671309

COMINCO LTD.

EXPLORATION

WESTERN DISTRICT

TERMINATION REPORT 1974

JEAN PROJECT

N.B.C. SYNDICATE

NATION LAKES AREA, B. C.

N.T.S. 93N/2W
55°07'11; 124°50'W

Report by:

R.U. Bruaset

Project Geologist

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1. INTRODUCTION AND SUMMARY

The Jean Property, a porphyry copper-molybdenum prospect, is situated about 55 air miles north of Fort St. James, B.C. The property is owned by the N.B.C. Syndicate which consists of Messers. Bacon and Crowhurst, representing a group of prospectors, Cominco Ltd., Conwest Exploration, The Granby Mining Co. Ltd., Duval International Corporation, and Standard Oil of California.

Under the original management of Bacon and Crowhurst, programs of prospecting, geochemical and geophysical surveys and diamond drilling were carried out between 1968 and 1971. Inconclusive results were obtained in diamond drill evaluation of an unusually attractive soil geochemical anomaly. A re-evaluation of the geochemical and geophysical results was recommended by Cominco in 1972 and they assumed field management with the backing of the Syndicate.

The new approach in 1972, mainly one of I.P. coverage, led to the discovery of several new anomalous zones along the southern contact of the Jean stock. A subsequent evaluation of the total data, which included new geological mapping, led to an extensive program of percussion drilling in 1974. This program was centered on the "A", "B", and "C" anomalous zones indicated by work in 1972 and 1973.

Approximately 30 million tons of material grading about 0.41% combined Cu-Mo can be strongly inferred from the drilling in the A & B zones. Good possibilities for improvements in tonnage and grade exist in extensions of the two zones.

It is recommended that work on the property be continued in 1975 with a modest program of mapping, geophysical surveys, and diamond drilling. The proposed geophysical program consisting of I.P. and magnetic surveys would cover indicated southern and western extensions of the A & B zones. The potential for additional tonnages of similar or better grades in the A & B zones and their immediate extensions would be tested by a small diamond drilling program. One test, for example would be in an area where a 1974 percussion hole ended in material grading about 1% copper equivalent. It is felt also that diamond drilling in critical areas would provide pertinent geological information which could not be provided by the percussion drilling.

An exploration program on the Jean property in 1975 would as indicated above, provide critical information as to the potential of the property, but it would also be important from a logistical point of view. Road and raft access established at considerable expense and difficulty in 1974 would have to be almost completely re-established if the program was deferred beyond 1975.

2. OWNERSHIP AND OPTION TERMS

The Jean Property is owned by the N.B.C. Syndicate which consists of Messers. Bacon and Crowhurst, representing a group of prospectors, Cominco Ltd., Conwest Exploration, Duval International Corporation, The Granby Mining Company Ltd., and Standard Oil of California. The estimated interest of each of the partners as per the 1974 program is as follows: Conwest 15.4%, Cominco, Granby, Duval-Standard Oil, each 21.5%. The interest of Conwest will progressively decline since they no longer participate in the expenditure. The property currently consists of a total of 265 located claims full size and fractional. A claim list is included as an Appendix to this report. Included in this are eleven full size claims located in 1974 in the southwest corner of the property to protect an area of favourable geology.

3. LOCATION AND ACCESS

Locational inserts are included on Plate JP74-1. Road access from Chuchi Lake to the property was built in 1974 under difficult conditions involving the compounding effect of late ground thawing, heavy snow accummulation from the previous winter, heavy rainfall during most of the construction period, extensive areas of low swampy ground and a general prevalence of clayey road building material. A total of about 16 miles of new road was built and 8 miles of old road was rehabilitated.

The Jean Property occupies a broad east-west trending valley located about 2 miles south of Mount Alexander (Elev. 5,466). The gently sloping hillsides have good stands of mature spruce and pine. The elevations of the current areas of interest range from about 3,300 to 4,100 feet.

The western part of the Jean Property lies within 20 miles of the B.C. Rail mainline along Takla Lake.

4. HISTORY

The sequence of events that led N.B.C. Syndicate to acquire ground in the area and the exploration work that followed is covered in the 1973 Termination Report. The property was located as a result of prospecting by C. J. Stephen, prospector, working on behalf of the Syndicate in 1968. Since then the exploration work has progressed gradually in a westerly direction along the volcanic-intrusive contact of the Jean stock.

5. SUMMARY OF DEVELOPMENT - 1974

Roadwork	Rehabilitation of the old Mount Alexander road from Chuchi Lake - Distance 8 miles.
	New road construction from the above road to the northwestern property boundary of the Jean - Distance 7.5 miles.
	New road building on the property - Distance 8.9 miles.
Percussion Drilling	40 holes up to 300 feet in length - total 10,493 feet.

6. REGIONAL GEOLOGY

The Jean Property lies in the Omineca Mountains within a composite outlier of the Hogem Batholith. The batholithic rocks lie within the regional tectonic feature called the Quesnel Trough. This is believed to be a graben underlain largely by Mesozoic volcanic and clastic sedimentary rocks. The productive areas in the trough appear to be those in which granitic, alkaline or intermediate stocks and batholiths of zoned character intrude the Upper Triassic island arc volcanics of the Takla and Nicola Groups of north-central and southcentral B.C. respectively. In some important instances , it has been impossible to distinguish an age differences between the intruded volcanics and the differentiated intrusive rocks which leads one to believe that the two magmatic types may be coeval and thereby related along the lines of the plate tectonic model such as is inferred in the case of the Chile-Argentina and Southwest Pacific porphyry copper provinces.

