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Tasmania Gold Mine, Beaconsfield

by W.H. Cundy and Fawcett.

5th May, 1914.

Also in Geological Survey Typed Reports 1861-1920, pp. 152-176.

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Tasmania Mine Beaconsfield

LAUNCESTON,

May 5th, 1914.

Report on Tasmania Mine Beaconsfield

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The Hon. J. E. Ogden, M.H.A.,
Minister for Mines,
HOBART.

Dear Sir,

Following instructions contained in letters dated April 3rd and 7th, 1914, we have completed a detailed inspection of the Tasmania Company's Mine at Beaconsfield and beg to submit the following report:

Before entering into the details of the report itself, it is necessary to state the conditions laid down, which may be summarised as follows :-

1. That there was no desire to question the conduct of the Mine either under former or present management.
2. That the stability of the shafts and underground workings be reported upon with estimates to be furnished of probable cost of further sinking.
3. "That the report should not only deal with the future prospects as to the occurrence of gold at a depth, but should also consider the question of the financial resources required to fully carry on the working of the Mine at Lower levels."
4. The report to be of a general character throwing as much light as possible on the commercial prospects of the Mine in view of its further development at greater depth.
5. That the fullest information should be given to the general public in as clear a manner as possible.
6. That special attention should be given to the advisability or otherwise of extending the upper workings in either direction, and the probability or otherwise of opening up shoots of stone beyond the limits of the present drives.

(V)

7. And further, that consideration be given to the question of securing additional ventilation by connection with adjoining Mines.

These instructions are clear and definite and in the following report we deal with the position as we find it, without reference to, or criticism of, the past policy of management.

FINANCIAL POSITION.

A summary of the financial results since the Mine was taken over by the English Company may be given by way of prelude.

In 1903 the new Company started with an amount to credit of working capital of £180,000

Since reconstruction in 1910 there has been called up 25,000

£205,000.

The position on March 31st, 1914, was that this working capital (less cash in hand) had been expended. 545,708 tons of stone had been mined and treated for a return of 250,116 ozs. of gold - 9 dwts. per ton. No dividends had been paid and the Company had at that date a credit balance of £10,500.

In addition, there is an estimated profit on treatment of accumulated concentrate and slime, &c., of £40,000.

It is under these conditions that we are called upon to report as to the commercial prospects of the Mine involving chiefly consideration of the probable value of the reef below the present workings and cost of further development. (Schedule A. & B.)

GEOLOGICAL CONDITIONS.

For the purposes of this report it is not necessary to enter into any lengthy detailed statements regarding the geological conditions, seeing that numerous reports have been written from time to time in

connection with the Mine itself and the surrounding locality. Some reference is, however, necessary in order to explain the deductions arrived at in other portions of this report.

The country in which the reef has been worked consists of sandstones and conglomerates striking N.W. and S.E. and dipping about 45° N.E. The strike of the reef is N.E. cutting the country practically at right angles and dipping at varying angles but approximately 50° to the S.E.

The reef varies in width, and, in places, is split in two, and occassionally three branches, by "horses" of country rock. It is in varying widths from 1 ft. to 20 ft. - this is given in a general way - the actual stoping widths being dealt with later on. The average length of the reef worked is about 1400 ft. and may be regarded as one shoot, for, although values vary, there have been few blanks and practically the whole length has been stoped down to the 1370 ft. level.

Regarded as one shoot of stone, it shows a decided pitch to the N.E. and a gradual shortening for the last few levels from 1420 ft. at the 900 ft. to 1200 ft. at the 1370 ft. Level. The middle portion on the length of the reef contains the best values which lessen towards each end. The upper portions of the reef were undoubtedly richer than those at a depth and it is evident that the rich shoots were more regular in their downward course than they have been in the lower levels - say below 900 ft. Rich portions have frequently been met with in the lower levels, but erratic in their deposition, and no definite line of pitch could be laid down.

In the upper portions of the workings a strong fault cuts obliquely across the country rocks in a north westerly direction displacing the lode channels some 240 ft. northward. This fault has been followed along its course and subsequently the displaced portion found and followed for some hundreds of feet in a west and north-west direction. This extension of the reef channel is well defined, but the quartz is very small as a rule, though fairly large masses have been found but of a very low grade.

It is also to be noted that with increasing depth the character of the reef has altered in the respect that it contains a larger percentage of sulphide minerals, chiefly iron pyrites, than in the shallower levels. The immediate effect of this is that a lesser quantity of gold is recovered by amalgamation, and a larger percentage is accounted for in the slime and concentrate.

The western portion of the reef channel ends in black gritty sandstone and conglomerate country with the hanging wall fairly defined, but, for a considerable distance after leaving the payable shoot, the ore channel becomes wider, consisting of country rock, small spurs, and threads of quartz. There is abundant evidence that the lower levels in the western portion of the Mine are in close proximity to the limestone as deposits of iron and copper sulphates and carbonate of lime are forming on the walls of the drives. It may be noted that the western portion of the Mine is generally in softer country, and more cheaply worked than the eastern.

