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TO J. VINCENT	DATE April 2, 1980
ROM P. PETO	REPLYING TO
SUBJECT AJAX MOLYBDENUM PROPERTY	IN YOUR REPLY REFER TO

SUMMARY

The Ajax deposit is considered to be sufficiently attractive to warrant serious consideration for further evaluation at this time. By engaging in further exploratory operations Inco may increase its equity in what appears to be a significant and very promising deposit. The deposit is thought to contain 417 million tons grading 0.09% MoS_2 (Soregaroli & Sutherland-Brown, 1976). Previous evaluations of the deposit in 1968 (Sheldon) and 1975 (Costin) have indicated that the present drill indicated reserves are uneconomic by either open pit or block-caving mining methods.

The Ajax deposit occurs in a mineralized, granitic plug of early tertiary age belonging to the Alice Arm intrusions. Surface mapping and diamond drilling to the 1,500 foot level indicate that the ore zone is primarily fault controlled, that grades are therefore erratic, and that the ore zone grows larger with depth. Drill-indicated reserves are estimated to be 194 million tons grading 0.12% MoS_2 (Costin, 1976). A preliminary interpretation of present information suggests that the property is underlain by a multiphase, epizonal granitic cupola or diapir. The ore deposit is believed to have a geological configuration resembling the volcanic porphyry model of Sutherland-Brown (1976). Therefore the deposit is expected to have mineral zonation and alteration patterns conforming to the classical porphyry model. If this interpretation is correct then there is cause to expect a considerable increase in ore reserves with depth, possibly of higher grade locally, and additional prospects of finding significant amounts of Sn, W and Re mineralization in the hypogene core.

If present ore reserves could be increased sufficiently, stripping ratios could be lowered to a level where an open pit mining operation could become economically feasible. A three stage evaluation program is proposed according to the following timetable: 1980 - justification, 1981 - deepdrilling, 1982 - adit entry.

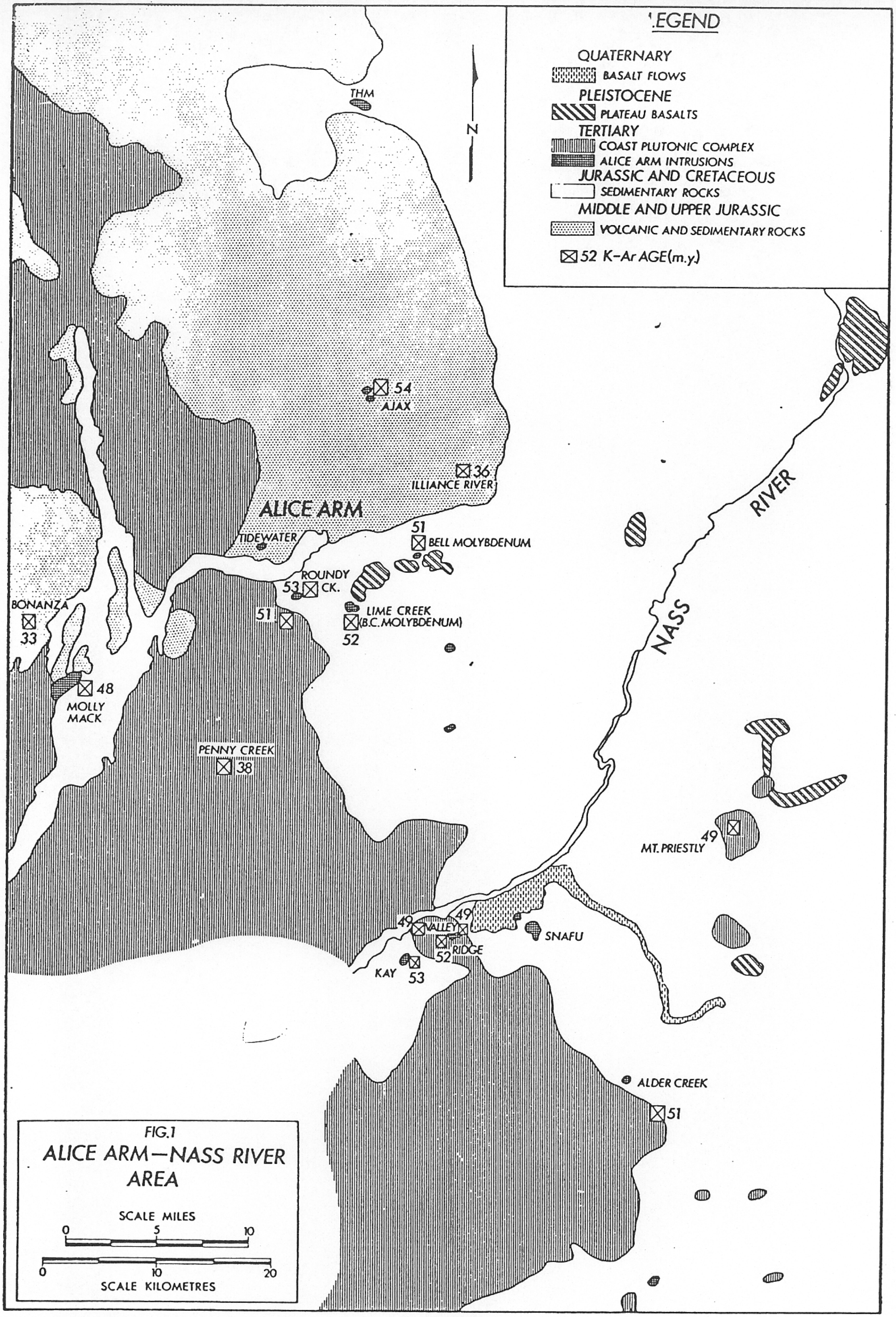


FIGURE 1 — Generalized geology of the Alice Arm/Nass River area.

