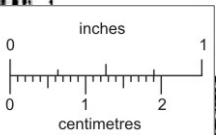
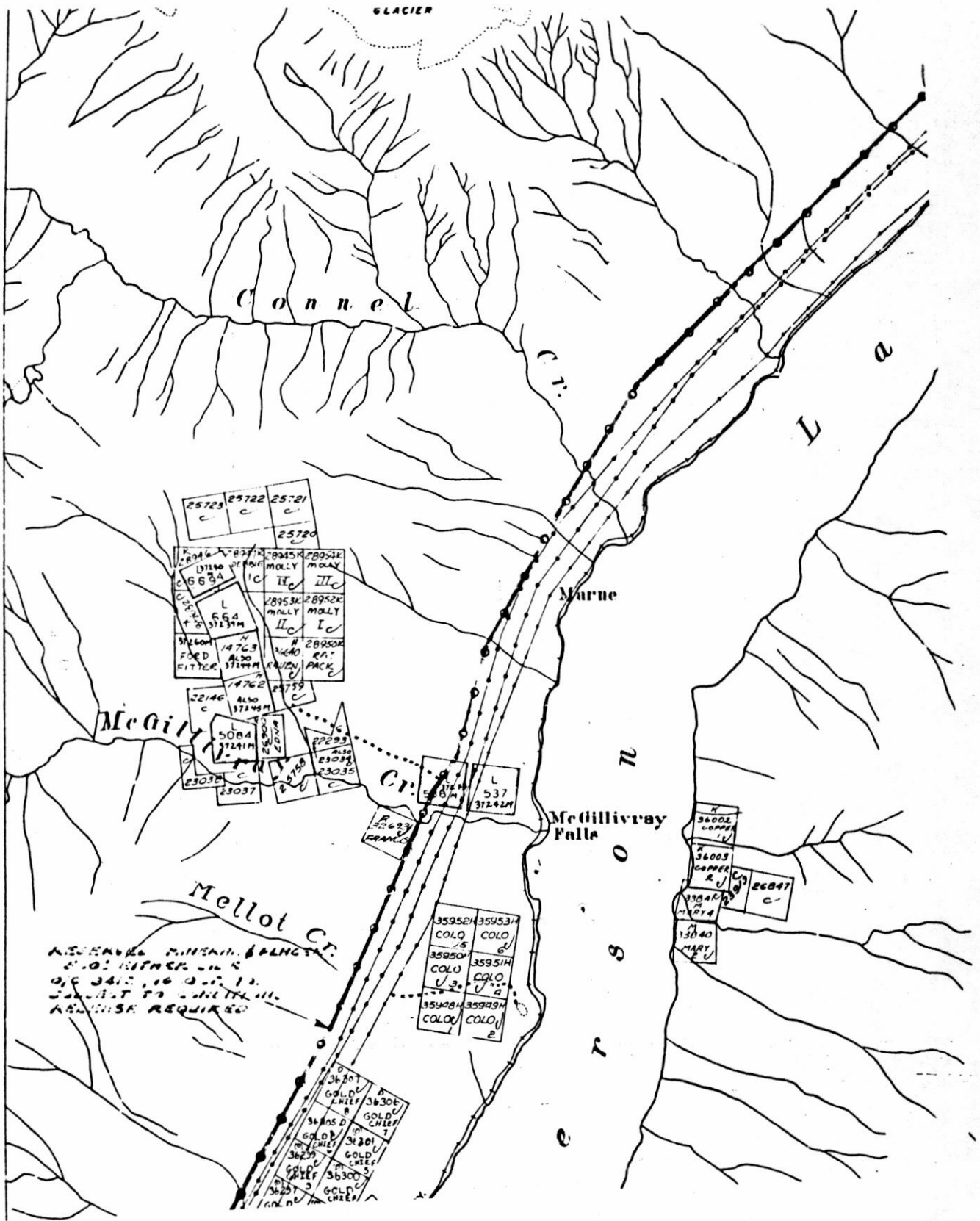


5

4

3

TO WEST SEE MAP 92 J/10 E



This reference scale bar has been added to the original image. It will scale at the same rate as the image, therefore it can be used as a reference for the original size.



Creek. Showings reportedly containing disseminated chalcopyrite mineralization occur on the property.

The work done in 1962 was mainly confined to road construction and the clearing of a camp-site. According to company reports, the Tyaughton Creek road was repaired over a distance of 6 miles. A total of 3½ miles of jeep-trail was improved, and 3½ miles of new road was built to the showings. A camp-site was cleared, and four tents were erected, and construction of a cook-house and bunk-house was started. Two storage sheds were erected for tools and small machinery. A crew of five men was employed, together with some contract labour. Work was suspended for the winter on November 1st.

#### FRASER RIVER (50° 121° N.W.)\*

##### Copper

**Pine, Elm (Mount Askom Mining Company Limited)**

Company office, 817, 402 West Pender Street, Vancouver 1, B.C. George Milburn, president. This private company holds thirty recorded claims in the vicinity of Nesikep Creek, about 15 miles southeast of Lillooet and about 2 miles west of the Fraser River. The property appears to be in part a continuation of the Askom group, which was explored in 1960 by Tombac Exploration Ltd. The showings are reported to contain disseminated chalcopyrite mineralization.

Work on the property was commenced in April and concluded in November. Approximately 4 miles of road was constructed to provide access to the property, and several open cuts were made on the showings. A magnetometer and a soil survey were carried out. A crew of three men was employed.

#### ANDERSON LAKE†

##### Gold

**Golden Contact (Cassiar Copperfields Limited)**

(50° 122° N.E.) The company has under option two Anderson Lake Mining and Milling Co. Ltd. two mineral claims which were located in 1898 and which at that time were known as the Brett group. The Anderson Lake Mining and Milling Co. Ltd. acquired the claims in 1900 and installed a ten-stamp mill. Between 1900 and 1904 the mill recovered 674 ounces of gold from 8,890 tons of quartz mined. In 1908 Northern Exploration Company of Seattle milled 1,200 tons, for which there is no record of production, and in 1910, 300 tons was milled, from which 7 ounces of gold was recovered. The property lay idle until 1929, when it was acquired by McGillivray Gold Mines Ltd., who did some work, then in 1932 the ground was acquired by National Gold Mines Ltd., who operated until 1934. At that time three levels had been driven on a wide quartz vein which extends for a considerable distance. Nothing further was done until 1947, when Golden Contact Mines Limited acquired the ground. This company, between 1947 and 1953, did some diamond drilling, drove the Mac level at 3,320 feet elevation, the 49er at 3,187 feet elevation, and the Pep at 2,018 feet elevation.

