825693

TORBRIT SILVER MINES LIMITED
(Non-Personal Liability)

# GEOLOGIC REPORT ON CLAIMS NORTHWEST OF TORBRIT MINE

Note:
- 6 of the 8 claims discussed here are not in the Copper Belt intrusive at all. They are in the Volcanic Rocks surrounding the south end of the intrusive.
- The other 2 are partially on the southern tip of the intrusive
- See blocked up claims map for claims location.

Respectfully submitted by

Rade Calich

August, 1952.

CONTENTS

# GEOLOGIC REPORT ON CLAIMS NORTHWEST OF TORBRIT MINE

## Introduction

Geologic surveying of a group of claims held currently by Torbrit Silver Mines Limited was carried out, under authority of the Company, during a period extending mainly from 9 July to 15 August, 1952. Following are the claims mapped:

Torbrit (James Varden) Fraction
Sportsman
Sunset No.1
Sunset No.2
Red Point
Red Point Extension
Kitsol No.1
Kitsol No.2
Maud McPhee

The only other record of previous geologic work in this area which was on hand at the time of the present mapping was a report prepared by G. Hanson and published in 1935[1]. This was not consulted by the writer until the field work was nearly completed.

Immediately on completion of the present geologic map, a newly-published report by Dr. J. M. Black[2] arrived, in which a more detailed treatment of the claims under present discussion is given.

The present mapping was carried out using a Brunton compass and a tape, constant reference being made to a chart for conversion of slope distance to map distance; carrying an aneroid barometer was considered impractical, as no accurately contoured base map was available. The traverses were run in directions of easiest travelling, and were joined whenever possible to claim posts or other features which could be located on the base map.

Excellent and able field assistance was rendered by Mr. W.G. Cooper.

Base maps for each claim were prepared by enlarging the 300-scale claim maps, furnished by the British Columbia Land Survey, to 100-scale; these were taken into the field, used in the actual mapping, then reduced by pantograph, with the geology, back to 300-scale, in which form they are herewith presented as a single map.

Contour lines were enlarged by pantograph in stages from Hanson's[3] map; this map was on a scale of 3000 feet to the inch, consequently the enlarged version could not be considered adequate for detailed field work. Moreover, the directions of rivers and creeks as shown on Hanson's map, and those shown on the B.C.L.S. maps, do not coincide, so that the writer has had to distort the contour lines taken from one map in order that they fall reasonably in place on the topography taken from the other. The contours on the finished geologic map are therefore to be regarded as merely indicative of the general form of the topography, and not as accurate indications of elevation.

Some topography has been portrayed on the map in other ways as seen during the present survey, and these might be of assistance to future workers in locating prospects, though no attempt was made to depict the topography at all completely.

## Lithology of the Claims Area

Hanson describes this area as consisting of purple and green volcanics, most of which he regards as feldspar porphyries, some containing fragments of the same rock; the rock west of the Copper Belt he calls red tuff. The Copper Belt, according to Hanson, is

the oldest rock, shattered and pyritized by the intrusion of the adjacent feldspar porphyries. (It is in deference to Hanson that in the legend of the present map, the writer has placed the Copper Belt rocks at the bottom as the oldest, whereas after completing the map it became apparent that the Copper Belt rocks are more likely to be the youngest. Black has listed them as younger than the surrounding purple and green rocks, and it was his report which caused the writer to adopt the same theory). The sediments are called argillites by Hanson, and are identified as an inclusion in the adjacent intrusive rocks.

Black has recognized the green and purple rocks as agglomerate and tuff, and the "argillites" as shale with minor greywacke and tuff. The Copper Belt rocks he has placed in his legend in a manner indicating them to be younger than the sediments and the agllomerates.

The map based on the present investigation, and the deductions made from it, coincide much more closely with the map and deductions of Black than with those of Hanson.

Copper Belt

The Copper Belt extends down at least as far as the portal of the long tunnel on the Red Point No.1 claim. Whether it cuts across the creek, as shown on the map, or not, is not certain; but the tunnel in the northeast corner of the Maud McPhee is definitely in Copper Belt rock; and the cliff on the west side of the Sportsman, where sample 4 was taken, is a rusty pyritized rock, which might belong to the same body. At any rate, the boundaries of the southern tongue of the Copper

Belt were not thoroughly enough investigated because exposures were too rare.

