GEOLOGICAL, GEOCHEMICAL & GEOPHYSICAL REPORT JULY CLAIMS #1 TO 32

92P/15W

F.R. GATCHALIAN 26 JULY - 10 DEC.,1972

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GEOLOGICAL, GEOCHEMICAL & GEOPHYSICAL REPORT JULY CLAIMS #1 TO 32

LOCATED 5 MILES NORTHWEST OF EAGLE CREEK ON CANIM LAKE IN THE CLINTON MINING DIVISION 51° 120° NW

F.R. GATCHALIAN

26TH JULY TO 10TH DECEMBER, 1972

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APPENDICES

LOCATION AND ACCESS

The July Claims lie between Susan Lake, to the north, and Roger Lake, to the south, on the east half of Bonaparte Lake map sheet (N.T.S. 92-P). The approximate centre of the claims is 52° 54' 30" N latitude, and 120° 54' 30" E longitude.

The main showings on the property are 23 miles from 100 Mile House and are readily accessible via a year round paved road running easterly to Eagle Creek and from Eagle Creek four miles on a good private gravel road to the east end of Roger Lake. From that point, for a distance of three miles, an old logging road, requiring a four-wheel drive vehicle, along the northern shore of Roger Lake leads to the western end of Roger Lake, which is also the south central portion of the claim group. Several well flagged cut lines lead to the copper showings.

TOPOGRAPHY

The property is located in the eastern portion of the Fraser plateau, one of several plateaux and highland regions in the Interior Plateau of British Columbia (Holland 1964). The southern portion of the property, which is situated along the shore line of Roger Lake, is topographically the lowest part of the claim group. It is about 2,680 feet above sea level, rising abruptly over a distance of 2,000 feet to an elevation of 3,300 feet above sea level in the central portion of the claim group, and flattens or gently rolls northward beyond the property.

The only year-round drainage is Eagle Creek, which is situated immediately south of the property. There are several small lakes, including Roger Lake, along this creek. Apparently, they are the widened portions of Eagle Creek. There are also a number of tributaries flowing into Eagle Creek, but these are occasionally dry during the summer season. Eagle Creek flows southward and drains into Canim Lake.

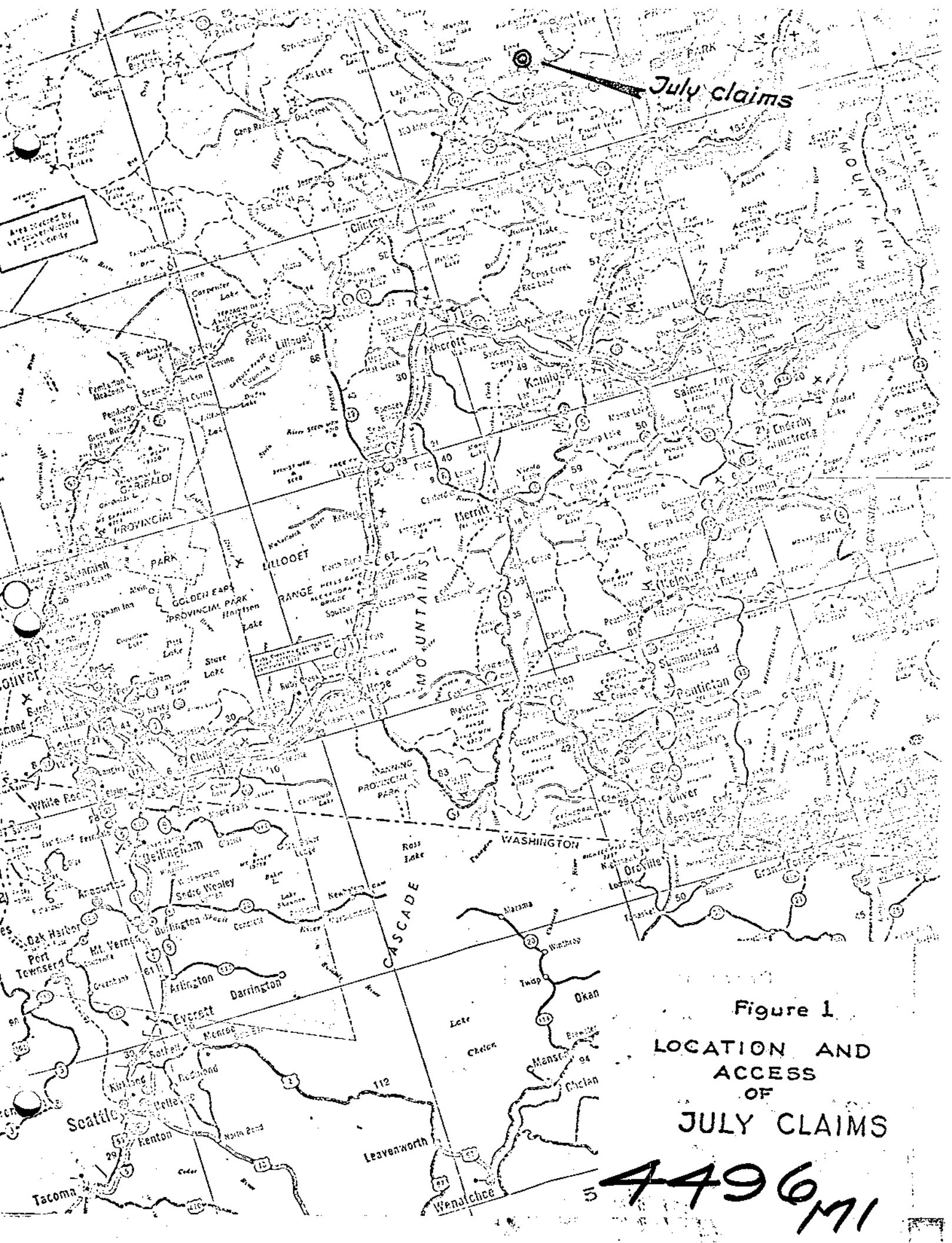

Figure 1

LOCATION AND ACCESS OF JULY CLAIMS

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CLIMATE

Because of the elevation of the property, the effective working season is, at best, from mid-May through early October. At the Boss Mountain Mine, located some 14 miles to the north, an average annual snowfall of about 35 feet is reported between October and April, and at that time, the temperatures are extremely low.

PROPERTY AND HISTORY

The property, July 1 to 34, was staked by the author on 10th July, 1972, and was recorded in the Clinton Mining Divison on 25th July, 1972. Record numbers are 28830 to 28863, inclusive.

Previous workers on the property, as far as the author is aware, were Royal Canadian Ventures and Texas Gulf Sulfur. Previous ownership of the ground is evident from the claim posts of Texas Gulf(24 Nod Group) dated 25th June, 1971, and the RL Group, staked 3rd July, 1969 by Royal Canadian Ventures. There is no record or evidence of ground work having been done by either of the companies. On the northeastern section of the July claims, a number of claims (the Beer Group) were located by Aragon Exploration Ltd. in 1970. Although no assessment work has been recorded, there is evidence of a geochemical survey and bulldozer trenching at various places on the property.

WORK DONE TO DATE

After the staking of the July Claims was completed, an initial survey consisting of geological mapping, soil sampling (soil geochemistry) and a ground magnetic survey, was carried out.

The control grid of these surveys is shown in Figure 2. The control lines were established by pace and compass with stations located every 200 feet. A total of 14.5 miles of control lines were put in. All geochemistry, magnetometer work and geologic mapping was oriented to this grid.

To date, a total of 33 working days were spent on the July Claims and are summarized as follows:

DATE	DAYS	WORK PERFORMED
July 26, 1972 to August 8, 1972	14	Grid preparation, geologic mapping and soil sampling.
August 19 to 29, 1972	11	Additional grid made, soil and magnetometer survey.
December 1 to 3, 6 to 10, 1972	8	Report writing, finalization of maps.

REGIONAL - Figure 3

The property lies within the "Quesnel Trough", a eugeosynclinal belt within the Alaska-Canada segment of the North American Cordillera. The southern part of the trough is flanked on the east and west by variably metamorphosed Paleozoic strata of the Cariboo and Cache Creek groups, respectively. The trough itself is characterized by early Mesozoic, slightly metamorphosed, eugeosynclinal rocks of the Takla or Nicola groups, composed mainly of basalt and andesite flows, pyroclastic rocks, and, less frequently, by limestones. During mid-Mesozoic, two episodes of intrusion (100 m.y. and 200 m.y.) occurred and were emplaced at high crustal levels. During, or probably after, mid-Mesozoic faulting occurred, and the deformed or disturbed eugeosynclinal rocks were partly buried by mid-Mesozoic conglomerate, volcanic-clastic rocks, and, later, by Tertiary volcanics, plateau and valley basaltic lavas.

LOCAL GEOLOGY - GENERAL STATEMENT

Figure 4 depicts the local geology of July 1-34 claim group. Mapping was done by the author. Outcrops were located by pace and compass with respect to the pace-and-compass-made picket lines established by a senior student assistant while soil sampling.

In general, outcrops are moderate ($\pm$ 20%) and best exposures are found in the central portion of the claim group, with shallow, 3 to 10 foot thick, glacial debris occurring in the non-outcrop areas. In much of the covered areas the float is of uniform composition and is presumed to be rubble accumulating from surface weathering of underlying bedrock, therefore, the

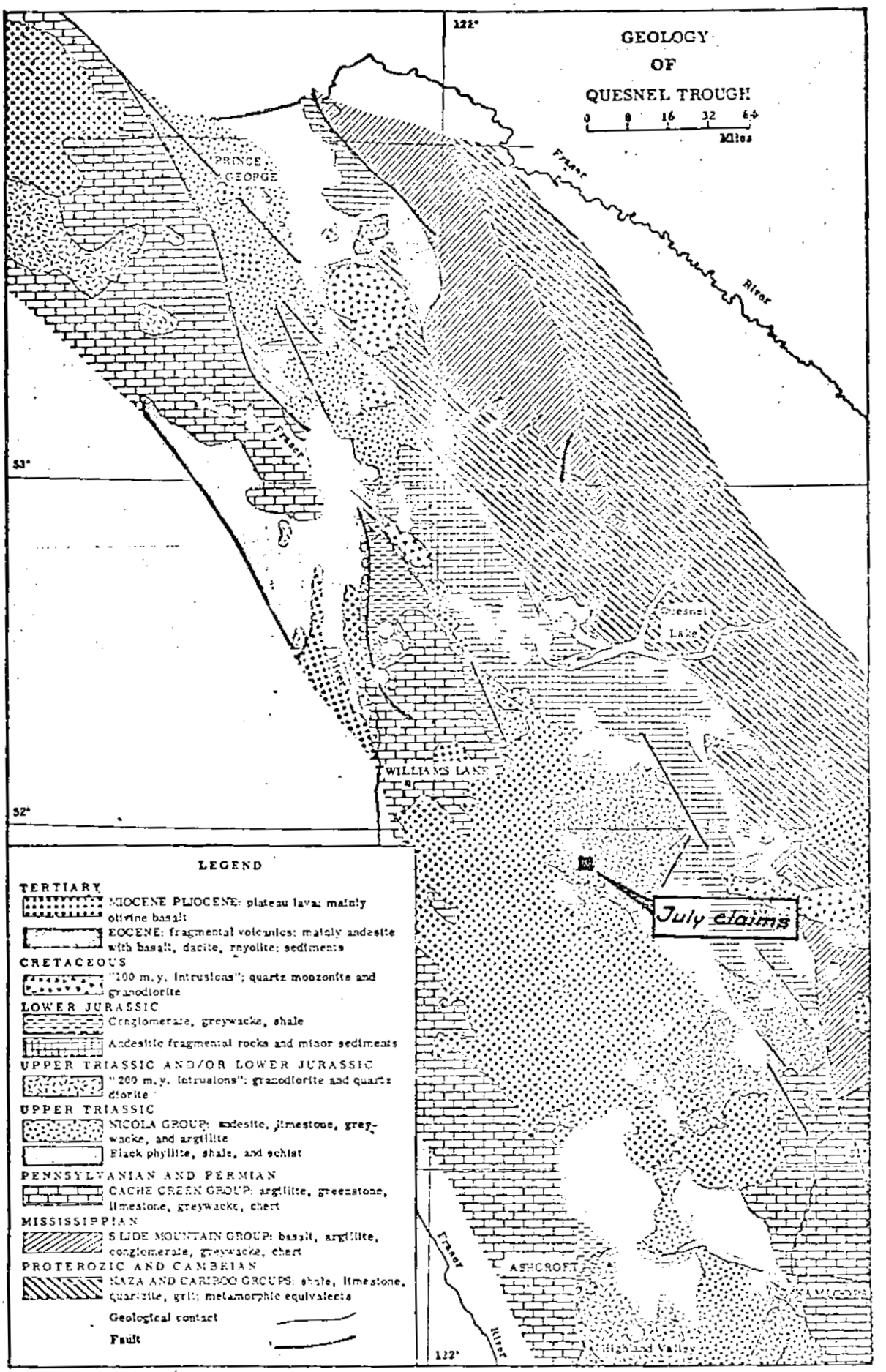

Figure 3

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M3

float can be used in mapping where direct evidence is lacking. In additon, a magnetic map also contributes a good deal of information as to the extent and contacts of rock units.

Present geologic mapping on the property has indicated six recognizable intrusive phases believed to belong to the 200 m.y. old Takomkane batholith, but, because of limited outcrop, the size and spacial relationships of these intrusives can only be inferred. They may also represent plugs, erroded cupolas of a larger pluton or possibly dykes. The intrusive phases range in composition from ultrabasic to acidic. They can be divided by their distinctive texture, mineral composition and field distributions. Although their relationship is not clearly understood, they apparently exhibit a zonal distribution which may be important for the localization of a mineral deposit.

