

CORANEX PROJECT

Proposed Program and Budget for 1966

(J. R. Woodcock)

862277

Vancouver, British Columbia
January 14th, 1966

% CORANEX LIMITED

1521 PEMBERTON AVENUE,
NORTH VANCOUVER, B. C.

January 14th, 1966

Mr. J. J. Rankin
Suite 911, 85 Richmond Street West
Toronto 1, Canada

Dear Joe:

Enclosed are five copies of my proposed program and budget for 1966. I have tentatively reserved a helicopter for a four-month period from Foothills Aviation. However, I plan to cancel this and concentrate on the Cariboo area. Unless there are extensive forest fires, we can charter helicopters for brief periods of time from either Burns Lake or Revelstoke. If you object to this general plan please let me know immediately as Jack Strath wishes a ~~firm~~ ^{decision} commitment on his helicopter as soon as possible.

In regard to the copper deposit at Bootjack Lake, it is apparently quite large but a few trenches indicate a low grade (0.35% to 0.4% Cu). Carl Springer offered the property to Kennco and both Charlie Ney and John Sullivan recommended it and John Sullivan reached an agreement with Springer. However, Kennecott in New York turned this down. Consequently, Springer intends to form a public company on the property and raise money to drill it. If this new company and its property appeal to the public in the way that Brenda Mines Limited did then it will focus attention on the Cariboo. I believe the Cariboo area will be a very active spot this coming season and am starting to order aerial photographs and compile data on it.

As mentioned in the accompanying report, the work in the Cariboo will be done from roads and waterways. We will probably need two additional vehicles for the coming season and suggest that we purchase one more 4-wheel drive pickup (cost - nearly \$4,000) and rent a jeep for the summer (rental cost - \$1,000).

I will contact you by 'phone in the near future but am proceeding with the hiring of the crew, etc. for the proposed pro-

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gram. I hope to submit the report on the Big Creek area and Southern Dawson Range, early in February.

Yours very truly,

J. R. Woodcock

J. R. Woodcock

JRW:mb

Encls. -- 5 copies proposed program & budget for 1966

C O R A N E X P R O J E C T

PROPOSED PROGRAM AND BUDGET FOR 1966

(J. R. Woodcock)

Vancouver, British Columbia

January 14th, 1966

GEOCHEMICAL RECONNAISSANCE PROGRAM

Many of the large mining companies doing exploration work in British Columbia are searching for copper and molybdenite deposits that will lend themselves to open pit operation and most of these companies are relying heavily on the use of geochemistry, both in the reconnaissance prospecting and in the work on mineralized zones. Because of the extensive geochemical coverage throughout all geologically potential parts of British Columbia, it is very difficult to decide on an area for our 1966 program. A generalized overlay and part of the geological map of British Columbia are enclosed as an aid in reviewing the geologically potential areas, the known discoveries, and the exploration activity.

Geological Divisions

The overlay shows the interior part of the province (Nass Basin, Hazleton Arch, and Interior Plateau) bounded on the west by the Coast Crystalline Belt and bounded on the east by the Omineca Mountains and the Cariboo Mountains).

The Coast Crystalline Belt (Coast Range batholith) is generally considered inhospitable for mineral deposits and consequently the central parts have received very little attention. The eastern margin, however, is favourable to mineralization and has received most of the exploration of the major mining companies.

The Nass Basin is filled with relatively undeformed Mesozoic sediments and is not favourable for porphyry type mineralization.

The Interior Plateau of British Columbia is covered by extensive volcanic flows and sedimentary formations of upper Mesozoic and Tertiary ages. These formations are younger than known mineralization. There are, however, windows of Mesozoic rocks throughout this vast area and these have received some attention by geochemical reconnaissance crews.

The Hazleton Arch or porphyry belt is actually a relatively high area between the Nass Basin and the Interior Plateau. It is characterized by numerous small stocks intruding the Mesozoic rocks and it

has been compared with the highly mineralized Colorado Porphyry Belt in the United States.

Other major geological features which must be noted include the Topley batholith, the Ominica batholith, the Quesnel and Cariboo areas and the Pinchi fault.