The eastern ends of the lower levels are of a somewhat different character in that they show the hanging wall usually fairly well defined until a particularly hard natured sandstone is met with which almost approaches a quartzite in character. In this the reef invariably becomes erratic in its course and splits up into small stringers with occasional bunches of quartz of no value. Here also the limestone is not far distant, in fact, several of the upper levels have been driven into it.

The occurrence of such large bodies of water has frequently been commented upon and numerous theories advanced as to its source and extent. It seems tolerably certain, however, that the water being drained is contained within the limits of two parallel limestone deposits, some 1700 ft. apart, and running in a N.W. and S.E. direction. These limestones probably have bands of impervious rocks or pug seams bounding them, sufficient to hold the water back from other parallel water channels that exist on either side. There is justification for this conclusion when it is remembered that with all the water raised by

the Tasmania Company the mines of the Tasmania West Extd. on one side, and the East Tasmania, on the other, are unaffected by it.

PRODUCTION AND YEIDLS.

For the 10 years, 1903 to 1913, the ore raised and crushed amounted to 524,842 tons which yielded 242,143 ozs., equal to 9.22 dwts. per ton.

For the 6 months from September 30th, 1913, to March 31st, 1914, there was mined and crushed 20,866 tons, yielding 7973 ozs., equal to 7.64 dwts. per ton.

Total tons crushed 545,708, yield ozs.250,116, equal to 9.16 dwts. per ton.

There are also in stock for treatment Concentrate and Slime with a recoverable content of 24,130 ozs. which added to the above gold yield gives a total of 274,246 ozs. equal to 10 dwts. per ton.

This Concentrate and Slime will yield on treatment an estimated profit of £40,000 as shown on Schedule annexed and the treatment with the present roasting, grinding and cyanide plant will extend over four to five years. (Schedule C).

WATER AND PUMPING.

The large quantity of water which has to be dealt with in the Mine has been the cause of the greatest outlay, and is the most serious item in working costs.

During the last 8 years it has varied from £21,000 to £15,000 per annum - the latter during the year 1913, when development had practically ceased.

With a fair proportion of development the cost of pumping would be at about £20,000 per annum - a serious charge on a yearly output of only 50,000 odd tons.

The pumping plant on the Mine is in 3 units of a combined capacity of 6½ million gallons per 24 hours running at normal speed.

Two units are in Grubb Shaft with the permanent plungers at 1500 ft. and one unit in Hart Shaft down to 1370 ft.

The beds of sandstones and grits cut through by the reef vary in composition in that some are fairly hard and impervious while others are comparatively soft and porous, forming channels for the underground waters.

These latter are the so-called "wet strata" through which most of the water comes into the mine workings.

The reef itself in this Mine is not the water channel (a fact which we desire to emphasise) though where the roof is a bit more open and fissured than usual there would be some flow of water into the advancing level, before the wet stratum was cut.

As these strata are cut when driving along the reef, heavy bursts of water occur, to control which it has been found necessary to fix concrete dams in the main crosscuts near the shafts at each level, so that the flow of water to the sumps can be regulated to the capacity of the pumps until that particular wet stratum has been drained and driving can be proceeded with. Apart from the coming water or daily flow, there is a reservoir of stored water in the country which has to be pumped. The west end, i.e., west of the main crosscuts from Grubb and Hart Shafts, is the wet part of the Mine in which most of the wet strata are met. The quantity of water to be dealt with may, and probably will, gradually lessen with depth, but it will still be heavy, and have to be pumped from increasing depths.

Since the management has contemplated ceasing operations and decided until closing down only to mine the stone already developed which was likely to be payable, no driving has been done West at the 1500 ft. level, the reasons being that the values underfoot at the 1370 ft. level West were low, and that there was the certainty of cutting heavy water and so adding to current expenditure on Pumping. (Schedule 1).

Under these conditions, with no development going on except the blocking out of ore at the two levels for stoping, only one unit of pumping plant at Grubb Shaft has been at work, raising 1,600,000 gallons per day, and pumping costs have been low, amounting to £6175 for the half-year ending 31st March, 1914. (Schedule E).

VENTILATION.

If subject only to ordinary mining conditions, the Tasmania Mine would to-day, having three big shafts ~~easily~~ open, be a well ventilated Mine. The occurrence, however, of heavy Carbonic Acid Gas, probably from the limestones known to exist at both ends of the Mine just beyond the workings, complicates the matter. The difficulty of keeping the old workings open is elsewhere referred to and, during the past year or so when all expenditure has been reduced, the old Main Shaft which is down to the 1000 ft. level and is connected by direct winze with the 1100 ft. level, has been blocked up. Several sets of timber have fallen away just below 200 ft. and this with general debris has fallen to the bottom at 1000 ft. and blocked the air way that was formerly conducted from the lower levels by a connecting rise from 1100 ft. It may be stated that all the necessary gear is in position to admit of this shaft being put into thorough repair, and the cost would not be a matter of much consequence.