The distribution and description of these intrusive phases are as follows:

QUARTZ MONZONITE PHASE

The actual extent of the quartz monzonite in the map-area is unknown, as it was only observed at two localities, one in the southeast corner of July 21 claim, and another along the logging road north of Judy Lake.

The quartz monzonite is megascopically, slightly porphyritic, fine grained, leucocratic and pinkish. Phenocrysts (10 to 20%) consist of subhedral plagioclase feldspar (1-3mm) and quartz in a fine grained matrix. Black streaks of manganese mineral or hydrocarbon (?) healing tiny fractures are common. Alteration is white flakey sericite or muscovite pseudomorphs of plagioclase. Because of the limited exposure, there is no mappable structure that can be observed from the rocks.

Thin section and stain study, shown in Appendix I, for specimens #9 and #61, indicates the quartz monzonites in the map-area are microscopically porphyritic and consist of quartz and plagioclase feldspar ($An < 20$) phenocrysts in a matrix of quartz, plagioclase feldspar and hornblende. Opaques are fine grained hematite. The quartz monzonite contains no sulfide mineraliz-

ation, but is slightly altered with white mica, pseudomorphs of the plagioclase.

The field relations of quartz monzonite to the nearby rock exposures are not precisely known. To the east and north, the quartz monzonite zone is flanked by diorite and gabbro, presumably with sharp contact relations; to the south, it is bordered by magnetite-rich, slightly porphyritic diorite, but separated by a narrow siliceous chilled contact zone, (mapped as rhyolite); and to the west, it is in contact with foliated volcanic rocks with sharp discordance. Field observation indicates that the quartz monzonite is barren of sulfide, although sericite and reddish-brown hematite are present.

DIORITE OR DIORITE PORPHYRY PHASE

The outline of diorite/diorite porphyry was also approximated, although it has the most extensive exposure among the intrusive phases. This intrusive is best exposed in the central part of the property, and extends northward. In the western and southern portion of the property, (July #17 and July #5 claims) the intrusive is partially exposed under a thin veneer of metavolcanic rocks, but deeply buried to the southwest and southeast. Farther south, it is unexposed.

Megascopically, this phase is non-porphyritic to porphyritic, varying from dark green to black, depending on the impurities present in the rock. The porphyritic variety is concentrated in the north. It is characterized by subhedral crystals of white feldspar, pyroxene and/or hornblende phenocrysts, set on a dark mafic rich (60%) coarse grained matrix. This variety is highly magnetic, with visible magnetite grains disseminated thoughout the matrix. Prophyllitic alteration (chlorite, epidote and carbonate) after the mafics is recognizable. Specks of pyrite are present in most of the outcrops with occasional grains of chalcopyrite.

The non-porphyritic variety of the diorite is common to the south. It is typically medium grained and dark green. White feldspar, together with hornblende and other mafics, constitute the megascopic identity of this rock.

Magnetite is also finely disseminated throughout the matrix, but in lesser amounts compared to the porphyritic variety. The megascopic alteration is of moderate intensity, consisting of chlorite after the mafics, and white sericite after feldspar, probably of deuteric origin. Sulfides, including specks of chalcopyrite, are present locally. Pink feldspar veinlets in varying degrees of intensity are also present healing tiny fractures. The veinlets trend in all directions.

Thin section study of the diorite phases is shown in the appendix. Specimen #4 and specimen #15 for the porphyritic and non-porphyritic varieties, respectively, are as follows:

MINERAL COMPOSITION PORPHYRITIC VARIETY		MINERAL COMPOSITION NON PORPHYRITIC	
Phenocrysts	40%	Aklaki Feldspar	30%
Hornblende		Hornblende	30%
Tremolite		Sericite	15%
Pyroxene		Saussurite	15%
Matrix	60%	Pyroxene	7%
Plagioclase		Magnetite	2%
Amphibole		Apatite	1%
Epidote			
Quartz			

Microscopic alteration of the non-porphyritic variety is only moderate. Pyroxene alters to hornblende then to chlorite. The original plagioclase (An 40) is altered to alkali feldspar, sericite and saussurite. The (microscopic) alteration of the porphyritic diorite is also moderate. Pyroxene alters to hornblende then to chlorite. Plagioclase feldspar is altered to white mica (sericite). These alterations are minor and believed deuteric in origin.

ULTRAMAFIC AND MAFIC ROCKS

Ultramafic and mafic rocks underly the northern portion of the property and are particularily abundant as outcrops in the northeastern part where they form pronounced hills. They range from gabbros and their brecciated equivalents, to pyroxenites. A few isolated outcrops of basic diorite are inclu-

ded within the zone of the ultramafic map-area.

The gabbro is generally dark green to black, medium to coarse grained, and massive. The rock is typically feldspathic, laced with white feldspar, thus resembling a brecciated rock. Large crystals of pyroxenes, mainly augite, are the prominent minerals with minor amounts of flakey black biotite crystals. Chloritization of the mafic minerals, believed deuteric, produces the dark green coloration of the rock. Secondary epidote and carbonate veinlets, also believed to be deuteric, are the universal alteration of gabbro. Gabbro in the map-area is seldom mineralized, except to the northeast where they are feldspathized, brecciated and slightly mineralized with chalcopyrite. The mineralization is only minor.

The pyroxenite has a more abundant mafic content than the gabbro, mainly pyroxene and hornblende which are generally altered to chlorite. Metamorphic recrystallization is sometimes seen outcrops with biotite and hornblende on a planar surface which in some outcrops exhibits an obscurely foliated texture. At one locality, on a logging road east of July #27, pyroxenite occurs as a dyke. It apparently has intruded a fine grained andesite and has generated foliated recrystallization up to a few feet away from the dyke margin. The dyke resembles, minerallogically, the pyroxenite to the north of the map-area, except that it is porphyritic and coarse grained. Amphibole and pyroxene are the predominant phenocrysts in a dark green chloritized, epidotized groundmass. The dyke, as well as the adjacent andesite, contains veinlets of quartz and carbonates, occassionaly rusty and pyritized. The petrographic study for the ultramafic dyke is shown in the appendix (specimen #28). The alteration, according to the study, is pyroxene altering to hornblende; and secondary epidote, carbonate and tremolite veins after plagioclase feldspar, which is believed to be a late stage of alteration, and possibly, hydrothermal alteration.

The brecciated gabbro, as I mentioned earlier, is seen in the northeast corner of July #34, outside the property. The unit is characterized by mafic-rich, highly magnetic gabbro fragments, welded by white carbonate, and creamy feldspar. The breccia is surprisingly saturated with quartz veins and is mineralized with sparse chalcopyrite.

GRANODIORITE/PORPHYRITIC EQUIVALENT PHASE

The type locality of this unit is situated in the central portion of the map-area where it forms an isolated outcrop, possibly a plug, injected (?) into a brecciated zone (contact breccia) and andesite, and forms like a cupola of an intrusive stock. An example of such an occurrence is at the northeastern corner of July #23 and at the southeast corner of July #25. Both occurrences are lithologically similar. The possibility of a dyke forming the outcrops has not yet been eliminated.

The granodiorite in hand specimen is medium grained, grey, and sometimes porphyritic. Phenocrysts of slightly altered plagioclase and elongated hornblende are surrounded by a fine grained equigranular groundmass of alkali feldspar and quartz. Compared to the basic units described previously, the granodiorite is weakly magnetic and generally sulfide free. Megascopically, alteration of hornblende to chlorite, epidote and carbonate, and plagioclase feldspar to sericite were identified.

A Petrographic description is given (Specimen #24) in the appendix.

DYKES

Dykes on July claims are the youngest intrusive units as they invade open fractures in the larger sized intrusive bodies. Four varieties are recognized and they are as follows:

Syenite - One exposure of this dyke is at the southwest corner of July #25, where it is found injected in the granodiorite porphyry. The dyke is very narrow, three to five feet wide, clearly striking to the northeast with an almost vertical dip. Lithologically, it is a buff color, medium grained and feldspathic. It contains minor amounts of hornblende and magnetite. Although alteration is negligible, it carries disseminated chalcopyrite mineralization. Another dyke of the same composition occurs on a bluff on the northern section of July claims #1 and #24. Here, a number of dykes (granitic and syenitic) exposed along the east-west slide (fault?) area, are injected into the brecciated rock. The dyke orientations are random, though they are generally steep dipping. They vary widely in size and sometimes

form part of the brecciated rock, as its matrix and/or fragments. Copper mineralization, along the slide area is evident and consists of pods, fine disseminations and veinlets in the dykes or in the syenite breccia fragments. Copper mineralization consists of chalcopyrite and bornite.

A petrographic description of the dyke and breccia is shown in the appendix, Sample #2, #23 and #27.

Latite: Exposures of this are found on July Claims #5 to #7 and #27. Latite dykes are generally narrow, three to five feet wide, striking north-northwest and commonly with steep or vertical dip. The dykes cut the basaltic andesite and dioritic intrusive rocks. Latite differs from syenite in that it is gray colored, finer grained and porphyritic. Phenocrysts are a randomly oriented, slender grained amphibole in a fine grained grey matrix, consisting of amphibole, plagioclase feldspar, and, less commonly, epidote and quartz grains. The dykes are relatively fresh and barren.

A Petrographic description of Sample #54 is given in the appendix.

Pyroxenite Dyke: This dyke was laready mentioned earlier and the dyke was mapped only by a logging road, 3,000 feet east of July #27. The dyke exposed here is only five feet wide cutting the volcanic country rocks. The dyke has an east-west strike, and has a vertical dip.

In hand specimen, it is dark green, consisting of interlocking mafic crystals of amphibole and pyroxene in a lighter green matrix, forming a felted to massive structure. Alteration, as stated previously, consists of chlorite and epidote, after the mafics. Microscopically, hydrothermal alteration consists of veinlets of plagioclase, feldspar and tremolite, and possibly the alteration of the pyroxene to hornblende and hornblende to epidote and chlorite. Veinlets of carbonate associated with plagioclase feldspar, and tremolite occur in late veins, as a late stage of alteration.

The pyroxenite dyke is slightly mineralized with pyrite and occassional grains of chalcopyrite.

A Petrographic description is represented by Specimen #28 in the Appendix.

Rhyolite: It is uncertain whether this unit is a dyke or part of the volcanic Nicola sequence. Outcrops of this unit were encountered only in the northeast section of the property on July #31 and #32. It is a dense, very fine grained, creamy colored rock, with brownish limonite stain and some steel grey colored material, probably a manganese mineral. Alteration, from microscopic examination, consists of white mica, believed to be pseudomorphs of feldspar. Epidotization and sericitization of the plagioclase is minor. This unit is completely barren of sulfide.

A Petrographic description is represented by Specimen #32 in the Appendix.

Breccia (Contact Breccia): Brecciated zones occur at several localities on the July claims. These zones, particularily those situated in the central portion of the property, are important hosts for copper mineralization. The breccia, which appears to be related to the forceful intrusion of granitic rocks, is best developed at or close to the intrusive-volcanic contact. Obviously, the breccia is related to the forceful implacement of the granitic rocks in a weak zone in the volcanic country rock.

The breccia is essentially composed of well packed fragments of two rock types. One type is the dark fragments of recrystallized porphyritic mafic-rich volcanic (now hornblendite) with phenocryst of pyroxene (augite?) and hornblende in a fine grained, highly magnetic and mafic-rich groundmass. The other type of fragment, which sometimes occurs as matrix, is the leucocratic-feldspathic-syenite or granite. This type of fragment contains minor amounts of sulfide disseminations, such as pyrite, bornite and chalcopyrite.

The alteration in the brecciated rocks consists of dark green, chloritization of the pyroxene and hornblende in the volcanics or dark fragments, and the development of white mica (sericite) after the plagioclase feldspar in the leucocratic granitic fragments. Quartz veins and pinkish K-feldspar are minor in the leucocratic fragments.

A Petrographci description of this unit is described in the appendix, Specimen #2 and #27.

Volcanic (country rock): The volcanics of the Triassic Nicola Group are the country rocks in the map-area. They occur as a roof pendant in the granitic intrusions. The volcanics, at and near the intrusive, have undergone a certain degree of metamorphism. On the property, there are two fairly distinct varieties of the volcanic which can be identified and mapped based on color, texture, mineralogy, structure and distribution. The most common and extensive variety consists of dark, basic to intermediate volcanics, mapped as andesites and basaltic andesites. Like the other basic units, the basaltic andesites are characterized by prominent mafics and occasionally display porphyritic texture. They are much finer textured than previously described basic intrusive units, but sometimes they display an intrusive texture approaching a hybrid diorite. As an example, the outcrops to the northwest (July 17 and July 18) which, though slightly foliated, are texturally coarse grained and could be classified as diorite.

The andesites mapped are located in the northeast portion of the map-area. They differ from the above in that they are unfoliated, finer grained and non porphyritic. They are also mafic-rich, but more extensively chloritized and epidotized. Many exposures are now skarn, typified by the presence of magnetite, epidote, calcite veins and amphiboles, and less commonly garnet with associated copper mineralization. Thin section study of the andesites is represented by Specimens #A-4, 30 and 31 in the Appendix.

Another volcanic country rock is the foliated or schistose variety, mapped as foliated metavolcanic. This unit is characterized by strong foliation of the mafic minerals. Mafics include amphiboles and chlorite. Carbonate veins occur as lineations along the surface of foliations. Also, there are porphyroblasts of chlorite and hornblende which also occur along the surface of the foliations. The degree of foliation varies from one place to another, but the most pervasive and prominent foliation is found near the intrusive, particularily on the western margin of the main intrusive mass. In this area, although local, the volcanic is completely metasomatized and converted to amphibole schist.

The only apparent structures in the amphibolite schist of the volcanic variety are the well developed foliation at the western margin of the main

intrusive. Surprisingly, the foliations have a general trend of either north or northeast and have a steep dip. If the enclosing intrusive rock is parallel to the foliation, it may suggest that the intrusive stresses caused the northeasterly alignment, which is transverse to the northwesterly trending grains of the batholith. This feature may be of some importance.

