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MOUNT NANSEN PROJECT #158

PROGRESS REPORT #1

FOR PERIOD JUNE 1-30, 1970

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INTRODUCTION:

The work program proposed for the evaluation of the Mt. Nansen property includes; road repair, line-cutting, claim location, soil sampling, ground geophysics, geological mapping, trenching, and drilling. A six man crew of Cyprus personnel arrived at the Mt. Nansen Mine site on May 30th to begin this program. To date, several phases of this comprehensive program are completed in the area of coincident geological, geochemical and aeromagnetic anomalies located at the north end of the Mt. Nansen property.

ROAD ACCESS & REPAIR:

A 5 mile, 4-wheel drive road traverses from the Mine site across the saddle between Discovery and Back Creeks, crosses the East Fork of Nansen Creek and continues north to the end of the Mt. Nansen claims. Mr. T. Wheeler of Carmacks built this road in the fall of 1970 to provide access to a placer claim located on the East Fork of Nansen Creek, and also a mineral claim block which is adjacent to, and N.W. of the Mt. Nansen holdings. This road, because of its central location, provides excellent access to the grid and surrounding area. It takes 20-25 minutes to drive from the mine site to the East Fork. Five man days were spent ditching several mud holes along the route and a culvert was put in at the East Fork crossing. The road will greatly increase the mobility of IP and drill crews. In addition, 2 man days were spent repairing a 10 ft. washout on the 40 mile all weather road leading from the mine site to Carmacks. This washout occurred at the 31 mile mark and was due to a period of very heavy rainfall.

LINE-CUTTING:

A total of 51 miles of line have been picketed over the anomalous areas. Of this total, it was necessary to cut out only 23½ line miles. Two line cutters, Andre Leblanc and Leopold Laramie, were contracted to cut and picket 23½ miles while the rest of the grid was completed by Cyprus personnel. The line cutters finished this contract in 11 days for an average of 2 miles per day. Room and board was supplied to them for this period. A contract price for the 23½ line miles will be forwarded to the Vancouver office by

the line cutters.

The grid baseline extends 30,000 ft. NW-SE across the property. At the northern end of this baseline 22 cross lines are at 800 ft. intervals and stations are marked at 200 ft. spacings with fluorescent laths. These cross lines extend over a quartz-feldspar porphyry intrusive and its perimeter. At the south end of the baseline 6 similarly marked lines extend 5000 ft. to the S.W. of the baseline. These lines cover a porphyritic granite intrusive and its perimeter. Fill-in lines will be picketed midway between the cross lines as needed. A copy of the two grids has been sent to the Vancouver office.

CLAIM LOCATION SURVEY:

Most of the Mt. Nansen claims that cover the grid area have been located. Claims located include Dome 29-31, and Dome 41-72. A plot of these posts shows that only minor internal fractions occur. It appears the Betty Group on the N.W. corner of the property has not been tagged and further work is being carried out to formulate a north and west claim boundary.

Although several days have been spent in an effort to locate ME 11-14 and YAL 13 posts belonging to Silver Standard Mines Ltd., no satisfactory results have been obtained. Initially the ME group was staked as a large block and 4 posts should occur together along a E-W or N-S claim line. Although approximately 20 tagless posts have been located, no such configuration has been resolved. Continuing work will be carried out in an effort to locate these posts.

GROUND GEOPHYSICS:

1) Magnetometer Survey

A magnetometer survey (MF-2 fluxgate) was begun on June the 8th under the direction of Mr. G. McMillan (Peter Walcott and Associates). Readings were taken at 100 foot stations and detailed across anonmalous zones. The entire north grid was completed by June 18th. Still remaining are cross lines 32-72 of the south grid. Profiles have been plotted and a contour map nears completion.

95% of the grid area is covered by overburden, and the

magnetometer survey results were found to be very useful in delineating contacts, possible faults and/or dykes in conjunction with float mapping and photogeology. The survey is especially useful in delineating the porphyritic stock which shows as a consistent magnetic low surrounded by magnetic granodiorite, diorite, and volcanics.

