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REPORT ON THE
MOUNT LINDSAY TIN MINE
NEAR
ZEEHAN, TASMANIA.

BY
H.F. PEARSON.

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Mt. Lindsay Tin MineSection 1. Situation and access.

The Mount Lindsay Tin Mine is situated about 16 miles in a northerly direction from Zeehan and about 10 miles west of Renison Bell. The area is very inaccessible and the lack of any means of access is probably the reason why this area has not been more thoroughly tested.

When the Stanley Reward Mine was working in 1911 all machinery and supplies had to be brought in from Renison Bell by pack-horse teams. The track then ran from Renison Bell to the Pieman River over which there was a suspension bridge with a corded track from the Pieman to the Stanley River, the total distance was about 12 miles. The turn-off from this track to Mt. Lindsay is about 2 miles from the Stanley River and the track to the mine, a further $1\frac{1}{2}$ miles was also corded. The suspension bridge over the river has been down for many years and the track has fallen into a bad state of disrepair.

Present means of access is from Zeehan, a good metal road goes out for about 4 miles, from there to the Pieman River, $5\frac{1}{2}$ -6 miles, there is a pack and foot track across button grass country. The Pieman River can be crossed at the present time either by boat or by a cage on a light aerial ropeway. From the Pieman to

the Stanley River, about 10 miles, stores can be taken by pack horse, from the latter river to the mine all stores must be packed in on the backs of men due to the state of disrepair of the road. Personnel have to walk from the metal road to the mine, some 19 - 20 miles. Under present conditions, any sick or injured person would have to be carried on a stretcher for that distance.

The Pieman River is a deeply incised one and approach road making on either bank would be difficult. Furthermore the river is liable to flooding so that any bridging plan must legislate for a flood level of 20 feet above normal river level.

The Department of Mines is making a track suitable for a jeep or similar vehicle from the metal road to the Pieman River. Progress is slow as the gang is poorly provided with equipment, even so when this track is completed, it will do very little to lessen the problem of transport.

There are four ways by which access could be made to the area:

1. by a road from Zeehan
2. by a road from Renison Bell.
3. by a road from the Waratah - Corinna road and
4. by means of helicopter.

No. 1. would involve a road about 20 miles long with a bridge across the Pieman; No. 2 would involve bridging the same river and a road about 12 miles long. The

Road in No. 3 is roughly estimated at 30 - 35 miles, there are no rivers to be bridged but the country is very wild and rugged and road-building would be very expensive. No. 4 alternative seems to be the most attractive but the possibilities and limitations of the method have not been explored. The initial capital cost would be high and at this juncture would appear to be more suitable for a company with many activities to service. The problem of transport at this stage overshadows all others and is constantly recurring as different schemes of prospecting present themselves. Any engineer or other person in charge of men working in the bush would be constantly faced with the possibility of an accident and the problem of how to evacuate the injured man.

Section 2. History.

Tin was discovered on the Stanley River about 1908 and a year or so later a company, the Stanley Reward Mining Company, was formed to work the alluvial ground adjoining the river. A water race some $3\frac{1}{2}$ miles long was constructed and water was taken through 3000 feet of pipeline to provide headwater for the nozzles and hydraulic elevators. The company was unsuccessful and the mine was handed over to tributors. The quantity of water available at the head of the race was frequently insufficient and operations had to be suspended during these periods. These shortages were due to lack of rain

on the small water-shed supplying the race. Employees had to be kept on the pay-sheet while operations were suspended otherwise they would have left for more steady employment, this unproductive expenditure made operations unprofitable. The water supply might have been improved by building a dam to hold the water just up-stream from the head of the race but it was considered that the amount of ground available for sluicing did not warrant the additional expenditure.

The Mt. Lindsay mine was discovered in 1911 and was evidently prospected by a small local company. There is not much information available to show how long this company was working but it is probable that it did not operate long after the end of 1919. It would appear that most, if not all, of the ore extraction was done by tributors who finally ceased work in 1932. Since that date the mine has been idle. The tributors only extracted ore from the oxidised portion of the orebody which was easy to crush and where it was high grade. The material was crushed through a light 5-head battery (stamps each weighing about 100 lbs) and the tin recovered by streaming through boxes. It is assumed that the reason that so little work was done between the fault A - B and Tulloch Creek is due to the poor equipment of the mine being inadequate to deal with a harder pyritic ore. The amount of tin won is not available and in any case, it would be no indication

of probable tin values, bearing in mind the nature of tribute workings.

