PBF

010775

Review of data on file, maps, diamond-drill records etc on Snowstorm Group of Claims, Highland Valley, Kamloops M.Div. 250-121 (Geological Dr. White's file 3062)

So much information is lacking in the records, chiefly diamond-drilling, that it is virtually impossible to correlate such mineralization as was found. For instance: The elevation of the collar of the drill-holes is not given so that a general cross-section of the drilling cannot be plotted. The drill-cores recovered were a very low percentage of the whole. Sludges were taken over different footages than the cores. This probably meant drilling beyond the casing and possible salting. In the geological section of the drill log no types of mineralization are mentioned. Some of the drilling was done along the strike of the mineralized zone; other holes were too far away from it. No gangue minerals are mentioned. Altered basalt is logged surrounded by granite at a depth of 1000 feet in No 7 drill hole. Mineralization generally seems to accompany the basalt(?). Widths of basalt vary from 2 feet to 30 feet. No foot or hanging wall is mentioned in relation to the mineralized zone. No cross-cuts were driven in the adits where minerals exist so that the widths of ore are not known. No drilling was done on the Iona or Owl claims where there is surface evidence of copper ore. Many of the open-cuts ~~were~~ put in were ~~but~~ not described or sampled.

Other than the fact that there is widespread mineralization on the surface as well as underground, the diamond-drilling results are meaningless. Mr R.W.Thomson, the Resident Mining Engineer for the district, was ill most of the time and unable to superintend the work. The man in charge was not a mining engineer and although he, no doubt, did the best he could, he was not trained for the purpose and unable to specify rock types or minerals.

No survey

92I/7W 92I/SE-5,6

Review-Snowstorm Group of Claims(cont.)

According to correspondence Mr Thomson believed in the possibility of finding a secondary enriched copper zone below the copper-carbonate zone evident in the surface workings,hence his recommend-ation regarding diamnnd-drilling. Mr A?W.Davis,mining engineer,agreed with Thomson and in 1929 took an option on the group.According to his (Davis) letter dated October 1929,he checked many of the samples taken by the Government representative and found them to be much too high in copper content,and,therefore relinquished the option.

It seems possible that Davis had,and may still have,more data on the Snowstorm Group than appears on the files. He was Resident Engineer at Kamloops after Thomson died. Davis mentions a good showing of copper ore on the Owl claim which he thought worth exploring.

W.S.Drewry,Dominion and Provincial Land Surveyor(now deceased) surveyed the claims and the diamond drill holes. Apparantly the direction of these holes was not checked underground and they may not lie along the course plotted. A general cross-section of the drilling is shown on Drewry's map but because it is on a scale of 300 feet to the inch practically no information can be obtained from it.

Many open-cuts and shafts were excavated and sunk,some of them to a depth of 25 feet. On the Iona claim these workings portrayed the fact that there is widespread copper mineralization some of it,according to the records,assaying as high as 10% copper.Although widths of ore are not generally mentioned in some cases they reach 6 feet and possibly more.

No samples are recorded in the Snowstorm cross-cut.From personal observation there was a good deal of copper carbonate derived from blebs of chalcopyrite from 6 inches to 1 foot apart. The workings

Review--Snowstorm Group of Claims(cont.)

at the end of the cross-cut could not be examined at that time on account of water. Apparantly some high grade ore was mined from these workings(shafts and drifts) when the price of copper was between 20¢ and 30¢ a lb. in 1915 and 1916.

The extent of the mineralization both on the surface and underground on the Snowstorm measures about 1000 feet in an easterly and about 500 feet in a northerly direction. This does not allow for dips of mineralization found in the diamond drill holes.

