

673549

March 30th, 1972.

M E M O

To: D.W. Tully
R.H. Seraphim

From: W.R. Bacon

Re: AJAX-MONTE CARLO PROPERTY,
KAMLOOPS M.D.

PROPERTY

The Cominco property consists of eight (8) Crown granted claims - Ajax, Neptune, Sultan, Grassroots, Wheel Tamar, Monte Carlo, Forlorn and Copper Star; plus five (5) located claims - Jacko No. 4, Jacko No. 6 Fr., Jacko No. 8 Fr., Jacko No. 10 Fr. and Jacko No. 18 Fr.

(The "IMA" claim was held by Cominco as Jacko No. 9 and subsequently dropped.) *out.*

The 13 claim property is about 6 miles south of Kamloops in an area of open, rolling rangeland that varies in elevation from 2900 feet in Jacko Lake and Peterson Creek valley to 3300 feet on the ridge of rock above the lake. The claim area is covered, for the most part, by varying thicknesses of boulder clay which reaches its greatest depths in a series of small, southeasterly trending drumlins. The drumlins have a relief of about 50 feet and some of them have rock cores.

Rock outcrops occupy less than 10 per cent of the claim area. Consequently contacts and structural features, as they occur at the surface, are to a considerable extent inferred.

DEVELOPMENT

Trenches -	Numerous.
Adits -	4 (totalling 500 ft.), 2 of which were caved in 1967.
Sinking -	28 feet in a winze plus numerous shallow test shafts.
Diamond Drilling -	Cominco (1928) 5,319 ft.
	Newmont (1952) 1,380
	Cominco (1955-57) 15,200
	Cominco (1961) 1,004
	Cominco (1967) <u>4,171</u>
	27,074 ft.

In 1928, and 1955-61, Cominco's drilling was mainly concentrated on the Ajax claim and the Neptune which adjoins the Ajax on the southeast. Newmont's drilling was on the Monte Carlo claim, near the adit.

In 1966, Cominco undertook a program of geological mapping, magnetometer and induced polarization surveys. In addition, Vanco carried out a geochemical survey on the property, the results of which were made available to Cominco. The results of the geochemical and geophysical surveys appeared to be extremely encouraging. Coincident anomalies indicated that a large area on the Wheel Tamar and Monte Carlo claims merited further attention and the 1967 drill program was to test these anomalies.

GEOLOGY

The property is on the southern margin of the Iron Mask batholith. The batholith intrudes Nicola andesites, basalts and fragmentals.

Until 1967, it was thought by Cominco (but not by J.M. Carr) that the Ajax deposit was a contact type and that the mineralization was deposited in an albitized assemblage of Nicola volcanics. In 1967, Cominco came to the conclusion that the significant mineralization occurs in the finer grained batholithic rocks (As for the writer, he finds it extremely difficult to differentiate between microdiorite and recrystallized Nicola andesite.)

Picrite-basalt occurs along the margin of the batholith. It is almost invariably serpentized and is generally porphyritic with small black ovoid phenocrysts in a grey, aphanitic ground mass. This rock is not a favourable host rock but it does occur in the immediate vicinity of the Ajax mineralization - and occupies a similar strategic position elsewhere in the batholithic area.

The finer grained batholithic rocks are bordered on the north by coarsely crystalline rocks and the contact between these two types is a breccia in which the fragments are either gabbro or pyroxenite. Only small, localized shear zones within the breccia contain weak sulphide mineralization. It is not a potential host rock.

MINERALOGY

Chalcopyrite is the primary ore mineral. It occurs mainly in fractures and shear zones, in veinlets with calcite and less commonly

as disseminations replacing the mafic minerals of the diorite. Minor amounts of bornite and pyrite are associated with the chalcopyrite. Pyrrhotite and hematite have been noted, and trace amounts of molybdenite in polished sections. Magnetite is an accessory mineral not genetically related to the sulphides.

Coatings of calcite, epidote and pyrite on joints are also not genetically related to the economic sulphides.

Malachite and azurite occur to depths of 150 feet.

With regard to alteration, the bulk of the mineralization occurs in the zone of albitization but the best disseminated mineralization occurs in only moderately altered rocks. Sections of porcelaneous albitite are commonly barren.

ORE CONTROL

Nearly all the known ore occurs in the alteration zone on the Ajax claim.

Mapping in the South Ajax adit indicates that the mineralization is associated with two principal shear directions as follows:

1. Strike N60°E, dip 60°N.
2. Strike N35°E, dip 45°E.

The picture is complicated by post-mineral faults, the whole resulting in a lack of continuity to the mineralization. It may be stated that the mineralization occurs in irregular, discontinuous, northeasterly trending shoots which form a porphyry copper deposit.

GEOPHYSICS

Drilling of IP anomalies on the eastern part of the property indicated the probable cause of anomalous readings to be the polarization of pyrite in a widespread assemblage of calcite, epidote and pyrite that occurs on numerous joints and fractures in the area. In contrast, the main mineralized zones on the Ajax claim gave only a moderate ("probable" or "possible") geophysical response. A local high IP response to the northwest of the main mineralized zone was tested by a drill hole which cut serpentized gabbro and practically no sulphides.

RECOMMENDATION

It is essential to stay in the finer grained batholithic rocks, i.e. the microdiorite, particularly where any albitization is known. Moreover, the shear directions on the Ajax claim should be kept in mind. Beyond this, little is certain and therefore the writer strongly recommends a percussion drill program in order that as much ground as possible can be tested with the money available. Selection of drilling sites should be deferred pending onsite inspection of the potential ground by either Dr. Seraphim or the writer or both.

From what is known at present, the value of further IP surveys appears doubtful to the writer.

W.R. Bacon

WRB/ic

J.R.
Dec. 11/67

EXPLORATION

WESTERN DISTRICT

AJAX-MONTE CARLO
KAMLOOPS M.D. 92I-9
SUMMARY OF 1967 EXPLORATION PROGRAM

1. SUMMARY

Detailed mapping of the Ajax-Monte Carlo property has revised the interpretation of the geology somewhat. The property is a true porphyry copper deposit in which the host rocks are younger, more acidic phases of the batholith. The concept of the ore controls is essentially the same with the mineralization contained for the most part, in irregular discontinuous north east trending shoots. Large breccia zones in the older intrusive types are virtually barren.

The 1967 drilling program was carried out to evaluate the numerous IP anomalies obtained by the 1966 program of geophysics. Drilling on the eastern side of the property on the Monte Carlo, Wheel Tamar and Jacko No. 18 Fr. claims indicated that the IP responses were likely caused by pyrite, which with epidote and calcite, coats the numerous joints and fractures and appears to be genetically different from the copper sulphide mineralization.

One hole was drilled on the Ajax zone and added nothing to the current reserves of 8,000,000 tons grading 0.68% Cu (inferred).

2. PROPERTY

Eight (8) crown granted claims: Ajax, Neptune, Sultan, Grassroots, Wheel Tamar, Monte Carlo, Forlorn and Copper Star.

Five (5) located claims: Jacko No. 4, Jacko No. 6 Fr., Jacko No. 8 Fr., Jacko No. 10 Fr., and Jacko No. 18 Fr. Assessment work has been applied to these claims to keep them in good standing till their respective anniversary dates in 2000. Provision was also made for the application of assessment work against taxes on the crown granted claims.

