

December, 1944.

*Mr. 4.*

Harrison Group

860222 L53-127SE

(Tweedsmuir Park - Whitesail Lake Area)

By Stuart S. Holland

Reference: Eutsuk Lake Area, Geol. Surv., Can., Sum. Rept. 1925, Pt. A, p. 144.

From September 13 to September 23, 1944, were spent on the Harrison Group. Of this time 6 days were lost because of bad weather. The group consists of 28 claims and one fraction, the Harrison Nos. 1 to 18, Harrison Nos. 21 to 30 and the A.E. Fraction. The Harrison claims were staked by the Harrison brothers of Wistaria in 1943 and 1944 and are under option to Pioneer Gold Mines of B.C. Ltd.

Six claims were staked in the autumn of 1943 on quartz showings containing scheelite. At that time a sample from one quartz vein was reported to contain some gold. Franc Joubin, working for Pioneer Gold Mines of B.C., Ltd., examined the claims in the summer of 1944. It is reported that he identified a telluride mineral in a large quartz vein hitherto not considered of importance. At his suggestion more claims were staked to cover the extension of this vein which is the one now undergoing development. When news of the gold values in the quartz became known there was a rush of staking of claims in August 1944 by other prospectors and company scouts.

The claims of the Harrison Group lie on the north side of Lindquist Lake. They extend from the lake shore to the top of the ridge at an elevation of 5,800 feet. A temporary tent camp has been established just below timberline at an

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elevation of 3,800 feet. The campsite is 1,100 feet above, and 5 miles by newly constructed pack-horse trail from the west end of Whitesail Lake.

The group is in Tweedsmuir Park, south-west of Burns Lake on the Prince Rupert branch of the Canadian National Railway. From Burns Lake it is reached by 15 miles of road to Francois Lake. The lake is crossed by a Provincial Government ferry to Southbank. From Southbank it is 27 miles by road to Ootsa Lake and an additional 13 miles westward by road along Ootsa Lake to Wistaria. It is necessary to use shallow draught, flat-bottomed river boats the rest of the way either from Wistaria or Ootsa Lake. From Wistaria it is about 57 miles by boat to the west end of Whitesail Lake. This distance consists of 10 miles to the west end of Ootsa Lake, 5 miles up Tahtsa River to the east end of Sinclair Lake, 6 miles along Sinclair Lake to the west end, and 7 miles up Whitesail River to the east end of Whitesail Lake. From there it is 29 miles along Whitesail Lake to the bay at the west end whence the trail leads 5 miles to the Harrison Group.

The claims are on the eastern side of the Coast Mountains. The country is rugged, rising from Whitesail Lake at an elevation of 2,694 feet to high peaks exceeding 7,000 feet. The Harrison Group claims are on the south side of a ridge having an elevation of about 5,800 feet. The main showings lie above 4,000 feet elevation and are at and above timberline. The lower slopes of the ridge are heavily timbered with spruce, hemlock and alpine fir.

At the time of examination a temporary camp had been

established just below timberline at an elevation of about 3,800 feet. A number of tent frames had been put up and a log cabin was to be built to store equipment during the winter.

Geology:

The Harrison Group lies along the eastern contact of the Coast Range Batholith. In a general way the eastern contact of the batholith runs in a north-westerly direction extending from the west end of Pondosy Lake, through the west end of Eutsuk Lake, between Lindquist and Whitesail Lakes, to the west end of Tahtsa Lake. There is an embayment in the contact on the ridge directly north of Lindquist Lake. As a consequence the intrusive contact runs westward across the Harrison Group. More specifically, the contact extends in a fairly straight line almost due west across the Harrison No. 22, No. 13, No. 12, No. 5, No. 1, and No. 2 claims.

Where seen on the Harrison claims Coast Range intrusive rocks are of two types ; a medium grained, pale pinkish weathering granodiorite and a medium grained grey quartz diorite. Quartz diorite outcrops in many places along the margin of the intrusive and may be a contact phase of the batholith. However, the two rock types were not seen in contact so it is not known definitely whether one phase intrudes the other. The impression received from the distribution and changes in the rocks is that the two may be phases of the same intrusion, either having gradational or local intrusive contacts.

