THE INITIAL DEVELOPMENT

OF THE

E L C A P I T A N M I N E

by

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INTRODUCTION

During the course of the recent financial crisis, it has become increasingly evident, that gold is the one basic commodity able to withstand the effects of both depression and inflation. This stability of price in turn stabilizes the production of the metal itself. For this reason, small claims of gold bearing ore, have better possibilities of ultimate profit to their owners, than those of other minerals on metals which are subject to large fluctuations in price. Such a claim is the El Capitan group; and in the discussion of its present and future development, it is intended to cover the principal points bearing on the successful initial development of a small gold mine.

The group consists of four claims; El Capitan numbers one, two, three and four, and is situated at an altitude of 4,300 feet on the divide between the sources of the Chemainus River and Cottonwood Creek. It is about three miles north of Youbou ~~Youbou~~ (on Cowichan Lake) in the Victoria Mining district.

Within a few hundred yards there are two other leads on which work has been done. The Cottonwood group is on the main trail to El Capitan and about five hundred feet below it. Considerable surface stripping has been carried out, and some promising mineral uncovered. On the other side of the divide and about two thousand feet down, is the Silver Leaf claim. Two shafts have been sunk there, and a good but small vein disclosed. It may be significant also, that the Tyee mine, famous earlier in this century, is in a similar formation about twenty miles to the East, in the same range of mountains.

There is an old logging railway grade running up Cottonwood Creek within three quarters of a mile of the mine, but nearly 3000 feet below it. This grade in turn connects with the existing C.N.R. line running from Victoria to the West end of Cowichan lake. A branch line from the C.N.R. runs down to Cowichan Bay, to a pier which could be quickly adapted to the transfer of ore to ships, or car barges. From Cowichan Bay it is a distance of about hundred miles to the smelters at Tacoma. Should the mine turn out to be large enough to warrant its renovation, there is the old Tyee mine's smelter on the sea at Crofton, with a C.P.R. logging spur running close to it.

PRESENT DEVELOPMENT

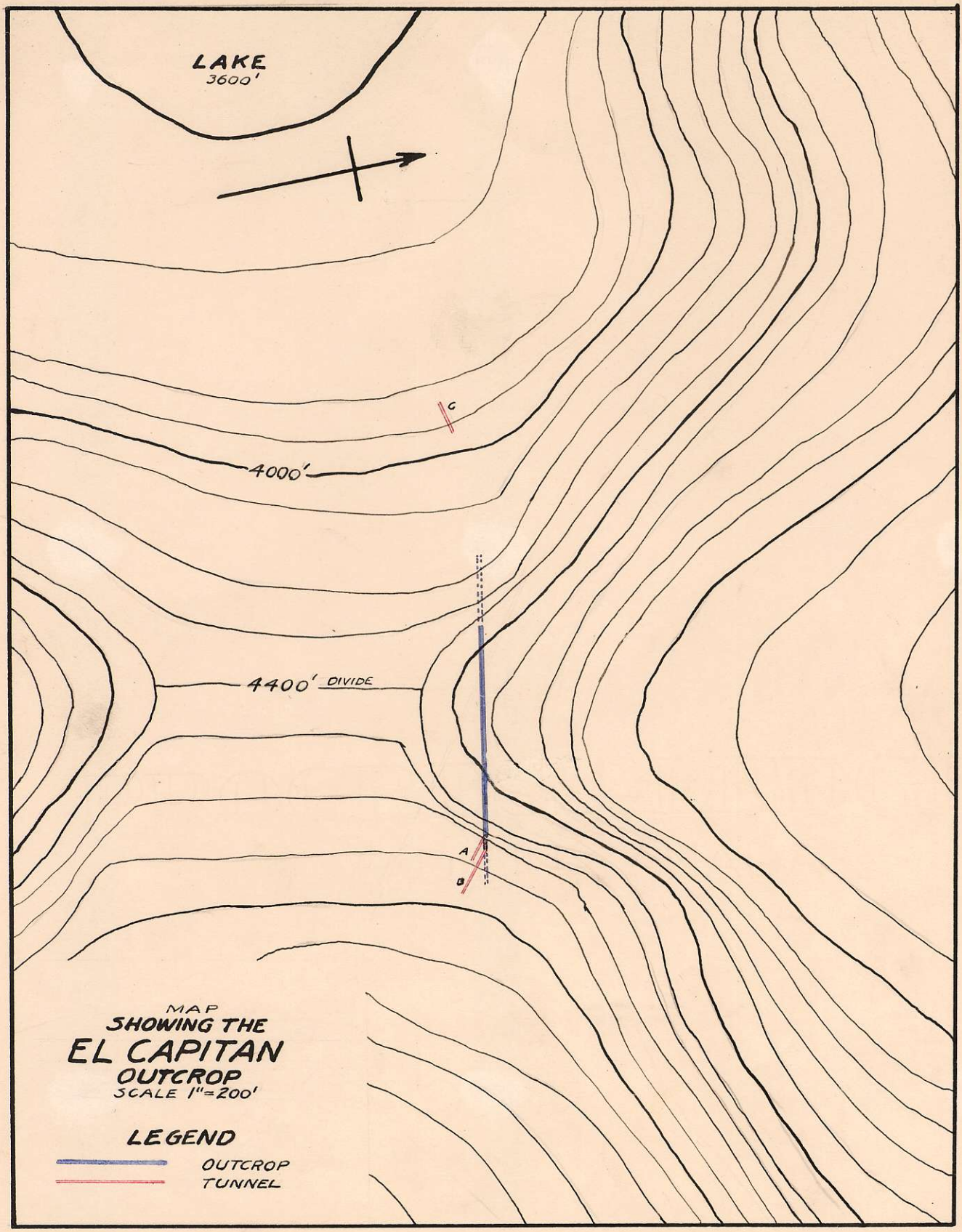
The first claim was staked by Mr. Lomas of Duncan, about seven years ago. Subsequently he entered into partnership with Mr. Miller, who had staked an adjacent claim. Together they carried out enough work on the main lead to satisfy the department of mines requirements on both properties for three years. They then returned to raise sufficient funds to drive a tunnel through the talus of the divide to the vein lower down. This was accomplished with the aid of a syndicate who took a half interest in the group, and who also staked two more claims. The resident mining engineer inspected the main tunnel, and on the strength of his report Consolidated Smelters sent a man to appraise the property. He considered the vein to be too small, but indicated that, in the event of another lower tunnel disclosing a larger body of ore, they would make another survey. The second tunnel while it did show more valuable ore, did not