3. OWNERSHIP

100% Cominco.

4. LOCATION

Lat. N. : 50°38' Long. W.: 120°22'
Elev.: 3000' Prov.: B. C.
M.D.: Kamloops NTS: 92I-9

The claims are located immediately east of Jacko Lake, approximately six air miles southeast of Kamloops or ten miles from Kamloops by road via Knutsford.

5. HISTORY

The original Ajax, Monte Carlo, Neptune and Sultan crown granted claims were located in the early 1900's. Cominco optioned the group in 1928 and did some drilling on the Ajax claim and some drifting in the Monte Carlo adit. Berens River (Newmont) optioned the claims in 1952 and did some drilling

on the Monte Carlo claim near the old adit. In 1954, Cominco again optioned the four original claims together with additional crown granted claims, staked additional claims and conducted a program of geological mapping and geophysical surveying. From 1955 to 1957, Cominco conducted drilling programs totalling 15,200 ft. In 1961, Cominco drilled 1,004 ft. in two holes. This work was concentrated mainly on the Ajax and Neptune crown grants and resulted in an inferred 8,000,000 tons grading 0.7% in three zones.

Increased activity in the Iron Mask Batholith area in 1965 and 1966 prompted reappraisal of the Ajax property. In 1966, a program of geological mapping, magnetometer and induced polarization surveying was conducted. In addition, Vanco carried out a geochemical survey across the Ajax property, the results of which were made available to Cominco. The results of the geochemical and geophysical surveys were extremely encouraging. Coincident anomalies from the above mentioned surveys indicated that a large area on the eastern side of the property, on the Wheel Tamar and Monte Carlo claims deserved further attention, and the 1967 program was proposed to test the anomalies.

6. PRODUCTION

Nil.

7. DEVELOPMENT

Trenching:	numerous
Drifting:	500 ft. in 4 adits, 2 of which are caved.
Sinking:	28 ft. in a winze plus numerous shallow test shafts.
Diamond Drilling:	Cominco (1928) 5,319'
	Berens River (1952) 1,380'
	Cominco (1955-57) 15,200'
	Cominco (1961) 1,004'
	Cominco (1967) <u>4,171'</u>
	Total
	Drilling 27,074'

8. GEOLOGY

a) General

The Ajax-Monte Carlo group of claims is located along the southern flank of the Iron Mask Batholith, an intrusive complex some twelve miles long and two miles wide. The long axis of this batholith trends northwesterly. The Batholith intrudes andesites, basalts, fragmentals and minor sediments of the Nicola group of Upper Triassic age. It was previously thought that this deposit was a contact type of deposit, and that the mineralization was deposited in an albitized assemblage of Nicola volcanics. However, the 1967 mapping suggests that such is not the case. It now appears that the mineralization occurs in altered intrusive rocks which form a part of the Iron Mask igneous complex.

b) Rock Types

In general, the batholithic rocks may be described as follows (oldest to youngest):-

The oldest varieties are coarsely crystalline and are basic to intermediate in composition. These are mainly pyroxenite and gabbros containing dark green pyroxene crystals, variable amounts of plagioclase, and abundant accessory magnetite.

Coarse-grained hornblende diorite is also included in this group. Except for local small shear zones with minor sulphides, these rocks are of no economic significance.

Picrite-basalt is a common and distinctive rock type. It is almost invariably serpentinized, and is generally porphyritic or glomeroporphyritic with small black ovoid phenocrysts in a grey aphanitic ground mass. Elsewhere in the batholith, it has intruded the coarse - crystalline batholithic rocks, according to Carr (1956). This rock type is apparently not a favourable host for sulphide deposition since little mineralization is associated with it. The only unaltered occurrence of picrite occurs approximately 1/4 mile south-east of the property.

Apparently younger than the picrite is a fine-grained equigranular diorite type described by Carr (1956) as "microdiorite". Fresh material is medium grey in colour, but on the Ajax property, this rock type has been strongly propylitized and is light buff to greenish white in colour due to an abundance of sodic plagioclase, calcite and epidote. This unit typically contains angular fragments of coarse-grained Iron Mask Gabbro. Altered microdiorite (albitite) underlies the Ajax and Neptune claims and is the primary host for sulphide mineralization there. Micromonzonite is texturally similar to the microdiorite. Both are fine-grained, hypidiomorphic-granular, but the micromonzonite is lighter and more pinkish in colour since it contains less mafics and more orthoclase. Very fine grains of disseminated magnetite (or hematite in altered varieties) are typical and inclusions of coarse crystalline rocks are uncommon. This rock type is not as abundant as the microdiorite and although weakly mineralized in places, does not appear to be an important host.

Apparently younger than the microdiorite is a group of porphyritic diorite and monzonite varieties known collectively as "lobe types" since these form the main mass of the crystalline lobe-like appendage to the batholith which underlies the Wheal Tamar, Grassroots and Monte Carlo claims. Older varieties display hornblende phenocrysts to 2 cm in a phaneritic ground mass composed mainly of anhedral feldspar. Included fragments of coarse crystalline rocks, primarily gabbro and pyroxenite, are very common. Younger lobe varieties are more acidic, and in addition to hornblende phenocrysts contain euhedral, often zoned, phenocrysts of plagioclase. Trachytoid texture is common in the younger varieties. These rock types have been given the general name, "Sugarloaf" by other workers since they comprise the main mass of Sugarloaf Hill.

Alteration of these types is not as intense as the alteration of the microdiorite, and is generally restricted to shear zones and zones of strong jointing. Propylite alteration is the main type, and is characterized by an abundance of epidote. Minor albitization in narrow zones adjacent to fractures and joints is typical.

Potassic alteration of the lobe types and the microdiorite is less common but is apparently closely associated with sulphide mineralization. This alteration type is typified by an abundance of red orthoclase in veinlets and irregular blobs, and by the development of minor hydrothermal biotite.

Intruding the loba rocks is an assemblage of lamprophyres. Common varieties are pyroxene and hornblende lamprophyres; biotite lamprophyres are rare. All are relatively unaltered and unmineralized.

Tertiary rocks include quartz-feldspar porphyry and olivine basalt of the Valley basalt formation.

c. Structure

The dominant structure on the property is a breccia zone on the northern edge of the property which occupies the position of the contact between the coarse crystalline rocks of the batholith and the finer grained younger intrusive types. Fragments are nearly invariably of gabbro or pyroxenite and rarely of diorite. The breccia matrix is variable in texture but is dioritic in composition and is quite likely microdiorite. Petrographic study is necessary for confirmation here. The width of the breccia zone is difficult to assess since the nature of the breccia changes from a very tight breccia (95% fragments) with little volume expansion to the north in the coarse crystalline rocks of the batholith, to a very open breccia (95% matrix) with only occasional isolated fragments of gabbro, over a distance of about 1000 ft. In most cases, there has been little, if any, assimilation of the fragments, but occasionally there are zones in the breccia in which the fragments have been partially digested and outlines of individual fragments are difficult to discern.

For the most part, fragments are angular to sub-angular but in one outcrop, near the eastern corner of the Ajax claim, the fragments are sub-rounded to well-rounded, but show little or no evidence of assimilation. One may speculate that the rounding of fragments resulted from abrasion in a breccia pipe which was subsequently filled with microdiorite. In any case, the breccia appears to have resulted from a removal of support rather than from any forceful emplacement of material.