 (Woodcock & Carter, 1976)

I. INTRODUCTION

The purpose of this memo, concerning the Ajax molybdenum property is to:

1) briefly review the essential geological features and history of the property,

2) provide a preliminary geological interpretation based on existing information,

3) discuss the implications of this interpretation with regard to further evaluation of the property,

4) present proposals intended to further evaluate the present viability of this property.

Most of the information upon which this report is based was obtained from Newmont Corporate files (#536) which included reports by Cannon (1965, 1967), Takeda (1966), Sheldon (1968), Costin (1975), and others. While these exploration summary reports were very obviously adequate accounts at the time, nevertheless they lack important information concerning secondary alteration patterns, vein and fracture densities, intrusive and mineral paragenesis, and metal zonation patterns based on core assays for Cu, Pb, Zn, Au, Ag, W and Sn. Such information would of course greatly facilitate the geological interpretation, evaluatien and significance of the Ajax property, particularly with regard to ascertaining the potential of increased Mo tenor with depth. Before I go on to discuss these matters it may perhaps be useful to review the history and geology of this property.

II. PROPERTY HISTORY

The Ajax property was staked in the spring of 1965 by S. W. Barclay, a prospector employed by Newmont Exploration, based on a 1927 B. C. Minister of Mines report referring to a series of narrow quartz veins carrying Mo, Fe, Cu, Pb, Zn sulphides. Exploration work conducted by Newmont during 1965 included surface mapping, trenching, geochemical sampling and a total of 5,126 feet of diamond drilling in seven boreholes. In 1966, 15 additional drill holes totalling 13,632 feet were completed to a depth of 1,500 feet below the surface.

The property was offered to Inco in 1967 as farm-in resulting in an additional 7,760 feet drilled which earned Inco a 24.67% equity in Ajax. Exploration drilling by 1968 totalled 26,509 feet in 26 boreholes, and had outlined 192 million tons averaging 0.123% MoS_2 at a cost of $1,103,127.07. The deposit was considered to be uneconomic under prevailing economic conditions and property exploration was suspended in 1968. An economic evaluation of the property was presented in the form of an M. Sc. thesis by P. Costin in 1975. He suggested that the deposit is amenable to a block cave operation, using a 20,000 ton daily milling rate, at a capital outlay of 95 million, in 1974 dollars. Although he conceded that a major upward revision in MoS_2 pricing, as related to production costs, is required to bring the deposit into profitable production.

LIST OF PROPOSED DRILL HOLES

GROUP	TENTATIVE DDH #	COORDINATE OF COLLAR (APPROX)	AZIMUTH	DIP (APPROX)	PROPOSED DEPTH	REMARKS
A	35	99,120 N 101,075 E	S 55° W 215	-45°	1,500 ft.	Quit due to close down of camp in 1966 (bottom 628')
	36	100,000 N 100,900 E	S 55° W 215	-70°	1,500 ft.	
	37	100,790 N 100,520 E	S 55° W 215	-45°	1,500 ft.	
	38	99,250 N 99,550 E	--	-90°	1,500 ft.	
B	34	100,570 N 99,390 E	S 22° E 158°	-50°	1,500 ft.	Quit due to close down of camp in 1966 (bottom 100')
	39	99,250 N 99,550 E	N 35° W 325°	-60°	1,500 ft.	Same collar as #38
	40	99,810 N 99,710 E	--	-90°	1,500 ft.	Same collar as #5
	41	99,250 N 99,550 E	S 35° E 145°	-50°	1,500 ft.	Same as collar #38
C	42	99,600 N 98,950 E	--	-90°	1,500 ft.	
D	43	99,800 N 102,000 E	S 55° W 215	-45°	1,500 ft.	
				TOTAL	15,000 ft.	

In 1979 the property was restaked according to the new modified grid system of staking which resulted in the new claims remaining in good standing until 1990, 3 years longer than previously. Renewed interest in the Ajax was expressed by Getty Mines in December 1979 who were seeking a farm-in to test the prospect at depth. Apparently this request has prompted Newmont to reassess the property by encouraging Inco to finance the deep drilling required. Since 1967 the contract price of MoS_2 has increased from $1.75 to $9.00 per pound. At this stage in property history Inco should give serious consideration to the opportunity of increasing their equity in what appears to be a very promising deposit.

III. REGIONAL GEOLOGY (Figure 1)

The Ajax molybdenum deposit occurs in a mineralized granitic plug belonging to the Alice Arm intrusions, known to be of Eocene age (Woodcock and Carter, 1976). The Alice Arm intrusions are emplaced in Jurassic sedimentary rocks of the Hazelton group flanking the eastern margin of the Coast Plutonic belt (Fig. 1). The intrusions usually occur as epizonal, multiphase granitic plugs, not exceeding 0.8 km in diameter and having metamorphic aureoles which may extend outward from the stock contact for 100 to 150 metres. Molybdenite mineralization occurs in the form of complex quartz vein stockworks usually concentrated near the stock contacts with the hornfels. Alteration patterns within and marginal to the molybdenum bearing stocks are similar to those of other porphyry deposits with a central core zone of potassic alteration, partly coincident with Mo mineralization. The potassic zone is gradational outward into a phyllic zone consisting largely of quartz, sericite, pyrite/pyrrhotite along the periphery of the stock and into the hornfels, which also hosts Molybdenite along veins and fractures. The pyrite/pyrrhotite halo may extend some 150 to 300 meters from the molybenite zone and give say to a peripheral zone of late-stage polymetallic quartz-carbonate veins which carry galena sphalerite, tetrahedrite, chalcopyrite and minor molybdenite.