The Copper Belt rocks are light green to light grey on the fresh surface, and almost invariably contain abundant fine disseminated pyrite. The northern part of the piece of Copper Belt shown on the map appears to be more grey than green, whereas the southern portion is light green; this difference may be caused by more intense silicification of the northern portion; this is supported by the presence of narrow quartz stringers in the northern area, these being relatively rare in the southern green portion.

The surface of the Copper Belt rocks is usually stained various shades of yellow and brown by residual iron oxide left after leaching of the pyrite by surface waters; and for about an inch in from the surface the rock is white, with no pyrite, but with cubic pyrite voids from which the sulphide has been removed. Rarely does this "gossan" zone extend farther down into the rock for more than inch or two.

The uniformity of the pyrite distribution in the Copper Belt, but the relative lack of pyrite in adjacent rocks, gives the impression that the pyrite is an accessory mineral of the rock - in other words, pyrite was one of the primary minerals of the Copper Belt rock, having been intruded together with the Copper Belt magma. That much of this pyrite did not escape into the surrounding rock might be ascribed to the fact that the agglomerate and shale were not porous enough to admit the pyrite which may have been, during the intrusion, already in the form of crystals and not in solution.

One observation which may make one wonder as to the true nature of the Copper Belt is the presence of well-defined, well-silicified agglomeratic fragments deep within the Copper Belt, namely, south of the vein on the Red Point Extension claim where samples 7 and 8 were taken. From a geologic viewpoint this is, however, an advantageous find, because if the fragments are looked upon as comprising an inclusion of agglomerate, somewhat re-worked by the intruding Copper Belt magma, then it follows that the Copper Belt must be an intrusive, and younger than the adjacent agglomerate.

Fragmental Rocks.

While the fragmental rocks are being mapped, no attempt was made to follow or distinguish contacts between the differently-colored phases; the contacts were moreover soon inferred to be gradational, judging by the way masses and spots of green rock were found in areas of purple rock and vice versa. But the preliminary map, on which only visible rock areas were colored in, showed that a line could be drawn between the green and purple-red rocks, this line being an indefinite gradational contact. Thus south and west of this line the rocks are predominantly purple and reddish-brown; north and east they are of the green variety, with purple patches in places.

The area covering the main part of the two Sunset claims is red-brown agglomerate. This rock ranges in structure from a fine-grained, massive, red-brown tuffaceous rock with fragments imbedded in it here and there, to a rock consisting mainly of fragments with the

fine-grained red matrix filling in the space left between them. The fragments look like feldspar porphyry and are of the same general color as the tuffaceous matrix between them, though slightly more purple than red-brown. No green rock was found mixed with the red-brown variety in this particular area.

South of Evindsen Creek, the greater portion of the fragmental rocks is purple in color, with small green patches more common in some places than in others. Here the red-brown tuffaceous material is rare, appearing only as streaks in the purple matrix, in a few places. The difference between the two reddish rocks is rather marked, and if there is a contact between them, it must be in Evindsen Creek. Moreover, the contact is probably a fault with greater displacement vertically than horizontally; such a fault would bring into proximity two rocks nearly alike but different enough to be recognized as two phases - one, for instance, being near the top of the volcanic deposit, and the other near the bottom. In other words, if a bed of volcanic agglomerate were deposited, the amount of red-brown tuff increasing as the deposition continued, then the bed would be dominant in red-brown tuff at the top, and in purple agglomerate at the bottom; and if the bed were not too thick, a relatively small movement on a fault through the bed would bring the purple bottom up against the red-brown top - conceivably what may have taken place along Evindsen Creek.

This might lead to the deduction of a continuation of the fault off the bend in Evindsen Creek and onward to the northwest "overland"; then the southern termination of the Copper Belt would be at the fault itself, with agglomerate south of the fault, and no projecting Copper Belt tongue; the Copper Belt rock on the Maud McPhee might thus be

merely a small body of that rock torn away from the main mass by the fault; or else a separate small intrusion.

The green agglomerate is texturally similar to the purple variety, but both the fragments and groundmass are green in color; it is interesting to speculate as to whether the green color is not due merely to alteration and bleaching of the purple variety, by reduction of the red iron oxides to green or colorless iron compounds. Spots of green are found in the purple rocks, and purple spots have been observed in the green as well.

