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Report on
SHERWOOD GROUP of MINERAL CLAIMS
Drinkwater Creek Area
By B. W. W. McDougall, M. E.

PROPERTY FILE

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Alberni Mining Division

Vancouver Island, B. C.

October 26th, 1944,
416 Bank of Nova Scotia Building,
Vancouver, B. C.

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SHERWOOD GROUP OF MINERAL CLAIMS

Alberni Mining Division, Vancouver Island, B.C.

INTRODUCTION

The purpose of the examination on which this report is based was to determine the general mining merit of the property and the possibility of establishing a profitable gold-mining operation on it. The area in which the property is situated has been recognized as gold-bearing for decades but there has been little serious development until recent years. The first claims of the Sherwood Group were staked in 1939 and development, effected during the first years of the war, disclosed an ore shoot. The area covered by the claims is topographically rugged and a reasonably complete examination of it would require considerable time. Since the present interest is almost exclusively concerned with the partly-developed ore shoot, the examination was confined to this and to the lode structure in which it occurs.

Assay maps made while development operations were under way and certain check-sampling results made by other engineers after the work was completed were made available to me. Considerable lengths of ore backs are now lagged over and conveniences were not available for transporting any considerable weight of samples. My own sampling work was confined to taking certain check samples at various places in the two upper levels. Since the assay results of these check reasonably with those of the operators and of the other examining engineers, I have used the assay records of the operating Company as the basis for value and tonnage estimates.

I was accompanied on the property by Mr. R.B. Gayer, M.E., Two days were spent on the ground working from the base camp in the valley bottom and two additional days were required for travelling to and from the property.

PROPERTY

MINERAL CLAIMS:

According to my information, the mineral claims and fractions comprising the Sherwood Group are as follows:-

Black Bear No. 2	Hamber No. 1
" " " 4	" " 2
" " " 5	" " 3
" " " 6	Hart,
" " " 8	Pluto No. 1
	" " 3
Patullo No. 1	P.M. No. 3 Fraction
" " 2	" " 4 "
" " 3	" " 5 "
" " 4	
" Fraction	

There are thus some 19 claims and fractions in all. Due to the rugged and difficult nature of much of the terrain, numbers of the claims and fractions are undersized and of irregular shapes. The claims have been surveyed by Messrs. Underhill, Underhill and Fraser, B.C. Land Surveyors. I believe, however, that this survey was a preliminary one and that all claim boundaries as indicated on the map are not necessarily final. The claims in their approximate relationship to each other and to other properties in the area are shown on a map prepared by Mr. Gayer which accompanies this report.

ADJOINING PROPERTIES:

Claims of the Sherwood Group are adjacent to and on the north-easterly side of Mamie (L 594), Marie (L 595) and Minnie (L 602) Crown Granted mineral claims which, I believe, are owned by the Good Hope Mining Company.

SITUATION:

The property is situated in the Strathcona Park area of Vancouver Island and from 3 to 4 miles north of the southerly boundary of the park. It is about 36 miles west north-westerly from the town of Port Alberni - a sea port at the head of the Alberni Canal. It is in the Alberni Mining Division, Vancouver

Island, B.C. More particularly, it is situated on the N.E. side of Drinkwater Creek, about 8 miles north-westerly from the west end of Great Central Lake.

TOPOGRAPHY:

The Sherwood Group is in the north-easterly section of the westerly portion of Vancouver Island which, in official publications, is referred to as the Bedwell River - Drinkwater Creek area and which extends from the coast easterly to the headwaters of Drinkwater Creek and from Bedwell Sound northerly to the Moyeha River. This entire area is mountainous and rugged. Along the coast, the mountains rise abruptly to altitudes of from 2,000 to 4,000 feet. Much of the central portion has an altitude of around 4,000 feet with numbers of peaks extending to altitudes of nearly 6,000 feet. The major streams of Drinkwater Creek on the N.E. McBride Creek on the E. Ursus Creek on the S.W. Bedwell River on the West and cutting easterly to within a few miles of Drinkwater Creek and the Moyeha River on the N.W. flow through deeply-cut and, in places, canyon-like courses. The steep-walled courses of the many tributary streams and the heavily glaciated upland terrain add to the topographic confusion.

