GEOLOGICAL REPORT ON THE PROPERTIES

OWNED BY WINDERMERE EXPLORATION LTD.

WINDERMERE PROJECT - "RACING RIVER AGREEMENT".

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June 19th - August 18th, 1971

by: C. BANNINGER

CANADIAN SUPERIOR EXPLORATION LIMITED

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SUMMARY

An exploration programme, under the direction of Canadian Superior Exploration Ltd., was undertaken to examine and evaluate eight separate copper prospects within the Gataga River area (approximately 100 miles west of Ft. Nelson). The programme was initiated under an agreement with Windermere Exploration Ltd., and was concluded over a two month period between the 19th of June and the 18th of August, 1971. The work consisted of geological mapping and sampling, with associated trenching.

Quartz veins, in association with basic dykes, occur within the Proterozoic rocks of the Aida formation, and constitute the principal manner of occurrence of the copper mineralization. These veins are present in the form of single veins, or as a composite series of veins, and are generally discontinuous in nature.

Copper mineralization, principally in the form of chalcopyrite, occurs in an erratic and discontinuous manner within the veins, and is of an overall poor grade.

CONCLUSIONS

On the basis of the examinations of the properties visited, the following conclusions can be stated:

1. The emplacement of the dykes and veins was structurally controlled as shown by their close association with adjacent faults and shear zones.

2. The dykes were emplaced under quiet conditions as shown by the minor degree of wall-rock alteration and disturbance.

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3. The general trend of the dykes and veins is in a northerly direction, primarily to the northwest, and in general agreement with the strike of the regional fracture cleavage.

4. The veins containing significant copper mineralization appear to be closely related to the type of country rock as shown by their occurrence primarily within argillic rock units of the Aida formation.

5. The lenticular form of the quartz veins is likely the result of movement along curved tension-shear fractures.

6. The veins were formed by fissure-filling as shown by the close association with adjacent faults and shear zones, and the enclosing of wall-rock particles within the body of the veins.

7. The veins appear to be of a replacement-composite lode-type as shown by the successive quartz banding parallel to the vein walls, and to the partial replacement of the wall-rock particles enclosed within the vein.

8. Copper mineralization shows a preference for sections of the quartz vein containing partially assimiliated inclusions of wall-rock, especially in the footwall and/or hanging-wall zones. Flexures and bends in the veins are also preferential locales for mineralization.

9. The emplacement of the copper sulphides is structurally controlled as shown by the lensoid nature of the copper mineralization and its parallel alignment with the vein margins.

10. The carbonate material (ankerite) in the veins appears to be a remnant of carbonate veining prior to the introduction of the quartz, and has played only a minor part in the localization of the copper.

11. Copper mineralization occurs predominately in the form of chalcopyrite, with minor occurrences of bornite present in association with the chalcopyrite.

12. The overall grade of the copper mineralization for each property is poor. The extent and manner of occurrence of this mineralization is decidedly erratic and spotty, especially in respect to the better grade sections of copper.

RECOMMENDATIONS

A major consideration in deciding on the economic potential of the vein deposits is the isolated and inaccessible nature of the occurrences. The closest means of land access to the area is via the two gravel roads which lead to the Churchill Copper and Davis Keays deposits. The nearest claim group is situated within twenty miles of a secondary road leading to the main Churchill Copper road, but involves the crossing of a mountain pass between 6,000 and 7,000 feet in elevation. The remaining properties are located up to a distance of thirty-five miles away in a straight line. Another means of access would be in the construction of a road joining onto the Alaska Highway (at Mile 442) via the east tributary of the Toad River. This route involves a distance of over fifty miles, and the crossing of a single mountain pass at just over 5,000 feet. The two furthest properties would best be approached by the Tuchodi River and Lakes via Ft. Nelson, which would involve distances of over one hundred miles.

Although the Fram prospect showed the best grade and extent of copper mineralization, this property, as well as the seven others examined, appears to present a less than favourable potential of realizing a commercial grade deposit meeting Canadian Superior's requirements. No additional work on the properties is therefore recommended on the part of Canadian Superior.

INTRODUCTION

This report covers the work done on the Meindl, 428, Chopper, 734, Lynda, Ice, and Fram Claim Groups by Canadian Superior Exploration Limited under the "Racing River Agreement" concluded with Windermere Exploration Ltd. (N.P.L.). In addition to work carried out under this agreement, an examination of the Gataga Claims and Central Zone of the Bronson Claim Group also was undertaken.

The work was performed over a two month period between the 19th of June and the 18th of August, 1971. This work consisted of geological mapping and sampling of the vein occurrences in conjunction with related trenching, where warranted. The latter two activities were carried out mainly by three field assistants, D. Amor, D. Pluth, and D. Hopper, who accompanied the writer, at separate occasions, on the various properties.

Information pertaining to the regional and local geology of the claim groups contained herein was derived from Dr. D.L. Cooke's report on the "Churchill-Racing River Project - 1970" for Windermere Exploration Ltd.

Reports covering the Meindl and 428 claim groups were prepared for assessment purposes, and appear elsewhere under separate cover.

LOCATION (See MAP "A")

The eight copper properties are situated approximately one hundred miles to the west of Ft. Nelson, and occur within a fortyfive mile radius of the Churchill Copper Corporation Mine. All, except for the Meindl Group, are located to the south of the mine, with the Meindl situated to the west.

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The area to the south of the Alaska Highway, except for the access roads leading to the Churchill Copper and Davis Keays deposits, is relatively inaccessible by land, and hence the use of aircraft, preferrably helicopters, is desireable. A dirt airstrip, suitable for light, fixed-wing aircraft, is located on the Gataga River, four miles southeast of the Bronson Group.

Elevations within the immediate surroundings of the claim groups range from 4,000 to 5,000 feet for the river and stream basins, to over 8,000 feet for the ridge and mountain tops.

All of the vein occurrences are situated on ridge or mountain slopes, generally well above tree-line.

