quartz greisen vein mentioned above.

Trench 3 (length 176m): Located at what Santos refers to as the South Royal Mint but MRT name Birkett's and Moore's Shaft in the Deposits database.

Gold assays low and conclusion drawn that as the main granite – Mathinna Beds contact is approached either laterally or vertically the nature of the gold mineralisation changes from being narrow, higher grade and primarily associated with quartz veins to that of a much lower grade but more disseminated.

Trenches 4, 5 and 6: Located outside the main zones of workings with Trench 4 and 5 near the creek to the west of Fly by Night Creek and Trench 6 south of the Fly by Night tin mine.

Low gold values mainly attributed to Tertiary detrital material.

The main work in the area by Anglo Australian Resources NL consisted of two angled diamond drill holes (94m total) in 1996, both at the Royal Tasman No 1, designed to intersect the reef 15m to 20m below the reported maximum depth of the old workings. A small portable rig was used. In GL1 the main reef was intersected from 38.1m to 40.3m (true width 1.8m) and a second zone of veining from 24.8m to 29.5m. Only the main reef was assayed, returning 1.2m at 0.018 g/t Au and 1.0m at 0.022g/t Au from 39.3m to 40.3m. In GL2 the main reef was intersected from 43.2m to 44.0m (true width 0.65m) and a second zone of quartz veining between 15.5m and 18.5m. Again only the main reef was assayed and 0.08m at 0.022g/t resulted.

Limited mullock sampling from Flemings, Royal Tasman No 1 and North Tasman resulted in the only economic gold grades (82.5g/t, 16.6g/t and 28.2g/t) coming from the North Tasman reef.

### **Tin Mining and Exploration**

Limited hardrock tin mining has taken place on EL66/2007. The Fly by Night mine was probably discovered around 1880 and early mining was considered very successful. It may have continued profitably (albeit with limited production) for about 40 years. Two companies, Geopeko (1978-79) and Santos (1981-83), have explored the Fly by Night greisen deposit for its bulk mining potential in recent times.

Geopeko, in an option agreement with Ron Lawry over the Fly by Night mine carried out a programme of gridding, surveying, geological mapping (1:1,000 scale), RC drilling on 50 metre centres (95 holes totalling 536m with average depth of 5.64m and deepest hole to 15m), percussion drilling (2 holes, one of 14m and other 10m) and a single diamond hole to 24.4m. Based on the results of this work Geopeko calculated a probable reserve of 658,000 tonnes at 290ppm Sn + or – 50ppm and a possible reserve of 2.6 million tonnes at 110 – 316ppm Sn. The company concluded that insufficient tonnage, low cassiterite grade, erratic distribution of the mineralisation, and difficulty in tin recovery meant that the ore body was uneconomic and the agreement was terminated.

In 1981 Santos acquired title to 14 contiguous mining leases and immediately drilled two diamond holes totalling 150.5m. An intersection of 2 metres of 0.89% Sn (DFBN 5) related to quartz fissure veining indicated further work should be undertaken. In 1982 a programme of gridding, geological mapping and geochemical sampling across the leases defined four areas (Harden's Ravine, Fly-by-Night, 400m West of Fly by Night, Enterprise) worthy of follow-up exploration and diamond drilling for tin, but this did not eventuate because emphasis shifted to the gold targets.

Harden's Ravine: Two of four samples from a quartz-muscovite greisen body, some 200m wide and of unknown strike extent returned values of 300ppm and 580ppm Sn.

Fly by Night: An area of muscovite greisen at least 200m wide and elongated NW-SE returned eight assays in the range 210-460ppm Sn.

400m West of Fly by Night: A 250m wide sub-circular feature of +200ppm Sn overlaps greisen developed at a tri-contact between older porphyritic feldspar granite, younger altered granite and altered Mathinna Beds. The situation is complicated by a Tertiary gutter (defined by a 500ppm Sn contour) and shallow eluvial wash.