Drinkwater Creek which, with its several tributaries, drains much of the eastern portion of the area flows into the western end of Great Central Lake. The valley near the mouth of the stream is possibly one-half mile in width. Northerly or upstream it gradually becomes narrower and from beyond the $5\frac{1}{2}$ -mile point to the vicinity of the Sherwood Group, it is but a few hundred yards in width and both walls rise steeply to about 2,000 feet above the valley floor. Thus, in effect, Drinkwater Valley is a great gash or trench cutting deeply into the midst of an area of high relief and giving reasonably convenient access to a locality which would otherwise be accessible only with great difficulty.

Most of the Sherwood claims lie on the north-eastern slopes of the

valley and on rugged terrain immediately above. A small part of the property, near the western end of the group, extends over to the S.W. side of the valley. The altitude of the valley bottom at the so-called base camp on the Minnie claim is about 1,800 feet and the highest point is a mountain summit bordering the west side of Love Lake which summit attains an altitude of about 5,000 feet.

In respect to topography the Sherwood vein, with which this report is principally concerned, is readily accessible for development and exploitation though an aerial tramway will be required.

ECONOMICS

CLIMATE:

The annual precipitation at the eastern end of Great Central Lake is about 70 inches, - that in the upper Drinkwater Creek area is probably very considerably more than this. Coast climatic conditions prevail and winters are relatively mild. Freezing temperatures prevail for considerable periods in the valley and snow may be expected to accumulate to depths of 5 or 6 feet. Both snow accumulation and temperatures may be expected to be more severe on the upper margins of the valley. To an established operation, climatic conditions present no serious impediments to the carrying forward of year-round mining and milling operations.

TIMBER:

The firm of Messrs. Bloodell, Welch and Stewart are conducting logging operations on the margins of Great Central Lake. Some years ago, this firm constructed a logging railway some $5\frac{1}{2}$ miles up Drinkwater Valley from the lake and logged off the merchantable timber in the valley and from the adjacent mountain sides. Above the $5\frac{1}{2}$ -mile point the original timber stand remains intact since it was impracticable to extend the railway grade farther. Above the limit of logging operations the valley is narrow and the gradient much

steeper. Big timber extends in the valley bottom and on the steep adjacent slopes to a well beyond Della Falls and the Sherwood property. Varieties include fir, hemlock and some pine. At the higher altitudes balsam is the chief variety.

There is an abundance of the finest timber for every construction and operation purpose close at hand. In the event that a production operation is begun, it would undoubtedly be greatly in the interest of economy to instal a portable sawmill in the valley bottom to provide lumber and timber practically at the place where it would be required for construction and operation purposes.

WATER:

There is abundant water for all requirements. Drinkwater Creek is a sizable stream carrying, at the time of our visit, upwards of 100 cfs. Several smaller creeks cascade down the slopes on both sides of the valley on or close to the property. It may, however, be necessary to pipe water some little distance for mining purposes since the mine workings are on the upper slopes and not close by any continuously-running stream.

WATER POWER:

Water power can be developed at two or more places along Drinkwater Creek. At a locality about 7 miles from Great Central Lake about 800-horse power is available. The creek by a series of falls and cascades drops through an altitude interval of 150 feet in a distance of possibly one-half mile. A smaller amount of power can be developed from the same stream a mile or so below the Sherwood property. Della Falls, directly across the valley from the Sherwood adits tumbles down the precipitous valley wall in a series of plunges and cascades through an altitude interval of about 1,600 feet. The volume is, however, normally small and possibly would be about sufficient for developing about 300 HP. Love Creek, fed from a lake of the same name, situated partly on the Sherwood property can probably be used to develop from 200 to 300 HP.