Mineralization Controls

On the accompanying sketch the good deposits (indicated by a double circle) and the significant prospects (indicated by a single circle) are divided into molybdenum deposits, porphyry copper deposits and copper-molybdenum deposits. In trying to use regional controls of mineralization as a guide to reconnaissance exploration for these types of deposits, geologists have noted several regional features.

One of the first features noted in early molybdenum exploration in British Columbia is what could probably be called a "molybdenum line". Geologists pointed out that the Lime Creek deposit, the Hudson Bay Mountain deposit, the Endako deposit, and the Boss Mountain deposit are all in a straight line. Very few people have taken this seriously even though they have noted it. However, a band containing the British Columbia deposits could be extended southward into the western United States to include most of the major molybdenum deposits and many of the molybdenum prospects. On its north end the band would cross the Coast Crystalline Belt and extend through the panhandle of Alaska and into the main part of Alaska and it would also contain the best known prospects in Alaska. To emphasize this further one can note that stockwork molybdenite deposits have not been found in the Yukon to the northeast of this band even though the Coast Crystalline Belt and its eastern margin extend into the Yukon. Furthermore, in the western United States one molybdenum-copper deposit (the Hall deposit in Nevada) and only a few unimportant molybdenite prospects occur west of the Rocky Mountain uplifts. It is doubtful that any geologist would seriously accept this band as a definite regional control, however it is a feature that should be kept in mind.

One regional control that seems to be very important is the eastern margin of the Coast Crystalline Belt. Many of the important molybdenum deposits (Dak River, Lime Creek) and most of the significant prospects occur within 20 miles of this contact. If the irregularity in the eastern contact and the outlying body of granodiorite south of Terrace are included in the Coast Crystalline Belt then the Hudson Bay Mountain deposit would also be within this 20-mile limit.

The Hazleton Arch is definitely a very important loci of the porphyry-type deposits especially for the porphyry-copper deposits. Copper deposits occur along the Arch for 150 miles from the east margin of the Coast Crystalline Belt.

The major molybdenum deposits at Endako and at Boss Mountain are not along the margin of the Coast Crystalline Belt nor on the Hazleton Arch. Although they are stockwork types, they are not related to exposed porphyry stocks.

Another important type of mineralization for central British Columbia is the mercury associated with the Pinchi fault. Mercury prospects have been noted for a distance of 120 miles along the southern part of this fault. Prospectors at Quesnel have also reported mercury but the report has not been confirmed.

The other part of central British Columbia which merits mention is the Cariboo area which has been noted for its placer gold and its lode gold. The relatively high grade and profitable molybdenite mine at Boss Mountain occurs in this region. In addition, within the last two years a couple of worthy copper prospects have been located (Helcon Explorations Limited at Hen-Ingram Lake and Mastodon-Highland Bell Limited at Bootjack Lake). Old prospects of copper mineralization include the McLeese Lake area (Gibraltar Mines) about 30 miles southeast of Quesnel and the Mounse Mountain area about 13 miles east of Quesnel.

Colour Anomalies

Aerial observations made by the writer, along the margin of the Coast Crystalline Belt indicated that, in places, the Belt is flanked on the east by broad rusty bands. Such localities included the stretch opposite the Hazleton Arch and the Iskut-Stikine and Tatsamenie areas in northern British Columbia.

In the stretch opposite the Hazleton Arch, whole mountain blocks or ranges (e.g. the Kasalka Range, the Sibola Range and the adjacent Tahtsa Range) have a pervasive orange colour. Within these large (up to 250 sq. miles) blocks or ranges of orange rock, occur smaller patches of more brilliant yellow-to-reddish rock. All of the copper and molybdenite deposits along the belt (excepting the Morice Lake and Huckleberry Mountain deposits) coincide with the more restricted brilliant rusty zones. In the area between Aiyansh and Stewart, the broad patches of pervasive iron stain are lacking but the restricted brilliant colour anomalies are still present and the major molybdenite-bearing stocks are characterized by brilliant rusty patches.

Whether or not the broad zones of pervasive iron staining extend eastward along the Hazleton Arch is not known. Certainly restricted brilliant patches are associated with some of the porphyry intrusions and the whole Tomlinson Mountain area is characterized by a bright rusty colour.

