

REPORT ON
SECTION NO. 9679 - 80 ACRES
MOUNT CLAUDE DISTRICT
CHARTED IN THE NAME OF V.P. JONES

Location and Access

The Mount Oliver Tin Mine is situated in the Mount Claude mineral district, comprising Mineral Lease No. 9679/M, charted in the name of V.P. Jones.

Access to the locality is by main road from Roland to Lorinna which passes within less than a mile of the mine. From Roland to the point of turn off the distance is 10 miles. Roland is the terminus of the branch railway from Railton Junction on the Western Line passing through Sheffield; to the latter it is $8\frac{1}{2}$ miles, and on the Roland 14 miles.

Railton Junction by rail is $15\frac{1}{4}$ miles from Devonport, one of the chief shipping ports on the North-West Coast. The district is well served by roads from Devonport and other centres. The route traversed by the road from Roland is somewhat hilly, but on the whole is well-graded and suitable for motor traffic.

Connection from the road to the mine is by a steeply graded track 70 chains in length commencing at the crossing of Tin Spur Creek then taking a general south-westerly direction to the mine workings.

Topography

The workings are situated on the crest of a high ridge or spur extending from the peak of Mount Oliver in a north-westerly direction. To the west of the spur is the valley of the Forth River while on the east flows Tin Spur Creek. The crest of the ridge in the vicinity of the workings has an altitude of 1400 feet. Its southerly termination - the summit of Mount Oliver - is 2,000 feet above sea level. The valley of the Forth River lies at an elevation of 800 feet below the workings.

The spur has a gentle slope to the north terminating at the junction of Tin Spur Creek and the Forth River about a mile from the workings. The Sheffield-Lorinna road winds round the northern portion of the spur. Access to the mine workings can therefore be made from the road on either side of the hill.

History

It is now over 30 years since the discovery of tin was recorded in the locality although many years prior to that time the surrounding country was the scene of much activity in the search for gold and other minerals.

The only work carried out on the mine before the present Syndicate commenced active prospecting operations consisted of a short tunnel driven from the western side of the hill and some trenching work higher up the hill to the south - east. Farther south some old shallow surface excavations can be seen, this work having been done in the early days of the field in the search for gold. To the north of the present workings on what is known as the Tin Spur Mine some intermittent sluicing work has been carried out for some years past on shallow tin-bearing detrital

and decomposed lode material. The inadequate water supply available would prevent continuous work consequently very little attention has been given to the locality in the way of active work for some years past.

Economic Geology

The general geology of the district is fully dealt with by A. McIntosh Reid in Geological Survey Bulletin No. 29.

Three distinct lode formations have been located on the section. What is known as the east lode which has a general strike of $N45^{\circ}W$ is a siliceous tin-bearing formation occurring in sandstone country rock. Where exposed on its southerly extension in a surface excavation it is about 10 feet wide and consists of silicified sandstone in which occurs small irregular short veinlets and bunches of black tin oxide. In addition it carries a fairly regular distribution of finely divided grey tin oxide. The lode here dips westerly at a steep angle. The hanging wall country in appearance differs but little to the lode itself. The cleavage faces of the wall rocks frequently show a thin layer of black tin. This is particularly noticeable in the surface rubble scattered about on the hillside.

The footwall country is much softer than that of the hanging wall. The former has been subject to some decomposing influence, probably due to the oxidisation of pyrites, a former constituent of the lode, in conjunction with organic vegetable matter. The depth to which the softening influence extends has not been determined. The width at the point examined is about 11 feet. Beyond that it is fairly hard siliceous sandstone carrying a little tin on the jointing planes. The extension of this lode has been located over a distance of 400 feet. At the most northerly point where exposed in a shallow excavation it shows a width of 2 feet between well defined walls dipping easterly. The footwall country at this point is finely laminated slate. The alteration in dip is probably local due to a thrust in the strata through the intrusion of a porphyry dyke a few chains to the westwards.

The "West" lode is roughly parallel to the eastern lode, the difference in strike being 15 degrees. These two channels and that known as the Yellow lode would converge at a point some distance south of the workings, probably in the vicinity of the ironstone outcrops formerly prospected for gold. The West lode has been traced on the surface over a similar distance to that of the east lode. The southerly extension of the former so far as traced overlaps the latter in the direction of strike, a distance of 240 feet. The lateral distance between these two lodes is roughly two chains.

The "West" lode differs in character to that of the eastern one. The former where exposed at the surface is hard and crusted consisting chiefly of limonite - a derivation of iron pyrites - showing enrichments of tin in black crystal form. The enclosing country rocks are hard and silicified, the fracture planes and cleavages often showing facings of fine black tin crystals. This lode being closer to the intrusion of porphyry the effects of metamorphism shown by the almost complete silicification of the adjacent rock formation is very marked.

