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SUMMARY:

The following report presents an exploration project designed to find further lead deposits like those at the Giant Mascot Mine at Spillimacheen. The available data show that the large scale structures which probably influenced the location of the Giant Mascot orebody are repeated at Steamboat Mountain. This section of the Columbia valley was unsuccessfully prospected in the 1890's so that it can be assumed that no worthwhile mineralization is evident at surface. A program of geological mapping is recommended to determine whether favourable smaller scale structures occur in the favourable horizon. If warranted by the mapping results, a further programme of staking and geophysical and/or geochemical surveying is recommended. The mapping would cost $800 - $1300 in wages and expenses. Costs for other stages are not estimated since they would be contingent on the size of the favourable area.

INTRODUCTION:

Location

Jubilee Mountain, the site of the Giant Mascot Mine, and Steamboat Mountain, the site of the suggested exploration project, are both isolated mountains within the valley of the Columbia River, approximately midway between Golden and Radium Hot Springs. Both

are west and within 5 miles of the Columbia River. The Canadian Pacific Railway and the Golden-Radium Highway follow the east bank of the Columbia.

GENERAL GEOLOGY:

The Columbia River marks a division between the Precambrian Purcell Mountains on the west, and the Paleozoic Rocky Mountains on the east. Jubilee and Steamboat Mountains lie within a plate of Paleozoic rocks caught between the major Purcell Thrust and a smaller thrust on the west. The synclinal structure within the plate seems to be a Rocky Mountain structure rather than a Purcell structure. (Figs. 1 & 2).

Mineralization in the Columbia valley is scant. Of the ten known occurrences in the section between Golden and Windermere, seven are primarily barite (4 barite with galena, 1 barite with chalcopyrite, 2 barite with pyrite). Two of the other occurrences are malachite-azurite, the third is an occurrence of galena-sphalerite. Four of these occurrences are in the Jubilee dolomite, three in the upper section; the remaining six occurrences are each in a different stratigraphic horizon. Three mineral occurrences are being mined - two are intermittently quarried for barite, and the third, the Giant Mascot Mine, is a lead producer.

GIANT MASCOT MINE

History:

The Giant Mascot Mine outcrop ore was staked before 1890. Various companies and individuals did exploration work prior to 1947.

Silver Giant Mines Ltd., which was organized to acquire the property in 1947 optioned the property to Siscoe Gold Mines. The option was dropped upon completion of a drilling programme in 1949. Silver Giant Mines Ltd. merged with Hedley Mascot Gold Mines Ltd. to form Giant Mascot Mines - Silver Giant providing the property, Hedley Mascot providing a mill and some liquid capital. A bond issue was floated as a source of additional capital. Production began in 1951.

Geology:

The geology of Jubilee Mountain is shown on the geological maps in Figs. 1 and 2. Jubilee Mountain lies within a plate of Paleozoic rocks caught between two major thrust faults - the Purcell Thrust on the east, and an un-named thrust on the west. The plate is thin in the vicinity of Jubilee and Steamboat Mountains but widens to the north and south. The major structure on Jubilee Mountain is a syncline plunging gently north at the south end, and gently south at the north end.

The mineralization at the Giant Mascot Mine occurs at the top of the Jubilee formation, where the Jubilee-McKay contact on the west limb of the major syncline is cut off by the un-named westward dipping thrust (Fig. 3). The mine-controlling structure is a local anticlinal nose plunging south 75° West at 45° (Fig. 4). Ore is localized at a contact between the slate and limestone on the nose of the minor fold and along its northern limb. The ore is a replacement of shattered Jubilee limestone by barite with streaks and clusters of fine-grained galena and scattered pyrite and sphalerite. Locally small amounts of chalcopyrite, bornite, tetrahedrite (?) malachite and azurite occur. Unreplaced

inclusions of country rock within the ore zone have been silicified and there is usually some silicification of the wall rocks on the borders of the barite zone.

