A GEOLOGICAL REPORT

ON THE

"P" GROUP OF MINERAL CLAIMS

LIARD MINING DIVISION, B.C.

Latitude 58°08'N Longitude 125°19'W

FOR

# FORTUNE CHANNEL MINES LTD. (NPL)

AND

BEAUMONT RESOURCES LTD.

	Department of
Mine	s and Patrolaum Resources
	ASSESSMENT REPORT
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BY

L. L. Storey, Geologist R. B. Stokes, P. Eng. G. L. Kirwan, Consultant

FOR

ADVANCE GEOPHYSICS LIMITED

September 23, 1970.

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# INTRODUCTION

From July 5, 1970 to August 15, 1970 a 5 man team of field personnel carried out a photogeological, geological and intense surface prospecting program on the <sup>1</sup>P<sup>1</sup> group of claims owned jointly by Beaumont Resources Ltd. and Fortune Channel Mines Ltd. and located in the Liard Mining Division, British Columbia. The period of field work represents 32 man days while airphoto interpretation represents 3 man days. This report is a compilation of the data obtained from these various work programs. The purpose of the programs was to evaluate the economic potential of the property.

#### GENERAL

The 'P' group of claims is situated in one of the most active areas of mineral exploration in the Province of British Columbia. The property is located some 100 miles WSW of Fort Nelson in the Churchill Peak area, a region which has a number of proven copper deposits. A total of over 100 copper occurrences have been located to date, including those of Churchill Copper Corp. Ltd., Davis-Keays Mining Co. Ltd., Windermere Exploration Ltd., Copperline Mines Ltd., Bralorne Pioneer Mines Ltd. and others.

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# General (Cont<sup>1</sup>d)

Churchill Copper Corp. Ltd. has a 1000 TPD mill in operation and nearby Davis-Keays is progressing with construction for a 1000 TPD mill based on a feasibility report recommendation. Both one bodies are in the range of 2,000,000 tons of proven ore grading 3% to 5% copper.

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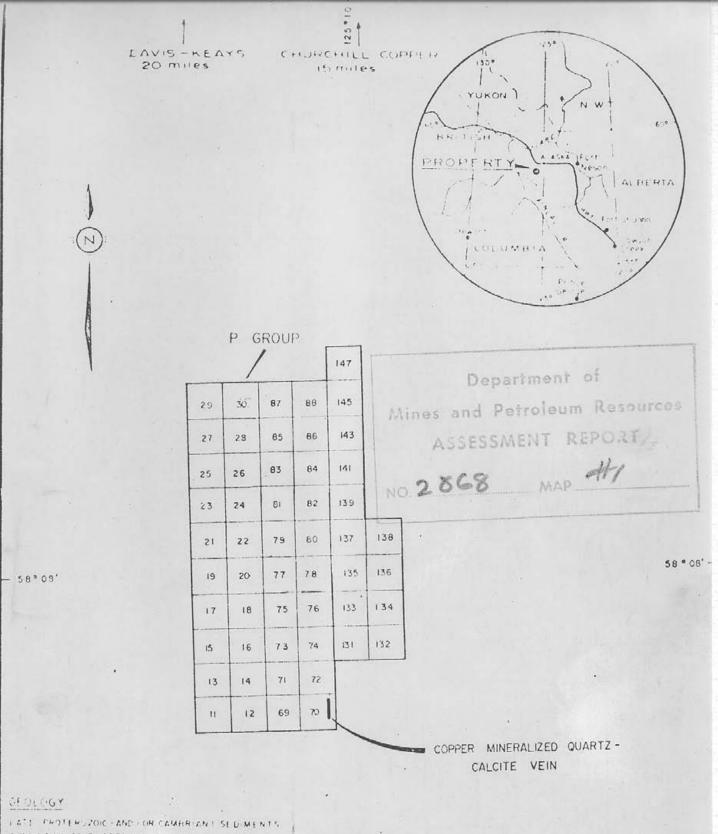
Windermere Exploration Ltd., adjacent to the subject property, is presently continuing an exploration and assessment program on the Bronson Vein, one of the company's 10 holdings in the area.

Copperline Mines has discovered 3 veins within a width of 100 feet. The one grades from 1% to 6% copper with associated silver values. The company is carrying out a trenching program to further expose and assess vein structures.