The present company acquired the ground in 1960, and in May of that year began to rehabilitate the bottom two levels and to construct a camp and a concentrator of about 100 tons daily capacity. The concentrator was completed in May of 1962, and about 847 tons of vein material mined from the 49er level, the head of the raise from the Pep level and 80 tons of quartz and wallrock from the Mac level.

\* By A. R. C. James.

† By Stuart S. Holland.

stope on the Pep level was milled. Gold recovered from this operation amounted to 7 ounces. Mining operations terminated at the mine in August, 1962.

The camp, about 50 feet above the Pep level, is reached by about 5 miles of truck-road from Marne station on the Pacific Great Eastern Railway.

The vein outcrops at and above 3,640 feet elevation. It strikes north and dips 65 to 70 degrees to the west and very largely lies within black slates, with which it is conformable in strike.

The vein has been explored by six adit levels driven northward as follows: No. 1 level at 3,650 feet elevation; No. 2 at 3,550 feet elevation, in which there is some 400 feet of drift on the vein; No. 3 at 3,400 feet elevation, in which there is some 800 feet of drift on the vein; the Mac adit at 3,320 feet elevation, with about 250 feet of drift on the vein; the 49er level at 3,187 feet elevation, with about 410 feet of drift on the vein; and the Pep level at 2,918 feet elevation, with about 500 feet of drift on the vein. A raise on the vein connects the Pep and 49er levels.

Only the Pep, 49er, and No. 3 levels were open to examination. In them the vein is intersected by a fault zone striking about north 40 degrees west and dipping 35 to 70 degrees southwest, which displaces the vein to the right. This is a major fault which is encountered in all the mine workings from No. 2 level down and which separates the vein into two segments—one west and one east of the fault. On the 49er level the horizontal separation at right angles to the vein is 90 feet and on the No. 3 level it is about 200 feet.

It is evident that the vein which was drifted on in No. 1 and No. 2 levels lies on the hangingwall side of, or west of, the fault. From the portal on No. 3 level there is some 460 feet of drift on the vein west of the fault before the vein is offset some 200 feet to the right; on the same level there is approximately 340 feet of drifting on the vein segment east of and on the footwall side of the fault. On the 49er level there is about 250 feet of drifting west of the fault and 160 feet on the segment east of the fault. On the Pep level, all drifting on the vein, some 500 feet, is on the footwall side, east of the fault.

The vein varies greatly in width, from a foot, locally, to as much as 16 feet in the north face of the drift on the 49er level; for considerable lengths the vein is of drift width or greater. The vein is very sparsely mineralized with pyrite, and visible gold is locally present. In places the vein has a falsely encouraging appearance because of a ribboning along the footwall side that consists of closely spaced shear planes smeared with black argillaceous material from the wallrock. Such vein material simulates the appearance of the high-grade ribboned ore that occurred in the Bralorne and Pioneer mines. Selected samples of ribboned quartz failed to show the presence of exceptional amounts of gold.

The width and continuity of the vein and the presence of visible gold, some of which may be coarse, has induced, over the years, the driving of a good many hundred feet of underground workings to explore the vein in order to find and develop sufficient mineable quartz for a profitable operation.

The gold content of the vein is disclosed by the amount of gold recovered by early milling, by assay plans of No. 2 and No. 3 levels prepared by several reliable examining engineers, and by detailed assay investigation of twenty-two samples taken during the course of an examination in February, 1962.

Between 1900 and 1910, 9,190 tons of ore was mined, largely above No. 2 level, and milled in the old ten-stamp mill. From this amount of ore 681 ounces of gold was recovered—the equivalent of 0.074 ounce recovered per ton mined. If the recovery by the stamp mill was as low as 50 per cent, then the average grade of the quartz mined probably was not more than 0.148 ounce gold per ton.

Detailed assay plans showing the systematic sampling results of three reliable examining engineers are available of the No. 2 and No. 3 levels. An analysis of No. 2 level shows that, of sixty-eight samples taken, only five assayed more than 0.20 ounce gold per ton; the numerical average of the assays is 0.05 ounce gold per ton in the segment west of the fault.

On No. 3 level west of the fault, in one set of 134 samples taken only ten assayed more than 0.20 ounce gold per ton, and of these one assayed more than 9 ounces gold per ton. In a second set of 112 samples taken, ten assayed more than 0.20 ounce per ton, the highest assaying 8.72 ounces per ton. There is no correspondence in position between the high assays of the two sets of samples.

Moreover, it is impossible from information available to reconcile the two independent sets of assay results on samples taken from the drift on No. 3 level on the vein east of the fault. For example, at the south end a 70-foot section, with an average width of 5.0 feet, is shown on one plan as assaying 0.36 ounce gold per ton and on another 0.009 ounce gold per ton. Toward the north end of the same drift a 135-foot length of vein on one plan averages 5.3 feet in width and is shown as assaying 0.30 ounce gold per ton, and on the other a 95-foot length at the same location averages 5.7 feet in width and assays 0.005 ounce gold per ton.

These assay results illustrate the problem of determining by assay the average gold content of a vein in which some of the gold is coarse and randomly distributed.

In February, 1962, a special examination was made at the property in order to investigate the source of some samples from which the company had obtained extremely high assay results. The company had taken ten samples on the 49er level from vein quartz exposed in the drift south of the head of the Pep level raise, and reported that the numerical average of these samples was 63.07 ounces gold per ton, with one sample assaying 442.92 ounces gold per ton. Twenty-two samples were taken during the course of the present examination, of which thirteen were channel samples of the vein as it was exposed in the drift for 60 feet south from the head of the raise from the Pep level. The sample results are tabulated below:—