The amphibolite schist is only locally mineralized with pyrite, but copper mineralization may be present as float containing chalcopyrite was encountered.

The Petrographic study is represented by Specimen #3 shown in the appendix.

MINERALIZATION

To date, information on the July Claims has indicated the presence of sulfide mineralization, such as pyrite, chalcopyrite and bornite. These are only minor showings, and of insignificant grade, but they may be important because of their widespread occurrences. The mineralization occurs in all rock types, except some of the dykes. They form as clots (up to 1-2cm), and as disseminated and impregnated grains commonly in the syenitic intrusive units. Similar occurrences, in other units, are present in trace amounts.

The abundance of pyrite, in general, is meagre. The author seldom found more than 1 per cent in any mineralized exposures, and it is considered an excellent feature for an induced polarization survey.

Magnetite is present universally, (except the leucocratic syenite or granite), as pods, veinlets and disseminations in various degrees of concentration.

GEOCHEMISTRY

GENERAL STATEMENT

A total of 341 soil samples were gathered on the July 1-34 Claims, as shown on a semi-gridded geochemical map, Figure 3. The soil samples were gathered at sample sites dug by a pick, 6 inches to 12 inches deep, depending on

the depth to reach the "B" horizon. This horizon can easily be recognized in the area, as it is a rusty, brown, clay rich soil and is not more than one foot below a veneer of partially decomposed organic debris, twigs and leaves. All sample sites have been placed on the downhill side at the base of a large tree nearest to the sampling point to assure maximum protection of the sample from physical disturbances. The samples, weighing about 4 to 5 grams, were then collected, freed from rock fragments, twigs and foreign materials, placed in a Kraft soil sample bag and legibly marked with the corresponding locations. Neither silt nor water samples were collected because of the poorly drained nature of the property. Only two rock chips were taken for geochemical analyses.

The soil samples were sent to Chemex Labs Ltd. in North Vancouver and geochemically analysed using the Atomic Absorption Method. All samples (341) were analysed for total copper value in parts per million (ppm) and also, 170 samples (corresponding to 400 foot intervals along lines) were analysed for molybdenum. The analytical results for copper and molybdenum are shown in Figure 5.

Copper values in soil were processed statistically. The 341 values were plotted on a cummulative probability plot (Figure 6) and anomalous ranges were established from inspection of the resultant graph. It would appear that three populations are separated at about 90 ppm and 50 ppm. On the basis of this interpretation, it is concluded that about 12 per cent of the values are anomalous (i.e. 43 values). These are tabulated below.

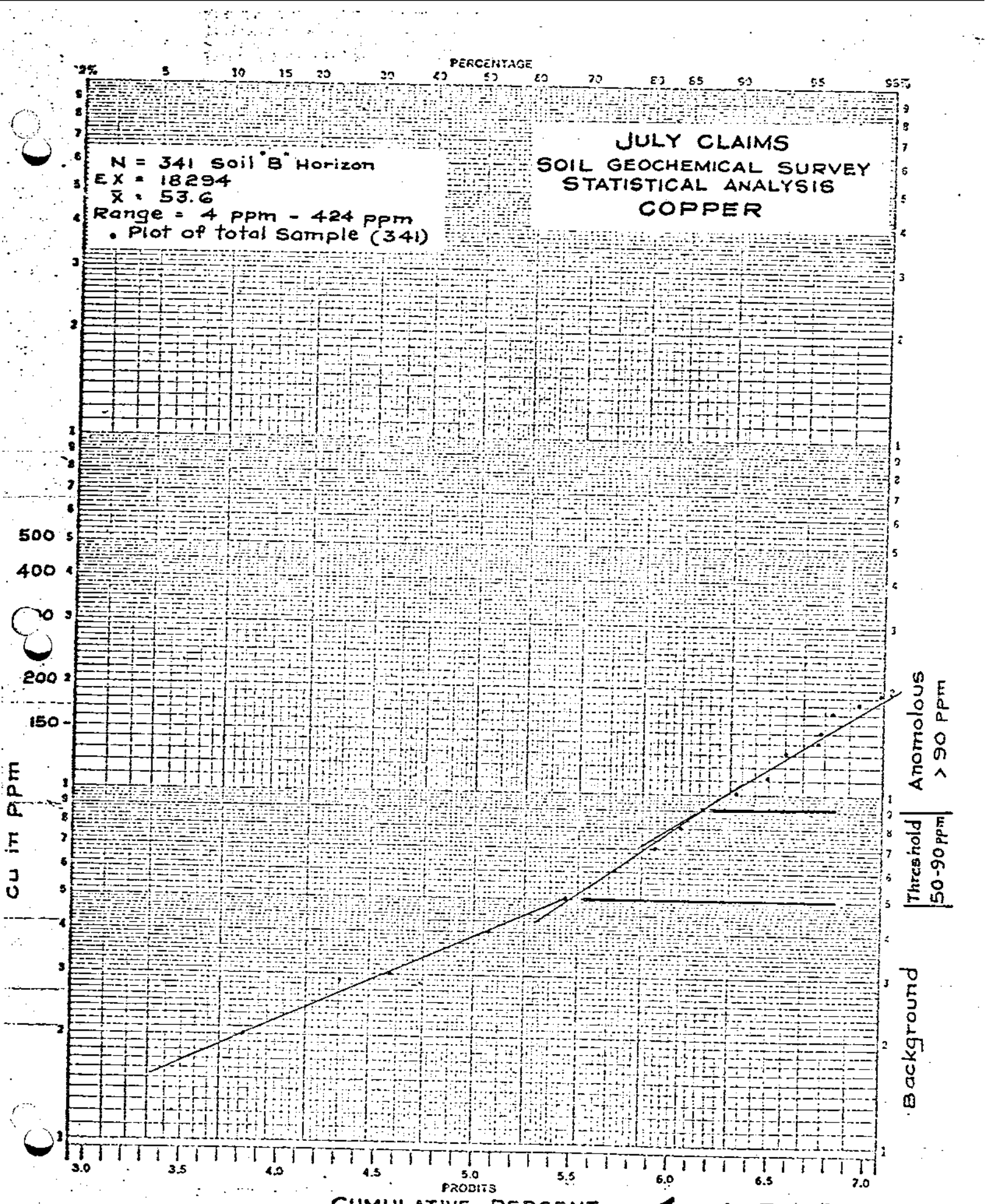

Figure 6

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Copper In Soil

Background ---------- 0-50 ppm

Threshold ---------- 51-90 ppm

Anomalous ---------- 91 ppm

Molybdenum in soil, generally less than 1 ppm, did not give any correlation with copper values.

DESCRIPTION OF ANOMALY (SEE FIGURE 5)

A copper anomaly in soil on the July Claims (which locally exceeds 4 times the threshold value of 90 ppm) demonstrates low to moderate contrast. Six anomalies have been outlined and are all located in the central portion of the property. Although some of these anomalies exhibit a sharp contrast, the majority are diffuse and irregularily shaped. Descriptions of these anomalies are as follows:

ANOMALY #1 is the largest and consists of an irregularily shaped area of about 1,000 feet by 1,000 feet. It is located along the contact of mesocratic hornblende diorite and pyrosene-hornblende andesite. Possibly, some of the sub-outcrop exposures containing small amounts of sulfide including chalcopyrite may bear a spatial relationship to the anomalous copper condition in the soil.

ANOMALY #2 is situated immediately north of Anomaly #1, and is separated from it by about 200 feet of very low copper values. The strength of the anomaly is classified as moderately strong with a peak value of 424 ppm. The anomaly is about 1,000 feet long and 400 feet wide and has an east-west trend. Although there is no rock exposure within the anomaly, the

interpretation of the geology has indicated that a contact of the andesite and diorite crosses in the central part of the anomaly. The cause of this anomaly is not yet certain, but it could be a dispersion of Anomaly #1.

ANOMALY #3 is an irregular, but elongate, shaped anomaly located some 500 feet from Anomaly #2. The anomaly possesses a very sharp contrast to the surrounding very low background values. It is about 1,600 feet long and about 400 feet wide and has an east-west-northeast trend. The anomaly lies in outcrops of andesite and diorite, partially mineralized with pyrite.

ANOMALY #4 is located to the south and southwest of Anomaly #3 and #2, respectively. It is elongated along an east-west trend and is about 1,200 feet long by 300 feet wide. This anomaly was considered moderately strong and exhibits a fairly sharp contrast of about six times background. The cause of the anomaly is not understood, as there is no rock exposure in the locality.

ANOMALY #5 is a small, somewhat circular shaped anomaly, located about 2,800 feet south of Anomaly #4. The copper values in the soil also show a sharp contrast over poor background values. It is obvious that the anomaly can be accounted for by the copper mineralization in the nearby andesitic outcrop.

ANOMALY #6 is situated in the southernmost part of the property. It is long and narrow (1,800 feet by 300 feet) with values 2 to 3 times above background. Although the strength of this anomaly may be classified as moderately strong, its significance is unknown, as the anomaly lies immediately on a break in slope and is most likely a spurious or transported anomaly.

OTHER ANOMALIES: Erratic highs of copper in soil in the north and northwest sections of the geochemical map are common. The significance of these highs is not known, but, because of the swampy or seasonal swamp conditions in which these geochem highs lie, it is suspected that these anomalies are transported or diffuse.

MAGNETOMETER SURVEY GENERAL STATEMENT

Magnetic measurement was conducted on the July claims using a Jaylander magnetometer, Model 1957, manufactured by Optillinen Tehdas Oy (Finland). It operates on the fluxgate principle and measures the vertical components of the earth's magnetic field.

The purpose of the magnetic survey was to aid in the interpretation of the geologic map. Since magnetism of all rocks is controlled by their content of ferromagnetic material, different lithologies can be distinguished by their magnetic properties. The survey may also aid in outlining zones of alteration and related mineralization, an example being intrusions accompanied by widespread hydrothermal alteration zones in which ferromagnetic minerals may be redistributed to the periphery of alteration.

The control grid for the magnetic survey was the existing geochem lines and stations. A maximum two hour loop traverse was maintained and the necessary diurnal corrections were made. The survey consisted of readings at over 380 stations over a length of about 14.5 miles.

RESULTS AND DISCUSSION

The result of the survey is shown in Figure 7. It shows the corresponding magnetic readings (in gammas) at each station. Data is contoured at every 500 gamma interval.

In general, the magnetic boundaries of major rock types are quite distinct and their contacts can be located with reasonable certaintly. For instance, the more basic intrusive rocks, (diorite or gabbro) in the north central part of the property are only partially exposed, but magnetic measurement here displays a unique and high magnetic response indicating a massive magnetic trend to the northwest. It is characterized by values between 6,000 to 13,500 gammas and may correspond to the dioritic and gabbroic intrusive body. On the east and west of this magnetic high, a gentle change in magnetics is recognized. It is obviously represented by volcanics and metavolcanic rocks with values ranging from 6,000 to 8,500 gammas. On the south of the high magnetic body, values of below 6,000 gammas are indicative of poorly magnetic intrusive rocks such as syenite, granite and granodiorite. On the south central portion (July #3, 5, 25 and 26) a subtle magnetic gradient with readings from 4,000 to 9,700 gammas is essentially underlain by brecciated rocks intermingled with leucocratic dyke swarms. Magnetic depressions on July #16 as well as other local lows are unexplained by surface geological observations, but are probably due to irregularities in the overburden.

On the extreme south of the property, there are two sets of magnetic trends that intersect at the northeast corner of July #1. One trends easterly and coincides with the alignment of granitic dykes within the breccia zone

and the other trends northerly and parallels the regional aeromagnetic trend. Both sets of trends are interpreted as faults.

CONCLUSION

July 1-34 Claims located five miles northwest of Eagle Creek, immediately north of Roger Lake, in the Clinton Mining Division of British Columbia, were staked because of favorable geological features together with the occurrences of widespread important copper mineralization.

Investigation by traditional geological, geochemical and magnetometer surveys has disclosed several areas of interest.

The claims are underlain by Triassic Nicola volcanics, intruded by intrusive rocks, ranging from pyroxenite to syenite. Alteration, brecciation and some copper mineralization is evident at the intrusive-Nicola rock contact. The copper mineralization on the property is widespread, erratic and low grade.

Geochemical survey results revealed the presence of six areas containing anomalous copper in soil. Although most of these anomalies coincide with surface mineralization, this significance is not yet fully realized.

The magnetometer survey seems to outline the various lithologic units. Some highs and lows were attributed to the presence of massive magnetite concentration in lenses, and some lows are apparently due to topographic relief and overburden thickness.

FLORENCIO GATCHALIAN

APPENDIX I

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CANADA
TELEPHONE: 985-0648

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CERTIFICATE OF ANALYSIS

CERTIFICATE NO. 19284
INVOICE NO. 8161
DATE RECEIVED Sept. 5/72
DATE ANALYSED Sept. 11/72

TO: Utah Mines Ltd.,
#412 - 510 W. Hastings St.,
Vancouver 2, B. C.

ATTN: Mr. F. Gatchalian

SAMPLE NO.:	PPM Copper
28N 8R	78
30N 8R	128
32N 8R	28
36N 8R	52
38N 8R	63
40N 8R	12
42N 2L	44
42N 4L	28
42N 6L	18
42N 8L	24
42N 10L	94

CTA MEMBER CANADIAN TESTING ASSOCIATION

Certified by

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CANADA
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CERTIFICATE OF ANALYSIS

CERTIFICATE NO. 19194

INVOICE NO. 8106

DATE RECEIVED Aug. 30/72

DATE ANALYSED Sept. 6/72

TO: Utah Mines Ltd.,
#412 - 510 W. Hastings St.,
Vancouver, B. C.