GEOLOGY & STRUCTURE

Sedimentary rocks of Proterozoic age represent the principal rock type within the various claim groups, and generally consist of argillites and argillaceous dolomites and limestones. The two uppermost units of the Proterozoic series constitute the principal geological setting for the vein occurrences, and rest conformably upon one another. The upper unit, the Gataga formation, consists of dark grey, fracturecleaved argillites and shales. The lower unit, the Aida formation, consists of interbedded grey to brown, fracture-cleaved argillites and brown-weathering argillaceous limestones and dolomites.

The sedimentary units show a general strike to the northwest, with shallow to moderate dips to the southwest. The rocks have undergone a weak regional metamorphism which has produced a welldeveloped, northwest striking fracture cleavage within the argillite members.

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The Precambrian rocks have been intruded by basaltic to doleritic dykes,often occurring in subparallel swarms. These trend in a northerly direction and dip steeply to the west. Dyke thicknesses range from less than a foot to over 100 feet. Narrow, and generally inconspicuous chill-margins occur along many of the borders of the dykes. Wall-rock disturbance and contact alteration are of a minimal extent, the latter consisting of minor recrystallization, silicification, sericitization and bleaching of the country rock. The formation of epidote and chlorite, plus secondary serpentization, occur within the dyke margins. The alteration of the sedimentary rocks is confined to a narrow zone extending less than a few feet in width from the borders of the dykes.

Faults, with associated shear zones, are common within all of the claim groups. The majority strike in a northerly direction and dip steeply to the west. They occur as transecting features across the dykes and veins, in addition to lying parallel to their margins. Small displacements of these bodies sometimes accompany the former type of faulting.

MINERALIZATION

The principal manner of occurrence of the copper mineralization is in the form of vein-type deposits. These are found primarily within the argillite members of the Aida formation. The deposits occur in the form of single veins or as composite series of subparallel veins and veinlets. They generally consist of long, attenuate, lenticular-shaped bodies which tend to pinch and swell along strike in a discontinuous manner. Dips are moderate to steep and mainly to the west, with strikes primarily to the northeast, north, and northwest. Vein widths range from less than an inch to over 30 feet, with widths of between 1 and 3 feet most common. Widths of vein zones may exceed 70 feet, but are very irregular and lack continuity along strike.

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Dykes often occur in close proximity to the vein systems, with many of the veins located along their margins. In the latter case, thin selvages of country rock are commonly situated between the walls of the dyke and vein. Veins removed from the immediate vicinity of dyke margins have a tendency to follow a sinuous or curving course along strike, sometimes exhibiting sharp changes in attitude. This trend often approximates the general strike of the regional fracture cleavage. The abrupt changes in strike and dip tend to result in an increase in vein thickness, especially at flexures and bends. Where the veins occur in close relationship to the dyke margins, their strike and dip is reflected in the attitude of the dyke. The pinching and swelling manner exhibited by the veins commonly results in lens-shaped bodies which taper out along strike.

Massive, white quartz constitutes the predominate material of the vein-fillings, with carbonate and wall-rock inclusions present in variable amounts. The wall-rock fragments, in many places, comprise the dominant component of the veins.

Chalcopyrite occurs as the most abundant copper mineral within the veins, usually in the form of disseminations, thin seams, and small, lens-shaped masses. It is also present, to a minor degree, within the sediments lying adjacent to the mineralized veins, but generally only where these sediments have undergone a fair degree of alteration.

Minor occurrences of bornite are present in association with chalcopyrite on a few claim groups.

For a more detailed discussion concerning the manner of occurrences of the copper mineralization in conjunction with the veinfillings, the reader is directed to the pertinent sections contained in the report on the the 428 Group which appears elsewhere under separate cover. Malachite is present in association with the copper mineralization, and forms stains and thin coatings on the veins and adjoining country rock.

Pyrite occurs as the principal non copper-sulphide, generally as minor disseminations sporadically distributed through the veins, and also is present within the adjacent altered sections of the dyke and country rock.

Minor occurrences of galena were noted in association with the chalcopyrite mineralization on five of the properties. A semi-massive, twenty foot seam ($\frac{1}{2}$ to 3 inches wide) occurs along a vein margin located on the Chopper Group.

Erythrite was found within the veins on two claim groups; one occurrence consisting only of a few minor surface coatings, with the other extending in very weak amounts over a relatively long vein strike-length.

DYKE - VEIN AGE RELATIONSHIP

The question relating to the age relationship between the dykes and veins was examined in respect to the occurrences as present within the claim groups.

In all of the areas examined by the writer, quartz veins are present either in direct association with dyke margins, or in close proximity to them. With respect to the former situation, thin selveges of country rock generally occur between the dyke and vein walls. On a number of claim groups (Chopper, Meindl, Lynda, Gataga, and 428), veins extending up to eight feet in width occur partially or wholely enclosed within the dyke bodies. The occurrence of altered dyke fragments within the margin of a vein lying in contact with a dyke on the 428 Group offers conclusive evidence of a post-dyke vein emplacement.

The presence of long, slender quartz veins along the margins of broad, curving dyke bodies is difficult to explain with respect to a post-vein dyke intrusion. This is especially the case when taking into consideration the presence of slender vein members which protrude into the margins of the adjacent dykes.

Direct evidence in favour of a post-vein dyke emplacement is limited to a few rather indecisive occurrences (Meindl and Gataga Groups) of quartz veins which appear to be cut by small, projecting fingers of dyke rock. Because of the lensoid nature of the quartz veins, it is difficult to ascertain whether the veins have in fact been cut by the dyke rock, or occur in this position due to their emplacement on either side of these fingers.

The quartz vein located on the Fram Group appears to terminate at the margin of a cross-cutting dyke, but insufficient time prevented a closer examination of the occurrence. It is possible that the vein terminates of its own accord irrespective of the intruded dyke.

No evidence of quartz vein inclusions within the dykes was noted, but this absence may possibly be explained by the quiet nature of the dyke emplacements.

