PINE HILL AREA + CURTIN PROSPECT.

(Report no 1)

4-1-67

2nd. January 1962.

PINE HILL AREA. CURTIN PROSPECT.

Refer: Ward, 1909, pp clxxxix, Sections 3650M, 3651M.
Aerial Photograph, Dec. 1961, Pine Hill enlargement, Pts 3 & 16

The two tunnels given this name are beside the Confidence Saddle - Renison Bell H.E.C. track to the north and south respectively of the saddle the track crosses immediately north of Confidence Saddle. The more northerly is referred to as the Curtin No. 1 tunnel and the other as the Curtin No. 2 tunnel.

Notes on the Prospect.

The area lies partly within the gabbro body and partly in the sediments to the south. A quartz porphyry dyke crosses near the No.1. tunnel and a doleritic dyke passes close to both.

Curtin No.1. tunnel, point 16 on the photo., is apparently that referred to by Ward in Section 3650M though the compass bearings do not tally. Excessive magnetite in the surrounding gabbros could cause this discrepancy.

The lode here is a narrow fissure with much quartz and tourmaline. Approx. strike and dip where I measured them was 850/90°: this does not agree with the photo. or with Ward. Estimation from the photo. is much closer to Ward's figure - see later.

Specimens PH5 and PH6 were taken from the dump of the adit. PH5 is mainly tourmaline of radiating, coarsely crystalline habit. PH6 is quartz with coarse cassiterite crystals and was found on the dump, the original location was not found.

The tunnel does not appear to be on the lode but has been extended since Ward saw it and a cross-cut has been driven to the west at the end. In the immediate vicinity of the lode the gabbro has been extensively altered.

To the north there is a quartz porphyry dyke running eastwards, approx. 20' wide apparently. Between this and the tunnel there is a large trench which has opened up another similar fissure, somewhat offset to the west. This could be the same fissure as that seen higher up the hill or another. The area is somewhat complicated by a more recent basic dyke which traverses the whole area from north to south and is similar to the dykes found in the mine.

This lode is of interest as it appears to be completely enclosed within the gabbro-type rocks which is unusual. The significance of this, if any, is not known except that the gabbros must be assumed to be:

(a) premineralisation

(b) Pre quartz porphyry and thus pre-Devonian in age.

A sample of highly tourmalinised material from the dump (Sample No 1196) assayed 0.38% Sn. (Chemical Assay)

Ward states: "Crystalline tin ore is visible in the gangue which is composed of quartz and fibrous radial aggregates of tourmaline needles.

The vein strikes S31°W, dips SE at 75°. A little work has been done by the former owners of the section but the intention has not apparently been to prove the lode, since the tunnel was driven away from it". Ward gives the bearing of the tunnel as S19°E, and the length as 40'.

Curtin No.2. tunnel, point 3 on the photo., is partially collapsed but is still accessible. The tunnel is referred to by Ward under section 3651M and has been driven on an approximate bearing of 30° in siliceous and brecciated slates. It appears to have followed some shears which have alteration associated with them. This tunnel was not sampled.

Ward says that this tunnel is 96' long and that there is no definite lode structure visible in it. He claims that a trench on the surface over the tunnel showed good tin values. Near the mouth of this tunnel there is an outcrop of a pale blue-green mineral with doubtful juxtaposition to the surrounding sedimentary rocks. McKenzie sampled this and qualitative analysis indicated that copper, nickel and chromium were absent, and that at least aluminium, phosphorous and ferrous iron were present. Chemical assay indicated no tin.

Conclusion. Curtin No.1. tunnel area appears worth further investigation for tin. The assay obtained from a randon sample from the dump is quite good enough to indicate the possibility of at least a little lode material of a free milling, coarse grained nature which might be classed as ore if sufficient were available.

Recommendations.

1. Curtin No.1. tunnel area should be thoroughly investigated and mapped on a large scale in detail, preferably with a plane table or by stadia. Further sampling to be done and the adit mapped and sampled if warrented.

2. Curtin No.2. tunnel and surrounding area to be mapped, sampled and the trench referred to by Ward found and cleared out.

J. F. Gilfillan. Geologist

Ass. to the General Manager (Min.)

PINE HILL AREA - CURTIN PROSPECT.

Report No. 2.

22.1.196~~2~~

RENISON ASSOCIATED TIN MINES N.L.

22nd January 1962.

Pine Hill Area-Curtin Prospect

Introduction.

Following my report of 2nd January 1962, I visited Pine Hill with two students on 10th January 1962, to prospect more fully the area referred to as the Curtin Prospect (Sections 3650m, 3651m, Ward 1909).

Curtin No1 Adit.

This adit was mapped and a quick tape and compass survey run to show the proximity of the trenches and the dykes. The Adit follows a zone of quartz and tourmaline in fissure like form - approximately 24" wide. This strikes obliquely across the tunnel and passes out the east wall at the south end. The fissure is steeply east dipping. The tunnel has run through the lode and the crosscut at the end has no apparent purpose as it runs away from the lode.