Small, localized shear zones within the breccia contain weak sulphide mineralization but the breccia zone itself is not an ore control.

9. MINERALIZATION AND ORE

A. Mineralogy

Chalcopyrite is the primary ore mineral. It occurs mainly in fractures and shear zones, in veinlets with calcite and less commonly as disseminations having replaced the mafic minerals of the diorite. Associated with chalcopyrite are minor amounts of bornite and pyrite. Pyrrhotite and hematite have been noted, and trace amounts of molybdenite were seen in polished sections. Magnetite is an accessory mineral in the gabbro and micromonzonite rocks and is not genetically related to the sulphides.

Coatings of calcite, epidote and pyrite on joints are also not genetically related to the copper sulphides.

The main secondary minerals are malachite and azurite. These carbonates have been observed in core at depths of approximately 150 ft; it should be kept in mind that assays of surface or near surface material have probably been enriched. Weathering of sulphides has also resulted in residual concentrations of gold in near surface assays.

B. Alteration

Alteration of mafic minerals to epidote and coatings of epidote, calcite and pyrite on joints ~~is~~ widespread throughout the batholith. Locally, on the Ajax property, strong propylitization of the rocks on the west side of the property in particular has resulted in a general bleaching of the rock. Mafic minerals have been altered to tremolite and epidote while the feldspars have been altered to albite and calcite. The resulting rock is white, porcelaneous, fine grained and is referred to as "albitite". This type of alteration may be extremely irregular in character and sharp contacts between bleached and unaltered diorite are common. It is not unusual to see fragments of diorite in various stages of alteration within a zone of albitite and it seems likely that brecciation preceded alteration in some zones at least.

Although the bulk of the mineralization occurs within the albitized zone, there appears to be no connection between the degree of alteration and the amount of sulphides present. In fact, the best disseminated mineralization occurs in only moderately altered rocks whereas sections of porcelaneous albitite are commonly barren. It was noted, however, that sulphide mineralization was present in albitite containing appreciable amounts of carbonate.

Potassic alteration, involving injection of K_2O as orthoclase, with minor biotite and sericite, is not as strong on the property as elsewhere in the batholith, but is closely associated with mineralization. At other properties, such as the Kimberley and Copper King, large zones of brick-red porphyry have developed from potassic alteration.

C. Ore Controls and Reserves:-

Nearly all the mineralization on the property is contained within the strongly altered envelope on the Ajax claim. Little has been added to the picture here; underground mapping in the South Ajax adit has shown that the mineralization is associated with two major shear zones, one striking ~~060~~ 060 degrees and dipping 60 degrees to the north, the other striking 035 degrees and dipping 45 degrees to the east, as well as with several other, less intense, shear directions. The picture is further complicated by post-mineral faults of varying attitudes and unknown displacements.

From drilling done to-date, all reserves are in the Ajax-Neptune zone. By correlation of intersections, 3 northeast trending mineralized zones were proposed.

<u>Zone</u>	<u>Grade</u>	<u>Tonnage (inferred)</u>
A	0.80% Cu	1,700,000
B	0.67%	2,760,000
C	0.64%	3,540,000
Total	0.67%	8,000,000

0.4% Cu was used as a cutoff grade.

The 1967 drilling program did not add to the established reserves.

D. Summary of 1967 Diamond Drill Results

See attachments.

10. GEOPHYSICS

A. Performed

A detailed magnetometer survey was carried out on the mineralized area on the Wheel Tamar claim to gain some insight as to the structure in the area. The contact between the coarse crystalline rocks and the younger varieties appears to be quite distinct in this area; that is, the breccia zone is probably fairly narrow since the position of the contact is quite apparent on the magnetometer map. Less obvious, is an east-west trend in the magnetic expression of the younger diorites which host the mineralization in the area. Lithology has been correlated for about 200 feet between drill holes here, but zones of mineralization in and adjacent to these lithologic units are discontinuous and cannot be traced over even this short distance.

B. Assessed

The purpose of the 1967 drill program was to assess the anomalies obtained during the course of the 1966 program of geophysics. Certain of the anomalies were in areas underlain by the older coarse crystalline rocks. Since it has been established fairly conclusively that major concentrations of sulphides are unlikely to occur in these rocks, these anomalies were not tested by drilling.

The major target established by the geophysics was a large irregular anomaly in the rocks underlying the Wheel Tamar, Monte Carlo and Jacko No. 18 claims. Detailed mapping and drilling of the anomalous zone on the Wheel Tamar claim established that chalcopyrite mineralization is mainly confined to narrow intermittent shear zones. Much more widespread is the assemblage calcite, epidote and pyrite coating the numerous joints and fractures in the area. It is probable that the IP anomaly here resulted from the polarization of the pyrite of this assemblage.

Drilling on the Monte Carlo claim and the Jacko No. 18 Fr. also indicated that chalcopyrite was mainly confined to narrow erratic shear zones whereas pyrite, calcite and epidote on joints and tight fractures were more widespread and regularly distributed.

In addition, the 3 drill holes in this area passed through the porphyritic diorite and into a brecciated serpentized picrite at a depth of about 250 feet. Serpentine is reported to have been polarized in rare cases. In all probability, the IP anomaly in this region is due to the scattered smears of pyrite on joint faces or perhaps to the serpentized breccia zone. This breccia zone is virtually barren.

It is interesting to note that although the main mineralized zones on the Ajax claim contain abundant chalcopyrite in fractures and disseminations, the geophysical response over these zones is only moderate and anomalies here are classified as "probable" and "possible". A local high IP response to the northwest of the main mineralized zone was tested by drill hole No. 56. The rocks underlying the anomalous zone were found to be serpentized gabbro breccia containing virtually no sulphides.

11. POSSIBILITIES

A. Ajax Zone

Detailed surface and underground mapping substantiate the hypothesis that the sulphides are mainly controlled by northeast-trending fracture zones as has been previously suggested. However, the large number of apparently

unrelated drill hole intersections and the complexity of the structure as seen underground suggest that the mineralization is contained in a large number of local, perhaps discontinuous, fracture zones in sets of several different attitudes. Further study of the controls is currently being undertaken. Established reserved figures are therefore open to question. Additional sampling is necessary to confirm the size and shape of the ore blocks as they are presently visualized.

The zone to the east of the main mineralized (Ajax) zone has been tested by section holes about 500 feet apart. Intersections here are more widely spaced, but grades are in the same order of magnitude as those of the Ajax zone. It seems probable that additional drilling here could increase the reserves by perhaps 30 percent. In view of the complexity of the situation, this must be considered to be speculative.

B. Wheal Tamar Zone

No reserves are established in this zone. Mineralization is controlled by shear zones trending north-east and southeast but concentrations of mineralization are small, spotty and irregular. As previously mentioned, mineralized intersections cannot be traced from hole to hole despite the fact that lithology and structure can be correlated. The possibility of developing a significant tonnage of ore grade material in this area seems remote.

12. CONCLUSIONS

Induced polarization anomalies on the Wheal Tamar Monte Carlo and Jacko No. 18 Fr. claims are likely to have been caused by pyrite, which, with calcite and epidote, coats joints and fractures. This mineral assemblage appears to be genetically distinct from the chalcopyrite - pyrite - bornite assemblage controlled by local shear zones. The shear zones in this area are weak and irregular; the possibility of making ore here is remote.