The relationship of the mine fold to the major structures,i.e. (the thrust fault, and the major syncline) has not been determined. Apparently, the geology has not been mapped beyond the limits indicated in Fig. 4. However, the major fold in the vicinity of the mine plunges north-northwest at about 15°. If the mine structure was the usual dependent type of drag fold it would have to plunge gently to the north-northwest. Actually it plunges to the west. Occasionally drag folds related to major folds, are perpendicular rather than parallel to the major fold axis and in the plane of the fold limb. Near the mine, the west limb of the major syncline dips steeply to the east, so if the mine structure were related to the major fold in this fashion it should plunge steeply east-northeast. Since the mine fold plunges to the west it does not seem to be related in any understandable manner to the major fold. (See Fig. 5).

The mine fold plunges westerly underneath the northerly striking thrust fault on the west side of Jubilee Mountain. The plunge of the mine fold (accurately known) is parallel to the dip of the thrust fault (known approximately). Generally, the axis of a drag fold which is related to a fault, is perpendicular to the direction of movement on that fault. If the mine fold were produced by the fault then there probably was a strike-slip movement to the north or south. This is not in keeping with the major movement on the fault, a thrust movement towards

the east. One of the more reasonable recent hypotheses with respect to the Purcell Thurst suggests that it originated as a transcurrent fault with strike-slip movement and that subsequently major thrust movement took place on the older break. If the thrust on the west side of Steamboat Mountain was also initiated as a transcurrent fault the orientation of the Giant Mascot fold could be reasonably explained.

The mine fold must be related either to the major syncline or to the thrust fault. The evidence as presented above is not conclusive, but it seems probable that the mine fold is related to the faulting rather than the folding.

Development:

The mine is developed by 5 adit levels, the lowest of which, 6 Level, is 400 feet lower than the ore outcrop. An inclined shaft was sunk from 6 Level and 7 Level, established 150 feet below 6. The lowest level, 8, is now being developed.

Above 6 Level, the orebody averages 20 feet in width and is 200 feet long. On 7 Level, the orebody averages 30 feet in width and is 250 feet long. The incline length of the orebody from outcrop to 7 Level is 700 feet.

Ore Reserves:

Date	Tonnage	Grade Pb.	Zn.	Ag.	Remarks
June 1949	113,700	7.83	-	-	positive ore
	54,500	7.26	-	-	probable
	34,700	6.16	-	-	possible
Apr. 1951	141,790	7.20	-	-	indicated to 200 below 6 Level.
Nov. 1951	577,243	6.1	-	-	probable and possible
July 1952	483,800	5.8	-	-	proven and indicated
Sept. 1952	412,135	5.8	0.8	1.0	to 300' below 6 level
Sept. 1953	404,000	5.6	1.2	1.0	proven and indicated

The orebody is a pipelike body plunging at 45° and it is not considered economic, apparently, to block out ore more than 200 feet below the lowest workings. Probably ore reserves will be kept more or less constant until the mine approaches depletion.

Production:

Production prior to 1951 was 2,254 tons of shipped ore. Giant Mascot Mines began milling in February of 1951 at a rate of 80 tons/day which was gradually increased to the current 550 tons/day.

	1951 (10 mos.)	1952	1953	1954 (6 mos.)
Tons milled	22.411	86.299	170.176	93.113
Smelter receipts	$ 314,207	$1,090.195	$1,454,960	-
Smelter receipt/ton	$14.02	$12.63	$ 8.54	-
Operating profit	-	$322,687	$381,317	$186,045
Operating profit/ton	-	$3.67	$ 2.24	$2.00
Net earnings	-	$300,681	$351,284	-

A pilot mill was installed recently to determine the feasibility of producing barite as a by-product.

Conclusions:

The Giant Mascot Mine has not yet paid any dividends although it should be in a position to do so within the next year or so. However, it should be noted that the operating company did not pay for most of the development and exploration work which was done on the property. There is no obvious reason why the orebody should not extend to a depth considerably beyond the explored limits. The Giant Mascot operation should eventually be modestly profitable.

Whether an exploration programme aimed at finding a similar occurrence is warranted depends upon the attitude of the exploration company. If it is assumed that the Giant Mascot Mine represents the largest and highest grade deposit, one is likely to find then an exploration programme is not warranted. If the possibility of finding a better deposit is considered, then an exploration programme is warranted.

GEOLOGY OF STEAMBOAT MOUNTAIN.