Although there are at least 14 known mineralized intrusions in the Alice Arm molybdenum camp, only four are considered to be economically significant, namely B.C. Moly, Ajax, Bell Molly and Roundy Creek (Table 3). The B.C. Molly deposit, with a minable ore reserve of 105 million tons of 0.192% MoS_2, is presently being put into production by Climax Molybdenum Corp. of British Columbia, as an open pit operation, at an estimated capital cost of 143 million dollars (Born & Lenton, 1979). As shown in Table 3, the Bell Molly and Roundy Creek deposits are considerably smaller than Ajax, which is potentially the "mightiest" of all the mineralized Alice Arm intrusions.

IV. PROPERTY GEOLOGY

The Ajax property is located on the east slope of Mount McGuire, some 13 km northeast of Alice Arm at an elevation of 900 m above sea level. I will now briefly describe the essential geological characteristics of the Ajax property upon which the geological interpretation is founded and later discussed at length.

TABLE 3 — Significant Undeveloped Molybdenum - Bearing Deposits of the Canadian Cordillera

Property	Company	NTS	Class*	Minerals	Metals	Size** (tonnes × 10^6)	Grade (% MoS_2)	Metal Content (tonnes × 10^3 Mo)	Type***	Remarks
					BRITISH COLUMBIA					
10. Cascade Moly		82K/12E	SK	mo, Au	Mo	1.36	0.27	2.20	MI	Adjacent to Red Mtn. in small separate bodies (0.034 oz. Au/ton)
11. Giant, etc.	Scurry-Rainbow	82K/12E	SK	mo	Mo	0.73	0.39	1.70	M	Adjacent to Red Mtn. in small separate bodies.
12. Highmont	Teck	92I/7W	P III	mo, cp, bn	Cu, Mo	136.0	0.051	41.64	M	Low strip ratio (0.27 % Cu).
13. J-A	Bethlehem	92I/7W	P III	cp, bn, mo	Cu, Mo	259.4	0.030	46.70	M	High strip ratio (0.43 % Cu).
14. Gnawed Mtn.	Minex	92I/7W	P III	cp, bn, mo	Cu, Mo	32.66	0.016	3.13	M (SM)	(<0.5 % Cu)
15. Maggie	Bethlehem	92I/14W	P I	cp, mo	Cu, Mo	181.4	0.017	18.51	MI	Ecological problems in exploitation (0.28 % Cu).
16. Gem	Gemex	92H/12E	P I	mo	Mo			42.18	MI (SM)	
17. Poison Mtn.	Copper Giant	920/2E	P I	cp, mo	Cu, Mo	77.1	0.022	10.18	MII (SM)	(0.33 % Cu)
18. Salal Cr.	B P Minerals	92J/14W	P I	mo	Mo					No reserve established; large low-grade potential.
19. OK	Granite Mtn.	92K/2E	P I	cp, mo	Cu, Mo	90.7	0.03	16.33	MII	(0.30 % Cu)
20. Carmi	Vestor, Kennco	82E/11E	P I?	mo, ur	Mo (U)	?				
21. Red Bird	Phelps Dodge	93E/6E	P I	mo	Mo	27.2	0.25	40.82	MI	
						+ ca 54.4	0.1	32.66		
22. Ox Lake	Asarco, Silver Standard	93E/11E	P I	cp, mo	Cu, Mo	27.2	0.07	11.43	M	(0.26 % Cu)
23. Huckleberry	Granby, Kennco	93E/11E	P I	cp, bn, mo	Cu, Mo	78.92	0.025	11.84		(0.41 % Cu)
24. Berg	Placer, Kennco	93E/14W	P I	cc, cp, bn, mo	Cu, Mo	357.4	0.054	115.81	M	(0.25% cutoff, but only 226.8 × 10^6 tonnes with 2.75:1 stripping ratio (0.40 % Cu).
25. Lucky Ship	Amax	93L/3W	P I	mo	Mo	18.0	0.17	18.36	M (SM)	Potential for more.
26. Glacier Gulch	Climax	93L/14W	P I	mo, sc	Mo (W)	90.72	0.29	157.85	M	
27. Serb Cr.	Amax	93L/12W	P I	mo	Mo				SM	
28. Mt. Thomlinson	Amax	93M/12W	P I	mo	Mo	40.82	0.12	29.39	MII (SM)	
29. Bell Moly		103P/6W	P I	mo	Mo	31.75	0.11	20.96	MI (SM)	
30. Ajax	Newmont-CANICO	103P/11E	P I	mo	Mo	178.54	0.121	129.62	MI (SM)	Very high stripping ratio, with total reserves of 417.3 × 10^6 tonnes 0.09 MoS_2
31. Roundy Cr.	Climax	103P/6W	P I	mo	Mo	1.36	0.347	7.45	M	
						+7.0	0.11			
32. Schaft Creek	Hecla, Silver Standard Paramount	104G/6E, 7W	P I	cp, bn, mo	Cu, Mo	266.7	0.036	57.61	MI	(0.40 % Cu)
						90.72	0.047			
33. Joem (Mt. Haskins)	Della Mines	104P/6W	P I?	mo, sl, cp	Mo, Cu	12.25	0.15	11.02	MII (SM)	Molybdenum-bearing stockwork with adjacent skarn.
34. Storie	New Jersey Zinc	104P/5W	P I?	mo	Mo				MI	
35. Adanac	Noranda	104N/11W	P I	mo, sc	Mo (W)	94.53	0.16	90.75	M	Recent drilling added minor new tonnage and slight increase in grade. Low stripping ratio, 0.63:1
					YUKON					
36. Casino	Teck	115J/10W	P I	cp, cc, mo	Cu, Mo	161.1	0.023	22.23	MI (SM)	(0.37 % Cu)
							Sub-Total —	968.78		
							Mines —	372.2		
							TOTAL —	1,340.98		

* — Geological class, P I, P II and P III - porphyry deposits; SK — skarn; PEG — pegmatite (SEE SUTHERLAND-BROWN, PP. 44-51, this volume)

** — Maximum size indicated on initial or subsequent exploration

*** — Reserve at 31/12/74. Type M — measured; MI — measured and indicated; MII — measured, indicated and inferred; SM — submarginal

Data from B.C. Department of Mines and Petroleum Resources

(Soregaroli & SutherLAND-BROWN, P.422)

(i) AGE

The intrusion has yielded a K/Ar age date of 54±3 m.y. corresponding to an epoch of widespread Eocene plutonism throughout British Columbia. Many intrusions of this age host Cu-Mo porphyry deposits such as those in the Alice Arm, Babine Lake, Nanika and Tahtsa areas.

