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PRELIMINARY REPORT ON MOINA-TIN
WOLFRAM-BISMUTH PROJECT
EMBRACING S&M & ALL NATIONS MINES

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MOINA TIN-WOLFRAM-BISMUTH PROJECT
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Prelim. Rep. on Moira Tin-Wolfram-Bismuth
Project, embracing S & M & All Nations Mines
(4, 5?) copies - copy 1

C.A. Hills
by 14/7/52
(LOFTVS - HILLS)

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on
Moina Tin - Wolfram - Bismuth Project
embracing
S & M and All Nations Mines

by
G. Loftus-Hills M.B.E., D.Sc., M.A.I.M.M.

Object of this Report

The intention at the present juncture is to present in concise form the salient fundamental elements of the proposition and the essential steps to be taken immediately to lay the foundation for full development of the enterprise.

The Minimum Basis

If we had to confine our attention to the proved lodes in relation to the leases already secured there would emerge a sound mining proposition based on the following lodes:-

	(No. 2 Lode proved for a length of	900 feet.
	(No. 4 Lode " " " "	1400 feet.
S. & M.	(No. 5 Lode " " " "	600 feet.
	(No. 6 Lode " " " "	800 feet.
	(N.W. Branch " " " "	300 feet.
All Nations	Main Lode " " " "	600 feet.

It must be realised of course that the S. & M. lodes are almost completely worked out above No. 3 Adit or No. 1 level. The shaft opened up No. 2 level at 75 ft. and No. 3 level at 150 ft. Development at those levels was confined to No. 6 lode and N.W. Branch; these are stoped above No. 2 level but only partly between Nos. 3 and 2 levels. However, Nos. 2, 4 and 5 lodes are untouched below No. 1 level.

The S. & M. Lodes thus enumerated were the basis of very successful mining operations between 1908 and 1918 during which the S. & M. Syndicate (London) paid annual dividends of upwards of 50%. The average width of the lodes as worked was 12 to 15 inches. Stopes were cut to a width of 4 to 5 feet and sometimes even wider; thus 75% of the material milled was wall-rock. The annual through-put was 5,000-6,000 tons. The yield was 1.75% of concentrates.

The All Nations Lode is from 10 to 20 inches wide and has never been worked properly. It is practically untouched below No. 2 Adit level. Past crude methods have yielded 2% wolfram concentrates from the stone broken. If worked similarly to the S. & M. it can be relied upon to produce 1.75% wolfram-bismuth concentrates from the stone broken.

The minimum basis to be visualised is an annual through-put of 6,000 tons with the production of 105 tons of concentrates.

Additional Possibilities.

All past operations at both S. & M. and All Nations have been confined to the Prominently exposed

quartz lodes. Of the 7 lodes originally located at the S. & M. only 4 have been explored and developed. The North-West Branch from No. 6 Lode was a later development, and was never recognised as a Counter Lode. It would indeed be strange if it were the only one as Counters occur as a system and not as an isolated individual. Others were never looked for.

It is by no means certain that Nos. 1, 3 and 7 lodes do not deserve attention.

The discovery in more recent years of a group of lodes north of No. 2 Adit demonstrates that the old S. & M. Syndicate omitted to adequately explore. There are 4 of these lodes closely spaced with widths of from 8 to 12 inches. Their structural relationships to the other lodes has not yet been demonstrated.

And now we must turn to take cognisance of the outcome of my recent investigations. It must be realised that my knowledge of the genesis of the ore-deposits of Western and North Western Tasmania and their relationship to geologic structure is far greater than it was in 1915. Deciphering of actual geologic structures themselves has advanced enormously during the past six years. I went to Moina armed with this knowledge, hoping for enlightenment far beyond the bewilderment of Twelvetree's time. I found it.

The S. & M. lodes strike east-west and pass from sandstones and quartzites to the east into skarn-rock to the west. This skarn-rock is metamorphosed limestone. The contact between the rock units runs north-south and the beds of each dip westwards conformably at 35 degrees. - 45° This contrast to the regional east-west strike of the rock series was emphasised by Twelvetrees and puzzled him. The explanation now emerges that the S. & M. structure is an anticlinal fold with axis east-west but plunging steeply westwards. Lodes Nos. 1 to 6 are in the southern half of the fold. The northern half of the fold is buried beneath the basalt and has never been entered or seen.

The economic significance of this lies in the following sedimentary rock and magma structures:-

(1) The fractures represented by Nos. 1 - 6 Lodes are an inherent by-product of the folding and can be expected to characterise the whole fold. How many are in the unseen northern half of the fold?

(2) The granitic magma must rise as a cupola within the fold. This accounts for the conversion of the limestone into skarn-rock. It is important to realise in this connection that the primary tin deposits of the World are located in and above granitic cupolas. Thus we have at the S. & M. an individual cupola giving its concentrated effect. The granite exposure to the east and south-east is a distinct structure - magma unit and did not produce the S. & M. mineralisation.

