MINERAL HOLDINGS AUSTRALIA PTY LTD

EXPLORATION LICENCE 32/2001
GREAT NORTHERN PLAINS
NE TASMANIA

ANNUAL REPORT ON EXPLORATION
TO APRIL 2004

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ABSTRACT

This report describes the work carried out by Mineral Holdings Australia Pty Ltd in Year Two of the licence covering 48 sq km of the Great Northern Plains, near Gladstone in NE Tasmania.

The licence was selected to allow exploration and evaluation of the alluvial resources extending from the former mines Scotia and Lochaber along the Scoloch Lead to the Fosters Marshes area. The targets are the placer deposits with their contained heavy minerals particularly cassiterite, ilmenite, rutile, zircon, monazite, tantalite and gold. Gemstones particularly sapphire and topaz are held under SEL 22/1999 but are an essential part of the evaluation.

The area also includes the hard rock tin of the Fly By Night Deposit near Gladstone where there is a possible resource of 3M tonnes of mineralisation as a greisen in the Mt Cameron Granite.

In Year 2, Niugini Resources Pty Ltd carried out a major reassessment of the area considering all of the archival material held by Mineral Resources Tasmania, particularly the drilling data, and relying heavily on the 1935- 44 major, drilling campaign, carried out by the State Mines Department, which reached nearly 24,000 metres in total.

The assessment has delineated resources, to varying degrees of certainty, totaling some 43,658,678 cu m containing 14,351 tonnes of tin concentrate at 70% Sn.

Based on that study, MHA unsuccessfully applied for two retention licences to secure the resources so that further work could be carried out to upgrade the resources to the JORC Code standard.

EL 32/2001 – GREAT NORTHERN PLAINS, NE TASMANIA- ANNUAL REPORT 2004

1.0 INTRODUCTION

EL 32/2001 was applied for by Mineral Holdings Australia Pty Ltd on 3rd December 2001 to cover 42 sq km of the Great Northern Plains. The licence was selected to allow exploration and evaluation of the alluvial resources extending from the former mines Scotia and Lochaber along the Scoloch Lead to the Fosters Marshes area. The targets are the placer deposits with their contained heavy minerals particularly cassiterite, ilmenite, rutile, zircon, monazite, tantalite and gold. Gemstones particularly sapphire and topaz are held under SEL 22/1999 but are an essential part of the evaluation.

The area of application was subsequently modified on 19th December 2001 by including an additional 6 sq km to include the hard rock tin of the Fly By Night Deposit near Gladstone where there is a possible resource of 3M tonnes of mineralisation as a greisen in the Mt Cameron Granite. The EL was granted on 19th of April 2002. The EL boundaries are shown on Plan 1 relative to the State Government geological mapping (Winnaleah, 1:100,000 scale, Moore, 1991).

This licence is an integral part of Mineral Holdings Ringarooma Project of North Eastern Tasmania which consolidates all of the potential alluvial tin resources in the region and allows exploration and evaluation to proceed in a coherent manner with subsequent economies of scale. The project as a whole is currently under option to Hanbury Ltd of Sydney.

2.0 PREVIOUS EXPLORATION

The Scotia deposit was one of the first located in the region where the rich, north trending, buried palaeochannel was exposed and reworked in the valley of the crosscutting Ringarooma River. This led to the Scotia Tin Mining Company being formed in 1881 and by 1891 six working faces, 3 to 5m deep had been opened at the southern end (Nye, 1932).

In 1901, Scotia became a leading producer with the location of deeper ground in the north of the deep lead with a narrow high-grade gutter on a slate basement. Mining then continued with declining production in later years until it ceased in 1908. Production records of tin concentrates are inaccurate but 283.9 tonnes can be established and it could have been as much as 1,000 tonnes.

During the next 30 years, sporadic drilling attempted to test for continuations of the lead before a major drilling campaign by the Mines Department in the period 1935 to 1944 saw 855 holes drilled to an average depth of 27.7m for a total of 23,827m. This represents one of the most significant resource development projects ever carried out by the Department.