(ii) LITHOLOGY (Figure 2)

The property is underlain by layered sequence of black argillites, siltstones, greywackes, and calcareous equivalents, interbedded with tuffaceous volcanic rocks, all belonging to Middle and Upper Jurassic rocks of the Hazelton group. These rocks are intruded by a series of comagmatic granites ranging in composition from holo-leucocratic "quartz-porphyry" (granite porphyry) having very fine grained textures, and later medium grained, serriate, mesocratic, "monzonite" (granodiorite). Post-mineral lamprophyre dykes cut the intrusive mosaic. Country rocks adjoining the intrusive centre are intensely hornfelsed to a compact biotite hornsfels, extending a distance some 900 metres outward from the centre. Another annular zone, extending some 150 to 300 metres from the intrusive centre, consists of light green, bleached hornfels composed largely of albite, chlorite, and epidote. These lithologies were observed to persist at depth, but in addition, a pervaise zone of silicification, accompanied by secondary K-spar flooding was observed in the deeper drill holes (Leitch, 1980).

(iii) STRUCTURE

Surface geology indicates that intrusive complex comprises four small granite stocks, interconnected by a maze of felsic dykes which together comprise an area of some 300 square metres. The "stocks" are roughly rectilinear to plan and appear to be fracture controlled. The intrusive massive is "drill-indicated" to plunge steeply to the east or northeast. The country rocks underlying Mount McGuire are believed to represent the steep east limb of a regional, north-trending anticlinorium, having a steep plunge to the NNE. The local reticulated fracture pattern ("doming") centred on the intrusive complex is believed to have resulted from the forceful emplacement of the intrusion (Cannon, 1965). In addition, two prominent fracture systems were observed; one set strikes N35°W - dipping steeply east, and the other N50°E - dipping steeply southeast.

(iv) MINERALIZATION

An excellent account of the nature of Ajax mineralization was presented by Woodcock and Carter (1976), which I will quote verbatim:

> "Sulphide mineralization exhibits a zoning pattern which, near the outer limits of the bietite hornfels zone, consists of sparse pyrrhotite as disseminations and in widely spaced fractures. Proceeding inward toward the intrusive complex, hairline fractures contain chlorite and pyrrhotite. Nearer the intrusive complex, these fractures become wider and are filled with quartz, which carries pyrrhotite as well as coatings and minute bands of molybdenite.
>
> Sulphide minerals constitute less than two percent (by volume) of the rock, with pyrrhotite in the major amount. Molybdenite is always associated with quartz and occurs in the pyrrhotite-bearing veinlets

