

ASSESSMENT REPORT

FUR Claim Group
Dorsey Range, Yukon

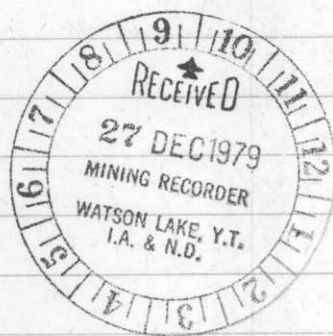


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This report has been examined by the Geological Evaluation Unit and is recommended to the Commissioner to be considered as representation work in the amount of

\$ 1200.00

Jamoin

Resident Geologist or
Resident Mining Engineer

Considered as representation work under
Section 53 (4) Yukon Quartz Mining Act.

B. R. BAXTER
Supervising Mining Recorder

Commissioner of Yukon Territory

INTRODUCTION

During the Spring of 1978, a partnership was formed between Leonard Peever and Eric Johnson of Whitehorse for the purposes of prospecting in specific areas of the Yukon. The primary target for exploration in 1978 was the area adjacent to Dorsey Lake. The area was familiar to both Peever and Johnson because of trapping and hunting activities on the lands encompassed by Registered Trapping Area #344. The trapping rights to the area were formerly held by Peever and sold to Johnson in 1977. The FUR claim group was staked during the tenure of the partnership and is presently held exclusively by these individuals.

The qualifications of the individuals involved in the development of mining claims are not considered extensively in the Quartz Mining Act. Although neither Peever nor Johnson are recognized Professional Engineers, the contents of this report are hereby verified as credible to the best abilities of the author (Johnson), given the state of development of the FUR claim group.

The FUR claim group is located northwest of Dorsey Lake, Yukon Territory. The claims are staked on two lines bearing north-south. The lines were flagged and cut out at the time of staking and have been maintained and improved to some degree during the course of subsequent work. One of the claim lines (1-6) follows approximately the crest of a north-south lineated ridge; the other claim line (7-12) follows along the east side of the unnamed creek which flows into Dorsey Lake near its outlet into the Smart River.

The unnamed creek which flows between the claim lines drains an area which extends to the north for approximately three miles. The sediments of the creek are dominantly coarse in the area covered by the claims. Much of the sediment can be attributed to glacial loading but in the segment of the stream covered by the claims the gradient is steep and local material is being contributed. The creek will hereafter be called Blueberry Creek because of the abundance of that fruit present near its confluence with Dorsey Lake.

At the time of staking (July 1978), the creek water was low and prospecting was facilitated. During June and July of 1979, heavy rains made prospecting of the creek impossible. Blueberry Creek contains cobbles of the metamorphic rocks of the area which contain easily visible sulfide minerals, particularly and

almost exclusively in the area covered by the FUR claim group. The occurrence of sulfides and common oxides was taken as an indication that mineralization might be present in adjacent metamorphic rocks of similar appearance exposed at higher elevations above the granitic rocks which form the bed of the creek in most places. For this reason, the claims were staked to cover the metamorphic rocks and the adjacent intrusive rocks. A direct relationship between the mineralized boulders in the creek and exposures of similar rock in situ within the boundaries of the FUR group has been sought after in prospecting; to date, no direct correlation has been demonstrated by field evidence, due mainly to the lack of exposure of bedrock on the slopes contributing sediment load to the creek. However, the hypothesis that mineralization occurs in the contact zones has been reinforced by subsequent findings of the field study and the abundance of exploration activity in the area.

At the present stage of development of the FUR claims, it has not been possible to confirm or deny the central thesis that the contact zone is mineralized by sulfides, oxides and tungstates. The reasons for this inability to evaluate the mineralization at the contact is because of the factors of poor exposure and lack of geochemical continuity between soils and bedrock. In addition, physical and budgetary restrictions of the developers have not allowed fully adequate sampling of outcrop and overburden-covered areas. Given the ability to extract representative samples for analysis, the economic potential of the property can be evaluated more adequately. The central purpose of this report is to provide background geological information concerning the assessment of the property. A review of the information will elucidate the reasons why the property is of interest despite the lack of conventional showings, and will indicate what steps are necessary to continue development to a point where the economic potential can be confirmed or denied.