The geology of Steamboat Mountain is almost identical to that of Jubilee Mountain (see Figs. 1 and 2). A major trending syncline involving Beaverfoot, McKay and Jubilee strata is cut on its west limb by a westerly dipping thrust fault. The fold and fault involved are extensions of the structure on Jubilee Mountain

Comparison between Steamboat and Jubilee Mountains.

	Steamboat Mtn.	Jubilee Mtn.
Faults	Both in narrow part of plate, between two thrusts.	
Folds (major)	Both on the same syncline.	
Folds(minor)	Not known.	West plunging nose.
Favourable horizon	Jubilee-McKay contact present in both.	
Mineralization	Barite-silica-pyrite.	Barite-silica-galena-sphalerite-pyrite.

From the above it may be seen that Steamboat Mountain is a favourable area for repetition of the ore making structures at the Giant Mascot Mine.

One general report refers to barite-lead-copper mineralization on "Jubilee and Steamboat Mountains." However, the Steamboat Mountain occurrences are not described in any of the Minister of Mines Annual Reports, so presumably they are unimportant. The area has been prospected so worthwhile lead mineralization if present, is either blind or covered with overburden. At the north end of Steamboat Mountain however, barite replaces brecciated dolomite (McKay formation?). This barite is accompanied by minor amounts of pyrite and by silicification. Brecciation in the dolomite is probably the result of movement along the thrust fault on the west side of Steamboat Mountain (See Figs. 1 and 3).

Fig. 6. is an uncontrolled photo-mosaic of the north half of Steamboat Mountain. Stereoscopic study of these and adjacent photos has provided the only available information concerning the smaller scale geological features.

The thrust fault on the west side of Steamboat Mountain is placed in different locations by the original authors of Figs. 1 and 2 as shown in Fig. 6 by Faults A and B. Fault position B is the more reasonable one.

The favourable horizon is the upper part of the Jubilee formation near its contact with the McKay formation. The Jubilee is a massive cliff-making member and the McKay is a thin-bedded member; consequently the two can be distinguished on the air photos. The photos show that the area of interest near the intersection of the Jubilee-McKay contact with the thrust fault is largely covered with overburden. However, there

probably are enough outcrops (outlined with broken lines) to enable one to choose between the alternative fault locations.

Two localities (C and D) are shown on the photo mosaic where minor folds of the Giant Mascot type may occur. From the photos themselves it is impossible to determine conclusively whether the minor structures are actually faults or folds although, as indicated, C seems to be a fold structure and D seems to be a fault structure. These minor folds (?) are well exposed and, since the country has been prospected, are presumably not ore bearing. However they are a considerable distance from the thrust fault and are important, not as potential ore-bearing structures, but as indicators of the type of structure present in the covered "area of interest."

The aerial photo data, inconclusive though it is, seems to support the contention of this report - i.e. the ore making structures at Giant Mascot may be repeated on Steamboat Mountain.

SUGGESTED PROGRAMME:

Steamboat Mountain is a geologically favourable area for repetition of the conditions which produced the Giant Mascot deposit. The unfavourable factors are:

(1) lack of known minor structures similar to those at the Mascot; and

(2) lack of appreciable galena-bearing barite mineralization.

No conclusive information is available with respect to the first factor, although the aerial photographs suggest that a suitable minor fold may exist.

It is suggested that the west flank of the syncline on Steamboat Mountain be mapped geologically to determine the location of the major thrust fault and to determine if minor structures similar to those at Giant Mascot exist.

If the geological mapping suggests favourable possibilities, then a block of ground large enough to provide adequate protection should be staked, probably that shown as "Area of Interest" in Fig. 6. According to the Claim Maps in the Vancouver Recording office this is all open ground (Feb. 1, 1955).