The contact between green agglomerate and the other reddish varieties is gradational, as has been pointed out. The wavy portion shown on the map east of Black Bear Creek appears incongruous in view of the main direction of the contact, but was deduced as a result of certain observations made along Black Bear Creek in that vicinity. The contact was thought at first to follow Black Bear Creek, perhaps being in the form of a fault along the creek; but a walk down part of the creek did not disclose any faults, even where the bedrock in the creek was imbricating across the creek in such a manner that all the rock across the stream could be examined. What was seen instead was an interfingering of green and red rocks, the "fingers" pointing not along the creek but across it. Moreover, on the trail leading upward from the cabin ruins, an east-west trending contact between green and purple agglomerate was found. The only explanation of this arrangement would therefore be that the contact between the green and red rocks, at least in the zone in question, is an irregular interfingering one.

This might have been caused either by deposition of two different rocks side by side from two different volcanoes; or else by progressive hydrothermal alteration and bleaching of the red rock progressively along the bedding (of which the direction could not be determined except in the one place where the visible contact was seen) from east to west.

Sedimentary Rocks

The sediments, shown in blue on the map, were seen in only a few exposures, but these were sufficient to outline the area roughly. Two types were noted - a strikingly bedded fissile shale along the west side of the body, and a massive black structureless and finely-crystalline argallite. The few dips that were obtained show that the contact between the Copper Belt and the sediments is not conformable.

At the northwest corner of the junction of Evindsen Creek and Kitsault River is a small exposure of Copper Belt Rock - grey, rusty-weathering, containing disseminated pyrite and quartz stringers. This is either a very large boulder, or else part of the Copper Belt intrusion itself. The latter idea is reasonable if we presume that the main intrusive body flares widely downward; then the locality on Evindsen Creek, because of its low elevation, might easily reveal a small portion of the eastward extension of the intrusive body.

## Prospects and Mineralization

For convenience, summaries of assays and sample locations and descriptions are presented on the following two pages.

Near the north corner of the Red Point Extension claim is a shear zone nine feet wide at the west (samples 7 and 8) widening out to at least sixteen feet at the east, that is, downhill (samples 18 and 19). The west end of the vein as shown on the map contains a three-foot wide zone rich in grey quartz stringers, which assayed 0.2 ounces gold per ton. The sheared rock beside this quartz-rich band does not contain notable amounts of any visible mineral other than pyrite, and sample 7, cut across the whole vein, including the quartz and the remaining six feet of rock, assayed only 0.22 ounces of silver and negligible amounts of gold, and other elements.

Farther downhill, where sample 18 was taken, the shear zone, still nine feet wide, appears quite barren, the rock being merely broken up by parallel slips; some quartz stringers are present here too, mainly limited to a three-foot zone, which assayed 0.56 ounces silver per ton, with negligible amounts of other elements.

Sample 19 was cut across the entire sixteen feet of the lowest exposure on the shear zone, as the quartz stringers were sparsely distributed over the entire width of the shear zone. Here chalcopyrite, though not abundant, was visible in many places. Assays showed 0.76 ounces silver and 1.1 per cent copper over the entire sixteen feet. No showings on the vein or exposures of it were noted west of the exposures discussed above; nor could it be followed through the increasingly dense woods down to the east. Though the assays of the exposed vein are not in

## TABLE OF ASSAYS

| Sample No. | Au oz./ton | Ag oz./ton | Pb % | Zn % | Cu % |
|---|---|---|---|---|---|
| 1 | | 64.40 | 0.3 | 1.0 | |
| 2 | | 2.68 | 0.1 | 1.2 | |
| 3 | | 0.20 | 0.3 | 1.7 | |
| 4 | | 0.16 | 0.3 | 0.1 | |
| 5 | 0.08 | 1.16 | 0.2 | 1.5 | |
| 6 | 0.02 | 0.18 | 0.1 | | |
| 7 | 0.02 | 0.22 | 0.1 | | |
| 8 | 0.20 | 0.20 | 0.2 | | |
| 9 | Tr | 0.22 | 0.3 | Tr | Tr |
| 10 | Tr | 0.04 | 0.2 | Tr | Tr |
| 11 | Tr | 0.10 | 0.1 | Tr | Tr |
| 12 | 0.01 | 0.16 | 0.2 | Tr | Tr |
| 13 | Tr | 0.40 | 0.1 | Tr | Tr |
| 14 | 0.005 | 0.02 | | | 0.2 |
| 15 | 0.01 | 0.76 | | | 0.1 |
| 16 | 0.01 | 0.35 | | | 0.1 |
| 17 | 0.52 | 1.08 | | | 15.4 |
| 18 | 0.005 | 0.56 | | | 0.1 |
| 19 | 0.08 | 0.76 | | | 1.1 |
| 20 | Tr | 0.20 | | | |