The drill program outlined a 6.5km long, sinuous, 30-80m wide palaeochannel with rich cassiterite in a basal wash up to 10m thick lying on a Mathinna sediment basement. Six blocks were defined by 185 holes within which 3.35 M cu m of wash averaged 288g/cu m SnO2.

From 1938, to protect their position from over pegging, the Department made the area exempt from mining by declaring a Special Reserve and this prevailed until 1965 when the reservation was lifted.

From then until 2001, when Mineral Holdings took up EL 32/2001, the area was evaluated by a number of companies most of whom conducted check drilling to verify the Department drilling with generally positive results and calculated resource figures with various mining parameters. These were Storey's Creek Tin Mining Company from 1965, BMI Mining from1970 and Amdex Mining from 1976. Plan 4 shows the outlines of the Scotia, Lochaber and Scoloch Leads and the general intensity of the drilling carried out to define the structures. **Details of the drilling and appropriate maps are found in Standard, 1971 and Kinnane, September, 2003.**

Exploration by Mineral Holdings Australia Pty Ltd is summarized in the Year 1 annual report for EL 32/2001 (Kinnane, March 2003).

The initial approach was to evaluate the Scotia Lead, recognised as the main resource within the licence and considered to be uneconomic due to deep burial and low grades. In carrying this out, Mineral Holdings had to overcome the poor reproduction and archaic format of much of the drilling information during its transformation into modern metric equivalents and digital mode.

The central section of the Scotia Lead, just down palaeoslope from the intersection of the Scotia and Lochaber Leads, was chosen for the evaluation exercise of pre-stripping the barren overburden. The drill data and density was most complete in this area and it was considered to be a good test of the method.

The study, involving three chosen sections across the palaeochannel, indicated that compared with a resource calculated by BMI Mining in 1974, the present treatment with the overburden removed resulted in a considerable reduction in the wash to be processed at some 720,000 cu m at a grade of 1,734.33g/ cu m of 70% SnO2 but with a gain of 50 tonnes to a figure of 1,251 tonnes of 70% Sn concentrate at a stripping ratio of 6 to 1.

From this preliminary study, it was concluded that the resource could be divided into barren overburden and high tin-grade basal wash by selection involving grade and/or geological criteria and that pre-stripping and selective mining would have a beneficial effect on capital return periods and recovered tin concentrates. It was also acknowledged that the accessory minerals particularly gold and sapphires would increase the economic value of the resource.

3.0 PRESENT EXPLORATION

In Year 2, Niugini Resources Pty Ltd carried out a major reassessment of the area (Kinnane, September, 2003) considering all of the archival material held by Mineral Resources Tasmania, particularly the drilling data, and relying heavily on the 1935-44 major, drilling campaign, carried out by the State Mines Department, which reached nearly 24,000 metres in total.

The approach was to completely reformat this exceptionally valuable archive of drilling information which was in a poor state of preservation and reproduction and to translate it from imperial into modern metric units. At the same time, this allowed a judgment on the reliability of the data and enabled the definition of resource boundaries at defined mining cut-off grades and a demonstration of where the drilling coverage and geological knowledge was inadequate to test the potential of the 6.5km long palaeochannel and its tributaries.

The assessment has delineated resources, to various degrees of certainty, totaling some 43,658,678 cu m containing 14,351 tonnes of tin concentrate at 70% Sn.

4.0 RESULTS

The outcomes of the studies are reviewed in turn.

4.1 GEOLOGY OF THE SCOTIA LEAD

The Scotia Lead has been documented by drilling to varying degrees of certainty from the Scotia Mine northwestwards for some 9km where it includes the Scoloch Lead running into the Great Northern Plains estuarine environment in the Foster Marshes area.

The leads are narrow, sinuous, buried alluvial deposits (50 to 150m wide) in Eocene, terrestrial and marine, unconsolidated sediments on a basement of Mathinna metasediments and slates.

The cassiterite placers are high-grade, mainly basal to the leads and consist of gravely and pebbly wash with large boulders and quartz blocks upstream in the old Scotia and particularly in the Lochaber Mines and becoming more uncommon downstream.