The Fortune Channel Mines Ltd. - Beaumont Resources Ltd. joint property is located in the immediate area of Windermere Exploration Ltd. and Copperline Mines Ltd.

### CLAIMS

The 53 claims of Fortune Channel Mines Ltd. and Beaumont Resources Ltd. located in the Liard Mining Division, British



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# Claims (Cont<sup>1</sup>d)

Columbia are listed below:

Claim	Record No.	Date Recorded
P 11 - 30	42840 - 42859	March 20, 1970
P 69 - 88	42898 - 42917	March 23, 1970
P 131 - 138	42960 - 42967	March 20, 1970
P 141	42970	March 20, 1970
P 143	42972	March 20, 1970
P 145	42974	March 20, 1970
P 147	42976	March 20, 1970

Witness posts were used in many instances to claim favourable areas which were, because of topography and climatic conditions, inaccessible during the period of staking.

### LOCATION AND ACCESS

The claim group is located some 100 air miles WSW from Fort Nelson, British Columbia near Churchill Peak. Coordinates of the property are 58°08! N Latitude and 125°19! W Longitude. It is accessible by helicopter from either Mile 442 or Mile 392 on the Alaska Highway. At these two points, lodging can be obtained. An alternative route is offered via a secondary road branching from Mile 401, Alaska Highway, to

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#### Location and Access (Cont<sup>1</sup>d)

an airstrip near the mill site of Churchill Copper Corp. Ltd. A helicopter can be taken from the Churchill airstrip to the property, a distance of some 28 miles. Copperline Mines Itd. plans to improve their extension of the Churchill road which will shorten the air distance. Okanagan Helicopter Co. Ltd. has a base located at the Fort Nelson Airport. Flying time from Fort Nelson to the property is approximately one hour in Bell 206A Jet Ranger, 5 place turbine helicopter.

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It should also be noted that a light plane airstrip has been built on a glacial wash on the Gataga River near the north-western corner of the property. The strip is presently 500 feet long but an extension to 1500 feet would not be difficult. The rocks here are relatively small in size and a D4 'Cat' would have no trouble building an airstrip. The shaley glacial debris forms a very solid base easily capable of supporting medium weight aircraft of DC 3 size equivalent.

### CLIMATE

The climate of the area is sub-arctic. This climatic belt is characterized by relatively short summers and long cold dry winters. January, the coldest month, has a mean minimum

# Climate (Cont<sup>1</sup>d)

temperature of 55° below zero while July, the hottest month, has a mean monthly temperature of 60° F with maximum around 95° F. Freeze-up commences in mid-October and break-up begins in late April, limiting the field season to just over 4 months. It is noteworthy that snow fell 3 times at an elevation of 5,000 feet during the month of July, 1970. These 3 inch falls, however, melted within a day. Precipitation ranges from 12 to 20 inches and snow fall totals 4 to 5 feet per year.

### VEGETATION

Timberline in the area ranges from 4500 feet to 5000 feet ASL. Thus trees are confined to the low lying areas of streams and glacial valleys. The vegetation is mixed, with alpine fir, balsam fir, and spruce being dominant. Dwarf birch is the principal shrub and inhabits the lower reaches of talus slopes and washouts. Above timberline, alpine moss, grass and flowers grow on the more gentle slopes.

#### TOPOGRAPHY

The property lies in the westernmost, sub-province of the Rocky Mountains physiographic belt, the Sentinel Ranges. This range trends NW to SE, extending from Muncho Lake into Tuchodi

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# Topography (Cont<sup>1</sup>d)

Lake, a distance of 75 miles with a width of up to 30 miles. The Sentinel Range terminates in the west in the Gataga Riven which marks the limit of the Rocky Mountain Ranges. High peaks in the surrounding area are numerous. Churchill Peak, the highest, rises to over 9000 feet. Elevation on the property ranges from 3800 feet to 6000 feet. There is much evidence of Pleistocene glaciation and some small hanging gradiens still remain. Some prominent characteristic glacial features noted in the region were U-shaped valleys, cinques, aretes, hanging valleys and many glacial sediments. Glaciotalus debris fills most of the valley floors, the lower slopes are talus covered and the upper slopes are steep with many vertical cliffs.

The Gataga River meanders west through a large area of glacial wash which covers the northern section of the joint property of Fortune Channel Mines Ltd. and Beaumont Resources Ltd. Two milky white glacial streams are found at the south end of the property. These streams originate in glaciers and snowfields some distance south of the IPI claims.