At present an effort is being made to compare the magnetic results with zoned hydrothermal alteration and possible magnetite zones within the porphyry stock.

2) IP Survey

Peter Walcott and Associates have been contracted to do an Induced Polarization Survey over the grid area. On June 14th Mr. Walcott attempted to begin the survey. However, a conductive near surface layer of frost impeded depth of penetration and a decision was made to wait until the Cat had bladed frost "windows". These windows have now been completed and foil and salt electrodes are being placed into these sites after geo-chem sampling. Approximately 100 electrodes have been prepared by Cyprus personnel.

3) EM-16 Survey

(Please find attached a report prepared by R. Savidge.)

GEOCHEMISTRY:

On May 31st Mr. B. Smee of Barringer Research Limited performed an orientation soil survey on the Mt. Nansen ground. The purpose of this survey was to:

a) test the geochemical characteristics of soil at various depths in an unglaciated and permafrost environment.
b) determine an appropriate method of analysis for Copper and Molybdenum.
c) determine the best method of soil collection.

23 sample sites were located at 100 foot stations along a line trending S.W. Sample number one of this survey was taken in the proximity of Line 216N-177W while sample number 23 was taken near Line 216N-200W. Three samples were taken at each site. One sample

near surface, one sample at a depth of approximately 8 inches, and one sample in a frost-permafrost zone. The results indicated that since coppervalues increased with depth, soil samples should be collected well within the permafrost zone, and also below a volcanic ash horizon that overlies the Mt. Nansen property. This volcanic ash horizon lies 3-12 inches below surface and was found to inhibit the absorption of copper ions.

A D-7E Cat equipped with ripper has been contracted from Carmacks Construction Corp. Ltd. to rip sample sites at the 200 foot stations. At each station a 10 foot square area of moss and surface rubble is bladed off followed by two parallel ripper cuts. This method allows a soil sample to be taken at a depth of approximately 2 feet or greater, well within the permafrost horizon. Only 2% of the grid area cannot be reached by the Cat. These steep areas have been sampled using a mattock. 1,200 sample sites have been prepared using the Cat in a period of 119 hours. The Cat has been contracted for $30 per hour with all fuel, oil, etc. supplied by the operator. Soil samples can be collected from the trenches at a rate of 55 samples per man per day. This is 3 times more than can be collected with a mattock.

The samples are dried at room temperature at the camp and sent to the Barringer Research Ltd. laboratory in Whitehorse. The samples are being run for copper and molybdenum using Atomic Absorption Spectrometry. Copies of the results will be sent to the Vancouver office.

Geochem results returned have been plotted completing lines 152N through 208N. The highest anomalous value for copper is 885 ppm while the high for molybdenum is 145 ppm. The main anomalous zones are found at the ends of lines 160N, 168N, 176N, 184N, and 192N. Also included are lines 216N and 224N from stations 176W to 164W. These anomalies correspond with anomalous copper-moly zones located by Dr. Branconi and Dr. Saager during a 1970 soil survey. The anomalous zone located on lines 224N and 216N is just at the edge of an intense sericitic alteration zone which extends across line 232N. It will be interesting to receive the results for line 232N.

GEOLOGY:

A geologic map has been prepared by P. Lewis and R. Dickinson. This map shows the main rock units located in the area of the north and south grids. P. Lewis has submitted a progress report on the investigations to date (please find attached). Still to be mapped in this fashion is the S.W. portion of the property.

A detailed study of the porphyry stock and its immediate perimeter is now being undertaken in an effort to locate zones of hydrothermal alteration, silicification, pyritization, and fracturing.. Rock samples taken from the grid are being assessed under a binocular microscope. The study is being hampered by supergene alteration.. However, three distinct types of hydrothermal alteration have been recognized within the quartz-feldspar porphyry. These are propylitic, argillic (kaolinization), and quartz-sericite. Geochem data plotted to date indicates that anomalous copper and molybdenum values are and will be associated with sericitic alteration and silicification.