This matter of Gas in the Mine workings has always been a serious one and naturally increases in depth. It has caused loss of time and has, therefore, increased the costs, as at certain changes in atmospheric pressure when the gas increases in the Mine, men and contractors have to be withdrawn from their working faces and moved to emergency places which are kept open for the purpose.

This trouble has never been made much of in the Mine Reports for obvious reasons connected with the supply of labor.

It is doubtful if any system of ventilation by currents of air between shafts, however well controlled and directed, will effectively clear the Mine of such a heavy gas and it is probable that if the Mine is worked to greater depths actual pumping of the gas will have to be resorted to.

The suggested scheme for improving the ventilation of the Mine by effecting a connection with the Bonanza Shaft is a feasible one but not considered advimble. The latter shaft is 1030 ft. from Hart Shaft in a south westerly direction, and according to reliable

information, it is 1180 ft. deep. The shaft is 205 ft. from the west end of 1000 level in the Tasmania Mine, and 250 ft. from the end of the 1100 ft. level. The collar of the Bonanza Shaft is 190 ft. above that of Hart Shaft, consequently the bottom of the shaft is approximately on the same level as the 1000 ft. drive, but as the latter level is now inaccessible, it would be very costly to connect these two points, besides which the pitch of the ore shoot takes it further from the Bonanza each lift. Another disadvantage is that the bottom of the shaft is in limestone.

For the satisfactory working of the Mine in the future, it is essential that airways must be established and maintained.

FURTHER SINKING.

Under favourable conditions, and with a big output to keep up, the Mine would have another lift sunk by this time, levels out draining the country, winzes sunk blocking out the reef ready for stoping, and all preparations made for sinking the next lift.

The Mine is now quite eighteen months behind in its development, and there is not stone enough opened up, regardless of quality, to keep the mill going until another lift is sunk.

During the last six to twelve months, since it became evident that the developments at the 1370 and 1500 ft. levels were not furnishing profitable stone and that the Mine was still working at a loss, development work has been reduced to a minimum, all idea of sinking has been abandoned, and the best stone has been stoped from above the 1250, 1370 and 1500 ft. levels.

In 1912, when further sinking was being considered, as a necessary work and imperative even at that time if the Mine was to be kept going, the whole question was thoroughly gone into by the superintendent and his staff, several alternative methods considered, much correspondence passed between the local office and the London Board, advice and tenders were sought from eminent engineering firms who specialise in pumping, and a mass of information obtained which resulted in a definite scheme being evolved and its cost ascertained.

Owing to the inclination of the sandstone beds cut by the reef any vertical shaft in a suitable position to work the known length of reef, whether sunk in the footwall or hanging wall must at some depth cut wet strata.

Grubb Shaft at 1500 ft. is close to one of them and early in the next sink must enter it.

The idea of sinking Grubb Shaft another lift under these conditions was abandoned by the Management as impracticable and an alternative scheme of sinking an underlie shaft on the footwall side of the reef in a comparitively dry stratum, pitched so as to keep in the stratum, and within a short distance of the reef at each successive level, was finally adopted although not carried into effect. A drive has been made at the 1500 ft. level to the proposed site for this shaft.

The Underlie shaft equipped with electrically driven Rees Roturbo Pump would be sunk direct to a vertical depth of 250 ft. before opening out. At that depth a crosscut would be put out towards the reef and a floodgate put in, after which the crosscut would be continued to the reef and a level driven to cut the water strata.

The water would then be pumped to a cistern at 1500 ft. where the plungers would take it to the surface and the country be drained until Grubb Shaft could be sunk comparitively dry to 1625 ft., it being proposed to make each lift 125 ft. vertical.

In further development the underlie shaft would always be sunk one lift ahead of the vertical pumping shafts. This would give a dry lift which could be blocked out and mined rapidly if labour were available, further sinking being pushed on at the same time.

Details of this scheme and estimated costs are given in Schedules F & G.

Under it, with machinery to order and install it would not be safe to reckon on developing the 1625 ft. level sufficiently to keep the mill going, in less than two years.

During and after that time all ore above the 1500 ft. level which would pay costs of mining and treatment, would be broken out,

and after that the treatment of concentrate and slime in stock would go on.

It seems to us probable that the amount of water to be dealt with will gradually lessen with depth but in providing for further sinking it would not be safe to reckon on this.

As each lift of 125 ft.vertical will develop approximately 100,000 tons of stone on the anticipated length of reef, the cost of £72,000 plus further development on the level, blocking out, proportion of current pumping charges while mining the ore and contingencies will amount to about £1 per ton on 100,000 tons.

