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July 7, 1939.

Mr. R. C. McCorkell, Managing Director  
Ymir Consolidated Gold Mines Ltd.  
Royal Trust Building,  
Vancouver, B. C.

Dear Sir:-

As instructed by you, I have spent a week studying the possibilities of developing farther ore on your Ymir and Goodenough properties, at Ymir, B. C.

The following records the conclusions drawn from my work there, which I have gone over in detail with your superintendent, Mr. G. G. Sullivan.

YMIR MINE

In 1926 I spent three days on the Ymir property, covering such of the old workings as were accessible and also the surface which was not then so densely covered with brush as it is now.

In the conclusion of my report I wrote the following, - "Although the vein is still strong in the central part of the No. 10 (bottom) level, there is nothing to indicate an expectation of further ore in any direction, and further development of the Ymir Mine cannot be recommended".

The development work which was done by your Company has shown nothing encouraging and, while it is perfectly possible that at some point the Ymir vein still contains ore, in the absence of any indication as to its location it is unjustifiable to spend the necessary money to explore for it.

An indefinite distance, perhaps 500 feet, to the east of the present workings the vein would cut a granitic dike about 150 feet in width, provided both extend far enough beyond known exposures. This should be a favorable locus for ore, but I do not consider the chance for an oreshoot there sufficiently good to justify the expense of exploring.

Several barren, or nearly barren, veins are known on the east side of the North Fork of Wild Horse Creek having roughly the same dip and strike as the Ymir vein, but which one, if any, is the extension of the Ymir is uncertain.

Just what has happened to the Ymir vein west of the orebody is not known, except that it has narrowed considerably, with perhaps a little cross-faulting. On the No. 10 level, which is the only accessible one driven far enough west, there

is a somewhat indefinite indication that the vein has turned sharply and is following the bedding of the formation to the southeast. I see no particular encouragement for further work in this direction.

The area in the hill above the old Ymir ore-shoot, and east of the long No. 2 level crosscut, seems to have been adequately explored by the old Company whose workings are now tightly caved, at least at the portals. Some of the old maps show "quartz" in the tunnel above the Speak tunnel, and there are a few chunks of quartz, some of them showing galena, on the Speak tunnel dump. Also, old maps show some unidentified disturbance, possibly shearing, in the rambling workings near the end of the long No. 2 level crosscut which line up well with two rather unimportant appearing veins, or shears, shown on my old surface map near the northwest corner of the Rockland claim. If any of these showings had been promising it seems certain that the old Company would have developed them further.

Everything considered, I do not think the expenditure of any money to further explore the Ymir ground is justified.

#### GOODENOUGH MINE

In the Goodenough Mine I platted all the veins, shears, and geology in some detail on separate-level maps. These maps and other data show rather conclusively that - (1) the vein on which all the development work has been done is the one which outcrops on the surface at the North Shaft (near the south corner of the Magwamp claim); (2) this vein strikes N 67° E in the eastern part of the mine, cutting diagonally across the formation, bends sharply in the central part of the mine, and strikes S 35° W in the western part, where it follows the bedding planes of the formation; (3) the vein-fissures were caused by tension in the sediments (Pend 'd Oreille Series); (4) there are two and perhaps three stages of mineralization of which the last, depositing gold-bearing sulphides in the interstices of brecciated quartz and pyrite, is the main ore-bearer; (5) the vein (not to be confused with the so-called South Vein) outcropping at the South Shaft on the surface has apparently never been found in the mine workings.