## LOCATIONS AND DESCRIPTIONS OF SAMPLES

| Sample Number | Location and Description |
|---|---|
| 1 | North Star Claim, 1649' adit, muck sample from dump: Dark quartz, pyrite, galena, sphalerite, ruby silver, argentite. |
| 2 | North Star Claim, 1587' adit, chip sample across 5' of face: White and black quartz, pyrite, jasper. |
| 3 | North Star Claim, 1500' adit, chip sample across 5' of face. |
| 4 | Sportsman: grab sample taken from side of cliff: Rusty ?Copper Belt rock. |
| 5 | Red Point No.1, trench, chip sample across 36 feet of sheared Copper Belt rock with quartz stringers, pyrite, galena, chalcopyrite. |
| 6 | Red Point Extension, trench, chip sample across 27 feet of Copper Belt rock with white quartz stringers and pyrite. |
| 7 | Red Point Extension, trench, chip sample across 9 feet of Copper Belt rock, sheared, with pyrite and grey quartz veinlets. |
| 8 | Red Point Extension, same trench, grab sample of grey quartz only, about 3 feet wide. |
| 9 | Red Point No.1 tunnel, chip sample across drift face 5 feet wide: Copper Belt rock with few white quartz stringers. |
| 10 | Same tunnel, grab sample from fault gouge about 530 feet from portal, east wall. |
| 11 | Same tunnel, grab sample from quartz and fault zone, 190 feet from portal, east wall. |
| 12 | Same tunnel, grab sample 30 feet from portal, west wall: Quartz stringers and pyrite in wall rock. |
| 13 | North of northern corner of Sunset No.2, across 2' shear zone between Copper Belt and red fragmental rock: Contains some white quartz stringers. |
| 14 | Red Point No.1, longer tunnel on cliff, across 5 feet of face: Copper Belt rock. |
| 15 | Red Point No.1, trench, across 7 feet of shear zone containing quartz stringers, pyrite, and some chalcopyrite. |
| 16 | Red Point No.1, trench above shorter tunnel where sample No.14 was taken: 13 feet of broken Copper Belt rock with quartz stringers and pyrite. |
| 17 | Same place as No.16, but across adjacent 3.5 foot thick lens rich in chalcopyrite. |
| 18 | Same shear zone but farther downhill from where samples 7 and 8 were taken. Shearing here 9 feet wide, but sample taken across 3 feet of grey quartz stringers - rest of shear zone barren. |
| 19 | Downhill from sample 18 on same shear zone. Across 16 feet containing quartz stringers, pyrite, and some chalcopyrite. |
| 20 | Maud McPhee, short adit, grab sample taken from left wall; Copper Belt rock. |

themselves adequate, large enough "kicks" are present in the grey quartz at least to warrant a small-scale search for any possible extensions of the vein under the overburden east and west of the exposed ground. The location of the shear zone away from good trails and roads, and its structure - that of a shear zone which does not have the habit of flaring out suddenly into a large orebody - are decidedly unfavorable factors which should be considered before any serious work is contemplated.

The trail across Red Point No.1 claim encountered a large rusty bluff extending up from the trail to the north. At the top where the cliff levels off abruptly, a series of trenches was found. In the side of the cliff about seventy feet below the trenches are two short adits, one forty feet long and the other fifteen feet. Far below this, and below the trail to the south, is a tunnel seven hundred feet long, still in excellent condition, though driven in 1927. This is easily reached by way of a branch off the main trail as shown on the map. The upper tunnels and trenches can be reached by climbing up the bluff, but another route is eastward from the trail above the cabin ruins, over the gentler ground above the bluff.