Sample			Location and Description	Assay—Gold, Silver (Oz. per Ton)	
No.	How Taken	Width (Ft.)			
1801	Chipped	1.0	Pep level—Ben's raise—quartz with small amount of pyrite on hangingwall side of fault.	Tr.	Tr.
1802	Chipped	1.5	Pep level—Ben's raise—quartz with small amount of pyrite and pyrrhotite on the hangingwall side of fault	Tr.	Tr.
1803	Channel	7.0	49er level—east segment of vein; across back of drift north of raise; ribboned quartz with argillaceous partings	0.14 0.60 Tr. 0.12	0.1 0.4 Tr. 0.2
1804	Channel	16.9	49er level—east segment of vein; horizontal channel along west wall of drift between No. 1803 and fault; ribboned quartz with argillaceous partings	Tr. Tr. Nil 0.03	Tr. Tr. Nil Tr.
1805	Channel	6.0	49er level—east segment of vein; across the back on the south side of the raise; ribboned quartz with argillaceous partings and small amount of pyrite	Tr. Tr. Tr. Nil Nil	0.1 Tr. Nil 0.1 Nil
1806	Channel	5.6	49er level—east segment of vein; 5 feet south of No. 1805; ribboned quartz with argillaceous partings	Nil Tr. Tr. Tr.	Nil Tr. Tr. Tr.
1807	Channel	5.5	49er level—east segment of vein; 10 feet south of No. 1805; quartz with argillaceous partings and sparse pyrite	2.38 Tr. 0.11 Tr.	0.6 Tr. Tr. Tr.



Sample			Location and Description	Assay—Gold, Silver (Oz. per Ton)	
No.	How Taken	Width (Ft.)			
1808	Channel .....	5.5	49er level—east segment of vein; 15 feet south of No. 1805; faulted sections of vein quartz	0.03 Tr. Nil Tr. Tr.	0.2 0.2 Nil Tr. 0.3
1809	Channel .....	1.8	49er level—east segment of vein; 20 feet south of No. 1805; quartz with argillaceous inclusions and some carbonates	Tr. Tr. Tr. Tr. Tr.	0.4 Tr. Tr. Tr. 0.2
1810	Channel .....	2.0	49er level—east segment of vein; 25 feet south of No. 1805; intermixed quartz and argillaceous material	Tr. Tr. Tr. Tr. Tr.	0.1 0.2 0.2 0.2 0.3
1811	Channel .....	0.85	49er level—east segment of vein; 30 feet south of No. 1805; faulted end of quartz lens	Tr. Tr. Tr. Tr. 0.10	Tr. Tr. Tr. Tr. 0.2
1812	Channel .....	4.0	49er level—east segment of vein; 35 feet south of No. 1805; quartz with horse of argillite	Tr. Tr. Tr. Tr.	0.2 Tr. Tr. Tr.
1813	Channel .....	5.9	49er level—east segment of vein; 40 feet south of No. 1805; quartz with intermixed argillite	Nil Tr. Tr. Tr.	Nil Nil Nil Nil
1814	Channel .....	9.0	49er level—east segment of vein; 45 feet south of No. 1805; massive quartz without sulphides	Tr. Tr. Tr. Tr. Nil	0.2 Tr. Tr. Tr. Tr.
1815	Channel .....	7.9	49er level—east segment of vein; 54 feet south of No. 1805; quartz with inclusion of argillite	33.41 0.17 8.54 0.06	15.4 Tr. 1.9 0.1
1816	Selected .....	-----	49er level—east segment of vein; at head of raise from Pep level; selected piece of quartz well mineralized with pyrite; no visible gold	0.14	0.2
1817	Selected .....	-----	49er level—east segment of vein; 5 feet south of raise; selected pieces of quartz well mineralized with pyrite; no visible gold	0.01 Tr. 0.03 Tr.	0.2 Tr. 0.1 Tr.
1818	Selected .....	-----	49er level—east segment of vein; 15 feet south of raise; quartz with "lacy" pyrite	16.50 Tr.	3.66 Tr.
1819	Selected .....	-----	49er level—east segment of vein; 15 feet south of raise; well-ribboned quartz with argillaceous partings	Tr. Tr. Nil Nil Nil	0.2 0.2 Nil Tr. Tr.
1820	Selected .....	-----	49er level—east segment of vein; 6-inch vein in wall of drift	Tr. Tr.	Tr. Tr.
1821	Selected .....	-----	49er level—east segment of vein; from west wall of drift between samples Nos. 1806 and 1807; selected pieces of quartz well mineralized with pyrite	Tr. Tr. Tr. Tr.	Tr. Tr. Tr. Tr.
1822	Selected .....	-----	49er level—east segment of vein; from west wall of drift between samples Nos. 1807 and 1808; selected pieces of quartz	0.36 0.04 0.02 Tr.	0.1 Tr. 0.1 Tr.

When the first assays were made, coarse "metallics" were found in some samples, indicating that coarse free gold was present in the vein. It was decided therefore to assay additional cuts of each crushed sample (not additional assays of a single pulp) so as to obtain better information on the gold content. The difficulties

of determining the true gold content of the quartz are readily apparent when one observes in the table the wide range of assay values that may be obtained from a single sample of material (see samples Nos. 1803, 1807, 1815, and 1818).

These assay results show that a single fire assay of an individual sample may not be reliable. The only way to obtain a true assay of a sample would be to extract by amalgamation, or other means, the entire gold content of each sample. The problem is entirely a consequence of the random gold distribution. The difficulties are compounded many times when only a few samples are used in an attempt to assess the gold content of a tonnage of quartz many thousand times the weight of the samples assayed.

The thirteen channel samples, and other selected samples, taken from the 49er level from the 60-foot length of vein exposed in the drift south from the head of the raise from the Pep level, indicate that ore of the grade reported by the company does not exist. The assay value of the 60-foot length of vein quartz represented by the samples in the table can only be obtained by using an arbitrary method of "cutting" the several high assays. By one method an average of 0.22 ounce gold per ton across a width of 5.1 feet is obtained.

Despite the fact that no systematic sampling was done elsewhere in the mine workings, all available observations and assay information fail to indicate the presence of vein quartz of mineable grade in the mine.

[References: *B.C. Dept. of Mines*, Bull. No. 1, 1932, p. 72; *Minister of Mines, B.C.*, Ann. Repts., 1961, p. 28; 1934, p. F 27; *Geol. Surv., Canada*, Sum. Rept., 1933, Pt. A, p. 71.]