#### PHOTOGEOLOGY

An airphoto interpretation program was carried out in conjunction

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# Photogeology (Cont<sup>1</sup>d)

with geologic mapping and surface prospecting. The study searched for zones of weakness and dyke formation as economic copper deposits are related to them. Such zones were investigated and assessed in the field. Air photograph interpretation is reliable due to the almost entire absence of vegetation on the steep mountain sides and the distinct lithologic expression of the rock units.

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### REGIONAL GEOLOGY

All the rocks exposed in the Sentinel Ranges are of sedimentary origin except for the basic dykes which intrude only the oldest (Proterozoic) strata. The meta sedimentary sequence exposed trends N to NNW and ranges in age from Late Precambrian to Early Ordovician. The Proterozoic units in the area consist of thinly bedded, often slatey cleaved, medium to dark greyblack, calcareous shales and siltstones. Minor fine grained sandstone lenses are sometime present. These strata are cut by grey-green diabase dykes, which average about 15 feet thick but may exceed 50 feet widths in some areas. Overlying these units are Paleozoic sediments of Early Cambrian Age. These are characterized by brown weathering conglomerates, sandstones and shales with thick lenses of impure limestone.

# Regional Geology (Cont<sup>1</sup>d)

These sediments are not cut by dykes and strike approximately N to NNW with a shallow westerly dip. They form an angular unconformity with the underlying Proterozoic strata. Units younger than Lower Cambrian were not exposed in the subject areas. The Proterozoic strata in the region studied consists of three sub-parallel zones with a general NNW trend.

Only the western and central zone were examined but it is assumed that the eastern zone is similar. The two zones were examined in varying detail with the western one receiving most work. It was found to be overlain by unconformable Paleozoic sediments on the west and bounded by a thrust fault on the east. To the east of this thrust fault Paleozoic sediments were again exposed and noted to be unconformably overlying the Proterozoic sediments of the centre zone.

These three zones of Proterozoic sediments are characterized by the existence of sub-parallel basic igneous dykes and related quartz-carbonate veins, which cut them but not the younger sediments. The most western zone trends along the W side of the Toad River and continues south through the Fortune Channel property, and also Windermere's Bronson property.

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# Regional Geology (Cont<sup>1</sup>d)

The centre zone contains the mines of Churchill Copper Corp. and Davis-Keays Mineral Co. and also Copperline Mines main property. This zone crosses the Alaska Highway at Mile 436. The eastern zone was not examined but is assumed to be similar.

The dykes have been noted to strike in two directions, northwest and northeast, with the northwesterly trend far more common, and on occasion, dyke intersections are observed. These intrusions often have reported strike lengths of over three miles. The dykes average 15 feet wide and dip vertically or steeply to the west. As mentioned earlier, the dykes cut only the Proterozoic and not the younger sediments. The presence of dykes is the main criterion for recognition of the favourable Proterozoic units in airphoto studies and preliminary reconnaissance.

The dyke contact with the country rock is generally sharp and there is little evidence of contact metamorphism. Rock alteration from dyke emplacement is generally restricted to those dyke contacts where shearing and brecciation are in evidence. The wall rocks may become siliceous, talcose, serpentinized and

### Regional Geology (Cont<sup>1</sup>d)

show calcite remobilization.

Of economic importance is the copper mineralization found in quartz carbonate veins and vein systems which often attend and are associated with the dykes. In these veins, the copper mineral is usually chalcopyrite, with minor bornite and secondary malachite and azurite in weathered surface zones. The carbonate in the mineralized veins is generally ankerite. Although minor copper occurrences have been noted in lower Paleozoic strata, all major quartz carbonate veins are related to basic igneous dykes which only cut the Proterozoic units.

This fact was used as a basis for efficient prospecting. The results of detailed prospecting on this basis showed that all major dyke systems have related copper mineralization although it was often only in very sub-economic occurrences. The dykes and vein systems have similar attitudes which are constant in certain zones of the area examined.