Sample 5 was taken across thirty-six feet of sheared rock containing quartz stringers, pyrite, galena, chalcopyrite, and some sphalerite. The shear zone is merely a zone of broken-up rock, with only a little schist and gouge, and trending north-south. The most notable values here, across thirty-six feet, were found to be 1.16 ounces silver per ton and 1.5 per cent zinc.

East of this trench was discovered another trench, off the main zone. This is a shear zone, striking westward, and dipping almost vertically, seven feet in width, containing quartz stringers, pyrite and some chalco-

pyrite. Sample 15, taken across seven feet, showed 0.76 ounces silver per ton and negligible values in other metals. The broken muck lying by this trench contains some pieces quite rich in chalcopyrite, indicating that the vein at this point may have contained a copper-rich pod which was removed during the trenching.

A short distance south of the location of sample 5, and right on the edge of the bluff, is another trench on the main mineralized zone, exposing thirteen feet of broken-up rock with quartz stringers and pyrite; the trench also exposes two bodies of chalcopyrite-bearing rock, from which were obtained some pieces the size of a man's fist that appeared to be nearly solid chalcopyrite. The larger body was about three-and-a-half feet thick and about five feet long, and assayed 15.4 per cent copper and 1.08 ounces silver per ton (sample 17). Sample 16, taken across the rest of the zone, but excluding the chalcopyrite lenses, gave no significant assays.

The two short tunnels directly below this trench do not seem to be driven on any sort of lead, and the walls and face are merely Copper Belt rock, almost solid, showing a few white quartz stringers. Only the longer tunnel was sampled for this reason (sample 14) and yielded poor assays.

Down the bluff from these two short tunnels to the trail, the rock contains occasional crystals of galena and sphalerite, some of these being up to almost a quarter of an inch in diameter; but such crystals are rare and widely scattered. No mineralized shear zone could be found on the face of the bluff, though the edge of the overburden comes close to where such a zone might be present. Even immediately below the exposure containing the high copper values, no shear or definite zone of any sort could be seen on the face of the bluff, which is exposed.

The faults shown on the map as cutting through the workings are not major structures defining the mineralized zone, but merely small faults in most cases across the zone.

The long tunnel beginning down south of the trail was no doubt driven in an attempt to reach any possible downward extension of the copper-bearing zone which appears high above it on the cliff. This attempt met with no success. The small accompanying map shows the geology of this tunnel, and the samples, which were actually taken from areas thought to be most favorable of any in the tunnel, yielded disappointing assays. Apart from a few quartz stringers and sheard, nothing but "fresh" Copper Belt rock was encountered. Mapping of the unwashed walls was accomplished by chipping the wall with a hammer every foot or two and examining the fresh surface of the chips, but nowhere was any sign or evidence of an orebody found, even though the tunnel passes directly under the mineralized trenches.

One more trench, supposedly on the same zone, was found near the centre of the Red Point Extension claim. Here the trench intersects twenty-seven feet of Copper Belt rock in which occur some white quartz stringers. Sample 6, taken here, showed negligible values.

Similar values were found in a short eighteen-foot adit driven into the side of a cliff in Copper Belt rock on the Maud McPhee claim (sample 20). Conceivably this was driven to intersect the same copper zone as found north of Evindsen Creek. The lower face of this adit is covered by finely broken rock as if this had come from a shear zone; but the large pieces of "loose" hanging from the back of the adit made entrance unsafe, so that only a grab sample from the wall near the entrance was taken. No quartz or mineralization could be seen in the tunnel by standing within the portal and looking in.

Sample 4, knocked from the face of a rusty cliff, on the Sportsman claim, showed better than a trace of lead, silver and zinc, but there was no other evidence indicating the presence of minerals in this rock except that the rock was rusty.