The porphyry dyke is exposed in cliff-like form

about $2\frac{1}{2}$ chains to the south-west of the workings on this lode. On bare rock outcrops between these two points small veins of crusted limonite rich in tin and running parallel to the lode can be seen.

The third formation known as the Yellow lode strikes $S65^{\circ}E$. It has been located and a small amount of work carried out at a point some seven chains SW of the northern workings of the "West" lode. This lode formation consists of soft sandstone stained a yellowish colour by oxide of iron leached from a gossaneous vein in the centre. Small thread-like veins of tin are showing in the more solid portions of the lode material. Dish washings over a width of four feet show very encouraging prospects of fine tin oxide.

These several lode formations on which only a comparatively small amount of work has been done show very good prospects of "free" tin on the surface outcrops; evidence however points to the fact that at the time of their deposition the tin oxide was associated with pyrites which has since by atmospheric agencies become oxidised to limonite as in the "West" lode. In the E lode the oxidisation has been more complete, the iron as well as the sulphur constituent having been completely removed for some depth below the outcrop, leaving the original silica constituent of the ore in a more or less skeleton form. The primary ore of the "West" lode being more pyritic than that of the E, a secondary product of higher iron content would result.

The depth to which the oxidisation occurs has not been determined; it will probably extend to a greater depth in the eastern than in the West lode and is likely to vary at different points along the same lode formation.

In developing lodes of this description it is only to be expected that pyritic ore will replace the oxidised cappings at a moderate depth below the surface. This can be proved by actual developmental work only.

Prospecting and Development

On each of the three lode formations located a little prospecting work has been undertaken.

East Lode - This lode as stated has been traced on the surface for a length of 407 feet. It runs parallel to the Spur outcropping on the eastern side near to the crest. Good facilities exist for its development from the eastern fall of hill by tunnelling, but as it dips to the W each successive tunnel to test it at depth would necessarily increase the distance to be driven to intersect the lode.

A scheme of development to include this lode can be accomplished in conjunction with the two other lodes from the western fall of the hill.

The work so far carried out on the E lode consists of some trenching, surface excavations on the hill side and a shaft 50 feet in depth.

At the south end a fairly deep open cut has been put across the formation, exposing a face 17 feet in depth. In making this excavation a width of 25 feet of siliceous sandstone was passed through. This material carries a little tin, principally on the cleavage faces. Between this and the lode 11 feet of soft decomposed sandstone almost black in colour was met with. The remaining distance of 10 feet is the lode formation consisting of easy working silicified

sandstone. Dish prospects taken from this gave good prospects of fine grey tin oxide.

Occasional small veins and bunches of black crystal tin oxide occur, chiefly in those portions of the lode having a porous or honeycombed structure. The lode formation has a definite wall of harder silicified sandstone. The latter has not been penetrated for more than a foot or two, but from indications obtained in the trenches across the outcrop farther N, the limit of tin-bearing material is confined to the channel exposed in the cut.

At a point on the outcrop 60 feet to the N a shaft has been sunk to a depth of 50 feet. In sinking the first 16 feet was carried through lode material similar to that exposed in the open face described in which a regular distribution of tin occurred with some enrichments. At this depth the same soft black stained non-tin bearing sandstone passed through in the open-cut was encountered. Sinking was continued through this material to a depth of 50 feet without change. At this depth a drive was sent out easterly a distance of 16 feet. The decomposed formation was passed through and the harder siliceous rock underlying it was reached.

This work proved definitely that the lode at this point assumes a westerly dip. Although high up on the hill side a good deal of water was met with making the work of sinking through the soft material rather difficult as well as retarding progress through it necessitating constant bailing by means of bucket and windlass, also rendering it necessary for close timbering to support the ground. Providing the water is not too heavy valuable information concerning the character and value of the lode at depth of shaft would be gained by putting out a drive westerly to intersect the lode channel. Should the water prove too heavy a short tunnel put in from the eastern fall of the hill to the E cross cut from shaft and carried on to cut the lode would serve the same purpose. This work would serve as an expeditious means of proving the lode only and would not be of any material advantage for subsequent developmental operations in any comprehensive scheme laid out for productive work in conjunction with the working of the western lodes. The shaft being closely timbered from the surface, an examination of the lode could not be made.

To the north of the shaft as far as the lode has been traced several shallow surface excavations have revealed similar grade of ore in the outcrop.

At the most northerly point located a small pit has been sunk on the lode to a depth of 5 feet. Here it is two feet in width between well developed walls and dipping easterly. The country rock on the west side is slate. The variation in the dip is probably only local. Further sinking would no doubt prove this. The lode material is similar to that exposed in other parts of the lode and shows tin freely.