Section 3. Geology of District.

The geology of the district has been fully described by L.L. Waterhouse, Assistant Government Geologist in the Geological Survey Bulletin No.15 "The Stanley River Tin Field" issued by the Tasmanian Department of Mines in 1914. Some later work appears to have been done by the then-Director of Mines, McIntosh Reid, in 1927, any report made by him is not on record in the sources available to the writer. The area containing the Mt. Lindsay mine consists of slates, sandstones and tuffs which have been altered and in part replaced by sulphides due to the intrusion of the granite mass that forms the backbone of the Meredith Range. Mt. Lindsay mine lies on the southern slope of Parson's Hood, one of the highest points in the range. The slates sandstones and tuffs have a strike of N 80 W and dip to the south at an average of 80 degrees. The tin-bearing zone is not a "lode" as the term is generally understood with definite walls terminating the mineral contents. It is in reality a mineralised zone in which certain beds have been replaced by pyrite, cassiterite and a little chalcopyrite, the replacement by pyrite appears to be continuous in length whilst the deposition of cassiterite appears to be sporadic. The terms "footwall" and "hanging wall" used on the plan are incorrect and should not be used. The limit of the

tin deposition has been governed by some structural or similar feature and would be expected to diminish as the distance from this feature increases. Accordingly, the boundary would be an economic one depending on the price of tin and the cost of mining. As far as the writer is aware, there is nothing on record to show where these boundaries might be. The country is steep as can be seen from the contour map, covered with dense rain forest and deep loam and to obtain this information would be the first part of an intensive prospecting programme.

When Waterhouse investigated the Mt. Lindsay area, the Main Adit had been driven and the costeans and various cross-cuts and other adits made to the west of Tulloch Creek. These costeans and adits were made on a line to correspond more or less to a continuation on strike of the Main Adit. It is evident that the company found nothing of value, samples taken by Reid in the adits shewed low values and two samples taken by myself were also low grade. The costeans were partially filled at the time of my visit so no information was available from them. At the time of Waterhouse's visit, one fault with a throw of 70 feet to the south had been identified in No.1 West Crosscut. By the time of Reid's visit, two more with a southerly throw had been found in the workings of the main adit. The writer found a third in the adit area an unknown direction of throw but probably southward immediately to the west of Battery Adit.

These faults may have an important bearing on any future prospecting programme. If there are a series of them between Tulloch and News Creeks, then instead of the outcrop of the mineralised zone following more or less a straight line, it would more resemble a flight of stairs with each step going further to the south. If this assumption be the correct one, the costeans and adits between Tulloch and News Creeks would be to the north of the mineralised zone. In any campaign to evaluate this area the following should be done;

1. correlate the magnetite-pyrrhotite bed to the zone worked by tributors between faults E - F and G - H
2. using this bed as a "marker", trace the mineralised zone between Tulloch and News Creeks and between Tulloch and South-East Creeks.

This bed is about 30 feet wide, unaltered on the surface and can be easily identified.

The deposition of the tin minerals originated from the granite mass forming the backbone of the Meredith Range. It is believed by Waterhouse that the contact between the granite and the surrounding sedimentary rocks dips underneath the latter at a flat angle. It is not known whether the mineralised zones in the sedimentary rocks continue as such into the granite of Parson's Hood. This aspect is important as whatever occurred at the surface contact would probably be repeated at the contact beneath the outcrop in the sedimentaries and this contact might be quite shallow in the region of Tulloch Creek and

Battery Adit.

Section 4. Labour

Labour is very scarce in the Zeehan district even for established mines with plenty of amenities. Fantastic rates of pay are said to have been offered for good miners to do certain work but the appeal was unsuccessful. To consider any kind of work at Mt. Lindsay with the present labour supply and transport conditions is out of the question.

Section 5. The mine.