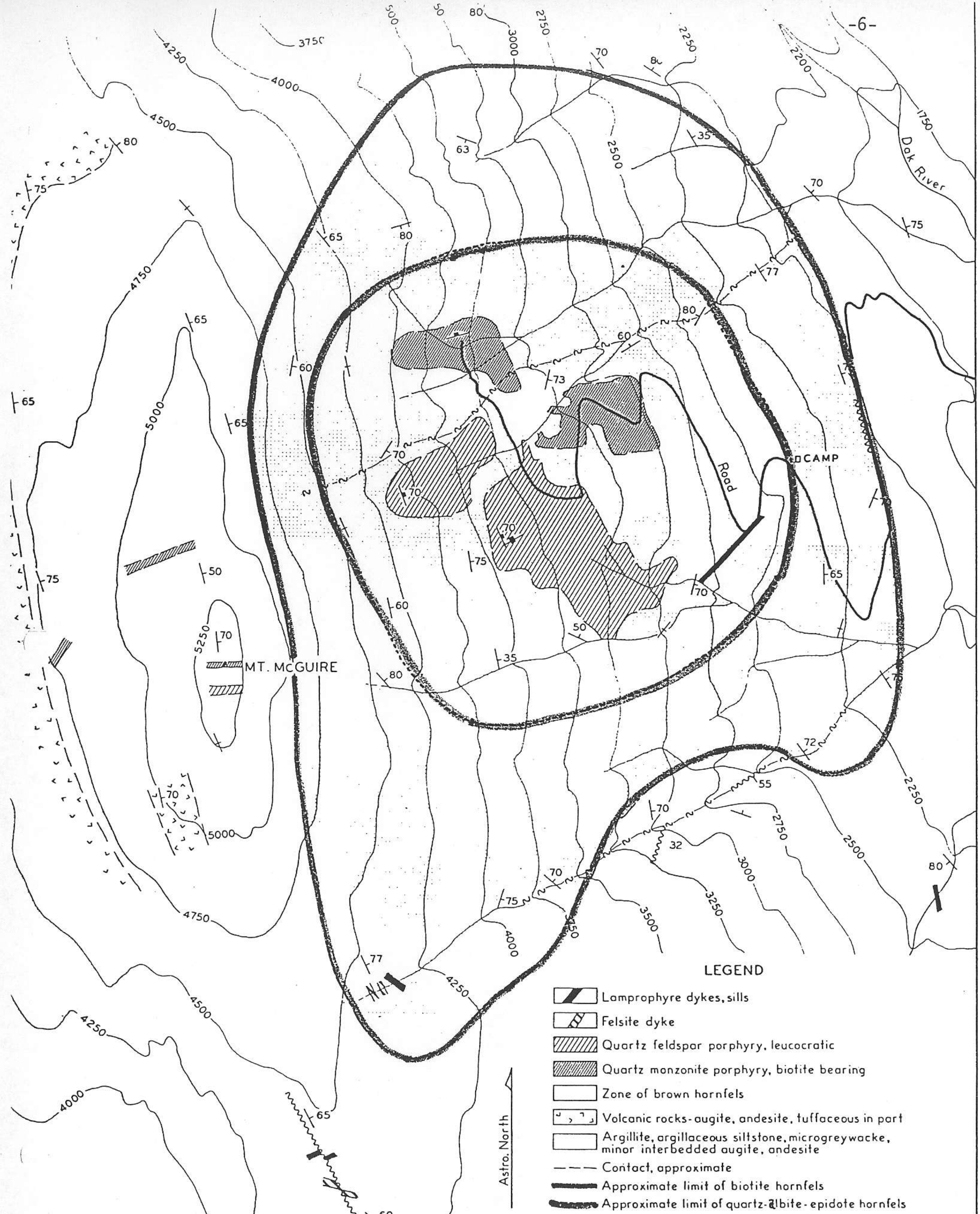


FIGURE 2

BCDM. ANN. Rpt 1964 P.

and in the hairline fractures as stringy lenses or smears along shears. Molybdenite is usually concentrated along selvages of the veinlets. The quartz veins or quartz stockwork are present in both intrusive rocks and in the contact zone of the hornfels. Very minor amounts of scheelite have been noted within the quartz veinlet zone or associated with garnet skarn within areas of hornfels.

The deposit has several significant features evident on plans and cross sections. In the upper part of the mineralized area, the strata dip about 60 degrees northeast, compared to dips greater than 70 degrees at lower parts of the stocks. The strata near the surface are cut by numerous parallel or subparallel faults. The molybdenite mineralization is controlled by these pre-existing structures and the grade contours form bands that are subparallel to, but definitely crosscutting, the stratification. At a lower level, a somewhat arcuate form for the molybdenite zone is evident in which there is a relatively lower grade core area that parallels the many northeasterly striking, steeply dipping faults. The outer diameter of the molybdenite zone at this level is about 425 by 540 m.

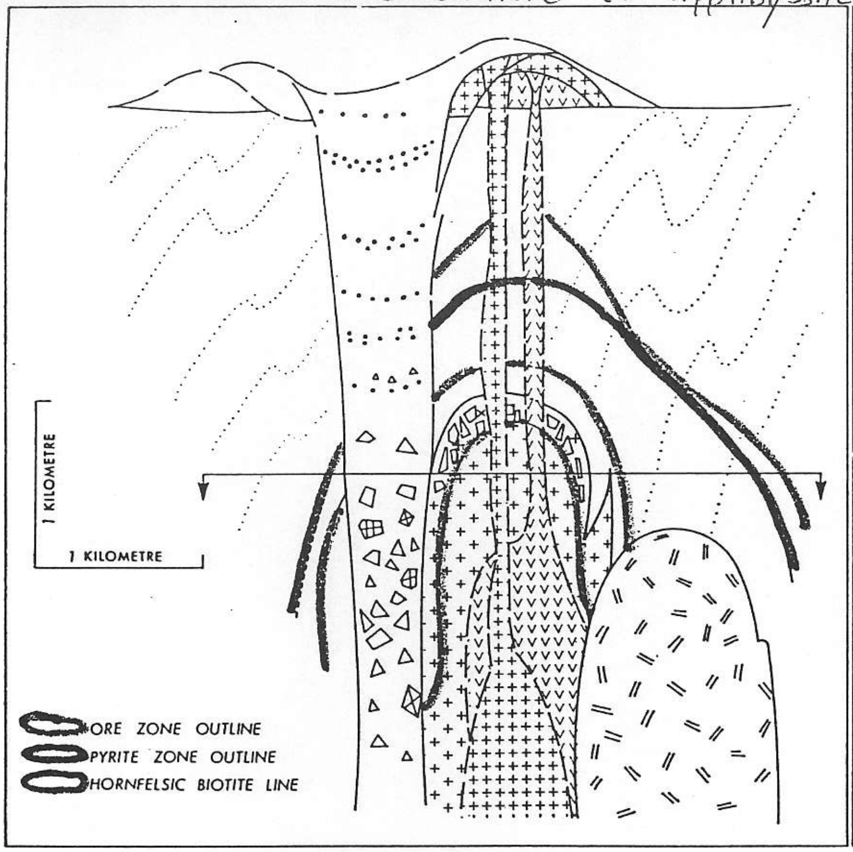
At a much lower level, the molybdenite zone has expanded to 850 by 610 m, oriented in a northwesterly direction. The ore area has a definite partial ring or arcuate shape with steeply dipping internal structures, as indicated by the grade contours, and with a definite barren core measuring 490 by 300 m and also oriented northwesterly. However, a zone of molybdenite mineralization about 180 m wide trends northeasterly through the middle of the barren core. This represents mineralization controlled by faults and shear zones. At higher levels, this fault-controlled linear zone merges with the northwest side of the main arcuate zone, leaving the barren core with a apparent northeast trend.

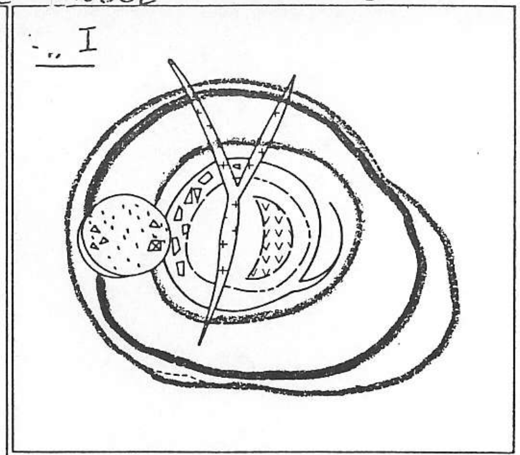
Four stages of sulphide mineralization are evident, including initial quartz-pyrrhotite mineralization, followed by at least two stages consisting of quartz-molybdenite-pyrrhotite mineralization, and a final stage represented by coarse-grained quartz veins several centimeters wide, containg sphalerite and lesser amounts of pyrite, galena and chalcopyrite."

