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REPORT ON THE TYEE CONSOLIDATED GOLD
MINES, LIMITED.

BY

N. E. NELSON

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The following report follows a third examination of the Tyee Consolidated properties on the Mt. Sicker near Duncan, B. C.,

The properties were visited in 1935, in 1937, and Oct. 12th, 13th and 14th, 1940. In all about 10 days have been spent underground. Considerable work having been done between the first and last visits, much light has been thrown upon the question of structure, on which a future for the properties so largely depends.

In a report following the 1937 examination I covered the matter of general and local geology and gave my conception of the controlling structural features. The conception still holds, in fact is somewhat bolstered by the information gained from work that has been done since 1937, and I still believe the general shallowness of the Tyee ore zone is not caused by a confining cyclinal trough marked especially by a band of graphitic schist of varying thickness. Rather there is a series of folds in two of which have been found ore bodies. The North Ore zone consists of enechelon lenses of ore, and it seems likely, judging from the shape of the square set stopes, that the South Orebody was also so made up.

The two Orebodies have been essentially "bottomed", but there is as yet no work to prove that there is not another lense to the north of the north Orebody. The new work in the Richard III mine shows a small lense in what seems from old maps

and sections to be a continuous mineralized zone that might lead to something if the zone continues to pitch to the more open country to the west. Certainly that is the only chance in that immediate area as the diamond drilling and drifting have shown the ore zone to be narrow and confined between porphyrite on the south and a dyke or sill of diorite (or gabbro) on the north. The porphyrite is probably the same rock as bounds the Tyee-Lenora-Richard III ore zone on the south. The north wall of the porphyrite has been pictured as a great nearly vertical fault plane surface extending to a depth of at least 1800 feet, and having a length of 5000 feet. The conception still holds good, though the faulting shown in the new workings in the contact zone in the Richard III, 244 winze, does not bespeak a movement of the magnitude ascribed to the Tyee fault.

THE NEW WORK

Since 1937 the drift east on the 250 Level of the Tyee Mine has been continued into the Richard III claim. This drift which connects with the No. 2 Level of the Lenora Mine at the Lenora-Tyee common boundary, had an end since early days about half way across the Tyee claim. The face was in the black and grey schist of the North Ore zone, about 200 feet east of the square set stope opened in the North vein in Tyee ground, The

old work east of the stope showed little or no ore. When the new work brought the drift under a crosscut on the 165 (Tye) level a raise was driven from the new drift. This nearly vertical raise opened to the 165 Level, at a point ^{shown} on old Tye maps as a place the North Orebody had been crosscut. The ore was found as indicated near the 165 Level. Subsequently the vein was drifted upon for about 130 feet on the 165 level. Sampling shows an average width of 3.9 feet and average grade of 0.06 oz. gold and 1.34% copper. Of the ten samples listed only three were run for zinc, showing 7.82%, 7.72% and 13.48%. This ore may be the northerly continuation of the North Orebody, last shown 325 feet to the ^{? west?} (south) in the square set stope. The width and average grade are somewhat less than shown by previous sampling in the stope. The economic end of the ore shoot may be somewhere between the two showings.

Three Hundred and Fifty feet east of the upraise the black schist which marks the north ore zone swung into the south wall of the drift and was not again seen until the Richard III workings were opened. Later, drilling showed it in No. 25 diamond drill hole but No. 24 hole still to the east gave but a faint indication of it. The black schist at the Richard III workings and that shown in holes 22, 8 and 27 may be parts of the North Zone band, but it seems to have lost the continuity

characteristic of the band further west.

Two drill holes, Nos. 2 and 21, drilled from the drift extension, encountered ore in the Richard III zone. By sinking a winze 24 feet and a few feet - 22 - of drifting the ore was opened. It shows in the drift as a short lense which comes in on the left and cuts diagonally across the drift. The width in the widest part is about 3 feet. The vein goes into the right corner of the face. There it shows as about 18" wide at the roof, 4" wide 18" down, and 16-18" wide about 2' above the floor. Water and muck prevented it being seen at the floor. A sample of the ore in the face assayed:-

<u>Gold Oz.</u>	<u>Silver Oz.</u>	<u>Copper %</u>	<u>Zinc%</u>
.16	2.00	1.10	15.54

The gangue is largely "barite".

Another sample taken there previously assayed

<u>Width</u>	<u>Gold Oz.</u>	<u>Copper %</u>	<u>Zinc %</u>
2.9'	0.14	1.57	14.41

This, I am told, was taken across the widest part of the lense as exposed in the drift.

As shown on the map at the mine no other holes explored the ground below the showing in the drift off the winze - 500 Richard. The "50" scale map shows No. 4 undercutting the zone somewhat. No. 23 to the west failed to find ore at about the 500 Richard level so if there is an ore shoot it must be pitching

to the west. Hole No. 8 drilled at 75 degrees probably did not go far enough to thoroughly crosscut the ore zone, though it did intersect black schist. Holes 18, 19 and 20 drilled to the south, went into porphyrite near the collars and continued in it, indicating that the ore zone is here in the fault zone which is believed to mark the boundary between the ore bearing schists and the barren porphyrite. In sinking the winze - 244-ore resembling "drag ore" was encountered. The small lense investigated while in a somewhat broken zone seemed in place and has the characteristic tendency to cut diagonally across the ore zone.

Because of the high zinc content it is regarded as north vein type ore, though its position near the porphyrite, would tend to make it South vein ore, but as the Richard III mine cannot be entered except at this place, it is not yet possible to say this ore connects with the south vein ore, of the old upper levels. The south vein is said to have been mined at a level about 325 feet above the 500 Richard, but the exact nature size etc., of the orebodies, is not known. 10,000 tons of ore are said to have been taken from the mine, not a large amount for the depth opened, so the widths were probably small.