The plan supplied with this report is from that made by the then-Director of Mines in 1927, about 5 years before the tributors ceased work. On the original plan he states "Compass survey not reliable because needle influenced by large pyrrhotite and magnetite bodies, the plan, therefore conveys an idea only of relative positions". The interpretation of this is that the various rises, crosscuts etc in the Main Adit are in correct relationship to one another, but the Main Adit is certainly in an incorrect relationship to the Battery Adit and it is almost certain that the Main Adit is an extension of adit marked C - D and accordingly should be further to the north. This would then coincide with the general outline of the adit as drawn by Waterhouse in 1914. This being the case, samples 6 - 8 - 9 - 10 - 19 (in black) would be relative to adit C - D where it is marked "Open Stope". The only

underground workings that were accessible were Battery Adit and portion of the rise put up from No. 3. Crosscut. In the Battery Adit, access was possible along the drive to the 3 - compartment shaft and the continuation of the drive about 15 feet long past it. Battery Adit was itself blocked by a fall just north of the "t" in "adit". Water level in the shaft was at the level of the plat in the drive so that the crosscut at the 70 feet level could not be examined. An attempt was made to get down the rise off No.3 Crosscut but we were only able to get down to a crosscut 60 feet from the surface. This rise appears to be about 160 feet deep and to clear the 100 feet below the crosscut was beyond the physical capacity of the men at my disposal.

Fault A - B which is not shown on Reid's plan actually divides the mine into two distinct parts; that portion to the west of the fault where primary sulphides occur at the surface and the other east of it where oxidised material extends from the surface to at least 25 feet below the adit level as recorded by Waterhouse in 1914. This is illustrated in Sketch D, it has been assumed that the last part of the shaft and the crosscut at the bottom were in the magnetite body. This assumption has two bases; one, the last mullock dump made consists of this rock and two, in 1919 the manager in his reports

stated that the last few feet of the shaft and the crosscut were in very hard rock and progress was slow.

As access could not be gained to the underground workings, no check samples could be taken there. It was particularly desirable that systematic sampling should be done of the primary sulphide ore. The percentage of tin per ton would be expected on an average to be much lower than the average of the oxidised ore. This is explained by the complete or partial removal of the iron and sulphur from the ore leaving only the siliceous skeleton and cassiterite. Although there would be the same amount of cassiterite per cubic foot of ore, there would be more cubic feet of oxidised ore per ton than there would be of primary ore. Due to the very irregular exposures of the mineralised zone on the surface between Battery Adit and Tulloch Creek, systematic sampling of even that small area was impossible, immediately to the west of the creek, the zone is covered with dense rain forest and deep loam. What samples could be taken indicate wide variations in value in a short distance. No good purpose would be achieved by endeavouring to work out any average from so few samples.

Such sampling as could be done show two things:

1. that the magnetite body is too low grade to be considered as a potential ore-body

2. that immediately to the north of this body, taken in conjunction with the sampling done by Reid, there is a zone that although variable in value, makes the area warrant serious consideration.

Although the pyritic seams are very numerous, many are tin-bearing only to a minor degree. Sample No. 13 was taken in the bottom of a hole that had been sunk on some high-grade material, probably by itself would average 50% tin. This high-grade seam was about 2 inches wide at the surface and at the depth of 5 feet had widened to about 8 inches. Three feet of sulphide material adjoining this sample assayed .1% tin, the extreme variation in value of similar mineral in close proximity is illustrating. Had sample 13 been taken where the hole was started on the surface, the result would have been lower on account of the lesser width of the high grade material. Where the distribution of the mineral occurs in this pattern, sampling at close intervals over a considerable length is essential to be able to arrive at a total value with the required amount of certainty of the correctness of the result.

As the area has been subjected to faulting as previously described, the position of the magnetite body west of fault A - B relative to the high grade zone east of it is important. If the magnetite body is to the north of the tribute workings, then the sulphide zone sampled between A - B and Tulloch Creek has not been touched between A - B and G - H and represents virgin ground.

This relationship and the extension of the mineralised zone west of Tulloch Creek can only be determined by intensive surface prospecting.

Section 6. Conclusion.