7. PROPERTY GEOLOGY: GENERAL DISCUSSION

Geological mapping in 1974 was done on a scale of 1" = 200' in the A and B zones and on a scale of 1" = 400' in the C zone. The property is underlain by volcanic rocks of the Upper Triassic Takla Group which are intruded by a complex assemblage of differentiated intrusives probably of Lower Jurassic age. The general contact zone between the volcanics and intrusives provides the geological setting for all of the mineralization known on the Jean. Cuttings from the percussion holes have been systematically examined under a binocular microscope and it is felt that the resulting logs give a reasonably accurate picture of the general rock types, mineral content, and associated alteration. This work has supported the earlier impression that mineralizationalong the intrusive-volcanic contact is genetically related to late granitic and alkaline implacements.

The granodiorite and diorite are texturally and compositionally similar to the Hogem Granodiorite and Hogem Diorite as mapped by J.A. Garnett, B.C. Department of Mines. Potassium argon dates of these phases indicate an approximate age of 190 million years. To date no K/A dates are available from the Jean, but samples are presently being prepared for analysis by Garnett. Because of scarce bedrock exposures and somewhat restricted drilling, the configuration of the Jean stock is largely unknown. The available data indicates that the Jean stock may extend significantly further to the south than has previously been thought. The southern portions of the stock appears to be roofed by an unknown thickness of Upper Triassic Takla volcanics. The evidence supporting this hypothesis include scattered windows of intrusive - in some instances mineralized - located well to the south of the main volcanic intrusive contact and the apparent southerly dip of the andesite-granodiorite contact. In some instances intrusives are obviously roofed by volcanics and in one case a percussion hole passed through the volcanics into the intrusive below. The compositional types involved include granodiorite, quartz diorite, diorite and monzonite. It appears that the degree of magmatic differentiation, as suggested by the variety in compositional types, is high. The trend in increasing complexity in the Jean stock is to the south. This has important implications in so far as the economic potential of the area is concerned. In his recent paper on the Hogem Batholith and subsequent revisions (pers. comm.) Garnett indicates that the Hogem Batholith and its manyoutliers are composite in character. The Jean stocks is an outlier of the Hogem Batholith and Garnett is of the opinion that the diorite and granodiorite of the Jean are the Hogem type. Monzonite or syenite phases associated with the Hogem are somewhat younger and this is also the case on the Jean. A late granodiorite phase with a K/A date of 106 million years occurs in the Kwanika Creek area of the Hogem Batholith. It is interesting to note that of the granitic phases of the Hogem only the Kwanika phase is known to have significant associated sulphide mineralization. The Jean appears to be an exception to this. What this means in terms of the Jean is not known but it is quite apparent on the Jean that the granodiorite grades into diorite to the north suggesting very strongly that the two phases here are indeed closely related genetically. The results of the K/A dating by Garnett are expected to shed some light on the evolution of the Jean porphyry system.

Mapping and drilling in the eastern part of the B zone has indicated the existence of an extensive zone of contact metamorphism after the Takla volcanics. The calc-silicate development consists of massive garnet and/or epidote and/or magnetite and/or calcite. No carbonate rock has been found to outcrop in the area although some float suggests that carbonate rock is probably involved at least locally. The skarn zone is approximately 4,000 feet in length and 1600 feet in width. Its thickness is unknown but it may not be great since one percussion hole appears to have passed through it. Its attitude is not known but a gently dipping zone is probable. Fine grained disseminated chalcopyrite is occasionally noted in the skarn but the extent of mineralization is small. A fist-size specimen of skarn-float was found near the south end of line 32W (plate JPH 74-4). This material contains about 0.3% copper. The friable character of the material suggests a nearby source. Typically, the skarn zone grades outward through a zone of silicification into fresh or weakly altered Takla andesite. The hard white material of the transitional zone resembles scapolite. It occurs as irregular veinlets and as massive flooding of the volcanics. There is no clear relationship between the "scapolite" and mineralization on the Jean, however, similar looking scapolitized Upper Triassic Nicola volcanics occur at the Ingerbelle Mine at Princeton, B.C.

The geology of the C - Zone area about 1 mile to the east of the B-Zone is quite similar to that of the aforementioned. Here dioritic intrusive flanks the mineralized zone to the north. Granodiorite is the host for the copper-molybdenum mineralization. Again there is some suggestion that intrusive rock underly the volcanics to the south. This is interesting in view of the fact that the I.P. response does extend to the south beyond the area drilled and there is no apparent explanation for this in the outcrops of the area. Possibly, again mineralized intrusive occurring at shallow depth is indicated. As a side-line, the aeromagnetic data over the Jean area suggests that the intrusive body of the Jean stock actually extends signficantly to the south of the volcanic-granodiorite contact.

8. DETAILED GEOLOGY: A,B,C, ZONES

Strongsimilarities between these zones exist, hence they are covered under one heading. They differ in extent and grade of mineralization, shape of mineralized body and apparent controlling structure. These differences will be elaborated on under other headings.