In respect to the occurrences examined on the various claim groups, there appears to reason to conclude that the majority of the quartz veins are a post-dyke phenomena. The possibility exists that contenporaneous emplacements of the veins and dykes occurred, but evidence to support this contention was not readily observed.

Signed:

C. Banninger, Geologist.

Vancouver, British Columbia 25 October: 1971

Gataga Group

LOCATION

Located forty miles southwest of Summit Lake (Alaska Highway), and adjoining onto the northwest corner of the Bronson Group, the property is mainly situated on a north trending mountain slope lying to the south of the North Gataga River.

Elevations within the immediate vicinity range from 4,500 feet for the river basin to just over 7,000 feet for the top of the mountain. The vein occurrences are situated between 5,000 and 6,000 feet, but occur principally from 5,400 to 6,000 feet.

The lower veins lie to one side of a steep-walled gorge situated in a lightly treed, but dense, low brush area. The upper showings occur well above tree-line.

INTRODUCTION

The claim group was examined over a three and one half day period during the latter part of July and early August. Geological mapping and sampling of the vein showings were undertaken by the writer with the assistance of D. Amor and D. Pluth on separate occassions.

GEOLOGY AND STRUCTURE

Argillites and argillaceous dolomites comprise the principal sedimentary rocks occurring within the claim group. These beds strike to the northwest with moderate dips to the southwest. Basaltic to doleritic dykes intrude the country rock, striking to the northwest, north, and northeast. Dips are steep and to the west. Faults, striking mainly in a north to northwest direction, cut across the dykes and veins. They also occur parallel to the margins of these bodies in close association with shear zones.

MINERALIZATION

Quartz veins occur in a number of widely spaced locales within the claim group. They strike in a northeast to northwest direction and dip steeply to the west. A few veins exhibit dips to the east and northeast. A large number of veins occur at or in close proximity to the margins of the dykes, and, in a few instances, terminate within them.

Chalcopyrite occurs in weak and erratic amounts throughout the overall vein systems, with a few small, semi-massive pockets representing the high-grade copper sections.

The combined strike length of the separate vein systems is approximately 1,650 feet. The cumulative total is nearly 1,200 feet, with a representative width of from 1 to 2 feet. With respect to the latter total, only a vein located along the northwest margin of a dyke is of any significance in regards to extent, width, and grade of copper. This vein occurs over a strike distance of 460 feet, but, due to its very discontinuous nature, has a total vein length of only 275 feet. Widths are between 6 inches and $3\frac{1}{2}$ feet and average between 1 to 2 feet. The average grade of copper of the eight samples taken along this vein is 4.47%. This figure includes two abnormally high sample values which represent two very small, semimassive copper sections not representative of the grade of mineralization for the entire vein. A more realistic grade for the vein would be in the order of 1.5% Cu., and possibly much less. A total of 17 chip samples were taken across various sections of the veins, and their copper assay values, along with their widths, are given on the geological map which accompanies this report (Map "B"). A list is also given below:

ASSAYS

Sample No.	<u>Width</u>	<u>Cu. %</u>
Ga-1	3.5'	0.73
Ga-2	2.2'	0.06
Ga-3	0.7'	0.33
Ga-4	0.6'	2.20
Ga-5	1.2'	0.08
Ga-6	3.0*	3.80
Ga-7	2.3'	10.50
Ga-8	2.0'	15.50
Ga-9	3.2'	2.40
Ga-10	2.7'	0.76
Ga-11	3.84	1.43
Ga-12	2.0'	0.97
Ga-13	1.0'	0.41
Ga-14	5.0'	4.05
Ga-15	1.3'	7.00
Ga-16	0.9'	0.27
Ga-17	2.0'	0.18

Samples No. Ga-7 and Ga-8 represent the two high

assay values of the semi-massive chalcopyrite sections referred to in the above section.

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RECOMMENDATIONS

Considering the widely spaced nature of the vein systems, and the very limited extent of the better grade mineralized sections, there appears to be a less than favourable likelihood that a deposit meeting Canadian Superior's requirements will be realized. No further work is therefore recommended on the part of Canadian Superior.

CHOPPER GROUP

LOCATION

Located forty-two miles southwest of Summit Lake, and 6 miles southeast of the Bronson Group, the claim group is located on an east facing slope situated to the west of a tributary of the Gataga River.

Elevations range from 4,000 feet for the stream bed to just over 7,000 feet for the top of the mountain. The vein systems are located at elevations between 5,600 and 6,600 feet, and all occur above tree-line.

INTRODUCTION

An examination of the property took place over a two day period between the 5th and 8th of August, and consisted of geological mapping and sampling. Two field assistants, D. Pluth and D. Hopper, accompanied the writer on separate occassions, and took the majority of the samples.

GEOLOGY AND STRUCTURE

The sedimentary rocks which occupy the claim group are composed of beds of argillite and argillaceous dolomite. These beds strike to the northwest, and dip to the southwest at a moderate angle. Basic dykes have intruded the country rock and trend to the north and northwest.

Faults and shear zones occur along the margins of the dykes and veins, and commonly transect these bodies in a northwest to southwest direction, with a few striking to the north and northeast. Displacement of the veins is common, with short offsets apparent.

MINERALIZATION

Four widely separate vein systems occur within the claim group, three of which are present in an argillite rock unit. The fourth occurs within an interbedded argillite and argillaceous dolomite unit (Aida Formation?). The systems trend in a northerly direction, with strikes between N35^OW and N30^OE. Dips are moderate to steep, and occur to the west and east. The veins occur over relatively short strike distances, with the longest approximately 480 feet in length. All are generally of a discontinuous nature. The total length of the four systems is approximately 1,300 feet, but the veins tend to either terminate abruptly or pinch out along strike. Widths are less than 6 inches to 5 feet for individual veins (average 1 to 2 feet), and 6 to 17 feet for vein zones.

Chalcopyrite occurs in weak amounts throughout the vein systems, and is very spotty and discontinuous in nature. A few short sections carry moderate amounts of copper mineralization. Galena is present in a number of occurrences in association with chalcopyrite, the most noteworthy being a 20 foot long, $\frac{1}{2}$ to 3 inch wide, semi-massive seam which occurs along the footwall of a quartz vein.