Disseminated and fracture filling pyrite is found over large areas of the stock. Limonite is found as vug fillings and as staining through the host rock. Most of the limonite appears to be of a transported (pyrite) nature. Limonite is being precipitated in all creeks leading from the porphyry intrusion especially the East Fork, Discovery Creek, and Eva Creek. Encouraging, but minor, malachite/azurite staining has been observed near Line 216N at stations 174W and 184W.

SUMMARY OF PROGRESS:

From EM, geochemical and geological data obtained to date, two anomalous zones have been located. They occur on a quartz-feldspar porphyry stock at the north end of the Mt. Nansen property. One zone is found near the north ends of lines 160N through 192N. The other is located between the South and East Forks of Nansen Creek. EM anomalies are coincident with geochem anomalies in these areas. Geochem values run as high as 885 ppm copper and 145 ppm molybdenum in these zones. Threshold values appear to be 100 ppm copper and 10 ppm molybdenum. Both occur near zones of intense hydrothermal alteration and silicification. Minor malachite and azurite is also found in these areas. Further data is being compiled in an effort to delineate these anomalous zones.

MOUNT NANSEN CLAIMS

ELECTROMAGNETIC SURVEY REPORT

FOR

AREA EXPLORATION CORPORATION LTD.

Project 158

June 1971

By

R. Savidge

ELECTROMAGNETIC SURVEY

INTRODUCTION

During the month of June 1971, approximately 45 line miles of electromagnetic survey were done in the Mount Nansen area of the Yukon Territory, using the Ronka EM-16. This electromagnetic survey constitutes one phase of the exploration program being performed by Area Exploration Corporation over a portion of the mineral claims held by Mount Nansen Mines Ltd. in the search for an Arizona-type porphyry copper-molybdenum deposit.

METHOD OF SURVEY

The electromagnetic survey was done using one transmitting station--NLK/NPG, which is located at Jim Creek, Washington. The survey was performed over an established grid with a baseline length of 16,800 feet. Distance between survey lines is 800 feet; the lines are picketed every 200 feet. EM readings were normally taken at 100-foot intervals along these lines, and in some anomalous areas readings were taken at 50-foot or 25-foot intervals; all distances for reading stations between picket stations were paced. All readings were taken with the operator facing approximately at a 235 degree azimuth. The survey lines are for the most part oriented at a 225 degree azimuth, giving a 10 degree acute angle effect between reading direction and survey line direction. This effect may be considered insignificant for interpretation purposes except in cases where a survey line may come within a few feet of the end of a conductive area.

Because topography has an appreciable effect upon the results obtained using the Ronka EM-16, at each reading station slopes along the survey lines and true topographical slopes were measured and recorded in percentages with the EM-16 inclinometer. For survey-line slopes, if the operator was facing uphill or downhill when taking a reading, the slope was recorded as "up" or "down," respectively.

The geological structural trend in this area appears to be predominantly NW-SE, making the instrument orientation used good for determining dyke-like conductors.

ACCURACY OF MEASUREMENTS

A monotonic speaker was used for approximately the first half of the survey. Using this device, the readings are accurate within ±2%. An earplug was used for the latter part of the survey, and these readings are accurate within ±½%. Nulls were sharp at all times.

PERSONNEL INVOLVED

One man, the writer, was used for the performance of the survey and its compilation. Three men assisted in the compilation of the data which was used to draw up the electromagnetic contour maps using D. C. Fraser's method and an arithmetic "smoothing" method. Approximately four line miles of survey were read per man day. Total man days for each facet of the survey are given below.