The mode of typical Jean diorite is: 6% biotite plus hornblende, 6% quartz, 5% K-spar, and 92% plagioclase of total feldspar. The corresonding values for typical granodiorite here are 6%, 14%, 12% and 85%. Although the contact between the two is nowhere exposed, outcrop distribution is such as to suggest a probable gradational one. In hand specimens the diorite and granodiorite are virtually indistinguishable. Both are massive hypidiomorphic granular and the grain size is medium. Etching and staining has been necessary to classify the rocks. The composition of the granodiorite is rather closer to quartz diorite than to quartz monzonite. Miscellaneous other intrusive types are recognized. These include porphyritic varieties of monzonite and quartz diorite composition. Leucocratic rocks of quartz diorite and diorite composition occur in the western part of the Apple Cot showing located on Jean Creek near line 88W. These intermediate intrusive types are quite dissimilar texturally from that of the main diorite phase of the Jean. The intermediate intrusive rocks of the Apple Cot area are best described as allotriomorphic. A short distance to the west along Jean Creek typical hypautomorphic Jean granodiorite outcrops. This outcrop is thought to be a window of an acid core occurring at a shallow depth. The allotriomorphic rocks contain fracture controlled chalcopyrite grading an estimated 0.3% copper. The multidirectional character of the fracturecontrol in the allotriomorphic diorite, the indication that it is not a dyke, and the undefined extent of the mineralization make further trenching with a bulldozer at the Apple Cot imperative.

Takla volcanics, typically occur as massive fine grained black flows which exhibit augite and feldspar phenocrysts diagnostic of the Takla and Nicola elsewhere. These are probably rocks of andesite to basalt composition. Minor pyroclastic rocks occurring as breccias and agglomerates are occasionally noted. These are thought to be part of the Upper Triassic sequence. It has not been possible to determine the attitude of the volcanics. No flow banding or marker horizons have been recognized to date on the property.

9. STRUCTURAL CONTROL AND ALTERATION: A,B, ZONES

The mineralization contained in these zones is in the form of two tabular bodies, somewhat undulating, striking generally to the north west and dipping southerly at about 5 - 10%. Plate JP 74-5 is a longitudinal section approximately parallel to the overall strike of the two zones. It is not known for certain whether or not the two zones are actually part of one large zone. The geophysical survey suggests that the B-Zone extends at least as far west as line 64W. The mineralization may be extended as far as line 64W on this basis in view of the very good correlation between the I.P. and copper-molybdenum mineralization in the area immediately to the east and west. Owing to difficult access, no drilling was done on Line 64W. This area is largely low wet ground. A bulldozer could most certainly not be utilized in this area during the summer months.

The nature of the A and B-Zone ore controls are speculative. A number of possibilities are indicated. A gently dipping fracture zone is one possibility. Data supporting this is found along Jean Creek. There the predominant control of mineralization is gently southerly dipping fractures. The origin of this fracture pattern is surmised to be one resulting from unloading during erosion of cover rocks. This process is claimed to be responsible for some flat structures developing in the upper parts of intrusive masses and in their roof rocks. Subsidence resulting from a cooling magma might also give rise to flat fracture pattern such as indicated on the Jean. A peculiar aspect of the mineralized zones in that they extend across the volcanic granodiorite contact without any apparent displacement. This suggests the possibility that the mineralization is controlled by some other late feature such as a gently northerly dipping fault zone. There can be little support for the later theory in the absence of diamond drill information. Another possibility that has been considered is that the tabular zones which occur quite close to the present topographic surface may be enriched zones. However, the support for this is equally weak. Secondary chalcocite is not present in significant amounts. A little malachite and cuprite have been noted in the cuttings but there is little doubt that the bulk of the copper present is in the form of the primary copper minerals such as chalcopyrite and bornite. Assaying for soluble copper confirm the inferred low soluble copper content. An interesting aspect to the shape of the A and B-Zones is the indicated thickening of the mineralization with depth in the centre of each zone. This feature gives each zone and particularly the A-Zone, a mushroom or laccolith-like shape. The stem of the "laccolith" is centred more or less over the andesite-granodiorite contact. This feature may be important in terms of possible upward migration of mineralizing fluids from a hypothetical body of magmatic eminations occurring at depth below the centre of each horizon. In such a model "the plum" may indeed lie undetected at depth. On the other hand, hole JPH 74-7 may very well have intersected such a hypothetical high grade zone in its last twenty feet. This intersection averaged over 1% copper equivalent. It is intriguing that the mineralogy of this section is also different. Here significantly higher bornite content is indicated than is known elsewhere on the property. The alteration of both the "A" and "B" Zones are similar. In each case secondary biotite is pervasive. However, phyllic alteration expressed by sericite and quartz form a prominent zone of alteration over the indicated "stem" of each of the laccolith shaped mineralized zone. Possibly this is suggestive of a lateral zonation in alteration related to a mineralizing system whose source is located at depth below the centre of each zone. Another possibility, which is more speculative is that of the possible existance at depth to the west and south of the A and B-Zones of a source for the mineralization now contained in the A and B Zones. In this concept, copper-molybdenum mineralization migrated upwards into a structurally favourable horizon by means of a gently southerly dipping structure. A strong lineament paralleling the main Pinchi Fault passes through the Jean Property about one mile to the west of the A-Zone. This could overcome the obvious lack of strong structures on the property.

10. <u>ZONING AND MINERALIZATION: A,B. ZONES</u>

Sulphides recognized include pyrite, chalcopyrite, molybdenite and bornite in approximate decreasing orders of abundance. Metal zoning of copper and molybdenum is quite well developed. The copper values within the volcanic hosts are generally higher than that of the intrusive portion. However, for molybdenum the reverse is the case. The net effect is that the average copper equivalent for each host rock is about the same using a factor of three in the conversion to copper equivalents. In general the volcanic portion contain only trace molybdenum.