As a corollary to this structural interpretation there follows an intriguing possibility. Since it is abundantly clear that intense mineralisation has occurred at the S. & M. and since there is much evidence of crumpling and shearing within the fold, it follows that the conditions are present for the occurrence of replacement deposits as distinct from the known quartzose fissure fillings. The first hint of such an occurrence was reported by Twelvetrees in 1913 when he recorded bismuthinite in the skarn-rock at 692 ft. in from the portal of

3.

No. 3 Adit. The full significance of this was never realised. Recently, however, J. Godwin located on the east side of glory-hole where the ore-pass to No. 3 Adit reached the surface a deposit in the decomposed skarn-rock rich in tin and wolfram. This is definitely a replacement deposit, quite appreciably silicified but not exhibiting itself as white quartz. It is 5 - 6 feet wide but has not been traced longitudinally or vertically as it stands as a bank on the edge of the glory-hole. It is very difficult to understand how it was missed when the pass was holed through to the surface, and yet it was undoubtedly not spotted; perhaps the weathering over the 30 years since has altered the appearance to enable differentiation from the adjacent unreplaced skarn-rock. Such a position is not unprecedented in mining.

Now, if this replacement deposit continues a few feet westwards and downwards to the No. 3 Adit it must have been passed through in driving that adit. It is quite possible that this happened as the miners would be overwhelmingly quartz-conscious. This was before W.E. Hitchcock was in charge of the mine. And now an interesting piece of evidence has to be recorded. Recently, during the removal of the mullock-dump from No. 3 Adit for road-metal, the Godwins spotted some truck-loads of material clearly different from the rest of the dump. They gathered it up and washed several bags of concentrates from it. When it is realised that in driving No. 3 Adit the spoil was dumped to provide a graded tram-line to the mill, the position in which the material was found would correspond to about 400 ft. in the adit. This is just about where the replacement deposit could cross. It was the same sort of material according to the Godwins.

At this stage it is well to remember that the quartz-miners from Ballarat and Bendigo working at Hannan's in the northern part of the Kalgoorlie field threw away as mullock the first specimens shown them from the Golden Mile to the south. Did something like this happen at the S. & M.?

The All Nations lode has a structural environment different from that of the S. & M. It is not within an anticline. Rather does it seem to be on the southern limb of an anticline and there is some evidence that it may be in a syncline. Such a syncline could be that which would lie south of the S. & M. plunging anticline, but further field work is needed to clarify this problem.

It is clear, however, that the All Nations lode as worked up to the present is on the southern limit of a belt 100 - 150 feet wide which has been a zone of movement. The stratification within this belt differs from that both to north and south and shows signs of readjustment within the belt. Veins of quartz carrying wolfram are irregularly orientated through the belt. The possibility is thus visualised that a low-grade zone may exist much wider than the 10 - 20 inches of concentrated mineralisation so far worked. Cross cutting would be needed to explore this. No such cross cutting has yet been done.

The total length over which underhand stoping and shallow adits along the lode have been carried out is about 1500 feet. About 600 feet of this is within the 10 acres. The remainder is to the eastwards of the eastern boundary of the 10 acres.

The Essential Immediate Steps

It now becomes quite clear that certain steps

must be taken to secure control of additional areas covering the possibilities indicated above.

- (1) Of prime importance is the area to the north of Lease 11973 and 53M/51, east of 53M/51 and north of the disputed 15 acres of Molesworth and Turnbull. This could be covered by pegging at the N.W. corner of 11973 as the S.W. corner of a 250 acre Special Prospector's Licence.
- (2) Ignore and forget for the present Molesworth and Turnbull's 15 acres.
- (3) Take whatever may be considered the most promising procedure to secure the area east of the All Nations 10 acres. The total length of the All Nations Lode is 1500 feet. Molesworth only has 600 feet of this.
- (4) It would also be advisable to secure the area west of 11973, 10793, 46M/51. These I note are the subject of two applications - 30 acres and 80 acres.

In regard to actual work on the field, the reopening of No. 3 Adit is imperative. This is only a small job, but is important both to look for the Replacement Lode and as a preliminary to unwatering the Shaft. I am informed that the Water-race has been kept in good order. This should be checked and the penstock got ready to take the pipes to the Shaft as this water and power could be used for unwatering.

It would be as well in addition to approach the Hydro-Electric Commission re extending their line from Reebea to the mine.

It is advisable that the Mines Department be asked for a copy of the Mine Plans of the S. & M. Such plans are only supplied to the actual lease-holders and it will therefore be necessary to present evidence of firm option agreements.

The work at present being done by Molesworth at the All Nations is not urgent. In fact it may result in embarrassment if he opens up a bunch of rich ore, which if left may be stolen. It would be better to leave any work on the Mill until the reconditioning of the S. & M. mine is well on the way.

(Signed) C. Loftus Hills.

Hobart.
14th July, 1952.