Since prospecting in the past has not produced worthwhile prospects galena mineralization is likely to be covered with overburden or blind. One or both methods may be applied to checking favourable covered areas (1) electromagnetic geophysical survey; (2) soil sampling for zinc. Disseminated lead mineralization is difficult to locate by any geophysical or geochemical methods. However, it is believed that the Swedish-Loop-Frame method as used by Moreau and Woodward is capable of locating ore-bodies similar to that at the Giant Mascot. None of the soil or plant sampling techniques are particularly effective in testing for lead mineralization, but the zinc present at the Mascot should produce a detectable anomaly. The only way to determine definitely whether these methods are effective would be to try them over the known ore on the Giant Mascot property. This could probably be arranged without any difficulty, but it would not be wise to do so until the favourable area on Steamboat Mountain has been staked.

The suggested program then consists of:

(1) Geological mapping of the west limb of the fold on Steamboat Mountain (Cost $800 -$1300)

(2) Stake favourable ground.

(3) Test soil sampling and electromagnetic method over the Giant Mascot orebody.

(4) Do geophysical and/or geochemical survey over favourable area in staked group.

(5) Trenching and diamond drilling of anomalies.

The execution of Steps 2, 3 4 and 5, is contingent upon favourable results from the preceding stages. Costs are not presented since there is no basis for estimating them until the mapping has outlined the size of favourable area or areas.

OFK
for C.D.A.D.

C. D. A. Dahlstrom

Vancouver, B. C.
February 1st, 1955

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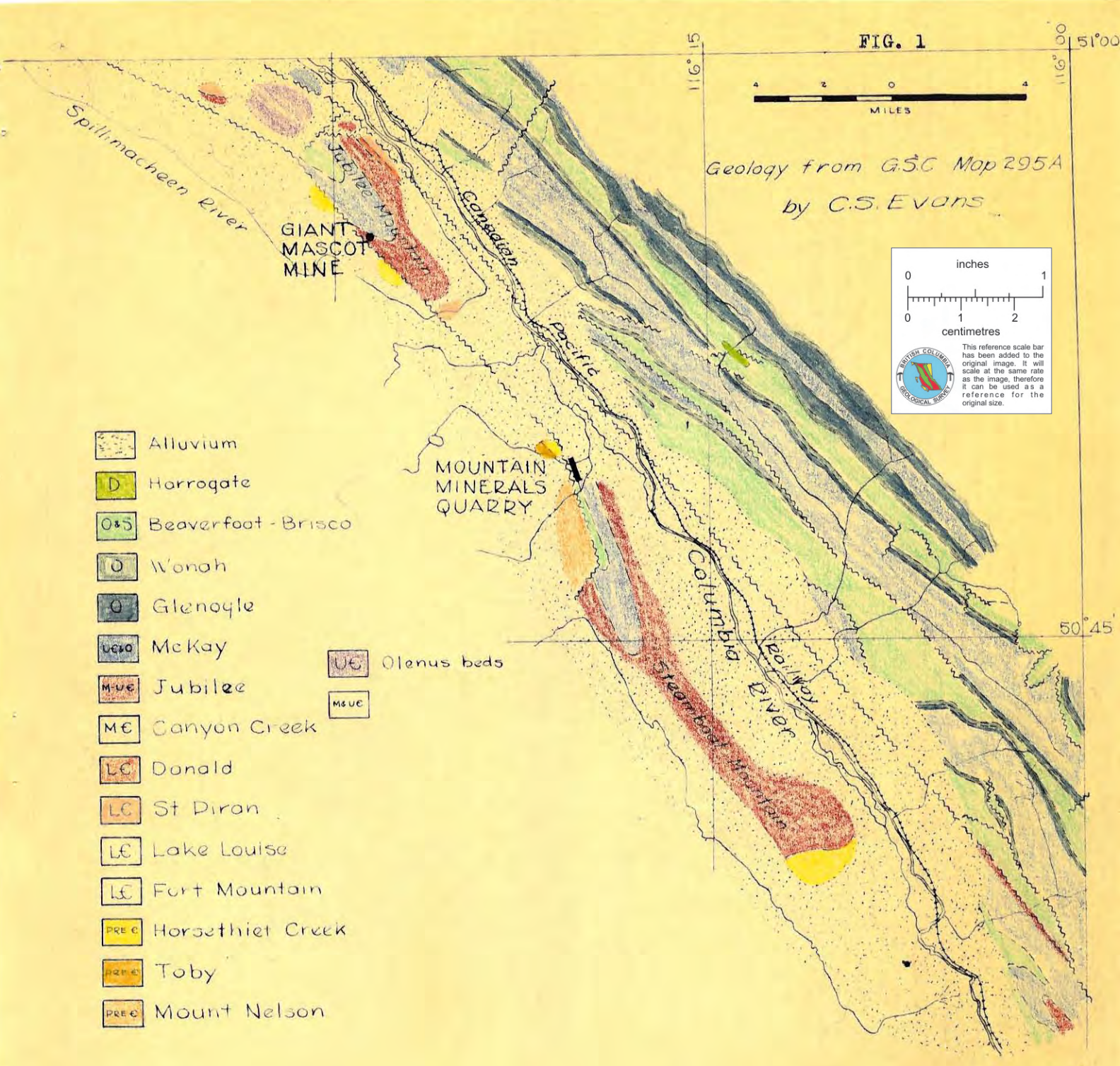
ILLUSTRATIONS.