#### Gold-Silver

##### Barkley Valley Mines Ltd.\*

(50° 122° S.E.) Office, 870 Blundell Road, Richmond. Thomas Barkley, president. This company holds the Gladys No. 1, Gladys No. 2, Nita, and Bluff groups of claims, totaling thirty claims, on Haylmore, Lawlawton, and Crystal Creeks, about 15 miles by road southeast of Darcy station on the Pacific Great Eastern Railway. Surface showings on the claims are reported to contain values in gold and silver. Work in 1962 has been mainly confined to constructing a road to the property. In previous years about 10 miles of road was completed, starting from the vicinity of Darcy and following the north side of the valley of Haylmore Creek. In 1962 a further 3 miles of road was completed and repairs carried out on 5 miles of existing road. A further 2 miles of road remains to be built to reach the property. A temporary camp was built at Mile 10 on the road. A log cabin was built on the Gladys No. 1 group, and some trenching and stripping was done on the claims. Work was started on May 11th and terminated on October 6th. A crew of three men was employed.

### THE GEOLOGY OF PART OF THE THOMPSON RIVER VALLEY BETWEEN ASHCROFT AND SPENCES BRIDGE†

#### INTRODUCTION

About ten weeks in 1962 were spent mapping the geology along the west side of the Guichon batholith in southern British Columbia. The area mapped is a narrow strip extending northward on either side of the Thompson River for 13 miles, midway between Ashcroft and Spences Bridge (Fig. 1). Parts of this area were

\* By A. R. C. James.  
† By J. M. Carr.

**INTRODUCTION**

The Sebring Creek property of Helgena Mines was examined by Robert L. Roscoe, P.Eng., on behalf of Allen Geological Engineering Ltd., September 1, 1971. Mr. Walter Butula, one of the owners, assisted with the examination.

The purpose of this report is to describe the property, review available information pertaining to the geology, and outline an exploration programme considered adequate to provide data upon which a complete assessment of the potential of the copper-gold-silver and zinc mineral showings may be made.

**LOCATION AND ACCESSIBILITY**

The property is located in the Bridge River area of southwestern British Columbia. Geographic location is 50° -48' north latitude and 122° -19' west longitude.

From Lillooet it is a one hour drive over 32½ miles of highway to the location of a pack trail which leads northerly up Sebring creek to the property. The trail, 2 miles in length, rises 2,300 feet to the cabin and higher to some of the showings. Side trails lead to the various workings.

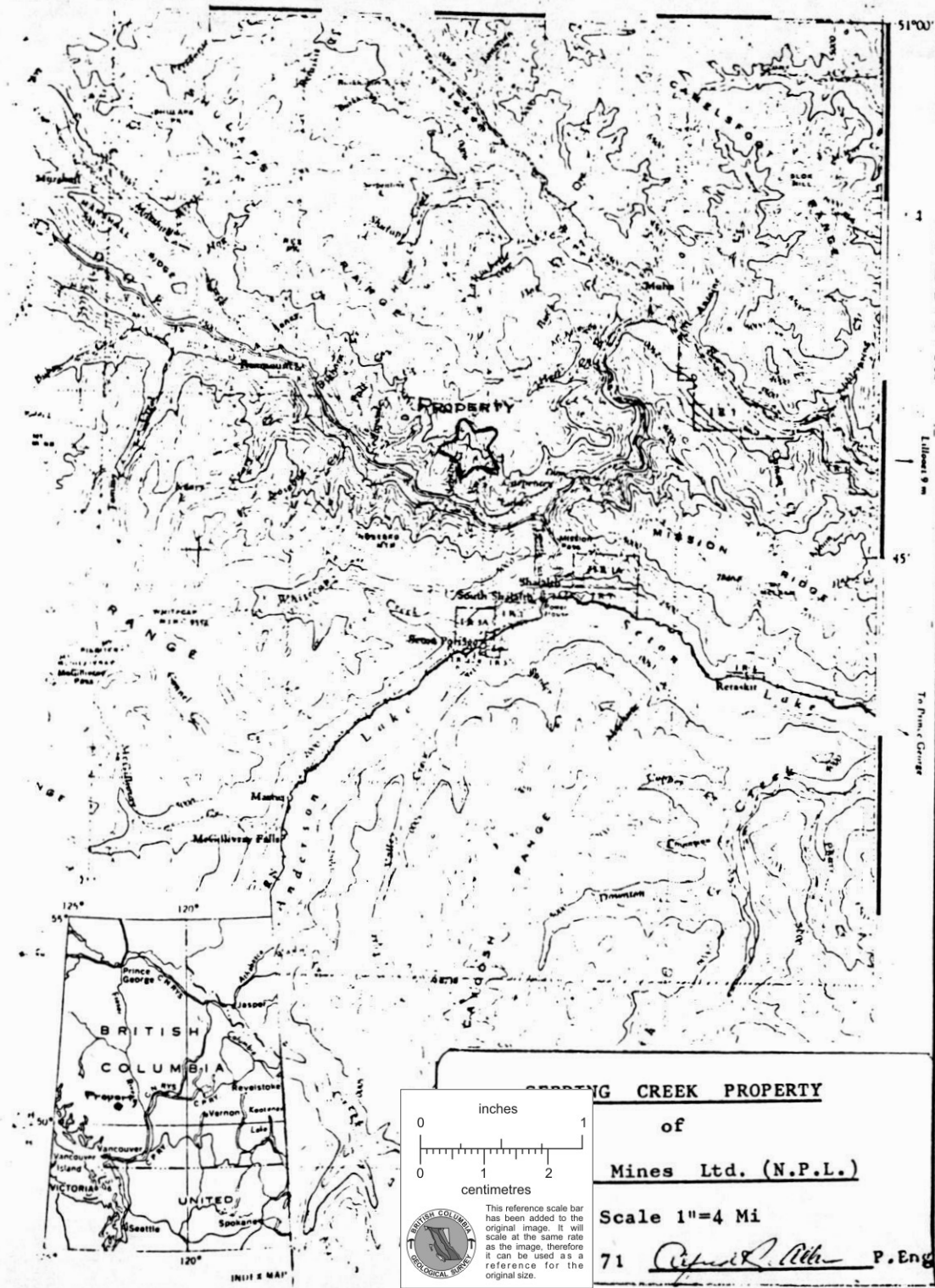
**PROPERTY**

The Sebring Creek claims group, held by Helgena Mines Ltd., (N.P.L.) are as follows:

<u>Claim Name</u>	<u>Record Number</u>	<u>Record Date</u>
Benn 5	27787	14 Nov. 1966
Benn 6	27788	"
Benn 7	27789	"
Benn 8	27790	"
Benn 9	27791	"
Benn 10	27792	"
Benn 11	27793	"
Benn 12	27794	"
Benn 13	27795	"
Benn 14	27796	"
Benn 15	27797	"
Benn 16	27798	"
Pola 2	28382	27 October 1967
Pola 3	28383	"
Pola 4	28384	"
Pola 5	28577	12 March 1968
Pola 6	28578	"
Pola 7	28579	"
Pola 8	28580	"
Pola 9	28581	"
Pola 10	28582	"
Pola 11	28583	"

<u>Claim Name</u>	<u>Record Number</u>	<u>Record Date</u>
Ace 1	28124	24 July 1967
Ace 2	28123	"
Ace 3	28122	"
Ace 4	28121	"
Ace 5	28120	"
Ace 6	28119	"
Ace 7	28118	"
Ace 8	28117	"
Jake 1	29248	2 October 1968
Jake 2	29249	"
Jake 3	29250	"
Jake 4	29251	"
Ace 9	28231	6 Sept. 1967
Ace 10	28232	"
Ace 11	28233	"
Ace 12	28234	"
Ace 13	28235	"
Ace 14	28236	"
Ace 15	28376	20 October 1967
Ace 16	28377	"
Ace 17	28378	"
Ace 18	28379	"
Ace 19	28380	27 October 1967
M & B No. 1	27799	28 November 1966
M & B No. 2	27800	"
M & B No. 3	27801	"
M & B No. 4	27802	"
M & B No. 5	27803	"
M & B No. 6	27804	"
M & B No. 7	27805	"
M & B No. 8	27806	"
M & B No. 9	27807	"
M & B No. 10	27808	"
M & B No. 11	28127	27 July 1967
Bee 1	28125	27 July 1967
Bee 2	28126	"
Copper 1	29182	9 Sept. 1968
Copper 2	29183	"
Copper 3	29184	"

*Broken Hill 92JNE087*



<u>Claim Name</u>	<u>Record Number</u>	<u>Record Date</u>
Silver 1	29180	4 Sept. 1968
Silver 2	29181	"
Spring 1	29235	27 Sept. 1968
Spring 2	29236	"
Spring 3	29237	"
Spring 4	29238	"

Total Number of claims - 67

**TOPOGRAPHY**

The area, dominated by the deep Bridge River valley is ruggedly mountainous. Flowing southerly in narrow canyon-like valleys, Sebring and Viera creeks constitute the main drainage pattern. Intervening ridges are sharp and steep. Up to 6,000 feet elevation there is moderate evergreen growth. From an elevation of close to 2,000 feet above sea level in the Bridge River valley, surrounding peaks and ridges top 6,000 feet, and the showings on the property range around the 4,500 foot level.

**HISTORY**

The Bralorne and Pioneer mines produced gold and some silver from the 1920's until recently. In 1912 the Broken Hill property near the head of Sebring creek was staked by John Hunt and friends. By 1915 they had exposed copper, gold, silver and zinc mineralization at many "spot" locations and driven two adit tunnels totalling 780 feet in length. An eight-man camp and pack trails had been completed. From 1966 to 1969 the area, including Sebring and Viera creek drainages was prospected, and many trenches and pits excavated by the present owners of the claims have exposed widespread mineralization.

**GEOLOGY**

The geology of the Sebring Creek area has not been mapped by the Geological Survey of Canada. Information available, however, points to geology being similar to that mapped by the Geological Survey to the southwest on the Taughton Lake and Cadwallader Creek sheets. An east-west sedimentary series, probably Fergusson, is composed chiefly of Quartzite, chert, interbedded chert and argillite, crystalline limestone and argillaceous limestone. An intrusive body, probably Bender granodiorite and quartz diorite, and/or older Bralorne quartz-diorite, with apophyses and dykes of acidic porphyry, lies to the north of the sediments. Faulting, shearing and fracturing are strongly evident. Pyrite, along with chalcopryrite and lesser sphalerite, magnetite and pyrrhotite occupy brecciated and fractured zones in both sediments and intrusives. There are also disseminated sulphides in the porphyritic intrusive rocks.

**MINERAL SHOWINGS**

There is a 1000-foot length of Sebring Creek valley where gossan material clearly shows occurrences of pyrite, chalcopryrite, sphalerite and iron and copper oxides and carbonates in altered and fractured quartzite.



This discovery zone was explored by two adit tunnels and numerous trenches and pits in 1912-16 by the original stakes, but is not now included in the holdings of Helgena Mines.

The large surrounding area, held by Helgena Mines, includes many gossans and contact zones between intrusives and altered sediments. Trenches and open pits have exposed the mineralized zones to the east and the west of the old workings.

Brief descriptions and assays of these sampled by Mr. Roscoe are as follows:

No.	Location	Au oz/t	Ag oz/t	Cu %
57701:	West showings, 200 ft. NW of Claim posts for M B 5, 6, 7 and 8, Grab sample from pit	Tr	Tr	Tr
57702:	West showings, 100 ft. NW of same claim posts as above, Grab sample from pit	Tr	Tr	0.08
57703:	West showings, 100 ft. SE of same claim posts as above, Grab sample from pit	—	—	1.80
57704:	West showings, 300 ft. NW of cabin, Grab sample from a wide and deep pit	Tr	Tr	0.40
57705:	Sebring Creek showings, above trail crossing on both sides of canyon, Grab sample from several pits	0.01	5.2	0.52
57706:	Sebring Creek showings, below trail crossing on west side, Grab sample from several pits	Tr	0.6	0.01

The copper mineralization exposed northwest of the cabin is in quartz porphyry, and appears to be on strike with the Sebring Creek old workings.

In the samples there was pyrite, chalcopyrite and in places, magnetite, malachite and a sooty black coating which appears to be either chalcocite or manganese stain. Mariposite is evident in one hand specimen, and sphalerite and pyrrhotite in another.

The samples are representative of the average mineralization exposed in numerous pits and trenches excavated from the Sebring creek and west showings, and do not include material from high-grade stringers or disseminations.

#### SUMMARY AND CONCLUSIONS

The Sebring Creek property of Helgena Mines is located in the Bridge River area. It is about one hour by automobile from Lillooet and three hours by pack trail up Sebring Creek.