The rocks surrounding the lode are of the gabbro type and show extensive alteration and kaolinization of the felspars near the lode.

Some of the lode has been stripped along the west wall near the first crosscut. This is probably the source of the material found in a heap near the portal and from which good specimens of coarse cassiterite have been found.

The lode was chip sampled over a 2 foot width in two places in the tunnel:

Sample 1511, 1.77 % Sn.

Sample 1512, 1.36 % Sn.

Exposures may be seen in outcrop near the portal and 60 feet up the hill to the south in a trench, a deep trench on similar material is located about 140 feet north and down hill. This is also in the gabbro but is nearer the Quartz Porphyry dyke. This trench was not sampled. The strike, dip and form of this outcrop is still not apparent but it lies on the projected strike of the lode seen to the south.

It is hard to see why, with good specimens of coarse cassiterite so apparent, this lode has not received more attention. It must be expected that this type of lode would be patchy in character but as Ward pointed out, the tunnel does not continue to test the lode, but turns away from it.

The results of samples 1511 and 1512 cannot be regarded as indicative and a further bulk sample of a least 100 lbs should be taken covering all the lode exposures. Even this, over the small distance that the lode is visible, would only be a better indication.

Curtin No 2 Adit

This tunnel has been driven about 90 feet from the partly collapsed portal and passes through indurated, brecciated shales with extensive quartz veining in places. There is no definite lode structure that the tunnel has followed. The tunnel was probably driven to try to reach values reported in the trench further north. However the position of the tunnel does not coincide with the expected position of the quartz lode projected from above and may run parallel to it.

Three zones of mineralization were sampled in the trench, Nos 1506 and 1507 were samples of weak gossanous material east of No 1508 which was taken from a quartz-rich vein.

Vanning Assays 1506, Trace Sn

1507, 0.10 % Sn

1508, 0.08 % Sn

No samples were taken in the tunnel.

We can add nothing more yet about the green mineral found near the mouth of the adit.

Conclusions.

Curtin No 1. This lode can apparently be traced for about

200'. It contains coarse cassiterite as well as much quartz and tourmaline. I would expect values to be patchy. Three samples taken to date suggest a grade of approx 1.20 % Sn. There is scope here for further prospecting.

Curtin No 2. Examination of this area is disappointing as the tunnel does not expose the lode. Ward claims that good values were found in one place here but the prospect is very poorly developed.

Recommendations.

1. Curtin No 1. A bulk sample of reasonable size should be taken to give a further grade estimate. The down hill trench should be sampled.

2. Curtin No 2. I don't think that anything further can reasonably be done here until access and facilities in the area make it easier to open up the lode more thoroughly.

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Ass. to Gen Manager (Min).

(Plans - per original)

NOTES ON PETROLOGICAL DESCRIPTION OF ROCK SPECIMENS FROM PINE HILL.

(Notes on A.M.D.L. Report No. MP 3.0.0/337)

2nd May 1962

- 2 MAY 1962

Notes on Petrological Description of Rock Specimens

from Pine Hill.

2nd May 1962.

AMDL Report MP 3.0.0/337 confirms McKenzies field identification of t is quartz-tourmaline rock from Pine Hill as a Schorl.

A schorl is essentially a tourmaline granite in which the felspar has been completely replaced by tourmaline; micas are absent, and the resulting rock is just quartz and tourmaline.

The "Rocke Rock" mentioned in this report from Cornwall, England, is the result of complete tourmalinization of the granite.

"Schorlite" is the mineral at the iron rich end of the Tourmaline Group and has the general formula $Na\ Fe_3B_3Al_3(OH)_4(Al_3S_{16}G_{27})$. The series changes with progressive substitutions of Mg and Li for Fe in this molecule.

The high iron content in this mineral is consistant with the very extensive hydrothermal iron sulphide deposits in the surrounding area. Assuming a common origin, the latter would then be the lower temperature phase of the same mineralization. As Cassiterite is essentially a high temperature mineral, it would be surprising if coaser grained cassiterite has not been deposited nearer to the site of pneumatolytic mineraliz tion than the fine grained deposits now being worked.

Schorlite is usually associated with granites and granite pegmatites and is found in tourmalinized granites, greisen and high temperature veins-where it is often associated with cassiterite.

The absence of Cassiterite in these Microscope sections is disappointing but not really surprising. The important point is that this rock type has known associations with Major tin deposits such as in Cornwall.

The complete absence of topaz may indicate that the higher temperature zones of mineralization were not sampled or could be the result of excessive amounts of iron and a deficiency in aluminum resulting in the information of tourmaline and fluorite.