Local IP anomalies occur in the coarse crystalline rocks on the northern edge of the property. No significant mineralization has been found in these rocks and it is unlikely that these anomalies were caused by sulphides.

A small IP anomaly on the northwestern flank of the Ajax zone was drilled but the underlying rocks were found to contain no sulphides. Consequently, nothing was added to the reserves as presently envisaged.

Detailed mapping underground disclosed several fracture sets and post - mineral faults. Major fracture zones trend northeasterly as was previously thought, but it is believed that these structures are discontinuous and irregularly mineralized; the ore-shoots as presently outlined, are therefore suspect. A study of the fracture and shear zones is currently underway.

13. RECOMMENDATIONS

Additional sampling of the Ajax zone is necessary to increase the confidence level of the ore reserve statistics. Reconnaissance drilling on the eastern flank of the Ajax zone resulted in moderately spaced intersections of low grade mineralization. Drilling in this region could be expected to increase reserves by approximately 30 percent.

15. ATTACHMENTS

- A. Appendix of 1967 Diamond Drilling Statistics.
- B. General Plan, 1" = 300'

15. REFERENCES

- 1. Cominco Reports, 1929, 1954, 1955, 1956, 1961, 1967
- 2. GSC Memoir 249
- 3. Report to B.C. Minister of Mines, 1956

Report by: "W. P. Armstrong"

Endorsed by: *J. Richardson*

WPA/nc

December 11, 1967

Distribution

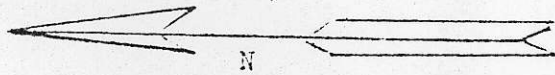
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



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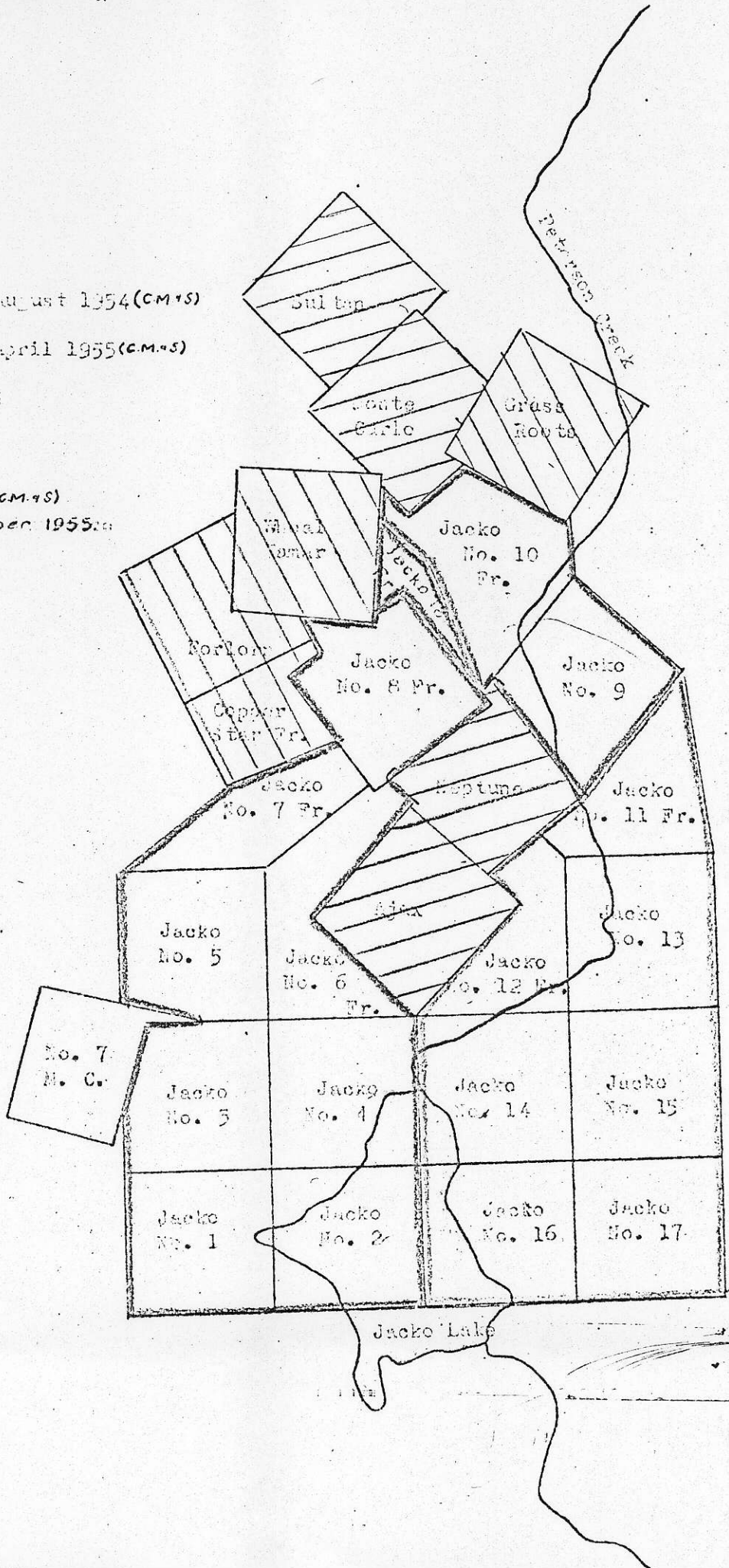
SUMMARY OF MINERALIZED INTERSECTIONS
1967 DRILLING

<u>HOLE</u>	<u>FROM</u>	<u>TO</u>	<u>WIDTH</u>	<u>% Cu</u>	<u>DEPTH</u>
49	210	233	23	0.93)	481
50	355	445	90	0.83)	570
	395	425	30	1.17	
	531	543	12	0.46	
51	0	314		0.20	411
52	389	404	15	0.37	507
53	195	205	10	0.55)	473
				Possibly another 15"	
54	63.5	78	14.5	0.90	509
55	67	85	18	1.08	598
	519	531	12	0.84	
	587	592	5	0.64	
56	523	608	85	0.68)	<u>622</u>
				TOTAL	4,171

Est. direct costs \$6.75/foot



-  - Staked August 1954 (C.M.S)
-  - Staked April 1955 (C.M.S)
-  - Optioned
-  - Leased
-  - Staked (C.M.S) November 1955



DRAWN BY		TRACED BY		THE CONSOLIDATED MINING & SMELTING CO. OF CANADA LTD.	PROPERTY:	
REVISED BY	DATE	REVISED BY	DATE		M. C. - MONTE CARLO	
					SCALE 1" = 1500'	
					DATE: April 55	PLATE No.

Feb. 24/1956

AJAX-MONTE CARLO (Kamloops M.D.)

Mine Series No.

Geological Report No. 2A

INTRODUCTION

The Ajax-Monte Carlo group is a potentially large, low grade copper prospect in Kamloops Mining Division. The group consists of four optioned claims, four leased claims and 18 claims and fractions held by staking. The property is situated six miles south of Kamloops and lies astride a portion of the south contact of the Iron Mask batholith. Numerous copper deposits occur around the periphery of this batholith and a few occur within the pluton. Frequently the deposits are accompanied by considerable albitization of the wall-rock. The largest deposit in the area was the Iron Mask Mine which produced over five million pounds of copper from about 200,000 tons of ore which averaged 1.4% copper and 0.02 ozs. Au per ton. This mine is on the north contact of the batholith and is four miles northwest of the Ajax group.