The entrance of tributary leads, including Lochaber and others, into the main channel are believed to cause the sudden swings in direction of flow and these leads are also considered as prospective exploration targets.

Plan 5 shows the distribution of known alluvial deposits and their defined deep leads from Scotia and Lochaber through Scoloch into the resources of the Fosters Marshes area as well as the associated, interpreted leads. The sinuous Scotia- Lochaber-Scoloch Lead running for at least 6.5km in a northerly direction is clearly fundamentally different in origin from the blanket-like deposits of Fosters Marshes.

The sinuous lead deposits are thought to be of fluviatile origin while the blanket style deposits are most probably marine with the NE –trending Braithwaites deposit likely to reflect reworking on a marine shoreline. The Fosters Marshes area is seen as a marine embayment and the confluence of at least five palaeochannels, including those at Aberfoyle, entering from the southwest.

Morrison (1989) classified the major alluvial tin deposits of the Ringarooma Valley- the Arba, Valley, Briseis, Pioneer and Endurance as late Oligocene braidplain deposits. Earlier deposits occupying narrow, sinuous channels north and west of Mt Cameron (Scotia, Lochaber and Scoloch) were probably older (Eocene), and terrace deposits of the present Ringarooma and Great Musselroe Rivers were probably younger at post-middle Miocene.

The age of the tin placers in the sinuous, deeply entrenched, palaeovalleys of the Scotia- Lochaber- Scoloch system is shown to be at least Late Eocene (40-36M years ago) by the occurrence of fossil leaves and fruits in small lenses in the gravels in the old alluvial workings of the Lochaber Mine. This fossil flora site is on the Register of the National Estate and it should be protected wherever possible.

4.2 MODERN RESOURCE FIGURES

The modern resource figures have been calculated by Niugini Resources Pty Ltd and are compared with several former resource figures following extensive study of previous exploration and mining history of the alluvial tin deposits. They have been arrived at with the metrication of the old imperial data, the use of modern computer software, the elimination of the barren overburden in the calculation and an appreciation of the geological nature of the deposits. The detailed information and methodology is contained in the project report by Kinnane (September 2003) already lodged in the Department.

Treatment of the resources figures is dependant on the variables in the ten drilling campaigns carried out on the Scotia lead from 1902 to 1980. However, the Mines Department campaign in the period 1935- 1944 in which a total 23,827m were drilled is considered to be the most reliable with subsequent drill episodes being check audits or to fill in gaps in the coverage.

The aim of the modern resource assessment has been to determine the potential grade and volume of the Scotia Lead. The modern resource figures have been compared with four previous assessments by the Department of Mines (1955), Storey's Creek Tin (1966), BMI Mining (1971) and Amdex (1976). The shortcomings of the data and the various historical treatments have been revealed in the modern resource calculations by Niugini Resources **(Kinnane, September, 2003).**

There is a lack of complete analytical data for most drill holes resulting in the resource being quoted as "surface to basement" or overburden plus ore. In one section only, Block 6, was it possible to assess the effects of pre-stripping the barren overburden. Resource summary tables by Block are contained in Kinnane (November, 2003).

The **"Measured Mineral Resource"** for the main Scotia Lead , referring to the three sections where the data is most reliable- Scotia Main, Blocks 6 and 7, is on a "surface to basement" basis-

7,320,695 cu m containing an average of 351.03g/cu m of SnO2 as concentrate at a grade of 70% Sn to give 2,570 tonnes of SnO2 concentrate.

An **"Indicated Mineral Resource"** for the Resource Extension Areas of Lochaber, Scoloch and Scotia Feeder is on a "surface to basement" basis-

14, 990,983 cu m containing an average of 289.93g/cu m of SnO2 as concentrate at a grade of 70% Sn to give 4,346 tonnes of SnO2 concentrate.

At Block 6, the implications of pre-stripping could be tested due to the complete analyses on the B series drill holes and by applying selective mining of the basal wash at a 100g/cu m cutoff. These results show an enhanced tin return using strict assay control with pre-stripping.

