

REPORT ON THE CAMBRIA TIN PROSPECT

BLUE TIER DISTRICT, TASMANIA

by R.G. Taylor, B.Sc., D.I.C., Ph.D., A.I.M.M., A.M. Aus. I.M.M.

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(Prepared for inclusion in this Prospectus)

This report is based upon inspection of the property and information gained from documentary evidence.

INTRODUCTION

The prospect is situated approximately miles S.E. of Weldborough and lies amongst the headwaters of Waratah Creek. The old workings are adjacent to the unsealed Lottah-Goulds Country road which provides both rapid and easy access from the sealed Weldborough-St. Helens highway. The Blue Tier district is a renowned tin bearing region and production to date is of the order of

TITLE

HISTORY AND RECENT EXPLORATION

Intermittent mining operations have been conducted on the Cambria Leases for over eighty years and although production figures are not available, considerably amounts of ore have been won from both alluvial and underground workings. Ringarooma Exploration Pty. Ltd., acquired title to the leases in 1968 and have, subsequently, conducted active preliminary exploration. Extensive costeaning has revealed the nature and surface extent of the mineralisation and this has been supported by surveying, prospecting and limited geological mapping.

GEOLOGY

The tin bearing ore bodies occur in coarse grained granite, overlain to the east by a thin capping of tertiary basalt. A deep lead is also present which appears to be partially overlain by the basalt.

The mineralisation is contained within two major sets of sheeted veins striking north-south and north-east/south-west. These intersect in the main mine area and each system is comprised of several closely spaced parallel veins which, individually, range from a fraction of an inch to over 5' wide. The total width of the sheeted system frequently exceeds 10' and within it individual veins often branch, intersect and show considerable fluctuations in width and ore content. The veins are composed of quartz and quartz-greisen, with varying amounts of cassiterite, fluorite, topaz and minor sulphides. The cassiterite is coarse grained and in this association should present no milling difficulties.

Both of the major vein systems have been traced on surface for considerable strike distances; the north-south system for more than 2,000' and the north-east/south-west for more than 3,000'. Their extension in depth is unknown but the recent survey results suggest a general minimum of 250-300'.

The detailed grade of the vein systems is uncertain, but old records and personal observations both indicate that many portions are in excess of 1%Sn. Unfortunately, the collapse of the shallow, old workings prevents extensive sampling operations.

PROSPECTS

It is inferred that some 500,000 tons of vein material is available for testing with 250-300' of the surface. There are good prospects that significant amounts of this could prove of economic grade, and there is scope for both lateral and depth extensions. The ^{ore} area is well suited to adit mining and limited open cutting could also prove feasible. It is recommended that initial explorations should aim towards establishing sufficient reserves to support a medium scale mining venture. This could quickly initiate profitable operations and indicate potential for further development.

EXPLORATION

It is considered that the vein systems offer sufficient potential to justify detailed exploration and it is recommended that they be subjected to a multi-stage approach.

Phase I

A relatively low cost approach involving testing

of the zone with shallow diamond drill holes. This phase would include detailed geological investigation, drill site planning, closely supervised drilling, sampling, assaying and assessment.

Phase II

Subject to encouraging results from the above, this stage involves underground exploration by means of adits driven along the veins, detailed sampling and pilot milling. At this stage, further deeper drilling may be required for further assessment.

Unsigned draft report.

January, 1970.

REPORT ON THE MOUNT PARIS TIN MINE

BRANKHOLM, TASMANIA

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(Prepared for inclusion in this Prospectus)

This report is based upon inspection of the property and information gained from documentary evidence.

INTRODUCTION

Situated about five miles southeast of Brankholm, Mt. Paris forms a prominent peak, rising 1,800' above sea level. An old mine road provides access to within about a mile of the old workings (Fig.1).

TITLE

HISTORY

Tin was located in the region in the late nineteenth century

and rich alluvial deposits were worked in the nearby river flats. Several mining operations have been conducted upon the hill, exploiting both underground and alluvial prospects. The last major operator was Mt. Paris Syndicate in 1928, which sluiced 25,000 cubic yards of decomposed granite for a yield of approximately 22 tons of tin oxide. Considerable underground work was conducted around 1900, by the Appalachian Company, which drove four major adits into the hill. The only available production records indicate that in the quarter ended September, 1898, they treated 150 tons of ore for a return of 1½ tons of concentrates.