Eight chip samples were taken at various points along the vein, and their copper assay values, along with their widths, are listed on the geological map which accompanies this report (Map "C"). A list is also given below:

Sample No.	Width	Cu.%
 Ch-1	1,11	0.34
Ch-2	5.8'	2.31
Ch-3	0.7'	1.12
Ch-4	0.4'	0.03
Ch-5	0.7'	0.05
Ch-6	1.7'	11.50
Ch-7	1.2'	1.64
Ch-8	1.6'	0.23

ASSAYS

Sample No. Ch-6 represents a short, 2 to 3 inch thick chalcopyrite seam overlaying the top of a quartz vein, and is not representative of the grade of mineralization for this section.

RECOMMENDATIONS

The decidedly sparse nature of the copper mineralization, in conjunction with the widely dispersed and limited extent of the vein systems, does not offer too great a hope of locating a significant deposit -- 16 --

of economic grade and extent. The property is therefore not considered to warrant further attention on the part of Canadian Superior.

734 GROUP

LOCATION

Located thirty-nine miles south-southwest of Summit Lake, and twelve miles southeast of the Bronson Group, the claim group is situated at the head of a small feeder stream which flows into a tributary of the South Gataga River. The claims are located along a north-northwest trending ridge, flanked on the east side by a small glacier. The vein occurs on a very steep east face of the ridge between the 7,500 foot and 8,000 foot elevations.

INTRODUCTION

The property was visited for one day by A. Randall and D. Hopper on the 11th of August, 1971. Five chip samples were taken and a sketch map of the vein was made. Only the lower quarter section of the vein, extending above the snow and ice, was examined, due to the inaccessibility of the upper portion of the face.

GEOLOGY AND STRUCTURE

The claim group occurs within an area occupied by argillaceous rocks of the Aida formation which strike to the northnortheast and dip to the west. The rocks immediately adjacent to the vein are grey weathered, generally thin-bedded shales and argillites. The area appears to be devoid of any dyke intrusions.

MINERALIZATION

The vein and mineralization extend for approximately 1,000 feet in length before terminating at the crest of the ridge. The upper part of the vein, which strikes almost due north, appears to divide into three branches at about its mid-point, with the lower segments striking $N10^{\circ}W$. Average dip for the entire vein is 61° to the west.

The width of the main vein at the lower end ranges from 2 to 5 feet (average $2\frac{1}{2}$ feet), with the two lesser branches having widths of between 6 inches and 1 foot.

The vein is composed of quartz-carbonate material inter-mixed in places with shale and argillite, with boundaries being very irregular.

Mineralization consists of sporadically distributed chalcopyrite and associated malachite, with the occasional small lens of massive sulphides.

Five chip samples were taken across the lower portion of the vein, and their copper assay values, along with their widths, are listed on the geological map which accompanies this report (Map "D"). A list is also given below:

ASSA	YS

Sample No.	<u>Width</u>	<u>Cu %</u>
734-1	3.5'	0.35
734-2	2.5'	0.06
734-3	1.0'	0.39
734-4	3.0'	0.09
734-5	0.5'	6.00

Sample No. 734-5 represents a section containing massive chalcopyrite.

RECOMMENDATIONS

Due to the narrow vein width and low grade of the copper mineralization, no further work on the claim group is warranted on the part of Canadian Superior.

LYNDA GROUP

LOCATION

Located thirty-nine miles south-southwest of Summit Lake, and fifteen miles southeast of the Bronson Group, the property is situated on a southeasterly facing mountain slope on the left side of a tributary of the Gataga River.

Elevations in the immediate vicinity range from approximately 5,000 feet for the valley floor, to over 9,000 feet for the ridge tops.- The vein showings are situated from 5,350 feet to nearly 6,200 feet, and occur above tree-line.

INTRODUCTION

The principal vein system was examined over a three and one half day period during the latter half of June, and consisted of geological mapping and sampling in conjunction with related trenching. Three field assistants, D. Amor, D. Pluth, and J. Makowski, assisted in the mapping and trenching at separate times within this period.

GEOLOGY AND STRUCTURE

The claim group occurs within the upper units of the Aida formation which consists of inter-bedded argillite and argillaceous dolomite. The strike of the bedding is to the west-northwest, with shallow to moderate dips to the southwest. Basaltic to doleritic dykes intrude the country rock, striking in a northerly direction and dipping steeply to the west.

A number of faults occur in close proximity to the dykes and veins, occupying positions parallel to their margins (generally with associated shear zones,) or cutting across these units in a northeast to northwest direction. Dips are usually steep ($>70^{\circ}$), and occur to the southwest, west, and northeast. Some of the transecting faults have caused a small displacement of the dykes and/or veins.

The sedimentary units in the near vicinity of the vein occurrences have undergone a small to modorate degree of folding, with a few thin-bedded members exhibiting overturning and dislocation at or near the faults.

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MINERALIZATION

Quartz veins are present along the greater part of the margins of a north trenoing dyke, the majority occurring in the upper portion and on the west side. The veins occur over a strike length of nearly 1,800 feet, and a vertical extent of close to 850 feet. The total extent of the mineralized sections approaches 2,000 feet in length, but occurs in a widely spaced and decidedly discontinuous fashion. Vein widths are from less than 6 inches to 5 feet, with the average between 1 and 3 feet. A weakening in vein width occurs towards the upper end of the dyke. Chalcopyrite occurs overall within the veins in weak amounts, and is spotty and discontinuous in nature. Two mineralized lenses, 75 and 25 feet in length and between 2 and 5 feet in width, contain the only high-grade copper sections of any substance. Within these sections, the mineralization is of an inconsistent nature, generally occurring as discontinuous small lenses and pockets.

Two minor occurrences of galena were noted in association with the copper mineralization.

Three trenches were drilled and blasted across mineralized sections of the veins, with six chip samples obtained by the writer from these and other localities. The copper assay values, along with their widths, are listed on the geological map which accompanies this report (Map "E"), and are also given below.