V. GEOLOGICAL INTERPRETATION

The purpose of this section is to formulate a conceptual framework, or geological model of Ajax, based upon geological information previously given. The model will enable us to make predictions concerning the possibility of finding economic mineralization (ore) at unexplored depths and also to design a rational exploration program to test such a possibility. I shall construct the geological model, in a peicemeal fashion, by interpreting the essential geological features of the Ajax property, discussing their significance, and combining them into a synthesis as illustrated in Figure 4. Some of what follows

SUBVOLCANIC or HYPABYSSAL PLUG MODEL





ANNULAR SHELL TYPE	DISTANCE FROM AXIS →
METAL	Mo Cu Fe Zn Pb
ALTERATION	POTASSIC PHYLLIC PROPYLITIC
METAMORPHISM	HORNFELSIC
VARIABLE CORRELATION BETWEEN SHELL TYPES AND DEGREE OF DEVELOPMENT	

FIGURE 2 — Phallic Porphyry Model in Plan and Section — showing four related intrusive phases, two pre-ore, a post-ore diatreme, and also shells of metamorphism, alteration and mineralization.

VOLCANIC MODEL

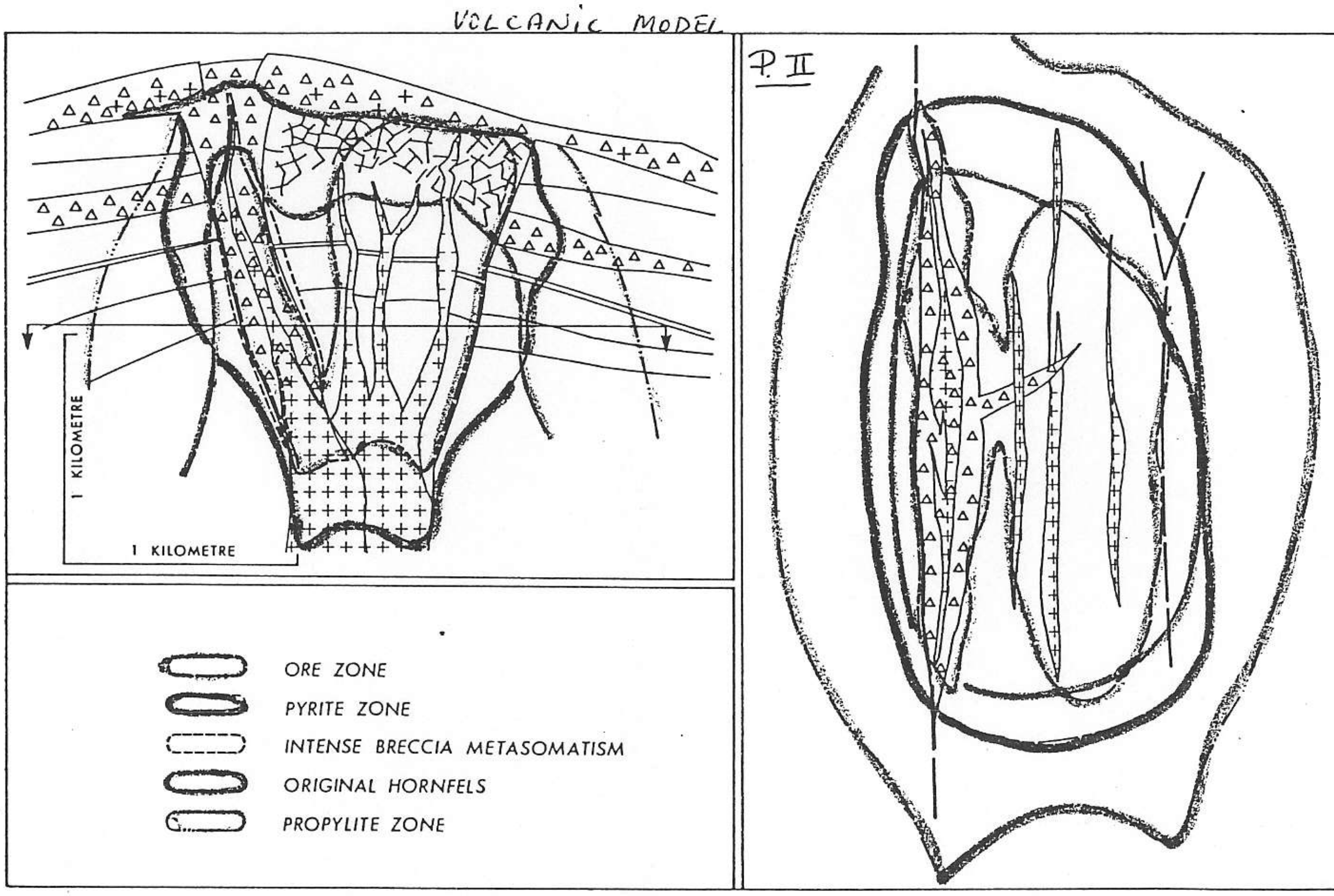


FIGURE 3 — Volcanic Porphyry Model in Plan and Section — showing related intrusive porphyries, brecciated dyke and carapace breccia, all cutting related marine volcanic vent sequence.

might seem very obvious, however I would urge the reader to bear with me as I outline the model.