Field Survey	11 Man Days
EM Profile Maps	3 Man Days
EM Contour Maps	
Fraser Method	3 Man Days
Arithmetic Method	3 Man Days
Data Compilation	3 Man Days
Report Writing	1 Man Day
Complete EM Survey and Compilation	24 Man Days

COMPILATION OF RESULTS

I. GENERAL

With the idea of aiding the interpretation of the results, three different methods of presentation have been utilized. These are in the form of in phase and quadrature (out of phase) profiles, the D. C. Fraser method of in phase reading contours, and an arithmetic method of in phase reading contours.

II. PROFILE PRESENTATION

The EM results, both in phase and out of phase, have been profiled at a scale of 1 inch equals 10% with a horizontal scale of 1 inch equals 200 feet. Topographical features such as creeks, hilltops, and slopes are shown. The main transportation roads crossing the grid area are also shown. Slope arrows show the direction of downhill slope with accompanying percentage. Slope arrows parallel to and below the survey (reference) lines show the slopes as they may affect the EM readings. Slope arrows cutting the reference line show direction and steepness of true topographical slopes. Where the true topographical slope is the same as the instrument track slope, this is indicated above the reference line with the initials "S.S.A.L.S.M." (slope same as line slope measurement).

COMPILATION OF RESULTS (cont.)

III. CONTOUR PRESENTATION - "FRASER METHOD"

The method described by D. C. Fraser ("Contouring of VLF-EM Data" from GEOPHYSICS, Vol. XXXIV, No. 6, December 1969) is designed to filter the in phase results as follows:

"1. ...phase shift dip-angle data by 90 degrees so that crossovers and inflections will be transformed into peaks to yield contourable quantities.

2. ...completely remove dc and attenuate long spatial wavelengths to increase resolution of local anomalies.

3. Maximum amplitude occurs for wavelengths of 250 feet, or five times the station spacing."

By using this method, "the spatial wavelengths which result from..." mountainous regions "...are greatly attenuated by the filter and generally do not appear on the contoured maps." "The filter operator described herein uses the first difference (i.e., the discrete first derivative) as one of its components."

"The filter also amplifies anomalies from near-surface, highly conducting ore pods..."

In utilizing the Fraser method for this survey, the following data compilation was done. Only in phase data was used, always working from the northeast end of a line to the southwest end. If ABCD are four consecutive 50-foot readings, a contourable quantity falling midway between B and C is obtained by the following method: (A+B)-(C+D). Where readings were not taken at 50-foot intervals, they were interpolated from the 100-foot readings. Only positive values have been contoured, beginning with 1, then to 10 and thereafter 5 integer jumps. Negative values normally do not represent conductive zones.

This plate has been scaled at 1 inch equals 400 feet.

Faults mapped over this area by P. Lewis and R. Dickenson for this survey mainly from photogeological interpretations have been accurately transposed from the geology map to this contour map to assist in interpretation.

IV. CONTOUR PRESENTATION - "ARITHMETIC METHOD"

This method is designed to "smooth" the results. Contourable quantities have been obtained by adding the in phase readings at four consecutive 100-foot stations and finding their average. This average result falls midway between the second and third readings. Both positive and negative values have been contoured, with 5-integer contours between -10 to +10 and thereafter 10 integer contours. This plate is scaled at 1 inch equals 400 feet.

INTERPRETATION OF RESULTS

A great number of conductors of all classes and amplitudes have been obtained in this survey, indicating the area to be well mineralized. As there are so many conductors, no attempt to discuss each individually will be made. Most of the conductors obtained are of the fault-vein-contact type.

A Geonics Ltd. (Toronto) manufactured Ronka EM-16, number 250, was used for this survey. The writer has used two other Ronka EM-16 units in the Mount Nansen area, and at the date of writing it has been determined that the quadrature component of the instrument used for this survey gives radically different results over known veins previously surveyed with the other two instruments. This would cause the interpretation of conductors to be questionable as regards conductive overburden, good conductivity, poor conductivity, etc. However, it is believed that this malfunction has no effect upon the in phase results.