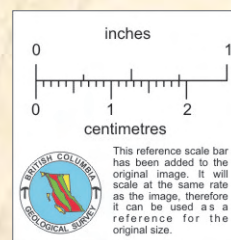
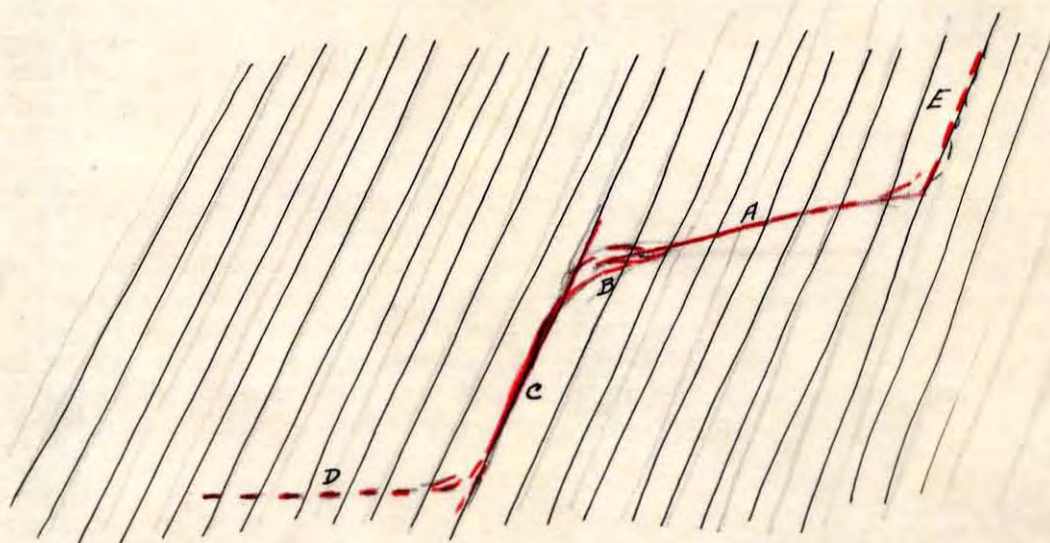
The veins occur in argillites of the Pend 'd Oreille Series which in, and near, the mine strike from N 20° to 40° E and dip at an average of 70° northwest. In them there are sills and dikes of gray porphyritic rock which is older than the veins and is cut by them. It is probably genetically related to the granite-porphry of the district, but does not appear to have any influence on the value of the ore. There are later, very irregular, dikes which cut the veins and may be roughly classed as lamprophyre.

In the eastern part of the mine the vein is comparatively straight and clear cut, although at the far end of the most easterly workings there is a strong suggestion that

the vein is weakening and fraying out into the wall rocks.

In the central part of the mine, where the strike is changing, there are numerous stringers, spurs, and fractures, some of which contain short ore-shoots, and the vein appears quite ragged and irregular. Still further west, or southwest, the vein follows the formation in strike and dip and becomes more regular again.

The following sketch illustrates the structure, the parallel lines representing the strike of the formation; "A" being the part of the vein crossing the formation, "B" the zone of strong and irregular fracturing; and "C" the part of the vein following the formation. Theoretically, it would not be surprising if the vein again crossed the formation to the west, "D", or again followed the formation to the east as indicated at "E". There is however no indication that the "D" and "E" extensions occur.



There has been only a small amount of faulting along the plane of the vein, and little cross-faulting and that, in part, appears to have been pre-mineral. The general structure strongly indicates that the fissure was formed by tension (as at the Reno Mine and at Zeballos) and the existence of similar parallel, or overlapping, structures is not unlikely.

The so-called South Vein is an offshoot from the main vein, first cutting the formation at a small angle, then turning and running with it. It is my impression that this vein will prove to be of little greater length than already proven, but it should be explored still further southwest before being abandoned.

There is no sign anywhere in the mine that the South-Shaft vein has ever been cut, although it would seem that the South vein drift on No. 3 level should have done so. Nothing is known about this vein except that it was opened on the surface by open cuts and a shallow shaft (now caved) which showed it to be fairly or

showed it to be fairly strong, nearly parallel to the main north vein, and about a hundred feet south of it. This vein is well worth some exploration and might turn out to be important.

Whether there were more than two stages of ore deposition is uncertain, and perhaps unimportant. During the first (or first and second) stage it appears that most of the quartz and a considerable part of the pyrite were deposited, but little gold. Later earth movements crushed and brecciated parts of the quartz in the vein, and in these brecciated areas lead, zinc, and iron sulphides, carrying gold, were deposited, cementing the crushed vein-matter and to a slight extent replacing it. Those veins, or areas in the veins, which were not brecciated were not permeable to the rich solutions and are now below commercial grade. It is believed that lack of sufficient secondary brecciation on the No. 4 level is the reason for the lack of ore there. Why the veins on this level should have less brecciation than those above is unknown.