This report represents the first step towards a more conclusive assessment, provides background information and should serve to reduce costly prospecting efforts in the future.

DESCRIPTION OF WORK PERFORMED DURING 1978-1979 CLAIM YEAR

Work assessable for the 1978-79 claim year was performed during July and August of 1978 and June and July of 1979. The major part of the work during the 1978 season consisted of basic prospecting and removal of samples. Approximately 50 lbs (20 kg) of rock were removed, examined and selected for analysis to determine the presence of tin (Sn) minerals at background level. Samples were examined and described in an attempt to unravel the complex fine-grained mineralogy of the metamorphic rocks. The results were not conclusive, although very low levels of tin and tungsten were found in whole rock analysis. The 1978 season included about 16 man-days spent on the property. The 1979 season was delayed until mid-June because of heavy snows remaining at higher elevations. The author arrived at Dorsey Lake on June 18th. Prospecting of the FUR group was commenced on the 19th and continued until June 29th. Approximately 100 lbs of rock were excavated and flown out by Beaver aircraft. During the remainder of the season, traverses and chip sampling were carried out as time was available from other prospecting activities.

Bears were a problem during the 1979 season and it was decided that a permanent structure was necessary to expedite continued activity in the area. Two of the author's tent camps were destroyed in June. A 12' x 14' cabin was constructed at Dorsey Lake, therefore, to provide secure sleeping and storage facilities. The author completed work at Dorsey Lake and flew out on September 2nd. Approximately 14 days of full-time work can be allotted to the FUR group during the 1979 season.

In total, for the 1978-79 claim year, there have been approximately 30 days of work spent on the FUR claims or in related work such as cutting trails, packing rocks, etc. This does not include cabin construction. Two days were spent in staking the claims and are therefore not applicable. Of the remaining 28 days, the distribution of labour has been as follows:

- 5 days cutting trail and line
- 4 days mapping and locating showings
- 2 days packing rock
- 14 days basic prospecting, pounding rock, taking samples
- 3 days miscellaneous work, camp chores, etc.

It has been necessary to spend about one week on office work for prepara-

tion of this report; however, this work has not been applied as it occurred after the expiration of the claim year.

In the future, i.e. for the 1979-80 claim year, additional work will be directed to obtaining better samples by drilling, blasting and excavating. Development will be facilitated by the presence of the cabin at Dorsey Lake. Assessment credit will be applied for the cabin, if that is acceptable.

GEOLOGIC MAPPING AND SAMPLING PROGRAMME

Location, Access, Vegetation and Climatic Characteristics

The FUR claim group is located in an area covered by N.T.S. sheet 105-B. The geologic map was prepared under the supervision of W. H. Poole, J. A. Roddick and L. H. Green and is designated as Map 10-1960. This map and accessory notes are the primary references utilized while gathering information for this report. The 1:50,000 scale map reference is Sheet 105-B-4, east half. The approximate latitude is $60^{\circ}10'$ north and the longitude is $131^{\circ}38'$ west.

Access to the claim group is normally obtained by flying in a float-equipped aircraft or a helicopter to the west end of Dorsey Lake and then utilizing a trail which leads north, subparallel to a small creek. This unnamed creek is central to the claim group and will hereafter be called Blueberry Creek. The trail starts behind a small cabin constructed by the author and leads north to the claim line for FUR 7-12. At the northern termination of the trail is a small lake at elevation 3850'. It is possible to land a helicopter near this small lake. Southwest of the lake, across the outfall of Blueberry Creek, a trail has been flagged west toward the adjacent ridge. Approximately along the crest of the ridge the claim line for FUR 1-6 is located. It is possible to land a helicopter at several locations along the claim line but it is not recommended. The FUR 1-6 claim line extends downslope to the final posts, where a poor trail leads east toward Blueberry Creek approximately 1500'. It requires about four hours to walk from Dorsey Lake via the claim lines and to return.

The vegetation in the area is normally dense. Mature pine and spruce

forest covers the lower slopes and grades into alpine fir and spruce thickets at higher elevations. Moist areas arising from run-off of meltwaters through the mantle of gravel under the thin moss-covered soil give rise to local areas of dense mountain alder, dogwood and willow. There is some correlation between vegetation and lithology. The most striking example of correlation is the presence of poplar trees and grey willow associated with exposures of metamorphic rocks along the ridge west of Blueberry Creek. The metamorphic rocks are highly siliceous and do not form clays when weathered, as do the surrounding granitic rocks. This factor is probably at least partially responsible for the different vegetation patterns.