In a general way the grey quartz diorite appears to extend along the margin of the batholith with the white to pink granodiorite lying to the south of it.

The granitic rocks intrude rocks belonging to the Hazelton group. These are sediments with interbedded lava or fragmental volcanics. On the Harrison Group there are slates, which close to the intrusive contact have been metamorphosed to andalusite schist, tuffaceous argillite, pale green thinly bedded tuff, and some coarser fragmental volcanics. These rocks strike north 70 to 80 degrees west, more or less parallel to the intrusive contact, and dip from 50 to 75 degrees to the southwest, into the intrusive contact.

There is a foliation in the quartz diorite near the contact dipping to the south-west, which together with the strike and dip of the intruded rocks suggests that the contact between the two may dip to the south-west as well. This cannot be proven at the present moment but should be borne in mind as it has an important bearing on the depth environment of the vein system.

Another rock type seen on the claims is a black fine-grained dense dyke rock outcropping in three places as dykes having a maximum width of about 12 feet. The dykes cut diorite, sediments and quartz veins clearly showing them to be the youngest rocks in the vicinity.

The structural feature of importance is the diorite-sediment contact which is thought to dip south-ward. One other feature mapped is a fault running about south 45 degrees east through the Harrison No. 22 and No. 23 claims and followed by the creek that flows past the temporary camp. The fault cuts across the granitic contact displacing it a horizontal distance of about 900 feet. In addition it is thought that the easternmost vein

may be terminated at each end by faults. These faults could not be proven but were suggested by two well marked straight-line topographic depressions running along the hillside. Evidence of further faults was not seen.

The Hazelton Group rocks dip to the south-west on the Harrison Group but on the ridge to the north and east are seen dipping north-westward. They evidently are involved in open folds in this particular section as there was no indication of close or isoclinal folding.

Veins:

The showings that first aroused interest in the autumn of 1943 were the quartz veins containing scheelite that outcrop close to the No. 1 posts of the Harrison No. 1 and No. 2 claims. Lately interest has centred on the outcrops of vein quartz on the Harrison No. 5 and No. 13 claims. Besides a number of isolated quartz outcrops that as yet are unrelated, there are three main outcrops of quartz veins, two of them are on the Harrison No. 13 claim and one is on the Harrison No. 5 claim.

The outcrop of the easternmost segment of vein quartz is sickle-shaped and about 260 feet long. On the south-east side it terminates on the wall of a prominent gulley striking about north 25 degrees east that is interpreted as a shear zone or possible fault. On the north-west side the vein terminates at a second, less prominent gulley, running about north 25 degrees east that may be either a shear zone or a second possible fault. Unfortunately bedrock exposures are not sufficiently numerous to map any displacements of the diorite -

sedimentary contact that would prove the existence of the two hypothetical faults.

This easternmost quartz segment is in quartz diorite. At its north-west end it strikes about north 65 degrees west and dips 30 degrees to the north-east.

A second segment of vein quartz outcrops in the east corner of the Harrison No. 13 claim. It is considered to extend from an outcrop of vein quartz in a small creek southwestward for 315 feet to the quartz exposed at the waterfall on the creek at station 9. There is no trenching along the intervening ground so that continuity is not absolutely certain. The trend and approximate strike of the outcrop is south 60 degrees west. Its dip is about 45 degrees to the north-west.

At the time of examination there had been no trenching done on the quartz vein, consequently the extension of the vein beyond the present terminal outcrops is not known.

The third segment of quartz vein is on the Harrison No. 5 claim. Vein quartz is exposed at close intervals for a length of 480 feet. The trend of the outcrop on the rising sidehill is about south 85 degrees west while the actual strike of the vein is south 75 degrees west and its dip 60 degrees north. At station 21 there is a foot-wall strand of quartz that may be either a split in the vein or a slice faulted segment of the vein. It is about 150 feet long.

At the time of examination the company had just started to strip and trench the vein near station 21 at the presumed split. No work had been done beyond the present limits of the terminal quartz outcrops.