Early mass geochemical reconnaissance was not guided by the rusty zones. However, geologists soon realized that the geochemical anomalies in mountainous regions were restricted to the rusty areas or to the vicinity of rusty areas. Subsequently there has been a tendency of exploration companies to check the bright

rusty zones rapidly by landing on them with a helicopter and by checking the streams draining the central parts of them. This is also a mistake as in some known instances the best mineralization does not occur in the most brilliant part of the colour anomaly. It can occur anywhere in the broad rusty zone or in a covered area adjacent to a conspicuous colour anomaly. As a matter of hindsight (at a time that is about four years too late) one might conclude that the best form of reconnaissance geochemistry along the well exposed margin of the Coast Crystalline Belt would be to geochem areas that have any rust and to omit areas of outcrop that have no rust whatsoever.

The accompanying overlay of the map shows the broad areas of rust along the margin of the Coast Crystalline Belt in central British Columbia and it also shows the flight lines from which these observations were made.

Exploration Activity

Two companies (Kennco Explorations Western Limited and Southwest Potash Corp.) have led Western Canada in geochemical reconnaissance and these two companies have covered, in a quick reconnaissance way, most of British Columbia and the southwest part of the Yukon that is favourable for copper or molybdenum deposits. In general these companies have covered such large areas and obtained so many geochemical anomalies that they have only been able to follow up their better anomalies. As a result both companies have located some very favourable prospects but both have also missed prospects that were indicated by mediocre or small anomalies. The time has come for them to review their past work so that they can check additional anomalies and also pick out relatively restricted areas for detailed geochemical sampling and follow-up work.

In a quick review of the exploration activity along the margin of the Coast Crystalline Belt one might generalize and state* that Phelps-Dodge has concentrated its efforts in the area south of Eutsuck Lake, Kennco has done considerable work between Eutsuck Lake and Morice Lake, Southwest Potash (Amax) has worked along the whole belt but has concentrated its efforts between Tahtsa Lake and Terrace, Newmont did a detailed program in the vicinity of Alice Arm, and numerous companies prospected the area between Terrace and Alice Arm.

Many of the companies are now moving eastward along the Hazleton Arch where Noranda have been active for many years. Kennco and Falconbridge are very active in this area and other companies are moving in.

The Quesnel area has been the object of intermittent search for copper for many years. Doubtless it has been "geochemed" but it has not received the sophisticated geochemical attack that has been

*Based on facts and rumours so not necessarily accurate.

launched against the eastern margin of the Coast Crystalline Belt. Helcon Explorations Limited based their exploration on special air photo interpretation. The targets were examined by a geologist and silt-sampled by a prospector.

Coranex Program

In choosing an area for our 1966 geochemical reconnaissance several pertinent conclusions can be drawn from the previous data:

1. The major companies regard the porphyry belt of the Hazleton Arch and the margin of the Coast Crystalline Belt as the most potential area for large low grade type deposits and these companies have attacked this area en masse with geochemical and conventional prospecting methods.
2. Two of the best molybdenite deposits (Endako and Boss Mountain)* are not in the porphyry belt but are in the relatively subdued and highly covered areas to the south-east.
3. The low grade copper deposits under exploration in the Cariboo area are apparently comparable in potential grade and tonnage to those being explored along the Hazleton Arch**.
4. Most low grade deposits have associated pyrite and in the mountainous areas above timber line this pyrite oxidizes to form large conspicuous rusty zones. All these rusty zones in the mountainous areas of the Coast Crystalline margin and the Hazleton Arch have been prospected and "geochemed". However, the relatively subdued areas to the southwest are covered by overburden. The pyritic zones in the covered areas will not form conspicuous colour anomalies and the areas are generally amenable only to geochemical prospecting.
5. In most cases the geochemical prospecting has led to mineralization in the vicinity of known or forgotten mineral showings.
6. In the area along the Coast Crystalline Belt and along the Hazleton Arch, a helicopter is necessary as a means of transportation. This involves a great expense,

* These two deposits, now in production, are exceeding all expectations.