ATTN:

SAMPLE NO.:	PPM Copper	PPM Molybdenum
42N 10R	68	< 1
12	63	
14	100	< 1
16	31	
18	54	< 1
20	285	
22	13	< 1
24	24	
42N 26R	18	< 1
Std.	46	25

1336

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Certified by B Twarte

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CERTIFICATE OF ANALYSIS

CERTIFICATE NO. 19192
INVOICE NO. 8106
DATE RECEIVED Aug. 30/72
DATE ANALYSED Sept. 6/72

TO: Utah Mines Ltd.,
#412 - 510 W. Hastings St.,
Vancouver, B.C.

ATTN:

SAMPLE NO.:	PPM Copper	PPM Molybdenum
5L 00	100	< 1
5L 2N	22	
4	34	< 1
6	48	
8	14	< 1
10	48	
12	30	< 1
14	74	
16	106	< 1
18	20	
20	36	< 1
22	38	
24	41	< 1
26	24	
28	34	< 1
30	38	
32	52	< 1
34	110	
36	86	< 1
38	22	
40	173	< 1
5L42N	106	
5L 2S	46	< 1
5L 3.5S	28	
8R 12N	18	< 1
14	50	
16	26	< 1
18	36	
20	30	< 1
22	66	
8R 24N	40	< 1
34N 2L	46	
4	33	< 1
6	41	
8	22	< 1
10	28	
12	56	< 1
14	100	
16	34	< 1
34N 18L	48	
Std.	46	26

CTA MEMBER CANADIAN TESTING ASSOCIATION

5360

Certified by B. L. Swartes

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CERTIFICATE OF ANALYSIS

CERTIFICATE NO. 19193
INVOICE NO. 8106
DATE RECEIVED Aug. 30/72
DATE ANALYSED Sept. 6/72

TO: Utah Mines Ltd.,

#412 - 510 W. Hastings St.,
Vancouver, B.C.

ATTN:

SAMPLE NO.:		PPM Copper	PPM Molybdenum
34N	20L	41	< 1
	22	12	
	24	40	< 1
	26	36	
	28	28	< 1
34N	30L	31	
34N	2R	58	< 1
	4	424	
	6	102	< 1
	8	98	
	10	48	< 1
	12	40	
	14	104	< 1
	16	42	
	18	54	< 1
	20	36	
	22	36	< 1
	24	31	
34N	26R	20	< 1
38R	00N	48	
	2N	24	< 1
	4	78	
	6	48	< 1
	8	54	
	10	10	< 1
38R	12N	108	
42N	12L	135	< 1
	14	41	
	16	6	< 1
	18	36	
	20	92	< 1
	22	31	
	24	16	< 1
	26	14	
	28	30	< 1
42N	30L	86	
42N	2R	28	< 1
	4	36	
	6	36	< 1
42N	8R	26	
Std.		46	25

CTA MEMBER CANADIAN TESTING ASSOCIATION

17, 65

Certified by B. L. Swarbrick

J5

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CERTIFICATE OF ANALYSIS

CERTIFICATE NO. 18517

INVOICE NO. 7642

DATE RECEIVED July 31/72

DATE ANALYSED Aug. 2/72

TO: Utah Mines Ltd.,
#412 - 510 W. Hastings St.,
Vancouver 2, B.C.

ATTN: Mr. Flor Gatchalian

SAMPLE NO.:		PPM Copper	PPM Molybdenum
00	0N	42	< 1
	2	20	
	4	52	< 1
	6	50	
	8	76	< 1
	10	22	
	12	30	< 1
	14	48	
	16	21	< 1
	18	30	
	20	34	< 1
	22	58	
	24	54	< 1
	26	28	
	28	36	< 1
	30	38	
	32	46	< 1
	34	100	
	36	212	< 1
	38	31	
	40	90	< 1
	42	96	
	44	38	< 1
	46	46	
	48	26	< 1
	50	33	
	52	13	< 1
	54	44	
	56	22	< 1
	58	70	
	60	76	< 1
	62	44	
	64	40	< 1
	66	20	
	68	76	< 1
	70	63	
	72	48	< 1
	74	41	
00	76N	44	< 1
1E	0N	21	< 1
Std. #24		56	3.6

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Certified by R. G. Woodside

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CERTIFICATE OF ANALYSIS

CERTIFICATE NO. 18518
INVOICE NO. 7642
DATE RECEIVED July 31/72
DATE ANALYSED Aug. 2/72

TO: Utah Mines Ltd.,
#412 - 510 W. Hastings St.,
Vancouver, 2. B.C.

ATTN: Mr. Flor Gatchalian

SAMPLE NO.:	PPM Copper	PPM Molybdenum
1E 2N	154	
4	218	< 1
6	46	
8	52	< 1
10	48	
12	90	< 1
16	64	
18	76	< 1
20	64	
22	36	< 1
24	94	
26	40	< 1
28	82	
30	38	< 1
32	138	
34	66	< 1
36	58	
38	41	< 1
40	70	
42	33	< 1
44	34	
46	31	< 1
48	51	
50	60	< 1
52	38	
54	48	< 1
56	41	
58	82	< 1
60	54	
62	36	< 1
64	51	
66	74	< 1
68	58	
72	16	< 1
1E 74	28	
1W ON	26	< 1
2	41	
4	28	< 1
6	28	
1W 8N	24	< 1
Std. #24	52	16

July 31/72

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CERTIFICATE NO. 18519
INVOICE NO. 7642
DATE RECEIVED July 31/72
DATE ANALYSED Aug. 2/72

TO: Utah Mines Ltd.,
#412 - 510 W. Hastings St.,
Vancouver, 2. B. C.

ATTN: Mr. Flor Gatchalian

SAMPLE NO.:	PPM Copper	PPM Molybdenum
1W 10N	36	
12	44	< 1
14	42	
16	28	< 1
18	38	
20	24	< 1
22	42	
24	28	< 1
26	16	
28	33	< 1
30	64	
32	320	< 1
34	122	
36	40	< 1
38	110	
40	42	< 1
42	173	
44	126	< 1
46	34	
48	78	< 1
50	74	
52	36	< 1
54	16	
56	20	1
58	33	
60	22	< 1
62	131	
1W 64	34	< 1
2E 0N	40	< 1
2	68	
4	163	< 1
6	36	
8	163	< 1
10	38	
12	33	< 1
14	56	
16	28	< 1
18	30	
20	310	< 1
2E 22N	52	
Std. #24	56	16

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INVOICE NO. 7642
DATE RECEIVED July 31/72
DATE ANALYSED Aug. 2/72

TO: Utah Mines Ltd.,
#412 - 510 W. Hastings St.,
Vancouver 2, B. C.

ATTN: Mr. Flor Gatchalian

SAMPLE NO.:		PPM Copper	PPM Molybdenum
2E	24N	52	< 1
	26	33	
	28	26	< 1
	30	28	
	32	28	< 1
	34	16	
	36	22	< 1
	38	12	
	40	26	< 1
	42	60	
	44	44	< 1
	46	40	
	48	31	< 1
	50	20	
	52	16	< 1
	54	22	
	56	24	< 1
	58	26	
	60	30	< 1
	62	26	
	64	4	< 1
	66	10	
	68	18	< 1
	72	14	
	74	26	< 1
	76	34	
	78	21	< 1
	80	138	
2E	82N	26	< 1
2W	0N	22	< 1
	2	14	
	4	10	< 1
	6	10	
	8	8	< 1
	10	24	
	12	40	< 1
	14	22	
	16	41	< 1
	18	48	
2W	20N	22	< 1
Std. #24		54	16

July claim

CTA MEMBER CANADIAN TESTING ASSOCIATION #302

Certified by P. Woodley

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CERTIFICATE OF ANALYSIS

CERTIFICATE NO. 18521
INVOICE NO. 7642
DATE RECEIVED July 31/72
DATE ANALYSED Aug. 2/72

TO: Utah Mines Ltd.,
#412 - 510 W. Hastings St.,
Vancouver 2, B.C.

ATTN: Mr. Flor Gatchalian

SAMPLE NO.:	PPM Copper	PPM Molybdenum
2W 22N	51	
24	21	< 1
26	24	
28	46	< 1
30	13	
32	70	< 1
34	18	
36	41	< 1
38	31	
40	28	< 1
42	41	
44	36	< 1
46	36	
48	34	< 1
50	41	
52	33	< 1
54	54	
56	33	< 1
58	51	
60	42	< 1
62	18	
64	126	< 1
66	54	
2W 67N	54	< 1
16N 00	28	
2R	84	< 1
4	44	
6	173	< 1
8	86	
10	22	< 1
12	183	
14	41	< 1
18	41	
20	20	< 1
22	18	
16N 24R	22	< 1
18.5N 26R	33	< 1
28	34	
30	13	< 1
18.5N 32R	34	
Std. #24	54	16

CTA MEMBER CANADIAN TESTING ASSOCIATION

10 175

Certified by W. P. Woodley

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CERTIFICATE OF ANALYSIS

CERTIFICATE NO. 18522

TO: Utah Mines Ltd.,
#412 - 510 W. Hastings St.,
Vancouver 2. B. C.

INVOICE NO. 7642

DATE RECEIVED July 31/72

ATTN: Mr. Flor Gatchalian

DATE ANALYSED Aug. 2/72

SAMPLE NO.:		PPM Copper	PPM Molybdenum
18.5N	34R	50	< 1
	36	21	
	38	70	< 1
18.5N	40R	22	
20N	40R	30	< 1
22N	40R	72	
24N	40R	28	< 1
26N	2R	12	< 1
	4	136	
	6	106	< 1
	8	40	
	10	189	< 1
	12	92	
	14	92	< 1
	16	63	
	18	42	< 1
	20	63	
	22	66	< 1
	24	31	
	26	58	< 1
	28	22	
	30	22	< 1
	32	34	
	34	20	< 1
	36	8	
	38	63	< 1
26N	40R	56	
26N	2L	18	< 1
	4	30	
	6	33	< 1
	8	38	
	10	13	< 1
	14	68	
	16	386	< 1
	18	52	
	20	46	< 1
	22	16	
	24	42	< 1
	26	20	
26N	28L	74	< 1
Std. #24		54	16

July claims

CTA MEMBER CANADIAN TESTING ASSOCIATION

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CERTIFICATE OF ANALYSIS

CERTIFICATE NO. 18523

INVOICE NO. 7642

DATE RECEIVED July 31/72

DATE ANALYSED Aug. 2/72

TO: Utah Mines Ltd.,
#412 - 510 W. Hastings St.,
Vancouver 2, B.C.

ATTN: Mr. Flor Gatchalian

SAMPLE NO.:		PPM Copper	PPM Molybdenum	
26N	30L	21		
MC	1	134	< 1	12700
MC	2	26	< 1	
44464		960	1	Rock
44465		262	< 1	Rock

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Certified by .....

APPENDIX II

STATEMENT OF COST

SALARIES

F.R. Gatchalian	@ $40.00/day for 33 days	$1,320.00
D. Beal	@ $25.00/day for 25 days	$ 625.00

SAMPLE ANALYSIS including sample preparation by Chemex Lab

342 soil samples for Cu @ $1.20	$ 410.00
170 soil samples for Mo @ $1.00 each	$ 170.00

MAGNETOMETER SURVEY

Magnetometer rental @$5.00/day for 25 days	$ 125.00

VEHICLE

Truck rental Jimmy from Pacific G.M.D. @ $10.00/day for 25 days	$ 250.00

THIN SECTION

Preparation and study by G. Cargill & D. Cooke	300.00

$3,200.00

M Young

Declared before me at the City
of Vancouver in the
Province of British Columbia, this 25th
day of July 1973 A.D

Wm Slabotsky

G Phelps

A Commissioner for taking Affidavits within British Columbia or
A Notary Public in and for the Province of British Columbia.

REGISTRAR

APPENDIX III

STATEMENT OF QUALIFICATION

NAME: Florencio R. Gatchalian - Project Geologist

EDUCATION: B.A. Geology 1959 Adamson University, Manila, Philippines

EXPERIENCE: 1959-1963 Field Geologist for American Asiatic Oil Corporation, Manila, Philippines

1963-1968 Geologist, Incharge Base Metal Exploration, Elizalde & Co., Manila, Philippines

February 1968 to date, Geologist, Utah Mines, (Utah International) formerly Utah Construction & Mining Co.

NAME: David Beal - Student Assistant

EDUCATION: 3rd Year Geological Engineering, University of British Columbia,

EXPERIENCE: 1970 Summer Field Assistant to the Geologist for Vangulf Exploration

1971 Summer Field Assistant to the Geologist for Cypress Exploration

APPENDIX IV

PETROGRAPHIC EXAMINATION

H.S.	X
T.S.	X
Stain	X
XRD	
XRF	
Photo	

Specimen Number: 1

Locality: Collector: F. G.

Identity Can't establish identity of sufficient feldspar to name rock exactly — probably either quartz monzonite or quartz diorite

Hand Specimen Description

The specimen is a porphyry with phenocrysts of slightly clouded feldspar in a fine grained, dark green matrix. There is a couple of percent of finely disseminated pyrite scattered throughout the matrix of the specimen.

Microscopic Study

Mineralogy

Phenocrysts

Plagioclase Feldspars

— The crystals which haven't been totally altered are nicely zoned

- Alteration

- white mica, minor clay, minor epidote and carbonate.

- alteration is usually spread evenly over pheno - occasionally centres are altered & margins are fresh.

Matrix

Quartz

K-Feldspar

Plagioclase Feldspar — minor.

Epidote - occasional grains.

Chlorite - 2 types (1) iron rich (pennine?) in little clots after some mafic

(2) normal chlorite in little veinlets

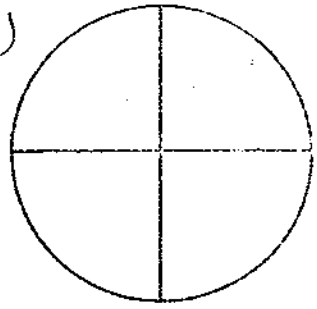
Opaques

Subhedral dissem. pyrite.