Sulphide zonation is evident in the B-Zone and is expressed by chalcopyrite to pyrite ratios on the cross-sections. Within a contour encompassing holes JPH 74-10, 34, 35 chalcopyrite to pyrite ratios range from 7:1 to 17:1. To the south and north the chalcopyrite to pyrite ratios decrease to 1:1 or less. A zone in which bornite is present includes holes JPH 74-2, 74-7, and 74-35. Of these, bornite is most abundant near the end of hole 74-7. In the A-Zone the zonation is less definite. A portion of the A-Zone is characterized by chalcopyrite: pyrite = 12:1. JPH 74-24, 25, 26, 27, and 38 are included in this zone. Bornite is noted in holes JPH 74-23, 28, 29 and 33. The sulphide zonation in the A-Zone suggests that the more favourable metal ratios extend to the west beyond the present drilling. This is interesting in view of the occurrence of several different compositional varieties of intrusives roofed by Takla volcanics in the western end of a trench that exposed an extensive zone of mineralization at the Apple Cot showing. The pattern of zonation in the B-Zone is concentric with the andesite-granodiorite contact. At the A-Zone, the sulphide became progressively more copper rich in the direction of the open I.P. response on the south side of the zone as well as to the west.

11. GEOLOGY, MINERALIZATION AND STRUCTURAL CONTROL: C-ZONE

This zone is similarly situated to the other zones in respect to the andesite-granodiorite contact. Unlike the other two zones, copper-molybdenum mineralization occurs almost exclusively in the granodiorite. The C-Zone also lacks the pronounced tabular shape of the other zones. It is rather a homogeneous mass of material grading 0.2% copper equivalent to a depth of 300 feet. There is no strong indication of improvements in grade in any direction either laterally or vertically. Again secondary biotite is the dominant alteration type although the intensity of alteration is far less than either of the other zones. One observation that may have some bearing on the interpretation of the I.P. over the C-Zone is that fine grained magnetite is more widespread in the C-Zone than in either the A or B zones. It may be that part of the I.P. responses of the C-Zone is attributable to fine-grained magnetite occurring in the intrusive. Surface area of mineral grains as well as the composition of the mineral grains influence the I.P. response measured. An interesting aspect of the I.P. of the C-Zone is the extension of the anomaly to the south of the area drilled. There is no trend in alteration or grade indicated nor any metal or mineral zoning apparent to explain this. Certainly, the extent of mineralization in the outcrops of the area seems inadequate to explain the I.P. response. It appears that the granodiorite may extend southward underneath the volcanics here as well as in the A and B-Zones. However, with more attractive targets presently available for exploration in the southwestern part of the property it is felt that further work in this area should be deferred. Possibly, if interesting copper mineralization continue to appear as the exploration work in the western parts of the property continues to the south, considerations might be given at a later date to further testing the C-Zone by drilling through the volcanic "roof" to the south of the C-Zone.

The structural control of the C-Zone is one of hairline fractures which are generally somewhat steeper in dip than those indicated in the A & B-Zone areas. Outcrops in the C-Zone are quite abundant and mineralization is certainly very spotty in them, indeed. Locally, at best within a few square feet, material grading about 0.3% copper occurs. In addition to granodiorite, an area of about 30 feet by 30 about 100 feet easterly of JPH 74-15 is underlain by monzonite. This material is well fractured, deeply weathered and containing about 0.5% copper as fracture controlled chalcopyrite and disseminations. This material is in fault contact with the granodiorite. It is likely that the monzonite is actually a dyke. Similar appearing fine grained monzonite form the host rock of a 20 foot section grading 0.42% copper near the bottom of DDH71-10. Monzonite of this type was intersected at the top of JPH 74-15. It appears that monzonite dykes locally may act as mineralizers i.e. vehicles for bringing sulphide mineralization up from "below". However, to date no significant concentrations of such dykes has been found on the property. Miscellaneous dykes of this kind have been intersected in the A & B Zones but without core drilling it is difficult to assess their importance. Generally, though, they tend to improve the grades somewhat whenever they are intersected. They do however, enhance the concept that mineralization on the property has been brought up from below and conversely one might argue that there could be something better still undiscovered at depth.

12. POTENTIAL RESERVES

Potential reserves are classed as strongly inferred in the case of the A and B Zones. Estimates were made using the cross section method and the assumption the grade and mineralization of each section is continuous halfway to the adjacent section. Intersections such as that of holes JPH 74-34 and 35 which were several hundred feet off section were not utilized in the calculations. These holes would not have had a significant effect on the average grade although they convincingly demonstrate the continuity in grade and thickness. Pitwalls of 45° and pit outlines as follows were considered:

For the "B" Zone:	Line	32W	11N	to	18N
		40W	11N	to	19N
		48W	7N	to	22N
		56W	9N	to	21N

The hypothetical pit would extend 400 feet and 500 feet easterly and westerly of lines 32W and 56W respectively.

For the "A" Zone:	Line	72W	14N	to	25N
		76W	13N	to	28N
		80W	15N	to	29N
		84W	16N	to	24N
		88W	17N	to	34N

The hypothetical pit would extend 200 feet and 400 feet easterly and westerly of lines 72W and 88W respectively.

Based on the above considerations, the estimate of potential reserves is indicated on the tabulation below. In addition, the tonnage of waste and low-grade possible leachable material lying above the mineralized zones is indicated. Grades are indicated in terms of copper equivalent by which Mo is included.