The Thomson Tunnel on the Iona claim, driven approximately 275 feet, explores ground about 65 feet below the surface. The extension of this tunnel would bring it only about 35 feet below the plotted surface. Open-cuts put in on the surface along the strike of the tunnel indicated copper values between 1% and 2%. From a point about 100 feet in the tunnel to 135 feet, samples indicate values from 1% to 1.7% copper. This mineralized zone lies directly below a large open-cut showing similar values. The difference in elevation is about 65 feet. Since no ore-widths are given it is impossible to estimate the value of the discovery until crosscuts or drifts are driven. There are other shorter sections in the tunnel assaying between 1% and 2% copper. Practically the entire tunnel carries low values in copper. On Drewreys map of the claims and workings the Thomson Tunnel is shown as a cross-cut driven in a north-westerly direction and across what is plotted as the vein, or possibly mineral zone. Drewery plots a hanging-wall but there is no written information on this. No dips are plotted.

On the Eagle Fraction and Owl claims lying to the south and east of the Iona, many open-cuts and shafts have been put in but there are no

Review--- Snowstorm Group of Claims (cont.)

reports of samples being taken. These workings cross the south-easterly projection of the vein system.

On the Isle of Man claim which lies between the Snowstorm and the Iona no work has been done apparantly. Possibly this claim is drift covered and there are no outcrops.

Should the mineral-zone or vein as it has been called, extend for 4500 feet as the two extremities and the centre indicate, and the width in the Thomson cross-cut tunnel continue, a closer examination of the geological structure and mineralization appears to be justified. It seems unlikely that diamond-drilling will bring any better results than those attained on the Snowstorm. Evidently it is impossible to recover enough core to justify the expense incurred. Bulk sampling rather than channel sampling will probably give more reliable results especially where the values are "spotty".

In the Summary Report of the Geological Survey of Canada, 1915 C.W.Drysdale describes the Snowstorm Group briefly, as follows:

"The main vein on the property is opened up by means of a 100-foot shaft with a 62-foot drift at the 50-foot level. The level is connected with the surface by a 70-foot crosscut tunnel. The vein varies in strike from north-north-east to north (magnetic) and dips to the east at an angle of 75 degrees. The ore-shoot from which the shipping ore was mined, has a pitch length of about 125 feet, a stope length, at a point 65 feet below the shaft collar, of 75 feet, and a stope length in the shaft bottom said to be from 15 to 20 feet. the shoot has a tendency to pitch steeply to the southwest. The average width of the ore-shoot is 2 feet, with a maximum width of 4 feet. Above the tunnel level, the vein makes a sharp bend of 20 degrees and it was in this

Review--- Snowstorm Group of Claims(cont.)

part of the vein that the highest grade of ore was obtained.The best ore was found to follow the hanging-wall which is well defined and marked at the southwestern end of the ore-shoot by a gouge 1½ feet wide.When the shaft was visited October 1915 it was full of water and inaccessible below the tunnel level. The walls of the vein are an altered granite with,in places,a porphyritic phase on the foot-wall. To date Mr Henderson has shipped 108 tons of first grade ore from the above described ore-shoot.Some second grade ore in which bornite occurs desseminated through the altered granite, lies on the dump awaiting better transportation facilities.

Practically no development work has been done in search of additional ore-shoots on the main vein or to locate parallel shoots. Surface prospecting is restricted by the occurrence of capping flows of basaltic lava belonging to the Kamloops Volcanic group(lower Miocene).

The above description is included in this review because there is more information in it than all the old data on file in the Department. Drysdale also made a reconnaissance survey of several other properties in Highland Valley and his conclusions may be worth repeating,as follows: "The copper veins of Highland Valley may be classified according to form as lode fissure veins and sulphide disseminations, in a sheared coarse-grained grey granitic rock varying from quartz diorite to granite and associated with spotted porphyry intrusions. One or other of the walls of the veins,most commonly the hanging-wall,is well defined and the other is indistinct and of a commercial rather than structural nature.

