UR1928B/31-36

ABERFOYLE TIN NO LIABILITY

Head Office, 422 Little Collins Street, Melbourne.

MINERAL LEASES : 9223/M 80 acs., 10141/M 40 acs., 10153/M 80 acs.

These leases are situated on an elevated terrace on the foothills extending from the southeast slope of the Ben Lomand Mountain Range, the latter being a prominent land mark of north eastern Tasmania, its summit rising to an elevation of a little over 5000 feet above sea level.

Access to the mine is made by a branch road from the Avoca-Storey's Creek road. The distance from the former is about 14 miles. The road is hilly but well suited for motor traffic.

TOPOGRAPHY -

The area may be described as a plateau lying at an elevation of approximately 2000 feet above sea level. It is deeply dissected by Aberfoyle Rivulet flowing to the east, whilst Story's Creek, which lies to the south west, has cut a deep channel in the granite rock which outcrops in that locality.

In the vicinity of the mine workings the area presents a strikingly level surface extending over approximately a square mile. The watershed from the higher ground in the direction of the mountain range causes a good deal of surface accumulation in the wet season. The Aberfoyle Rivulet has cut a deep channel a short distance to the east, which will afford a ready means of surface drainage by the construction of open channels thereto. To a limited depth the valley of Aberfoyle Rivulet gives facilities for exploring the area by tunnelling.

GEOLOGY. -

The tin bearing area is occupied by a comparatively narrow belt of metamorphic slates and sandstones of Cambro-Ardovician age. The intrusion of the granite into these sedimentaries has been responsible for a considerable amount of fracturing, narrow fissures have been formed into which tin bearing siliceous solutions, derived from the cooling granite mass underlying them, found their way and were deposited.

In addition to tin ore, other accessory minerals associated with the lode quartz are iron pyrite and small quantities of wolfram. These minerals are common associates of the vein quartz gangue in other portions of the district.

The tin occurs in the form of well crystallised light brown coloured oxide, in segregations also as veinlets on the marginal faces of the gangue rock, forming a division between the latter and the wall rock. In some instances it is encrusted on the slate wall necessitating the inclusion of portion of country rock in mining operations. Small reticulated stringers often rich in tin oxide penetrate the country in places 20 inches or more beyond the lateral extension of the vein itself.

The bedding planes of the rock have a general north westerly strike, dipping westerly at a high angle. The main tin bearing veins assume a strike of practically due north.

A short distance to the east of the outcrops are two parallel quartz veins about 73 feet apart, they conform to the strike of the strata and are exposed on the edge of the valley of Aberfoyle Rivulet. These veins are not known to be tin bearing to any appreciable extent, they are much bigger and stronger bodies of stone than those of the main workings, they probably represent fault planes. Cross fractures in the vicinity show tin bearing quartz leaders, and, where these intersect the fault planes, larger natural concentrations of tin ore may be found.

At other points where surface excavations have ben made small quartz veins, which are invariably tin bearing, have been exposed.

So far as present operations have been carried out, the main deposition of tin appears to have taken place in the vicinity of the shaft workings. In these; a crosscut through the zone of mineralisation, a number of parallel quartz veins have been intersected, these carry an erratic distribution of tin oxide. The veins vary in thickness from 2 to 3 inches up to 20 inches. As they belong to a definite fracture system they will be persistent along their strike and dip.

Apparently this series of veins represent branches from a much larger parent vein. This idea receives its credence from an examination of the workings where it is found that the most westerly of the group lies at a much higher angle than its neighbours and the most easterly is at a lower angle than any.

MINE WORKINGS -

These consist of two shafts sunk to a depth of 60 feet and connected by a crosscut at that depth. Several other shallow shafts have been sunk but there is not sufficient work done to render them of any importance in the way of mine development.

At the main workings the shaft sunk on the western side of the ore channel is vertical, that on the eastern side followed the underlie of a vein 20 inches wide to a depth of about 30 feet. Where an intermediate drive was extended a few feet both north and south on the lode subsequently a connection was made to that cross-cut at 60 feet level from main shaft.

From the 60 foot level some driving has been done on the same lode. Going north the vein as followed on the footwall for 12 feet a slight variation in direction, apparently left the vein in the wall. At 32 feet where the drive terminates the extension of the lode was again located on the footwall side of the drive. A parallel vein is here opened up on the western or hanging wall side of the drive.