The climate of the area is similar to other mountainous regions of the Yukon. The rainfall and snowfall are generally heavier and more frequent than in other areas of the Yukon. The winter snows are normally melted by mid-June and the first snows usually occur in September. In Spring and Fall, the region can be hazardous to aircraft due to poor visibility conditions; this, combined with the mountainous terrain, claim lives regularly. An additional hazard is lightning storms during summer; these storms are sudden and intense, sometimes causing problems for aircraft and humans depending upon them.

The phenomenon of alteration of geochemical characteristics of certain metals is known to occur with variations of climate such as increased rainfall or temperature. Whether or not geochemically anomalous responses are affected by the wet climate in the Dorsey Range is not demonstrable at present but should be kept in mind. In areas below timberline, it is often difficult to obtain a fresh sample of some rock types due to the influence of weathering. The weathering agents produced and carried by vegetation and meteoric waters no doubt have an influence upon the chemical composition of certain rock types as well as upon the external appearance of the rocks.

The degree of exposure of bedrock on the FUR claims ranges from about 50% along the ridge and along certain parts of Blueberry Creek to no exposure in areas where erosion is slow and vegetation growth rapid. On the whole, exposure is poor, averaging perhaps 80% covered. For the purpose of this report, only samples which have come from outcrops or are directly attributable to outcrops have been analyzed.

Unfortunately, the prime area of interest, the immediate contact zone

between the metamorphic rocks and the granitic intrusive, is covered in all locations. The lack of exposure of the contact is due primarily to factors of slope, elevation, glacial moraine and vegetation. Secondly, poor exposure is attributable to factors of lithology and structural relationships between the metamorphic and intrusive rocks. Zones of alteration and quartz veining which apparently radiate from the contact are recessive in character where they are exposed along the ridge.

General Regional Geology

The regional geologic history is similar to other mountainous regions in the Yukon and British Columbia. During upper Paleozoic time, sediments were accumulated in a dominantly marine environment. The thickness of Devonian-Mississippian sediments north of Dorsey Lake has been estimated at 25,000' by the Geologic Survey (Map 10-1960 notes). During the Mesozoic era the dominant event was the intrusion of batholiths of granitic rocks, characterized by intense orogenic events. During this period of geologic time, the contact metamorphism of sediments adjacent to the granitic rocks took place. Regional metamorphism of the Paleozoic sediments probably took place contemporaneously with the orogenic events.

The region has been subject to intense glaciation and associated erosion. The topography is dominated by glacial features. The alpine type of glaciation which has left its imprint upon the landscape so characteristically probably continued for some time following the last major event of continental glaciation. The impact of late stage alpine glaciation appears to be dominant in the mountains of the Dorsey Range. The valleys are filled with an unknown but substantial thickness of fluvial and alluvial gravel. On the FUR claims, glacially-derived sediments are preserved at elevations up to about 4,000'.

Lithology (Units from G.S.C. Map 10-1960)

The two rock units exposed on the FUR claims are Unit 16, Seagull and Hake Batholith, and Unit 8, Devonian and Mississippian sediments and metamorphic

equivalents. The area covered by the FUR claims contains exposures of Unit 8 rocks which were not delineated on the map prepared by the Geologic Survey; this omission was probably the result of the poor exposure of outcrop.

The granitic rocks of the Seagull-Hake Batholith complex which are exposed on the FUR claims are dominantly quartz-monzonite or adamellite in composition. At lower elevations along Blueberry Creek, the quartz-monzonite is medium-grained (up to 2 cm) idiomorphic granular in texture and leucocratic in colour. Biotite is the dominant mafic mineral. Exposed in the creek, the unit appears to have a characteristic flocky weathering pattern but is otherwise very homogenous and massive.