The fissuring systems appear to have been controlled in their development by master joint-planes in the granitic mass. Alomg these

Review -- Snowstorm Group of Claims(cont.)

joint-planes the accumulated crustal stresses found relief by shearing and faulting. The presence in the ores of such high temperature and pressure minerals as sericite, bornite, and molybdenite indicates that the ore-bearing solutions were primary and probably ascended from some deep-seated metallic hearth depositing the metals at an intermediate depth below the surface. The magmatic solutions in this case were given off probably following the lower Miocene volcanism, for the capping basalts of the Kamloops Volcanic group are reported to be mineralized and to contain copper ores in places. The sheared intimately faulted and/master joint-planes served as channels for the solutions and at certain localities the physico-chemical conditions were favourable for the formation of ore-shoots. With more underground development ## work it may be possible to gather enough geological data to determine the factors which have controlled such localization of values. At present the limited extent of the mine workings and the concealment of so much of the territory by drift and deep overburden prevent the gathering of the necessary information." (end of quote)

Since these old reports were written on the Snowstorm Group M.S. Hedley visited the area in 1937 and his report is available under Special Reports in the general office. Hedley was evidently hindered from making a more detailed study of the rocks and mineralization just as Drysdale was because of caved workings and drift covering. On this account no conclusions were arrived at concerning the potentialities of the group.

In 1943, Ventures Ltd. through the medium of the St. Eugene Extension Co., Vancouver B.C., diamond drilled the Iona with the result that core values beneath the tunnel averaged below 0.50% Cu.. Unofficially, it is understood that spotty values in scheelite and molybdenite were found in the drill cores.

In October 1943, S. Holland visited the area and sampled the Iona Tunnel from 100 feet to 140 feet in from the mouth, with the result that his samples checked, fairly well, the results obtained when the work was being done many years ago. An examination of some of the drill cores from beneath the tunnel portrayed the fact that there was no basalt in evidence such as that mentioned in the drill log under the Snowstorm workings. The reason for drawing attention to basalt is that much of the better grade copper ore was found associated with basalt(?) in the Snowstorm drilling. It is possible, of course, that basalt dykes do exist on the Iona but they were not intersected by the drill.

Summary of information obtained on Snowstorm Group;

1(-Some extensive areas of supposedly low grade copper ore, found in granitic rocks, that extend to 1000 feet or more in depth and of unknown width(possibly 300 or 400 feet).

(2) Some high grade ore-shoots,one of which has been mined on the Snowstorm,controlled apparantly by favourable structure(Drysdale). Other shoots up to 4.6% copper are indicated in drill holes,such as No.4 between a slope depth of 355to 362 feet;in No.7 between a slope depth of 76 to 80 feet and between 652 to 659 feet;in No 8 between 203 and 207 feet and between 516 and 521 feet.

(30) No one now in the Department has ever seen any of the high grade ore-shoots.

(4) According to Hedley the low grade material occurs a bornite and sometimes chalcopyrite in strongly seriticized fractures,and as disseminated chalcopyrite in weakly seriticized and locally kaolinized quartz-diorite. Much malachite is generally present.

(5) The chief gangue minerals are sericite,guartz,epidote and chlorite.

(6) No structural control of mineralization has been noticed except underground by Drysdale.

(7) Hollands sampling of part of Iona Tunnel checked fairly well with original Government sampling.

(8) Hollands inspection of Ventures drill cores put down under the Iona Tunnel# failed to disclose any basalt but some hornblende.

(9) None of the original drill cores are available for inspection.

(10) No sections of the Snowstorm drilling can be made because there are no elevations reported.

(11) In the Summary Report 1915,Geological Survey,Drysdale offers the only conclusion ever mentioned as to the possible reason for the mineralization on the Snowstorm Group.Hedley and Holland may have information on this subject. W.E.Cockfield,who has covered part of the area,has not reported upon his findings.

Some criticisms and suggestions;

(1) Diamond drilling is not a sure method of arriving at mineral values but rather of outlining mineral bodies.

(2) Bulk sampling is the only safe method arriving at average values in a low grade deposit such as the Snowstorm. A chip or moil sample is apt to be erratic.

(3) Insufficient time has been spent on the area to make a comprehensive study of the geology.

(4) Evidently important rock formations are obscured by drift and have not been uncovered.

(5) Since mineralization similar to that found on the Snowstorm and more important still on the Aberdeen, is evident in many places in the triangle between Aspen Grove, Kamloops and Spencer's Bridge that a study be made of this whole area before any definite decisions are made.

(6) There appears to be too much copper mineralization in this area to be passed by without a more intensive geological survey.