Ringroona Exploration Pty. Ltd., acquired title to the area in 1969 and have subsequently conducted preliminary exploration activities involving literature research, improving access, bulldozer clearance and costanning, surveying and initial geological inspection.

GEOLOGY

Mount Paris is composed of early Palaeozoic slates and quartzites which have been intruded by granite rocks of Devonian age. The apex of the granite intrusion is very close to the present day land surface, and inclusions of altered sediments are common. The granite suite comprises a porphyritic granite, a fine grained muscovite granite and veins of greisen, quartz-greisen, quartz and pagnetite. Cassiterite is the only mineral of economic importance and occurs in all of the above rock types with the exception of the porphyritic granite. The principal tin bearing rocks are the greisen,

quartz-greisen, veins and the fine grained muscovite granite. The latter is very decomposed and has been extensively sluiced. It is not established whether its soft nature is due to surface weathering or to deeper seated metasomatic alteration. The greisen veins cut the decomposed granite and range in width from a few inches to more than 50'. The largest is the quartz-greisen, Pinnacles Lode, which strikes west-north-west and appears to maintain a width in excess of 40' for at least 250'.

GRADE

Tin distribution in both the decomposed fine grained muscovite granite and the greisen veins is of a disseminated low grade type. Within the decomposed granite large areas are mineralised and sampling operations conducted in 1934 and 1935 indicated that large yardages of material were present, carrying 2-3 lbs. of recovered cassiterite per cubic yard. Both investigations failed to delineate the full extent of the ore zone, particularly its extension in depth. The greisen veins usually carry slightly higher concentrates of tin, but their relatively hard nature renders them of less interest than the more easily worked decomposed granite.

PROSPECTS

The soft decomposed granite could be extracted by low cost mining operations, i.e. sluicing or large scale open cutting. With a potential of several million cubic yards of payable values, a preliminary exploration programme is considered to be well justified. The more prominent greisen veins could also prove suitable for large scale open cut operations and the Pinnacles Lode is particularly

worthy of close investigation.

EXPLORATION

The area contains sufficient potential to warrant a detailed exploration programme and the following general approach is recommended.

1. Detailed geological mapping, accompanied by a closely supervised sampling programme of all available surface and underground outcrops of potential ore zones.
2. Pending encouraging results and detailed assessment of the above, shallow depth percussion drilling to delineate the full lateral extensions of the decomposed granite ore zone.

At this stage a feasibility study will enable decisions to be taken concerning deeper drilling and further exploration.

Unsigned draft report.

January, 1970.

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Mr Deardon

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REPORT ON THE BELL HILL TIN PROSPECT

BRANXHOLM, TASMANIA

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(Prepared for inclusion in this prospectus)

This report is based upon inspection of the property and information
gained from documentary evidence.

INTRODUCTION

The prospect is situated on the northern slopes of Bell
Hill, about six miles south-east of Branxholm, (Fig.1.). Access
is via miles of recently constructed forestry track, which
passes by the foot of the hill.

TITLE

HISTORY

The Bell Hill prospect has been worked intermittently both by alluvial and underground operations since the early eighteen seventies. No authentic production records exist, but up to 1925 some 40 tons of tin concentrates are estimated to have come from eluvial sources. Two early hard rock ore parcels of 300 and 100 tons are reported to have yielded concentrates equivalent to 3½% and 1½% cassiterite content respectively.

The main underground workings comprise a 564' long adit driven to intersect the major mineralised region approximately 200' below its surface outcrop. Four major veins were revealed and each was subjected to limited development (Fig.2). These workings are now inaccessible.