There are at least two areas which have given good sized "horizontal-body" type responses. These fall in the central northeast to northeast portion of the grid, and in the central western portion of the grid. These areas are giving wide, low amplitude responses which are definitely conductive and not due to topographical effects solely.

In the interpretation of the EM profiles, topographical effects must be considered. "In mountainous terrain, in the ground is conductive the profile will be distorted in the direction of the ground surface." (from "Five Years Of Surveying With The Vlf - E.M. Method" By Norman R. Paterson and Vaino Ronka, presented at the 1969 annual international meeting, Society of Exploration Geophysicists). After taking topographical effects into consideration, one will recognize that the two above mentioned zones are definitely conductive. In profile form, these areas are generally characterized by horizontal-conductor "curves," i.e., a half-crossover on each edge of the conductive body with a relatively flat, somewhat erratic curve above the conductor. The erratic nature of the curve over a conductive zone could be caused by differences in conductivity; e.g., differenes in the concentration of mineralization.

A large part of the grid area contains disseminated pyrite and veinlets of pyrite at surface, which may explain the responses over these two wide areas. From the geology, it would appear that there are numerous faults and fractures in these two areas of interest, and the assumption that many of these are mineralized may be a plausible explanation for the erratic small amplitude responses in these areas.

The 800-foot separation between survey lines has made an accurate interpretation unfeasible.

INTERPRETATION OF RESULTS (cont.)

The interpretation of these two main areas of geophysical interest is apparently not facilitated by using the Fraser method of contouring. Theoretically, by using this method, a horizontal-body type conductor of homogeneous conductivity would be characterized by a positive (conductive) zone on each edge of the conductor with a zero value above the conductive zone. In this survey, the two main areas of interest, when compared with the EM profiles, are usually characterized by positive values over each edge of the conductive zone with small (approaching zero) negative or positive values above the conductive zone. The small positive values should represent zones of increased conductivity relative to the small negative values. However, it is believed that topography, e.g., over one hill, though a basin, and over another hill, could give rise to a similar type of response. When the entire survey is considered, by using the Fraser method, the wide area of small positive values in the central western portion of the grid is the most interesting and would seem to represent a wide area of nearly uniform relatively good conductivity.

The writer has had no previous experience with the arithmetic contour method; therefore an attempt at interpretation will not be made, other than to point out that topography shows up well with this method, characterized by positive values as a slope is ascended from northeast to southwest, zero values on hill tops, and negative values when a slope is descended. Any deviation from the above, when the results have been compared with the topography, should prove conductive.

In this exploration program, the following information taken from "VLF-E.M. Data Processing" by D. C. Fraser, Geophysical Engineering and Surveys Ltd. and Keevil Mining Group Ltd., Preprint, April 1970, CIM Annual Meeting, Toronto, is perhaps significant: "...cupriferous breccia pipes of the Tribag mine near Batchawana, Ontario, yield strong IP anomalies but not VLF-EM anomalies, illustrating that disseminated ore targets should be sought with IP rather than VLF-EM." Also, "A truly disseminated copper deposit will not provide a VLF-EM anomaly but will yield a large IP effect..."

CONCLUDING REMARKS

An electromagnetic survey using a Ronka EM-16 at a near perpendicular to the expected structural strike has defined numerous areas of conductivity, mostly of the vein-contact-fault type category, which this instrument is noted for defining accurately. At least two wide areas of poor conductivity have been found using this method, which may be caused by the disseminated pyrite mineralization which is widely evident at surface, or possibly by other forms of mineralization. The EM profiles viewed in conjunction with the topography would appear to be the most easily interpretated method of presentation. The Fraser contour method has outlined at least one large zone thought to be conductive which was not readily apparent from the profiles.

CONCLUDING REMARKS (cont.)

This survey should prove useful for geological mapping purposes, and it possibly would have been of more value had another transmitting station been used in conjunction with station NLK/NPG with a different (approximately perpendicular) primary field direction. This survey should serve as a useful and interesting "backup" to the results obtained through the geochemical, ground magnetic, geological, and induced polarization surveys over the same grid area.