(7) That structure is, no doubt, responsible for the ore-bodies already found and particular attention should be paid to regional as well as local structure.

(8) That reports of individual properties have not taken into considera tion the area as a whole.

(9) That the Aberdeen Mine, which produced a considerable amount of high grade secondary(?) copper ore, chalcocite, found in highly altered volcanic rocks, be carefully studied. According to Nichols, Annual Report, Minister of Mines, 1925, page 183, the condition of the rocks underlying the ore-deposit is similar to that found on the Snowstorm and t#### other properties. It is not inconsistent, therefore, to suggest that similar conditions to those prevailing on the Aberdeen may exist where the mineralized and fractured grantitic

Original Copy: 92I No. 21

ANNUAL REPORT OF THE MINISTER OF MINES
FOR 1937.

Part D--Special Report by
M.S. Hedley.

92I/7W
92I/8E-5,6

Snowstorm: ✓

This old property, including the Iona group, has recently been restaked by Chris. H. Allan, and the Butalma Mining Company, 505 Stock Exchange Building, Vancouver, of which Allan is a member, are planning development. The property, consisting of some 20 claims, is on the summit of Kirkpatrick mountain 3 miles north-east of the head of Witches Brook in Highland valley. A rough trail leads from the Highland Valley road to the Snowstorm camp with a difference in elevation of 1,000 feet. The foot of the trail is 22 miles from Ashcroft and 9 miles from the Merritt-Savona highway.

Kirkpatrick mountain is a part of the plateau surface, with a summit elevation of about 5,000 feet. It has an uneven, rocky and timbered surface on which are three small lakes, at the shore of one of which the Snowstorm camp is located. The south edge of the mountain drops off steeply in drift-covered slopes half a mile from the camp. The deposits are in a large area of intrusive rock said by Drysdale to vary from granite to quartz-diorite; in the vicinity of the property it is a grey quartz-diorite. Copper mineralization is of two sorts: as bornite and rarely chalcopyrite in strongly sericitized fractures, and as disseminated chalcopyrite in weakly sericitized and locally

kaolinized quartz-diorite. Hydrothermal alteration has been extensive, and has only locally been concentrated on joint-planes.

The Snowstorm group and the Iona group were staked in 1905 and the existing development-work on the former was largely done prior to 1915. A little more work was done in 1916 and 1917 and some shipments made of high-grade copper ore. In January of 1919 the Department of Mines let a contract for diamond-drilling, and 8 holes, aggregating 5,736 feet were put down on the Snowstorm copper-bearing zone. Work on the Iona by the Department of Mines in 1919 and 1920 consisted of driving the present adit, sinking a 40-foot shaft and the sinking of numerous test-pits.

The combined property subsequently lapsed and was restaked early in 1937 by Chris. H. Allan of Vancouver. Two cabins of the old Snowstorm camp were repaired and plans were being made, early in September, to clean out the old workings.

About 300 feet north-east of the camp and at the same elevation is a zone of alteration and mineralization about 15 feet wide. A central part of this zone strikes north 55 degrees east, dips 60 degrees south-east and is about 40 inches wide, in the walls of which, particularly the hanging wall, are additional bands each an inch to several inches wide; 40 feet farther north-east the total width over which narrow bands occur is 6 feet, and 30 feet still farther the zone appears to play out. Study here

furnishes more data on the nature of mineralization than of other similar occurrences.

The rock is quartz-diorite which has been fractured along nearly parallel south-easterly dipping planes with some reticulation; there is no evidence of shearing, very little gouge has been produced, and there is practically no evidence of alignment of the sericite grains: the fractures have the appearance of joint planes of little displacement. The rock adjacent to these planes for a width of a fraction of an inch to here a maximum of 40 inches has been strongly sericitized by hydrothermal action and converted to a soft friable mass of sericite, quartz, epidote and chlorite; epidote also occurs in bands with little if any sericite. Bornite and a very little chalcopyrite occur in these sericitized fractures as lenses and bands which are individually rarely more than an inch wide. Concentrations of such bands and lenses are productive of high-grade material.