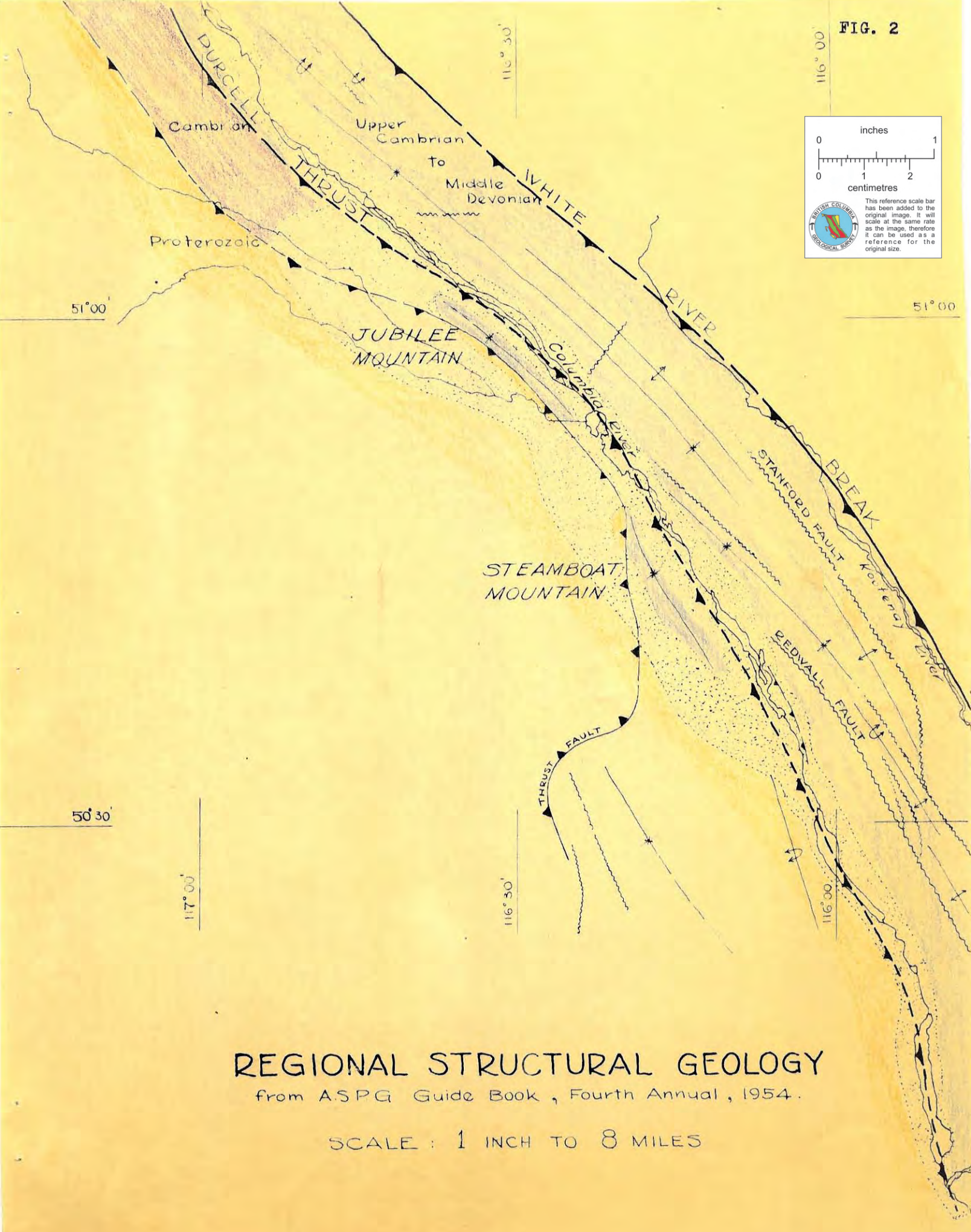
FIG. 1



GEOLOGY

STEAMBOAT MOUNTAIN AREA

FIG. 2