The dykes and veins follow similar zones of weakness in the sediments and are approximately contemporaneous in deposition with the dykes, perhaps predating the veins. The zones which were easily intruded by the dykes also provided channelways for

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# Regional Geology (Contid)

The copper bearing quartz carbonate solutions. The more important deposits show evidence of shearing and brecciation, indicating that the dykes, although not much older than the veins, probably enhanced the channelways and thus indirectly localized the major deposits. The important deposits of the area are in relatively strong shear zones associated with dykes and, therefore, likely persist to considerable depth. The zones are observed to be extremely variable in width over short distances. Thus, the search for length potential is the major factor in exploration and length potential is far more significant than the width in evaluating any particular showing.

# PROPERTY GEOLOGY

#### A)Stratigraphy

The IPI block of mineral claims lies in a highly favourable geological environment. All the sediments recorded were of Proterozoic Age and mainly of the calcareous, dark grey siltstone and shale. Overburden as glacial debris, swamp and scrub substantially hindered prospecting and geologic mapping. However, outcrops located in the creek beds and at the SE corner of the

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### A) Stratigraphy (Cont'd)

property were of Precambrian age The metasediments strike north and dip at low angles to the west. Dip angles of the fine grained strata on the property range from 5° to a maximum of 30°. The sediments are quite siliceous with calcareous cementing. No evidence of fossilization was encountered while traversing the claims.

#### B) Igneous Intrusions

Cutting through these sediments are no less than 10 basic igneous dykes, and probably many more which were not located due to the existence of overburden. The dykes average 15 feet in width and strike NNW. They dip steeply west, mostly at 85° and some are vertical. These igneous intrusions are much more resistant to weathering than the surrounding calcareous sediments and thus are often easily recognizable by their relief. One dyke, located on claim P69, because of its resistant nature, produces a face of a 200 foot waterfall.

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### B) Igneous Intrusions (Cont<sup>1</sup>d)

Augite and plagioclase make up the main portion of the diabase dykes composition. Biotite, pyrite and magnetite are also evidenced in varying amounts. In places weathering of these inon minerals gives a distinctive red brown staining to the dyke rocks. Epidote, an alteration mineral, was common to the dykes in areas of shearing.

### C) Mineralization

Related to these igneous intrusions are two quartz carbonate vein systems which outcrop on mineral claim P12 and P75. They are systems rather than single veins because several parallel veins have developed in a shear zone. Quartz carbonate golutions have filled the channelways opened by shearing action. Both of the quartz-carbonate vein showings were mineralized with blebs of chalcopyrite. Although the two showings are a distance of some five thousand feet apart it is thought that they are outcroppings of a single mineralized shear zone.

A copper mineralized system is located at 3800

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# C) Mineralization (Cont<sup>1</sup>d)

feet ASL on claim P12. The zone strikes at 160° and dips sharply west at 80°. The showing is exposed on both sides of an E - W trending stream, an exposure of 400 feet. At the surface, the zone has a width of 15 feet. Five basic dykes cut the stream in the immediate area, the closest dyke being 5 feet west of the vein system. On both sides of the zone are highly fractured, reheated and recemented siltstones of grey-green colour. On the east side of the vein system, a 8 foot high quartz face has been produced due to the differential weathering of the broken calcareous shales. Malachite stains much of this face. The chalcopyrite is in blebs and is consistent over the exposure. Visual estimate of the grade is 2%copper.

The second showing located on claim P75 is at 4800 feet ASL. The vein-dyke system lies in a vertical direction on a cliff face. The mineralized zone is 25 feet wide and has a horizontal exposure length of 200 feet before disappearing into overburden.

# C) Mineralization (Contld)

The zone strikes approximately 160° and dips at 80° in a westerly direction. This showing is again the vein system type. It is made up of several small fracture filling veins and veinlets of one inch to one foot Approximately twenty of these veinlets are width. found over the exposed 200 feet. The system is more closely related to the dyke intrusion than the previously described showing. Several of the veinlets fill fracture channelways in the basic dyke rock. Others have filled shear and fissure areas of the schistose shale wall rock. All the veinlets seen pinch out after no more than 6 feet. Chalcopyrite inhabits the guartz carbonate veinlets. It is in blebs and is very inconsistent. Visual grade of this zone is up to 1% copper, much lower than the first showing.

Other economically mineralized rock on the property was located in the form of float. Chalcopyrite in quartz float was located in a small stream on claim P14. This could be an extension of one or both of the 'in place' chalcopyrite quartz-carbonate vein showings.