About 200 feet south-west of the camp are old workings which are described in the Minister of Mines' report for 1915 but are now inaccessible. An adit 72 feet in length intersects the bottom of a 50-foot shaft, some 15 feet north-east of which is a second shaft. Drifts extend 40 feet north-east and 35 feet south-west and high grade copper ore has been mined out to near the surface in this section, over widths between 8 and 30 inches; a winze

was sunk 50 feet on high-grade copper ore 6 to 16 inches wide. From the drifting and stoping operations 96 tons of sorted ore were shipped with an average grade of: Gold, 0.086 oz. per ton; silver, 6.4 oz. per ton; copper, 30.4 per cent. A third shaft 190 feet south-west of the first was sunk to a depth of 58 feet, from which 40.5 tons were shipped in 1916 assaying: Gold, nil; silver, 4.52 oz. per ton; copper, 23.71 per cent. This 200-foot zone strikes north 40 degrees east and dips steeply south-east; variations in strike probably represent branches as well as bends. Where now clearly seen it is 3 to 5 feet or more wide, including bands of bornite mineralization locally up to 18 inches in width. At the south-westernmost shaft a narrow zone is indicated with a strike of north 10 degrees east.

On the old Iona section of the property is a small hill about level with the Snowstorm cabin and about 3,000 feet south-westerly from it. An adit at the base is driven 280 feet into the hill in a direction of north 69 degrees west. An almost continuous line of stripping extends to the crest of the hill from the portal, a distance of 150 feet, and pits spaced about 40 feet apart coninue for an additional 700 feet, all on a line bearing north 69 degrees west. Scattered pits, 8 in number lie north-west of the adit and north and north-west of the crest of the hill. There is a

40-foot shaft, tightly lagged, 400 feet from the crest in a direction south 65 degrees west, and about the shaft and between it and the main line of pits are a number of scattered pits.

Each of the pits penetrates from 2 to 15 feet of overburden and extends a short distance into bedrock, and in all but one or two there is some copper mineralization either as malachite, chalcopyrite, or both. There is no apparent reason for the precise location of most or any of these pits and they do not outline the limits or distribution of mineralization. The rock is quartz-diorite which has been altered, perhaps by thermal metamorphism; miscroscopic study shows that there is, even in the freshest rock, some sericitization of the feldspars, and cases where the rock is bleached the sericitization has been more complete; kaolin is present, and albite has developed from what was originally probably a more calcic plagioclase. At the shaft, a silicification of the quartz-diorite is accompanied by considerable brown tourmaline.

Sampling of the pits is a problem, as they are now almost without exception caved in. The dumps consist largely of overburden, but the material excavated in rock is commonly piled separately. Where material was clearly representative of the pit bottom and consisted mostly of fines, liberal grab samples were taken, and while there must have been some leaching and impoverishment the writer does not believe that this

has removed more than a small percentage of the original copper content. Four such samples returned traces in gold and silver and 0.2 to 0.5 per cent. copper.

The Iona adit, 280 feet long, shows rust- and malachite-stain throughout, specks of chalcopyrite are also seen. The inner 20 feet consists of minutely shattered and later cemented quartz-diorite; small slips occur in the adit with a general north-easterly trend, but do not appear to localize or otherwise affect the mineralization. A thorough sampling of this adit would take considerable time and effort and should include dressing down of the walls. Three chip samples from the north wall taken by the writer are believed to be indicative.

(1) 235 to 240 feet from portal: Gold, trace; silver, 0.4 oz. per ton; copper, 0.3 per cent.

(2) 140 to 145 feet from portal: Gold, trace; silver, trace; copper, 0.3 per cent.

(3) 65 to 70 feet from portal: Gold, trace; silver, trace; copper, 0.3 per cent.