ASSAYS

Sample No.	Width	<u>Cu. %</u>
Ly-1	2.0'	0.11
Ly-2	1.7'	2,82
Ly-3	1.2'	1.25
Ly-4	1.2'	0.13
Ly-5	2.4'	4.95
Ly-6	3.0'	8.40

The latter two sample assays (4.95% and 8.40% Cu.) represent the two high-grade lens of 75 and 25 feet respectively, and appear to be the only two significant occurrences of high-grade copper mineralization.

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RECOMMENDATIONS

Although copper mineralization occurs over an extensive strike length, the discontinuous nature and narrow widths of the veins, in conjunction with the poor and spotty occurrences of copper mineralization over most of the vein length, are large negating factors to a realization of an ore deposit meeting Canadian Superior's requirements. The property does not therefore warrant additional work on Canadian Superior's part.

ICE GROUP

LOCATION

Located 42 miles south-southwest of Summit Lake, and 20 miles southeast of the Bronson Group, the property is situated in a cirque basin at the headwaters of a west tributary of the Tuchodi River.

INTRODUCTION

The area was visited during a one day period in mid-August, but it is now believed that an area occupied by a cirque located to the east of the property, and not the actual claim group, was visited.

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GENERAL GEOLOGY

The area visited contained a few small, barren quartz-carbonate veins (strike $N10^{\circ}W$, dip $78^{\circ}E$) within a sedimentary setting consisting of argillite, red quartzite (exhibiting cross-bedding), quartzitic sandstone, greywacke, argillaceous dolomite, white quartzite, and siliceous dolomite rocks, and a conglomerate containing red quartzite pebbles. Northerly trending basic dykes occur within the cirque, and cut across the sedimentary units.

Moderate to strong folding of the sedimentary units is exhibited in some locales. It is most noticeable with respect to a thick, white, quartzite unit which displays overturning with associated dislocation in a number of places.

Dolomitic veins, some containing minor to moderate amounts of quartz, are present at the south end of the cirque. The veins intersect the bedding and other dolomitic veins at various angles. Branching, sharp changes in dip, and undulating trends are common. Lenticular-shaped wall-rock fragments have been incorporated within the veins in a perpendicular alignment to the vein-walls. No mineralization was noted within these veins.

FRAM GROUP

LOCATION

Located 46 miles south of Summit Lake, and 30 miles southeast of the Bronson Group, the property is situated to the south of a tributary of the Gathto Creek on a north facing ridge slope. Elevations in the immediate area extend from approximately 5,500 feet for the cirque floor to over 8,000 feet for the ridge tops. The vein is exposed well above tree-line, and occurs from 7,450 feet to just over 8,000 feet.

INTRODUCTION

The property was examined on the 18th of August by the writer and A. Randall, and consisted of geological mapping and sampling. The latter was undertaken by A. Randall.

GEOLOGY AND STRUCTURE

Interbedded argillites and argillaceous dolomites form the principal setting for the vein emplacement, and appear to belong to the Aida Formation. These units strike to the northwest, and dip gently to the southwest. The country rock has been intruded by basic dykes of basaltic to doleritic description which strike in a northeast direction.

The margins of the vein and dykes are bordered by faults and shear zones, and a prominent fault occurs down the centre of a dyke located at the lower end of the vein.

MINERALIZATION

The vein system extends for over 950 feet along strike, and shows a vertical exposure of nearly 600 feet. Strike of the system is in a northerly direction, starting at $N10^{\circ}E$ for the upper section, but changing to $N15^{\circ}W - N30^{\circ}W$ for the lower, northern section. Dips are moderate to steep and generally to the west, although, where a sharp change in attitude occurs, the dip tends to be steeply to the east. The vein appears to terminate at its lower end near a cross-cutting dyke.

The vein material consists essentially of quartz, carbonate, and altered argillitic rock which are present in differing amounts along the vein length. The upper section of the vein system is comprised principally of barren quartz-carbonate material, with the lower end almost entirely represented by quartz. The section inbetween consists essentially of mixtures of quartz and altered argillitic rock. Pinching and swelling occurs along the entire vein length, with a number of vein segments occurring as separate, drawn-out, lenticularshaped bodies.

The mineralized sections of the vein constitute a combined length of 600 feet which occurs over a strike distance of 800 feet. Average width of this section is from 3 to 5 feet, with the range in widths from 1 to 14 feet. The better mineralized sections occur as two separate lenses, with a combined length of 130 feet. These consist of either quartz veins or strongly altered quartz-argillite zones containing bornite and/or chalcopyrite.

Minor, but noteable occurrences of erythrite are present within the vein, especially in the upper portion of the mineralized section.

Seven chip samples were taken at various points across the vein, and their copper assay values, along with their widths, are listed on the geological map which accompanies this report (Map "F"). A list is also given below.

AS	SS	A'	Y	S
-	-	-	-	-

Sample No.	<u>Width</u> <u>Cu%</u>		<u>Co%</u>
Fr-1	4.5'	3.20	0.12
Fr-2	6.2'	10.60	0.39
Fr-3	5.0'	0.44	< 0.01
Fr-4	8.0*	1.62	0.01
Fr-5	7.5	4.82	0.06
Fr-6	5.0'	2.20	< 0.01
Fr-7	14.0'	1.30	0.01

The average grade for the seven samples is 3.45% Cu over a strike distance of 750 feet, but this value is based upon a limited number of samples which were taken across better sections of mineralization. One sample (Fr-2) added significantly to the above obtained average, and occurred over a short section containing an appreciable quantity of bornite with chalcopyrite. Excluding this sample value, an average close to 2.25% Cu is obtained. This value would appear to be more representative of the overall grade of the copper within the mineralized sections of the vein.