A related, yet distinct, phase of the granitic rock unit is exposed in several locations on the slope west of Blueberry Creek. This rock is probably between quartz-monzonite and granodiorite in composition but is fine-grained (less than 1 cm) and reddish-brown in colour; it seems to contain more abundant mafic minerals, including hornblende, than the coarser-grained monzonite. The biotite crystals often contain metamict zones which are visible to the eye with the aid of a hand lens. The contact between the fine-grained red granodiorite and the coarser leucocratic intrusive is gradational in some locations and sharp in others. The fine-grained reddish intrusive appears within a few hundred feet of the metamorphic rocks and appears to bear some ambiguous relationship. The fine-grained red intrusive fractures into cobbles up to two or three feet in any dimension. In some locations, the red granodiorite has zoned feldspar phenocrysts in its fine matrix. Veins or dykes of this fine-grained intrusive can be seen at several locations within the metamorphic unit. It may be correct to consider the unit as a chilled margin of the Batholith, but this relationship has not been clearly demonstrated in the field.

The metamorphic rocks as a unit are quite diverse because of factors of original composition, degree of metamorphism and subsequent alteration. As field units, the rocks seem to group into three categories - these are: quartzites, which are generally light in colour, dominantly fine-grained in texture and normally bedded or banded in outcrop appearance. These quartzites are very hard but usually appear in broken outcrops shattered by frost action. The second field classification is cherts. The cherts are very fine-grained siliceous rocks of variable colour. In some outcrops, the original sedimentary structures characteristic of cherts (ribbons and bands) have been preserved.

The outcrops are normally massive, hard, dark-brown in colour and variable over short stratigraphic distances. Dark-grey and dark-brown cherts are dominant. In some outcrops, where cherts presumably contained sufficient impurities to allow for accessory mineralization, secondary banding is apparent. The third and most general classification of the metamorphosed sedimentary rocks seen on the FUR claims is the hornfels. By definition, a hornfels is a fine-grained, non-schistose metamorphic rock resulting from contact metamorphism. Within the field classification, it is possible to differentiate the hornfels by grain size, colour, degree of banding, presence of specific minerals (such as biotite, tourmaline, amphibole), induration and density. Hornfels of various types and composition are hosts for contact metamorphic ore deposits throughout the world. The range of hornfels characteristics - from green calc-silicate-bearing to red-brown oxide-rich to massive and banded black and white - seen on the FUR claims must be related to original composition and subsequent metamorphism. Much of the time spent prospecting the FUR claims was used in attempting to delineate and determine the relationships within the hornfels and between the intrusive and the hornfels. Some hornfels contain bands which are weakly fluorescent and some which are mineralized with sulfides and oxides. However, it is difficult to find showings of economic minerals in place within the limited exposure of the hornfels. Results of the whole rock geochemistry show minute amounts of tin and tungsten several hundred stratigraphic and topographic feet from the contact. Mineralization was found in hornfels float on the slope and in Blueberry Creek below the contact. The zones of highest grade metamorphism near the contact are not assessable using standard prospecting techniques.

Although the hornfels are obscure in their field relationships and appearance, it is possible to make certain generalizations based on field observations. First, because banded hornfels is exposed adjacent to quartzites and cherts which exhibit few effects of metamorphism other than recrystallization and induration, the banding does not result from a general geologic situation prevalent during metamorphism as is the case with many of the textures of regionally metamorphosed sediments. Secondly, the original and present composition of the hornfels is variable between and within distinct lithologic units. Thirdly, the abundance of hydrous minerals such as micas and amphiboles indicates that hydrous fluids were active within the hornfels during metamorphism. This thesis is further supported by the abundance of quartz veins in some hornfels units.

The potential value of the FUR claim group rests with the resolution of the thesis that the hornfels units have equilibrated with ore-bearing fluids in the contact zone adjacent to the Seagull-Hake Batholith. If a condition exists where the hornfels assimilated tin and tungsten minerals at economic levels, then the merit of the hypothesis becomes obvious and the economic possibilities manifest.

Details of the lithology are summarized in the stratigraphic column presented as Figure 4. Consultation of the map, cross-sections and the stratigraphic column should provide the most complete information.