The total charges against ore developed by next lift, assuming it to be 100,000 tons would then be

Development per ton	£1: 0: 0
Mining & Treatment and all charges except development.	1: 5: 0
	£2: 5: 0

Allowing for a loss of 1½ dwts. in tailings, the whole of the block for a length of 1200 ft. by a width of 10 ft. and the depth of lift 125 ft. vertical would have to contain 12½ dwts. per ton with a recoverable value of 11 dwts.

Any quantity less than 100,000 tons of stone of quality good enough to mine and treat would increase the cost per ton- for instance, if only 50,000 tons were available the cost per ton would be £2 and pro rata for developing and pumping.

The total recovery per ton on the 53,812 tons mined and treated in 1913 was 7 dwts. 21 grs. per ton. The total recovery from 350,447 tons mined and treated in six years 1908 - 1913 was 7.91 dwts. During the last six months 20,866 tons yielded 7973 ozs. equals 7164 dwts. per ton and the Mine has made a loss.

This last return is subject to qualification. The output being small the costs per ton for General Expenses and administration have been heavy, against which, little development work having been done it has not borne its fair share of costs for development and pumping

It will be seen that considerable improvement on these results

would have to take place at the next level to make it profitable.

In estimating the costs as above no account has been taken of the capital outlay on power and pumping plant etc., on which heavy/interest and redemption would amount to an appreciable charge per annum and per ton of ore, as it is assumed that the Mine would start a new campaign with a clean sheet.

(Schedule F & G).

SINKING GRUBB AND HART SHAFTS.

If the Company were in a good financial position and paying dividends so that an extra capital cost of £20,000 to £25,000 would not matter much, we would join in approving of the underlie shaft proposal as being safe and thorough - though costly.

If further sinking is undertaken, as matter stand, it has to be done as economically as possible.

We have given the subject very serious consideration and have arrived at the conclusion that it is quite possible to sink another lift of 125 ft. vertical with the present shafts, by doing so utilizing the present splendid pumping plant and incurring no additional capital outlay for plant.

The plan we suggest would be to complete Hart Shaft at once to a sump below the 1500 ft. level and install the permanent plunger workings there, so rendering available a unit of pumping plant capable of dealing with 2,500,000 gallons per day, which, at present, is not in use.

The Western Level at the 1500 ft. to be driven to cut the water beds so draining the Mine to that level.

The sinking of Grubb and Hart Shafts to be then proceeded with, with draw lift workings to handle the water as has been done in previous sinks.

All three units of pumping plant would then be in operation when a burst of water took place and after it was mastered the shafts could be sunk concurrently or one sent ahead of the other as conditions suggested. The position is assisted by the fact that two floodgates are already built, one in the main 1500 ft. Crosscut, the other in the drive, leading to the rise which connects with the bottom of Hart Shaft.

THE RECONSTRUCTION IN 1910.

When the Company was reconstructed in 1910 it was after

7 years of work during which the whole of the working capital of £180,000 has been expended and no return whatever had been made to the Shareholders.

Grubb Shaft was then down to 1500 ft., Hart Shaft to 1370 ft. and the reef had been cut by the Main Crosscut from Grubb Shaft at the 1370 ft. level.

The circular issued by the Board at the time gives the reasons for reconstruction, shewn by the following excerpts:-

> "Necessity to provide further working capital if the deepen-
> "ing of the Mine and the exploration of the reef at the
> "1370 ft. and 1500 ft. levels are to be regarded as essential
> "for the proving of the mine below the poorer zone in which
> "during the last three or four years the operations have
> "been carried out".
>
> "The Mine has a splendid equipment".
>
> "It is not an uncommon experience for Mines to pass through
> "an impoverished zone and to eventually recover their
> "former value".
>
> "Our financial position is that we have about £5000 in hand
> "out of which we shall have to pay for Filter Press, &c.
> "£1100.

Under these conditions the Company was reconstructed so as to provide a further working capital of £62,500 of which £25,000 has been called up.

The definite purpose for which the additional capital was provided, viz., the exploration of the 1370 and 1500 ft. levels, has been achieved, and in the course of that work the Superintendent has come to the conclusion that further exploration in depth is not warrented; his opinion has been confirmed by Mr. Llewellyn after investigation, and has been adopted by the Board.

REDUCTION WORKS.

The stone as it comes from the Mine to the elevated brace at Hart Shaft passes through rock breakers to bins, whence it is conveyed by electric tram to the mill a mile away.

At the mill 40 heads of 1000 lbs. stamps crushing 4½ tons a day each through punched screens having 12 holes to the linear inch, deal with the present output.

The old 65 heads have been dismantled but if the output were increased additional 1000 lbs. stamps would easily be added- shed, foundations, &c., being there.

The pulp, after passing over the amalgamating tables, is

classified and concentrated on Card Tables.