RECOMMENDATIONS

The Fram Group represents the best occurrence of copper mineralization in respect to grade, width, and extent amongst the eight properties examined. Yet, even with a possible average grade of approximately 2.25% Cu over widths of between 5 and 8 feet, a decidedly negating factor in respect to the overall reserves lies in the limited extent of the mineralized vein. Termination of the lower vein section is at a dyke contact, and the upper limit of mineralization is determined by an abrupt change into a barren quartz-carbonate vein. These terminations delineate a horizontal extent of 600 feet for the mineralization. Although a possibility exists for a continuation of the lower end of the vein, no evidence to its extension was indicated.

- 25 -

Taking into consideration all the factors, it appears unlikely that a potentially economic deposit meeting Canadian Superior's requirements will be realized. The property does not therefore warrant further work on the part of Canadian Superior.

BRONSON GROUP - CENTRAL ZONE

LOCATION

Located 41 miles southeast of Summit Lake, the Bronson Central Zone is situated on the north face of an east-west trending ridge, just below a peak at 8,098 feet. The overall slope angle of the face is near 45° .

The zone is located between the 7,600 and 7,900 foot elevations.

INTRODUCTION

It was suggested by R. Kirkham (Geological Survey of Canada) that because of the nature of the mineralization within the Bronson Central Zone, sampling across the entire breadth of the zone might indicate a deposit containing sufficient copper mineralization to warrant open-pit mining.

Two sample lines were laid out to intersect the two sections of the zone which contain the largest occurrences of the quartz veins. Continuous chip samples were then collected for each of the separate quartz and sedimentary (including the small quartz veinlets and stringers scattered through the sediments) units. .

GEOLOGY AND STRUCTURE

The Bronson central zone occurs within a large (approximately 750 feet by 300 feet), wedge-shaped area occupied by brown-weathered, slightly altered argillite rocks. The zone is surrounded by dark grey to black-weathered argillites and shales. The brown-weathered argillites exhibit a strong fracture-cleavage which strikes to the northwest and dips moderately to steeply to the southwest.

Faults are very prevalent within this area. The majority of them strike to the northeast and northwest, and dip inwards towards the centre of the zone. A large number of the faults transect the quartz veins, with some offsetting apparent. In a few instances, distinct fault zones (with associated shear zones) occur parallel to a number of the vein margins.

A few large, prominent faults delineate the east and west extremities of the zone, and give the area a wedge-shape which tapers towards the north end.

A basic dyke occurs on the western periphery of the zone, but none are found within the zone area.

MINERALIZATION

Quartz zones, in the form of single veins or series of veins, occur primarily in the eastern and western sections of the zone. Dispersed inbetween these two sections are thin quartz veinlets and stringers.

The western veins are mainly short, discontinuous lenses measuring not more than 50 feet in length, with widths of between 1 and 24 feet. These veins strike to the northwest in approximately the same direction as the fracture cleavage. The argillites, which occur between the individual vein zones, generally contain thin quartz veinlets and stringers which extend along strike for short distances. The majority of the larger vein zones terminate abruptly at both ends between two major northeast striking faults.

The eastern section consists of a smaller number of veins, but these occur over a greater width and/or extent. Two prominent veins, approximately 170 and 200 feet in length, and between 10 and 30 feet in width, occur at the upper and lower boundaries of the zone. Both veins are terminated at each end by cross-cutting faults. A 3 to 10 foot wide and 140 foot long vein follows along the strike length of the major fault which defines the boundary of the eastern section.

Chalcopyrite occurs as the principal form of copper mineralization. A few small but appreciable occurrences of bornite are present in both the western and eastern vein sections (specifically at sample location No. BR-18, BR-20, and near No. 105). Mineralization is sporadic and discontinuous, and is mainly weak in grade. Small, high-grade pockets of mineralization occur isolated within large sections of weak to negligible copper, but these highgrade sections are relatively infrequent.

Minor occurrences of galena were also noted in association with the copper mineralization.

Twenty continuous chip samples were taken (along two sample lines) across both the vein occurrences and the argillites. Their copper assay values, sample widths, and types are listed on the geological map which accompanies this report (Map "G"). A list is also given below.

<u>Sample No.</u> Br-1	Width 1.2'	<u>Cu %</u> 0.25	<u>Sample Type</u> Quartz vein
Br-2	6.0'	0.14	Sediments
Br-3	17.7'	3.80	Quartz vein
Br-4	47.0'	0.05	Sediments
Br-5	11.0'	0.10	Quartz vein
Br-6	51.0'	0.01	Sediments
Br-7	63.5'	0.02	Sediments
Br-8	28.0'	1.14	Quartz vein
Br-9	2.2'	0.01	Quartz vein
Br-10	5.5'	0.01	Sediments
Br-11	3.7'	0.04	Quartz vein
Br-12	4.0'	< 0.01	Sediments
Br-13	13.5'	0.01	Sediments & quartz
Br-14	19.0'	0.01	Sediments & quartz
Br-15	112.0'	0.02	Sediments & quartz
Br-16	24.0'	1.22	Quartz veins
Br-17	25.0'	0.12	Sediments & quartz
Br-18	16.8'	3.00	Quartz veins
Br-19	115.0'	0.19	Sediments
Br-20	1.5'	6.60	Quartz vein