THE CONTACT ZONE

The major zone of interest from an economic standpoint is the zone of contact metamorphism within the Paleozoic metasediments and the Mesozoic intrusions. Most of the immediate contact zone is covered by vegetation and glacially-derived overburden. As shown on the map, the projected contact covers an area which essentially wraps around the ridge west of Blueberry Creek and extends westward onto another claim group (J.C.) At the north end of the claims, approximately 400' south of the initial post of FUR 1 and 2, metamorphic rocks are encountered suddenly, without the exposure of the fine-grained red intrusive between the lueco-quartz-monzonite of the main intrusive. The metamorphic rock is light coloured, fractured quartzite with dark oxide coloured bands. The quartzite is bedded and dipping moderately to the southwest. The beds are regular, between 1" and 3" in thickness. There appears to be little or no mineralization or deformation.

Another minor exposure proximal to the contact occurs approximately 1500' south on claim line 1-6 (ridge) and 500' east downslope. This rock is a greenish-brown banded hornfels with abundant biotite and amphibole. The outcrop clearly shows a southwest dip and relict bedding. Quartz veins and oxide brown facas along small fractures indicate mobilization of components within the rock unit. Some small grains of sulfide, pyrite and arsenopyrite are present. Walking a contour north, exposures of red granodiorite are seen to displace the contact up-slope. Further along, beds of chert displace the contact down-slope. The

relief on the contact suggests that there are lithologic variables controlling the contact's shape and contraindicating the presence of a fault along the entire contact.

Although there appears to be no good exposure of the contact as a sharp or well-defined feature, it is possible to obtain a general impression of its nature. This method of extrapolating or approximating is well-known to geologists. Upon such extrapolations, the cross-sections (Figures 2 & 3) were drawn. The contact appears to have topographic relief on its surface; this is indicated by veins or dykes of granite in the metamorphic rocks and outcrops of chert below the projected contact. There may be some minor faulting affecting the contact, as shown by displacements along contours. The general dip of the contact seems to be southwest at 15° or 20° . The approximate average dip of the metasedimentary rocks is between 30° and 45° S.W.

The author may also draw on indirect evidence obtained by observation of similar situations in the Cassiar and other mountains. Igneous-metasedimentary contacts frequently exhibit irregularity due to slumping of blocks with associated igneous infilling of the zones of fracture. In the Dorsey Range, the shape of igneous-metasedimentary contacts can be seen on mountainsides where the rocks are partially eroded away from the contact. The most notable of these occurrences can be seen in the mountains immediately south of Dorsey Lake; there, the contact exhibits a gentle dip with minor relief and minor faulting. Dykes or veins of granitic intrusive origin intrude the host metasediments in some areas, while in others the contact is well-defined.

Regarding the potential for mineralization along a contact such as has been discussed, there are also several variables to consider; these include structure, lithology and hydrothermal activity. If we make the assumption that ore-bearing fluids could travel along the contact zone at the time of intrusion and metamorphism, we are left with the need to know where these fluids are precipitating their wealth. For this information, we can call on geochemistry, geophysics or other exploration tools. Because of the cost of these tools, however, we must in most cases use our minds to determine what rocks are the possible hosts for the tin and tungsten mineralization which is being sought. It would be of great assistance to be able to know what other geologists have found.

Because of the drilling activity proximal to and on strike with the FUR claim group, some direct evidence may be gained in the future at limited expense. Until such time as more information becomes available, I present the assumption that calc-silicate hornfels is the preferred host rock for mineralization. More information will require time, money and work. Small amounts of tin and tungsten value in whole rock geochemistry speak for the thesis. Additional sampling and assay using drilling or trenching would seem to be the way to prospect the property at depth.

OVERBURDEN

Fluvial, alluvial and glacial deposits cover most of the metamorphic rocks and virtually all of the contact with the intrusive. These deposits appear on the maps and cross-sections in an exaggerated scale to allow for illustration. Excavation with a bulldozer could probably expose bedrock in areas of interest. The metamorphic rocks do not tend to weather into large blocks like the granite, thus greatly facilitating excavation.

The alpine type glaciation which occurred in the valley of Blueberry Creek left a distinct moraine at an elevation of about 3850'. Below that elevation, the glacial deposits are modified by fluvial or glacio-fluvial action. The small lake along Blueberry Creek occupies a flat area or depression behind the remnant moraine. The moraine deposits contour the valley at and below 3800' elevation. Unfortunately, the igneous-metamorphic contact normally occurs below that elevation.