** The Granisle deposit on an island in Babine Lake has published ore reserves of 23 million tons grading 0.53% copper.

especially where fuel has to be flown in by Beaver aircraft. The helicopter is a great asset in that it enables a crew of men to cover a great deal of country in a season. However it often becomes a liability in that the exploration program must centre around it and must move rapidly. In this modern geochemical approach to reconnaissance exploration there has been a slight tendency for the exploration crews to become slaves to a geochemical laboratory and to a helicopter.

For our main centre of geochemical reconnaissance in 1966 I propose the Quesnel area. A good part of this can be tackled from jeeps on road, boats on the main waterways, and small rubber boats on the small lakes. The inaccessible areas can be filled in by using a helicopter for brief periods of time.

The mineral potential of the Quesnel area is mainly copper and secondarily molybdenite. In addition, asbestos has been noted and the aeromagnetic coverage indicates several ultrabasic bodies that could be briefly prospected. An interesting feature to note is the Pinchi fault along the northeast side of the area and the bodies of serpentine that occur along this fault. The Pinchi fault in the Stewart Lake area to the northwest is mineralized with mercury -- moreover the major mercury deposits of California are associated with serpentine bodies. There seems to be no reason why silt sampling will not pick up mercury and consequently any streams draining this fault should be checked with a mercury detector.

The margin of the Coast Crystalline Belt has been extensively prospected in recent years, with the result that one would be reluctant to base his whole geochemical reconnaissance program in an area that has been checked by several companies using both geochemical and conventional prospecting techniques. However, as noted before, in much of this geochemical reconnaissance many of the lesser anomalies are not followed up and many of the smaller streams entering major lakes are missed in the sampling. Much of the Tweedsmuir Park area can be sampled from the lakes and it would probably be worthwhile having one geochemical crew on Eutsnck Lake and Whitesail Lake. The sampling program would need very little supervision. However, it would be guided by the sample sites marked on aerial photographs. In this way no streams would be missed and the samples could be collected at the best spots (e.g. above the swamps which often border main valleys and which will remove much of the anomalous metal values).

CUB CREEK, Yukon Territory

The massive sulphide float on Cub Creek has an average un-

weighted grade of 1.6% copper and 4.4% zinc and the type of mineralogy is similar to that found in many large deposits. Because of the fairly good grade and the potential for large tonnages, one is justified in searching for the source.

The fact that the float is in very large blocks, all occurring in a very small area on Cub Creek, indicates that the source is probably very local. The possibility that the float was moved a short distance by a northwesterly-flowing glacier has not been tested.

In a report submitted on December 8th, 1965, the writer has recommended six miles of I.P. work to check the potential area. The accompanying sketch shows a tentative outline (in red) for about four miles of this work. Two of the lines extend across highs in the existing resistivity anomaly and one of the lines is placed off the southeast end of the resistivity anomaly and across the hole drilled by Canex Aerial Explorations Ltd. This short line should determine whether or not Canex placed their hole in the anomalous zone. The remainder of the cross lines, and a northwesterly line check the proposed source area of the sulphide float.

It is important to decide immediately, whether or not this work will be done. I. P. crews will be hard to get in the coming summer and we will have to commit ourselves for this short job. Unless other I.P. work is planned by other companies for the Yukon Territory we will have to pay the cost of mobilization from Vancouver, British Columbia.

BIG CREEK and HAYES CREEK, Yukon Territory

The report on the geochemical work in the southern Dawson Range is not complete. It is possible that some additional work will be needed on Big Creek or on the Hayes Creek claims.

Although no ore-grade mineralization has been noted at the Big Creek locality it is an interesting and "juicy" spot. It is characterized by a porphyry stock containing abundant pyrite; by anomalous values in heavy metals, copper, molybdenum, and arsenic; and by some mineralization consisting of brecciated porphyry filled with carbonate, sphalerite and galena. The area is covered by extensive overburden and any further work would require bulldozer stripping, possibly a week to ten days of work with a D-8 Cat. Prior to any bulldozer stripping, we must stake claims and do some more soil sampling.