#### 4 EXPLORATION COMPLETED DURING THE PERIOD OF TENURE

During the first year of tenure, MHML undertook a review of historic mining and previous exploration followed up by field work which consisted of the following:

- checking the locations of old workings in the Fly by Night Creek area,
- NITON assays of mullock samples,
- laboratory assays of mullock samples,
- surface exploration for extensions to previously mined tin greisens on strike between Fly by Night Creek and Hardens Ravine,
- soil surveys at Popes prospect (NE of Gladstone) and at an area immediately to the west of Gladstone (N of the Bridport Road), and
- assaying 1m samples of drill core (representing the drill holes GL1 and GL2 drilled by Anglo-Australian Resources NL in 1996 and targeting the Royal Tasman No. 2 reef) obtained from the MRT's drill core storage facility at Mornington (Richardson, 2009).

The drill core assays were not reported in full in the 2009 annual report; the full sample list with assays has now been collated and is presented in Appendix 1 in this report.

During the current reporting period, work consisted of a review of the previous exploration by MHML and preceding explorers as well as a 1-day site visit, undertaken by technical staff new to MHML and the project.

Work undertaken by MHML and previous explorers has consistently concluded that the main potential for economic gold mineralisation in this area lies within possible vertical extensions of the small vein-related deposits previously mined near-surface. It is interpreted that these deposits were formed at relatively shallow crustal depths, with numerous small "shoots" of mineralisation forming in discontinuous fracture sets; while some of the formerly-mined deposits at or close to the surface were of locally of higher grade, grade was erratic and mines short-lived. Such deposits present as "challenging" and expensive exploration targets.

After careful review, it has been considered that the type of gold deposit presented by this locality is not compatible with the type of targets being sought by MHML, and that therefore the tenement be surrendered.

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## 6 EXPENDITURE

Total annual expenditure for EL66/2007.

<b>Geoscientific Costs</b>	
Geology	10,321.00
Geochemistry	122.00
Geophysics	
Remote sensing	
<b>Drilling &amp; Gridding Costs</b>	
Gridding	
Drilling	
Earthmoving	
<b>Land Access Costs</b>	
<b>Feasibility Costs</b>	
<b>Other Costs</b>	1,418.00
Rental fees	
Vehicular track Construction	
Surveying, contract drafting etc	
Capital equipment purchase	
<b>Administration Costs</b>	1,736.00
(note: not to exceed 10% of annual expend)	
Legal	
Office & Admin	
<b>Total</b>	<b>13,597.00</b>

# APPENDICES

Appendix 1: Drill core samples and assays

Sample_ID	Hole_ID	From_m	To_m	Interval_m	Au_ppm
NE1723	GL1	0.5	1.5	1.0	<0.01
NE1724	GL1	1.5	2.5	1.0	0.02
NE1725	GL1	2.5	3.5	1.0	0.02
NE1726	GL1	3.5	4.5	1.0	<0.01
NE1727	GL1	4.5	5.5	1.0	0.01
NE1728	GL1	5.5	6.5	1.0	0.01
NE1729	GL1	6.5	7.3	0.8	<0.01
NE1730	GL1	7.3	8.3	1.0	<0.01
NE1731	GL1	8.3	9.3	1.0	<0.01
NE1732	GL1	9.3	10.3	1.0	<0.01
NE1733	GL1	10.3	11.4	1.1	<0.01
NE1734	GL1	11.4	12.6	1.2	<0.01
NE1735	GL1	12.6	13.8	1.2	<0.01
NE1736	GL1	13.8	14.9	1.1	0.02
NE1737	GL1	14.9	16.0	1.1	0.03
NE1738	GL1	16.0	17.0	1.0	0.02
NE1739	GL1	17.0	18.3	1.3	0.01
NE1740	GL1	18.3	19.2	0.9	0.01
NE1741	GL1	19.2	20.1	0.9	<0.01
NE1742	GL1	20.1	21.0	0.9	0.08
NE1743	GL1	21.0	22.0	1.0	0.02
NE1744	GL1	22.0	23.0	1.0	<0.01
NE1745	GL1	23.0	24.0	1.0	0.01
NE1746	GL1	24.0	25.0	1.0	0.03
NE1747	GL1	25.0	26.0	1.0	<0.01
NE1748	GL1	26.0	27.0	1.0	0.01
NE1749	GL1	27.0	28.0	1.0	0.01
NE1750	GL1	28.0	29.0	1.0	<0.01
NE1751	GL1	29.0	30.0	1.0	0.01
NE1752	GL1	30.0	31.0	1.0	0.02
NE1753	GL1	31.0	32.0	1.0	0.01
NE1754	GL1	32.0	33.0	1.0	<0.01
NE1755	GL1	33.0	34.0	1.0	<0.01
NE1756	GL1	34.0	35.0	1.0	0.02
NE1757	GL1	35.0	36.0	1.0	<0.01
NE1758	GL1	36.0	37.0	1.0	<0.01
NE1759	GL1	37.0	38.1	1.1	<0.01
NE1760	GL1	38.1	39.2	1.1	0.02
NE1761	GL1	39.2	40.3	1.1	0.02
NE1762	GL1	40.3	41.5	1.2	0.03
NE1763	GL1	41.5	42.7	1.2	<0.01
NE1764	GL1	42.7	43.8	1.1	0.01
NE1765	GL1	43.8	44.9	1.1	<0.01
NE1766	GL1	44.9	46.0	1.1	0.01