GEOLOGY

The hill consists of granite rocks of Devonian age which are traversed by numerous veins of quartz rich greisen. To the south-west, the granite rocks are overlain by altered slates and sandstones of the Mathinna series. The mineralisation occurs within the greisen veins and the major ore mineral is cassiterite and pyrite. The veins range from a few inches to over twenty feet in width and individual veins often show rapid pinch and swell characteristics. The strike of the veins is variable between east and north-east, although the major ore bodies trend approximately east. Dips are predominantly northwards at 60-80°.

RECENT EXPLORATION

Ringarooma Exploration Pty. Ltd., acquired title to the area in 1969 and have since conducted a vigorous surface exploration programme involving scrub clearance, costeaning, surveying and preliminary geological investigations. Several new veins have been revealed and of these, the White Lode to the north appears to be of major significance. It has been traced for more than 300' and appears to maintain an average width of 6-8'. The nature and surface extent of many of the previously known lodes has been examined and the largest, the Main Lode, appears to maintain a width of 8-12' for over 600' along strike. Many of the veins revealed contain substantial amounts of coarse cassiterite and at two isolated points, wolframite is visible.

GRADE

Cassiterite distribution within the veins is erratic, with rich and poor patches apparently alternating. The only detailed information concerning ore grades, comes from two independent investigations of the mine workings conducted in 1925 and 1944 respectively (Fig.2). The earlier results are substantially higher and the apparent discrepancy may be due to faulty sampling procedures by one, or both, of the investigators or, it could also reflect the erratic distribution of tin values within the veins. However, in both investigations, some promising results were achieved and they clearly indicate the need for further examination.

PROSPECTS

The underground workings prove that the greisen veins persist to 200' and they give every indication of extending strongly to considerable depths. The tonnage potential of the veins is very large and clearly sufficient to support mining operations provided that significant amounts prove to be of economic grade, i.e. 0.60 - 1.00% Sn. The veins are well situated for adit mining and limited open cutting might prove possible on some of the larger' formations. It is, thus, highly recommended that preliminary' exploration be conducted to determine the tin distribution within the greisen formations.

EXPLORATION

Exploration of the grade potential is recommended along the following general lines:-

Phase I

A low cost approach involving -

- (a) reclamation of the adit and detailed resampling of the old workings,
- (b) deep trenching across the surface exposures, accompanied by detailed sampling and geological mapping.

Phase II

In the event of encouraging results, the veins can be further tested by continuing the underground drives and by extending the cross cut to intersect the promising White Lode.

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At this stage, assessment of the results should indicate clearly the economic potential of the prospect.

Unsigned draft report.

January, 1970/

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BELLS HILL TIN MINE.

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W. H. Cundy 17-12-25

SITUATION:

The property is situated about 6½ miles south-east of Branxholm and about the same distance from Weldborough, on the road between Weldborough and Ringarooma.

AREA:

The property is held under Leases as follows:-

No.9516	-	20 acres	
9525	-	40 acres	Consolidated Lease
9520	-	5 acres	

In addition a Water Right area 2206/W of 26 acres and 2230/W in names of G.C. and T.V. O'Brien.

An application has been lodged for a further 20 acres west and adjoining Lease 8845.

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FOREWORD:

Before entering into the detailed information regarding the property I would draw attention to several important features concerning "Lode" Tin Mining, and, in many instances, the cause of its failures. To put it briefly but concisely the chief cause of many failures lies in the fact that Companies in the past have invariably spent most of the capital subscribed in machinery and milling plants without first adequately developing the mine. The shoots of tin in lodes are invariably erratic, and bearing this always in mind, the object of any management should be that, where a number of lodes exist, that reasonably long levels be extended on each of them to define the payable and unpayable portions. Many failures by companies working lode tin can be attributed to the fact that probably only one lode has been opened up at a time, and perhaps a fairly rich shoot of tin operated upon. In time this shoot dies out and shareholders become discouraged, thinking that it has petered out altogether, whereas, if the level had been continued another shoot would have been met in all probability.

In event of this property being taken over by a Company, I would strongly urge that the mistakes of former years be avoided, and let the first object of any new Company be to further develop the lodes already partly opened up and extend levels to locate others that are known to exist but not yet seen at depth.