ZONE	CUT OFF GRADE % Cu EQUIV.	WASTE MATERIAL (<.1% Cu EQUIV.)	LEACH MATERIAL (>.1% Cu EQUIV.)	POTENTIAL MINING RESERVE	% COPPER	% Mo	Cu EQUIV. GRADE (3 X Mo.)	Cu EQUIV. GRADE (5 X Mo.)	WASTE / ORE
A	0.22 (same value for 3 X as 5 X Mo)	19.6 m.t.	3.4 m.t.	14.2 m.t.	0.30	0.015	0.35	0.38	1.38:1
B	0.31 for 3XMo; 0.32 for 5XMo	14.0 m.t.	2.9 m.t.	15.4 m.t.	0.31	0.025	0.39	0.44	0.91:1
C	No cut off used. Includes all mineralized material in area drilled.	-	-	33 m.t.	0.11	0.017	0.16	0.20	-

The following additional material can be inferred in the core of the B-Zone below the main mineralized horizon to the depth drilled. This encompasses the bottom of the following holes: JPH 74-6, 7, 9, 11, 34, 35.

ZONE	CUT OFF GRADE % Cu EQUIV.	WASTE MATERIAL (<.1% Cu EQUIV.)	LEACH MATERIAL (>.1% Cu EQUIV.)	POTENTIAL MINING RESERVE	% COPPER	% Mo	Cu EQUIV. GRADE (3 X Mo.)	Cu EQUIV. GRADE (5 X Mo.)	WASTE / ORE
	0.15 for 3XMo 0.21 for 5XMo	-	-	8 m.t.	0.13	0.029	0.22	0.28	-

Note: Copper equivalents for copper-molybdenum mineralization was determined as follows:

For 3XMo: % Cu + 3 (% Mo); for 5XMo: % Cu + 5X (% Mo)

In regard to which values should be accepted as the better estimate of the true grade the following experience factor should be considered. According to Vic Hollister of Duval International Corporation, it is their practice in porphyry copper-molybdenum deposits to use a factor of five times the molybdenum assay in converting moly to copper equivalents. This is an emperical factor that takes into account the relative marketing of molybdenum and copper products and considers recoveries as well as the relative prices of the two metals. This approach is used successfully at Duval's Mineral Park and Esperanza-Sierrita operations. It is noted that the practice involves diamond drill samples. However, there does not appear to be any basis for not expanding this practice to percussion drilling on the Jean.

Analysis for soluble copper indicates that no appreciable amount of copper is contained as malachite and copper oxides on the Jean. The analyses was done at Cominco's Trail Laboratory using the Copper Soluble in SO_2-Water Method. This method will leach copper carbonate and copper oxides but will not affect copper sulphides.

SAMPLE LOCATION		SOLUBLE COPPER	TOTAL COPPER
JPH74-27	110'-120'	$<$ 0.001 %	0.39%
	120'-130'	$<$ 0.001 %	0.32%
	130'-140'	0.007 %	0.60%
	140'-150'	0.013 %	1.50%
	150'-160'	0.011 %	0.75%
JPH74-28	100'-110'	$<$ 0.001 %	0.32%
	110'-120'	$<$ 0.001 %	0.41%
	120'-130'	$<$ 0.001 %	0.18%
	130'-140'	$<$ 0.001 %	0.17%

These analyses confirm the result of the systematic logging of drill cuttings using a binocular microscope. That work indicates that no appreciable copper is contained in copper carbonate or copper oxide form. Further analysis is not considered warranted at this stage.

13. CONCLUSIONS

The 1974 program on the Jean has indicated significant copper-molybdenum mineralization in the potential reserve category. The potential for the occurrence of more in the same grade category as well as of significantly better grades is also indicated. The property has now been established as a significant porphyry system, and appears more interesting than at any time previously. The need for additional work along the lines of that carried out from 1973 to 1974 is definitely indicated by the potential present. The present availability of good access from the north, constructed with considerable difficulty and high cost in 1974, should be made use of now when it is available.

Potential reserves in the A and B Zones total about 30 million tons grading 0.41% copper equivalent. The average waste to potential reserve ratio of 1.14 : 1. The total amount of material which would have to be moved to gain access to the main zones includes 6.3 million tons of material grading 0.17% copper equivalent. This material has potential for leaching. Both of the zones are open laterally and with depth.

14. RECOMMENDATIONS FOR 1975

The proposal for 1975 involves ten miles of I.P. and ground magnetic surveying in the southern and western extensions of the A & B Zones. In addition 2200 feet of B.Q. diamond drilling is recommended for the following locations:

HOLE	ZONE	SECTION	NORTHING	LENGTH	AZIMUTH	DIP
1	B	48W	11+70N	700'	Northerly on section	-55°
2	A	96W	35N	600'	----	-90°

3,4 Two holes totalling 900 feet to test targets resulting from the proposed I.P.

The basis for doing I.P. and ground magnetics on the Jean is two-fold. Firstly, the magnetics will aid in distinguishing between magnetic and non-magnetic conductors. Secondly, the magnetic survey is expected to indicate possible areas of intrusive since the intrusives on the property are normally magnetic while the volcanics are not.

The proposed diamond drill hole on section 48W would provide valuable information on the grade of the B-Zone, its control, as well as the extension of the well-above average grade material in which hole 74-7 bottomed. The diamond drill hole on section 96W would test the extension of the A-Zone in an area of a wide weak I.P. pattern similar in form to that produced by a broad zone of low grade mineralization.

Miscellaneous projects either being carried out or planned on data from the Jean include analyses of heavy mineral samples from the area of Jean Creek to the west of the A Zone, assaying for rhenium and sulphur analysis. This data will be presented to the Syndicate when available. A high rhenium content in molybdenum concentrate would enhance the potential of the property significantly. Utah Mines' Island Copper deposit is believed to carry about 1700 ppm rhenium in molybdenum concentrates.