Several large quartz boulders were found in the creek

# C) Mineralization (Cont<sup>1</sup>d)

(A-06) flowing north into the Gataga River. These were erratically mineralized with high grade chalcoprite and malachite. The boulders were well rounded and presumably came from a glacien area several miles to the south of the property.

### D) Trenching

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A trenching program was carried out over the two showings to further test their economic potential. Trenching is located on P12 and on P75. An Atlas Copco plugger was used with 40% Forcite explosives. The purpose of the trenching program was to test: (a) degree and extent of copper mineralization

(b) attitude

(c) for vertical and horizontal continuity and

(d) to test for purity of quartz in relation to wall rock inclusion.

Trenching done on claim P12 was very effective. It exposed a mineralized zone of greater width than expected. Trenching exposed several varying rock units. On the west side of the vein system is a 10 foot wide dyke striking at 250° and lying almost

# D) Trenching (contid)

vertical. Pyroxene is the main component with small amounts of epidote and minor pyrite. This basic dyke has a serpentinized appearance on its contacts. East of the dyke is a 10 foot wide zone of light grey shale. Heavy fracturing of the shale makes it impossible to measure an attitude of the bedding. Minor guartz-carbonate stringers fill some of the fractures. These veinlets are probably gash veins as they are obligue to the main vein system and thus tensional features. No economic mineralization was seen associated with the gash veins. East of the shale is a much darker grey siltstone which has a width of 8 feet. Throughout this highly fractured region are one inch quartz stringers which give the zone a brecciated look. Chalcopyrite is consistently found as blebs in the quartz stringers. A visual estimate of the grade is 2% copper. The stringers follow weakness in the country nock and thus panallel bedding planes and vein structures. Next to this brecciated shale is a one foot wide quartz-carbonate

# D) Trenching (Cont'd)

vein. The chalcopyrite mineralized vein dips west at 75° and strikes at 345°. Small amounts of bornite are also present. Visual estimate of the grade here is 10% copper. East of this vein is a 2 foot wide area of grey shale. It trends approximately N-S and dips at 70°. The shale is highly altered and has been reheated and recemented. Again it is highly fractured and slightly calcareous. Kaolin fills some of the fracture planes. Minor gash veins are present and slightly mineralized with chalcopyrite. East of this shale is another vein which parallels the vein mentioned above. This vein is 6 inches wide and chalcopyrite is consistent through-The grade of this vein is estimated (visual) at out. 10% copper. On the most eastern end of the trenching a unit of light green very fine grain siltstone is exposed. The siltstone is slightly calcareous and fractured.

Trenching done of claim P75 was much less effective. The showing is vertical on a cliff face and thus safety ropes were a necessity. Trenching at the top of the cliff would not have been useful due to the presence of

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# D) Trenching (Cont<sup>1</sup>d)

deep overburden. The mineralized zone which was exposed is much less continuous. It consists of a 340° trending dyke cut by one to 6 feet in length fracture filling quartz carbonate veinlets. These veins are weakly mineralized with chalcopyrite and tend to pinch out at both ends. The dyke has been faulted and sheared and is erratically serpentinized. Small mineralized guartz-carbonate veinlets are also located in the contact zone of dyke and the schistose siltstone wallrock. Here again the veins fill a discontinuous cavity. Several of these lenses or stringers were found to be massive pyrite. The entire veindyke system dips to the west at 70°. It is obvious that this particular mineral zone is uneconomic. Howeven, it is felt that because of the evidence of a great amount of shearing and minor faulting an enriched zone could exist along this vein-dyke system.

The results of the initial mapping and the trench mapping indicate that the two mineral showings a distance of 5000 feet apart are of the same zone. Several geological factors favour this reasoning:

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# D) Trenching (Cont<sup>1</sup>d)

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- Chalcopyrite mineralized quartz float was located on claim P14 in a small stream midway between the two showings.
- 2) All the vein dykes and sedimentary units trend in a general northly direction on the claim group and in the area. The showings are in line with this direction.
- 3) There is a strong similarity of formation of mineralization. Both showings are composed of multiple quartz veins, mineralized generally with bleby chalcopyrite within altered and highly fractured shales and dykes.
- 4) Shear zones such as the one in which the quartz-carbonate veins are found, are known to possess continuity for several thousands of feet in the area.

5) Both are associated with a N-S trending dyke.

