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A MEMORANDUM on the IRON MASK BATHOLITH KAMLOOPS M.D. BRITISH COLUMBIA

for Conwest Exploration Compahy Limited

by W.R. Bacon, Ph.D., P.Eng. Apr. 4/72

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GRANT FROM HORSLEY

BACON SHOULD SPEND NOT MORE THAN 5 DAYS WRITING A SUMMARY OF THE IRON MASK BATHOLITH TO INCLUDE RELATION SHIP OF GEOLOGY TO MINERALIZATION. (2) HISTORY OF EXPLORATION. (3) POTENTIAL AS OF NOW OF VARIOUS PARTS I.E. PROPERTIES IN BATHOLITH. (4) RECOMMENDATION AS TO PROBABLE STEPS IN COMPREHENSIVE EXPLORATION (5) OF A BATHOLITH PROPERTY. ANY OTHER COMMENTS WHICH IN BACONS OPINION MAY BE SIGNIFICANT. HODGE HAS MAPS AND DATA FROM 1929 1956 AND 1967 MINISTER OF MINES REPORTS AND HAS COPIED THESE FOR COLOR AND STUDY. YOU SHOULD MAKE DATA YOU OBTAINED AVAILABLE TO BACON. WE ANTICIPATE CLOSING DEAL ON KALAMALTA GROUND TUESDAY. WE ANTICIPAE BACON AND POLLOCK AND YOURSELF MAY WISH TO MAKE FIELD EXAM OF PINNACLE - KALAMALTA CLAIMS AND UNITED BATA - KIMBERLY GROUND NEXT WEEK. HODGE MAY COME TO VANCOUVER TO DISCUSS THEN. GIVE BACON COPY OF THIS.

April 4th, 1972.

Conwest Exploration Company Limited,
Tenth Floor - 85 Richmond St. W.,
Toronto, 1, Ontario.

Attention: Mr. T.L. Horsley

Dear Trevor:

Please find enclosed my memorandum on the Iron Mask batholith, also a copy of my February 28th report on Afton (which is now far out-of-date).

I spent four days sifting and screening information to make the memorandum as concise and useful as possible. I presumed you wanted it at the earliest possible moment.

As you will realize, I have a great deal of information that is not included; please contact us if there is any specific information you want of if there are any questions arising from the memorandum.

Yours very truly,

BACON & CROWHURST LTD.

W.R. Bacon

WRB/ic

P.S. Please return the Afton report when it has served your purpose.

BACON & CROWHURST LTD.

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Vancouver 1, B.C.

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W.R. BACON, Ph.D., P.Eng.

Vancouver, B.C. April 4th, 1972

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INTRODUCTION

The request for a review on the Iron Mask batholith stated that the data in the 1929, 1956 and 1967 Annual Reports of the Minister of Mines were already under study. Presumably G.S.C. Memoir 249, "Geology and Mineral Deposits of Nicola Map-Area", is also at hand. In view of this, the present report will be confined to information which, in the writer's opinion, may be of direct use in the exploration of the batholith.

The data in the 1956 and 1967 Annual Reports are first rate and give a reliable picture of the situation at those times.

The Iron Mask batholith outcrops about 3 miles southwest of Kamloops. It trends northwesterly and is less than 3 miles in average width. In length the batholith may be said to extend no farther northwest than the Trans-Canada Highway and, if so, its dimensions, 3 miles x 12 miles, do not qualify it for the name 'batholith'. If, however, one presumes the batholith to continue beyond the Trans-Canada Highway, beneath the Tertiary volcanics and sediments, and resurface in the Kamloops Lake area, its dimensions could be 3 miles x 20 miles and thus it would attain the minimum dimensions required of a batholith.

In the Cordillera one is apt to think of 'batholith' and 'granite' in more or less synonymous terms. Our undersize Iron Mask batholith, however, is a complex of quartz-poor, nondescript intrusive rocks. In spite of the variety of igneous rocks present, the writer is not aware of any granite outcrops within the boundaries of the Iron Mask batholith.