About ½ mile west of the line of pits are other copper showings and one of molybdenite. The latter, explored by a 20-foot shaft, consists of molybdenite in sericitized quartz-diorite and accompanied by a little chalcopyrite and pyrite; the molybdenite content varies directly with the degree of sericitization and the chalcopyrite indirectly. Two hundred feet southerly is a shaft

perhaps 50 feet deep on a badly oxidized sericitic zone, strike north 55 degrees east, dip 75 degrees south-east containing chalcopyrite, hematite and bornite. This occurrence is apparently similar to the Snowstorm.

are
rocks, overlain by volcanics. Contacts should throw some light on this subject.

(10) That large highly fractured low grade mineral deposits have proved to be profitable elsewhere and the possibilities of leaching might be considered.

(11) Is there any underlying cause for the fracturing and mineralization?

Respectfully submitted

Philip R. Freeland

Dec 9/43

92I/7W
92I/SE-5,6

No. 10

SNOWSTORM GROUP (50° 120°)

by Stuart Holland - 1944.

References

(1915): Geol. Surv., Canada, Summ. Rept., p. 87

(1915): B. C. Dept. of Mines, Ann. Rept., p. 270

HEDLEY, M. S. (1937): B. C. Dept. of Mines, Special Report

The several groups that included the Snowstorm, Iona, Jersey, and Guernsey mineral claims were restaked in 1942. The ground is included in 25 claims and fractions, 3 held under option and the remainder held by location by Ventures Ltd., Toronto.

The claims are at the head of Witches Brook, on the north-east side of Highland Valley, 26 miles by road from Ashcroft, thence 2 miles by steep wagon road to the mine camp. The camp is at an elevation of about 5,000 feet and is 1,000 feet higher than the valley. The rocky, timbered plateau surface drops away steeply by drift-covered slopes into the valley on the south.

Bed-rock near the deposits is mainly grey quartz diorite, though at several places fine-grained porphyry is exposed. The copper mineralization on the Snowstorm is confined to a strongly altered narrow shear whereas on the Iona, chalcopyrite is disseminated through sericitized quartz diorite across a fairly large area.

The Snowstorm and Iona groups were staked in 1905, in 1915 and 1916 some high-grade copper ore was shipped from the Snowstorm. In 1919 the Department of Mines contracted for 8 diamond-drill holes, totalling 5,736 feet on the Snowstorm zone, and on the Iona drove a 280-foot adit and put down numerous shallow test-pits. The ground was restaked in 1942 and in the spring of 1943, 4 diamond-drill holes totalling 2,359 feet were drilled to test the mineralized area near the adit on the Iona and one 419-foot hole near an old showing on the Jersey. There is no core remaining from the drilling done by the Department of Mines, but core from the latest drilling of Ventures Ltd. is stacked in core boxes at the camp. Other than the recent diamond-drilling no work has been done on the claims for twenty years. The surface test-pits are sloughed, the winze on the Snowstorm is filled with water, and the drift on the shear to the north partly caved, only the crosscut and south drift and the Iona adit are accessible.

The main workings on the Snowstorm are about 200 feet south-west of the camp. There a 72-foot crosscut adit connects with a 50-foot shaft; drifts extend along a narrow shear for 40 feet north-east and 35 feet south-west. To the north of the junction of the adit and drift, a winze was sunk about 50 feet; it is now filled with water. It is from this section that copper ore was mined in 1915 and 1916. Sorted ore totalling 96 tons and averaging - gold, 0.086 oz. per ton; silver, 6.4 oz. per ton; copper, 30.4 per-cent was shipped. The south drift was driven along a shear in the quartz diorite striking south 35 degrees west and dipping 80 degrees south-east. The shear at the face is 6 inches wide in sericitized quartz diorite, narrow quartz and calcite stringers run along it,

and specular hematite and malachite are present. The sorted ore mineralized with bornite and smaller amounts of chalcopyrite, pyrite and pyrrhotite evidently came from quartz stringers running along the shear.

Another shaft 190 feet south-west of the first was sunk to a depth of 58 feet on narrow shear striking north 55 degrees east and dipping 80 degrees south-east. The shaft at present is caved at a depth of 20 feet. From this shaft 40.5 tons of sorted ore was shipped assaying: gold, nil; silver, 4.52 oz. per ton; copper, 23.71 percent. The sheared quartz diorite is altered, stained by malachite and sparingly mineralized by specular hematite.