Recommendations I recommend that the following work be done on the Goodenough Mine:-

Level 1: Crosscut about S 60° E from survey Station 120 for probably something over 50 feet to explore for the downward extension of the vein showing in the South Shaft and on the surface. This crosscut should intersect the vein on its dip approximately below the shaft, and should be extended to a length of 120 feet if the vein is not cut before.

Level 1: Crosscut about S 45° E from survey Station 115 to cut the South vein on this level. Probable length of crosscut 45 feet.

Level 3: Crosscut southerly from about fifty feet back from the extreme east face of the Level for approximately fifty feet to open the vein showing below on Level 4. (Nearly 200 feet of the eastern end of Level 4 is on a vein or spur which strikes nearly 15 degrees more easterly than the vein opened on levels 1, 2, and 3. It has produced some ore from 447 Stope which, on its upward extension, would be in the footwall of No. 3 level drift.)

Level 6: Start a new level on, or about, the 3800 foot contour (200 feet below No. 4 Level) at west-southwest from the portal of No. 5 level. Drive about due north to the vein, as spotted on No. 5 Level by diamond-drill holes, then drift northeastward along the vein. The distances to be driven should be approximately as follows, omitting the footage of any side crosscuts and assuming that drifts will be comparatively straight:-

Portal to vein	200 Ft.
thence to point under where No. 4 cut the vein	700
thence minimum additional drifting	500
Total	1400 Ft.

The approximate cost of this development is estimated at \$25,000.

My reasons for recommending this new level are as follows:- While nearly all the vein on No. 4 Level is below commercial grade, no reason was found to indicate that the impoverishment of No. 4 is a condition that may be expected to continue indefinitely; true, on the other hand, there is no definite indication that ore will again occur at depth. Many cases, some of them in B. C., are known where one or even two levels are barren underneath ore-shoots, but where good ore has again come in lower down.

Where the upper levels of a mine have produced as much as those of the Goodenough have, it is, in my opinion, poor business to quit without deeper exploration to prove whether or not the ore comes in again, which I believe there is a reasonable chance of its doing at the Goodenough.

Three alternative methods of deeper development are (1) by sinking a winze and drifting from that, (2) continuing the present No. 5 level to and along the vein, and (3) starting a new No. 6 level.

Sinking would require some new equipment and use nearly all the air now available. It would also very probably be hampered by a considerable flow of water and therefore be expensive. The present No. 5 level is 115 feet lower than the No. 4 and while there would be 400 feet less driving required in No. 5 than in No. 6 to reach the same final point, the extra depth attained by No. 5 is hardly enough to be sure of getting below the barren zone, - assuming that it is nothing worse than a zone. Then, also, if No. 5 were driven in and struck ore there might easily be only a few feet of ore above it before the barren zone were reached. Therefore it seems best to recommend a new level at approximately 200 feet below No. 4; there is a fairly good site for a tunnel portal at that elevation.

Thus far I have not mentioned the possibilities for ore in the area between the Goodenough and Ymir creshoots. This area is covered with deep overburden except a narrow, poorly exposed strip along the small creek just west of the Ymir No. 10 tunnel portal. This does not show anything of apparent importance. Both the west end of the Ymir vein and the east end of the Goodenough are narrow and weak, and appear to be playing out, giving little encouragement for work in the section between them. Such work would be rather expensive and, I think, unjustified by the probability of finding important ore.

To summarize the foregoing, - I do not think any further work is justified on the Ymir property, nor to the eastward on the Goodenough.

The best chances for further important ore seem to lie in the development of the South-Shaft vein of the Goodenough, and in the chance for deeper ore in the Goodenough main (or north) vein, and I recommend that development along these two lines be undertaken.

Yours respectfully,

*Chas. C. Starr*