(i) STRUCTURE (Figure 3)

The surface and subsurface geological plans clearly suggest that the Ajax property is underlian by an epizonal, multiphase, granite plug, which has forcefully pierced, "domed", shattered and baked country rocks belonging to the Hazelton group. Felsic dykes and stocks appear to have been emplaced along faults and fracture zones. These same fractures also appear to have provided channelways for mineralizing solutions. "Molybdenite mineralizations is largely localized by wide zones of fracturing along steeply dipping faults that are coincident with the boundary between the intrusive mass and surrounding hornfels." (Sheldon, 1968).

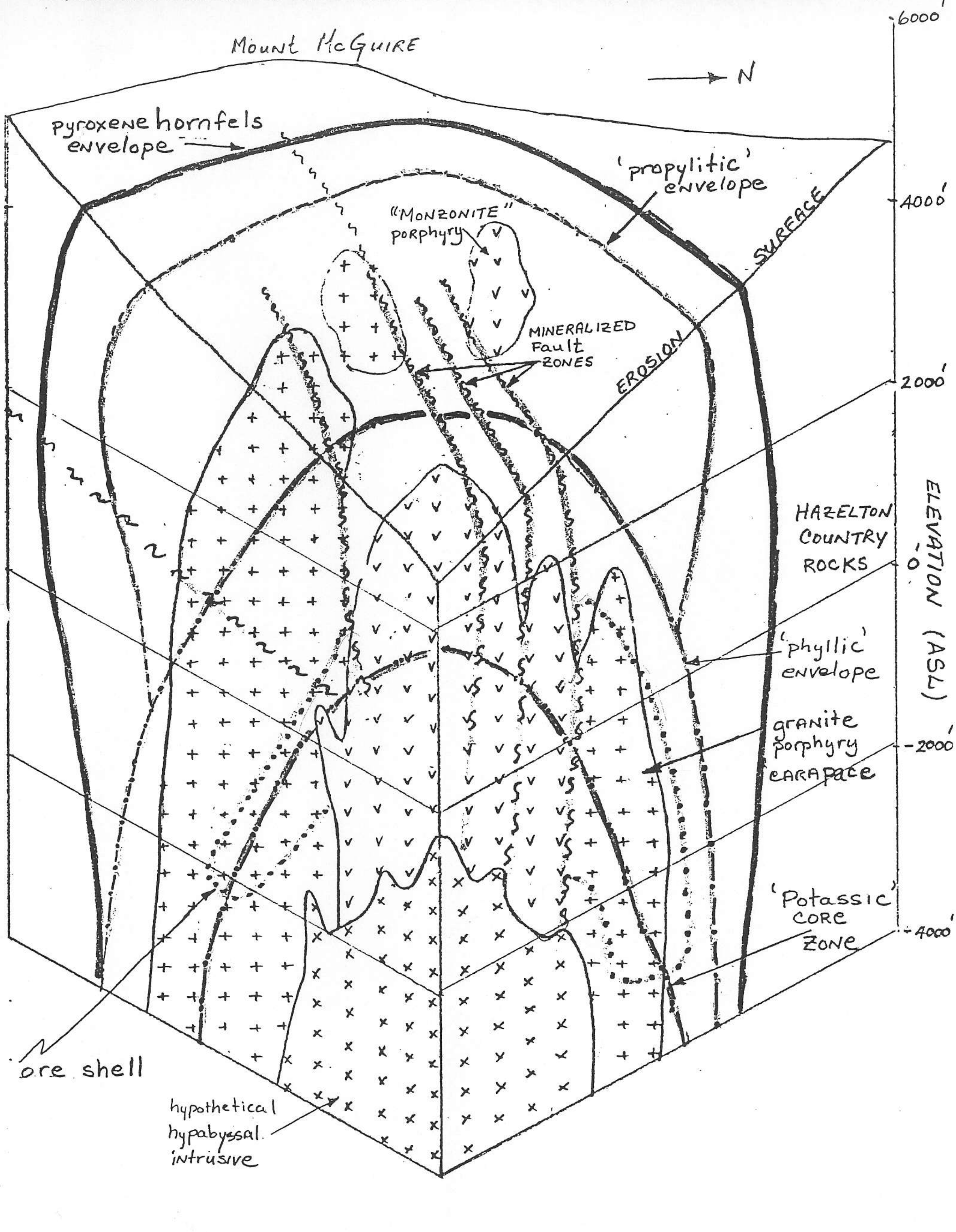
A general porphyry model, propounded by Sutherland-Brown (1976), which would generally describe Ajax, is shown in Figure 3, as a "volcanic porphyry". Although Soregaroli and Sutherland-Brown (1976) believe that Ajax is best described by the "phallic" porphyry model, as indicated in Table 3. However, the absence of diatreme breccia pipes, the erratic distribution and tenor of ore zones, the network of interconnected dykes and sills, and the association of fracture zones with mineralization are more indicative of the volcanic model. Previous drilling indicates a progressive widening of the intrusive complex, and its associated ore zone, with depth. This suggests the intrusive zone may represent the tip of a cupola of a stock or that the intrusive zone is gradually coalescing into a nearly vertical, cylindrical diapir.

(ii) PETROLOGICAL CONSIDERATIONS

The intrusive complex consists of several magmatic pulses of granitic injections which were channeled upwards along steep fracture zones. The earliest pulse appears to be a highly siliceous, quartz-feldspar porphyry, of probable granite composition. This phase consists of an aphanitic matrix and appears to represent a chilled, boarder phase. A later, slightly coarser grained, quartz-plagioclase porphyry, of similar composition, was then intruded into the initial chilled phase (Leitch, 1980). Both quartz-feldspar porphyries were then intruded by "monzonite" (granodiorite) porphyry, consisting of plagioclase phenocrysts with interstitial hornblende, biotite and felsite. These appear to be unmineralized (Leitch, 1980).

