

673548 REPORT on  
KIMBERLEY COPPER MINES LTD.  
and GALAXY COPPER LTD.  
in the IRON MASK AREA  
KAMLOOPS MINING DIVISION, B.C.  
for BOW VALLEY INDUSTRIES LTD.

by: J.W. Murton, B.Sc.  
G.D. Delane, B.Sc.      March 31, 1970.

REPORT  
on  
KIMBERLEY COPPER MINES LTD.  
and  
GALAXY COPPER LTD.  
PROPERTIES  
in the  
IRON MASK AREA  
KAMLOOPS MINING DIVISION  
BRITISH COLUMBIA

for  
BOW VALLEY INDUSTRIES LTD.

by  
J.W. MURTON, B.Sc.  
G.D. DELANE, B.Sc.

Vancouver, B.C.

March 31st, 1970.

TABLE OF CONTENTS

	<u>Page</u>
INTRODUCTION	1
CONCLUSIONS	1
PROPERTIES AND OWNERSHIP	2
GENERAL FEATURES	4
HISTORY AND PRODUCTION	4
GEOLOGY	6
General	6
Local	7
MINERALIZATION	8
General	8
Local	9
PREVIOUS WORK AND SURVEYS	10

LIST OF ILLUSTRATIONS

Fig. 1 - Location Map - 1" = 39 miles	Frontispiece
Fig. 2 - General Geology and Claim Groups - 1" = 1 mi. approx.	Back of report



SCALE 1" = 39 MILES

### INTRODUCTION

This report is a summation based on a review of available data concerning the mineral potential of certain claims and properties in the "Iron Mask" area southwest of Kamloops. It deals particularly with the claim groups of Kimberley Copper Mines Ltd. and Galaxy Copper Ltd.

### CONCLUSIONS

There are sufficient indications of widespread copper mineralization in the Iron Mask area to make certain sectors of it attractive, particularly when one considers recent low grade developments in the nearby Highland Valley area.

The Kimberley Copper property contains a zone of interesting mineralization in its central area, as indicated on the ground and by limited IP and geochemical surveys. The remainder of the central block (not including the Joe claims) contains no geochemical expression of interest and only weak or isolated IP response. It is understood that little or no work has been completed over the Joe claims but their location in the Nicola volcanics, beyond the margins of the batholith, does not enhance their value. Hence, the claim group as a whole cannot be described as very promising.

The Galaxy ground is reported to contain five million tons of proven mineralization grading 0.56% Cu, as well as the possibility of additional new mineralization, the latter being indicated from the

results of an IP survey on the rest of the claims. Two areas of interest on the Rocket claims, west of Jocko Lake, warrant further investigation. It appears that only limited geochemical sampling has been conducted on the property, with encouraging results being obtained over known copper-bearing zones. The southern zone should definitely be soil sampled to ascertain if the IP anomaly is due to the presence of copper in the diorite. If this is indicated, then diamond drilling would be warranted.

It is understood that the temporarily suspended underground development program may be resumed in the future and, although the drift faces are presently in low-grade (0.1% Cu) mineralization, they are directed towards areas of better grade material as indicated in surface drill holes.

In summary, it is considered that, of the two properties scrutinized, Galaxy Copper Mines Ltd. has the better possibility of containing a mine. In any event, Galaxy has to be considered as good prospecting ground.

PROPERTIES AND OWNERSHIP  
(See Fig. 2)

The Kimberley Copper Mines property is located three and one half miles SW of the City of Kamloops and, according to the B.C. Department of Mines records, consists of 77 contiguous claims in two groups:

(1) North Group (40 claims)

<u>Claim Name</u>	<u>Record No.</u>
Joe 1-28	69349-76
KA 2 Fr.	69734
Kinnor (cancelled 1969)	69605
K 102	67077
Alf 1-6	33470-75
Occidental C.G.	L1452
Charlotte C.G.	L1448
Morning Star C.G.	L1450

(2) South Group (37 claims)

<u>Claim Name</u>	<u>Record No.</u>
Dan 1-6	43857-62
Adze Fr.	69512
K4	78860
Last Chance C.G.	L1449
Kimberley C.G.	L1447
Stemwinder C.G.	L1451
Keystone C.G.	L1453
Apex Fr.	69678
Jeep 1-10	42730-39
Jeep 13-18	67170-75
Zed Fr.	70137
New	67115
New Fr.	67116
Kim 1-5	62633-37

The Galaxy Copper Ltd. property is approximately one mile west of the Kimberley ground and is located near the centre of the Iron Mask batholith. There are 52 contiguous claims in 2 groups:

(1) East Group (31 claims)

<u>Claim Name</u>	<u>Record No.</u>
No. 7 C.G.	L998
Venus 1-11 Fr.	34216-26
Dart 1-2	34181-82
Dart 3	34227
Rocket 1-16 Fr.	34185-200

(2) West Group (21 claims)

<u>Claim Name</u>	<u>Record No.</u>
Kentucky C.G.	L835
Ben Hur C.G.	L1037
Golden Star C.G.	L845
Evening Star C.G.	L1013
Prince of India	L1038
Ursus 1-5 Fr.	34206-210
Ursus 6-7	34292-93
Key 1 Fr. - 2 Fr.	34183-84
Shear 1-5 Fr.	34211-215
Shear 6-7 Fr.	34290-91

The Galaxy claims are now held by United Bata Resources Ltd. of Toronto, Ontario.