This creek falls through an altitude interval of about 2,000 feet in a slope distance of about $1\frac{1}{2}$ miles. There is another smaller but un-named creek flowing down the slopes on the N.E. side of the valley about $\frac{1}{2}$ mile below Love Creek. (See photograph.)

The watershed areas of these small tributary creeks is small and the run-off fast. Some investigation would be required to determine the flow data and the best means of conserving run-off. From mere inspection, however, I think it probable that Love Creek, which is most convenient to the Sherwood site, will be found to have sufficient flow to develop 200 HP or possibly more at minimum flow periods particularly if some conservation can be cheaply effected by damming the outlet from Love Lake.

The cost of developing this water power depends, to a very considerable extent, on the choice of equipment. For mine power, a direct Pelton-driven compressor would be desirable while a Pelton-driven AC generator would be required for the mill. A double type of installation such as is suggested would materially help to conserve water. The cost of the water-power installation should not exceed \$100.00 per horse power and it might be as low as \$75.00. On a 50-ton-per day production basis, hydro power should be cheaper than diesel power to the extent of at least \$1.00 per ton.

TRANSPORTATION:

A good motor road connects Great Central, at the eastern end of Great Central Lake, with the highway system of Vancouver Island. The distance from Alberni is about 12 miles. The lake, from end to end, is about 20 miles in length. As already noted, important logging operations are now being carried on along the margins of the lake and the logs are rafted and towed by tugs to the mill at Great Central. The logging and lumbering firm have barges and tugs suitable for conveying all types of equipment. A passenger service from one end of the lake to the other, is also maintained by Mr. P. Burke who uses a fast speed

boat capable of negotiating the distance in about one hour's time.

The logging railway which formerly extended some $5\frac{1}{2}$ miles up Drinkwater Creek has been dismantled and the rails have been removed. The landing at the West end of the lake remains intact and can readily be altered for use by trucks. The ties along the right-of-way remain more or less in place and the bridges, with one exception, are in place and appear to be in good shape. About 4 miles from the lake, a bridge across a tributary creek has been removed. The abutments, however, appear to be in good order and the cost of replacing this structure would be small. With this single exception, the railway grade is intact from the lake to the $5\frac{1}{2}$ -mile point. The matter of converting the railway grade into a good truck road is largely that of removing the ties, doing minor ditching and providing additional ballast at some places. Altogether, it would be a relatively inexpensive job.

The altitude of Great Central Lake is 260 feet, - that at the end of the railway grade at the $5\frac{1}{2}$ -mile point is about 715 feet, - the average grade is thus about 82 feet to the mile.

The distance from the end of the railway grade to the base cabin on the Minnie claim is about $4\frac{1}{2}$ miles, in which distance the trail crosses Drinkwater Creek at two places, - at Drinkwater Falls where there is a good pack trail bridge and a mile or so below the base cabin where the original bridge has been washed out. In this $4\frac{1}{2}$ -mile stretch the trail rises from 715 feet to 1800 feet, or an average gradient of 240 feet to the mile. This trail, with the exception of the upper bridge, is in fair condition. Not having been in use for some time it is, of course, badly overgrown with brush for considerable distances.

There appear to be no serious obstacles to the construction of a truck road from the end of the railway grade to and beyond the Sherwood property. There would, however, be a considerable amount of rock work and two sizable bridges. A production operation at Sherwood certainly requires access by trucks.

The cost of constructing this road, including the conditioning of the old railway grade, may be expected to be upwards of \$25,000 depending on the degree of perfection desired. A very good road can probably be constructed at a cost of about \$35,000.

With this truck road available, the cost of transportation from Port Alberni should not greatly exceed $1\frac{1}{2}\%$ per pound. Carrying costs on a route where transfers from one conveyance to another are required vary considerably according to the type of freight carried and to the steadiness or otherwise of the traffic. The transport cost figure indicated is to be considered as approximate only.