The Concentrate is ground and amalgamated in Forwood- Down Pans, roasted in Edwards Furnaces, cyanided by agitation and filter pressed the extraction being 90% of the assay value.

The tailings from the concentrating tables is classified into sand and slime. The latter going to the storage dam and average about 3 dwts. per ton, though latterly it assays higher than this.

The plant under the new process of treating this cannot deal with the current output from the Mill, but on what is treated makes an extraction of 80% of the content at a cost of 8/- per ton.

Portion of the classified sand is cyanided by percolation but no profit is made. This sand averages a content of 1½ dwts and ½dwt is extracted at a cost of 2/- per ton.

It is stated that better extraction cannot be made without fine grinding, agitation and filter pressing, a process which would cost more than the value of the recovered gold.

(Schedule H).

EXPLORATORY WORK.

Regarding the question of parallel reefs existing or likely to exist to the North and South of the main Tasmania lode it may be pointed out in this connection that extensive prospecting work has been done by the Tasmania and adjoining companies without meeting with any tangible success. The chances appear remote for finding any parallel reefs, seeing that the country is practically driven across for many hundreds of feet. Some 1600 ft. to the south of Hart Shaft the Tasmania Company had been prospecting from a shaft 100 ft. deep and at this depth crosscuts have been driven covering over 700 ft. of country. At varying depths from near the surface down to 1250 ft. the footwall or noth country has been cut across with the object of finding other parallel reefs, whilst the shafts and crosscuts to the lode have well prospected the hanging wall country.

At 1250 ft. from Hart Shaft a crosscut has been driven 655 ft. Northward.beyond the main reef channel, the end being in clean country. At 370 feet from the main reef, a small

Irregular reef was cut and followed east for 210 ft., but, though carrying gold, it was too small and too low grade to pay.

Whilst the current work was going on at 1000, 1100, 1250 and 1500 ft., and in other levels above, prospecting drives have been put out at intervals into the footwall and hanging wall country, and, in places small veins have been followed. At the end of the three lowest levels going east the reef channel was kept in the middle of the drive to avoid missing any branch reefs that were likely to "make" off the main reef channel. At times off shoots were met with and followed a reasonable distance until proved poor or perhaps cutting out altogether.

To summarise the general conditions in the east and west end of the workings at 1250 ft. and 1370 ft. it can be said that the payable shoot has been contained within a length of about 1400 ft. and for considerable distances beyond that length the levels have been driven sufficiently far, and cross drives put out, to enable us to say that all reasonable precautions have been taken to thoroughly explore the country beyond the limits of the payable ore shoot.

The whole of the upper workings of the Mine and down to 1000 ft. are inaccessible, but the old records show that down to 715 ft. the levels were continued to the west and north west many hundreds of feet beyond the limits of the payable ore shoot.

In the early stages under the present management, a number of the upper levels were open and wherever possible the old stopes were closely examined and in places further tested with a view to ascertaining whether anything of value had been left. In some instances small blocks of ground were found containing payable quartz which was taken out as opportunity offered. These portions were, as a rule, near the east or west ends of the payable ore shoot, and, consequently did not offer much inducement to follow them beyond a reasonable distance when the ore became of low grade. As there is considerable movement and settlement always going on the keeping open of the workings requires constant attention and in the upper portions of the Mine it is practically impossible to keep them open. The existence of interbedded limestone at each end

of the Mine beyond the payable ore has been proved and unnecessary extension of levels into this, and the consequent liberation of carbonic acid gas, has had to be avoided.

CONDITIONS OF WORKINGS AND PLANT.

As stated under the head of Exploratory work, the workings above the 1000 ft. level are now inaccessible, and, owing, to movements in the country due in a measure, to the extensive openings made and to the drainage of the country, they require constant work and attention to keep open the drives, passes and airways.

The conditions of the Old Main Shaft is referred to under the head of ventilation.

Hart Shaft. Is in good condition down to 1370 ft. below which it is connected with the 1500 ft. level by a vertical winze 8 ft. x 4 ft., timbered and centred. This winze has passed through the reef at 1470 ft., so that the shaft from thereon will be on the footwall side of the reef.

Grubb Shaft. Has caused a lot of trouble down to the 500 ft. level having had to be practically retimbered to that level recently and there is still movement going on so that it requires constant attention. The upper portion goes through alluvial drifts, but below 500 ft. the shaft is in good solid country.

The condition of this shaft is unsatisfactory at present in that it does not admit of direct winding from 1500 ft. to the surface, although the capstan gear is available right through. At present the ore is hauled from 1500 ft. to 1370 ft., trucked along a connecting drive to the Hart Shaft, and then hauled to the surface.

All the winding gear, and pumping machinery, are in excellent order and working smoothly.

CONDITIONS OF UNDERGROUND WORKINGS.