Should any interesting mineralization turn up in the work at Big Creek, then we should hold the Hayes Creek claims and explore the suitable parts (that not covered by frozen moss) by geochemical soil sampling.

Some of the silt samples from the Yukon reconnaissance have not yet been analyzed and there is a possibility that a few anomalies may need checking. The work on Cub Creek, Big Creek, and Hayes Creek

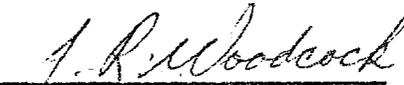
could be done by three men -- a junior geologist and two student helpers.

GENERAL RECONNAISSANCE

In the exploration work using geochemistry, the fastest way to find a good mineralized zone is to do geochemistry on or near known properties. In the coming season the writer would like to have time to do some of this work. In addition, he has several ideas and locations that he would like to briefly investigate. Furthermore, it may be necessary to do some follow-up work on the few silt samples collected in the Stewart area. This general reconnaissance program would be time-consuming but it would involve relatively small cost -- some travel expenses and some possible helicopter costs.

RUSTY GROUP

The status of the Rusty option is indefinite and the budget does not include an allowance for work. The first phase of investigation of the claims would be geochemistry -- silt and soil sampling. Such work could be done by the geochemical crews working in the region.

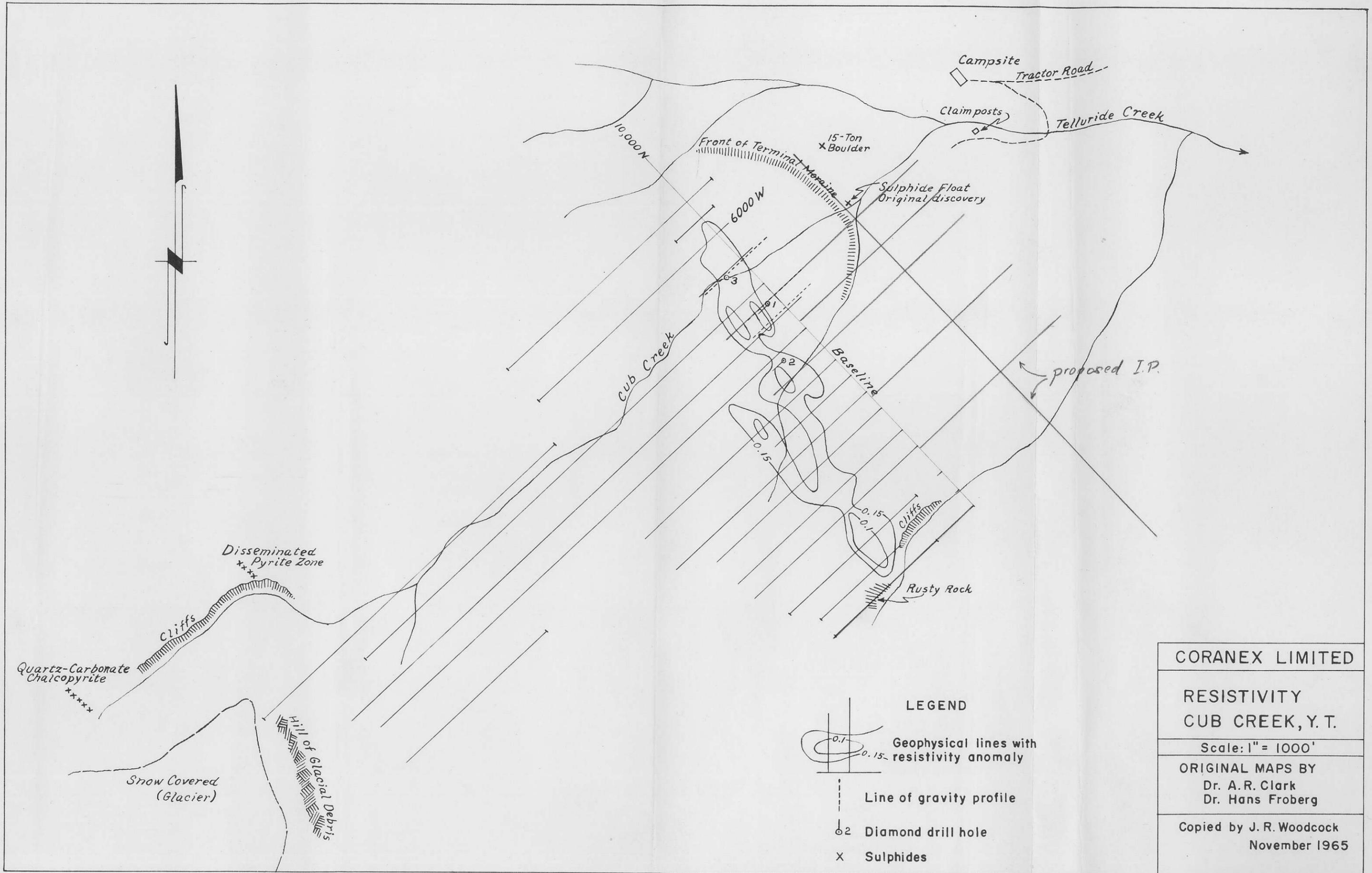


J. R. Woodcock

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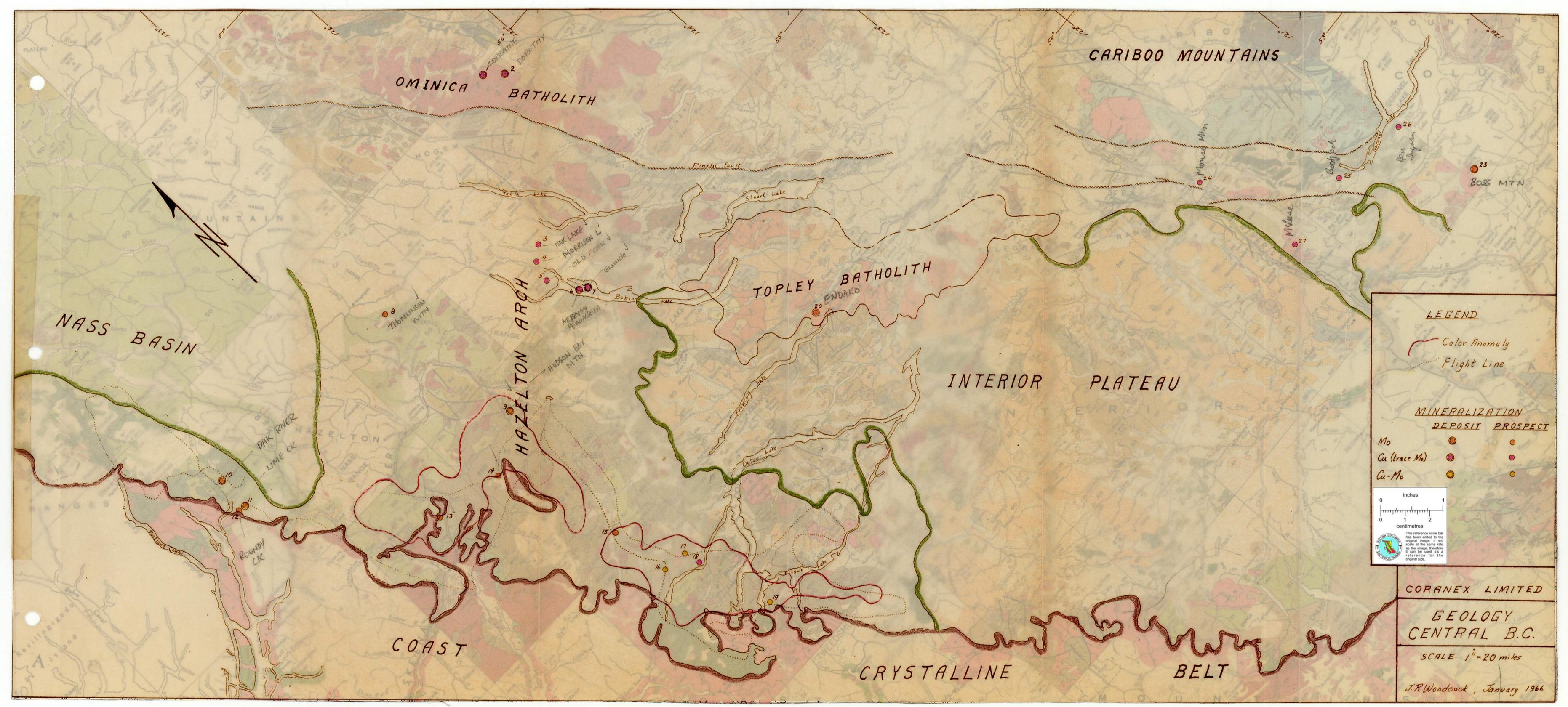
BUDGET ESTIMATE - 1966