If this was relationship was valid in the area of the Measured Resource above then an amended resource could be envisaged of –

3,327,589 cu m at an average grade of 807.37g/cu m SnO2 in concentrates at 70% Sn, or

1,262,189 cu m at an average grade of 2,071.08g/cu m SnO2 in concentrates at 70% Sn-

depending on which pre-stripping interval was used.

In addition to the Main Channel and the Resource Extensions, the Scotia Project is considered to have the following prospectivity or an "**Inferred Mineral Resource"** of -

21,347,000 cu m at an average grade of 348.31g/cu m of SnO2 or 7,435 tonnes of tin concentrate

-contained within the tributary feeder systems of Scoloch, Lochaber, Mallinsons, Newhaven, Doone and Stinking Creek.

Geological evidence including sudden changes of trend suggests the possibility of other tributary leads entering along the length of Scotia Lead.

This assessment has resulted in the delineation of resources potentially totaling some 43,658,678 cu m containing 14,351 tonnes of tin concentrate at 70% Sn.

4.3 MINING STRATEGY AND FEASIBILITY

The tenements are centred some 4km north of the township of Gladstone which has a population of about 300. The access is excellent with all-weather, sealed roads to Gladstone from the regional centres of Launceston, Scottsdale and St Helens. Electrical power is situated within 200m of the former workings of the Lochaber alluvial mine and abundant water is available from the adjacent Ringarooma River.

The eastern section of the tenement encompasses a large tract of significant "Inland Heath" plains environment with eucalypt, banksia, leptospernum, tea tree, melaleuca and other scrub species.

The northern section of the Scoloch Lead falls within the Foster Marshes Ramsar Site which comes under Commonwealth jurisdiction, specifically the "Environment Protection and Biodiversity Conservation Act, 1999". Plan 2 provided by Mineral Resources Tasmania shows the land tenure of El 32/2001 including the Ramsar Site.

Ongoing feasibililty and mine planning will have to address the implications of this Act and similar State Provisions.

The use of modern gravity circuits and mining incorporating controlled stripping of barren clay horizons using hydraulic excavators is expected to improve recoveries of cassiterite and the accessory heavy minerals, zircon, rutile, ilmenite, tantalite, gold and sapphire (Kinnane, internal memo).

Only preliminary feasibility studies have been carried out on the deposit.

On the above resource figures and taking the current price of tin metal to be $A 11,132 (The Mercury, 31st March, 2004) per tonne the insitu value of the Scotia Lead Deposit would be about $A112M making no allowance for the accessory heavy minerals or sapphires.

Based on a number of mining techniques such as a single bucket ladder, an overburden stripping and smaller dredge, a double ladder dredge and backhoe mining, the operating costs would be around Aus$1.68, $1.59, $1.40 - $1.50 and $1.44 - $2.22/ cu m respectively.

Kinnane (internal memo) has suggested using other methods such as strip mining using scrapers, bulldozers or large hydraulic excavators and mining using conventional backhoe, trucks or gravel pumps or the removal of overburden by dragline and mining of wash by conventional methods. Preliminary estimates suggest that running a 100 cu m/hour alluvial plant with backhoe and bulldozers and jig based gravity plants would cost from $2.50- $10.00/ cu m depending on a number of variables such as overburden to ore ratios, grade, water and labour availability, location, access and infrastructure.

In a specific case, Kinnane has calculated that for a two dredge or pre-stripping operation, the estimated cost would be $1.70/ cu m. It is also expected that similar costs and surplus figures could be achieved using a "dry mining" method. More

recently, the estimate of a current dredge operator using modern technology advocated the possibility of getting the costs down close to $1.00/ cu m (Kinnane, pers com).

An appropriate treatment plant circuit would recognise the complex assemblage of accessory heavy minerals including gold, sapphire, ilmenite, rutile, zircon and tantalite which substantially increase the value per cubic metre of the alluvial deposits. Preliminary costs suggest an amount of $1.25million for the plant although the availability of second hand plant would reduce this figure substantially.

The treatment plant could be mobile and would either be on site or at a central locality depending on the other sites to be mined in the Ringarooma Tin Project.