West Lode - The outcrop of this lode has been traced for a distance of 400 feet along the western portion of the Spur. The approximate strike is S60°E being a variation of 15 degrees from that of the east lode. At the most northerly point located some recent prospecting work has

been carried out. An open face on the steep hill side has been cut in on the lode for a distance of 10 feet which here is composed of moderately hard siliceous gossan averaging 4 to 5 feet in width. The wall rocks are of hard silicified slate.

A short distance to the N of the open face a shaft has been sunk to a depth of 7 feet on the lode from which very good quality ore was obtained, the estimated average value being 2% tin. Encouraging enrichments of tin can be observed in this portion of the lode.

Some years ago at a point 80 feet vertically below these surface workings a tunnel was driven from the W side of the hill a distance of 62 feet which cut the lode. At the intersection the lode channel is 4 feet wide, containing a little tin and gold.

The present operators put a rise 5 feet on the lode from the back of the drive. Fairly soft gossan was cut showing over a width of 3'6", carrying fair tin values. The ground at this depth is much more easy to work than that nearer to the surface.

"Yellow Lode"- The positions of the workings on this lode have already been referred to. Some shallow trenches have been cut across the formation and an excavation carried into the hillside along the course of the lode. The face here is 8 feet deep showing fair tin prospects over a width of 4 feet.

In the centre of the face is a gossaneous seam about one foot thick; on the footwall side of this the lode material is light-coloured decomposed sandstone; on the W side is similar soft material for a few feet. Extending further W the country rock hardens, consisting of laminated siliceous rock of gossaneous character with threads of tin oxide showing prominently on the cleavage faces. Under foot on the lode the ground is soft and from a drill hole put down to a depth of 9 feet the cuttings gave fair prospects of tin.

In altitude these workings are 15 feet above the N workings on the W lode.

At a point 40 feet NW on the lode 20 feet below workings described, a tunnel has been driven south easterly on course of lode a distance of 40 feet. The face shows similar lode material to that exposed at the surface face; the tin content is low. Further driving is necessary to prove the lode at this depth.

The surface soil and rubble in the vicinity of the respective lodes show good prospects of tin by dish washing.

The comparatively small amount of work carried out on the property is sufficiently encouraging to warrant a continuance of operations on a vigorous scale.

There is not sufficient work carried out to enable data to be obtained on which to base an estimate as to the probable average value or quantity of ore.

Taking samples for assay in the present immature state of development would not serve any useful purpose. Tin can be seen in practically all the surface exposures and

dish washings from the lode material invariably show very good prospects. In lode outcrops of this character surface enrichments usually occur, consequently a capping showing high tin values cannot be taken as an indication that similar values will continue below the altered zone.

The facilities for developing the lodes by tunnel work for a depth of several hundred feet below the outcrops at a minimum of cost are very favourable.

A drive sunk on the course of the 'West' lode from the level of the open face above the old tunnel would give much valuable information concerning the value and extent of this lode. Such work would also fit in for a general scheme of productive work if the prospects obtained are sufficiently favourable when that stage is reached.

It will probably be found advantageous to prospect the E lode from the drive on the 'West' lode by a cross-cut easterly. In subsequent work all stone mined will be delivered to the west side of the hill. Consequently in formulating a scheme of prospecting and developmental work provision should be made with that object in view.

In the event of it being decided to drive S on the course of the 'West' lode it is probable as depth is attained below the outcrop due to the rise in the hill, that pyritic ore will be met with.

In the initial stages of development it would be advisable to carry out developmental work in order to prove the quantity of oxidised or free milling in the first instance. Assuming that as stated pyritic ore is found to occur in driving at the level referred to, it would be advisable to drive another tunnel on the line of lode S at a shallow level, say 50 feet vertically above it. Connection by rises between these could be made for ore productive purposes as required. The prospecting of all three lodes by shallow level tunnels is to be recommended to prove definitely the quantity and value of free milling stone available. Provision should also be made for dealing with pyritic ore in addition to the free milling stone if the values in the former are sufficiently high to show a margin of profit.

Conclusion and Summary

In addition to the favourable facilities for mining and developmental work on the lodes, the conditions for transport and milling site are also good.

Delivery of the ore from the W side of the hill to a site near the bank of the Forth River would be a comparatively easy matter by means of an aerial rope-way a distance of less than a mile of a grade of about 1 in $1\frac{1}{2}$.

A plentiful supply of water for concentrating purposes can be obtained from the Forth River. The development of the various lodes has not by any means yet reached a stage in which consideration can be given for the design and erection of a concentrating plant.

The present prospects of the several lodes are sufficiently encouraging to warrant their systematic development in order, as stated, to prove the quantity and value of ore available.

When that is decided the question of a treatment plant

can then be considered in the light of ore reserves available.

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