15. REFERENCES

Bruaset, R. U. - JEAN PROPERTY
Termination Report, 1973
November 2, 1973

Garnett, J.A. - Geology and Copper-Molybdenum Mineralization in the Southern Hogem Batholith, North-Central B.C.
C.I.M. Bull., September 1974.

16. LIST OF ENCLOSURES

Plans

Plate J.P.74-1	Claim Map	1'=1600 feet
Plate J.P.74-2	Proposed Geophysical Work	1"=400 feet
Plate J.P.74-3	Detailed Geology C-Zone Area	1"=400 feet
Plate J.P.74-4	Geology A, B Zones	1"=200 feet

Cross Sections

Plate JEAN 74-5	Cross Section A, B Zones	1"=200 feet
Plate JEAN 74-6	Sections 32E, 40E ASSAY LEGEND	1"=200 feet
Plate JEAN 74-7	Sections 16E, 24E	1"=200 feet
Plate JEAN 74-8	Section 32W	1"=100 feet
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Plate JEAN 74-11	Sections 64W, 68W	1"=100 feet
Plate JEAN 74-12	Sections 76W, 72W	1"=100 feet
Plate JEAN 74-13	Sections 84W, 8W	1"=100 feet
Plate JEAN 74-14	Sections 96W, 88W	1"=100 feet

17. APPENDIX

Appendix 1	List of Claims
Appendix 2	Summary of Percussion drilling Non-assay data
Appendix 3	Summary of Assay
Appendix 4	Cost Statement

Report by: [signature]
Ragnar U. Bruaset
Project Geologist

Endorsed by: [signature]
D. W. Heddle
Chief Geologist
Western District

Approved for
Release by: [signature]
W. T. Irvine
Manager, Exploration
Western District

RUB/dr

February 17, 1975

Distribution:	Bacon and Crowhurst Ltd.	(1)
	Cominco Ltd.	(2)
	Duval	(2)
	Granby	(1)

APPENDIX I

OMINECA M.D., B.C.

DUE DATES AS OF JANUARY, 20/75

CLAIMS		DUE DATES
JEAN	1-4, 23, 25-26	April 15/77
JEAN	5-12, 20-22, 24	April 15/76
JEAN	27-44	Aug. 4/77
JEAN	45 Fr	Aug. 18/77
JEAN	46 Fr	Aug. 18/76
JEAN	47-54, 69, 71-79, 80-82, 119, 121,109	Sept. 4/77
JEAN	55-68, 70, 83-111	Sept. 4/76
JEAN	123-125, 127, 128	July 28/78
JEAN	126	July 28/79
JW	13, 15, 17, 19, 21-40	June 24/76
JW	41, 43-58, 59-62, 64, 66, 68, 70, 118, 120	June 24/78
JW	42	June 24/77
JW	63, 77-92, 94, 122	June 24/79
JW	65, 67, 69, 71-76, 93, 96, 98-106, 110-117,119,123, 124 ,108	June 24/80
JW	95, 97, 107, 109, 121, 125-128	June 24/81
JW	129, 134, 135	June 26/80
JW	130-132, 136-143	June 26/79
JW	133	June 26/76
JW	134 Fr	June 26/78
JW	144 Fr, 145 Fr	July 28/79
JW	200, 201, 211	Aug. 29/79
JW	202, 203, 205 Fr	Aug. 29/81
JW	024	Aug. 29/80
JW	206, 207-210	Aug. 29/76
JW	212, 221	Aug. 19/78
JW	213, 215, 217, 219,222	Aug. 19/79
JW	214, 216, 218, 220	Aug. 19/81

SUMMARY OF PERCUSSION DRILLING

NON-ASSAY DATA

JEAN PROPERTY
1974

All Holes are Drilled @ -90°

HOLE NO. JP '74	ZONE	ELEVATION OF COLLAR	NORTHING	EASTING/ WESTING	OVERBURDEN DEPTH IN FEET	LENGTH FEET	GRIDLINE OR GRID POINT RELATIVE TO WHICH HOLE MUST BE PLOTTED	REMARKS
1	B	3460	16+95	56+03W	30	300	56W	
2	"	3440	13+10	56+95W	15	300	"	
3	"	3460	8+95	55+90W	10	100	"	Hole abandoned in caving section.
4	"	3500	4+62	55+88W	5	300	"	
5	"	3540	7+10	47+97W	68	300	48W	
6	"	3520	10+70	47+85W	40	300	"	
7	"	3520	14+80	48+14W	60	300	"	
8	"	3540	19+10	47+95W	--	40	"	Abandoned in O/B, broken casing.
9	"	3540	19+11	47+95W	85	300	"	
10	"	3570	15+12	39+90W	60	300	40W	
11	"	3680	15+03	31+84W	50	300	32W	
12	"	3790	10+73	32+04W	25	160	"	Drill rods, stuck at 160'.
13	"	3650	11+07	39+89W	zero	200	40W	Abandoned in extremely hard rock, values did not warrant risking casing which was in short supply.
14	"	3710	6+97	40+06W	zero	300	"	
15	C	3940	14+90	15+83E	10	300	16E	
16	"	3940	16+94	23+83E	zero	300	24E	
17	"	4040	12+90	23+94E	3	300	"	
18	"	4020	14+00	32+10E	10	300	32E	
19	"	3950	18+00	32+04E	zero	300	"	
20	"	4040	14+16	40+00E	12	300	40E	
21	"	4000	18+12	39+85E	zero	300	"	
22	A	3420	18+19	71+93W	55	300	72W	
23	"	3340	19+06	79+95W	42	270	80W	Very hard, blocky ground, broken drill rods, hole abandoned.