HISTORY OF EXPLORATION

Exploration dates back to 1896 with the discovery of copper ore on Coal Hill, 3 miles south of the town of Kamloops. "In this granitoid or gabbro mass of Coal Hill run, in various directions, fractures along which are found the gabbro more or less impregnated with chalcopyrite, magnetite, iron pyrites, etc. in which material are some gold and silver values. Not much work has been done on many of the locations, but on the "Iron Mask" (Kamloops Copper) quite a shute of copper pyrites and magnetite has been found, while on the "Lucky Strike" (Kamloops Copper) a good body of solid chalcopyrite was uncovered.

So far, all the "showings" have proved to be not large, and to carry no high values in gold and silver....." Thus reported the 1897 Annual Report of the Minister of Mines. Reference is made therein to the Iron Mask, Lucky Strike, Erin (Kamloops Copper), to the Python (Makaoo), to the Copper King (Rolling Hills) to Jacko Lake (Cominco), and to the Pothook claim (Afton).

From 1897 to the commencement of World War II, exploration on these properties was carried out mainly by the standard old time methods of surface pitting, shaft-sinking, drifting and crosscutting. Some diamond drilling was undertaken, notably by Granby on the Evening Star (Galaxy), Python (Makaoo) and Wheal Tamar (Cominco) groups. This was in 1916. In 1928, Cominco did 5,319 feet of diamond drilling on the Ajax and Neptune Crown grants at Jacko Lake.

Thus, up to World War II, one might say that there was 40 years of intermittent, exclusively physical exploration of the Iron Mask area with the following productive results:

Property	Period	Tons Produced	Pounds Cu	Ounces Au	Ounces Ag
Iron Mask	1901-28	189,230	5,194,871	3,630	41,292
Copper King	1906-40	7,491	391,381	1,183	2,180
Iron Cap	1937-40	263	9,462	209	414
Evening Star			5,628		29
Python		30	4,800		

In 1952, things began to hum again in the Kamloops area and geophysical surveys were utilized for the first time. Berens River (Newmont) did an electromagnetic survey of the Iron Mask property and followed this up by drilling. At the same time, Kenn.co conducted a similar survey over 58 claims in the Pothook area (SE corner of Afton) and followed this by drilling.

By the mid-1950's bulldozer trenching was being used extensively to expose as much bedrock as possible.

Then, in 1957, geochemistry was introduced, probably first on the Afton property. Soil samples were augured, screened and tested for total heavy metals using the cold extraction dithizone method. Numerous soil samples were sent for analysis to McPhar Geophysics Ltd., the suppliers of the geochemical cold kit. (In commenting on this survey, Bacon & Crowhurst noted in their report of November 25, 1970 to Great Plains Development "a strong geochemical anomaly (near co-ordinates 90E-134N) which has not been delimited or closed off to the west". This anomaly coincides with the new Afton orebody.)

It is further believed that the first induced polarization survey in the Kamloops area, in 1959, was carried out on the Afton property by McPhar Geophysics Ltd. (The McPhar method was still experimental in 1958.) Subsequently, in 1966, a second induced polarization survey was carried out on the property by Canadian Aero Mineral Surveys Ltd. This geophysical method plus soil surveying were the favoured preliminary exploration methods of the 60's.

To retrace a step, Afton was probably the first, again, to use percussion drilling - back in 1964, when they drilled 11 percussion holes and followed it up by 38 more in 1965. This work was on the Pothook zone.

In general, the 60's was a time of activity in the Kamloops area. The names that made news were Galaxy, Rolling Hills and Makaoo.

At the southeastern extremity of the batholith, on Pinnacle ground, there has been geological mapping, soil sampling, magnetic and induced polarization surveys, trenching and diamond drilling. In a report dated February 20, 1969, Bacon & Crowhurst Ltd. stated: "The results to date, however, are perhaps more inconclusive than negative in view of the shallowness of the diamond drilling. In addition to this, the lack of favourable results from the induced polarization survey may be attributable in part to the fact that this work was undertaken in the dead of winter, probably over frozen ground."

