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PRELIMINARY
GEOLOGICAL REPORT
ON THE
A S P E N M I N E
OF THE
SALMO-MALARTIC MINES, Ltd.
SALMO, B. C.

To Charles E. Blackburn, Pres.

Salmo-Malartic Mines, Ltd

By Chas. C. Starr

November 17th, 1928.

INTRODUCTORY: Since the important object at the Aspen mine appeared to be the directing of the development work along the most favorable lines for developing ore, no attempt has thus far been made by the writer to ascertain the value and quantity of ore that has been exposed to date.

In order to determine the mode of occurrence of the ore a rather detailed study and mapping of the geology was made, but the complete maps have not yet been prepared although conclusions may be drawn from the field maps. The following report is of a preliminary nature and will be followed by a more complete report and accompanied by maps; it gives the general conclusions reached by the geological study.

Since the location, equipment, and development of the Aspen mine is familiar to you it will not be necessary to repeat it here.

GENERAL.

GEOLOGY:

The claims of the Aspen Mine lie in an area of massive marbleized limestones, argillites, and schists, which belong to the Fend d' Oreille series. These sedimentary rocks have been irregularly intruded by the granite of the Nelson Batholith, and also by comparatively small, dark, basic dykes, probably belonging to the Rosslund Volcanic Series.

The Rocks.

The limestones have been highly metamorphosed and marbleized by heat and pressure attendant on the granite intrusion and earth movements. The limestones are generally of very light color and consist almost entirely of calcite which has recrystallized from the original rock. The texture is variable, but generally rather coarse. The limestone covers the larger part of the area covered by the claims. Several beds of so called "schist" occur interbedded with the limestone, and consist of alterations of impure limestone, argillites, and quartzites. They are thin-bedded, vari-colored, ribbons of rocks of various composition making an aggregate of sometimes considerable width.

The granite, more properly grano-diorite, is of more or less typical character and of medium texture; it is intrusive into the sedimentary rocks.

The basic dykes are nearly black, hard rocks of too fine grain to permit their mineralogical character to be determined by a hand magnifying glass, however it is probable that they are augite-porphyrates.

At several points lamprophyre dikes appear.

Occurrence

The sedimentary rocks (limestone and "schists") are the oldest, and

cover the greater part of the area. They are well exposed on the northern half of the property, and are inferred to occupy the greater part of the southern half also, although they cannot be observed except at wide intervals, on account of covering of soil.

These sedimentary rocks have been very irregularly intruded by dykes, tongues, and masses of granite which have penetrated from below, under pressure, and have altered and distorted them. The contacts are crooked and irregular, both in detail and in a broader sense. The granite covers a considerable area on the western part of the property, and dikes and tongues of considerable size cut through the southern half.

The black "Basic Dikes" cut the limestones and "schists" but have a strong tendency to follow the bedding planes of the schists in preference to the limestone. They are often extremely irregular, and while they are generally narrow, they occasionally widen to twenty feet or more.

STRUCTURE.

On the northern part of the property the sedimentary rocks strike northwest and southeast and dip 50° to 65° eastward into the mountain; further south the strike curves to north and south, and finally to southwest and northeast with steep dips to the southeast, forming an anticline whose axis is in the vicinity of "G" tunnel and which strikes roughly east and west. Locally, the strata are often much contorted and wrinkled as well as somewhat brecciated. The regularity of the structure has been greatly broken and complicated by the intrusion of the granite, and especially so near the axis of the anticline.

Upper ore Zone

The Upper Ore-zone occurs in limestone on the hillside on the southern part of the north half of the property. It has been opened by the "A" tunnel and numerous open cuts, for a length of over a thousand feet and a width of about sixty feet.

Mineralization to the extent of forming ore (silver-lead-zinc) is only occasional, and is localized at points of exceptional crumpling of the limestone beds where associated with an unusual amount of cross fracturing. This ore-zone has been identified in "B" tunnel, beginning at about 400 feet from the portal and extending inward for sixty or seventy feet.

On account of soil overburden this zone has not been traced on to the southern part of the property.

Lower Ore Zone

The Lower Ore Zone lies some six hundred feet to the west of the upper one and in a much lower stratum of the limestone.

It outcrops in one small area just north of "G" tunnel and has not been found elsewhere on the surface on account of a thick covering of soil.

From the geology of the area it is to be inferred with considerable assurance that in a broad way this zone will correspond in strike and dip to that of the Upper Ore Zone, although in detail and over short distances it may vary quite widely, especially in the vicinity of the "G" tunnel workings which are not far from the axis of the anticline and therefore in an area of maximum distortion of the strata.

The continuity of the Zone is broken and complicated by the granite intrusions which are in especial abundance near the apex of the anticline.

In the "G" tunnel workings the limestone beds have been thrown out of their normal position and now dip flatly to the southwest and show considerable crumpling and fracturing.

The sulphide mineralization and ore (silver-lead) that has been found here lies in a single, rather finely crystalline, bed of limestone about twenty feet in thickness, in an area that has been cut by a series of parallel fractures which strike from north and south to N 30° ^W and dip about 65° to the eastward.

RECOMMENDATIONS:

It has been shown in many other mines of the Kootenay region, as well as in other parts of the world, that orebodies of the replacement type such as those of the Aspen mine generally occur in favorable beds closely associated with sharp folds in the strata and with cross-fissuring.

So far as can be learned from the present development of the property, this condition exists at the Aspen wherever the mineralization is greatest; therefore future development should be directed to those areas in which these conditions are indicated by the geology to be present.

On the Upper-Ore-Zone there is general wrinkling of the strata, on the surface, both to the northwest and to the southeast of the line of "B" tunnel; cross-fracturing in some degree is also to be expected to the northwest, and most of the known mineralization is also in that direction.

I would, therefore, recommend that a drift be started in "B" tunnel at a point about 460 feet from the portal, and driven in a northwesterly direction along the course of the ore-zone. The point at 460 feet has been

picked because here the limestone of the ore-zone shows more iron pyrite mineralization than at any other point. From this drift crosscuts should be driven at intervals to cut the entire width of the ore zone. The length of drift that is driven may best be dependant on the results obtained in (say) the first two hundred feet.

On the Lower Ore-zone I would recommend drifting to the Southeast on the ore-bearing limestone bed, from a point approximately 140 feet in from the south portal of the "G" tunnel workings. On account of the general covering of soil very little can be predicted as to the structure that will be encountered in this drift. It is quite certain however that it will continue in an area of considerable distortion and fracturing, and therefore to be regarded as favorable. Granite is known to occur immediately to the East of the present workings and might be encountered unexpectedly in the drift recommended, but it seems probable that it will not be encountered for a considerable distance.

CONCLUSION:

Generally speaking, the geological conditions are favorable to the presence of ore-bodies on the Aspen ground; ore will likely be localized at points of greatest contortion of the strata, and I believe that further exploration for them is justified under the present conditions.

The Lower Ore-zone appears to offer a somewhat better chance of successful results than the Upper one.

To the eastward of the granite which has been encountered in the east end of the "G" tunnel workings, there should be a favorable area for ore, but exploratory work there would involve a considerable length of tunnel and I am not prepared to recommend it, pending further developments.

Chas. C. Starr