HOLE NO. JP 74	ZONE	ELEVATION OF COLLAR	NORTHING	EASTING/ WESTING	OVERBURDEN DEPTH IN FEET	FEET LENGTH	GRIDLINE RELATIVE TO WHICH HOLE MUST BE PLOTTED	REMARKS
24*	"	3340	16+75	86+60W	2	300	88W17N	
25*	"	3340	16+83	88+00W	45	220	"	Very hard blocky ground. Rods stuck and hole abandoned.
26*	"	3390	20+82	88+00W	52	300	88W22N	
27*	"	3390	24+44	87+95W	40	300	88W25N	
28	"	3400	29+00	88+11W	48	300	88W28N	
29	"	3390	23+36	80+17N	48	300	"	
30	"	3400	76+00	24+32W	40	300	24W	
31	"	3390	21+31	83+90W	60	300	84W	
32	"	3420	26+60	72+16W	5	300	72W	
33	"	3390	27+21	80+12W	35	300	80W	
34	B	3550	14+90	45+00W	65	300	48W	
35	"	3500	16+30	51+43W	60	300	"	
36	"	3530	21+10	56+32W	--	110	56W	Caving overburden. Hole abandoned.
37	"	3520	24+95	56+60W	--	10	"	Frozen water line; inadequate; hose line to complete hole. Hole abandoned.
38	A	3490	15+07	84+09W	40	300	84W	
39	"	3410	16+84	75+95W	76	85	76W	Caving overburden; hole abandoned.
40	Low water showing	3410	30+55	62+30	2	300	64W	
						10,495		

* Chainage error in Line 88W from 28N to 26N. The distance between these pickets is 250 feet. Accordingly, the coordinates of holes 24, 25, 26, 27 have been determined by chaining from a local picket on the grid rather than from BL 28N88W.

APPENDIX III

SUMMARY OF ASSAYS

JEAN PROPERTY 1974

HOLE No. JPH-74-	ZONE	TOTAL DEPTH	FROM	TO	THICK-NESS	MEAN % COPPER	MEAN % Mo	Cu Equi-valent %= % Cu + 3 X % Mo	Cu Equi-valent %= % Cu + 5 X % Mo	NOTE
1	A	300	30	300	270	0.19	0.01 in	0.22	0.24	
			30	130	100	0.12	-*composite		-	
			130	220	90	0.37	0.008	0.39	0.41	
			220	300	80	0.10	-		-	
2	A	300	20	300	280	0.14	0.01 in	0.17	0.19	15' - 20'
			20	200	180	0.05	-composite		-	No Sample
			200	280	80	0.32	trace	0.32	0.32	
			280	300	20	0.16	-		-	
3	A	100	20	100	80	0.05	0.01	0.08	0.10	
4	A	300	10	300	290	0.03	0.01	0.06	0.08	5 - 10 No Sample
5	A	300	68	300	232	0.04	0.01	0.07	0.09	
6	A	300	40	300	260	0.24	trace	0.24	0.24	
			40	90	50	0.05	-		-	
			90	180	90	0.46	trace	0.46	0.46	
			180	270	90	0.13	trace	0.13	0.13	
			270	300	30	0.27	-		-	
7	A	300	60	300	240	0.24	0.01	0.27	0.29	60' - 65'
			60	80	20	0.12	-		-	No Sample
			80	140	60	0.38	trace	0.38	0.38	
			140	280	140	0.13	-		-	
			280	300	20	0.72	0.08	0.97	1.12	
8	A	40	Lost in overburden							
9	A	300	90	300	210	0.09	0.04	0.21	0.29	85' - 90'
			90	170	80	0.15	0.07	0.36	0.50	No Sample
			170	300	130	0.06	0.03	0.15	0.21	
10	A	300	70	300	230	0.17	0.02	0.23	0.27	60' - 70'
			70	130	60	0.03	trace	0.03	0.03	No Sample
			130	230	100	0.33	0.04	0.45	0.53	
			230	300	70	0.07	0.01	0.10	0.12	

HOLE No. JPH-74	ZONE	TOTAL DEPTH	FROM	TO	THICK-NESS	MEAN % COPPER	MEAN % Mo	Cu Equivalent %= % Cu + 3 X % Mo	Cu Equivalent %= % Cu + 5 X % Mo	NOTE
11	A	300	60	300	240	0.10	0.05	0.25	0.35	50 - 60
			60	170	110	0.19	0.06	0.37	0.49	No Sample
			170	300	130	0.03	0.04	0.15	0.23	
12	A	160	20	160	140	0.04	trace in compo.	0.04	0.04	
13	A	200	30	200	170	0.10	-		-	0 - 30
			30	60	30	0.05	-		-	No Sample
			60	110	50	0.21	trace	0.21	0.21	
			110	200	90	0.06	-		-	
14	B	300	20	300	280	0.03	trace	0.03	0.03	0 - 20
			20	160	140	0.02	trace	0.02	0.02	No Sample
			160	200	40	0.08	trace	0.08	0.08	
			200	300	100	0.01	trace	0.01	0.01	
15	C	300	20	300	280	0.12	0.01	0.15	0.17	
16	C	300	20	300	280	0.07	0.02	0.13	0.17	
			190	300	110	0.10	0.02	0.16	0.20	
17	C	300	20	300	280	0.09	0.01	0.12	0.14	
			120	260	140	0.14	0.01	0.17	0.19	
			260	300	40	0.07	0.0075	0.09	0.11	
			20	120	100	0.04	trace	0.04	0.04	
18	C	300	20	300	280	0.11	0.02	0.17	0.21	
			70	110	40	0.31	0.03	0.37	0.46	
19	C	300	20	300	280	0.04	0.02	0.10	0.14	
20	C	300	20	300	280	0.08	0.02	0.14	0.18	
21	C	300	10	300	290	0.16	0.02	0.22	0.26	
			20	50	30	0.56	0.01	0.59	0.61	
			50	300	250	0.12	0.02	0.18	0.22	
22	C	300	60	300	240	0.15	trace in composite		0.15	55 - 60
			60	180	120	0.03	-	-		No Sample
			180	260	80	0.37	trace	-		
			260	300	40	0.11	-		-	
23	A	270	50	270	220	0.09	trace	0.09	0.09	42 - 50
			50	240	190	0.07	trace	0.07	0.07	No Sample
			240	270	30	0.25	trace	0.25	0.25	