Texture

Porphyritic

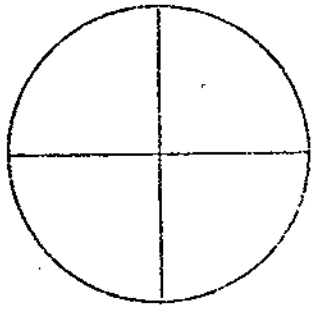
Mineral Phases (XRD)		



Alteration

Plagioclases → Mica, Clay, CB, EP

Mafic? → Chlorite.



Comments

Moderately altered

834 FRANCIS ROAD
RICHMOND, B.C.

TEL. (604) 277-0941

D. L. COOKE, Ph.D., P.ENG.
CONSULTING GEOLOGIST

PETROGRAPHIC REPORT

NUMBER: #1 LOCALITY: DATE: August 17, 1972

NAME AND CLASSIFICATION: ALTERED FELDSPAR PORPHYRY

MEGASCOPIC DESCRIPTION: The specimen consists of 2 - 4 mm. equant feldspar grains set in a dark aphanitic groundmass. Sulphides occur as disseminations

MICROSCOPIC DESCRIPTION:

Minerals	%	Remarks
1. Alkali Feldspar	30	Stubby 3 - 5 mm. feldspar phenocrysts constitute about 50% of the specimen, but these are altered to sericite and carbonate. Equigranular alkali feldspar occurs in the groundmass.
2. Quartz	25	Fine grained quartz and alkali feldspar are the main constituents of the groundmass.
3. Sericite	15	Sericite occurs as a secondary mineral after the feldspars.
4. Hornblende	10	Ragged ~~grains of green, pleochroic hornblende occur~~ in streaks within the groundmass.
5. Biotite	5	Brown biotite is associated with the hornblende.
6. Carbonate	5	Patches of carbonate occur within feldspar phenocrysts.
7. Chlorite	5	Some of the biotite is altered to chlorite.
8. Sphene/Leucoxene	3	Granular sphene and leucoxene occur as streaks within the groundmass in association with the micas.
9. Sulphides	2	Cubic as well as granular pyrite occurs as disseminations.

TEXTURE: A porphyritic texture, consisting of feldspar phenocrysts, is well developed. The groundmass is made up mainly of granular quartz and alkali feldspar. Sericite is well developed after feldspar phenocrysts, and granular hornblende and biotite appear as secondary streaks within the groundmass.

CONCLUSION:

The sample represents a sericitized feldspar porphyry. The streaky habit of biotite, hornblende and leucoxene suggests that some dynamic deformation has taken place. Sericitization has obscured the original composition of the feldspars.

T.S.	X
Stain	X
XRD	
XRF	
Photo	

Specimen Number: 2
Similar to 27

Locality:

Collector: F. G.

Identity Leucocratic Qz Monzonite – Monzonite

Mafic Hybrid Diorite or Monzonite
Possibility of a recrystallized Vole

Hand Specimen Description

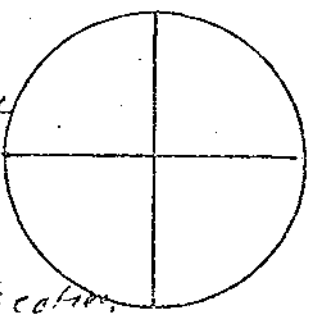
The specimen appears to be a breccia marginal to an intrusive. There are black strongly magnetic angular fragments recrystallized volcanic?, in a matrix of syenitic(?) material. There are clots of epidote within the syenitic(?) material. Pyrite occurs as disseminated subhedral grains within the light coloured material and occasionally within smaller pieces of the dark coloured material but not within the large angular fragments.

Microscopic Study

Mineralogy

Dark Patches	Light Patches
Clino Pyroxene – Altered to green chlorite + amphibole	Plagioclase Feldspars – Relatively minor.
Amphiboles (1) Chloritized Hornblende (2) Fibrous tremolite	K-Feldspars – Major part of feldspar – often shows crossed twinning characteristic of microcline
Epidote scattered grains	Amphiboles – occasional grain of hornblende
Plagioclase Feldspars – Poorly twinned + infrequent.	Epidote grains + clusters of grains.
K-Feldspars – Interstitial + difficult to distinguish from poorly twinned P.F.	Opaques – Pyrite subhedral to euhedral.
Quartz – occasional quartz grain.	Veinlets of light coloured material cross cutting dark fragments. a.o. K-Feldspar + Quartz with minor amounts of Plagioclase Feldspar
Opaques – scattered anhedral magnetic grains	

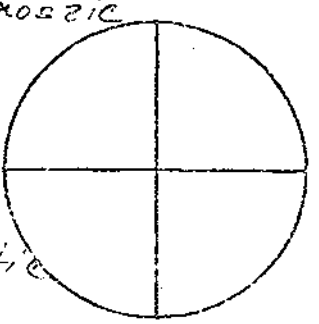
Mineral Phases (XRD)



Texture

Mosaic Intergrowth
Intrusive Texture

Leucocratic portion of the rock isn't well represented on section, what's there is a mosaic intergrowth



Alteration

Pyx → Hornblende → Chlorite
Plagioclases Minor White Mica

Comments

Pyx + Hbe alt'n is probably related to the intrusion of leucocratic material. Very minor alteration in the leucocratic portion of the section

RICHMOND, B.C.

TEL. (604) 277-0341

D. L. COOKE, PH.D., P.ENG.
CONSULTING GEOLOGIST

PETROGRAPHIC REPORT

NUMBER: #2 LOCALITY: DATE: August 17, 1972

NAME AND CLASSIFICATION: HORNBLENDITE WITH FELSITE DIKELET

MEGASCOPIC DESCRIPTION: This dark, medium grained rock is transected by pink feldspathic dikelets. Disseminated sulphides are associated with the feldspathic material.

MICROSCOPIC DESCRIPTION:

Minerals	%	Remarks
HOST ROCK:		
1. Hornblende	60	Stubby subhedral laths form an interlocking mass. Some hornblende occurs as rims on augite. Blue-green margins are also common.
2. Sericite	25	Fine grained sericite occurs between hornblende grains, and appears to be secondary.
3. Pyroxene	8	Remnant patches and crystals of augite are rimmed by hornblen
4. Epidote/Zoisite	7	Anhedral epidote occurs within the sericite matte.
5. Magnetite	Tr.	Subhedral grains are scattered throughout.
6. Apatite	Tr.	Apatite is a common associate of magnetite.
DIKELET:		
1. Microcline	55	Twinned and untwinned k-feldspar grains are stubby in nature.
2. Albite	40	Anhedral albite (An_{5-10}) occurs together with microcline.
3. Sulphides	2	A fine dissemination of pyrite ± chalcopyrite is noticeable.
4. Epidote	2	Clear epidote crystals are scattered near the walls of the dikelet.
5. Quartz	1	Tiny subhedral crystals occur within the feldspar and interstitially.

TEXTURE: The hornblende crystals form an equigranular mass, with interstitial sericite and epidote. Magnetite and apatite are accessory minerals.

CONCLUSION:
Alteration of the hornblende and pyroxene is non-existent, while the interstitiel sericite appears to be secondary in origin. The specimen is a hornblendite, and it is cut by felsitic syenite dikes.

T.S.	X
Stain	X
XRD	
XRF	
Photo	

Specimen Number: 3

Locality: Collector: F.G.

Identity Amphibole Schist

Hand Specimen Description

The specimen is a fine grained dark green rock with a strong foliation. Quartz appears to form a mineral lineation on the surface of the foliation. There are porphyroblasts of a mafic mineral on the foliation surface which don't appear to have a lineation

Microscopic Study

Mineralogy

Amphiboles
(1) Clumps & single crystals
(2) Two varieties apparently both hornblende one strongly pleochroic the other colourless.

Quartz
- Highly resorbed grains.
- Veinlets ~~penetrating~~ ~~trends~~ on the ~~cracks~~ foliation surface.

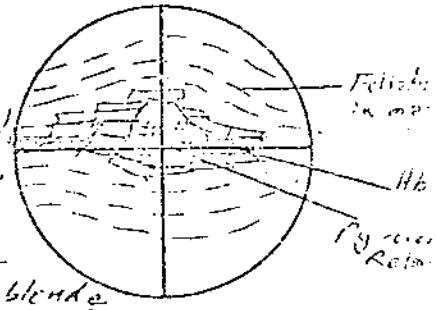
Carbonate - isolated clumps apparently filling cavities and veinlets on the foliation surface

Epidote - coves to some of clumps of amphiboles.

Matrix - Quartz, 2 Amphiboles, Chlorite

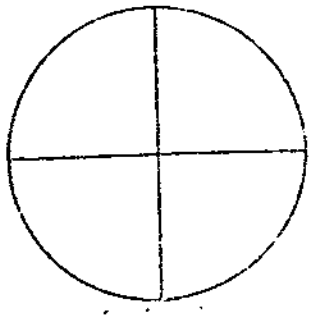
Opaques - Subhedral & closely associated with chlorite after amphibole - occasional grain has a red hematite margin.

Mineral Phases (XRD)		



Texture

- Strong foliation is due to alignment of amphibole and chlorite crystals in the matrix - Porphyro blasts of chlorite + hornblende



Alteration

Comments

T.S.	X
Stain	X
XRD	
XRF	
Photo	

Specimen Number: 4

Locality: Collector: F. G.

Identity Diorite – Quartz Diorite

Hand Specimen Description

The specimen is a dark coarse grained rock composed of about 45% mafic ~~minerals~~ crystals with a creamy interstitial material presumably mostly feldspar. The specimen is moderately magnetic and occasional grains of magnetite can be seen throughout the specimen. There are occasional strange looking patches on the specimen where the normal matrix material has acquired a green cast.

Microscopic Study

Mineralogy

Phenocrysts

Amphiboles

(1) Hornblende – partially altered to carbonate, chlorite, epidote

(2) Tremolite? – a few tufts of a very fibrous amphibole

Pyroxenes

Diopside? – occasional grain at the centre of an amphibole rim.

Matrix

Plagioclase Feldspar ——— An<20 ———

– slightly altered to white mica

Amphibole – needles probably Tremolite

Epidote – scattered grains

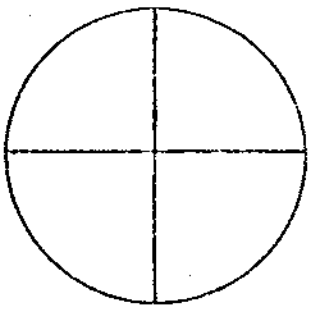
Quartz – interstitial – intergrowth

– high number of inclusions.

Opaques

Anhedral grains.

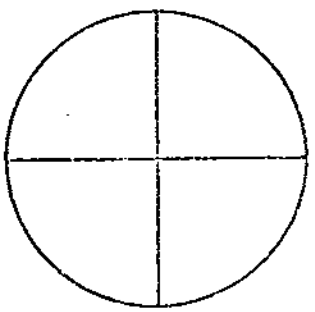
Mineral Phases (XRD)		



Texture

Porphyritic?

phenocrysts are jammed together in a closed Texture



Alteration

Mafics → chlorite, carbonate Epidote

Plagioclase → white mica

Comments

Alteration weak

RICHMOND, B.C.

TEL. (604) 277-0211

D. L. COOKE, PH.D., P.ENG.
CONSULTING GEOLOGIST

PETROGRAPHIC REPORT

NUMBER: #4 LOCALITY: DATE: August 17, 1972

NAME AND CLASSIFICATION: HORNBLENDIC DIORITE

MEGASCOPIC DESCRIPTION: The specimen is coarse grained and it consists of abundant dark green hornblende and pale pink feldspar grains.

MICROSCOPIC DESCRIPTION:

Minerals	%	Remarks
1. Alkali Feldspar	30	The plagioclases are abundantly altered to a mixture of fine grained alkali feldspar, sericite and saussurite. Remnant patches have composition of $An_{45 \pm 5}$.
2. Hornblende	30	Pyroxene crystals are resorbed to green pleochroic hornblende. A green-brown variety forms rims on the resorted crystals.
3. Sericite	15	The plagioclase is strongly altered to sericite.
4. Saussurite	15	A fine grained, granular mixture of leucoxene and epidote is secondary after plagioclase.
5. Pyroxene	7	Augite occurs as remnant patches within hornblende pseudomorphs.
6. Magnetite	2	Subhedral grains occur interstitially to hornblende.
7. Apatite	1	Apatite grains are sub-rounded, and they occur together with magnetite.

TEXTURE: Subhedral crystals of hornblende are randomly oriented and interlocked with equigranular plagioclase grains. Magnetite resorption of augite crystals to green hornblende is strongly developed. The original plagioclase (An_{40}) is altered to alkali feldspar, sericite and saussurite.

CONCLUSION:

The specimen is relatively fresh, except for deuteric alteration of the plagioclase grains.

PETROGRAPHIC DESCRIPTION

WORK DONE	
H.S.	X
T.S.	X
Stain	X
XRD	
XRF	
Photo	

Specimen Number: A-4 meta-volcanic

Locality: Collector: F.G.

Identity Recrystallized metamorphic rock with a penetrative mineral lineation. I think that it may have been a volcanic between andesite & dacite in composition.

Hand Specimen Description

The specimen is a dark green porphyritic rock with phenocrysts of clouded plagioclase feldspar, and clots of a greenish mafic mineral. The specimen contains disseminated pyrite and a disseminated grey metallic mineral possibly specularite

Microscopic Study

Mineralogy

Phenocrysts

Plagioclase phenocryst have their centres replaced by white mica, and minor carbonate & epidote

Mafic - clots of Amphibole, epidote chlorite

Matrix

Plagioclase
Chlorite
Hornblende } together as streaks
Biotite } apparently parallel to a penetrative foliation or lineation
Quartz - little patches & veinlets.