The values shown by most of the surface samples just discussed are presumably higher than would have been found in the apparently barren Copper Belt rock outside the mineralized zone. But the only one sample which showed definite values within this north-south zone is number 17, and this was picked especially for its high chalcopyrite content. Only two small lenses of this material were found, these both at the same showing, neither of them displaying any inclination to be continuous. A careful search might uncover other occurrences of chalcopyrite in this zone, but a search has in fact already been made as evidenced by the hundreds of feet of tunnelling and several trenches, most of which disclosed nothing. Certainly there is no geologic evidence in favor of the existence of a large orebody of copper minerals, unless we take as such evidence the fact that chalcopyrite has found its way into the country in small amounts; in other words, copper is present in the area, though this does not automatically lead to the assumption of a large hidden copper lode nearby. Any further prospecting of this zone would be more a wildcat venture than a systematic follow-up of the few inconsistent "leads" that exist.

In the face of a cliff near the southern tip of the Torbrit Fraction, a short tunnel was found driven on a four-foot shear zone. The shear zone consists of chloritized rock with no quartz or other mineralization.

A word might be said on the possibilities of finding an extension of the Torbrit orebody. The strike of the orebody is slightly north of west, but it plunges down at about thirty-three degrees in a direction N65°W. Inasmuch as it is a massive body and does not occupy a shear zone of

which the trace could be followed on surface, the only extension of the ore would run downward along the plunge - i.e., 33° down at N65°W. The vein is thus directed farther and farther away from surface, for not only does the plunge take the vein farther down, but also the land rises above the supposed extension of the vein as it progresses, so that a surface manifestation of the vein is highly unlikely west of the river. Faults occur in the footwall of the orebody, one of which at least is parallel to the footwall and serves as the contact between vein and wall rock; such a fault, striking roughly east-west and dipping about forty-five degrees north, should appear on the Torbrit fraction. But no faults of that attitude or strength were found there. The Torbrit foot-wall faults are not likely strong or continuous enough to be prominent so far away from the mine. Finally, if they are post-ore faults, as they certainly appear to be, the very reason why they occur in the Torbrit mine foot-wall is, in all probability, due to the foot-wall itself - in other words, the foot-wall, being a contact between two different materials, and therefore susceptible to shearing and fracture, has inself localized the fault; if there were no contact, there would be no faults.

No connection is evident between the Torbrit orebody and the North Star zone. The two bodies strike at widely different angles. The North Star, Dolly Varden, and Torbrit ore may all have been introduced by the same agency, but this is only conjecture; and if there is any structural relationship between the three, the relationship is far from obvious.

## Conclusions

The geology of the area, including the claims held currently by Torbrit Silver Mines Limited, west of the Kitsault River, is described in the text and depicted by the accompanying map. Fragmental volcanic rocks and argillaceous sedimentary rocks are cut by a py a pyrite-rich intrusive, the rusty-weathering Copper Belt.

The intrusive appears attractive from a distance because of its color and imposing bluffs; the rusty color is, however, only superficial, and the Copper Belt does not have, locally at least, the qualities of a gossan; the rusty color is merely a skin of ferric oxides on a rock full of disseminated pyrite.

The only mineral occurrences of any size and mineral content noted in the area were found in the Copper Belt, probably because this rock is more amenable to shearing than are the other rocks.

A shear zone about nine feet wide and containing grey quartz stringers was found striking about N80°W near the north corner of the Red Point Extension claim. The shear zone as a whole contains small amounts of silver, and the grey quartz shows a small amount of gold. None of these values are over an ounce per ton. One sample taken across sixteen feet has 1.1 per cent copper.

Another zone of mineralization, about thirty feet wide, not much sheared and having indefinite margins, extends down from the Red Point Extension to the Red Point No.1 Surface showings contain quartz stringers and in one place display more than an ounce of silver per ton over thirty-six feet; another sample taken from a lens very rich in chalcopyrite had 15.4 per cent copper and over an ounce of silver per ton. Tunnels driven

beneath these surface showings reveal no more mineralization than is present in the fresh rock outside the mineralized zone.

The assays quoted above are only the best of several that were made. The area is far from suitable roads though not too far from a fair pack trail. The deposits mentioned are definitely uneconomical as determined by values found in existing showings. But it might be advisable to expose these zones in a few more places to make certain that nothing is missed.

## References

1. George Hanson: Portland Canal Area, British Columbia. Canadian Department of Mines Mem.175, 1935, pp.37-87.

2. Minister of Mines, B.C., Ann.Rept., 1951, pp.76-107.

3. Dom. Geol. Surv., Publication No.1901, issued 1922.