ASSAYS

NAME OF CLAIM	AS RECEIVED	AS RETURNED	COMMENTS
Chopper 1 - 14	Oct 3, 1971	Expired	Excluded Aug 24, 1971
Ice 1 - 28	Aug 31, 1971	Expired	Restaked as Sun 1 - 24 by L.P. Duquette, Sept 30/71
Mar 37 - 40 Marv 21 - 30 Marv 31 - 36 Marvin 1 - 20	Feb 6, 1973 Feb 6, 1973 Feb 6, 1972 Feb 6, 1973	Feb 6, 1973) (Feb 6, 1973) (Feb 6, 1972) (Feb 6, 1973) (Windermere to assume responsibility as per letter A. Reeve to W.G.Robinson of Aug 24/71
Marvin 23, 24, 26, 27	Oct 16, 1971	Expired	Excluded Aug 24, 1971
Lynda 1, 3, 5 - 14 19 - 42	July 6, 1971	Expired	Excluded April 27, 1971
Lynda 2, 4, 15, 16 17, 18	July 6, 1971	July 6, 1972	Trenching
Meindl 21 - 42	July 13, 1971	Expired	Excluded April 27, 1971
Meindl 9, 10, 12	Aug 27, 1972	Aug 27, 1974	Geologic mapping & sampling
Meindl 11	Aug 27, 1972	Aug 27, 1975	Geologic mapping & sampling
Meindl 1 - 8, 13 - 20	Aug 27, 1972	Aug 27, 1972	No work done
734 1 - 12	Aug 3, 1971	Expired	Excluded July 28, 1971
428 1 - 5	Oct 3, 1971	Oct 3, 1973	Trenching and mapping
428 6 - 13	Oct 3, 1971	Oct 3, 1974	Trenching and mapping
428 14	Oct 3, 1971	Oct 3, 1973	Trenching
428 15,17	July 13, 1971	Expired	Excluded July 13, 1971
428 16, 18, 20- 24, 26, 28, 30, 32, 34	July 13, 1972	July 13, 1972	No work done or filed
428 19, 25, 27, 29, 31, 33, 35, 36, 37	July 13, 1971	July 13, 1972	Trenching
428 39, 40, 41, 4	2 Aug 31, 1971	Aug 31, 1972	• Trenching
Fram 1 - 18	Sept 11, 1972	Sept 11, 1972	Examined but no assessment work done

APPENDIX II RACING RIVER AGREEMENT - ASSESSMENT WORK

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The information contained in this listing is provided as a guide to the current status of these claims, however, no guarantee of accuracy, expressed or implied, is made by the author or Canadian Superior Exploration Limited. For positive determination on the status of these claims the reader is referred to the records of the Provincial Department of Mines and Petroleum Resources, Victoria, British Columbia.

2.

APPENDIX III

I am a geologist employed with Canadian Superior Exploration Limited.

I graduated with a B.Sc. degree in Geology from the University of British Columbia, Vancouver, British Columbia in 1966.

I have worked in the mining industry since graduation in the Yukon, Northwest Territories and in the Province of British Columbia.

I am the author of this report.

Signed:

C. Banninger, Geologist.

	JOINT VENTURE AGREEM	ENT PROPERTIES -	EXPIRY DATES AS OF	OCTOBER 1, 1971	
	NAME OF CLAIM	EXPIRY AS RECEIVED	DATE AS RETURNED	COMMENTS	1
	Book 1-8	Aug 27, 1972	Aug 27, 1977	Diamond Drilling	AL IN
	Book 9-10	Aug 27, 1972	Aug 27, 1978	Diamond Drilling	
15	16, 17, 18, 20, 29, 30, 31, 32, 39, 40	Aug 20, 1971	Aug 20, 1975	No work done in A group by C.S.E., Windermere applied 4 certificates on July 16, 1971	
	Bron 42, 44, 60, 82,	Aug 20, 1971	Aug 20, 1976	Windermere applied 5 certs. 7-16-71	
	2 Bron 49, 50	Aug 20, 1971	Aug 20, 1978	Diamond drilling plus 2 certificates applied by Windermere	allowed and the second
1	Bron 4, 8, 7, 8, 91, 9 48, 45, 46, 47, 107	Aug 20, 1971	Aug 20, 1977	Diamond drilling plus 4 certificates applied by Windermere	A REAL PROPERTY OF A REAL PROPER
. F:	Bron 26, 27, 28, 61 65, 66, 67, 68, 69, 70, 71, 72, 73	Aug 20, 1971	Aug 20, 1990	Diamond drilling plus 4 certificates applied by Windermere July 16,1971	/
	Bron 10, 13, 14, 19, 21, 22, 23, 24, 25	Aug 20, 1971	Aug 20, 1990	Diamond drilling plus 5 certificates applied by Windermere	
1	Bron 63	Aug 20, 1971	Aug 20, 1989	Drilling plus 4 certs. by Windermere	
C	Bronson 106, 107, 108, 109, 110, 111, 112, 113	Aug 10, 1971	Aug 10, 1981	Diamond drilling plus 4 certificates by Windermere	
2	Bronson 114, 116	Aug 10, 1971	Aug 10, 1979	Drilling plus 2 certificate by Windermere	and the second s
C)	Bronson 76, 77, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88	Oct 3, 1971	Oct 3, 1990	Diamond drilling plus 4 certificates by Windermere	

	JOINT VENTURE AGREEMENT PROPERTIES - EXPIRY DATES AS OF OCTOBER 1, 1971				
	(Continued)				
	EXPIRY DATE				
	NAME OF CLAIM	AS RECEIVED	AS RETURNED	COMMENTS	
7	Bronson 54, 55, 56,	0at 2 1072	0-+ 2 1072		
and a second sec	1, 36, 34, 78	000 3, 1973	000 3, 1973	by Canadian Superior Expl.	
AL	Bronson 94-105	July 13, 1971		Restaked in CSE's name as Alf 1-7 Recorded Aug. 26, 1971	
6	Gataga 1-6	Sept 24, 1971		Excluded on April 27, 1971	
11	Gataga 26-35	July 13, 1971		Excluded on April 27, 1971	
4	Gataga 22-25	July 13, 1971		Restaked in CSE's name as HOP 1-4 on July 29, 1971 Recorded Aug 26, 1971	
14 -	Gataga 7-20	Sept 24, 1971	Sept 24, 1972	Trenching	