OTHER DIAMOND DRILLING:

Diamond drilling was done from the crosscut on 165 Level opened by the raise from the 250 Level drift. One hole No. 14

drilled upward and toward the south orebody encountered 13 feet of good ore in the hanging wall of the south orebody. What it represents is not known, but the implication is that the ore in this part was not cleanly taken. The old timers say much ore was left in the old stopes due to careless mining and the tendency to high grading in order that a shipping grade might be maintained. Just how much ore was so left it is not possible to say, nor is it known that much could be recovered. Its quantity and value must remain a question.

Hole No. 7 drilled to prospect somewhat the same area in the hanging wall of the south orebody as No. 14 failed to find ore. Evidently at this place no hanging wall lense had escaped mining.

Holes No. 15 and 16 were drilled to overcut the narrow ore shown in the drifting at the top of raise. Neither encountered ore, so it must be concluded the orebody here has small vertical extent, as it did not show in the raise until the Level was nearly reached.

SURFACE DRILLING:

In conjunction with geophysical prospecting by Mr. Oates, three holes were drilled on surface east of and north east of the Richard shaft. No. 1 encountered ten feet of slightly mineralized material in "diorite". No.'s 5 and 6 showed a few feet of mineralized quartz in grey schist. The presumption is, based on the geophysical work, and the drilling, that the area to the east

of the Richard Shaft is of much less interest than that to the west.

THE TREGEAR WINZE:

This winze, sunk in the east wall of the Tregear stope orebody of the north vein, was unwatered and sampled by Mr. McGuire. Unless it has been partly filled with muck, it is not as deep as sometimes believed. Measurement shows it to be but 20 feet deep whereas some reports say it is 40 feet deep. For the depth now open remarkably fine ore is revealed, samples by Mr. McGuire showing:

	<u>Au. Oz.</u>	<u>Ag Oz.</u>	<u>Cu%</u>	<u>Zn%</u>
E. Wall 6' below sill, width 9'	0.10	3.59	2.80	13.58
" " 15' " " " 7'	0.46	5.64	2.80	11.52
W. Wall 7' " " " 9'	0.08	3.73	3.00	19.96
" 13' " " " 13'	0.14	4.00	7.20	10.59
Averages 9½'	0.17	4.14	4.34	13.68

This is better than the stope average and probably is the hanging wall band, which created quite a little excitement when first cut 35 years ago. Mr. Bellinger says in his letter of 1935, that the ore in the winze turned up like a Turkish crescent, but does not say which way. If it turned to the north it would be in keeping with the theory that the ore "makes" in folds and another may "make" to the north. If it curls up to the south the chances

of another lens to the north are not so good. Crosscutting on No.3 Lenora, has fairly proven that the ore does not go to that Level.

TONNAGES:

In my report of 1937, I accepted the tonnage figure set up by Mr. Doelle, 34,080 tons, as well taken and as large a figure as should be taken at that time. The showings resulting from the new work, have not been such as to warrant a change in the figures of 1937. But the outlook is changed somewhat, as the new openings afford opportunities for studying the complex structural conditions, and, I believe, by careful mapping and sampling it would be possible to tentatively increase the tonnage figure by 50%, possibly more. A small amount, 1,000 to 1,500 feet, of diamond drilling, some pumping and clean up work, should make the tonnage reasonably certain, and an additional 1,000 feet of drilling would test the parallel fold theory.

It is not difficult to believe that upwards of 100,000 tons can be gleaned from these old mines, this figure to include odd bits that might be taken here and there where the development work has now been done.

VALUE OF THE ORE:

The prices of metals have changed since the 1937 reports were made, especially that of copper and the net value of the 34,080 tons would be slightly greater than that then set out, due to the increase in the prices of gold and zinc. The metallurgical

tests made by Mines Branch at Ottawa show that the concentration problem will bear more study, but is solvable.

CONCLUSION:

The Tyee property is now, as it has been since its revival by Mr. Peterson, an interesting borderline mining venture.

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In order to give some idea of the value of the Tyee ore the following table, similar to the one used by Mr. Doelle in 1937, is compiled.

Average values are taken as then derived, little or no new work having been done in the part of the mine in which this reasonably certain tonnage is located.

ORE BLOCK OUT - 34,080 TONS.

	<u>Assay Value</u>	<u>Total Mine Content</u>	<u>% Recoverable Contents</u>	<u>Recoverable Contents</u>	<u>Market Price</u>	<u>Smelter Price</u>	<u>Net Value Per Ton</u>
Au	0.10	3,408 oz.	80%	2,726 oz.	\$38.50 oz.	35.80 x	2.86
Ag	3.0	102,240 "	80	81,792 "	35¢	33.25 x	0.80
Cu	1.7	1,158,720 lbs	90	1,042,848 lbs.	11.40	8.40 x	2.57
Zn	6.7	4,566,720 lbs.	80	3,653,376 "	7.35	3.5 x	<u>3.75</u>
							\$9.98
		x Gold calculated	38.50 x 93%	(Canadian)			
		Silver "	35 x 95%	"			
		Copper "	10.4 less 2.75	x 110% (Canadian)			
		Zinc "	7.35-1.50 x 110-	2.63 "			

If the average ratio of concentration can be held to 10 to 1, the net value of the ore should be, allowing \$3.50 for mining \$1.00 for milling, \$1.00 for freight and treatment, \$0.50 for miscellaneous, about \$4.00 per ton.

Vancouver, B. C.
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