CATEGORY	B.C. GEOCHEM.	YUKON WORK	GENERAL RECONN.	GENERAL OVERHEAD	TOTAL
Wages	16,000	5,000	--	35,000	\$ 56,000
Office Costs	--	--	--	5,000	5,000
Fares	1,000	700	300	600	2,600
Transportation	2,000	500	200	200	2,900
Accommodation	500	300	200	200	1,200
Meals & Food	6,000	2,200	300	200	8,700
Camp Supplies	900	300	--	--	1,200
Camp Equipment	1,500	300	--	--	1,800
Vehicle & Boats	6,000	--	--	--	6,000
Laboratory Equipment	300	--	--	1,200	1,500
Laboratory Supplies	1,000	--	--	500	1,500
Office Supplies (+ photos)	500	--	--	500	1,000
Helicopter	15,000	3,000	1,000	--	19,000
Plane Charters	3,000	--	600	--	3,600
Geophysics	--	3,000	--	--	3,000
Bulldozer	--	6,000	--	--	6,000
Claim Costs	2,000	1,500	--	--	3,500
Legal Costs	--	--	--	500	500
TOTAL	55,700	\$22,800	\$2,600	\$43,900	\$125,000



COPPER AND MOLYBDENUM DEPOSITS
CENTRAL BRITISH COLUMBIA

<u>Map No.</u>	<u>Name</u>	<u>Company</u>	
-1	Lorraine	Kennco	Cu
-2	Dorothy	Kennco	Cu
-3	Nak Lake	Noranda	Cu
-4	Morrison Lake	Noranda	Cu
-5	Old Fork	Falconbridge	Cu
-6	Newman Peninsula	Noranda	Cu
-7	Granisle	Granby	Cu
-8	Thomlinson Mountain	Amax	Mo
-9	Hudson Bay Mountain	Amax	Mo
-10	Dak River	Newmont	Mo
-11	Lime Creek	Kennecott	Mo
-12	Roundy Creek	Silurian Chieftain	Mo
-13	Pitman	Canex	Mo
-14	Serb Creek	Amax	Mo
-15	Morice Lake	Amax	Mo
-16	Berg	Kennco	Mo-Cu
-17	Whiting Creek	Kennco	Mo-Cu(?)
-18	Huckleberry Mountain	Kennco	Cu
-19	Haven Lake	Phelps-Dodge	Mo-Cu(?)
-20	Endako	Canex	Mo
-23	Boss Mountain	Noranda	Mo
-24	Mouse Mountain	Private	Cu
-25	Bootjack Lake	Mastodon-Highland Bell	Cu
-26	Hen-Ingram	Helcon	Cu
-27	McLeese Lake	Gibraltar Mines	Cu