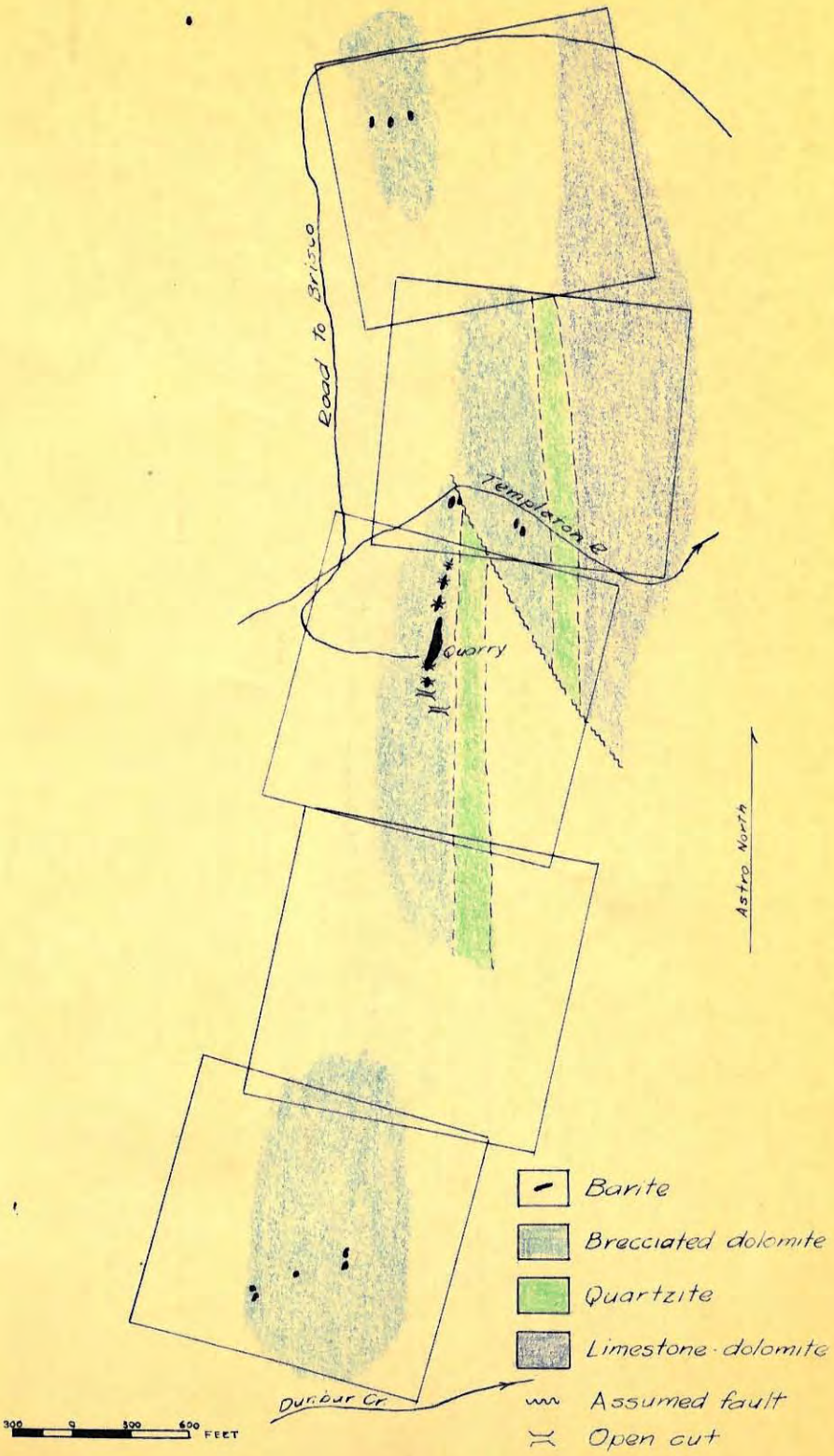


REGIONAL STRUCTURAL GEOLOGY

from A.S.P.G. Guide Book, Fourth Annual, 1954.