The Copper-gold-silver-zinc mineralization occurs in and near porphyry intrusive rocks which have invaded limestone, argillite and quartzite. Alteration includes silicification and pyritization of these older strata.

The showings are near the 4,500 foot level, forest cover is uniform but moderate and overburden extensive but generally thin.

Numerous open pits and trenches have been excavated to expose gossan-type mineralized zones both to the east and west of the original Sebring Creek showings and workings.

Additional exploratory investigations are warranted on the property. Additional data will be required to make possible an assessment of the potential so far as a large tonnage porphyry copper and/or contact metamorphic deposit is concerned.

#### RECOMMENDATIONS

The property has been prospected, and now requires geological and geophysical data upon which to plan the most practical means of exploring for sizeable mineral deposits.

It is recommended, therefore, that a three-phase programme be carried out. The first phase should be a short-term technical examination, followed up by more comprehensive surface investigation.

Lastly, if results are satisfactory, detailed surface and underground data should be acquired in order to formulate estimates of the potential of the property.

#### Phase No. 1.

	<u>Estimated Costs</u>
1. Establish a tent camp on the property	\$1,000.00
2. Conduct a geological survey over selected portions of the property and tie in by pace and compass, known showings and workings	1,750.00
3. Conduct a geochemical survey over selected areas, on a reconnaissance basis	2,500.00
4. Office, overhead and supervision	1,250.00
5. Contingencies	1,000.00
Total estimated costs	<u>\$7,500.00</u>

This work should require not more than one month to complete.

#### Phase No. 2.

1. Check claims, and where advisable stake fractions and/or additional claims	\$1,500.00
2. Conduct an electro magnetic survey over selected areas, on grid patterns	4,500.00
3. Excavate rock trenches across mineralized zones, using a gasoline drill	2,500.00
4. Core drill to depths of 50 to 100 feet, on selected mineralized zones, using light portable equipment, a total of about 800 ft.	5,000.00
5. Office, overhead and supervision	3,000.00
6. Contingencies	<u>1,000.00</u>

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Numerous open pits and trenches have been excavated to expose gossan-type mineralized zones both to the east and west of the original Sebring Creek showings and workings.

Additional exploratory investigations are warranted on the property. Additional data will be required to make possible an assessment of the potential so far as a large tonnage porphyry copper and/or contact metamorphic deposit is concerned.

#### RECOMMENDATIONS

The property has been prospected, and now requires geological and geophysical data upon which to plan the most practical means of exploring for sizeable mineral deposits.

It is recommended, therefore, that a three-phase programme be carried out. The first phase should be a short-term technical examination, followed up by more comprehensive surface investigation.

Lastly, if results are satisfactory, detailed surface and underground data should be acquired in order to formulate estimates of the potential of the property.

#### Phase No. 1.

	Estimated Costs
1. Establish a tent camp on the property	\$1,000.00
2. Conduct a geological survey over selected portions of the property and tie in by pace and compass, known showings and workings	1,750.00
3. Conduct a geochemical survey over selected areas, on a reconnaissance basis	2,500.00
4. Office, overhead and supervision	1,250.00
5. Contingencies	1,000.00
Total estimated costs	<u>\$7,500.00</u>

This work should require not more than one month to complete.

#### Phase No. 2.

1. Check claims, and where advisable stake fractions and/or additional claims	\$1,500.00
2. Conduct an electro magnetic survey over selected areas, on grid patterns	4,500.00
3. Excavate rock trenches across mineralized zones, using a gasoline drill	2,500.00
4. Core drill to depths of 50 to 100 feet, on selected mineralized zones, using light portable equipment, a total of about 800 ft.	5,000.00
5. Office, overhead and supervision	3,000.00
6. Contingencies	<u>1,000.00</u>

Total estimated costs \$17,500.00

This phase should be completed in two months.

Phase No. 3.

- |                                                                                                                                                                                                         |                 |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|
| 1. Establish a road from the highway to the camp, and necessary access roads to areas of mineral showings. This road may be steep and narrow for short lengths, but suitable for 4-wheel-drive vehicles | \$10,000.00     |
| 2. Conduct detailed geochemical surveys over selected areas on 400 by 100 foot grids                                                                                                                    | 3,000.00        |
| 3. Expose bedrock by trenching to provide information regarding the extent and grade of mineralized zones                                                                                               | 10,000.00       |
| 4. Map the geology of mineralized areas of the property in detail                                                                                                                                       | 2,000.00        |
| 5. Diamond drill with BQ wireline equipment to check selected mineralized zones to a minimum of 300 feet of depth, about 1,000 feet total.                                                              | 12,500.00       |
| 6. Office, overhead and supervision                                                                                                                                                                     | 4,500.00        |
| 7. Contingencies                                                                                                                                                                                        | <u>8,000.00</u> |

Total estimated costs \$50,000.00

This final phase should be completed in three months.

This programme should not require more than six months of field work. The estimated \$75,000.00 costs are based on the assumption that the programme will be carried on continuously, weather permitting.

Respectfully submitted,  
ALLEN GEOLOGICAL ENGINEERING LTD.

Per "ALFRED R. ALLEN" P. Eng.  
Alfred R. Allen

Vancouver, B.C.  
September 22, 1971.

## REFERENCES

- |                         |                                                         |
|-------------------------|---------------------------------------------------------|
| Drysdale,               | G.S.C. Summary Report, 1915, Map 1610                   |
| Drysdale & McCann,      | G.S.C. Memoir 130, 1922, Map 182                        |
| B.C. Minister of Mines, | Annual Report, 1913 p.K. 270                            |
| B.C. Minister of Mines, | Annual Report, 1915 p.K. 282                            |
| Cairnes, C.E.,          | G.S.C. Memoir 213, 1937                                 |
| Cairnes, C.E.,          | G.S.C. Paper 43-15, 1943                                |
| Hunter, S.J.,           | Reports to Helgena Mines, Nov. 12, 1968, Aug. 20, 1969. |

## CERTIFICATE

I, Alfred R. Allen, certify that:

I am a graduate of the University of British Columbia and hold the following degrees therefrom:

BASc Geological Engineering 1939

MASc Geological Engineering 1941

I am a member of the Association of Professional Engineers of the Province of British Columbia.

I have practised my profession for the past twenty-eight years.

