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REPORT ON MR. A.C. NICHOLS' MINE, FROME RIVER

Location and Access:

This mine is situated on the Frome River about three miles to the north-east of Weldborough in north-eastern Tasmania.

Access is gained by cart road from Weldborough. This road is about 3½ miles long and has a rough surface and steep grades. Weldborough is connected by good road with Herrick the terminus of the north-eastern railway, and by road with the remainder of the State.

Leases:

The following leases are charted in the name of A.C. Nichols - 9280/M of 20 acres, 5445/M of 5 acres, 7274/M of 1 acre and 5963/M of 2 acres, while application 9766/M has been made for a 10 acre lease.

Geology:

The country in the vicinity of the leases is occupied by granite of Devonian age. The normal granite is the coarse grained type, with porphyritic crystals of felspar (plagioclase). In the vicinity of the lodes and mine workings the granite appears to be a medium even grained orthoclase type.

Shallow deposits of alluvial and detrital material occur along the Frome River and the banks thereof.

Economic Geology:

A considerable amount of tin ore has been won from the alluvial and detrital deposits in the vicinity of the above leases. Sluicing operations were at the time of the writer's visit being conducted on the northern leases where virgin detrital deposits still exist.

In addition to these secondary deposits, primary ones also occur in the mine leases. The most important primary lode the F.B. lode occurs on leases 5445/M and 7274/M. It has a bearing of 315 degrees and a vertical dip. The width ranges from 6 to 12 feet. The two walls are well defined and consist generally of the orthoclase granite. The lode material consists of a medium to coarse grained admixture of glassy quartz and a greyish-green micaceous mineral. The cassiterite is not easily visible in the ore and must occur as fairly fine particles. Fluorite appears to be the only gangue mineral in addition to the above. Chalcopyrite and bornite and probably also pyrite occur to a small extent and also the secondary copper minerals malachite and native copper. The oxidation of the sulphide minerals has resulted in brownish coloured and pitted patches throughout the material.

Near the southern boundary of 5445/M and in the river bed to the south thereof, a quartz vein occurs on the eastern side of the lode. The vein is 2 to 3 feet wide and is of ordinary white reef quarts. This quartz is apparently devoid of cassiterite. The lode at this locality consists of a number of independent veins throughout a width of six feet of granite.

Going north-westwards, the lode makes into the solid ore described above while the quartz vein diverges from the lode until it is 10 to 12 feet distant therefrom.

The lode crosses the river into the southern part of 9280/M where an excavation has been made on it, but has not been exposed in the timber country further to the north-west.

Several veins in the central portion of 9766/M (formerly 7622/M) have been thought to be the north-westerly continuation of the lode but they appear to be to the north-east of the line of the lode.

On 7274/M and part of 5445/M the granite to the south-west of the F.B. lode is generally of a soft nature and contains numerous narrow tin-bearing veins. The granite is an even-grained type and the veins are parallel to the main lode. Both fine and coarse cassiterite were obtained from the soft granite and contained veins, and while the bulk of it probably came from the veins, it would appear from statements made, that some of the ore may have been obtained from the soft granite. Towards the south-east the granite is harder and the veins are in some cases wider. The veins are composed of white quartz, white mica and cassiterite. The upper 12 feet of the granite is the porphyritic plagioclase type while underneath this is the orthoclase granite with pegmatite at the junction.

Material which can be Treated by Sluicing:

(a) Alluvial and Detrital

Practically all the deposits of this nature have been sluiced from the sections south of the Frome River. It is stated that some of this ground was treated by the Emu Company and was exceptionally rich.

On the sections north of the Frome River a fair amount of the ground has not been scrubbed and would appear to be virgin ground. At the time of the writer's visit, sluicing operations were being carried out in the central portion of 9766/M to the south of Hibernus Lake. The ground consisted of 2 to 4 feet of surface soil, sub-soil and detritus. The granite bedrock contains numerous narrow veins of dark quartz which would appear to have shed tin ore into the detritus. The cassiterite is generally coarse in size. From statements made as to results obtained it would appear that the ground is generally of a payable nature. It is shallow and easily sluiced, the only drawback being the scrub which has to be removed. Prospecting by means of shallow shafts would easily prove the extent and value of the remaining virgin ground.

(b) Soft Granite:

The soft granite and contained tin-bearing veins (described above) have been treated by sluicing methods,

A hole of approximately 1½ chains in diameter has been sluiced to a maximum depth of 40 feet, coarse and fine cassiterite of brown and dark types was obtained. The last run is stated to have yielded 3 bags for the fortnight. The material had to be elevated by hydraulic elevator with a lift of 27 feet. To the south-east the

granite became harder and the sluicing was confined to one of the most important of the series of veins.

It is stated that two to three acres of the soft granite occurs to the south-west. The extent and value of this could be determined by shafts or bores, or alternately the ground could be sluiced as before, the payable nature being determined by the actual results obtained. The workings were not available for inspection sufficiently (on account of water) to determine whether the softness of the granite is due to superficial weathering or actual lode action. Both causes are likely ones and it may be a result of both.

For more efficient working it is stated that a deep tail race should be brought in from the Frome River at a cost of £200. This would enable the tailings to be handled more satisfactorily.

Lode Mining:

The soft granite and contained veins would judging by the results of the sluicing operations, be too low in grade to be mined. The only material likely to be suitable as regards grade etc. is that of the F.B. Lode described above. As already stated this lode has fairly definite walls, is 6 to 12 feet wide and is vertical.

It has been worked by Mr. Nichols for its full width along a length of 7 chains by open cut methods. The workings were full of water at the time of the writer's visit, and the depth could not be ascertained but it is stated that it averaged 30 feet. The maximum depth was probably 40 feet.

The ore was transported up an inclined tramway to the treatment plant, the power being supplied by a Pelton Wheel supplied with water under a pressure head of 150 feet, and driving a winch.

The treatment plant consists of a 5' head battery which can crush up to 60 tons per week with a 10' hole screen. The only saving device is a sluice box. Riffles are placed in the box as it fills, when it is run down and cleared every fortnight. The tailings are streamed every 3 or 4 months.

During the past three years that Mr. Nichols has been working the lode, he has won 30 to 35 tons of the tin ore, the usual fortnightly return being 8 to 10 bags from 110 tons of ore.

The successful working of the lode depends largely upon the grade of the ore. Judging by the past results (8 to 10 cwt. from 110 tons) the ore would average 0.36 to 0.45 per cent of cassiterite or say 0.25 to 0.31 per cent of metallic tin. A grab sample of several pieces of representative ore gave on assay a result of 0.40% metallic tin.

Conclusion:

Both alluvial and lodes occurs on the property. The alluvial is situated north of the river and is up to 4 feet in depth. The extent and value

could be readily determined by shallow shafts.

The soft granite and contained veins to the west of the F.B. lode has also been sluiced. The extent and value of any remaining part of this deposit could also be determined by shafts or boreholes.

The F.B. lode has been worked for a length of 7 chains, width of 6 to 12 feet and depth of 30 feet. The values are 0.25 to 0.31% metallic tin as determined by assay and 0.4% by a grab sample. These values are probably sufficient to render the mining and treatment of it profitable while open cut methods can be employed. As underground mining methods have to be employed, the costs thereof would be greater and the chances of success somewhat lessened.

Sgd. P.B. Nye

GOVERNMENT GEOLOGIST

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