A recently rediscovered specimen in the Zeehan School of Mines Museum shows a very rich, narrow vein of coarse grained cassiterite in t is rock. Despite the loss of its label, there can be little doubt that it came from this area which must be classed as very interesting.

Conclusions and Recommendations.

1. Pine Hill and the surrounding areas appear to be favourable for possible discoveries of tin ore. Further work must be done to determine whether the boundary of the Company's Lease should be extended.

2. Conventional methods of approach must be applied but because of the forest, regrowth and scree there can be little hope of "finding" any thing which has not been seen before other than by interpretation.

3. Despite the high rainfall, I feel there may be application here for geo~~logical~~ prospecting methods. This will be more fully discussed later.

J.P. Gilfillan
Assist to General Manager (Mining)

PINE HILL AREA - QUARTZ PORPHYRY DYKES.

24.1.1962.

RENISON ASSOCIATED TIN MINES (N.L.)

24th January 1962

Pine Hill Area - Quartz Porphyry Dykes.

Pine Hill is the centre of a system of acid dykes which may be traced over a wide area. The type commonly seen on the northern slopes of Commonwealth Hill and in places towards Renison Bell township is the quartz-felspar porphyry - in places, "Granite Porphyry".

On Pine Hill however, the porphyry has been highly altered and is found as a quartz-tourmaline porphyry.

Ward first notes the occurrence of tin ore within the granite porphyry. He notes that some tin bearing veins cut the quartz porphyry and sedimentary rocks alike. The tin within the quartz porphyry Ward sees as the infilling of cooling joints. Ward continues: "----- while the tin ore was not actually observed in the latter quartz-tourmaline rock, the writer is fully convinced that the quartz - tourmaline - cassiterite vein-stuff is precesely the same material with tin ore added. That is to say, the tin bearing veins of the Pine Area are merely special cases of the quartz - tourmaline intrusions". Ward also thinks that the invasion of a quartz vein into the granite porphyry has resulted in the alteration of the granite porphyry in the immediate vicinity, and added cassiterite and tourmaline.

A McIntosh Reid (1923) claims that the cassiterite at Mt. Bischoff is an original constituent of the porphyry but much of it is also the result of pneumatolytic replacement of the felspar. "Under pneumatolytic conditions cassiterite replaces felspar in porphyry: under hydrothermal conditions, cassiterite replaces dolomite".

This theory Reid proposes for Mt. Bischoff has applications to Renison Bell also as we have at Pine Hill a high temperature zone where the interaction of highly reactive hot gases has apparently occurred giving the quartz-tourmaline - cassiterite associations and, further away, the hydrothermal, sill-like, replacement bodies in the dolomites.

Ward emphasised the need to sample the quartz porphyry - see my report 4/10/61. During December 1961, some random chips were taken from the quartz-tourmaline porphyry. This was chemically assayed - Sample No 1503 - giving 1.47 % Sn. Check assays were made - chemical assay, 1.56 % Sn; Vanning assay, 1.25 % Sn.

This totally unexpected result prompted more careful sampling and two independent samples were taken from many small chips taken at random from pebbles, boulders, and outcrop. The former sample was taken mainly on the northern slopes of Pine Hill from the sluicing rubble, with some chips from the east ridge. The later samples came mainly from the south slopes, summit and east ridge. These were chemically assayed:-

Sample No 1509, 0.21 % Sn

Sample No 1510, 0.14 % Sn

It is not possible at the moment to give any reasonable estimate of the quantities of this type of porphyry which might contain tin, but it is not unreasonable to postulate several million tons on present indications.

Conclusions

The importance of the occurrence of tin within the porphyry is very great both from a geological point of view and as a possible source of large tonnages of free milling ore.

Geologically, the presence of high temperature cassiterite at Pine Hill and possibly lower temperature deposits of cassiterite in the sill-like deposits some distance away, makes the whole intervening area of great interest economically. It also makes the area to the south of Pine Hill of possible interest as at least one dyke runs to the south-east quite close to Confidence Saddle. If dolomitic horizons should occur at depth here, there could be mineralised sill like bodies formed.

Recommendations

1. It is of major importance to determine the grade of this material. Some preliminary estimate can be made of this by careful outcrop ~~of~~ and "float" sampling.

2. Preliminary quantity estimates should be made in conjunction with the above.

3. A study of the tin mineralization could be important and the following lines of approach may be followed:

(i) From detailed sampling, test for lineal concentrations.

(a) parallel to and surrounding fault zones if recognizable.

(b) surrounding veins as suggested by Ward.

(c) along joints and other fractures.

(ii) Microscopic study of the quartz-tourmaline porphyry for details of associations and paragensis of minerals, in particular the cassiterite and tourmaline.

(iii) Make an overall study of the temperature of formation of the cassiterite on the field, perhaps by liquid inclusion methods, to test for temperature gradients within the field and moving away from Pine Hill. This would probably require specimens to be sent to University of Toronto, Canada or sponsoring a local research programme.

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