It goes without saying that an area as small as that encompassed by the Iron Mask batholith, and as accessible, has been prospected intensively in the vicinity of the known showings. From here on in, the task becomes tougher - a scrutiny of what has been done in order to determine what has been missed and what should be redone.

In summary, a great deal of effort has yielded the production noted above and the following 'reserves' are on the books:

Property	Tons	% Cu	Environment
Cominco (Ajax)	8,000,000	0.68[1]	Albitized Sugarloaf microdiorite.
Galaxy Copper (Evening Star)	5,000,000	0.5[2]	Altered andesite, diorite.
Pinnacle	75,000	0.66[2]	Microdiorite, micromonzonite.
Maknoo	311,000	1.12[3]	Picrite basalt - diorite contact.
Afton (Pothook)	600,000	0.63[4]	Altered diorite.

1 Classified information.

2 Prendergast, J.B., Summary Report of Pinnacle Mines Ltd. for Velocity Surveys Limited, Jan. 30, 1969.

3 Geddes Webster, private report, Sept. 22, 1956.

4 Chapman, Wood & Griswold Ltd., Report on Afton Mines Ltd., March 9, 1967.

The foregoing reserves do not include Afton's Lake deposit or others currently being explored.

RELATIONSHIP OF GEOLOGY TO MINERALIZATION

The geology of the area has been particularly well done by Carr, Livingston and Preto; it should be emphasized that this is rolling range country in which, with the exception of Coal Hill, Sugarloaf Hill and the Cominco ground, sections of more than 5 per cent outcrop are not common. Moreover, it is a "petrographer's batholith" - one in which numerous variations, some unusual, occur. Batholiths are not commonly dominated by micro-varieties and yet fully 50 per cent of the Iron Mask batholith, from Pinnacle northwest to Afton, is composed of such rocks.

If one may be permitted an anecdote, it will serve to illustrate one of the difficulties within the Iron Mask. On September 9, 1971 the writer examined several bags of percussion cuttings, the earliest information on Afton's new orebody, the Lake zone. The writer came to the conclusion that the native copper present occurred in recrystallized Nicola volcanics. On February 1, 1972 Dr. Jim Allen, senior Cominco geologist, examined the core from several Afton drill holes and advised the writer that he considered the core was partly Nicola and partly intrusive. Dr. Carr, the authority on the area, believes the Afton is entirely in intrusive rocks. He is probably right but the point being made is that distinctions within the batholith are not always easy. The same thing happened at Cominco's Ajax deposit near Jacko Lake. After some 15,200 feet of drilling in 1955-57, Cominco thinking was that the Ajax is "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".

A very fine map of the Afton area was prepared by Noranda geologist Alex Burton in 1958. In addition to 3 post-mineral formations, Burton recognized: 6 distinct Iron Mask intrusions - diorite, gabbro, syenite, hornblende diorite, trachyte, pink feldspar altered diorite; 6 dyke rocks - diorite, felsite, hornblende diorite, leucite-feldspar porphyry, pyroxenite, magnetite; 3 forms of picrite basalt - picrite, augite, serpentine; and 5 distinct Nicola group components - flow, agglomerate, argillite, quartz-feldspar porphyry, carbonate breccia.

It is thus difficult to select one or two particularly favourable host rocks. Picrite basalt is abundant on the Cominco property but is not a host rock there whereas it is on the Makaoo.

There has to be something, however, with the picrite basalt. Even if it is unmineralized at Cominco, it is there, it is at the Makaoo, at the old Iron Mask and at a number of other mineralized sites in small amounts. This is sufficient for the writer to recognize its importance, if not its significance. The picrite occurs generally in relatively narrow, elongate intrusions that strongly suggest to the writer that these bodies were intruded along zones of shearing and fracturing that were reopened at a later date and subsequently mineralized.

The Sugarloaf and Cherry Creek Intrusions are considered for various reasons to be post-Iron Mask. Whether this is a valid

conclusion or not, both formations are mineralized here and there with copper. These formations will be dealt with again in the next section.