In connection with the Bell Hill Mine it must be remembered that it is many years since it was worked as a "Lode" tin proposition, when appliances were, to an extent, crude, and more important than all, tin was a price varying from £60. to £90. a ton. The latter consideration in itself will account for its lying idle so long, but with the increase in the market value of the metal it should be an inducement to re-open those mines carrying lodes, and, with systematic work, despite the increase in wages and materials, should show a handsome profit.

GENERAL INFORMATION:

The mine is situated on that rich belt of rich alluvial and lode tin bearing country occupying the high ground lying above the Cascade River.

The sections occupy both sides of the spur running in a direction and falling away from Bell Hill. Both sides of the spur have been extensively, and successfully worked for alluvial tin for many years. There still remains between 15 and 20 acres of shallow alluvial ground yet to be worked and known to carry good tin. This

(6)

area, if judiciously worked, would probably pay for all developmental work, down to the present tunnel level, and show a profit that would appreciably assist to carry on other sections of work.

On walking over the area already sluiced, a very large amount of loose boulders and forkings are seen, and although these have been picked over many times, there still remains a large quantity, carrying rich tin in places. Even those loose rocks and rounded boulders in which no tin is visible, on being crushed, show excellent prospects of tin, and, providing a mill were in full operation, would pay to pick over for treatment.

The result of sluicing this area is that 20 acres or more of the granite bottom has been clearly exposed which affords an excellent opportunity of viewing the lodes laid bare on the surface. At first glance the fissure lodes both large and small appear to run in indiscriminate directions, but, on closer examination, it becomes evident that they have a fairly definite strike to the north-east. A glance at the plan illustrates the different lines of strike and how they converge in places one with the other. Beyond the point of convergence it might be expected that they would continue as one lode, but it will be seen that they cut right through one another - perhaps showing a slight displacement near the point of intersection. This feature does not appear to be referred to in previous reports, but it should be specially noted as it will be of important practical value in the future working of the lode at depth.

MINE WORKINGS:

The plans and sections will assist to illustrate the position of the several lodes and their course, width etc. There are fine, well defined ore channels outcropping at surface which are again seen in the main tunnel workings at varying depths from very shallow to 200 feet. What may be termed the Main Lodes have a strike varying from 65 deg. to 85 deg. N.E., and, as previously mentioned, there is a secondary or cross lode system that, in three instances, has a strike of N. 30 deg. E.

In addition, and near the tunnel entrance, there is a network of small greisen formations that at a depth may be of importance, but for the present can be passed over as the smaller group of ore channels in what appears to be a very extensive system of lodes. Those mentioned above are all on the north side of the hill, but on the south side just above the brow, there is a large prominent lode that has been exposed by the sluicing operations. This lode carries veins and splashes of tin in places, but nothing is known of it below the surface outcrop. Near the S.W. corner of Section 9516 another defined lode is seen, so it would appear that if the drives from the tunnel levels are extended in the direction of these lodes, they are practically certain to be found, and probably others not yet exposed.

MAIN LODGE:

First opened on Crown of spur where an open cutting 40 feet long shows a lode channel from 4 to 6 feet wide. This lode has been cut in the main tunnel at 462 feet in and a rise put up to the surface and connecting with the open cutting. This rise really starts on a branch lode (No.3) for a short distance before it trends south towards the Main Lode. Unfortunately, there is no reliable information regarding this rise only that the lode is continuous for the whole distance of 200 feet. The main lode where cut in tunnel has not been driven on at that point, but at 74 feet in the west level a crosscut 27 feet south intersected the lode where it is 9 feet wide, and opened for 20 feet in length.

No.3 LODGE:

The following is a brief description of this lode which is mentioned now as it is closely associated with the Main Lode - in fact it junctions with that lode in the east drive at 35 feet where the

total width of the ore channel is 11 feet. In the west drive the lode averages 4 feet wide and followed for 125 feet, but at this point, for some unexplained reason, the level left the lode on a N.W. course and continued in 50 feet country rock to 210 feet and stopped. A glance at the plan will show that if this drive is continued on its present course, it will intersect at least three lodes seen on the surface, one of them called No.2. The winze is 40 feet deep and it is stated that it was sunk all the way in rich ore for a width of 4 ft. 6 in. On this lode the only stoping to be seen in the mine has been done at a height of about 18 feet right above the level and directly over the winze. From this stope and from the winze some 300 tons were treated and said to return 9 tons of tin or an average of 3%.