The 1100 ft. level is accessible from end to end of the workings, but the western portion in particular has given trouble and needs constant repairs. Near the extreme west end and a boxed rise is open to the 1000 ft., which is the only accessible travelling way to that level. The 1250, 1370 and 1500 ft. levels are all in good repair at the present

time, but even these comparitively recent levels require constant attention also.

The stopes are well timbered and the filling is in a fairly well advanced state. The matter of timbering and filling is an important item in this Mine as the movements in the country demand that the filling should be systematically carried out.

The filling material is obtained at a surface quarry adjacent to Hart Shaft - a series of shallow drives being put in and stopes formed which are held up by old waste stulls. These stopes are allowed to remain open for some time, the timbers are then shot away, and the rock allowed to gravitate into conveniently placed passes. The material is then trucked to the shaft and sent below to the return trip of the cage. The actual filling below is so arranged that the material is sent into the stopes and, by rilling, reaches its place with little or no shovelling.

GENERAL.

OUTPUT. On the formation of the Company in 1903 it was evidently the intention to provide for an out put of 80,000 to 90,000 tons per year. It was with this object that Grubb Shaft was sunk and the Mine equipped with such powerful pumping and winding machinery. The average amount of material treated, however, has been 55, 000 tons. With this output per annum the standing charges for pumping, winding, administration, &c., overweight it and form too large a proportion of the costs per ton.

ORE RESERVES. These were estimated at 30th. September, 1913, at 41, 389 tons since then 20,866 tons have been mined and treated and no further driving has been done at the 1500 ft. level.

The Mines during the last seven months has been treated as a Mine about to be closed down as far as possible the best stopes have been worked.

Present estimated ore reserves are shewn in Schedule J.

SAMPLING & VALUATION OF ORE. A close and systematic method of sampling the reef has been in existence and the results duly recorded on the plans. The samples have been taken at intervals of 4 to 5 ft. apart, and the results recorded for all levels, rises, winzes and stopes. Consequently, a complete record of the width and value of the reef can be seen from the 815 ft. to the 1500 ft. level, with the exception of the last few

months. During the latter period sampling has been discontinued, but as the levels and rises had previously been done a fair estimate can be made of quantities and values yet remaining to be stoped above 1500 ft. The battery results for the last few months are also a reliable means of getting at the values of the working stopes.

There is a greater width of ground stoped than is sampled and it is found in practice that the tonnage of stone broken and sent to the Mill is 50% more than the estimated tonnage worked out on the sampled widths and the value per ton 33% less.

The values given in the annual reports are on the sampled widths, and are subject to this deduction of one third, to represent the value per ton of the stone as sent to the Mill.

This is meant to be made clear to the shareholder in such paragraphs as the following, taken from the report for 1913.

"The total distance opened up to the date at the 1500 ft
"level has been 940 ft., average width of quartz 7 ft.
"Average assay value just under 13 dwts., the stoping width being
"about 10½ ft."

but may not always be understood.

In this case, if the whole of the stone broken from the block were accurately represented by this sampling which is done only along one side, the value of the stone sent to the Mill would be 9.3 dwts. per ton instead of 13 dwts.

The quantity of pyrites in the stone has increased with depth and the proportion of the gold recoverable by amalgamation has gradually fallen with a corresponding increase in treatment costs due to concentrating, and the treatment of the concentrate by fine grinding, roasting, cyaniding by agitation and filter pressing.

Costs. Some economies could be effected but none of such importance as to effect the main issues being considered at present, viz., values and cost of deeper sinking.

A highly qualified staff would always be necessary to handle and control to the best advantage power and pumping plant of such capacity, and the general conditions call for the very highest skill in management.

The way to economize in administration cost would be to increase the output and so get the very best value out of all standing charges with corresponding reduction per ton of ore.

Labour. Wages, at present, are not high in comparison with other mining fields, but are subject to the conditions and regulations prevailing in Australia and may, therefore, be expected to rise.

In regard to supply of labour, the Mine is at a disadvantage in being isolated, although climate and living conditions are good.

The bulk of the Driving, Rising and Stoping and any other work that can be arranged for is done by contract.

(Schedule K).

DIAMOND DRILLING. A suggestion has been made that the lode channel might be tested below 1500ft. by the use of the Diamond Drill. We consider that little satisfaction would result, as experience shows that the reef frequently varies in width and the values also vary considerably. The boreholes might pierce the reef channel in a number of poor places, or, on the other hand, they might do so in an abnormally rich part, and whatever the results they would be unconvincing as regards the true value of the reef. Boring is not necessary to prove that the reef goes down, that is sure, and it is likely to continue to great depths.

SUMMARY AND CONCLUSION.

The Mine is practically worked out down to 1500 ft.

There have been blocks of good grade ore down to the 1500 ft. level, but the stone as stoped in bulk and sent to the Mill has been unpayable.