Opaques

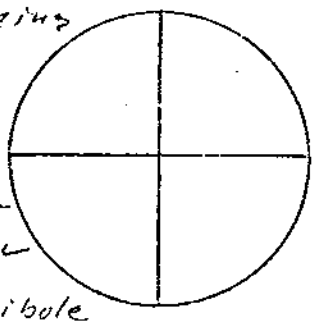
Pyrite scattered subhedral to euhedral grains
Hematite - scattered ragged grains.

Mineral Phases (XRD)		

Texture

Porphyritic Feldspar phenos and clots of Amphibole epidote & chlorite after mafic minerals.

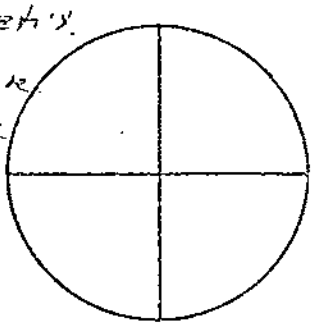
Lineation - nice alignment of amphibole and biotite grains in the matrix.



Alteration

PF → white mica, epidote, carbonate

Mafics → Amphibole, epidote & chlorite
Amphiboles



Comments

PETROGRAPHIC DESCRIPTION

WORK TO BE DONE	
H.S.	
T.S.	X
Stain	
XRD	
XRF	
Photo	

Specimen Number: 5

Locality: Collector: F. C.

Identity Monzonite — Quartz Monzonite ?

Hand Specimen Description

No Hand Specimen Provided.

Microscopic Study

Mineralogy

Plagioclase Feldspars
- An ~ 35 - often zoned.
- wide variation in alteration get some oscillatory & crystals with certain zones altd and some crystals with entire centres altered but generally crystals are only speckled with white mica.

Braid Perthite - occasional grains - very little white mica

Microcline Cross twinned occasional grains

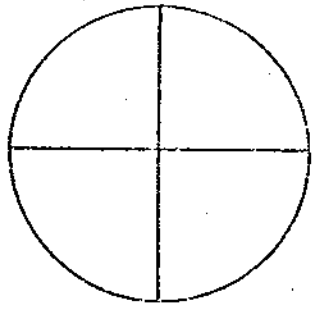
Amphibole
- Hornblends. - minor Chlorite & epidote alt.

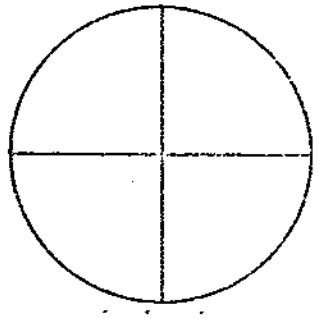
Quartz - Occasional grains & clumps of grains.

Green Phyllosilicate - between biotite & chlorite probably after Amphiboles

Opaques Hematite - interstitial grains.
Pyrite subhedral grains.

Mineral Phases (XRD)		





Texture

Some where between mosaic intergrowth & a crowded porphyry Close packed phenos usually touching but interstitial material is much finer grained

Alteration

Comments

FRANCIS ROAD
MOUTH, B.C.

TEL. (604) 277-0341

D. L. COOKE, PH.D., P.ENG.
CONSULTING GEOLOGIST

PETROGRAPHIC REPORT

NUMBER: #5 LOCALITY: DATE: August 17, 1972

NAME AND CLASSIFICATION: GRANODIORITE PORPHYRY

MEGASCOPIC DESCRIPTION: The specimen appears medium grained and feldspathic in nature, with small hornblende crystals set in a grey matrix.

MICROSCOPIC DESCRIPTION:

Minerals	%	Remarks
1. Plagioclase	50	An_{25-30}. Plagioclase phenocrysts are about 4 mm. in size. Zoning and twinning are well-developed within these phenocrysts.
2. Quartz	25	Equigranular quartz as well as micrographic quartz-alkali feldspar intergrowths are confined to the groundmass.
3. K-Feldspar	15	Anhedral grains and micrographic intergrowths with quartz constitute the bulk of the groundmass.
4. Hornblende	5	Green, pleochroic hornblende crystals are evenly distributed.
5. Sericite	3	Minor alteration of the plagioclase occurs in the form of fine grained sericite.
6. Leucoxene/Sphene	1	Magnetite grains are rimmed by leucoxene and/or sphene.
7. Chlorite	1	A few chloritic patches occur within the groundmass.
8. Magnetite	Tr.	Subhedral magnetite grains are scattered throughout.
9. Apatite	Tr.	Subhedral apatite crystals are associated with accessory magnetite.

TEXTURE: The texture is porphyritic with well-developed plagioclase phenocrysts (3 - 6 mm.) set in a mixed groundmass of equigranular and micrographic intergrowths of quartz and potash feldspar.

CONCLUSION:

The groundmass texture is sufficiently fine grained to place this porphyry in the hypabyssal class. It is relatively unaltered.

T.S.	X
Stain	X
XRD	
XRF	
Photo	

Specimen Number: #6

Locality: Collector: F.G.

Identity Probably between a Hybrid Diorite and a gabbro

Hand Specimen Description

The specimen is a mafic porphyry with phenocrysts of Amphibole (& Pyroxene?) in a fine grained grey-green matrix. There are clots and fracture fillings of epidote within the matrix. The specimen is cross cut by quartz veins. There are disseminated pyrite grains scattered through the matrix

Microscopic Study

Mineralogy

Mineral Phases (XRD)		

Phenocrysts

Pyroxene Clinopyroxene cores with hornblende and chlorite margins

Amphiboles

Hornblende - chloritized and epidotized

Tremolite? - fibrous amphibole

Epidote clots of epidote crystals

Clots of Epidote and Tremolite possibly after pyroxene

Matrix

Amphibole, Quartz?, chlorite, Feldspar.

Opaques

Occasional euhedral grain (pyrite?)

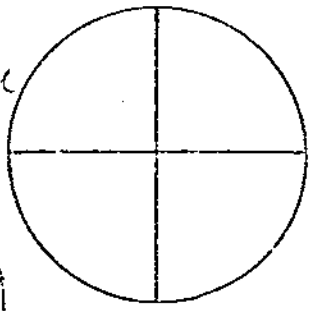
Quartz/Veins

Quartz(?) is extremely fine grained and strange looking. Has the appearance of a devitrified glass

Texture Porphyritic.

Matrix is extremely fine grained

Texture suggests a dyke, sill, or possibly a chilled margin

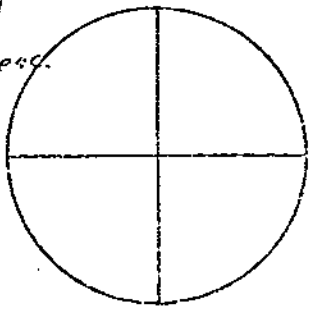


Alteration

Chlorite, amphibole, epidote after pyroxene

Chlorite after hornblende.

Comments - Alteration is relatively minor & may be tied to the cooling history of the rock rather than to later hydrothermal Action.



534 FRANCIS ROAD
RICHMOND, B.C.

TEL. (604) 277-0531

D. L. COOKE, PH.D., P.ENG.
CONSULTING GEOLOGIST

PETROGRAPHIC REPORT

NUMBER: #6 LOCALITY: DATE: August 17, 1972

NAME AND CLASSIFICATION: HORNBLENDE ANDESITE

MEGASCOPIC DESCRIPTION: Stubby pyroxene or hornblende phenocrysts are set in a dark green aphanitic groundmass.

MICROSCOPIC DESCRIPTION:

Minerals	%	Remarks
1. Hornblende	45	Twinned phenocrysts of green, pleochroic hornblende are 3-6 mm. in size. Tiny crystals constitute a major portion of the groundmass.
2. Epidote	30	Abundant epidote is scattered throughout, and it is secondary after plagioclase.
3. Plagioclase	20	Intermediate plagioclase microlites of the groundmass are extensively epidotized.
4. Leucoxene	3	Granular leucoxene is evenly dispersed.
5. Carbonate	2	A few carbonate patches occur within hornblende phenocrysts.
6. Chlorite	Tr.	Minor chlorite alteration is to be found within the hornblende.
7. Apatite	Tr.	Euhedral needles occur throughout.

TEXTURE: Euhedral to subhedral hornblende phenocrysts are set in a matted groundmass of plagioclase and hornblende crystals. Abundant epidote is developed after plagioclase microlites of the groundmass.

CONCLUSION:

This specimen is characteristic of a volcanic flow, which is rich in hornblende. Alteration of plagioclase to epidote is of a deuteric nature.

T.S.	X
Stain	X
XRD	
XRF	
Photo	

Specimen Number: 9

Locality: Collector: F. C.

Identity Quartz Monzonite

Hand Specimen Description

The specimen is a pink porphyry. There are phenocrysts of slightly altered plagioclase and quartz in a fine grained pink ground mass. The mafic content is very low with occasional scattered grains of amphibole. There are also scattered grains of a metallic grey mineral probably specularite.

Microscopic Study

Mineralogy

Pheno crysts

Quartz - phenos consists of 2 or 3 crystals
- usually resorbed along the margins

Plagioclase Feldspar An < 20
- Some twinned. - slightly altered
- Much untwinned to white mica

Hornblende scattered grains

Matrix

Plagioclase
Quartz
Hornblende.

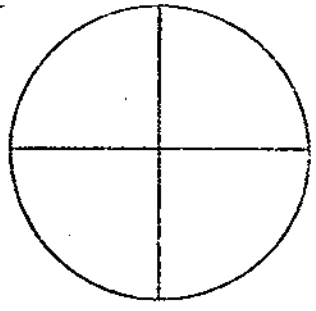
Opaques
- Abundant very fine grained irregular grains interstitial to the matrix material - Hematite that gives the rock its pink colour

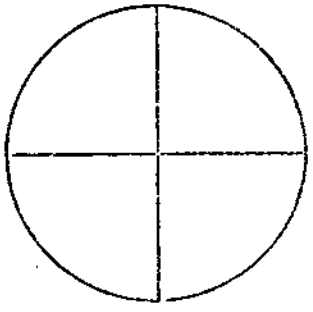
Texture
Porphyritic

Alteration
Very minor - Some white mica on the plagioclases

Comments

Mineral Phases (XRD)		





T.S.	X
Stain	X
XRD	
XRF	
Photo	

Specimen Number: 15

Locality: Collector: F. G.

Identity Quartz Diorite – Diorite ✓

Hand Specimen Description

The specimen is a dark green medium grained rock. The rock is composed of hornblende (amphibole) grains with white feldspar forming the matrix. There are magnetite grains disseminated throughout the specimen and it is moderately magnetic.

Microscopic Study

Mineralogy

Plagioclase
- Larger grains — An ~25 ? } minor white mica + carbonate alteration
- Interstitial grains

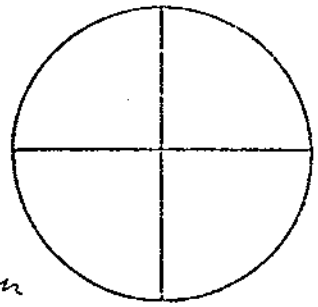
Pyroxenes – Centres of grains rimmed by hornblende +/- chlorite

Amphiboles
- Hornblende – altering to chlorite
- Tremolite – after pyroxene

Matrix
Plagioclase, white mica, amphibole, chlorite and occasional quartz grain.

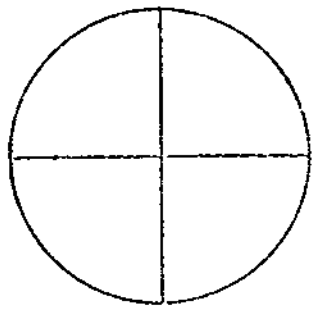
Opaques
Interstitial subhedral magnetite grains.

Mineral Phases (XRD)		



Texture
Porphyritic?
Larger grains are jammed together into a close packed framework with very fine grained interstitial material.

Alteration
Pyx → Hbe → Chlorite
P.F. → White mica
} moderate intensity of alt.



Comments

WORK DONE	
H.S.	✓
T.S.	✓
Stain	✓
XRD	
XRF	
Photo	

PETROGRAPHIC DESCRIPTION

Specimen Number: 24/GA 23

Locality:

Collector: F. G.

Identity Granodiorite ~~or Quartz Monzonite~~
Zoning of phenocrysts makes it impossible to precisely measure their composition.

Hand Specimen Description

The specimen is a porphyritic rock with phenocrysts of, slightly altered plagioclase, and amphibole in a fine grained matrix. The specimen is moderately magnetic and some grains of magnetite and evident. One grain of chalcopyrite was noted.

Microscopic Study

Mineralogy

Phenocrysts

Plagioclase
- generally oscillatory zoning.
- moderate to intense alteration to white mica in restricted zones. - occasionally some albitization of plagioclase

Hornblendes
- Range from fresh to completely altered to epidote, chlorite and carbonate.
- suggests amphiboles of 2 compositions.

Matrix
Quartz.
Plagioclase Feldspar
K-Feldspar
Tiny veinlets of Carbonate.

Opaques - Subhedral to anhedral grains Magnetite?

Mineral Phases (XRD)		

Texture

Porphyritic.

Alteration

Hornblende → Chlorite, Epidote, Carbonate
Ca. Plagioclase → White Micas.

Comments

334 FRANCIS ROAD
RICHMOND, B.C.

TEL. (604) 277-0341

D. L. COOKE, PH.D., P.ENG.
CONSULTING GEOLOGIST

PETROGRAPHIC REPORT

NUMBER: #23 LOCALITY: DATE: August 18, 1972

NAME AND CLASSIFICATION: SYENITE

MEGASCOPIC DESCRIPTION: The specimen is buff coloured and medium grained, and feldspathic in appearance. Some sulphides occur as disseminations.