Cominco drilled the immediate vicinity of a small surface showing on the Ajax claim in 1928 and 1929 and obtained scattered, wide, low grade mineralization, the best intersection being 81 feet of 0.9% Cu. The present group of claims, centering on the Ajax, was acquired by Cominco in 1954 by option, leasing and staking. Geological mapping in 1954 outlined the south contact of the Iron Mask batholith on these claims and showed that copper mineralization was confined to a *bread* albitized zone in andesite flows of the Nicola group immediately south of the intrusive contact. An electromagnetic survey in 1954 did not reveal any conductors which might be indicative of sulfide mineralization. It was then proposed to drill widely spaced cross-sections through the favorable albitized zone. This report deals with the results of the 1955 drilling program and recommends the action to be taken with the several claims.

SUMMARY & CONCLUSIONS

A total of 7,250 feet of diamond drilling in 14 holes was completed in 1955. The favorable albitized zone was initially cross-sectioned at 1,000 foot intervals and subsequent drilling was done in the vicinity of the better intersections. The drilling showed that nearly all and certainly the better mineralization is confined to the albitized zone. This zone extends from the diorite salient on Monte Carlo claim 6,000 feet westerly to Jacko Lake. It has a maximum width of 900 feet but narrows rapidly in the western part of Ajax claim. Albitization is confined to andesite flows lying parallel to and immediately south of the diorite contact.

The best intersections obtained in the 1955 drilling were 82 feet of 1.2% Cu and 62 feet of 1.1% Cu. Elsewhere, widely scattered intersections of 0.4% to 0.9% Cu over widths from 15 to 110 feet were obtained in the albitized zone. A discouraging feature of these relatively wide intersections is that they show very little continuity in either the horizontal or vertical plane. This discontinuity of mineralized sections is the result of the extremely irregular nature of the albite alteration and the irregular distribution of disseminated sulfides within haphazard, less altered blocks of volcanics in the altered zone. The deposit would, therefore, have to be mined as a large block since it would be quite impossible to mine it selectively. The best block that can be outlined contains about 50,000 tons per vertical foot of 0.3% Cu. This grade is definitely below minable limits even though the various physical factors provide excellent conditions for low cost open pit mining.

SUMMARY & CONCLUSIONS (Continuation)

Two exploration possibilities remain in the albitized zone. One is south of the 1929 drilling on Ajax claim, the other between the most easterly drilled section and the diorite salient on Monte Carlo claim. There is little to suggest, however, that the grade or continuity of any mineralization in these areas will be better than that already obtained.

Most of the mineralization is on the Ajax and Neptune claims. These claims and two others in the group are under option to purchase for \$20,000 in four yearly payments of which \$2,000 was paid on the 31st August, 1955. The next payment is for \$5,000 on the same date in 1956.

RECOMMENDATIONS

It is recommended that:-

- (1) The option on the four optioned claims be terminated.
- (2) The staked claims be held at least until the expiration of assessment work credits.
- (3) The four leased claims be retained for the same period as those under (2) above.

The reason for recommending the retention of certain claims lies in the hope of finding other structures or conditions in the area which may control mineralization. No such structures or conditions are known or inferred at the present time. The claims recommended for retention form a well-located group which can now be held at minimum expenditure.

EXPLORATION POSSIBILITIES

Two exploration possibilities, which may have some merit, remain. One is an untested zone 1,000 feet long and 200 feet wide along the south edge of the albitized zone on Ajax claim south of the 1929 drilling. The second possibility is the eastern 1,000 feet of the albitized zone which extends from the most easterly drill holes to the diorite salient on Monte Carlo claim. There is little to suggest, however, that the grade or continuity of any mineralization in these areas will be better than that already obtained.

There appears to be a concentration of mineralization near the south limit of the albitized zone. This concentration may have been caused by a damming effect of the adjoining basalt which underwent very little alteration. The untested zone mentioned above lies between our best intersection, which ran 1.2% Cu across 32 feet, and another intersection 1,000 feet to the west which ran 0.6% Cu across 58 feet. This zone could be tested with one drill hole 500 feet long drilled from the outcrop on the oil pipeline right-of-way.

The second possibility described above could be adequately tested with two cross-sectional drill holes each about 600 feet long. Here, the diorite transects the volcanics at a high angle to their strike. Since the diorite is assumed to be the source of copper mineralization and it is cross-cutting the favorable volcanics in the form of a cupola, then better conditions for ore may exist here with these added controls. We do know, however, that the volcanics in the immediate vicinity of the diorite contact do not contain much copper mineralization.

EXPLORATION POSSIBILITIES (Continuation)

Also, if better mineralization does occur in the volcanics in the vicinity of the cupola it does not extend as much as 1,000 feet west, as shown by the relatively narrow and low grade intersections in drill holes 21 and 22.

It is thus seen that the two exploration possibilities that remain are not too attractive with respect to size and possible grade.

At the present time no other ore controls or possibilities are known on the property or in the area. It has been recommended, however, that certain claims be held at least until the expiration of present assessment work credits. During this time we may find other conditions or structures in the area which may control mineralization and provide us with additional exploratory targets.

GENERAL GEOLOGY

The property is located about six miles south of Kamloops in an area of open, rolling range land that varies in elevation from 2,900 feet in Jacko Lake and Peterson Creek valley to 3,300 feet on the ridge of rock above the lake. The claim area is covered, for the most part, by varying thicknesses of boulder clay which reaches its greatest depth in a series of small southeasterly trending drumlins. The drumlins have a relief of about 50 feet and some of them have rock cores. Rock outcrops occupy less than 10% of the claim area and very little more occur in the immediate vicinity. Consequently contacts, attitudes and other structural features are inadequately outlined on the map. The outcrops take the form of isolated ridges trending in the direction of the regional strike of the extrusive rocks.

The property is underlain entirely by igneous rocks which are both extrusive and intrusive. The oldest rocks are a thick series of Nicola volcanics of Upper Triassic age. They underlie the central and south portions of the property. Andesite is the predominant rock type in this formation as represented in the map area. It is a fresh to slightly altered rock of medium grain with some coarser grained phases that are indistinguishable from certain phases of the diorite. Porphyritic andesite is quite common as are narrow sections of flow breccia. In the vicinity of the property the andesite shows local alteration to albite, epidote, chlorite and calcite. However, on the property the andesite flows are largely converted to a dense, light gray, porcelaneous albite. This altered zone extends from the diorite cupola on Monte Carlo claim for 6000 feet westerly to Jacko Lake. It has a maximum width of 900 feet but narrows rapidly in the western part of Ajax claim. Albitization is irregularly distributed throughout this zone and it appears that somewhat less than 50% of the andesite shows albite alteration. The andesite flows occur along the south contact of the Iron Mask batholith and extend for at least 1000 feet to the south. A thick series of basaltic flows, with some interbedded andesite, lies above the andesites. The basalt is a distinctive rock with numerous large phenocrysts of augite. It is generally strongly magnetic.

Danding is infrequently observed within the volcanics. A few scattered observations show that the flows strike sub-parallel to the south contact of the Iron Mask batholith and dip steeply to the south.