show a sufficient increase in the size of the vein to warrant this survey. Finally, after an interval of two years, a group of three men undertook to develop the holdings further with an option of purchase over a period of three years.

The two veins occupy a shear zone in an Andesitic formation of the Vancouver Volcanics. The actual surface showings consisted of two veins on either side of a ten foot dyke of oxidized material. Both veins strike East and West, and dip slightly South. They are highly oxidized on the surface due to excessive leaching from the melting snow. Considerable surface stripping was carried out, and then an open cut driven in on the veins. From this some ribs of Chalchopyrite were taken out which assayed fifty four dollars to the ton in gold, with values of about two dollars in silver.

As a result of these assays it was decided to tunnel into the vein about a hundred feet below the surface of the talus, in the hope that the lead would widen out, or that the two veins would converge below the dyke. This tunnel (A) about fifty feet long, showed the ore to be still highly oxidized, but a sample, containing both the oxidized ore and chalchopyrite, assayed forty dollars to the ton in gold.

Since the primary sulphides still showed better values than the oxidized vein, it was decided to try to get below the oxidized horizon. Accordingly, a tunnel (B) was driven about sixty feet lower. This was about ninety five feet long including a twenty foot drift on the vein. It showed a seam of four inches on the foot wall and three to four feet of oxidized material, and about six inches of chalchopyrite on the hanging wall. The foot wall seam assayed fifty-six dollars to the ton, and the hanging



MAP
SHOWING THE
EL CAPITAN
OUTCROP
SCALE 1"=200'

LEGEND

OUTCROP
TUNNEL

wall seam, eighty two dollars to the ton in gold. The fact that the foot wall seam contained much higher silver values than that of the hanging wall, indicates less leaching and a consequen lessening of the oxidation.

This summer, a third tunnel(C)was commenced from the West side of the divide to meet the vein approximately a hundred feet below B. While this last tunnel is not yet through to the vein, several encouraging mineralized boulders were taken from the drift, and it is hoped that this indicates a considerable widening of the shear zone with increasing depth.

Just to the West of the divide, and about eight hundred feet below it, is a small lake set in the crater of what is probably an extinct volcano. This lake is fed by the snow melting on the peaks about it, and would make an excellent water supply for a large camp. A comfortable log bunkhouse for ten men has been built where the trail meets the lake at the point where it overflows into Cottonwood Creek. From the cabin it is about half an hour's climb to the mine. With the assistance of a government grant, the old logging grade up Cottonwood Creek has been transformed to a rough truck read, the old trestles being planked over. From the end of this road a good pack trail has been built up to the lake. At present the main difficulty is to bring a truck from the end of the road at ~~Youkon~~ Youbou to the end of the new road; as permission has to be secured from the C.N.R. to drive it a mile along their right of way.

FUTURE DEVELOPMENT

Any further development will now depend on the financial backing that can be secured. At present there are two alternatives; either a new company may be formed, or the property sold

to one of the larger mining companies. In the latter case it is more likely that an option would be taken on the property until the company had further satisfied itself as to the quantity and value of the existing ore. It is, then, very probable that the method of development would depend on which alternative was under consideration.

