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REPORT ON THE TIN SPUR MINE

INTRODUCTION

This report is supplementary to that written in 1915 and appearing in Bulletin No. 29 of the Geological Survey. Since the issue of that publication a considerable amount of development work has been performed thereby providing much further information relating to the deposits. Developments have not yet reached the stage at which the prospective value of the deposits can be estimated, but the results so far obtained are very encouraging and provide sufficient information for the design of operations to that **and**. This report deals only with the recent developments on the Magee ore-body.

AREA SITUATION ETC.

In accordance with the recommendation made in Bulletin No. 29 the original lessees of the two 40 acre sections 7902M and 7903M, now forming the property of the Tin Spur Mining Company, amalgamated their interests. The Company's leases now enclose the richest of the known deposits of tin ore in the district. The property is conveniently situated on the Northern slope of Tin Spur about a mile south-west from Round Hill. The road from Sheffield to Lorinna passes through the property within five chains of the outcrop of the ore-body and a branch road connects with Staverton railway terminus, nine miles distant.

DEVELOPMENTS

Prior to the formation of the Tin Spur Mining Company about eight months ago, very little development wark had been performed. Recent improvements made by the Company consist of the excavation of a water race from Falls Creek to a point 84 feet above Magee's prospect adit on Section 7903M, the laying of an eight-inch pipe main to the workings, and the open-cutting of the ore-body 30 feet in depth and 70 feet in length. The breaking and removal of the ore material and gaugue rock is performed by the agency of water under a head of 84 feet operating through a three-inch nozzle. The effectiveness of this means of operation is limited by the increasing hardness of the rock and the depth of the open cut. Soon the method of excavation through mine openings will be adopted. The open-cutting of the ore body has revealed its nature, and half a ton of concentrated tin ore has been recovered in the operation. This output represents only a small proportion of the tin content of the ore-bearing material the greater part of which has been dumped for future treatment.

THE ORE BODY

Tin Spur deposits occur in an area of sharply folded rocks of Ordovician and Silurian ages. Representatives of the Ordovician are igneous schists, slates, and limestones; and the Silurian are conglomerates and sandstones. The formations of both divisions have been intruded by bodies of Devonian granite and quartz porphry which produced the deposits of tin ore. The conglomerate crown of Tin Spur is sharply broken on the North fall forming a great escarpment over 100 feet high and nearly a mile long.

Talne from the cliffs completely covers the underlying porphyry-invaded sandstones and quartzites, and effectively protects the ore bodies from the agents of erosion. The invading porphyry penetrated but did not completely intersect the overlying conglomerates and sandstones which apparently formed an effective barrier to its upward movement. In consequence of this the channels through which the ore bearing solutions ascended terminated also at that horizon. Subsequently the ore bodies were exposed in places by the denudation of the sedimentary cover, but they have not been greatly reduced at any point by erosion. From this it follows that the tin content of the ore body may be expected to continue in undiminished proportion to a depth of several hundred feet below the outcrop. The lode system exposed in the open-cut consists of four sills of quartz porphyry from three to ten feet thick intercalated with bands of quartzite dipping at a low angle to the east of south. The porphyry varies to an aplitic rock consisting of quartz and orthoclase. It is of fine grain size soft, and almost completely decomposed. The secondary micas, gilberlite and sericite, are abundantly developed and are usually accompanied by tin ore. Cassiterite (tin ore) however, is more commonly associated with quartz and limonite (derived from marcasite by exidation) and topaz. A striking feature of the occurence is the almost total absence of tourmaline. The carriterite is found in aggregates of well-developed crystals implanted on quartz, or with limonite and quartz filling joints and openings in the quartzite. It occurs also in porphyry replacing the felspar component, and again as short lenses in that rock. In parts of the ore body very rich concentrations of tin ore are found, especially in the quartzite. The fine grained porphyry is evidently an offshoot of the quartz-porphyry dyke rock exposed underneath the conglomerate cliff rock.

GENERAL REMARKS

Attention should be confined in future to the exploration of the ore body by means of adit cross-cuts one could with advantage be driven from the level of the open cut, and, if the results of this work prove satisfactory, a main adit should then be driven from road level. The object to be aimed at is the intersection of all the sills of porphyry up to the conglomerate cliff, which indicates a line of faulting and may indicate the position of the main ore channel. In any case these workings will provide the easiest and cheapest means for testing the value and extent of the ore body.

Consideration should not be given to the erection of milling and concentrating machinery until these development works have been carried into effect and until an adequate reserve of profitable ore has been opened up. It is commonly, but erroniously, held that the erection of concentrating plants during the early stages of development enable the Mining Company to derive revenue from the ore recovered in the exploratory stage thereby decreasing the amount of capital required to place the enterprise on a profitable footing. This policy in the past has had a ruinous effect on the mining industry and should be discouraged.

The sill-like form of these deposits had not been recognised heretofore consequently the work of the earlier operators was not laid out to the best advantage. Prospect shafts passed through alternate

hands of rich and poor material, and adits were driven underneath outcrops of rich ore, failed to intersect the deposits at predetermined points. These failures were due to a misconception of the nature of the deposit and led to the abandonment of the mine before the ore bodies had been tested. It is considered that the main body of ore lies towards the conglomerate cliffs, therefore, it is recommended that an upper level crosscut adit be commenced without delay. The proposal to extend the water-race to section 7902M in order to sluice the tin bearing detritus on that property is regarded with favour as the removal of this material will expose any ore bodies outcropping there. The work thus far performed has been confirmatory of the opinion expressed by the writer in 1919, and the results may be regarded as satisfactory.

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