OMINICA BATHOLITH

CARIBOO MOUNTAINS

NASS BASIN

TOPLEY BATHOLITH

INTERIOR PLATEAU

HAZELTON ARCH

COAST

CRYSTALLINE

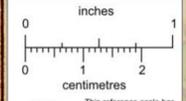
BELT

LEGEND

-  Color Anomaly
-  Flight Line

MINERALIZATION

	DEPOSIT	PROSPECT
Mo		
Cu (trace Mo)		
Cu-Mo		



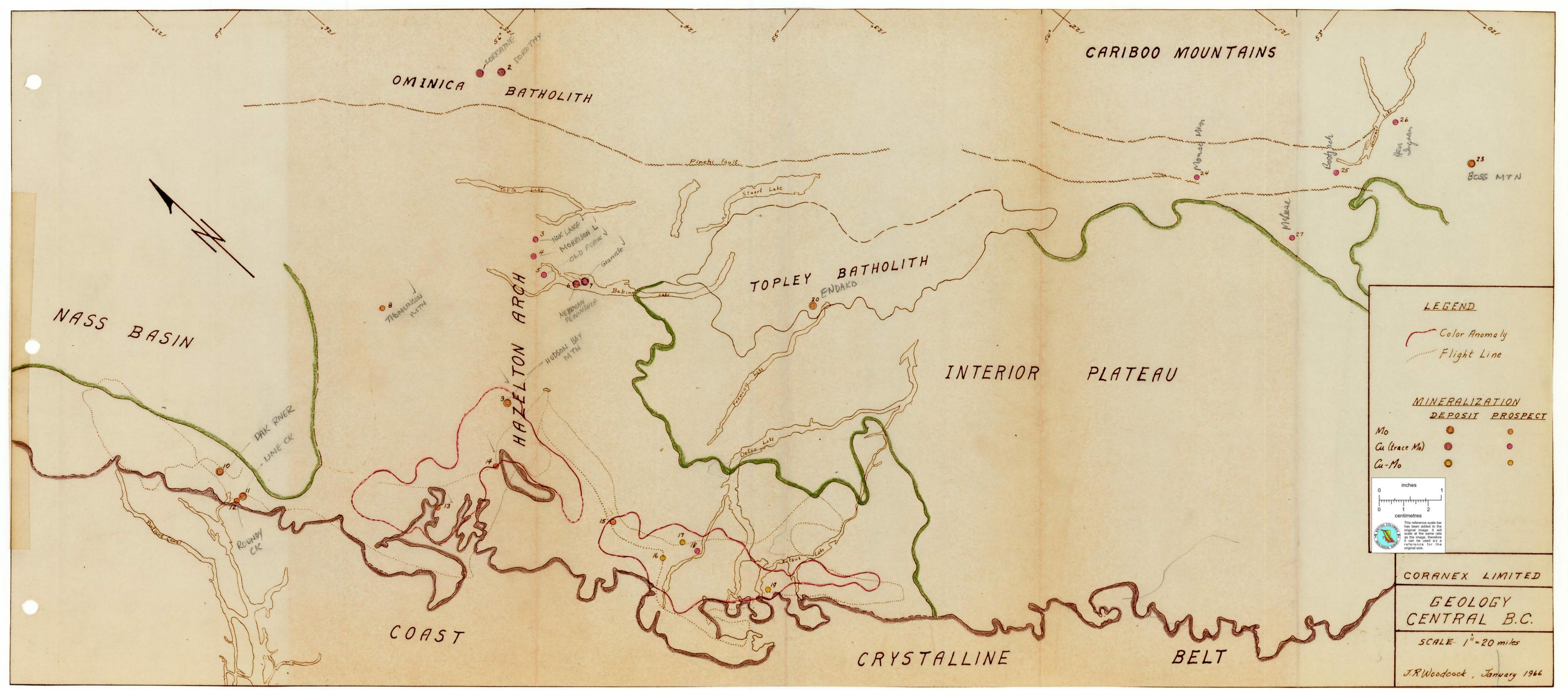
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CORANEX LIMITED

GEOLOGY
CENTRAL B.C.

SCALE 1" = 20 miles

J.R. Woodcock, January 1964



OMINICA BATHOLITH

CARIBOO MOUNTAINS

NASS BASIN

TOPLEY BATHOLITH
ENDAKO

HAZELTON ARCH

INTERIOR PLATEAU

COAST

CRYSTALLINE

BELT

LEGEND

Color Anomaly
Flight Line

MINERALIZATION DEPOSIT PROSPECT

Mo	●	●
Cu (trace Mo)	●	●
Cu-Mo	●	●

0 1 inches
0 1 2 centimetres

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CORANEX LIMITED

GEOLOGY
CENTRAL B.C.

SCALE 1" = 20 miles

J.R. Woodcock, January 1966