SCALE : 1 INCH TO 8 MILES

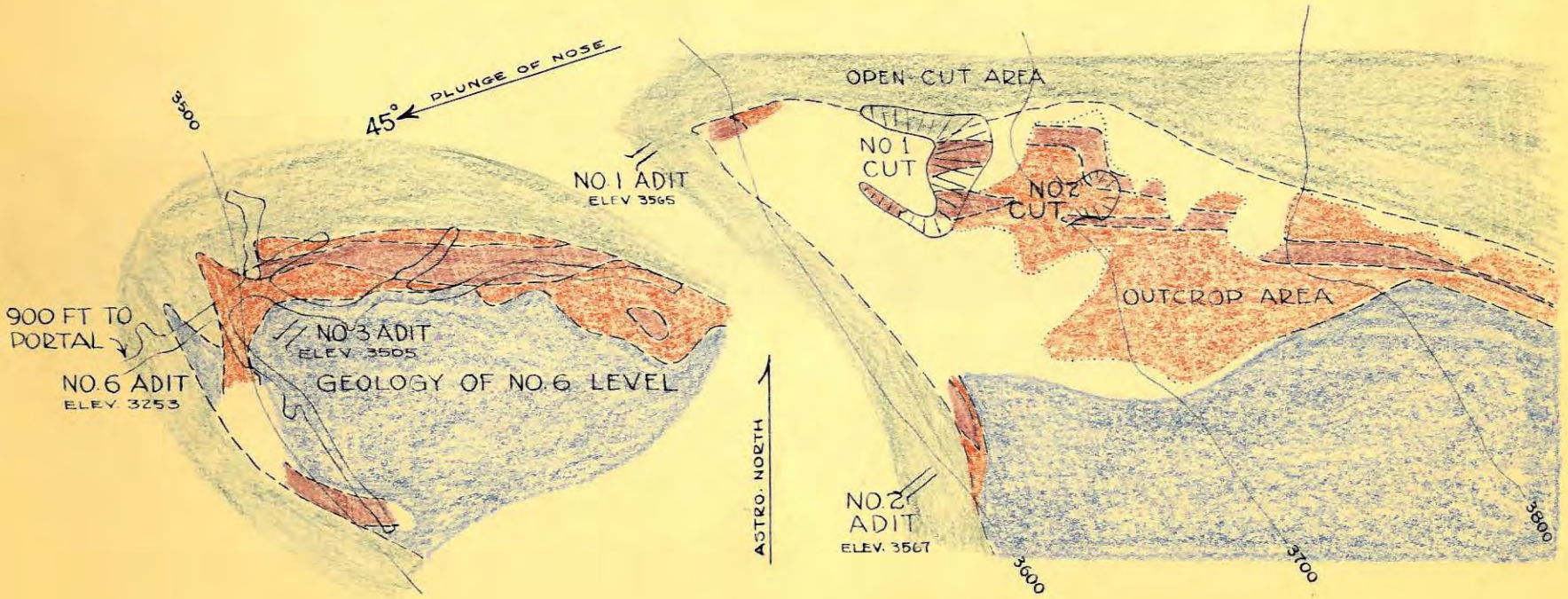
FIG. 3



GEOLOGY

MOUNTAIN MINERALS QUARRY

B.C. MIN. OF MINES REPORT 1952



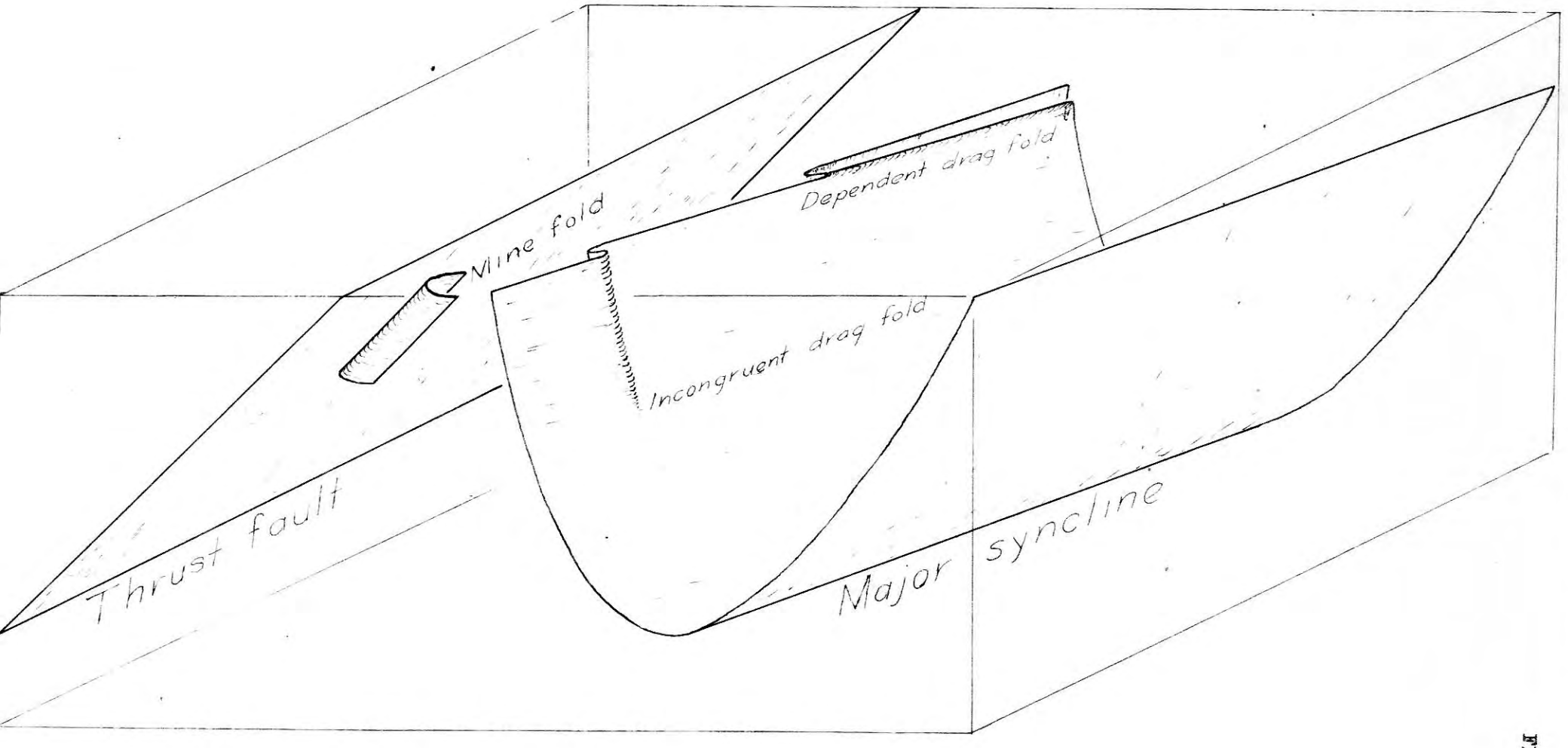
Slate
Barite zone
Mineralization
Limestone
---- Geological Boundary
..... Outcrop Boundary

40 0 40 80 120 160 FEET

GEOLOGY GIANT MASCOT

B.C. MIN. OF MINES REPORT 1949

FIG. 4



STRUCTURAL ELEMENTS - GIANT MASCOT MINE

Fig. 5

STEAMBOAT MOUNTAIN AREA

UNCONTROLLED MOSAIC

SCALE IN MILES 1 ½ 0 1