It is planned to use the geochemical survey to delineate any veins in conjuction with this survey.

Respectfully submitted,

R. A. Savidge

R. A. Savidge

A REPORT ON THE GEOLOGY OF THE MT. NANSEN CLAIMS, YUKON

JUNE 1971

PETER LEWIS

FOR AREA EXPLORATION CORPORATION LTD.
PROJECT 158

INTRODUCTION

LOCATION AND ACCESS

The Mt. Nansen Claims lie approximately 30 miles west of Carmacks, Y.T., on the south-west flank of the Dawson Range between Nansen and Victoria Creeks. They occupy about 20 sq. miles. Access is by dirt track from Carmacks, which is on the Alaska Highway.

REGIONAL SETTING

The area is part of a north-west trending belt of Mesozoic to Tertiary calc-alkaline igneous activity. The igneous rocks intrude and overlie metamorphic rocks of uncertain age.

PREVIOUS WORK

The area was mapped by D. D. Cairns in 1914 and his work served as a basis for part of the G.S.C. 1: 250,000 Carmacks sheet compiled by H. S. Bostock between 1932 and 1934. Both were used by W. Walker in 1964 in producing a map of area for Mt. Nansen Mines Ltd.

PRESENT WORK

This report is the result of field work between June 4 and June 19, 1971, and accompanies a map.

REFERENCES

D. D. Cairnes, 1917, Map 151A Canadian Department of Mines.
H. S. Bostock, 1936, Carmacks District, Y. T., G. S. C. Mem 189.
W. Walker, 1964, Geology, Mt. Nansen Mines Ltd.

GENERAL GEOLOGY

PETROLOGY AND STRATIGRAPHY

YUKON GROUP

All rocks in the area with a definitely metamorphic fabric were included in the Yukon Group (Cairns). These rocks comprise metaquartzites, mica schists, gneisses, foliated igneous rocks and migmatitic rocks. Excepted are sheared granodiorite and quartz porphyry, a fissile horizon at the base of the Mt. Nansen Group and a diorite with a lineation in amphibole. No subdivision of the Group was attempted due to its complex structure and the limited exposure. The rocks are believed by Bostock to be early Palaeozoic, perhaps Pre-Cambrian, in age.

LINEATED DIORITE

Intrusive into the Yukon Group, and intruded by aplites of probable Tertiary age, is a coarse-grained diorite with strongly aligned amphibole. Contact specimens, not in sites, show the lineation, the contact, and the schistosity of Yukon Group metasediments to be discordant. Hence intrusion is post - Yukon Group metamorphism, but the origin of the lineation is uncertain. The rock shows a strong spatial association with Tertiary porphyritic granite and the possibility of a Tertiary age cannot be ruled out.

MT. NANSEN GROUP

The Mt. Nansen Group consists of Mesozoic volcanic and hypabyssal rocks of predominantly andesitic composition with minor more basic and acid varieties. All are porphyritic with phenocrysts of amphibole and/or plagioclase. Occasional quartz-feldspar porphyry dykes in the volcanics may be part of the Group, or may be Tertiary.

The basal members of the group are rich in inclusions of amphibole-plagioclase porphyry and minor metamorphic fragments. These rocks are believed to result from a combination of brecciation during flow and addition of country rock fragments prior to ~~extension~~ EXTRUSION.

The base of the Group is represented in the south of the area by a "volcanic conglomerate" - well rounded pebbles, cobbles and boulders of volcanics and minor metamorphics in an andesitic matrix, concordantly overlying a thin, fissile, fine grained horizon which in turn overlies a ~~nibble~~ RUBBLE of granitic augen gneiss.

Finely bedded tuff was noted at one locality near Victoria Mountain.