The latter is no doubt the northerly extension of one of the easterly veins passed through in the cross-cut. This vein is not very well defined consisting of a main vein about 2 feet in width and small lateral stringers of quartz. The mineralisation here occurs over a width of 4 feet. The country rock is very favourable looking black slate, considerably broken, requiring strong timbering to support the roof. On the eastern side at end of drive the quartz vein is well defined.

Going south a drive was extended on the footwall vein a distance of about 40 feet. At this distance the vein is represented by several small leaders rich in tin oxide. On the several veins passed through in crosscut bottom level no development work has been undertaken.

The vein on the hanging wall portion of the main (pump) shaft has been driven on southerly a distance of 12 feet. At the time of writer's examination of the workings this drive was inaccessible owing to the pump not being able to keep the water under full control.

From the above it will be noted that the amount of exploratory work is very limited. Some difficulty has been encountered in supporting the workings on the footwall portion of the zone owing to the very broken character of the country rock.

Some surface prospecting has been carried out by means of small shafts, but these have done little more than proving the extension of the tin bearing leaders northerly through the Aberfoyle Mine leases beyond the northern boundary.

Some work has been carried out on McCormack's lease consisting of any underlay shaft sunk to a depth of 32 feet on a tin bearing quartz vein 4 to 6 inches in thickness. The shaft at the time of the writer's visit was filled with water. The vein material as represented on the ore heap at the mouth of the shaft consists of characteristic vein quartz with veinlets of tin oxide on the marginal faces. This vein is on the strike of those in the main workings of the Aberfoyle Mine.

One of the most promising surface outcrops is exposed some distance south of the main workings, it being near the northern boundary of Section 10141/M. A tunnel was driven in from the west side of the lode and cut it at a very shallow level. The ground is very soft; at the point of intersection with the lode an excavation has been made through to the surface which has since collapsed.

ORE RESERVES -

The mine, being in the initial stages of development, no computations regarding ore reserves can be made.

EXPLORATION -

The conditions existing for the efficient exploration of the area are somewhat unusual but since the future success of the mine will depend upon the location of larger bodies of payable stone than those exposed in the workings the question as to future development is a matter calling for serious consideration.

The work of shaft sinking so far carried out has undoubtedly shown better prospects than the surface outcrops indicated, although far from being of payable value owing to the narrow character of the veins a progressive improvement as indicated at the shallow depth attained should be of sufficient encouragement to persevere on the same lines of development work. Sufficient information has now been obtained to serve as a guide to future work. It would be hopeless, in the light of present developments, to expect a junction of the veins, if such does occur, at a depth of less than 150 feet of the surface. It is a wise policy to concentrate work at or near the point where the most favourable indications of tin ore occur. Under the circumstances, the most definite method of testing the ore channel at a deeper level is by sinking and crosscutting. In view of the fact that a compressor plant has been erected on the mine full advantage should be taken of its use in developmental operations.

DIAMOND DRILLING -

This, as a means of prospecting, has many disadvantages in a locality where ore veins are small and ore contents erratic. Any expenditure incurred in boring is of no value for subsequent operations, permanent openings, that is, shafts and crosscuts, would necessarily have to follow drilling work if ore of suitable grade and in sufficient quantity were located.

Diamond drilling used as an adjunct to shaft sinking and crosscutting in prospecting operations would serve a very useful purpose.

SURFACE PROSPECTING -

The location of the ore channel on the line of strike by means of shallow surface excavation is a very useful help in determining its continuity where conditions are favourable. The flat nature of area in the vicinity of the mine and the heavy accumulation of surface water would make it a difficult and expensive method during the winter months. Surface drainage by means of open channels could be cut to the edge of the valley of Aberfoyle Rivulet, but the expenditure necessary to carry this into effect would more than offset any information likely to be gained from the surface outcrops if located.

TIMBER AND FUEL -

Ample supplies of timber for mining purposes sufficient to serve for many years to come, can be provided at a minimum of cost in the vicinity of the mine workings; this also applies to fuel supplies as well. Trees unsuitable for timber can be used as fuel.

WATER SUPPLY -

An unfailing supply sufficient for steaming and ore dressing purposes could be procured from the Aberfoyle Rivulet, either by pumping at a point opposite the works or by the construction of a water race to tap the stream higher up. A survey of the locality is necessary to definitely determine length of race necessary.

ESTIMATION OF TIN CONTENTS -

Any samples taken from the ore veins exposed in the workings would merely serve as indicators of the approximate value and could not under any circumstances be regarded as a true representative of the veins as a whole.