MICROSCOPIC DESCRIPTION:

Minerals	%	Remarks
1. Perthite	60	Anhedral grains are interlocked. Some of these exhibit "microcline" twinning; others are untwinned.
2. Plagioclase	25	Twinned alkali plagioclase occurs in subsidiary amounts together with the perthite.
3. Quartz	7	Equigranular quartz occurs interstitially to feldspar grains.
4. Hornblende	4	Small, anhedral grains of green hornblende occur in patches.
5. Carbonate	2	Carbonate occurs in discrete grains, scattered throughout.
6. Sulphides	1	Anhedral sulphide grains occur as minute disseminations.
7. Magnetite	1	Magnetite has a similar habit to the sulphides.
8. Apatite	Tr.	Apatite needles are randomly distributed.

TEXTURE: An equigranular texture is well developed, and the constituent feldspars are medium grained. Minor amounts of hornblende and magnetite are the dark constituents.

CONCLUSION:
The rock is leucocratic and quartz-poor. It is classified as a syenite. Alteration is negligible.

334 FRANCIS ROAD
RICHMOND, B.C.

TEL. (604) 277-0341

D. L. COOKE, PH.D., P.ENG.
CONSULTING GEOLOGIST

PETROGRAPHIC REPORT

NUMBER: #24 LOCALITY: DATE: August 18, 1972

NAME AND CLASSIFICATION: GRANODIORITE PORPHYRY

MEGASCOPIC DESCRIPTION: The specimen seems to be a medium grained, grey, feldspathic intrusive unit. Hornblende is moderately abundant.

MICROSCOPIC DESCRIPTION:

Minerals	%	Remarks
1. Plagioclase	45	$An_{25\pm}$. Plagioclase phenocrysts constitute approximately half of the section. The crystals are 2 - 6 mm. in size.
2. Alkali Feldspar	20	Equigranular fine grained alkali feldspar (k-feldspar?) is confined to the groundmass.
3. Quartz	15	~~Medium to fine grained equigranular quartz occurs along~~ with k-feldspar in the groundmass.
4. Hornblende	10	Subhedral, green phenocrysts (2 - 5 mm. length) are common.
5. Sericite	5	Sections of the plagioclase phenocrysts are altered to fine grained sericite.
6. Carbonate	2	Irregular patches of carbonate occur at random.
7. Epidote	1	A few epidote grains occur in association with the secondary sericite and carbonate.
8. Apatite	1	The apatite crystals are subhedral and scattered throughout.
9. Magnetite	1	Like apatite, magnetite is randomly distributed.
10. Sphene	Tr.	Granular sphene is present in small amounts.

TEXTURE: A porphyritic texture, consisting of plagioclase phenocrysts and elongate hornblende needles, is enhanced by a fine grained equigranular groundmass of alkali feldspar and quartz. Some quartz feldspar myrmekite is also present.

CONCLUSION:
No pronounced amount of alteration is noticeable. The porphyritic texture is characteristic of a shallow intrusive body (hypabyssal).

PETROGRAPHIC DESCRIPTION

WORK DONE	
H.S.	
T.S.	X
Stain	X
XRD	
XRF	
Photo	

Specimen Number: 27

Locality: Collector: F.G. (Sproat?)

Identity Leucocratic Qz Monzonite

Mafic Hybrid Diorite or Monzonite
Possibility of a recrystallized Vole

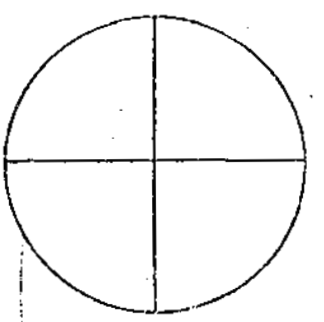
Hand Specimen Description

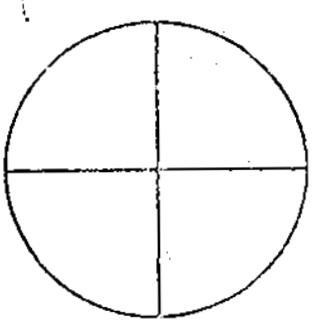
The specimen is a breccia apparently marginal to an intrusive. It consists of black angular, strongly magnetic fragments of a rock with a dioritic appearance possibly a recrystallized volcanic in a matrix of a light coloured quartzofeldspathic(?) material. The specimen contains very minor amounts of disseminated pyrite in the leucocratic material and some bornite on what Microscopic Study appears to be a small fracture

Mineralogy

Dark Patches	Light Patches
Clino Pyroxene - Augite?	Plagioclase Feldspars An < 20
Amphiboles (1) Fibrous & Interstitial to pyroxene Tremolite(?) (2) Fibrous and rimming pyroxenes (Uralite?)	K-Feldspars - Microcline crossed twinning - some with graphic texture
Chlorite - alteration of Amphiboles - contains rutile needles.	Quartz - occasional quartz grain - Tiny veinlets of quartz
Epidote Smaller grains 1/4 size of pyroxenes	Hornblende occasional grain
	Chlorite + Epidote clots after Hornblende?
Opaques - scattered ragged grains of magnetite & possibly some specularite (Ilmenite)	Opaques - scattered subhedral Pyrite grains.

Mineral Phases (XRD)		





Texture

~~Pyx → Hbe → Chlorite~~

Mosaic intergrowth resembles an intrusive rock more than a recrystallized vole

Intrusive Mosaic texture broken up by late quartz veins.

Alteration

Pyx → Hbe → chlorite
Probably associated with intrusion of leucocratic

Feldspar (minor) → white micas

Essentially unaltered

Comments Material

334 FRANCIS ROAD
RICHMOND, B.C.

TEL. (604) 277-0544

D. L. COOKE, PH.D., P.ENG.
CONSULTING GEOLOGIST

PETROGRAPHIC REPORT

NUMBER: #27 LOCALITY: DATE: August 18, 1972

NAME AND CLASSIFICATION: PYROXENITE WITH GRANITE DIKE

MEGASCOPIC DESCRIPTION: Dark mafic material is dissected by leucocratic feldspathic dike material. Minor bornite occurs in the leucocratic section.

MICROSCOPIC DESCRIPTION:

Minerals	%	Remarks
1. Pyroxene	85	Augite occurs in the form of subrounded, close-packed unaltered crystals.
2. Hornblende	11	Small amounts of green hornblende form rims on the pyroxene and fill interstitial positions.
3. Alkali Feldspar	2	Interstices are also occupied by alkali feldspar and quartz.
4. Quartz	1	Small equigranular quartz grains are associated with the interstitial alkali feldspar.
5. Magnetite	1	Anhedral grains occur throughout.
6. Apatite	Tr.	Small apatite crystals are to be found in the interstitial positions.
7. Sphene	Tr.	Crystalline sphene rims magnetite grains.
DIKE:		
1. Microcline Perthite	60	Anhedral grains are similar to those in Section #23.
2. Plagioclase	15	Finely twinned plagioclase is sodic in composition.
3. Quartz	15	Equigranular quartz occurs in the groundmass.
4. Hornblende	5	Small hornblende crystals exhibit pleochroism.
5. Biotite	2	Brown biotite occurs near the dike margins.
6. Leucoxene	2	Granular leucoxene is evenly dispersed.
7. Magnetite & Apatite	1	Accessory amounts are present.

TEXTURE: The close-packed pyroxene grains give the section a massive texture. The dike is granitic in composition, but its texture is similar to Section #23.

CONCLUSION:
The pyroxenite is probably intrusive in origin. It has been intruded by syenite to granite dikes. Alteration is of minor consequence.

PETROGRAPHIC DESCRIPTION

WORK DONE	
H.S.	X
T.S.	X
Stain	X
XRD	
XRF	
Photo	

Specimen Number: #28

Locality: Collector: F. G.

Identity A highly altered mafic rock. It may have once been a gabbro but I can't identify it in the hand specimen - thin section

Hand Specimen Description

Dark green coarse grained (5mm) rock. Grains of amphibole & pyroxene(?) in a light grey-green matrix. Centres of the phenocrysts are sometimes chloritized and epidotized. There are cross cutting and apparently open space filling quartz veinlets and occasional clots of carbonate. There are also occasional grains of chalcopyrite.

Microscopic Study

Mineralogy

Phenocrysts

Pyroxene - clinopyroxene cores and amphibole rims.

Amphibole - 2 Hornblendes
- one clear
- the other altered
- 1 Tremolite with P.F. in late veinlets.

Carbonate - clots of carbonate which appear secondary - Carbonate as a constituent of alteration.

Epidote and Chlorite - as alterations of Hornblende

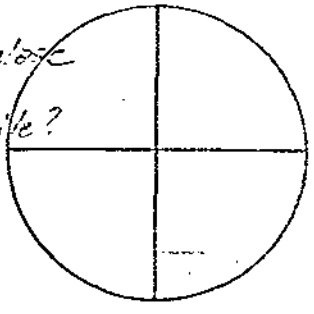
Veinlets

Plagioclase An < 20 - as late open space fillings. - with tremolite

Scapolite(??) a few tiny grains with plagioclase in late veinlets.

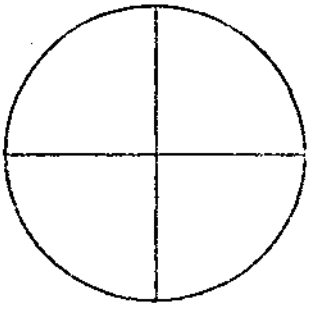
Opaques - occasional subhedral grain Pyrite?

Mineral Phases (XRD)		



Texture

Porphyritic



Alteration

Comments

① Apparently started with a rock of Clinopyroxene and Hornblende

② Hydrothermal Alteration: brought the veinlets of P.F. + tremolite and possibly the alt. of the pyroxene → Hornblende & Hornblende → Epidote + Chlorite happed at this time.

③ Carbonate is with P.F. + Tremolite in late veins but it may be a later stage of alteration

334 FRANCIS ROAD
RICHMOND, B.C.

TEL. (604) 277-0341

D. L. COOKE, PH.D., P.ENG.
CONSULTING GEOLOGIST

PETROGRAPHIC REPORT

NUMBER: #28 LOCALITY: DATE: August 18, 1972

NAME AND CLASSIFICATION: ALTERED PYROXENITE

MEGASCOPIC DESCRIPTION: The specimen consists of interlocking mafic crystals and interstitial feldspar (?).

MICROSCOPIC DESCRIPTION:

Minerals	%	Remarks
1. Hornblende	40	Subhedral grains, rims on, and replacements of pyroxene crystals account for the predominance of green hornblende.
2. Pyroxene	30	Some intact crystals and remnant grains appear to be augite. Alteration to hornblende is common.
3. Plagioclase	8	Minor amounts of ~~alkali-plagioclase occur in the inter-~~ stices between pyroxene and hornblende grains.
4. Epidote	7	Epidote is a characteristic associate of the interstitial minerals.
5. Biotite	7	Pale brown biotite flakes ~~are~~ in close association with epidote.
6. Carbonate	4	Irregular patches of carbonate occur within hornblende and pyroxene grains.
7. Apatite	2	Numerous apatite needles occur throughout.
8. Leucoxene	2	Streaks of granular leucoxene occur with the interstitial minerals.

TEXTURE: The hornblende and pyroxene grains are closely interlocked, resulting in a felted to massive structure. Interstitial and accessory minerals are of secondary importance. They are moderately course grained.

CONCLUSION:

Alteration is of a deuteric nature, and has resulted in the conversion of some pyroxene to hornblende. Epidote, carbonate and leucoxene are also secondary. The rock is intrusive and it was originally a pyroxenite.

PETROGRAPHIC DESCRIPTION

WORK DONE	
H.S.	X
T.S.	X
Stain	X
XRD	
XRF	
Photo	

Specimen Number: 29

Locality: Collector: F.G. ?

Identity Between a Quartz Monzonite and a Monzonite depending on how much of quartz in the little clumps is primary.

Hand Specimen Description

The specimen is a dark medium grained porphyritic rock with phenocrysts of feldspar and quartz in a very fine grained dark matrix. There are cross cutting epidote veinlets which are cross-cut in turn by a quartz vein. The quartz vein appears to have some carbonate in the centre. There is disseminated pyrite throughout the specimen.

Microscopic Study

Mineralogy

Phenocrysts

Plagioclase An < 20
Occasional flecks of white mica.

Quartz Occasional clumps of quartz grains

Matrix

K-Feldspar - occasionally get rims & veinlets x P.F. phenos

Amphibole
Hornblende? slightly chloritized.

Epidote - scattered grains

Opaques
Euhedral cubic crystals Pyrite?
with Mafics in matrix
Clumps of quartz grains

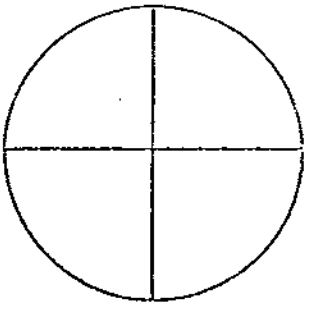
Veinlets
(1) Epidote.
(2) Quartz - cross cut earlier epidote veinlets - occasionally have a tiny veinlet of carbonate on the centre line

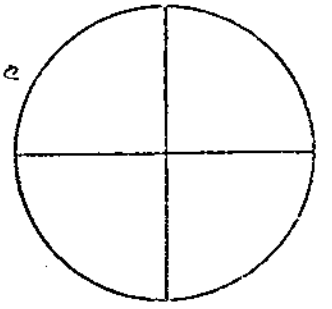
Texture
Porphyritic

Alteration - Slight
Plagioclase → tiny amounts of white mica
Hornblende → somewhat chloritized + epidotized.

Comments

Mineral Phases (XRD)		





PETROGRAPHIC DESCRIPTION

WORK DONE	
H.S.	X
T.S.	X
Stain	X
XRD	
XRF	
Photo	

Specimen Number: 30

Locality: Collector: F. G

Identity The specimen appears to be a skarnified mafic rock possibly a volcanic fragmental originally.