MINERALIZATION

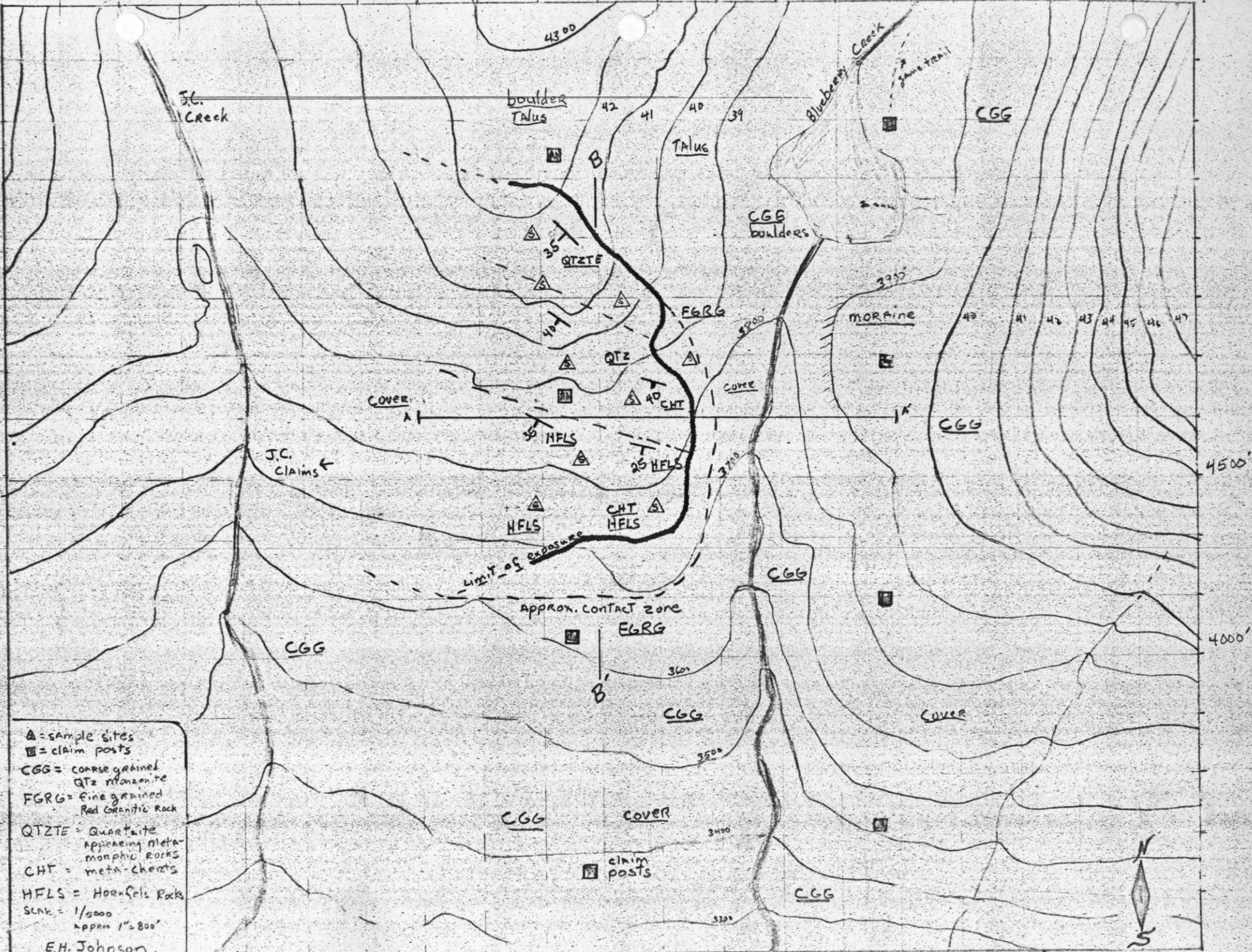
Discussion of mineralization of this type presents some difficulties. It is anticipated that low-grade non-sulfide mineralization is difficult to detect. On the FUR claim group, the associated minerals such as tourmaline, topaz, oxides and minor sulfides are present. The rocks which contain mineralization at p.p.m. level are best described as rusty-brown hornfels. Outcrops of this

rusty-brown hornfels occur along the ridge and in low relief areas extending downslope from the ^ecrust. Visible mineralization occurs in similar rocks which are found in float or in the creek.