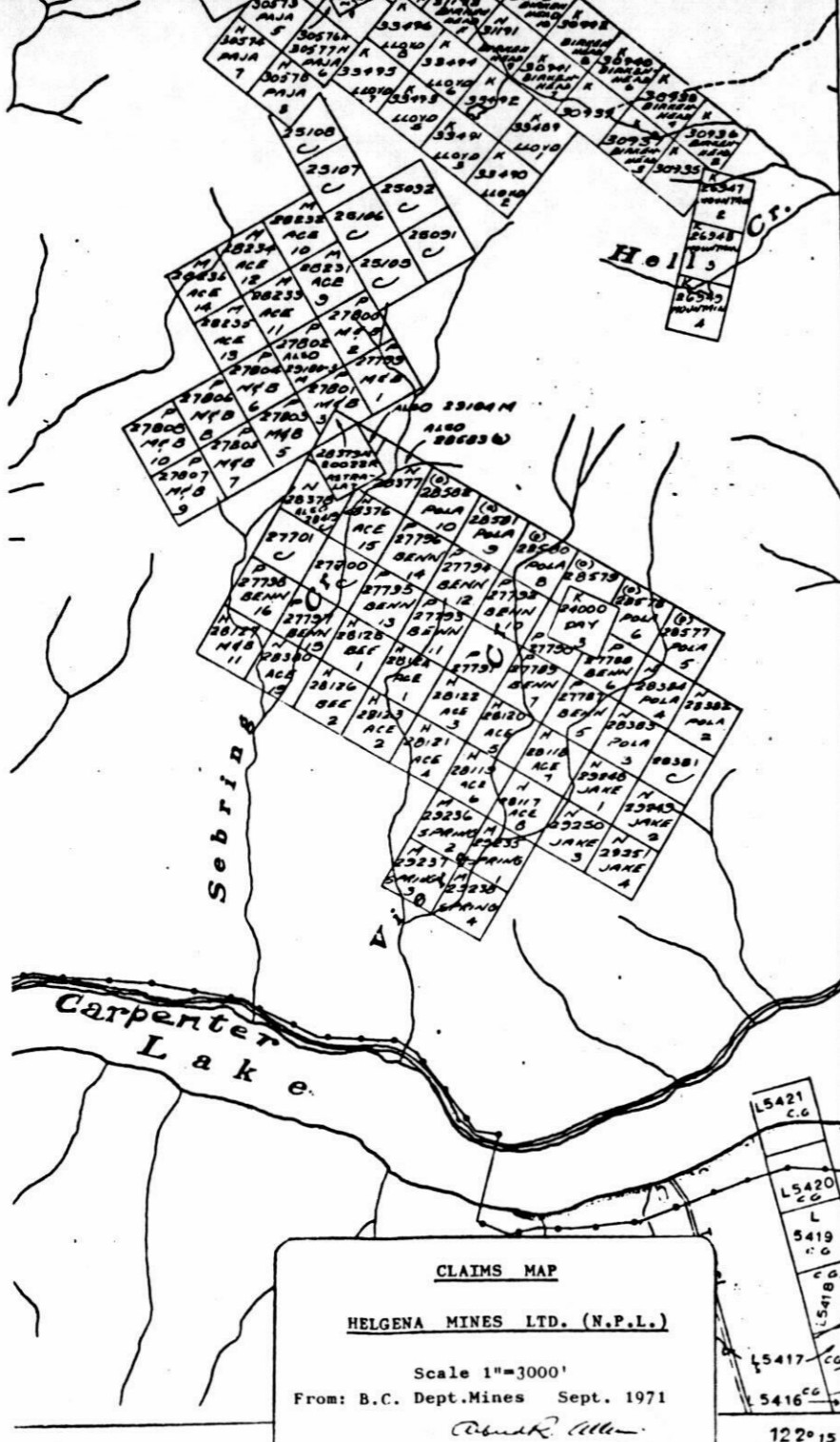
I hold no interest in the properties or securities of Helgena Mines Ltd. (N.P.L.), or affiliates thereof, nor do I expect to receive any, directly or indirectly.

My report of September 22, 1971, on the Sebring Creek property of Helgena Mines Ltd. (N.P.L.), is based on an examination of the said property on September 1, 1971, by Robert L. Roscoe, P.Eng., on behalf of Allen Geological Engineering Ltd.

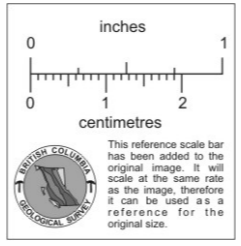
I consent to this report being filed with the British Columbia Securities Commission in a Prospectus by Helgena Mines Ltd. (N.P.L.).

Many of the claim posts and lines were examined by Mr. Roscoe, and they appear to be staked in accordance with the British Columbia Mineral Act.

"ALFRED R. ALLEN" P. Eng.  
Alfred R. Allen



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References: Min. of Mines, B.C., Ann. Repts. 1932, p. 217; 1933, pp. 269, 270; 1941, p. 76.

DOMINION 92JNE077

The Golden group (also known as the Dominion) of eighteen claims and fractions lies north of Bridge River and east of Gun Creek. It adjoins and lies between Congress Gold Mines and Minto Gold Mines. The property is owned by Federal Gold Mines, Limited, of Vancouver.

Early reports indicate that the property, or part of it, was owned in 1932 by H.E. Rines of Vancouver. At that time oxidized sulphide-bearing veins were said to be exposed in the steep bluffs, 400 feet and more above the road, within a belt 30 to 40 feet wide. A little work was done on them. Late in the following year the group was acquired by Dominion Gold Fields, Limited, and a crosscut adit was started to explore the showings beneath their outcrops. Later, the property is recorded as owned by Goldmint Mining Syndicate, and in October 1934 it was secured, under option to purchase, by the present Company. There followed a period of active exploration both underground and at the surface, supplemented by careful geological mapping. Work on the property is reported to have been discontinued in 1937. An option taken on the property in 1941 by Pioneer Gold Mines of B.C., Limited, was relinquished early in the following year. A shipment of 13 tons of cobbled antimony ore (stibnite) is reported to have been made in 1941. No other production is recorded.

The property is underlain by sedimentary and volcanic rocks (greenstones) of the Fergusson group and by a belt up to several hundred feet wide of carbonatized serpentinite rock. These are intruded by dykes and small bosses of feldspar porphyrite, like those on the adjoining Minto and Congress properties.