The three quartz vein segments are in quartz diorite close to the contact with the intruded sediments and volcanics. The westernmost segment is about 500 feet from the contact and the central segment 300 to 400 feet south of the contact.

The three segments differ in strike and dip from each other and failing any evidence to the contrary are considered to be three separate veins. They are similar in mineralogy and all dip to the north, towards the sedimentary contact.

At the time of examination trenching and stripping had just begun so that observations were made only on natural outcrops. The vein outcrops in most places exposed neither foot-wall nor hanging-wall so that seldom was the true width of the vein exposed. Nevertheless, vein quartz in true measured widths greater than 6 feet were exposed in many places. It would appear possible for the quartz to average 5 feet or more in width along considerable lengths of each vein. The veins occupy tight fractures, the quartz where observed is frozen to the quartz diorite walls.

The quartz of the three veins is mineralized with pyrite, galena, and sphalerite. It varies in amount in different places and on the average seldom amounts to more than 10 per cent of the vein. A small amount of magnetite was observed on one exposure. It is reported that a telluride mineral, possibly a bismuth telluride, is present in the ore. Joubin was the first to observe the mineral when he examined the showings for Pioneer Gold Mines Ltd., but no confirmation of its presence was made.

The sulphide minerals occur in bands running parallel to

the walls of the vein, lying within barren or sparsely mineralized white quartz. The bands show no preference for either wall.

Prior to the time of my examination no work had been done on the vein exposures. However, work was begun on trenching and stripping the vein by the supposed split at station 21. The accompanying map is a copy of a survey of the showings made by Joubin for Pioneer Gold Mines of B.C. Ltd. It shows the actual exposures of vein quartz and indicates the presumed continuities between them. As yet the continuity is not known with complete certainty, nor have the possibilities for extension of the various veins been explored.

Sampling:

The quartz veins had been fairly extensively sampled by Joubin for the Pioneer Company. The results were given to me for my information through the courtesy of A. Pike, who was in charge of the work. These company assay results are restricted to departmental information and are not for public release.

The easternmost vein outcrops along a length of 260 feet, but actually only about 70 lineal feet of vein is exposed in that length. The company samples were composite chip samples taken over the exposed area of vein quartz. The smaller of the two dimensions is an indication of the width of the vein at that point.



Sampling of that vein is tabulated as follows:

Area of vein sampled	Oz. gold per ton	Oz. silver per ton	Remarks
6.5' by 4.0'	0.02	0.5)	eastern end of vein
18' by 5.0'	0.01	2.4)	
20' by 6.0'	0.04	- )	
30' by 6'	0.24	4.0)	
17' by 7.5'	trace	0.3	middle quartz outcrop
20' by 8'	0.26	2.9)	northern quartz exposure.
20' by 6'	0.24	3.9)	
selected quartz	0.46	4.6)	

The central vein is exposed along a length of 315 feet with quartz actually outcropping for a length of about 95 feet. The company sampling results for the vein are tabulated as follows:

Area of vein sampled	Oz. gold per ton	Oz. silver per ton	Remarks
9' by 6'	0.30	6.9	eastern end
20' by 8'	0.48	4.6)	western end
10' by 6'	0.38	10.9)	
20' by 5'	0.40	3.3)	

The western vein is exposed for 480 feet with quartz outcropping for a total length of about 120 feet including the split. The company sampling results follow:

Area of vein sampled	Oz. gold per ton	Oz. silver per ton	Remarks
15' by 10'	0.16	3.2	large easternmost exposure of this vein
chips along a length of 150'	0.30	8.5	

Area of vein sampled	Oz. gold per ton	Oz. silver per ton	Remarks
5' width	0.84	20.2	(H.W. strand ( west end
4' wide	0.20	9.1	(H.W. strand
6.2' width	0.14	4.7	Channel sample F.W. strand
25.8' by 8'	0.34	12.0)	F.W. strand, west end
30' by 7'	0.40	16.0)	

I took seven samples to serve as indicators of value only. They were taken across the exposed width of quartz at the points indicated on the sketch map. They indicate the minimum width of quartz at each point. The difference from the company values at the approximate point is shown by the following tabulation of pairs of results:

Sample Number	Oz. gold per ton	Oz. silver per ton	Width	Remarks
53 F Pioneer Sample	0.36 0.24	5.0 4.0	6' -	H.W. exposed East vein.
54 F Pioneer	0.32 0.26	1.3 2.9	9' -	F.W. exposed East vein
55 F  Pioneer sample	0.13  0.30	2.3  6.9	5'  -	Middle vein - $\infty$ end - picked pieces of pyrit mineralization walls exposed.
56 F No corresponding Pioneer sample.	0.20	1.6	7'	Middle vein - middle exposure
57 F Pioneer Sample	0.09 0.48	1.5 4.6	7' -	Middle vein - F exposed
52 F  Pioneer sample	0.22  0.16	4.6  3.2	10'  -	West vein - no walls exposed.
51 F Pioneer sample	0.22 0.34	5.9 12.0	6' -	West vein F.W. strand

My sample results do not confirm the actual results of the Pioneer Company. Nevertheless they do indicate that the three quartz veins across widths of 5 feet and more contain gold values that are worth further investigation. The results show that the gold-silver ratio is not constant. There is no proof that the high silver values are associated with higher amounts of galena. There is an indication that high gold values are not necessarily associated with higher proportions of sulphide minerals and particularly of pyrite. This, in spite of the fact that no visible gold was observed or has been reported.

At the time of examination stripping of the west vein had just begun. The veins were exposed in interrupted natural outcrops that seldom showed the vein walls. As a consequence the averages of assay results and widths of quartz are of value only in suggesting what the true figures might be. Firm estimates of width and grade are not possible yet.

Possibilities:

At the present time the three quartz veins appear to have a total length of about 1,050 feet. The east vein may be cut off at each end by faults but this is not known definitely nor has the extension of the vein been explored. The present lengths of the middle and west veins are delimited by natural exposures of vein quartz. No attempt to trace the veins by stripping or trenching beyond the present outcrops has been made.

It is impossible to assess the depth possibilities of the veins completely. There is about 150 feet vertical difference between terminal outcrops of the west vein. The middle vein has about 25 feet difference and the east vein about 75 feet. The behaviour of the veins at further depth is not known. The general situation is that the veins are in the quartz diorite dipping to north, towards the diorite-sedimentary contact. The dip of the diorite-sedimentary contact is not definitely known but the indications are that it is to the south. Should the vein fracture extend to depth, the fracture will remain in diorite until the sedimentary contact is reached. This slope distance will vary with the dip of the vein, the dip of the intrusive contact, and the distance the outcrop of the vein is from the contact. How the fracture will behave when it breaks into the adjacent sedimentary and volcanic rocks is not known. A change in character of the vein fracture would not be surprising. At present the behaviour at depth of the veins must remain largely unpredictable until further exploratory and development work is done on them.

The attention of the Company has been largely occupied by the three main veins. Yet in the vicinity of them are a number of other veins, and a stringer zone, some of which are sufficiently well mineralized to contain interesting amounts of gold. These veins have had no work done on them other than some sampling. Nevertheless some of them may respond to exploratory work. Their relation to the three main veins is not apparent.

Conclusions:

1. The Harrison group claims were staked in 1943 and 1944 on a new discovery.
2. They are north of Lindquist Lake and about 112 miles from Burns Lake on the Prince Rupert branch of the C.N.R.
3. There are three veins having an exposed length of 1050 feet of quartz.
4. The veins are in quartz diorite, 500 feet or less from the contact of the Coast Range Batholith, by an embayment along its eastern contact.
5. The veins dip towards the contact so that a change when the vein fractures break out of the quartz diorite should be expected.
6. Little work has been done on exposing the quartz so that average widths are not known. It is expected that the average width may exceed 5 feet.
7. Sampling of the vein indicates that the gold content is sufficiently high to be interesting and to warrant initial development work. No average values can be quoted.
8. The lineal and depth possibilities of the veins remain to be explored.
9. The behaviour of the veins at depth cannot be predicted.

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