The mineralization cannot be adequately evaluated at present. Hopefully, more information will be available in the future.

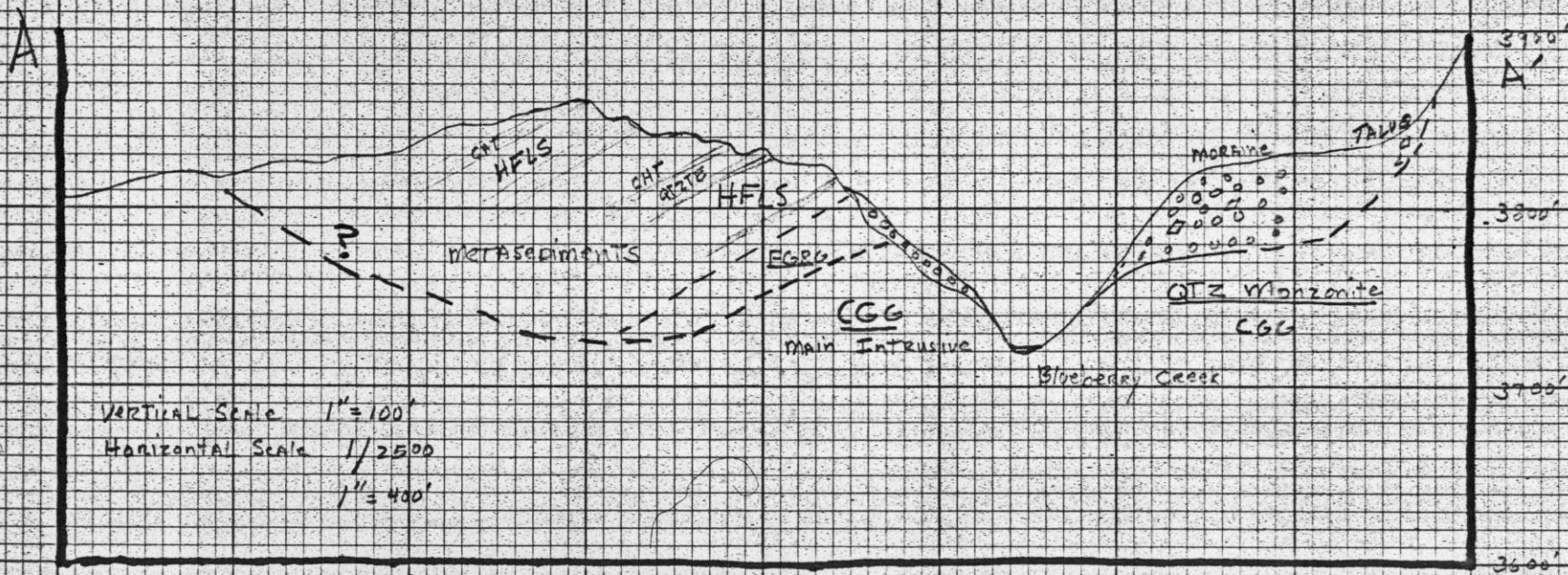
FUTURE WORK

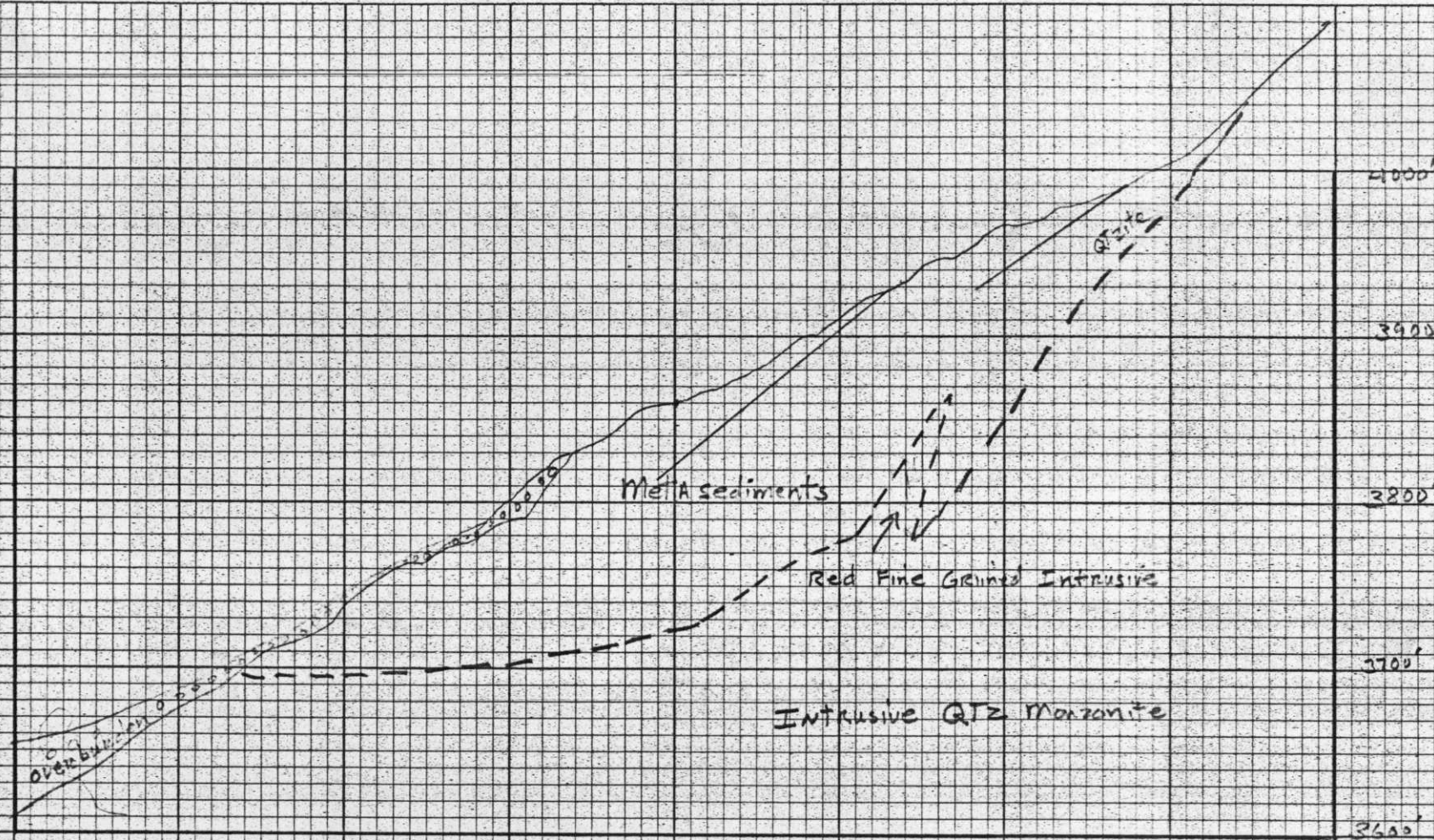
The key to evaluating the mineralization will be to obtain a better sampling of the rocks. This may be achieved by drilling or trenching. The next step will probably be to excavate selected outcrops using explosives. More whole rock geochemistry can then be carried out to gather information. Obtaining fresh rocks should expedite the study of these rocks in microscope sections to determine mineralogy. Both cassiterite and wolframite are easily identified in thin section. Future work commitments will largely be determined by the budget available.



▲ = sample sites
 ■ = claim posts
 CGG = coarse grained Qtz rhyolite
 FGRG = Fine grained Red Granitic Rock
 QTZE = Quartzite appearing metamorphic rocks
 CHT = meta-cherts
 HFLS = Hornfels Rocks
 Scale = 1/5000
 approx 1" = 800'
 E.H. Johnson

B'





Horizontal Scale = 1/2500

Rossbacher Laboratory

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W. H. ...

CERTIFICATE OF ANALYSIS

CERTIFICATE NO. 9367
 INVOICE NO. 0009
 DATE ANALYSED Nov. 4/79
 PROJECT 901 410-34

TO: NORANDA EXPLORATION COMPANY LIMITED
 (NO PERSONAL LIABILITY)

J.T.

No.	Sample	pH	Mo	α	Σ	W					No.
01	85-9 35		1		0	0					01
02	36		3		0	10					02
03	37		2		0	5					03
04	38		1		0	0					04
05	39		1		0	0					05
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07	41		2		0	5					07
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10	44		1		0	0					10
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