A word must be said about magnetite because there are still some geologists who think in terms of a close genetic magnetite-copper association. Too bad this is not true because there is one great deal of magnetite in the Iron Mask batholith. In fact, in the period 1891-1902, 16,773 tons of magnetite was mined from the Glen Mine in the same vicinity as the Copper King (Rolling Hills Cherry Bluff deposit) and in the 1950's magnetite was mined for pipeline ballast from Mineral Leases L899 and L4798 (Pothook area, Afton).

The relationship of geology to mineralization involves at least token consideration of structure as well as petrography. The main structures are northwesterly striking shear zones, parallel to the grain. In one or two significant places, such as Ajax and the Iron Mask, a conjugate set has developed and northeasterly trending shoots of copper mineralization form the orebodies.

POTENTIAL

In attempting to measure the potential of various parts of the batholithic area, the writer depends largely on petrography and the distribution of the known occurrences.

Dealing with petrography, the writer firmly believes in the "favourability" of the areas mapped as Cherry Creek Intrusions and Sugarloaf Intrusions - over the main batholithic rocks.

With the Cherry Creek Intrusions, there is the old Copper King on Rolling Hills northwestern property; there are Cherry

Creek rocks east and west of the new Afton; the Cherry Creek rocks east of Afton contain the promising Comet-Krain showings; the Evening Star (Galaxy) is off the western tip of a lobe of Cherry Creek rock; and finally there is Cherry Creek rock on the Pinnacle ground.

With regard to the Sugarloaf Intrusions, there is the Ajax deposit and the promising Leemac on Sugarloaf Hill.

Another way of looking at the above is to state that the margins of the batholith hold more potential than the interior of the batholith.

Apart from the properties with substantial established reserves (Afton, Cominco, Galaxy) or commitments (Leemac with Western Mines), the writer rates the prospects as follows:

1. Comet-Krain.
2. Rolling Hills (Cherry Creek, NW of Afton).
3. Rolling Hills (E of Leemac and W of United Bata).
4. Makaoo (extensive work done).
5. Pinnacle-Kalamalta.
6. Rolling Hills, W, N, E of Cominco.
7. Minex, S of Cominco.

EXPLORATION PROGRAM

A comprehensive exploration program on an Iron Mask property should involve the following sequence of steps:

1. Check on ownership of land in the claim area. You are looking primarily for ancient lots on which certain mineral rights were conveyed to the owner by the Crown. Lots with numbers smaller than '900' are suspect.

2. Survey the claims, using a B.C. Land Surveyor wherever you are not sure of your ground as there has been considerable recent blanket staking (e.g. Pinnacle property).

3. Lay out a proper grid with lines at 400' intervals and do a magnetometer survey. This will not find any ore but it can be useful in tracing contacts under areas of overburden and may indicate structures of possible interest.

4. Soil sample the grid area.

5. Do an IP survey. If an IP anomaly coincides with a magnetic high, but there is no geochemical anomaly, the situation is unattractive as one can assume that the magnetite has caused the IP anomaly. On the other hand, if a geochemical anomaly and an IP anomaly coincide, the situation is reasonably attractive.

   One does not throw his cap in the air on finding an IP anomaly coinciding with a soil anomaly. Drilling of coincident

anomalies on the eastern part of the Cominco property indicated the probable cause of anomalous readings to be 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 zone, Ajax, gave only a moderate ("probable" or "possible") geophysical response.

6. Percussion drill target areas where the overburden is not too deep. See the rancher who has the land and pay him $100 per setup.

7. Diamond drill any interesting areas disclosed by Step 6. Pay the rancher $100 per setup.

Much of the information that the writer has examined from various properties is fragmentary and much of the supervision of the 60's was not first rate. One should very seriously consider starting from scratch in a number of cases. In other cases, such as Afton, much of the early work was superb.

Respectfully submitted,
BACON & CROWHURST LTD.

W.R. Bacon, Ph.D., P.Eng.