From the base camp on the Minnie claim in the valley bottom, a peak trail has been constructed up the N.E. slopes of the valley to an upper camp on the Patullo No. 1 claim at an altitude of 3,567 feet and on to the portal of the No. 7 adit at an altitude of about 3,700 feet. The trail, though steep, is well built, - the distance between the two camps is probably somewhat more than one mile. A steeper though still usable pack trail leads from the main upper camp to the site of a former tent camp site at an altitude of 4,080 feet. This higher site was used while the driving of the Nos. 1 and 3 adits was under way. The site is near the general summit of the glaciated plateau which stretches away to the north and near the lower slopes of a mountain peak which rises to an altitude of about 5,000 feet and is situated near the N.W. boundaries of Patullo Nos. 2 and 4 claims. The altitude range on the property is from about 1,800 feet to 5,000 feet.

In respect to road construction from the west end of Great Central Lake up Drinkwater Creek valley to the Sherwood property, it is reasonable to anticipate that, given assurance that important mining operations are about to be undertaken, the Provincial Government will give serious consideration to constructing this road at its own expense. In the first place, the Drinkwater route

is the only transport avenue to a considerable area which is considered to be favorable for the occurrence of gold-bearing veins and in which numbers of such veins are already known. Secondly, the Strathcona Park area has long been recognised as possessing outstanding scenic attractions and it has been set aside for park development at some future time. Within this park there is such an assemblage of scenic grandeur, - mountains, rivers, lakes, waterfalls, glaciers, wild animal life, fishing and so on, as will make it one of the outstanding recreational areas of its type anywhere on the continent. The beginnings of its development might well fit into plans for post-war developments. To make this park area accessible from the south, the Drinkwater road is a first requirement. By the construction of good pack trails from upper Drinkwater valley, this great alpine area can quickly be made accessible from the highway system of the Island. A third consideration is that there is still a very considerable amount of merchantable timber in and adjacent to the valley though it is true that the major portion of this is on the steep side walls of the valley and can probably be obtained at the expense of considerable wastage on this account.

This short discussion has been included to indicate that it would seem unfair that the first mining operation to be established in the area should be saddled with the expense of constructing a road which may be expected to pave the way for important and varied industrial and recreational developments in the area and which would depend entirely on this one entry route.

GENERAL:

Alberni and Port Alberni are good supply centres. Port Alberni is a deep sea port and has regular steamer service with Victoria and Vancouver. The property, as has been noted, is less than 40 miles off the highway system of the Island and is accordingly very favorably situated with respect to general facilities, equipment and supply sources, communications and labor.

REFERENCES

Reference is made to an excellent publication descriptive of this particular area prepared by the B.C. Department of Mines. This publication is Bulletin No. 13 entitled - Supplementary Report on the Bedwell River Area, Vancouver Island, B.C., by H. Sargent. This bulletin includes a bibliography of all previous official descriptions of the area and it not only describes the general geography, topography, geology and other features but includes an intimate description of the Sherwood Group itself. The present report assumes that a copy of Bulletin No. 13 is available to the reader and for this reason it is unnecessary to restate much of the information which is given in the Bulletin.

HISTORY

Bedwell River and Drinkwater Creek vicinities have had somewhat lengthy gold-mining histories even including some placer production from Bedwell River. However the gold-bearing veins known in the earlier times were not only very narrow and the ore shoots small but the gold values were too intimately associated with sulphides to permit their recovery as bullion by crude and simple methods. Though the distances involved were not great, the rugged topography was an effective deterrent to the construction of roads. With the rise in the price of gold, the district assumed a new importance.

Following favorable developments at the Zeballos camp where geological conditions are broadly similar, extensive prospecting and claim-staking took place in the Bedwell River area and gold-bearing veins of some promise were discovered. The earliest gold discoveries in the Drinkwater Creek area were, I believe, made near the shore of Della Lake which occupies a glacial cirque above the valley rim and more than 1,600 feet above the level of Drinkwater Valley.