6) Both show mineralization related to a brecciated zone.

Copper content of this mineral zone appears to vary and further geological testing will be needed to prove it up as an economic body.

23 Quartz - carbonate, contains 10% (visual) copper, minor bornite -Mineralized vein 10% (visual) copper. Light green, Basic dyke Light grey shale Dark grey fine grained siltstone silststone. Minor pyrite Quartz - carbonate Quartz stringers stringers. containing blebs of chalcopyrite. Grey shale -Slight mineralization in gash veins. Mines and Percoleum Resources SSESSMENT REPORT 2868 .... BEAUMONT RESOURCES LIMITED 8 FORTUNE CHANNEL MINES LIMITED PLAN OF TRENCH LIARD M.D. No. P12 SCALE- 1"=6' DATE - SEP 2 3

#### SUMMARY

The 53 claims of Fortune Channel Mines Ltd. and Beaumont Resources Ltd.are located in an area of known copper vein properties such as Windermere Exploration, Churchill Copper Corp., Davis-Keays Mining Co. and Copperline Mines. Structurally the property is located along a Proterozoic meta-sedimentary fault block trending NNE. The formations within this block strike N-S and dip gently to the west. The sediments are relatively unfolded shales, mudstones and argillites which gives good depth potential to any vein system.

The mineral deposits of the area are all of the same general type, that is quartz-carbonate fissure veins which carry scattered and bleby copper in the form of chalcopyrite. All the mine making copper mineralization occurs in veins in Proterozoic sediments. In almost all instances green-brown diabase dykes attend or are intimately related to the veins. Thus the property is in an area of highly positive economic potential because the claims area covers solely Proterozoic formations with at least 10 dykes trending NNW through them.

Two major quartz-carbonate vein systems were located, both similarly mineralized with chalcopyrite and secondary malachite.

# Summary (Contid)

Of the two vein systems, the one on claim P12 is the most promising, but it is felt that the showing on claim. P75 is part of the same system. The intervening area is heavily covered in overburden and no outcrop is visible near the projected zone. Grades of up to 2% copper of significant widths were exposed in trenches on P12 claim. Mineralization improved substantially in freshly exposed rock. This is the best zone found in the property with width indicated up to 15 feet. The length potential is over 5000 feet.

Trenching was done on both P12 and P75. On P12 results were good, as a larger and higher grade zone was exposed as the trench cut less weathered rock. Some small sections of up to 10% copper (visual estimate) were exposed on the eastern edge of the mineralized zone. The results of trenching on P75 were not as favourable; similar geology was exposed but the mineralization was of lower grade. Although no economic sized ore zone has been discovered the zone has excellent potential along strike under the overburden.

#### RECOMMENDATIONS

Diamond drilling is warranted to prove continuity and grade

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# Recommendations (Contid)

between the P12 and P75 showings. Establishment of vein location between the two copper occurrences may be facilitated through use of geochemical or geophysical methods. Approximately \$100,000.00 should be allotted for the drill and exploration program.

Further work is contingent upon results of recommended program.

Respectfully submitted:

L. L. Storey, B.Sc., Project Geologist

R. B. Stokes, P.Eng.

G. L. Kirwan, B.Sc., F.G.A.C., M.C.I.M., Consulting Geologist.

September 23, 1970.

#### CERTIFICATION

I. RONALD B. STOKES, do hereby certify that:

- 1. I am a practicing Professional Mining Engineer with offices at Suite 213 - 678 Howe Street, Vancouver 1, British Columbia and resident of Vancouver.
- 2. I am a graduate of the Camborne School of Mines, Cornwall, England, 1952.
- 3. I have practiced Mining Engineering and Mining Exploration for eighteen years, fifteen of which were based in British Columbia.
- 4. I am a Member, in good standing, of the Association of Professional Engineers of the Province of British Columbia.
- 5. I am a Member of the Canadian Institute of Mining and Metallurgy and Associate Member of the Institution of Mining & Metallurgy, England, and the Australasian Institute of Mining & Metallurgy.
- 6. This report is based on study and interpretation of data assembled by personal examination on the property and work carried out under my supervision.
- 7. I have no direct, indirect or anticipated interest in Fortune Channel Mines Ltd. (NPL) or Beaumont Resources Ltd. (NPL)

RYStoken

R. B. Stokes, P.Eng.

September 23, 1970.

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