HOLE No.	ZONE	TOTAL DEPTH	FROM	TO	THICK-NESS	MEAN % COPPER	MEAN % Mo	Cu Equi-valent %= % Cu + 3 X % Mo	Cu Equi-valent = % Cu + 5 X % Mo	NOTE
24	A	300	2	180	178	0.03	trace	0.03	0.03	
			180	200	20	0.56	trace	0.56	0.56	
			200	300	100	0.02	trace	0.02	0.02	
25	A	220	50	170	120	trace	trace	trace	trace	45 - 50
			170	190	20	0.83	0.01	0.86	0.88	No Sample
			190	220	30	0.07	trace	0.07	0.07	
26	A	300	52	100	48	0.05	trace	0.05	0.05	
			100	170	70	0.30	trace	0.30	0.30	
			170	300	130	0.08	trace	0.08	0.08	
27	A	300	50	110	60	0.16	trace	0.16	0.16	40 - 50
			110	200	90	0.53	trace	0.53	0.53	No Sample
			200	300	100	0.17	trace	0.17	0.17	
28	A	300	48	90	42	0.11	trace	0.11	0.11	
			90	270	180	0.24	trace	0.24	0.24	
			270	300	30	0.11	trace	0.11	0.11	
29	A	300	48	210	162	0.21	0.01	0.24	0.26	
			210	300	90	0.22	0.03	0.31	0.37	
30	A	300	40	90	50	0.08	0.006	0.10	0.11	
			90	150	60	0.13	0.006	0.15	0.11	
			150	210	60	0.30	0.07	0.51	0.65	
			210	300	90	0.13	0.03	0.22	0.28	
			90	300	210	0.18	trace	0.18	0.18	
31	A	300	90	180	90	0.22	trace	0.22	0.22	
			180	300	120	0.05	trace	0.05	0.05	
			60	90	30	0.05	trace	0.05	0.05	
32	A	300	20	300	280	0.02	0.007	0.04	0.06	
33	A	300	40	150	110	0.03	0.008	0.05	0.07	35 - 40
			150	190	40	0.27	0.07	0.48	0.62	
			190	300	110	0.08	0.008	0.10	0.12	
34	B	300	70	130	60	0.13	trace	0.13	0.13	65 - 70
			130	240	110	0.33	0.05	0.48	0.58	No Sample
			240	300	60	0.14	0.02	0.20	0.24	
35	B	300	60	110	50	0.28	0.01	0.31	0.33	
			110	190	80	0.09	trace	0.09	0.09	
			190	300	110	0.19	0.02	0.25	0.29	

HOLE NO.	ZONE	TOTAL DEPTH	FROM	TO	THICK-NESS	MEAN % COPPER	MEAN % Mo	Cu Equivalent %= % Cu + 3 X % Mo	Cu Equivalent %= % Cu + 5 X % Mo	NOTE
36	B	110	Lost in overburden							
37	B	10	Abandoned in overburden							
38	A	300	40	60	20	0.20	trace	0.20	0.20	
			60	260	200	0.03	trace	0.03	0.03	
			260	280	20	0.26	trace	0.26	0.26	
			280	300	20	0.06	trace	0.06	0.06	
39	A	85	Overburden to 75'. 75'-85' no sample recorded.							
40	-	300	40	300	260	0.02	0.01	0.05	0.07	
		10,495								

Cominco Ltd.

Statement Of Expenditures

Jean Specific Project

For The Period

January 1 To December 31, 1974

Geology	$ 18,840
Percussion drilling	68,444
Transportation	9,197
Access	45,465
Camp costs	5,274
Tenure	8,004
Communications	1,327
Administrative services	15,655
Total expenditures on a cost sharing basis	$ 172,206

Financing of expenditures on a cost sharing basis as per letter of agreement dated March 20, 1973

Granby	1/3 of $172,206	$ 57,402
Standard Oil	1/3 of $172,206	57,402
Cominco	1/3 of $172,206	57,402
		$ 172,206

Standard Oil Account:

1/3 of $172,206	$ 57,402
Deduct: Contribution received August 20, 1974	25,000
Balance due Cominco as at December 31, 1974	$ 32,402

R. Craig: dw
Vancouver Office
January 27, 1975

P. D Brick
Supervisor, Exploration
& Foreign Accounting

Copies: Standard Oil Company of
British Columbia Limited (3)
Duval International Corporation
Manager, Administration, Exploration
Assistant Manager, Exploration
Western District
File (2)