The only method on which reliance could be placed in sampling the ore would be to take a portion from each skip or bucket of stone as it is removed from the face, over a given period. The whole of the sample put aside should then be broken to a convenient size for quatering and division. If the average weight of stone in the bucket or skip is known the quantity which any particular sample represents can be determined and its tin content estimated by assay. In breaking stone from the face either in driving or stoping, a certain contamination by more or less barren wall rock is unavoidable, hence when taking a sample from the veins as exposed a higher grade of stone is likely to be taken for assay than would be possible under actual productive mining work.

The ore heaps lying at the surface representing the material removed in actual mining work would serve as a more reliable guide as to the average tin content of the stone.

It would however, be a difficult matter to express a definite opinion on this question without being acquainted with the methods employed in breaking the stone and what precautions are taken to ensure as far as is possible consistent with efficient work the elimination of the country rock from the tin bearing stone.

In overhead stoping operations on an ore body of this description a much better grade product could be mined than would be possible in driving or sinking, the difficulty of keeping the wall rock separated from the lode material would not be so great.

Then again, a totally different set of conditions may be confronted at a depth of 100 feet or more from the surface. Should several of the veins junction giving an aggregate width, sufficient for stoping without breaking the wall rock, providing the tin content did not vary, a much higher average grade product for milling purposes would result.

There are many factors relative to sampling the ore of this mine which would tend to give misleading results. The erratic distribution of the tin ore in the stone would when sampled give a variable result for each successive foot driven on the course of the vein. The characteristic aggregation of tin oxide occurring in the vein stone have a marked tendency to break up into a finely divided state when the gangue rock is being broken out. The veinlets of tin ore on the margin do not exhibit this tendency to anything like the same degree.

The accumulation of ore stacked at the surface which has been broken out in the course of developmental operations is the best guide in making an estimation of the average tin content of the veins. There is, however, and undue proportion of country rock included with the ore. If the same conditions continue it would be possible to eliminate a good deal of the former by a rough system of selection during stoping operations.

A sample taken from the ore heap at the surface assayed at Geological Survey Laboratory, Launceston, returned 0.93% tin oxide by vanning, a chemical assay of the same sample gave 0.78% metallic tin.

The sample was taken roughly from the surface of the heap and cannot be regarded as a true representation of the whole, but is sufficient to serve as a guide as to the average quantity of tin contained in it.

MILLING AND CONCENTRATION

A five head stamp battery and concentration plant with steam power unit is in course of erection at the mine.

The information respecting the general character of the ore mined during the past few months should be sufficient to convince anyone with a knowledge of ore concentration that a more unsuitable method than that of crushing with a stamp battery could not possibly be devised.

The ore, as represented on the heap at the mouth of the shaft, consists almost wholly of barren stone, by far the greater quantity of tin present is in a fine state, the remainder being in the form of coarse lumps of tin oxide with a small proportion only attached to the gangue rock.

A separation of approximately 65% of the tin contained in the stone lying at the surface could be made by simple box sluicing. To crash this ore and subject it to concentration on reciprocating tables would involve a much heavier loss in tin, than would be represented in the oversize thrown aside in sluicing.

In the latter method no capital cost to speak of is required. The water pumped from the mine, if augmented to a small extent, would be sufficient for sluicing purposes.

The ore as raised from the mine could be dealt with from week to week. The over size would be forked out in the usual way and the fine tin oxide dressed up to a marketable product with practically no expense other than the small amount of labour necessary.

At a later stage, if larger quantities of stone were being produced from the mine, the question of a complete concentration plant, designed to suit the character of the ore developed would be considered.

GENERAL REMARKS -

Those responsible for the early development of the ore veins exposed in this mine have failed to appreciate the peculiar structure of the geological formations and in consequence the company has little to show for their heavy outlay and the long time taken to bring the mine to its present immature state of development.

Expenditure on milling and concentrating plants is not warranted until it can be assured that regular deliveries of the ore from the mine can be maintained.

(It is nommonly but erroneously held that the erection of metallurgical plants during the early stages of development enables the Company operating the mine to derive revenue from the sale of the ore mined and concentrated during that stage thereby decreasing the amount of capital required to place the enterprise on a profitable footing). In addition the erection of extensive buildings preparatory to the more extensive exploitation of the ore bodies before the actual value has been determined cannot be regarded as justifiable work. Except under extraordinary circumstances mining development should always precede surface expenditure.

In conclusion the writer desires to convey his appreciation of the assistance rendered and information supplied by Messrs. K. Prout Webb, Hooper (Mine Manager) and his assistants.

(sgd.) J.B. SCOTT

STATE MINING ENGINEER

Mines Department
Hobart.

19th June, 1928