Hand Specimen Description

The specimen is a dark green mafic rock containing abundant epidote and some magnetite. The rock is moderately magnetic. The specimen is cross-cut by veinlets of pyrite and carbonate.

Microscopic Study

Mineralogy

Pyroxene - cores surrounded by hornblende & chlorite rims.

Amphiboles
- Hornblende - scattered grains.
- Tremolite - surrounds & veins the pyroxene grains

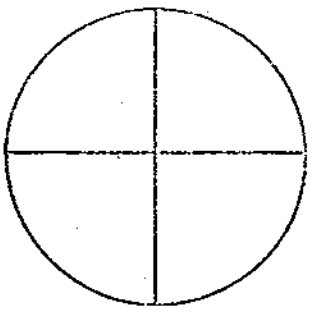
Epidote mass of medium sized grains which makes up the bulk of the rock.

Quartz There are occasional angular chunks of quartz which resemble fragments.

Carbonate calcite - late cross-cutting veinlets.

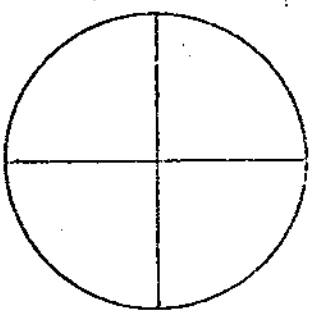
Opaques
(1) Ragged crystals of Magnetite occasionally have red margins suggesting some specularite
(2) Subhedral grains - pyrite

Mineral Phases (XRD)		



Texture

Mosaic intergrowth resembles a recrystallized rock.



Alteration

Pyroxene → chlorite & Epidote
Magnetite & Epidote, added
Carbonate added.

Comments

PETROGRAPHIC DESCRIPTION

H.S.	X
T.S.	X
Stain	X
XRD	
XRF	
Photo	

Specimen Number: 31

Locality: Collector: F. G.

Identity Skarnified rock I have no idea what it used to be.

Hand Specimen Description

The specimen is a light grayish green coloured rock which is highly weathered. It is composed of mainly of feldspar and epidote. There are disseminated grains of magnetite (moderately magnetic) and hematite. The specimen also contains abundant limonite apparently after sulphides. There is also a crust of malachite on one surface.

Microscopic Study

Mineralogy

Plagioclase Feldspar - both phenos & matrix
< An 20 - makes up the bulk of the rock.

Epidote grains disseminated through the matrix.

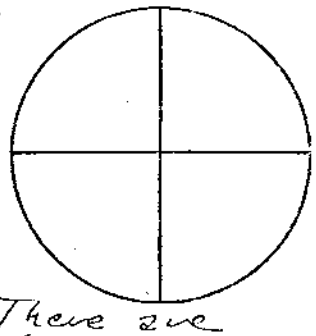
Amphibole - very fibrous probably tremolite - possibly after another Amphibole or Pyroxene.

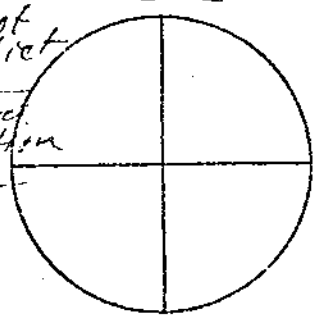
Quartz - a few grains in the matrix

Carbonate late veinlets usually with epidote

Opaques
Hematite: Ragged grains with bloodred halos.
Magnetite Subhedral grains.
Pyrite?? occasion euhedral cubic grain could be magnetite.

Mineral Phases (XRD)		





Texture

A little hard to say as section is about 50% holes.
Apparently a recrystallized rock with a rough mosaic intergrowth. There are occasional large subhedral grains of plagioclase which may be relict phenocrysts

Alteration

- Rock has been skarnified & weathered

Comments

The only post skarn hydrothermal alteration is the veinlets of carbonate + epidote

PETROGRAPHIC DESCRIPTION

WORK DONE	
H.S.	X
T.S.	X
Stain	X
XRD	
XRF	
Photo	

Specimen Number: 32

Locality: Collector: F. G.

Identity Rhyolite? — Quartz Latite? ?

Hand Specimen Description

The specimen is a very fine grained creamy coloured rock. There are small brownish patches of brown (limonite) stain and dendritic growths of a steel grey mineral (one of the Manganese minerals perhaps).

Microscopic Study

Mineralogy

Coarser Grains (Phenocrysts or fragments)

Quartz slightly resorbed along the margins.

Plagioclase

An < 20

Slightly sericitized

Very Fine Grains Matrix

Silic Feldspars (Plagioclase). < Balsam

White Mica

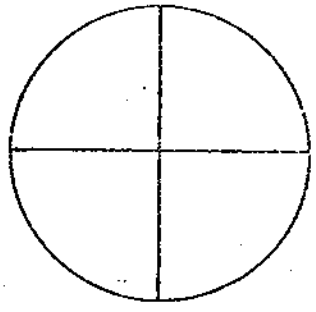
Quartz

Epidote or Zoicite.

Mineral Phases (XRD)		
	—	

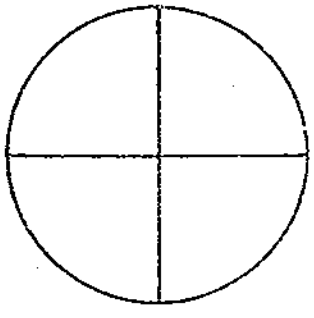
Texture

Porphyritic? phenos or crystal fragments in a very fine grained matrix which shows mosaic intergrowths



Alteration

Minor white mica on the feldspars



Comments

It's very difficult to estimate percentages of minerals present in the fine grained matrix. I would guess that the composition of this specimen is between a quartz latite — rhyolite. Texturally it looks more like a chilled margin than a volcanic

Specimen Number: 54

Locality: Collector:

Identity Lattke or Monzonite Dyke or Sill

T.S.	X
Stain	X
XRD	
XRF	
Photo	

Hand Specimen Description

The specimen is a porphyry with a strange leathery texture. The phenocrysts are long slender grains of amphibole in a light grey fine grained matrix. There are also occasional clots of epidote in the matrix. There are occasional very fine grains of sulphide disseminated throughout the matrix.

Microscopic Study

Mineralogy

Phenocrysts

Amphiboles - Tremolite - Actinolite series
- Lacks preferred orientation.
- some grains are partially replaced by clots of ~~chlorite~~ epidote

Matrix

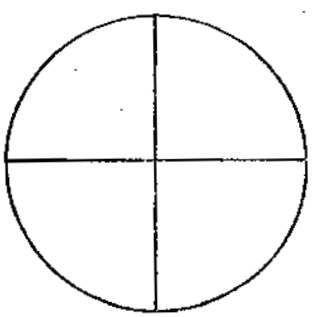
Plagioclase - An < 20
Amphibole needles - Tremolite?
Epidote grains.
Occasional Quartz grains.

Opaques

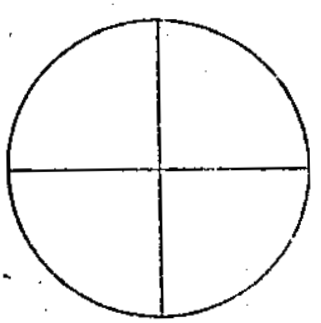
~~Hematite?~~ - subhedral grains with red rims.

Pyrite scattered subhedral grains.

Mineral Phases (XRD)		



Texture Porphyritic
- lack of alignment of phenocryst grains in matrix suggests a dyke or sill rather than a flow.



Alteration
Amphibole → Epidote } Very minor Alteration

Comments

Specimen Number: 61 - Similar to 9

Locality: Collector: F.G.

Identity Quartz Monzonite

T.S.	X
Stain	X
XRD	
XRF	
Photo	

Hand Specimen Description

Light pink coloured porphyritic rock. Phenos of slightly altered plagioclase and quartz in a very fine grained pink matrix. A black metallic mineral, probably a manganese mineral, occurs as dendritic growths along hairline fractures

Microscopic Study

Mineralogy

Phenocrysts

Quartz usually several crystals in each phenocryst
- minor amounts of resorption around the margins

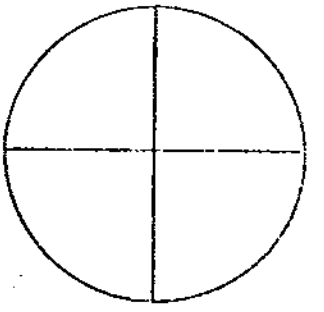
Plagioclase
- grains of both twinned and untwinned
- An < 20
- minor amounts of white mica on the grains.

Matrix
Quartz.
Plagioclase with white mica.
Hornblende - occasional grains.

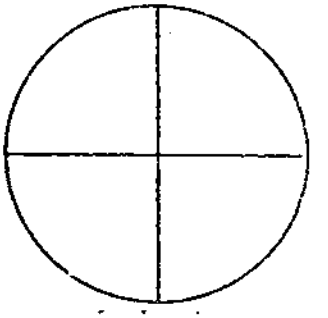
Opaques
Very fine irregular grains of hematite in the matrix give the rock its colour

Texture
Porphyritic

Mineral Phases (XRD)		



Alteration
Minor white mica on plagioclases



Comments

SUSAN LAKE

JUDY LAKE

ROGER LAKE

LINE 2 W
LINE 1 W
LINE 5 LEFT
LINE 00
LINE 0 RIGHT
LINE 1 E
LINE 2 E
LINE 3 RIGHT

42 N
34 N
26 N
18.5 N

EAGLE CREEK

Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 4496 MAP #2

TO ACCOMPANY
GEOLOGICAL, GEOCHEMICAL &
GEOPHYSICAL REPORT
JULY CLAIMS 1-34

F.R. GATCHALIAN 26 JULY TO 10 DEC., 1972

FIG. 2

4496
M2

UTAH MINES LTD.
MINERAL EXPLORATION & DEVELOPMENT DEPARTMENT
VANCOUVER BRITISH COLUMBIA

JULY CLAIMS

GRID LINE LOCATIONS

Work by F.R.G.	Date April 23 - 1973	NTS Ref
Drawn by C.D.	Revised	MAP of

500 0 1000

SUSAN LAKE

JUDY LAKE

ANOM. No. 3

ANOM. No. 2

ANOM. No. 1

ANOM. No. 4

ANOM. No. 5

ANOM. No. 6

42 N

34 N

26 N

18.5 N

LINE 2 W

LINE 1 W

LINE 5 LEFT

LINE 00

LINE 8 RIGHT

LINE 1 E

LINE 2 E

LINE 5E RIGHT

R O G E R L A K E

LEGEND:

Background - 0 - 50 ppm

Threshold - 51 - 90 ppm

Anomalous - 291 ppm

TO ACCOMPANY
GEOLOGICAL, GEOCHEMICAL & GEOPHYSICAL REPORT
JULY CLAIMS 1-34

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Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 4496 MAP #5

FIG. 5

UTAH MINES LTD.
MINERAL EXPLORATION & DEVELOPMENT DEPARTMENT
VANCOUVER, BRITISH COLUMBIA

JULY CLAIMS
GEOCHEMICAL SOIL SURVEY
Cu in ppm

Work by F.E.G. | Date April 26 - 1973 | NTS Ref.
Drawn by J.C. | Revised | MAP of

4496-M5

SUSAN LAKE

JUDY LAKE

ROGER LAKE

M.I. 92P-125

M1 92P-112

DDH-3

DDH-2

DDH-1

LEGEND:

- Quartz - Monzonite
- Quartz Diorite Porphyry
- Mafic & Intermediate (Gabbro - Diorite & Porcanite)
- Granodiorite / Granodiorite Porphyry
- Syenite or Granite (Dyke)
- Latite (Dyke) Pyroxenite (Dyke)
- Rhyolite (Dyke?)
- Breccia (Consort?)
- Andesite / Andesite Porphyry (Dyke)
- Schistose (Meta-Volcanic)

SYMBOLS

- Orthoclase Veins
- Quartz Veins
- Sulfide Veinlets & Disseminated
- Thin Section Made
- Attitude of Schistosity
- Attitude of Joints
- Minor Fractures
- Faults, Defined & Assumed
- Geological Contact, Defined & Assumed
- Proposed Drill Location Showing Angle & Trend
- Claim Post
- Swamp

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GEOLOGICAL, GEOCHEMICAL & GEOPHYSICAL REPORT
JULY CLAIMS 1-34

F.J. GAUDREAU 26 JULY TO 10 DEC., 1972

Department of Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 4496 MAP #4

FIG. 4

UTAH MINES LTD.
MINERAL EXPLORATION & DEVELOPMENT DEPARTMENT
VANCOUVER BRITISH COLUMBIA

JULY CLAIMS
GEOLOGY

SUSAN LAKE

JUDY LAKE

ROGER LAKE

LINE 2W

LINE 1W

LINE 5 LEFT

LINE 00

LINE 8 RIGHT

LINE 1E

LINE 2E

LINE 3B RIGHT

42 N

34 N

26 N

18.5 N

EAGLE CREEK

TO ACCOMPANY
GEOLOGICAL, GEOCHEMICAL &
GEOPHYSICAL REPORT
JULY CLAIMS 1-34

J.K. GATCHALIAN 26 JULY TO 10 DEC., 1972

FIG. 7

LEGEND:

INSTRUMENTATION:
JALANDER - Model 1957
Contour Interval 500 Gammas
Area of High Magnetic Susceptibility >9000 Gammas
Instrument Operator - D. Beal

Picket Lines
Isomagnetic Contours
Magnetic Depressions
Fault
Swamp

UTAH MINES LTD.
MINERAL EXPLORATION & DEVELOPMENT DEPARTMENT
VANCOUVER BRITISH COLUMBIA

JULY CLAIMS

MAGNETIC SURVEY

Work By: E.R.E.	Date: April 27 - 1973	NTS Ref.
Drawn By: C.P.	Revised	MAP of