The first claims of the Sherwood Group were staked by W.J. Sherwood in the summer of 1939. On the N.E. side of the valley almost directly opposite

Della Lake and falls Mr. Sherwood discovered a gold-bearing vein which outcrops at the top of a steep talus fan. This is the only vein of recognized importance yet discovered on the property. In the same year the claim group was optioned to Pioneer Gold Mines Ltd. which Company carried forward development work during 1940 and 1941. During this time the logging railway was in operation thus facilitating the freighting in of the necessary supplies and equipment. The option was, presumably, dropped because of matters pertaining to property payments and, generally, to conform with Company policy during the difficult war years.

GEOLOGY

For a complete description of the geology of the area generally as well as of the Sherwood claims themselves reference is again made to Bulletin No. 13. My own examination was confined principally to the ore occurrences.

Generally the Sherwood Group and the area in its immediate vicinity is underlain by an extensive series of late Palaeozoic and Mesozoic rocks. Remnants of Permian sedimentaries as well as older Palaeozoic flow and sedimentary members are recognized though the major portion of the complex is made up of Mesozoic volcanics - both intrusive and extrusive. The whole has been profusely intruded by dykes, principally quartz diorite and related types, correlated to the Bedwell batholith which is considered to be of Jurassic age. The volcanic rocks include both andesites and basalts together with many hybrid volcanic types.

The whole complex has undergone intensive and probably repeated deformation with the result that there has been much faulting, fracturing and shearing. The general similarity of the volcanic rock types together with the extensive dynamic disturbances and the particularly rugged nature of the topography have made it impossible to determine general geological structure in any intimate detail.

The Sherwood vein occurs in a relatively narrow shear zone which strikes about N 70° E and dips northerly at an angle of about 65°. The outcrop was discovered in the V-notch of a small but particularly rugged gulch or canyon at the top of a talus fan. It is accessible only with difficulty and some danger due to loose weathered rock on the nearly vertical walls of the gulch. The lode structure is typical of this sort of occurrence though the original mineral contents are heavily oxidized. It consists of quartz varying in width from a few to possibly 30 inches,- in some places two or more quartz strands parallel each other with sheared and crushed wall rock separating them. There is a consistent gouge seam a few inches in width. Small stringers, some of them minute, branch off at acute angles to fade away into the walls and the walls themselves are leached to a pale color to a depth of an inch or more due to hydrothermal action. The shear width as disclosed in the workings appears to vary from three to upwards of five feet though, presumably, the gold values are contained largely in the quartz and possibly to a lesser extent in the originally-silicified sheared country rock which in places occurs between quartz strands. The degree of oxidation has been extreme indicating the porosity of the structure. Comparatively little of the original sulphide content remains and much of the vein material is sufficiently soft and crumbly to be removed by a pick. The principal sulphide is pyrite,- galena and sphalerite are present in minor amounts and copper stains were observed in several places. Due to the intensive oxidation it is probable that very minor amounts of secondary sulphides occur. The zone of oxidation has not been bottomed by the workings which expose the shear to a vertical depth of about 750 feet. This circumstance is probably due to the pervious nature of the shear zone and to the fact that it is situated near and emerges to steeply inclined slopes.

The shear structure cuts across volcanics and dioritic dykes alike and with no apparent displacement. There is a tendency for certain very minor

veinlets to follow contacts,- at least for very short distances. The ore occurrences are considered to be related to the Bedwell River batholith which is one of a number of plutonic rock masses occurring along and near the West Coast and which have been exposed or unroofed by the deep erosion of the overlying volcanics and sedimentaries. Undoubtedly these granitic plutonics underlie the Drinkwater creek area at some depth. Assuming that the mineral-bearing solutions originated from sources well within the upper interior of the plutonics, as appears to have been the case elsewhere in West Coast districts, the loci of ore shoots within certain fractures and shear zone structures in both the upper portion of the intrusives and the overlying volcanics would appear to be largely influenced by the physical or mechanical circumstances of channels or zones invaded by the mineral-bearing solutions. It is believed that the development of heavy impervious gouge or other physical circumstances have operated to dam, impede, divert or otherwise influence the courses of uprising hydrothermal solutions. It is obvious that the precise mechanical influences which were operative during the ore-forming period cannot be known and that ore shoots which do not outcrop can only be located by exploratory mine openings along the planes of shears or, in some cases, by diamond drilling.