4.4 OUTLOOK

The LME price graph for refined tin metal (Plan 6) shows that the tin price is on an upward cycle having nearly doubled in price from about US$4600/tonne in April 2003 to about US$8460/tonne at end March 2004. In terms of Australian dollars, this represents a change in value from $7,465 to $11,132 per tonne or an increase of 50%.

Meanwhile, over nearly the same period, tin stockpiles at the LME have decreased from some 25,000 tonnes (Jan 2003) to about 7,720 tonnes or 3.0% of world production of 261,000 per annum.

The key to the rising tin price is that Asia now accounts for more than 50% of world demand and that China has displaced the US as the world's largest consumer. Asia also dominates the production having three of the top five producers contributing 40% or 102,000 tonnes of tin in concentrates. Four of the top five smelters and refiners are also in Asia giving 45% (237,000t) of refined tin output or 75% by the latest figures (Plan 7).

However, CRU has forecast a 50% decline in refined tin production from Asian smelters this year. Both the Malaysian and Thai smelters have a shortage of tin concentrate feed due to a move by Indonesian authorities against illegal tin miners and the consequent banning of exports of concentrates. Indonesia with limited smelter capacity cannot take up the shortfall in refined tin. The prognosis is that the tin market will move to a 20,000t deficit in 2004.

World tin production by region from the LME figures is given in Plan 7 as well as industrial consumption in terms of usage showing that solders have now marginally surpassed tin plate as the greatest consumers of tin. This coincides with the move by the computer and electronics industry to abandon lead in favour of high tin solder which is expected to add a demand for an additional 10,000t of tin this year. Substitution of tin for lead in shotgun pellets and eventually in all bullets is being considered in the USA which may give further upside to the demand for this low toxic, environmentally acceptable metal (The Australian, 29/03/04).

Malaysian Smelter Corporation took 30% equity in Marlborough Resources last year based on their Ardlethen tin deposit in New South Wales and entered into talks with Mineral Holdings and Hanbury Ltd to secure alluvial cassiterite from NE Tasmania.

These alluvial resources are an integral part of the Ringarooma Project of Mineral Holdings which seeks to explore and develop the cassiterite and associated heavy mineral and sapphire placer deposits of the Ringarooma River Basin including the Great Northern Plains and offshore. The relatively well-defined deposits at Monarch, Endurance and Pioneer as well as Scotia offer the best potential for the first production of tin concentrates in a phased mining operation in NE Tasmania. The project which has the potential to yield a resource base of up to 100,000 tonnes of cassiterite concentrates is currently optioned to Hanbury Pty Ltd of Sydney.

5.0 CONCLUSIONS

On the basis of two years of evaluation, Mineral Holdings Australia Pty Ltd applied for two 10 sq km retention licences - RL 6/2003- Great Northern Plain and 7/2003 – Marsh Creek (Duncan, November 2003).

These licences were required to secure the areas so that MHA could carry out the work to upgrade the resources to the "JORC" Code standard prior to a decision on mining.

However, on 21st January 2004 the Minister for Economic Development, Energy and Resources formally refused the applications on the grounds "of our failure to demonstrate that mining operations should not take place immediately."

Accordingly, the necessary work will be continued under exploration licence title EL 32/2001 in Year Three by the Joint Venture partners MHA and Hanbury under their operational company Van Diemen Mines.

The main thrust of the planned work is to -

- convert all old data to modern metric, AMG and digital format, with tabulation of data in the Arcinfo GIS system,

- replot the new resource outlines and construct accurate geological and assay cross sections,

- commence a full economic assessment of the resource including the value of the accessory minerals,

- complete a pre-mining feasibility study involving mining technique, processing methods and environmental considerations, and

- complete marketing studies in the light of the rising tin price.

6.0 ENVIRONMENT

Other than a few site visits to the licence with potential Joint Venture partners and inspection traverses, there has been no activity on the ground. Consequently, no rehabilitation is required.

7.0 EXPENDITURE

Exploration expenditure by Mineral Holdings for the licence to the end of December 2003 stands at $46,075 which is above the minimum commitment of $32,000 for the first two years.

As all of the work involved desk studies, apart from a few inspection traverses, there was no surface disturbance and consequently no need for rehabilitation.

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