Sample_ID	Hole_ID	From_m	To_m	Interval_m	Au_ppm
NE1767	GL2	0.5	1.5	1.0	0.02
NE1768	GL2	1.5	2.5	1.0	0.02
NE1769	GL2	2.5	3.5	1.0	<0.01
NE1770	GL2	3.5	4.5	1.0	<0.01
NE1771	GL2	4.5	5.5	1.0	<0.01
NE1772	GL2	5.5	6.5	1.0	<0.01
NE1773	GL2	6.5	7.5	1.0	<0.01
NE1774	GL2	7.5	8.5	1.0	0.02
NE1775	GL2	8.5	10.0	1.5	0.01
NE1776	GL2	10.0	11.0	1.0	<0.01
NE1777	GL2	11.0	12.1	1.1	<0.01
NE1778	GL2	12.1	13.5	1.4	<0.01
NE1779	GL2	13.5	15.0	1.5	0.01
NE1780	GL2	15.0	16.5	1.5	<0.01
NE1781	GL2	16.5	17.5	1.0	<0.01
NE1782	GL2	17.5	18.5	1.0	<0.01
NE1783	GL2	18.5	19.5	1.0	<0.01
NE1784	GL2	19.5	20.5	1.0	<0.01
NE1785	GL2	20.5	21.5	1.0	<0.01
NE1786	GL2	21.5	22.5	1.0	<0.01
NE1787	GL2	22.5	23.5	1.0	<0.01
NE1788	GL2	23.5	24.5	1.0	<0.01
NE1789	GL2	24.5	25.5	1.0	<0.01
NE1790	GL2	25.5	26.5	1.0	<0.01
NE1791	GL2	26.5	27.5	1.0	0.02
NE1792	GL2	27.5	28.5	1.0	<0.01
NE1793	GL2	28.5	29.5	1.0	<0.01
NE1794	GL2	29.5	30.5	1.0	<0.01
NE1795	GL2	30.5	31.5	1.0	0.01
NE1796	GL2	31.5	32.5	1.0	<0.01
NE1797	GL2	32.5	33.5	1.0	<0.01
NE1798	GL2	33.5	34.5	1.0	<0.01
NE1799	GL2	34.5	35.5	1.0	<0.01
NE1800	GL2	35.5	36.5	1.0	0.01
NE1801	GL2	36.5	37.5	1.0	<0.01
NE1802	GL2	37.5	38.5	1.0	<0.01
NE1803	GL2	38.5	39.5	1.0	<0.01
NE1804	GL2	39.5	40.7	1.2	<0.01
NE1805	GL2	40.7	41.8	1.1	<0.01
NE1806	GL2	41.8	42.9	1.1	0.02
NE1807	GL2	42.9	44.0	1.1	<0.01
NE1808	GL2	44.0	45.2	1.2	<0.01
NE1809	GL2	45.2	46.4	1.2	<0.01
NE1810	GL2	46.4	47.7	1.3	<0.01

## Appendix 2: Laboratory Certification