No.4 LODE:

The main tunnel was continued 78 feet from the rise and cut No.4 lode, but the drive has fallen in and the lode can only be seen in the East drive at 35 feet where it is 2 ft. 6 in. to 3 ft. wide. The East drive is open for 78 feet but at this point it has fallen in and there is no information as to its actual length.

No.2 LODE:

Is cut in the Main Tunnel at 275 feet and a short drive extended N.W. for about 15 feet. This is a strong lode averaging 5 feet wide and the downward continuation of a surface outcrop that can be definitely traced for some hundreds of feet on the surface. This lode shows other minerals in the form of iron and copper pyrite to a small extent, but so little is done upon it that its characteristics cannot be determined. If the drive is extended further to the North-west the lode will essentially intersect No.3 lode, and in fact very interesting developments may occur when this and the level on No.3 lode are extended to the north-west.

WATER:

It is scarcely necessary to state that one of the essential considerations is an effective water supply, both for hydraulic-ing the alluvial ground and perhaps for mill power purposes. At present the area is served by a Water Race, the intake of which is some miles distant near the "Star of Peace" Company's section on the Cascade River. About halfway along its course this race reaches a well constructed dam with a holding capacity of 6,000,000 gallons, and when full, supplies two heads of water for a six weeks continuous sluicing run. The race enters the property near the S.E. corner of Section 9525, and commands the whole of the area on both sides of the spar which takes a N.W. direction. A lower level Race owned by the Cope's Creek Central Tin Dredging Co. flows through the sections passing just in front of the main tunnel entrance. Some further reference is made to this race elsewhere.

In addition to the above there is a well constructed dam in proximity to the intake of Messrs. O'Brien's Race, over which an option has been secured. This dam commands a fairly large catchment area and includes a number of creeks running from the east and south-east towards the Cascade River; the dam is well constructed and at present has a capacity of 5 to 6 millions of gallons. This can be considerably increased, however, as the bank at the N.W. end has a fall of 8 feet and if this were brought up to level, the capacity would be materially added to.

Just below the last dam referred to, is the old site of the "Star of Peace" battery, and going down the course of the Cascade River for about 15 chains is an excellent site for a new dam. At this point the granite forms part of almost a natural bank on either side of the stream.

I would strongly recommend that all available Water Races

and sites be secured. The option over the dam above referred to should be exercised, and an 80 acre section applied for in the vicinity which will include O'Brien's Intake, Robert's dam, and the new Dam site abovementioned.

POWER:

Whilst advocating the securing of all water races and rights that are available, it would not be advisable to depend entirely upon water for power. I am assuming that eventually the mine will be equipped with a milling plant and as a standby, I would recommend that a steam or crude oil power plant be installed to ensure continuous running all the year round. It is hardly necessary to state, in view of this recommendation, that for certain months of the year there is invariably a shortage of water, and an instance of that is just being experienced all along the East Coast.

GEOLOGY:

This need not take much space, but a brief reference is necessary, perhaps only in a general sense, seeing that many geological points are referred to in other parts of this report under the heading of General Information.

The granite area under notice was at one time covered by a portion of that extensive belt of Silurian Slates and sandstones which traverses the country from, say, Ben Lomond on the south to the Coast line on the north, which includes the gold fields of Mangana, Mathinna, Mt. Victoria, Alberton and Warrentinna.

During the process of cooling of the granite, mass fissures and cracks resulted which form vents for the rising vapours and tin bearing solutions. These fissures represent the consolidation of the decomposed and altered surrounding rock filling up the spaces under partly atmospheric and chemical influences. The altered granite rock is called greisen and is formed by the action of mineral solutions on the granite itself and left practically with only quartz and mica as its constituents parts. Other minerals are associated with the lodes in the form of copper pyrites, tourmaline and iron pyrites, but not in appreciable quantities.