The use of the diamond drill has become almost standard practice in many of the larger mines for exploration work, and has in the past summer been adopted for testing undeveloped leads in the Cariboo. It is therefore, a very probable method to he employed by a company with an option on the property. It is quite possible, however, that the expense incurred in taking an outfit in to a property so completely isolated from their other enterprises, would, in the case of El Capitan, deter them from its use. Apart from this one hindrance, however, diamond drilling would be a very satisfactory means of proving the mine. Particularly as the contours of the mountain would make drill holes of any great length unnecessary, thus insuring accuracy of line. Further, the freedom of the formation from loose rock, other than the shallow talus, would obviate the necessity of using casing or concrete. The chief advantage, however, in using a diamond drill in this instance, lies in the fact that it would be the most satisfactory means of exposing any possible connection between the leads of El Capitan, Cottonwood, and Silver Leaf.

If a new company were formed it is more probable that they would continue the development by drifting on the vein; either by extension of the lower tunnel or by driving another lower

down. To do this, merely as a means of exploration, it would be unnecessary to install anything more than a compressor large enough to supply a single machine.

Since the oxidized horizon is practically bound to comform to the contours of the bedrock, it is quite probable that an extension of the lowest drift, in its present line, would pass the oxidized horizon and reach part of the unbleached vein. If this were done, it would be a much less expensive operation than driving another drift lower down the mountain. There is, of course, the possibility, that horizontal line is not cut by the convex curve of the horizon or water table; and if this be the case, the work would be of little value. On the other hand, a new drift lower down would entail a considerable length of tunneling through the loose talus, which gets deeper lower down the divide, or, as an alternative, a diagonal cross cut to the vein. Present indications show a distinct lessening of the oxidation in the twenty feet drift on the vein, the opinion of the engineer however, based partly on proving continuity and size of the vein, was that a new drift a hundred feet lower should be driven. It was decided to do this from the West side, as there was less talus to remove.

Should either of these methods of exploration disclose sufficient ore and a continued gold content sufficient to classify it as a mineable quantity; the mining itself would be a comparatively simple nature. Drifts would be driven along the vein at levels about one hundred feet apart below each other, and these could be driven right through for the first six hundred feet down, materially assisting in problems of ventilation.

The ore would then be taken out, first by cutting stopes up the vein and then drawing the rest out. For this purpose a roof of timbering is erected over the drift, with chutes at intervals, to keep the drift clear for removing the ore.

The question of transportation now becomes involved with that of whether or not a mill should be installed. This in turn is a question of the quantity and value of the ore exposed. Thus, should the ore be hand separated and the most valuable shipped direct, or should the whole vein be taken out and concentrated before shipping? The whole problem now becomes so involved that is not within the scope of this essay to deal with it further; except to present the more obvious possibilites of the locality as regards power and transportation.

As previously stated there is a branch line of the C.N.R. in operation within three miles, in a direct line, of the mine. There remains, therefore , the problem of providing transportation to the line. In this respect, the El Capitan is singularly fortunate, as the logging industry has materially assisted, by the construction of a railway grade up Cottonwood Creek. This would require only one new trestle and the laying of about four miles of steel to be ready for use again. There remains a distance of about three quarters of a mile horizontally and three thousand feet vertically between the end of steel and the mine. With the advantage of the large fall over a short distance, an aerial tramway from the mine to ore bins at the end of the railway would appear to be the final link required in the transportation system. Thus it is evident, that if the mine should develop as outlined, the cost of construction of transportation

facilities would be fairly small compared with those of the majority of mines in British Columbia.

For the early stages of development ample power could be secured from a large sawmill at Youbou, and for this purpose the construction and maintenance of only three ~~units~~ miles of power line would be required. Should a larger supply of power be required there are three possible alternatives; enlargement of the mill plant in cooperation with the mine, construction of approximately thirty miles of line to the B. C. Electric power line from Duncan to Nanaimo, or the establishment of a small hydro-electric plant on the upper reaches of the Chemainus river. Of the three, enlargement of the Youbou mill plant appears to be the most feasible, as it is a steam plant, using waste products of the mill as fuel.

CONCLUSION

In consideration of this subject, I have merely outlined the present and possible initial development of the mine, diverging as little as possible into technical detail. Two problems of great importance, those of finance and mill construction, have been merely sketched, as consideration of either is not within the scope of this essay. The former requires a technical knowledge of economics and general market conditions, which, while important to the mining engineer, is hardly within his province; the latter although of primary importance to a mine's development, is entirely dependent on greater knowledge of the quantity and value of the available ore, than is possible at this stage in the mine's development. Construction and

design of such a mill would in themselves require treatment at greater length than is allowed for this essay.

Under existing economic conditions then, with the possibility of gold being standardized at thirty dollars to the ounce, it would seem that further development of the El Capitan mine, should make it a profitable enterprise and a valuable addition to the mineral industry of British Columbia.