The workings are 300 to 800 feet above valley bottom in the face of a steep, bluffy slope. The lowest is a crosscut adit driven northeast for about 1,035 feet (October 1935) to get under the principal showings 500 to 800 feet above. At higher elevations the mineral deposits have been prospected by short adits and open-cuts and by much trenching.

The principal discoveries are in a body of greenstone outcropping in a general northwest direction and flanked by prominent dykes, of which the southern is coarsely porphyritic and the northern more uniformly fine-grained. Towards the southeast the two dykes approach each other, thereby limiting the width of greenstone to less than 100 feet. In the opposite direction the greenstone body widens within the prospected area to more than 400 feet. Little information was available to indicate the behaviour of the greenstone mass at depth. Apparently, the dykes stand steeply, but there is some suggestion that they dip towards each other and that the greenstone body between them will, in consequence, be cut off at their junction, though it should appear again at greater depth.

Within this greenstone body, the mineral deposits have formed along fracture zones striking northerly, dipping at various angles either west or east, and ranging from a few feet to 30 feet wide. The fracturing is attributed to strain set up within the less competent greenstone mass by differential movements between it and the massive dykes.

In detail, the fracture pattern is quite irregular. Faulting and shearing have occurred, but are not pronounced features. Fractures may be fairly continuous, as along one or other walls of a fracture zone, or may be short and occur at irregular intervals within the zone.

GSC P43-15

92JNE077

PROPERTY FILE

p 31

Three of these zones have been prospected and are mineralized over average lengths of about 200 feet. The most southeasterly lies above the face of the crosscut adit and, apparently, dips east at 50 to 60 degrees. It has an average width of about 10 feet and widens towards the south to where it is in sharp contact against the porphyrite dyke. That the contact is not a faulted one is indicated by a few minute fractures running into the dyke in line with the fracture zone. Mineralization, however, ends at the dyke. The intermediate fracture zone lies about 300 feet northwest and is less well defined than the first. It angles, in part, across a corner of the Omega No. 2 claim of Minto Gold Mines. The third zone lies 700 feet farther northwest and, at the dyke contact, is joined by a branch striking northwesterly along the dyke wall. Both this and the intermediate fracture zone swing southeasterly on approaching the porphyrite dyke and probably end along the greenstone-dyke contact.

Mineralization has given rise to veins in the fractures and disseminated sulphide deposits in the intervening greenstone. The principal vein mineral is stibnite, occurring mostly in coarsely crystalline masses associated with minor proportions of other sulphide minerals and gangue. The disseminated sulphides are chiefly pyrite and arsenopyrite. Values in gold are stated to be associated with these rather than with the stibnite. In the southeast fracture zone, assays are claimed of 0.20 to 0.95 ounce of gold a ton across average widths of about 4 feet. Values in the other two zones have, on the whole, been lower.

Mineral deposits have been discovered at other places and in different formations, but not enough work has yet been done on them to demonstrate either their continuity or probable value. One is a quartz vein encountered in the long crosscut adit, in a strong fault fissure along the southwestern flank of the more easterly porphyrite dyke. The fault strikes north 40 degrees west, dips 67 degrees northeast beneath the dyke, and has been drifted on for 50 feet northwest of the crosscut (October 1935). The vein carries a little scattered mariposite and some sulphides, chiefly pyrite.

Elsewhere in the crosscut adit, narrow veins of heavy sulphide ore have been intersected but not explored. They occur in sedimentary beds and vary from a few inches to a foot or more in width. One such vein is composed mainly of stibnite. Another consists of coarsely crystalline pyrite, arsenopyrite, and sphalerite, in a gangue of calcite and quartz. Galena and chalcocite are minor constituents. In the bluffs, 300 to 400 feet above the adit portal and within the same belt of sedimentary rocks, three or four heavy sulphide deposits have been discovered and partly explored. They are composed mainly of iron sulphides, form lens-like masses up to 6 feet thick, and assay up to about 0.2 or 0.3 ounce in gold a ton. No continuity to these deposits has been established.

Several narrow stibnite veins have been found in the wide belt of highly altered serpentine rocks. They occur in part along closely spaced fractures between which the rock is impregnated with pyrite and less arsenopyrite; the fractures strike nearly east and west and dip north at 45 to 70 degrees. Some sampling by the company has indicated values ranging from little more than a trace to more than an ounce in gold a ton across widths of 4 or 5 feet.

The aggregate amount of mineralized ground at so many widely separated places, and in such a variety of formations and the significant amount of gold that assays have yielded are both interesting and impressive. The deposits are probably all related to one source, which also gave rise to the dykes, and there is therefore a possibility of discovering a more persistent trunk channel of deposition than has been found to date. The strong, vein-bearing fault fissure in the long crosscut at the southern contact of the porphyrite dyke has more than a suggestion of continuity, though, so far as the writer is aware, no attractive values have been found

in it. The wide belt of altered rocks through which it runs affords strong evidence of the action of thermal, probably vein-bearing, solutions and is therefore, worth further investigation, particularly along or near its contact with the porphyrite dyke. Deposits in the incompetent sedimentary beds are less likely to be continuous. p32

#### Reliance

References: Geol. Surv., Canada; Sum. Rept. 1915, p. 84; Mem. 130, 1922, pp. 73, 74. Min. of Mines, B.C., Ann. Repts. 1933, p. 271; 1936, pp. 8-10F.

The Reliance is one of the older properties and has been known from the beginning as an antimony prospect. The original group of four claims was staked in 1910 by Mr. F.A. Brewer, who relocated the property in 1915. By September 1915, it is reported, 4 tons of ore had been bagged for shipment, and the richest carried up to  $\frac{1}{2}$  ounce in gold a ton. During the First World War a small tonnage is reported to have been shipped to England. Comparatively little further information, however, is available until 1933 when Reliance Gold Mines, Limited, a Washington incorporation, is represented as owning the property. Most of the work has been done since that time. Late in 1937 it was reported that Reliance Gold Mines had entered into arrangements with Bealemore Milling Company, Limited, to treat Reliance ore at the Wayside mill. The precise outcome of this venture is not known, but apparently it resulted in no very significant developments. All the claims have since been permitted to lapse.

The property, consisting of nineteen claims, is on the south side of Bridgo River Valley just above the mouth of Gun Creek. It is underlain by rocks of the Fergusson group, chiefly massive greenstones, but one north-striking belt of ribbon cherts, about 300 feet wide, crosses