The intrusive complex, although of restricted size at surface, was of sufficient temperature to produce a high-grade (pyroxene-hornfels facies) contact metamorphic aureole of considerable extent. This would suggest that the intrusive centre must have been very hot, over a considerable duration, perhaps due to a series of prolonged magmatic pulses. Now the inner aureole, immediately adjacent to the intrusive core represents a zone of propylitic, hydrothermal alteration. At some stage in the magmatic evolution of the intrusive complex, there was a violent release of mineralizing fluids along fractures, through the intrusive carapice and into adjacent hornfelsic aureole resulting in retrograde alteration of these rocks to albite-epidote-chlorite propylitic facies, also accompanied by considerable silicification (quartz veining).

FIG.4. SCHEMATIC BLOCK DIAGRAM OF AJAX INTRUSION



ii) HYDROTHERMAL ALTERATION PATTERNS (Figure 4)

A preliminary interpretation of scant information concerning hydrothermal alteration suggests that the Ajax deposit may be zoned according to the classical porphyry model. Surface geology indicates the presence of an outer pyrrhotite halo and an inner propylitic zone accompanied by some silicification. Drilling has indicated another zone of more intense silicification at depth suggesting another "silica-front" related to a deeper intrusive event. Preliminary thin section study of selected drill core by Leitch (1980) further indicates that a zone of near surface phyllic alteration which gives way to K-feldspar flooding and mantling indicative of a potassic zone at depth (Leitch, 1980). The evidence therefore suggests the presence of classical hydrothermal alteration pattern co-axial about a cylindrical plug. This would imply the possible presence of coaxial high-grade ore-shells, adjacent to the zone of potassic alteration, and an axial zone of lower grade "alaskite" ore in the core of the plug. Previous drilling may have only just penetrated the main ore shell near the tip of the cupola or diapir.

(iv) SULPHIDE MINERAL ZONATION

Preliminary information suggests that there is a concommitant ore mineral zonation associated with hydrothermal alteration patterns. The observed paragenetic sequence of mineralization appears to be late-stage quartz veins carrying chalcopyrite, galena, sphalerite, tetrahedrite and pyrite, preceeded by quartz-pyrrhotite-chalcopyrite veins, then at least three sets of quartz-molybdenite veins coming-in after an early episode of quartz-pyrrhotite veining. Each stage of veining may represent a separate pulse of intrusion, accompanied by fragmentation and mineral impregnation. In addition the deposit shows a rudimentary mineral zonation with hypogene core containing molybdenite and minor scheelite, prograding into a molybdenite-pyrrhotite zone and finally into a peripheral zone containing base metal sulphides. The last phase of base metal quartz veining observed at the surface may represent a mineralizing pulse associated with molybdenite-quartz veining at a depth beyond previous drilling.

VI. IMPLICATIONS

Previous investigators of the Ajax deposit agree that on the basis of present information there is no general increase in MoS_2 tenor with depth. It has been suggested, that higher-grade, mineralized fault intersections, particularly at the NE corner of the 1,500 foot level of the deposit, can be projected downwards with reasonable confidence. Although there is no rational justification to expect MoS_2 tenor to increase with depth there is sufficient reason to expect mineralization to persist to greater depths according to the proposed hypothetical model.

The predictive consequences, or implications, of the foregoing hypothesis may be enumerated as follows:

1. The eventual coalescing of the anastomosing network of dykes and sills into a composite, multiphase cupola or diapir at depth.

2. The prograde succession of alteration envelopes, from propylitic to potassic, around the central axis of the cupola or diapir.

3. The manifestation of some rudimentary prograde metal zonation culminating in a hypogene, high-temperature zone containing molybdenum, and possibly

tin and tungsten mineralization associated with skarns at depth.

4. The continuation of higher-grade fault-controlled mineralization into the core of the intrusive complex.

5. The possible development of co-axial ore-shells about the "potassic" core zone situated within the granite porphyry carapace.

6. The possible development of a Henderson-type ore mantle at a greater depth within the intrusive complex.

Given that these expectations are sufficiently plausible consider the economic implications of increased ore reserves without necessarily increasing ore grade. A larger deposit could lower the stripping ratio to make the present ore grade an economically viable open pit operation. Costin (1975) has calculated that "using a 0.10% MoS_2 cut-off and a 40° pit slope, the deposit containing 194 mil. tons carries an 8.4/1 strip ratio" (p. 38). He also calculates that a 5.6/1 strip ratio, requiring 269 mil tons of ore, would constitute a break-even point. Certainly, if present ore reserves could be significantly increased an open pit mining operation should not be dismissed.

VII. PROPOSALS

The Ajax property would appear to be sufficiently attractive at this time to warrant some action. A three stage program of evaluation is proposed; each stage would be contingent upon preceding results.

(i) Stage one (1980) - Justification program.

Although I have argued that a deep-drilling program appears justified from a theoretical viewpoint, such a program may cost in excess of $300,000 and therefore demand convincing evidence to justify such an expenditure. The program would essentially involve property and core examination with the object of obtaining evidence that might support the model proposed herein. Examination of the core would involve relogging of selected boreholes, preparation of thin sections and geochemical analysis of pulps in order to determine lithologies, fracture and vein densities, mineral and intrusive paragenesis, alteration patterns and metal zonation. These data may then provide a data base upon which other opinions might be rendered.

(ii) Stage two (1981) - Deep-drilling program.

Would consist of two 3,000 foot boreholes, to test the deposit to a depth approaching sea level. The object of these test holes would also be to: obtain information on the vertical extent of mineralization, determine whether there is any increase in grade with depth, investigate the extent of mineralization to the east, and to obtain a better estimate of the true grade of the core by using NX sized rod and collecting sludge for assay.

(iii) Stage three (1982) - Adit Entry

If stage two proved to be sufficiently attractive the next stage would warrant adit entry into the deposit in order to obtain large bulk samples for better grade determination and to facilitate pattern drilling necessary to delineate the deposit and provide data for a detailed feasibility study.

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