The Iona M.C. is approximately the same elevation as the Snowstorm and about 2,000 feet to the south-west of it. An adit 280 feet long is driven under the ridge on a bearing of north 69 degrees west. The ground has been stripped from the portal to the crest of the ridge a distance of 150 feet and from there pits 40 to 50 feet apart extend for 850 feet along the same bearing as the adit. Several dozen other pits lie to the south of this line while 900 feet to the south a second line of pits 1,000 feet long extends across the south-west corner of the claim, on a bearing of about north 70 degrees west.

The pits for the most part are sunk to bed-rock through a varying depth of overburden. Practically all are sloughed, but the dumps show that the bed-rock is sericitized quartz diorite much of which is stained by malachite and showing primary disseminated chalcopyrite. The pits indicate an extensive area over which there is copper mineralization, but they do not outline the limits of it.

Four samples taken by Hedley assayed between 0.2 and 0.5 percent copper.

The Iona adit is 280 feet long. In it the quartz diorite is malachite stained throughout. The rock is fairly extensively altered as evidenced by its bleached appearance but the sericitization does not appear to be related to the several small slips, nor to the narrow shear striking south 35 degrees west and dipping 80 degrees south-east that crosses the adit 200 feet from the portal.

An old assay plan of the Iona adit shows from 100 to 140 feet from the portal copper assays averaging somewhat more than 1 percent. This section was re-sampled by chip samples taken along each 5-foot section of the south side of the adit with the following results:

Distance from portal	Assay, copper, percent.
100 to 105 feet	0.13
105 to 110 feet	1.1
110 to 115 feet	1.1
115 to 120 feet	1.2
120 to 125 feet	1.1
125 to 130 feet	0.7
130 to 135 feet	2.3
135 to 140 feet	0.4

None of the numerous surface cuts was sampled.

During the spring of 1943, 2,778 feet of diamond-drilling was done by Ventures Ltd., of which four holes totalling 2,359 feet were drilled on the Iona claim. The collar of one hole is 50 feet from the portal of the Iona adit, the hole trends north-west and evidently was intended to explore beneath the higher grade copper mineralized section in the adit. Two other holes are 350 and 600 feet respectively south-west of the Iona adit portal, and the fourth

about 600 feet west of the portal. It is evident that the holes were intended to explore beneath the area of copper mineralization indicated by the old surface pits. The core from all the holes is stacked at the Snowstorm camp site. The core is largely quartz diorite altered in places, cut by narrow quartz stringers and carrying disseminated chalcopyrite, as well as thin films of chalcopyrite and a small amount of bornite. There is also a small amount of malachite in certain sections of the core. None of the core was sampled, but the average copper content is estimated to be lower than the high-grade section in the Iona adit.

The fifth drill-hole, 419 feet long, was put down on the Jersey M.C., some 4,000 feet north-west of the Iona.

In summary the copper showing on the Snowstorm is a comparatively narrow shear containing stringers of high-grade bornite ore, from which sorted ore has been shipped on, whereas on the Iona a fairly extensive area of sericitized quartz diorite is mineralized with disseminated chalcopyrite, at and near the surface oxidized to malachite, of a grade reaching 1 percent copper in places, but mostly less than 0.5 percent copper.

The claims were examined on September 10 and 11, 1943.

June 1944

Stuart S Holland

OFFICE OF THE CHIEF MINING ENGINEER

THE GOVERNMENT OF
THE PROVINCE OF BRITISH COLUMBIA

DEPARTMENT OF MINES
VICTORIA

September 4, 1943.

Dr. S. S. Holland,
Mining Engineer,
B. C. Dept. of Mines,
Revelstoke, B. C.

Dear Dr. Holland: Re: Highland Valley

Under separate cover we are sending you six blue prints, copy of the Department of Lands map 4-M, and a copy of the Summary Report G.S.C. for 1915. The last item is to be returned to the Library.