MINE WORKINGS, ORE AND VALUES

The Sherwood vein is developed by three drift adits and to a maximum vertical depth below the outcrop of about 800 feet or, measured on the dip, of about 880 feet.

The top or No. 1 adit is at an altitude of 4,402 feet. It is driven on the vein which outcrops in the almost vertical V-notch of the gulch. Access to the portal is by a short pathway cut in the wall rock of the gorge. The length is about 380 feet. The vein and shear structure is exposed continuously throughout and, with the exception of one small fault offset about 100 feet back from the face, there is no break in the continuity of the structure. Vertical

backs over this adit increase from about 30 feet a few feet back from the portal to about 90 feet at the face.

Ore values are continuous from the portal inwards for a distance of 185 feet. Sampled widths, and presumably ore widths, vary from 1.3 to 4.3 feet. Over the remainder of the distance the lode structure carries only low values over narrow widths and the quartz widths are narrow or lacking entirely. Much of the drift back is lagged over and continuous sampling cannot be done without removing this. I took some 5 samples at convenient points. Details of the assay results are given elsewhere in this report. The assays are as close a check on previously-available information as could be expected under the conditions. According to the information available from sampling and assaying while the work was under way the details of the ore exposure in this adit are as follows:

Continuous ore length,-	185 feet,
Average width sampled,	2.44 feet,
Average gold content,	1.09 ounces per ton.

The No. 3 adit is at an altitude of 4,190 feet or some 212 feet vertically below the No. 1. Here, too, the actual vein outcrop is in the notch of the gulch and entry is obtained by a crosscut driven from the south side of the gulch. This breaks through into the south wall of the canyon some 160 feet from the portal. A run-around crosscut from here, to avoid the canyon wall, continues for another 100 feet to the vein. A drift is extended on the vein a distance of about 20 feet to a break-through into the canyon. Inwards it extends on the shear for a distance of about 530 feet. Due to the outward slope of the mountain side which is at an angle of about 45° between the Nos. 1 and 3 portals the lode extends about 150 feet farther to the west on the No. 3 than on the No. 1 level. The adit exposes continuous shear structure for the full length of the drift but the average width of quartz exposed is less than half that of the No. 1 adit. From the records available the ore, though narrow in places, definitely terminates

at about the 260-foot point. From this point on the face there is but little quartz and this little is in the form of narrow disconnected stringers and assay values are low. In both adits the greatest ore widths are at the portals and these widths gradually diminish inwards. Values cut off abruptly in both levels in such manner as to strongly suggest an ore shoot raking westerly at an angle of about 70° . It is also plainly indicated that a considerable and perhaps the main portion of this ore shoot has been removed by the erosion of Drinkwater valley. The back of the No. 3 adit drift is also lagged over for considerable distances making continuous sampling impossible without removing it. I took 5 samples for checking against available records and the assay results of these indicate good checks. According to the available assay information I have computed the ore as exposed in the No. 3 adit level as follows:

Continuous ore length,	260 feet,
Average width sampled,	1.12 feet,
Average gold content,	1.00 ounce per ton.

The Number 7 adit at the 3,698-foot horizon or some 492 feet vertically below the No. 3 level begins as a crosscut since the topography prevents direct access to the vein. This working, like the No. 3, breaks through to the canyon wall in two places. The shear is drifted on for a distance of about 800 feet, more or less. No ore of apparent commercial consequence is indicated on this level. The quartz exposed is narrow and disconnected and entirely lacking over considerable distances. Oxidation appears to have been quite as intense at this horizon as on the upper levels. An upraise has been extended for a distance, measured on the slope, of 300 feet above level and a short 'blind' or sub-level has been driven out on the plane of the shear from the top of the raise. Commercial values are said to obtain in this sub-level. The raise is, however, blocked by a small cave and we were unable to effect entry to this part of the workings.