ROADS:

The property can be approached by roads from three different directions connecting with Braxholm, Ringarooma and Weldborough. These roads were made some years ago but, during the war period, were allowed to get into disrepair with the consequence that all three are in urgent need of attention - more particularly that from Braxholm. The road from Ringarooma is fairly good for three or four miles but the last two miles before reaching the mine are very bad, but £150. to £250., it is stated, would make it fit for vehicle and possibly motor traffic. Since I left the mine I understand the work of repairing this portion on the road has been taken in hand.

The best route to the mine would be from the Legerwood Railway Station, through Ringarooma, a distance of about 8 miles. With the road in decent repair, any heavy machinery could be transported to the mine without difficulty.

FUTURE WORK:

It should be the main object of any new Company to further develop the lodes already exposed, and extend drives to intersect new lodes seen on surface but not yet opened up at a depth. The north-west drive, if continued, will intersect several lodes and a main cross-cut is needed to cut those lodes seen on the south slope of the hill.

I have drawn a cross section plan to show that a lower level tunnel can be driven and a convenient site has been marked, showing

showing that by driving about 1000 feet the main lode will be reached and at a point 144 ft. 6 in. below the level of the present tunnel. This lower level tunnel is mentioned as a future consideration only, as there is plenty of work to keep any Company engaged in the present tunnel level.

When required there is an excellent mill site on a convenient small spur about 150 feet N.W. from the marked stump at proposed new tunnel site. This site is a convenient one to serve the transport of any milling ore from the present main tunnel, and, providing the lower level tunnel were driven, all milling material would gravitate to it.

SAMPLES & ASSAY RESULTS:

The samples were taken from eight different places and marked from A to H in red on plan. A brief description is as follows:-

A.	From a point 90 feet long West level No.3 Lode from roof of level for a width of 5 feet	2.75%
B.	From Main Lode end of crosscut at 74 feet on West Level Taken over a width of 9 feet	0.47%
C.	No.3 Lode from roof of level directly over winze at 40 feet in Taken over a width of 4 ft. 6 in	0.37%
D.	No.3 Lode in ^E last level 20 feet from main tunnel Taken over a width of 3 ft. 6 in.	0.68%
E.	East drive 60 feet in at junction of No.3 and Main Lodes Taken over a width of 11 feet 6 ins.	0.63%
F.	From Main Lode over full width of 7 feet 6 in. in Main Tunnel	1.12%
G.	East drive on No.4 Lode 2 ft. 6 in. wide 38 feet along level	1.5%
H.	No.2 Lode at 275 ft. in Main tunnel, 4'6" wide		6.55%

From the foregoing report it will be gathered that I am favourably impressed with this property, and the results of samples for assay show that a highly payable average should be maintained. The lodes are so well defined in their horizontal and downward extension that one can reasonably anticipate their continuation for great lengths and depths.

The property, therefore, is one that I can confidently recommend to investors and one that if handled in a systematic manner, should eventually result in a highly payable proposition.

(Sgd.) Wm. H. Cundy
Mining Engineer.

Launceston,
17th December, 1925.

Smelting Works,
Launceston,
16th Dec., 1925.

THE MOUNT BISCHOFF TIN MINING COMPANY.

THIS IS TO CERTIFY that I have analysed eight samples
of lode mineral received from Arthur Hart Esq., with the following
results:-

A	2.75%	pure Tin Oxide
B	0.47%	" " "
C	0.37%	" " "
D	0.68%	" " "
E	0.63%	" " "
F	1.12%	" " "
G	1.50%	" " "
H	6.55%	" " "

(Sgd.) Claude J. Penman
Metallurgical Chemist

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ASSAYS BY W.W. DODS, ANALYST, MELBOURNE - 2/12/1926.

Assays made from lode 10 feet wide in the tunnel gave: 15.7% Tin
and 22.7% clear concentrates assaying 69.4% metallic tin.

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70 feet lode gave: 45.9% Tin
65.3% clear concentrates assaying 70.4% metallic
tin.

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