Map 4-M shows several routes by which the Highland Valley can be reached, one of them direct from Kamloops, and another following the main road from Kamloops to Savona whence a branch road is followed to Highland Valley. You will also note that a branch road can be followed westerly joining the main highway again at Squilax, thus avoiding the need of returning to the main road at Savona. I have been unable to get information about the branch roads, and would suggest that you consult the Public Works office, or any other good source of information in Kamloops, before setting out for Highland Valley.

Attached to this letter you will find a note from Mr. Freeland. The general geology of the area is treated by Drysdale, G.S.C. Summary Report 1915, pp 85 to 90. It is desirable that you visit the workings and get such information as you can, so that you will be able to write a short report on the property.

The 6 blue prints which are being sent, include a claims map which indicates adits on the Snowstorm and Iona claims; also drill holes on the Snowstorm claim. Another blue print represents a vertical

(P.T.O.)

section along the Iona (Thompson) "cross-cut close cut tunnel". Another blue print is a plan showing surface cuts, shaft and adit on the Iona claim. Still another shows the drill holes and the buildings on the Snowstorm claim, and a sixth shows surface cuts on the Eagle Fraction.

Please go over the workings carefully and note the character of mineralization, particularly as to whether it is primary or secondary. Mr. Freeland is of the opinion that the better grade samples from the Iona adit may be unduly high because of the inclusions of copper carbonate. It is desirable that you check sample the sections from which the higher grade samples in the Iona adit were obtained. You may be able to get some information from cuts, although it is possible that they have sloughed in too much to permit examination. You will note that Mr. Freeland made specific reference to drill hole No. 4. If by any chance the core is still there, and can be identified, it is desirable that you make sure of the character of the mineralized rock, and get whatever information can be obtained concerning the grade.

Yours very truly,

H. Sargent

Chief Mining Engineer.

HS/BP
Encl.

C
O
P
Y

Some notes on correspondence and maps, in possesion of the Dept. of Mines, relating to the Snowstorm Group of Claims, Highland Valley, Kamloops M. Div. (Ashcroft M. D.).

There is no full report on the above group in the files of the Department. Some information is obtainable scattered through widely dated letters. According to the opinion of Mr. Thomson, formerly Resident Engineer at Kamloops, there was a chance of a secondary enriched zone underlying the oxidized (carbonate of copper) sections evidently found in the Iona adit and also widespread throughout surface cuts and shallow shafts as shown on the maps. Bornite and chalco-pyrite are the minerals occasionally mentioned as having been found in the D.D. holes; no secondary minerals other than malachite were registered. Specular iron was mentioned in D. D. hole No. 8 between 467' and 468'.

Evidently some of the drill cores were sent away for identification but the results are not filed. Sometimes basalt and hornblende are mentioned in the drill log. Possibly this is the result of advice received about the samples. This basaltic rock measured 68' in hole No. 4 and was apparantly well mineralized. Assays of the core were 1% copper. Granite and porphyry are mentioned chiefly in the D.D. holes. Basalt, apparently, carried most of the mineral. Porphyry occasionally carried values. Copper values ran as high as 4% over 10' of core.

I am very doubtful if these assays of drill cores are correct because of the evidently broken nature of the ground drilled. It seems to me that the only true criterion of possible ore-bodies could be found by sinking a shaft and drifting. The history of ore bodies found in the Highland Valley area militate against the possibilities of finding large permanent mineral-zones. This may not be applicable in the case of the Snowstorm group. It cannot be gainsaid that there is a remarkably large amount of copper mineralization scattered over the country-side and somewhere a mine may be found.

Should you be able to spare Holland for a few days he might be able to check some of the higher assays in the Iona adit and also in the open-cuts and shallow shafts. Probably some of the drill-cores are left in the D.D. shack and a check should be made on the rocks, particularly the basalt and porphyry.

The Provincial Police at Ashcroft or Merritt could possibly give Holland some advice regarding transportation and camping facilities. A.man named Chataway used to own a ranch in Highland Valley and was willing to accomodate any engineers. His ranch was about 5 miles from the Snowstorm. It seems to me that a report by Holland would be extremely helpful to the Department when dealing with the Snowstorm in the future.

"P. B. F."