On the surface, efforts have been made to trace the shear over a distance of more than 1,000 feet. However, except for a short distance back from

the No. 1 adit portal, it has been impossible to follow it with assurance because of deep oxidation and rock disintegration.

In their report for the fiscal year ending March, 1941, Pioneer Gold Mines Ltd. state that the first 185 feet of drift on the No. 1 level averages 1.26 ounces to the ton over an average width of 30 inches and that on the No. 3 level the first 254 feet of drift was in ore which averages 1.36 ounces over a width of 15 inches.

ORE

In compiling ore tonnage and value estimates I have made use of the assay information obtained by the Pioneer Company and check sampling assay results by two other examining engineers as well as those obtained by myself. I have also examined the assay results of sampling by Dr. H. Sargent of the B.C. Department of Mines as given in Bulletin No. 13.

The combined probable and possible ore area is considered to extend from the surface down to the sub-level through a maximum altitude interval of about 475 feet and from the slope of the mountain inwards or easterly to the apparent line of the 70° westerly rake of the shoot. Tonnage and value estimates are as follows:

Total ore - probable and possible,-	27,830 tons,
Total gold content @ 0.50 Oz/t,-	13,915 ounces,
Total value @ \$38.50 per ounce,-	\$535,727.50

Additional development required to make this ore body available for mining consists only of extending the upraise from the Sub-level to the No. 3 level - a distance of about 200 feet and this raise will pass through vein area considered to be in the 'possible' ore zone,

CONCERNING DEVELOPMENT POSSIBILITIES

This report is primarily concerned with a consideration of the Sherwood property from the point of view of the economic aspects of the ore resources at present indicated and partly developed, But apart from this entirely 'salvage'

point of view the occurrence of other ore shoots in the shear and of other ore-bearing shears elsewhere on the property are possibilities of equal or even greater importance. Unfortunately there is as yet very little information bearing on this matter. In respect to the Sherwood shear itself the known ore body may well represent the uneroded remnant of what was once a much larger shoot. The source of the mineral-bearing solutions was undoubtedly the underlying plutonics but this source was not necessarily directly below the known ore shoot. I have the opinion that the solutions penetrated from the Drinkwater valley side. There are two known narrow veins enclosing gold-bearing shoots in the vicinity of Della falls near the valley bottom and at a horizon nearly 2,000 feet below that of the No. 7 adit. Gold-bearing outcrops also occur on the S.W. side of the valley near the shore of Della Lake. This indicates that gold-bearing exposures in the general vicinity exist through an altitude interval of 2,500 feet though it is not yet known that such exposures are continuous throughout this vertical distance. The strikes of the Sherwood and Della Falls vein occurrences are considerably at variance and it is unlikely that they are connected on strike. But practically nothing is known of fracture and shear occurrences in the mid and lower portion of Drinkwater Valley on the N.E. slopes. It so happens that the westerly continuation of the Sherwood vein, on the downhill side, passes beneath a large and very steep talus fan. I think that there are possibilities that the Sherwood shear may contain other shoots on the downhill side extending to and even below the level of Drinkwater Creek. As to there being additional ore bodies in the shear structure East of the present workings, this is a matter for exploration and possibly also for some additional surface prospecting. I do think, however, that exploration, probably best effected by diamond drilling, is well warranted for the probable westerly continuation of the Sherwood shear on the mid and lower slopes of the mountain under the talus fan in the hope that ore shoot indications may be

revealed. Should such be found development could be effected from the main or base camp in the valley bottom. Unless there are plain indications to the contrary it may, I think, be presumed that the possibilities for finding gold-bearing vein outcrops decrease with distance from the contact between the Bedwell batholith and the overlying volcanics and sedimentaries. It may be that, to the N.E. erosion has not yet been sufficiently deep to reveal gold-bearing quartz occurrences which possibly exist beneath this area.