The reef is going down strongly, but there is no evidence on which to found expectation of increased values at the next or lower levels, though there is always a possibility of that happening.

On that possibility, and if we were reporting for Shareholders, we would not recommend the expenditure of £50,000 to £60,000 to sink the shafts and develop another lift.

We are,

Yours faithfully,

W.H. Cundy

L. Lamont.

SCHEDULES.

A Summary of Financial position.

B Comparison of Financial position for three years.

C Production and Yields.

D Quartz Treated, Gold Produced, Average Yield &c. from 1877 to 1914.

E Annual Expenditure for Pumping.

F Estimated Cost of Machinery (Underlay Shaft).

G. Cost of Developing Levels to 1625 ft. under new scheme.

G1 Cost of sinking the two Vertical Shafts.

H Retreatment Products in Stock.

I Values along 1370 ft. level west.

J Ore Reserves.

K Contract Prices.

SCHEDULE " A ".

SUMMARY OF FINANCIAL POSITION.

June. 1903.	The Tasmania Gold Mining Co., Ltd. started with a working Capital of	£180,000
	The Tasmania Gold Mine, Ltd., has called up since reconstruction in 1910.	25,000
		205,000
Mar. 31st., 1914	To Credit (liquids assets)	10,500
	Loss	£194,500

Aug. 1910.	There was to credit	£5,000
	call on reconstruction produced	25,000
		30,000
Mar. 31st. 1914.	To Credit	10,500
	Loss since reconstruction in 1910.	£19,500

This loss is now represented by value of Plant and recoverable in concentrates and slime.

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SCHEDULE "B".

COMPARISON OF FINANCIAL RESULTS FOR THREE YEARS.

For year ending 30th September	1911	1912	1913
Tons mined	53.590	54,918	53,764
Assay value to the battery in dwts.	9,436	8,252	9,219
Balance Sheet - loss on Revenue A/c	£3,653	3,736	2,703
Capital Expenditure	2, 113	---	---
Deficit.	£5,766	3,736	2,703
Excess Gold from residue heaps less treatment cost	£2,404	13,500	9,826
Deficit on Mining Operations	£8,170	17,236	12,529
Development @ 4/- per ton	10,718	10,383	10,757
" actually spent.	11,775	9,968	7,636
Difference	£1,057	415	3,121
Deficit on Mining with proper proportion of development	£7,113	17,651	15,650
Pumping with proper development should have been	£18,854	18,033	18,990
actual expenditure	19,867	17,986	14,819
Difference	£1,013	£47	£4,171
Deficit on Mining with proper proportion of development, Pumping, and Pump extention would have been.	£6,100	£17,698	£19,821

SCHEDULE "C".

PRODUCTION AND YIELDS.

	Tons.	Ozs.	Per Ton. Dwts.
1904	24238	19600	16.16
1905	43742	30648	14.0
1906	48076	32914	13.66
1907	58339	30354	10.33
1908	70272	30302	8.5
1909	53787	21850	8.08
1910	67113	20718	6.16
1911	53564	23143	8.58
1912	51899	21409	8.25
1913	53812	21205	7.87
To 31/3/14	20866	7973	7.64
	54508	250116	- 9.16
Add recoverable value of Concentrate on hand		9088	
Slime " "		15042	
		274246	- 10.0

SCHEDULE "D".

Quartz treated, Gold Produced, Average yield and Dividends paid in varying periods from 1877 to March, 1914:-

Period	Tons Treated	Gold Produced ozs.	Average per ton dwts.	Dividend £.
1877 to 1896	299,000	371,408	24.84	
1896 to 1903	198,850	199,435	20.06	772,072
1903 to 1913	524,842	242,143	9,22	
Sept. 1913 to Mar. 1914	20,866	7,973	7,64	
	1,043,558	820,959		
	1,043,558	820,959	15·7	
		28,130 (elsewhere)		
		849,089	16·2.	

SCHEDULE "E".

Showing the annual expenditure for pumping

From 1906 to 31st March 1914:-

1906.	£18,116.
1907.	21,044.
1908.	19,186.
1909.	19,260.
1910.	17,944.
1911.	19,898.
1912.	17,985.
1913.	14,819.
Half-year ending 31st March, 1914.	6,175.

SCHEDULE "F".

ESTIMATED COST OF MACHINERY FOR SINKING UNDERLIE SHAFT.