The Nicola volcanics are intruded by the Iron Mask batholith, a Coast Range intrusive of Jurassic or Lower Cretaceous age. This pluton is roughly 12 miles long and 2 1/2 miles wide. The direction of elongation is northwesterly and parallel to the strike of the enclosing

GENERAL GEOLOGY (Continuation)

rocks. The batholithic rocks vary in composition from syenite to ultrabasic types with diorite being by far the most common type. In the immediate vicinity of the Ajax-Monte Carlo group the plutonic rock is essentially diorite. Some syenite phases were intersected in the drill holes and a small lobe of pyroxenite outcrops at the east end of the property. All the plutonic types are medium grained and relatively fresh but show some local albite and epidote alteration. They are characteristically deficient in quartz and orthoclase is uncommon.

The south contact of the Iron Mask batholith traverses the north portion of the property in an easterly direction from Jacko Lake to the north corner of Neptune claim where it abruptly swings northeasterly to cross the central part of Wheel-Tamar claim. It then swings south to the south end of Grass Roots claim to form a prominent cupola about 2000 feet wide. Drill hole information indicates that the dip of the batholithic contact along the straight portions is steep to the south. However, the dip in the loop described above around Wheel Tamar claim is very flat. Consequently the overlying albitized volcanics in this area are very shallow. Some pits here show that the volcanics as much as 500 feet south of the contact are only 20 feet to 30 feet deep. No information was obtained on the dip of the contact of the cupola. It is known, however, that the east and west flanks of this structure transect the enclosing volcanics at a high angle.

A few sills of coarse feldspar porphyry up to 15 feet wide occur within the andesite flows of the Nicola volcanics. These sills also show considerable epidote alteration. It is not known whether they are genetically related to the volcanics or to the batholithic rocks. They are barren of sulphide mineralization.

A small remnant of Kamloops volcanics of Miocene age outcrops at the east end of the property on Sultan claim. The rock is a dark, fine grained basalt. It unconformably overlies all the other rocks in the vicinity of the map-area. They have been only slightly disturbed locally.

STRUCTURE

The extreme scarcity of outcrops makes it impossible to determine the structural elements in the map-area. A few observations show that the Nicola volcanics strike generally easterly sub-parallel to the south contact of the batholith and dip steeply south. The basalt flows to the south apparently overlie the andesite south of the batholith but the presence or absence of folding could not be determined.

Indirect evidence only indicates the possibility of a fault striking $N 15^{\circ} E$ from the north arm of Jacko Lake at the west end of the property. The amount and direction of movement on this fault could not be determined. Furthermore, it is not known whether this fault acted as a channelway for sulphide-bearing solutions. It appears most likely that the fault is post-mineralization.

A number of narrow crushed zones were intersected in the volcanics. They undoubtedly represent small faults. Also, brecciation is common in the andesite blocks adjacent to the more thoroughly albitized zones.

A shear zone about 50 feet wide was intersected in diorite near the bottom of D.D.H. 20 and 800 feet east another zone of similar size was intersected in volcanics in D.D.H. 22. These intersections may

STRUCTURE (Continuation)

represent the same shear zone. If so, the zone strikes N 60° W, which is about parallel to the diorite contact, but passes into the intrusive down dip. The shear zone contains finely disseminated pyrrhotite and some chalcopyrite. This, and possibly other similar shear zones, probably acted as ore solution channels from the intrusive into the Nicola volcanics.

MINERALIZATION

Numerous copper deposits are associated with the Iron Mask batholith. However, the only production of any significance was from the Iron Mask Mine which produced about 5.2 million pounds of copper from ore averaging 1.4% Cu and 0.02 oz Au. Many of the copper deposits are found around the periphery of the batholith and a few occur within the central part. Several are situated within the intrusive rocks and some are in the intruded rocks at the borders of the pluton. The deposits are in the form of impregnations, veins, stockworks, and mineralized shear zones. Some of the impregnation deposits appear to have no solution channels. Frequently the deposits are accompanied by considerable wall-rock alteration that involves the albitization of plagioclase feldspar with the development of carbonate, chlorite and epidote. There is no data to prove that this alteration was accomplished at an earlier stage than the mineralization, but its occurrence at some little distance from known ore bodies suggests that alteration and ore deposition may have been to some extent independent processes. Although the alteration is not invariably closely related to the ore bodies, it is sufficiently diagnostic to be used to some extent as an indicator that ore bodies are nearby. Thus it affords a somewhat larger target for exploration than the ore bodies themselves. The alteration is very pronounced in the vicinity of the Iron Mask Mine, and this is the largest ore body so far developed in the area. On the Ajax-Monte Carlo property the albitization is even more intense and considerable widespread copper mineralization is known here.

The deficiency of quartz, the abundance of magnetite and calcite and the general arrangement of the copper deposits with respect to the periphery of the Iron Mask batholith are all features which would relate them closely in origin to the batholithic rocks. Their occurrence within the hydrothermally altered rocks of the batholith and vicinity, however, would suggest that they are connected with the very late phases of the intrusion and consolidation of the batholith, or that they came from a deep-seated magmatic source not exposed at this locality.

Copper mineralization on the Ajax-Monte Carlo property occurs in a broad albitized zone in Nicola volcanics immediately south of the contact of the Iron Mask batholith. This highly altered zone extends from the diorite cupola on Monte Carlo and Grass Roots claims westerly for 6000 feet to Jacko Lake. It has a maximum width of 900 feet but narrows rapidly in the western part of Ajax claim and spreads out in a broad, but very shallow, zone west of the salient on Wheel Tenar and Jacko No. 5 Fraction. Albitization is confined almost entirely to the andesite flows south of the intrusive contact but a little alteration, in small, local, irregular patches, is also present in the intrusive rocks. The basaltic flows, however, show little to no albitization. Albitization within the broad zone mentioned above varies in intensity from zero to nearly 100% and the distribution of altered and unaltered blocks is extremely irregular and unpredictable. An intensely

MINERALIZATION (Continuation)

shattered zone was probably formed in the andesite during the orog-
eny and emplacement of the batholith. Then albite solutions, as
later emanations from this unsaturated rock, migrated into the
fractured zone, healing it and causing albitization of the andesite
flows which is very irregular both spatially and in intensity.

Most of the sulphides, consisting of chalcopyrite
and pyrrhotite with a little pyrite, occur in irregular blocks of
partially altered andesite adjacent to or enclosed by albitized
sections, particularly where the andesite has been fractured or
brecciated. Brecciation is very common in the andesite along con-
tacts with albitized sections. Sulphides are rare in the more
thoroughly albitized portions of the zone. The sulphides occur,
for the most part, as fine disseminations in albitized andesite
and rarely in minute calcite-filled stringers. No ore solution
channelways are known but shear zones, such as the sulphide-bearing
one intersected in D.D.H.'s 20 and 22, might have acted as such
from the intrusive into the Nicola volcanics.

The fact that the sulphides occur in andesite flows
in the form of fine disseminations rather than in stringers might
suggest that: (1) the sulphides were originally constituents of
the volcanics and during the process of albitization they migrated
to less altered sections, particularly where such sections are
fractured and brecciated "islands" in the albitized zone; or, (2)
the sulphides accompanied the albitizing solutions from the intru-
sive and accumulated in the less altered blocks of andesite which
are generally brecciated. The latter suggestion is probably the
more likely one because of the distribution of copper deposits
around and within the Iron Mask batholith.