METHODS AND PROCEDURE

It is intended here to outline very generally and briefly the approximate methods and procedure which will be required to exploit the Sherwood ore shoot. It is assumed that, from the outset at least, preliminary operations are to be primarily concerned with mining and milling the known ore. A road is the first requirement. Under the terms of the existing agreement with the interested syndicate it is of the utmost importance that this road be completed during the season of 1945. During 1945, also, a study of water-power matters should be made and definite decisions and plans made for the development of from 200 to 300 horse power of hydro and hydro-electric energy. Final plans should also be made with respect to mine equipment, aerial tramway, camps, mill and other lesser requirements. All equipment should be placed and all construction work effected during 1946. Careful planning will be required to do this work in the most economical fashion.

In respect to metallurgy the ores are similar to other West Coast occurrences except that the degree of oxidation is probably more severe. It would be good practice and in the interests of safety to have an ore test and a tentative flow-sheet design made by competent authority. It is expected, however, that the most economical processing will include the saving of coarse free gold by means of an intercircuit jig and of most of the remaining values in the form of concentrates by flotation. An overall metallurgical saving of 95% up-

wards may be anticipated with the use of standard appliances and equipment.

In general the operating plan visions the development of at least 200 horse power by hydro methods. Of this 100 HP would be made available at the portal of the No. 7 adit in the form of compressed air for steel sharpener and drills and the remaining 100 HP as 440-volt AC electric energy at a mill site in the valley near the creek and on the Black Bear No. 2 or P M No. 4 Fraction claims. An aerial tramway from the No. 7 adit portal vicinity to the mill site would be required. This would be about 3,100 feet in slope length and the average slope angle about 50 degrees. Jig-back equipment is indicated. Two camps, one in the vicinity of the No. 7 adit and the other near the mill site, would be required. The mill would be of nominal 50-tons-daily capacity.

COSTS

At the present time it is impossible to predict with accuracy what the cost of providing all the required equipment and facilities will be. The cost estimates given below are accordingly very approximate though it is believed that they err on the high side:

Road, (Nominal),-----	\$ 15,000
Tramway, including terminals & bins,-----	10,000
Power,-----	20,000
Mine and blacksmithing equipment,-----	15,000
Sawmill including planer,-----	3,500
Camps and other buildings with equipment,-	15,000
Assay office,-----	1,500
Pre-production mining expense,-----	15,000
Mill,-----	30,000
Miscellaneous,-----	10,000
	<hr/>
Total,-----	\$135,000

This amount represents an estimate of the capital requirements over and above such payments as may be required on property account.

Unit operating costs per ton may be expected to be approximately as follows:

Mining,-----	\$ 3.00	
Development,-----	.50	
Milling,-----	2.50	
Aerial tramming,-----	.35	
Marketing,-----	1.25	
Insurance & General,-----	2.00	
Milling losses,-----	.90	Estimated @ 5% of 0.5 ounce,
2% Mineral Tax,-----	.45	
Plus 10%,-----	<u>1.10</u>	
Total,-----	\$ 12.05	

This per-ton cost estimate makes no provision for mine development outside of the limits of the known ore shoot and most of the expected cost of the major development openings has been provided for under capital requirements.

CONCLUSION

Considered from a strictly 'salvage' point of view and based on the combined 'probable' and 'possible' ore reserve estimates, which I believe to be reasonable, the exploitation of this property, when operated under approximately pre-war conditions with respect to labor, equipment and supply costs, should provide operating profits sufficient to insure the return of the capital required together with some margin. The matter of establishing a continuing profitable operation lies in the possibility of locating other ore shoots in the Sherwood shear, particularly on the westerly end, and in the possibility of acquiring on suitably favorable terms other near-by properties having gold occurrences of known interest the working of which would require little additional equipment. Considered on this basis and having regard to the fact that gold mines are made rather than found I am of the opinion that the exploitation of the Sherwood property is a promising mining venture.

Respectfully submitted,

(Signed) B. W. W. McDougall,

Consulting Mining Engineer.

416 Bank of Nova Scotia Bldg.,
Vancouver, B.C.
October 26th, 1944.