3	Generator Sets with direct coupled Alternator	£2940.	
	Generating Station Switch Gear	230.	
	Wiring Engine Room	50.	
	Tasmania Cable - 9000 ft.	3510.	
6	End Connecting Boxes	27.	
6	Straight through Connecting Boxes	21.	
	Switch Gear (Underground)	75.	
	Electrically driven Rees Roturbo Pump.	1455.	
	Testing at Works	90.	
	Piping 10" 960ft. with bolts & joints	352.	
	Extras - Bends, Tees, Sluice Valves	105.	
3	Ventura Meters with Recording Charts	550.	
			£9405.
	Duty, Freight, Shipping Charges		£3868.
	Quotation for piping, Cast Steel Fittings, Bends, Tees, Crosses, Stop Valves, Gun Metal Seats		£365.
	Cleats for Cables	£185.	
	Steam Pipes	20.	
	Bolts, Nuts, Joints	50.	
	Foundations 161 cub. yds.	697.	
	Condenser - Moving & Installing	250.	
	Oil Separator	150.	
	Engine Room Wall Cutting	30.	
	" " Flooring & Painting	100.	£1482.
	Erecting Engines, Wiring, erecting Pumps & Pipe Lines	£156.	
	Sundries	78.	£234.
	Contingencies		£244.
	Total -		£15,699.

If Venture Meters be cut out would reduce total by £1290.

If only 2 Generating Sets, two pumping Sets, Switch Gear for three, but only two lines of cable the price would be £11,350.

With cheaper cable and no meters the price would be further reduced by £860.

If only two Generators Sets and three Pumping Sets and Switch Gear for three, but only two cables installed the price would be £12,500.

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SCHEDULE "G"

UNDERLIE SHAFT SCHEME.

Cost of developing Level at 1625 feet.

NEW UNDERLIE SHAFT TO 1750 FT.	
Machinery	£12540.
Chamber	400.
Foundations	80.
Sinking 250 ft. @ £26	6500.
Floodgate	350.
Opening cut below & contingencies, say	2130.
	£22000.

DEVELOPMENT FROM GRUBB SHAFT.	
Crosscut 120ft. @ 50/-	£300.
Floodgate	350.
Main Drive 350ft. @ 40/-	700.
Rises & Winzes 500ft. @ 40/-	1000.
Fluming 400ft. @ 10/-	200.
	£2550.

GRUBB SHAFT TO 1625 FT.	
Sinking 125 ft. @ £45	£5625.
Flat	150.
Extending Pump Work	3000.
	£8775

HART SHAFT.	
Driving 1500 ft. Level West 300 ft. @ 40/-	600.
Sinking 160 ft. @ £15	2400.
" 125 ft. @ £25	3125.
Extension of Pumps	1700.
	£7825.

VENTILATION.	
Clearing Main Shaft	£100.
Rise Connection 1625 ft. to 1100ft. 400 ft. @ 40/-	800.
	£900.

The probable cost of Pumping during 2 years will be £30000.

The total cost would then be -

New Underlie Shaft to 1750 ft.	£22,000.
Grubb " " 1625 ft.	8,775.
Hart " " "	7,825.
Development	2,550.
Ventilation	900.
Pumping during 2 years	30,000.
Total -	£72,000.

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SCHEDULE "G1"

SINKING THE TWO VERTICAL SHAFTS.

GRUBB SHAFT.

Sinking 125 ft. at £45 per foot	£5625.
Plat	150.
Draw Lift Work	1000.
Permanent Pump Work	2000.

HART SHAFT.

Sinking 160 ft. at £15 per foot	2400.
Permanent Pump Work	2300.
Development	2550.
Sinking further 125 ft. at £25 per foot	3125.
Ventilation	900.
Driving west at 1500 ft. 300 ft.	600.
Pumping during 2 years	30000.
Total -	£50650.

SCHEDULE "I"

Values along 1370 ft. Level going West in varying distances and not stoped underfoot.

Length	Value	Average Width
165 ft.	6.41 dwts.	
210 "	8.54 "	7.9 ft.
124 "	7.22 "	
499 ft.		

SCHEDULE "J"

ORE RESERVES

Estimated at 30th September, 1913:-		Tons.
Ore ready for stoping		36,061.
Ore partly developed but to be drained		5,328.
		41,389.
Mined from 30th September 1913, to 31st March, 1914	20.866.	
During April 1914	3.078.	23,944
		17,445.
To be expected when Western part is drained		21,000.
Total Ore Reserve -		38,445

SCHEDULE "K"

CONTRACT PRICES.

The under-mentioned prices are quoted for sinking. Driving Levels and Crosscuts, and Rises.

SINKING -	Hart, Shaft to 1250 ft.	from	270/- to 310/- per ft.
	Grubb Shaft	"	307/6 to 369/6 "
DRIVING -	1500 ft. Level going East	varied from	27/6 to 51/- per ft.
	" drive to position of Underlay Shaft		54/- to 57/6
	" Driving Main Crosscut		47/6
	" Driving Main Crosscut continued into Footwall		30/- to 62/6
	" Crosscut to Hart Shaft		47/6
RISING -	1000 ft. Level Rising to Grubb Shaft		62/6 to 70/- per ft.

STOPING - from 26/- to 63/- per fathom.

The highest contract prices for driving or stoping have invariably been for work in the eastern portion of the Mine - the ground being harder than in the West end.

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