The extremely irregular nature of the albitization
and the irregular distribution of disseminated mineralization with-
in the haphazard, less altered blocks of volcanics in the altered
zone precludes the possibility of individual intersections extend-
ing for any distance horizontally or vertically. The deposit,
therefore, would have to be mined as a large block as it would be
quite impossible to mine it selectively. Another feature of the
deposit is that the ore intersections are rather uniformly low grade
and no high grade zones have yet been intersected.

The best mineralization occurs on either side of a
large, intensely altered zone in the east-central part of the Ajax
claim. A fairly large area south of this zone and east of D.D.H.
16 remains to be tested. There appears to be a concentration of
mineralization near and along the south limit of the albitized zone.
This concentration may have been caused by a damming effect of the
overlying basalt which underwent very little alteration.

Mineralized outcrops are invariably oxidized. Very
little chalcopyrite is found in them, it being altered to malachite
and azurite to a depth of 30 feet or 40 feet. The grade of surface
deposits containing copper carbonates is frequently up to 2% Cu,
whereas the grade of the underlying protore is generally less than
0.4% Cu. This widespread enrichment of copper deposits in the Iron
Mask area suggests that there may be relatively rich carbonate ores
in significant quantities under the nearby Tertiary layered rocks.
Hence, if a copper deposit is found in this area near Tertiary vol-
canics or sediments, the possibility of enriched ores under the
younger rocks should be investigated.

APPENDIX

Attachments: (1) D.D. Hole Plans; 1" = 100'; dated Nov/55
(2) D.D. Hole Sections (7); 1" = 40'; dated Nov/55

References : Cominco Reports 1929, 1954, and 1955
G.S.C. Memoir 249

Report by:

J. Richardson
J. Richardson
S.M. Sub-District Geologist

JRichardson:ip
February 24, 1956

Distribution:

Geological Division (1)
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Dec. 14/66

COMINCO LTD.
TRAIL, B.C.

EXPLORATION

MINING DISTRICT

AJAX-MONTE CARLO
 GEOLOGICAL REPORT AND
 PROPOSED EXPLORATION - 1967
 (N.S.S. 92 1-7, KNEELANDS 12.0.)

TERMINATION REPORT (1955)
T.P.R.

SUMMARY AND CONCLUSIONS

During the summer of 1966 a two phase work program consisting of geophysics (I.F. and Mag) and geological mapping was carried out on the Ajax-Monte Carlo group. In addition a soil geochemical survey conducted by Vaseo Explorations over the area was made available. Each kind of work has indicated a significantly increased potential for copper mineralization and the excellent correlation among the various surveys strongly reinforces the favourable responses of each. On the basis of this a substantial drilling program could now be recommended, however, before becoming committed to any large program some verification of the favourable geophysical and geological indications must be obtained. To do this a relatively modest program of about 3,000 feet of drilling is recommended. Follow-up to this will depend on results, but if present indications are borne out a major program of systematic drilling could result.

INTRODUCTION

During the past two years a relatively high level of exploration activity has been maintained in the area of the Iron Mask batholith near Hurlelope. This activity has not resulted in significant finds but it did prompt a re-assessment of the Cominco owned Ajax-Monte Carlo group located along the south contact of the Iron Mask batholith. This assessment, begun last winter, suggested that the carried reserves of 7,000,000 tons grading 0.70% Cu could be significantly increased and that the open pit potential of the deposit should be examined more thoroughly. To test these possibilities, induced polarization, magnetometer and geological surveys were conducted during the summer.

PROPERTY

The group consists of 13 claims as per the following list:

Ajax	- Crown grant	Jacko #6 Fr
Lepturo	- " "	" #4 "
Copper Star Fr	- " "	" #8 "
Forlorn	- " "	" #10 "
Wheel Tamar	- " "	" #10 "
Monte Carlo	- " "	
Sultan	- " "	
Grass Roots	- " "	

The group is surrounded by the property of Rolling Hills Copper Mine Ltd., 360 Bay Street, Toronto, Ontario. Any expansion of the group would thus have to be negotiated with Rolling Hills.

HISTORY

The Ajax-Monte Carlo group has had a history of exploration dating back to 1900. Much of this has consisted of trenching, test pitting and the driving of a number of adits before 1930 and records of this work are not available. However, this work did show that copper mineralization occurs over an area 7,500 feet long by about 1,000 feet wide. In 1928-29, 1945-46 and 57, Cominco conducted drilling programs on the ground and an indicated ore reserve of 7,000,000 tons grading 0.7% Cu has been built up. Almost all of this reserve is contained in the Ajax and Lepturo claims.

GENERAL GEOLOGY AND STRATIGRAPHY

The Ajax-Monte Carlo group straddles the southern contact of the Iron Peak batholith, a body of diorite approximately 12 miles long by 2 miles wide. The long axis of the batholith strikes northwest. The batholith intrudes andesites, basalts, fragmentals and minor sediments of the Nicola group of upper Triassic age. Copper mineralization occurs in the diorite particularly near the north contact and to a lesser extent in altered zones in the enclosing volcanics.

On the Ajax-Monte Carlo group, copper mineralization occurs in poorly defined shoots contained in a zone of albited rock variously described as andesite or microdiorite. The mineralized zone is parallel to the diorite contact, however, individual ore shoots within the zone have variable strikes and attitudes. Mineralization is largely restricted to an irregular zone of albite alteration. Mineralization found in other parts of the batholith is similar in character and associated alteration but is often more closely related to fault or fracture zones.

WORK PROGRAM 1966

Geological Mapping

This was undertaken to provide a more complete and more up to date picture of the geology for use in assessing geophysical and geochemical results. Mapping control was provided by a picket line grid set up for the geophysical surveys. Line spacing was 400 feet. The accompanying map shows the results of the mapping.

The mapped area covers a section of the contact between the Iron Peak diorite and the enclosing Nicola volcanics. The contact strikes about east-west but is in detail irregular. Three types of diorite are recognized: (1) coarse-grained, (2) fine-grained and, (3) diorite breccia. The diorite breccia occupies an area on the north side of the group including parts of the Wheel Tower, Ferlora, Copper Star and Galton claims. This rock is a dark green generally coarse textured rock composed of pyroxene, hornblende, biotite, plagioclase and magnetite. The brecciated nature of the rock is not readily apparent on fresh surfaces but shows up well on weathered outcrops. This coarse-grained diorite is similar in appearance and composition to the breccia but is more uniform and has a speckled lighter colored appearance. Grain size is variable but crystals up to 1 cm are not uncommon. The fine-grained diorite occupies a southerly projecting lobe covering most of the eastern part of the group. This rock appears similar in composition to the coarse diorite but is uniformly fine-grained and has a distinctly different magnetic expression. The relationship between the coarse and fine-grained diorites is not known but there is reason to think that they are quite distinct and perhaps of different ages. The fine-grained diorite has low magnetic relief as contrasted to the coarser variety and significant amounts of copper mineralization occur in the fine diorite while the coarse diorite is only sporadically and poorly mineralized.