MESOZOIC INTRUSIVES

The whole area is apparently underlain by a north-west trending batholith of granodiorite. This is predominantly coarse-grained but extensive areas of fine - to medium - grained granodiorite were mapped at its margins. The area of marginal facies indicates that the present erosion level probably corresponds fairly closely to the roof of the batholith. The presence of outlier of volcanics, some in downfaulted blocks, supports this view.

TERTIARY INTRUSIVES

The granodiorite has been subsequently intruded by granitic porphyries of irregular geometry. These are characterized when fresh by large orthoclase phenocrysts - up to 1" long in quartz-feldspar porphyries with fine ground-mass and 2" in the granite porphyry in the south. The fine-grained varieties are generally badly altered by later hydrothermal activity. The relationship of the granite porphyry to a hornblende-rich, possibly lamprophyric, porphyry in the south (mapped as Mt. Nansen Group) is uncertain.

The hydrothermal activity was localized at the intersection of major fractures, and resulted in brecciation and silicification at these points. They now stand out as topographic highs and are surrounded by hydrous alteration zones. The map-unit "quartz-feldspar porphyry" probably includes magmatic porphyries as well as silicified and altered granodiorite. Hence its boundaries are diffuse and irregular.

Silicification has apparently permeated the roof of the intrusion as indicated by small silicified and brecciated areas in the volcanics and metamorphic rocks.

STRUCTURE

The Yukon Group is too complex structurally for any interpretation to be made with the given exposure. There is a suggestion of north-south structural trend in foliation and minor folds.

The volcanics appear to have shallow dips and variable strike probably resulting from the effects of later intrusion and block-faulting.

The batholith dips gently north-east under Victoria Mountain and south-west under Mt. Nansen.

In general the area has been block-faulted along N to NNW and NE to ENE trending fractures, the intersections of which appear to be the loci of hydrothermal alteration, probably becoming more intense and areally extensive with depth. For example, the dome above (N) Huestis is L-shaped having arms trending ENE and NNW, with most intense silicification at the angle. Nearby fault directions are parallel with the arms. The line of silicified domes in the east centre of the area trends NNW. Structurally the domes probably are cone-shaped with vertical ~~cones~~ axes - the faults are high angle, hence their intersections will be subvertical and it is reasonable to assume that the effects of the activity will decrease upward. The faulting continued after hydrothermal activity, isolating some silicified blocks.

MINERALIZATION

Hydrothermal silicic ore fluids admitted along the intersections of major faults have altered the host porphyry and granodiorite in a zonal fashion. Three main zones are immediately obvious:

(1) A highly silicic and brecciated core zone.

(2) An inner zone now characterized by very limonitic material, probably once pyrite rich.

(3) An outer zone of hydrous alteration of the host rocks. With careful work further sub-division of this zone according to alteration products may be possible. Sericite, kaolinite and chlorite are typical products.

The second zone at the margins of strong silicification would appear to be the most favourable site for disseminated chalcopyrite mineralization at depth. This zone will probably dip steeply away from the centre of silicification and is usually identifiable at surface by a change in slope as the more resistant silicia rock gives way to softer limonitic material. However, very little evidence of copper mineralization was noted at surface.

Lead-zinc-silver veining occurs in fractures apparently associated with the silicified porphyry.

CONCLUSIONS AND RECOMMENDATIONS

The area is one of Mesozoic and Tertiary igneous activity apparently showing a continuity in chemical trend:

Mt. Nansen Volcanics - basaltic to dacitic
Mesozoic intrusives - dioritic to granitic
Tertiary intrusives - granitic to highly silicic hydrothermal fluids

The last phases of activity, localized at the intersections of high-angle faults, have introduced Fe, Pb, Zn, Cu, Ag sulphide mineralization. The geological environment and geochemical results already obtained favour the presence of disseminated chalcopyrite mineralization. This is however not evident on the surface.

It is recommended that a detailed study of the alteration zoning around centres of silicification be undertaken, to enable plotting of the limonitic zone. Drilling on the outer margin of the zone should establish the presence or absence of economic mineralization.

P. F. Lewis, June 25, 1971