PROPERTY	No of CLAIMS.	Exfines	WORK DONE 1971 BY CAN-SUA	CAN SUP CONCLUSIONS	REMARKS. (AFR.)
Bearten	and the second and the second data and the second data and the second data and the second data and the second d	1070		The propriety of the existe	neist work dore hi lan Sin
BRONSON	93	10 1990	DRILLING, 4 HOLES, 4526'	The body of sufficient	particularly the surface
			GEOLOGICAL MAPPING & Sampling	size to g interest to	mapping has reduced the
				Canadian Superior cuting	polential of this prospect
				is caceedingly small.	Full annen to some chunce
					for a churchill the of deposit.
Rook	10	1977	True alt 11 10000 mg Ht		HOLD HOLD
AUOR.		197B	DILILLING, 16 HOLES, 118 F.	BODE VENTO RETOD NORMAN	all the were porced
				ERRATIC & Low grade to	Vein where drill water was
**				be of economic interest.	conversent to the sites. None
					fund and on the
					indicate the best material.
					(BRACORNE) [HOLD]
MEINDLE	20	1972	GEOLOGICAC MAPPINGY	Copper minerelization	has alle then
		1975	SAMPLING, SCREW DAYS)	to to know in	agant inpression
And the second s				mining.	mapping well done
10-					
428	.39	1972	GEOCOGICAL MARPING Z	The 428 Vecu System	Extensive but notennigh
		1214	Sampling (20 cut days)	aves not mer can sups	Reginale.
				eknowic elepsit.	anopton 2 Book
Read	100	1000			- Systend
GATAGA. (HOP)	18	1972	Mapping & Sampling	11	Carop/ never did
			(2 man earp)		this me exception antenlial
					A between skowings
CHOPORD			Manie Zandi		
South Confirm		1	mapping & Dempergence		Lapsed
and					
124			terew day sampling		Lapsid
	1/				
handa		1000			
nynaa	0	19/2	- mencung sampling mapping.		The sea engle of
100					
Ter. (Sun.)	24	1972	No effective work done.	None.	[Drop]
FRAM.	18	1972.	1 crew day	Best Occurrence	Hold voel ene
				but Not good enough.	

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1'-5'width; weak-moderate(sections) chalcopyrite + minor galena

740

630

6050'X ---- GA-14



FEET O

Brown—weathering Argillites Argillites and argillaceous dolomites X X Basaltic to doleritic dyke Quartz vein (showing dip) 340 Attitude of bedding 330 Attitude of fracture cleavage Fault (observed, inferred; showing apparent direction of movement) in the Geological contact (observerved, inferred) •сн-в Sample location • c-3 Windermere sample location 3 4Claim line - 6000' Contour interval (approximate) : 200 feet Elevation point $(\pm 20 \text{ feet})$ × 6400'

N.T.S. 94K/3 SCALE |"= 100' CANADIAN SUPERIOR EXPLORATION LIMITED WINDERMERE EXPLORATION PROJECT 'CHOPPER' CLAIM GROUP GEOLOGICAL MAP inches & ASSAY PLAN 1 2 3 4 centimetres This reference scale bar has been added to the original image. It will scale at the same rate as the image, therefore it can be used as a reference for the original size. DATE. OCTOBER 25,1971 DWG. C. BANNINGER MAP C.

JGICAL SURY

ISH

LEGEND

ASSAY RESULTS

SAMPLE No.	WIDTH(ft.)	Cu.%	
734-1	3.5	0.35	
734-2	2.5	0.06	
734-3	1.0	0.39	
734-4	3.0	0.09	
734-5	0.5	6.00	

LEGEND

Grey weathering shales and argillites Quartz vein •734-2 Sample location Snow and ice boundary Claim line

SCALE (APPROXIMATE)

375

250

-2'-3' width; very weak chalcopyrite

~ 8'-10'wide zone (individual veinlets 6''-21/2'widths); weak chaloopyrite

ARGILLITE & ARGILLACEOUS DOLOMITE

- 5800' ------

<6" width ; negligible -very -6"- 'width; weak -moderate (tew short

weak chalcopyrite; pyrite in dyke near contact

Scree

weak chalcopyrite

6"-2' widths; very weak-weak chalcopyrite

ARGILLITE & ARGILLACEOUS DOLOMITE

_ Narrow, discontinuous quartz veins occur along the lower margins of the dyke (negligible -very weak chalcopyrite)

Scree

200

ASSAY RESULTS			
AMPLE No.	WIDTH(ft)	Cu.%	
Ly-1 Ly-2 Ly-3 Ly-4 Ly-5 Ly-6	2.0 1.7 1.2 1.2 2.4 3.0	0.11 2.82 1.25 0.13 4.95 8.40	

1

N.T.S. 94 K/3

300

FEET O

SCALE

NOTE. Overall map control only approximate

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2.9

chalcopyrite + bornite

ARGILLITE & ARGILLACEOUS DOLOMITE

 $\left. \begin{array}{c} \text{Quartz} - \text{carbonate vein;} \\ 1' - 4' \text{ width; barren} \end{array} \right.$

-

FEET O

Same MOTH(#) C# 5 5 0 64 5 5 0 64 5 5 0 64 5 5 0 64 5 5 0 64 5 5 0 64 5 5 0 64 5 5 0 64 5 5 0 64 5 5 0 64 5 5 0 64 5 5 0 64 5 5 0 64 5 5 0 130	
ATTS 94 Κ/3 Δυματικά μαι	Interimentation CANADIAN SUPERIOR EXPLORATION LIMITED Interimentation MINDERMERE EXPLORATION PROJECT Interimentation 'F.R. A.M.' CLAIM GROUP GEOLOGY & ASSAY PLAN Inter 'Date: MAP F. 'Date: Output: DWG.c. BANNINGER

BR-7 BR-8 BR-9 BR-10 BR-10 BR-11 BR-12 BR-12 BR-13 BR-13 BR-13 BR-14 BR-15 BR-15 BR-16 BR-17 BR-18 BR-19 BR-20	63.5 28.0 2.2 5.5 3.7 4.0 13.5 19.0 12.0 24.0 25.0 16.8 115.0 1.5	0.02 1.14 0.01 0.01 0.04 <0.01 0.01 0.02 1.22 0.12 3.00 0.19 6.60	Sediments Quartz vein Quartz vein Sediments Quartz vein Sediments Sediments+quartz veinlets Sediments+quartz veinlets Sediments+quartz veinlets Quartz vein zone Sediments+quartz veinlets Quartz vein zone Sediments Quart vein
S 94K/3	0	inches 1	CANADIAN SL