Along the diorite contact, where exposures exist, a hornfels zone of variable thickness is present. This zone is best exposed near the west end of the property. The rock is fine-grained, dark green probably an altered volcanic. In contact with this hornfelsed zone to the south is a discontinuous band of a coarse green rock tentatively classified as an agglomerate. This rock is only exposed near the west end of the property but intersections of agglomerate in holes 21 and 25 and the presence of agglomerate on the dump of the Monte Carlo edit suggest that it may extend the full length of the property. The agglomerate intersections in holes 21 and 25 indicate a northerly dip of about 45° and provide the best evidence to date for the attitude of the volcanics.

Above (?) the agglomerate is a thick (100-500') but variable sequence of andesite, much of which is strongly albited. Very little fresh andesite outcrops so that its distribution is largely inferred from drill results. South of the andesite is a lenticular body of basalt of possible intrusive origin. A similar body of basalt occurs near the east end of the group.

Mineralization is largely restricted to altered andesite, however, significant mineralization occurs in the fine-grained diorite. The alteration accompanying mineralization is albitization, i.e. the introduction of albite often accompanied by calcite and epidote. Where strongly altered, the rock takes on a shaly appearance and gradation from this to unaltered andesite or diorite is common. In detail this alteration is quite irregular and variable, however, the zone within which it occurs is parallel and adjacent to the coarse diorite contact. The zone which is roughly 7,000 feet long by 600-1,000 feet wide is marked by a distinct magnetic low and it is within it that most of the favourable I.P. responses were found. The alteration zone cuts across rock contacts indicating a late stage intrusive origin.

Magnetometer Survey

The magnetometer survey was run on lines spaced 100 feet apart with a reading interval of 100 feet. The instrument used was a Sharpe M 1 fluxgate magnetometer and under the survey conditions a sensitivity of 50 gammas was achieved. The magnetic survey results are shown on an accompanying map.

The most striking feature of the magnetic survey is the broad fingered area of magnetic low striking east-west through the property. This low, bounded by the 500 gamma contour, contains almost all of the known copper occurrences and favourable I.P. responses. It also coincides very closely with the albitization and this suggests that the destruction of magnetite attendant on albitization is responsible for the magnetic low. Since copper mineralization accompanies albitization the magnetic correlation would appear significant. The current ore reserves are contained in the western portion of the magnetic low, a portion which represents only $\frac{1}{4}$ to $\frac{1}{5}$ of the total area of magnetic low. If this magnetic correlation proves valid over the whole area then reserves could be increased by a factor of 4 or 5.

The magnetic survey also shows up the volcanic-coarse diorite contact very well. The coarse diorite and diorite breccia along the north side of the property is marked by strong magnetic relief ranging from a background of 2,000 to 2,500 gammas to over 2,000 gammas. This contrasts markedly with the much lower relief and lower background over the volcanics.

I.P. Survey

This was done using a Koffax frequency domain instrument and results are shown on an accompanying map. This survey has been interpreted and reported on by G.D. Tikkanen, September 8, 1966.

The map shows numerous zones of definite anomaly surrounded by broader areas of probably anomaly. All of this correlates well with the magnetometer survey and with surface indications of copper mineralization. Several roughly parallel zones striking northwesterly are present, one of which contains the current ore reserve. On a geophysical basis there is no reason to believe that this zone is any different than the others and if so then a substantial additional reserve may be indicated.

Several holes have been recommended by G.D. Tikkanen on the basis of the I.P. survey. These are designed to test the more favourable I.P. responses over the entire area and as such should be considered a minimum program. Two of the recommended holes are vertical and at this stage of exploration southerly angle holes would be preferred since they are likely to give more geological information.

Geochemical Survey

During 1965 the area surrounding the Ajax-Monte Carlo was under option to Vanco Explorations Ltd of Vancouver. As a part of their program they ran a grid survey over the area including the Ajax-Monte Carlo. Through the courtesy of Mr. J.F. White of Vanco the results of this survey covering Cominco ground were made available and are incorporated in an accompanying map. The samples were taken at 200-foot intervals on lines

sampled at 500 feet. A fusion extraction method was used and copper determined by wet chemical methods.

The map shows that almost the entire Ajax group is anomalous for copper and that the higher values correlate extremely well with the mag low and the better I.P. responses. In some places the edge of the soil anomaly and the Ajax-Monte Carlo boundary seem to coincide. On the Vance regional geochemical map covering approximately 34 square miles the Ajax-Monte Carlo anomaly is even more distinct for it is the largest and strongest anomaly found in the whole area.

Correlation

The degree of correlation shown by the various surveys is remarkable and unusual. The area within which copper mineralization occurs coincides very closely to:

- (1) The area of magnetic low.
- (2) The area containing the best and greatest number of I.P. responses.
- (3) The area showing greater than 500 ppm copper in soil.

The manner in which each type of survey corroborates the other strongly reinforces each favourable indication and it would be indeed unlikely that drilling within the area would not intersect mineralization. Whether this mineralization is of ore grade is another matter but based on drilling results on the Ajax and Neptune claims there is reason to believe that similar mineralization would exist elsewhere within the favourable area. If this proves to be true then reserves could be increased very substantially perhaps as much as five times, i.e., 10,000,000 vs. 2,000,000 tons of underground ore. Considered on an open pit basis total available tonnage could be in excess of 100,000,000 but whether sufficient grade can be found to carry this tonnage is not yet known. There is however, a good possibility that this could be achieved.

Conclusions

The Ajax-Monte Carlo property represents the best chance within the Western District to develop a copper producer.

PROPOSED EXPLORATION

The initial objective of any work program should be to test the favourable geophysical and geochemical indications to determine whether they really are as favourable as they seem. To do this a relatively modest program of about 3,000 feet of diamond drilling is proposed. This program would include holes 1 to 4 as proposed by G.D. Tidman plus two more, the location of which can be decided on the basis of the first four. These holes will test the favourable area over a considerable length and should provide data to better evaluate the current picture. These holes should not, however, be considered as a conclusive test and even though results from them may be disappointing a large area of favourable ground will remain.

The situations will likely result from this initial drilling. Situation (1) drill results prove disappointing. In this case a minimal amount of follow-up drilling will be necessary and this will be designed to sample the favourable area for plants. Depending on the degree of disappointment perhaps further drilling will be required and this would be of a systematic type, i.e., on sections designed to clarify the geological picture and to cross-section favourable horizons.

Situation (2) drill results are encouraging. In this case a very substantial amount of follow-up drilling may be indicated and this should be of a systematic nature. Sectional drilling on sections 500 - 1,000 feet apart may be indicated and in conjunction with this some form of large diameter rotary drilling may be warranted for sampling purposes.

ESTIMATED EXPENDITURES

The exploration program outlined above is estimated to cost \$58,000. This amount will be distributed approximately as follows:

Phase 1

Diamond Drilling, 3,000 feet	\$ 25,500
Supervision	3,000
Transportation	700
Assays, board, et cetera	2,800
Contingencies	3,000
Total:	<u>\$ 35,000</u>

Phase 2

Diamond Drilling, 2,000 feet	\$17,500
Supervision, et cetera	5,500
Total:	<u>\$ 23,000</u>

AMOUNT OF THIS PROPOSAL: \$ 58,000

Report by:

J. M. Allen
J. M. Allen

Endorsed by:

J. Richardson
J. Richardson

JMA:sa
Trail Expl'n Office, Western District
December 14, 1946
Distributions: For Work Proposal (6)