The sampling done by Reid in the oxidised zone and those samples taken by myself in the pyritic zone indicate that the area has potentialities that warrant further investigation, this cannot be carried out until the means of transport undergo considerable improvement.

The Australian production of tin is less than consumption and the deficiency will be greater when the manufacture of tin-plate is started about 1952. As two mines produce about 45% of the total output, the overall position is even more insecure than statistics indicate. An increase in consumption can be anticipated with the installation of television so that the future prospects for tin in Australia can be considered to be bright.

The Department of Mines has started an extensive geological survey of the whole area from the Pieman River to a considerable distance north of Parson's Hood, it is expected that this will take about three years. No new mining tenures will be granted in the area being surveyed until it is completed. What will be the policy of the Government towards opening up this area when the survey is completed?

and if possible, no further action should be considered until this policy has been decided except that necessary to secure a title to the ground.

I consider that an area should be secured covering the present workings and probable extensions of the lode, such a title to be one that exemptions may be granted from the expenditure covenant. I would recommend that two 80 acre leases be applied for and simultaneously applications lodged for exemptions may be granted from the expenditure covenant. The approximate position of the leases is shown on "B" in red. The Mining Act, 1929 allows for total exemption aggregating three years during the term of the lease. If an aggregate of three years exemption could be obtained, the survey might be completed and some Government policy determined. With the present transport difficulties and general labour shortage, I am unable to recommend anything other than a holding policy for the time being.

I wish to express my appreciation of the very willing assistance given by Mr. Murray Shone under most trying and arduous conditions and to Mr. Taylor, Government Geologist at Zeehan for information concerning the district.

(Sgd.) H.F. Pearson.

Samples by H.F. Pearson

Number	Width, feet	Value	Locality
1	40	less than .1%	No.1. West X-cut, from 25' to 65' from entrance
2	30	.4%	Western Adit, 1 South X-cut
3	8	2.1%	See plan C
4.	7 $\frac{1}{2}$.2%	See plan C
5	5	.5%	Battery Adit, C.L. drive to shaft to 5' south.
6	5	.2%	Battery Adit, 5'S to 10'S
7	5	.3%	" " 10'S to 15'S
8	5	.1%	" " 15'S to 20'S
9	5	less than .1%	" " 25'S to 30'S
10	5	.5%	" " 25'S to 30'S
11	2	.1%	12' S.E. from entrance Battery Adit.
12	8	.9%	See plan C
13	3	27.6%	See plan C
14	3	.1%	See plan C
15	9	1.1%	See plan C
16	5	6.4%	See plan C
17	2 $\frac{1}{2}$.6%	See plan C
18	4	.1%	Entrance Tulloch Adit.
19	10	.2%	X-cut at 60' down in rise off No. 3 X-cut
20	5	.1%	ditto
21	5	.4%	Battery Adit, C.L. drive to shaft to 5' N.
22		2.1%	Rubble from tip at shaft at Stanley Keward.

Samples by McIntosh Reid

No.	Name of working	Width	Tin content %
1	Burkett opencut	8	Trace
2	West Adit		Trace.
3	O'Brien Adit		Nil
4	West X-cut		0.1
5	No.2 West X -cut		Nil
6	Battery Adit	5	2.15
7	" "	5	2.4
8	" "	5	5.4
9	" "	5	2.41
10	" "	8	9.21
11	No. 2 X-cut	9	2.63
12	No.4 X-cut	10	0.31
13	Rise No.3 X-cut	8	0.26
14	No.3. X-cut	10	Trace
15	No.2 X-cut South	6	0.13
16	No. 1 X-cut North	10	0.76
17	Cuddy off Main Drive	4.5	0.13
18	Main Adit Drive	8	6.50
19	Open cut Main level	12	1.25
20	Outcrop	20	0.30
21	Shaft		0.10
22	No. 2. X-cut	18	2.40
23	Open stope	15	1.75
24	No. 2. X-cut	10	1.80

Description of material sampled.

Oxidised and gossanous material:-

Samples Nos. 1,2,3,4,12,19, and 20.

Primary sulphidic material:-

Samples Nos. 13,14,15,16 and 17.

Magnetite - pyrrhotite material:-

Samples Nos. 5,6,7,8,9,10 and 21.