GENERAL FEATURES

The properties are on gently rolling rangeland at elevations of from 2800' to 3700' above sea level. Minor ponds and alkali sloughs occur on both properties; light to commercial stands of spruce and pine are present on the north and east half of the Galaxy property.

During summer months most parts of both properties are accessible by four-wheel-drive vehicles.

HISTORY AND PRODUCTION

The region of the Iron Mask batholith was first prospected in the late 1800's for gold and silver and, in the early 1900's, for copper which occurs in many places throughout the area.

In the early days considerable underground development work was done on some of the properties. In the middle 1950's there



was underground exploration on the holdings of Makaoo Development Co. Ltd. (Python, Noonday and Copper Head claims) and of Kamloops Copper Co. Ltd. (Iron Mask, Erin, Copper Queen, Lucky Strike and Ben Hur claims). Mineral production has been very small. A tabulation of the production of some of the properties of the Iron Mask area appears below:

<u>Property</u>	<u>Period</u>	<u>Tons</u>	<u>Cu Lbs.</u>	<u>Ozs. Au</u>	<u>Ozs. Ag</u>
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		

On Galaxy and properties in the vicinity of Galaxy Copper and Kimberley Copper, recent work has resulted in establishing (with varying degrees of reliability) the following reserves:

<u>Property</u>	<u>Tons</u>	<u>% Cu</u>	<u>Environment</u>
Cominco (Jocko Lake)	10,000,000	0.51% <sup>1</sup>	Altered porphyritic - Sugarloaf microdiorite.
Galaxy Copper	5,000,000	0.5% <sup>1</sup>	Altered andesite-diorite-peridotite.
Pinnacle Mines Ltd.	75,000	0.66% <sup>1</sup>	Microdiorite & micromonzonite.
Afton Mines Ltd. (Afton Ltd.)	600,000	0.63% <sup>2</sup>	
Rolling Hills Mining Co.	311,450	1.12% <sup>3</sup>	Contact between picrite, basalt & diorite.

- 1 Prendergast, J.B., Summary Report of Pinnacle Mines Ltd. for Velocity Surveys Ltd., Jan. 30, 1969.
- 2 George Cross News Letter, Afton Mines Ltd., Nov. 30, 1968.
- 3 Fawley, A.P., Report of Rolling Hills Copper Mines Ltd, April 1964

GEOLOGY  
(See Fig. 2)

General

The Iron Mask batholith is situated about 3 miles southwest of Kamloops and about 40 miles northeast of the Highland Valley copper belt which is in the Guichon batholith. The Iron Mask and Guichon batholiths are two of several on the eastern margin of the main Coast Range.

The rocks of the Iron Mask batholith are considered to be of Jurassic age and, as described by J.M. Carr, Minister of Mines Annual Report, B.C., 1956, consist mainly of syenites, monzonites, diorites and gabbros. These rocks are intrusive into the Upper Triassic Nicola series rocks (andesites, basalts, argillites, limestones) on the southwest and northeast. The Nicola rocks are overlain on the north by Kamloops group sediments.

The batholith itself is elongate in a northwest-southeast direction with approximate dimensions of 3 miles by 12 miles.

Outcroppings of dykelike masses of greenish-black, dense, picrite basalt have been reported in several localities on the margins of the batholith.

In the vicinity of Sugarloaf Hill, on the westerly edge of the batholith, and on Cominco's ground in the south central area, a microdiorite porphyry has been identified that intrudes the batholith.

The Cherry Creek intrusions are found along the east and northerly margins of the batholith. These rocks range from finer grained

phases of trachyte or latite porphyries, through porphyritic micro-diorites and micromonzonites, to breccias consisting of sub-rounded and angular fragments of plutonic and volcanic rocks set in a highly altered matrix. The Cherry Creek intrusions have been observed cutting the picrite-basalt, as well as rocks of the Iron Mask batholith.

Within the environment of the batholith as a whole, at least three major zones of fractures have been noted, one at each batholithic margin and a third within the batholith, between the Evening Star and Iron Mask localities. The distribution of Cherry Creek and Sugarloaf intrusive rocks is almost totally restricted to these three zones, indicating that they were loci of structural and igneous activity. The known occurrences of copper mineralization are associated with these zones and, in virtually every instance, they are accompanied by the presence of Sugarloaf and/or Cherry Creek intrusions.

#### Local

On the Kimberley Copper Mines Ltd. ground, nearly every rock type mentioned above is present. The south and central areas are underlain largely by fine-grained pyroxene diorite with intrusion of Cherry Creek porphyritic micromonzonite and latite porphyry in the centre of the block. The two fingers of Joe claims extending north and east are apparently underlain by Nicola and Kamloops volcanics.

On the central Crown granted claims (where most of the work to date has been carried out) two sets of faults and fracture zones have been recognized. The strongest set of fractures and faults trends

northwesterly, roughly paralleling the trend of the batholith. A second set of fractures trends northerly to northeasterly and is probably complementary to the northwesterly trending set. Both sets of fractures dip steeply. Flat lying shear zones are frequently developed with a gentle dip to the southeast.

Galaxy Copper Ltd. controls a block of ground underlain by an assemblage of batholithic rocks ranging from syenite to gabbro. Along the north margin of the property (called the #1 zone) occurs a mafic suite of rocks including diorites and andesites which are thought to represent a highly altered and disturbed portion of a roof pendant of invaded rocks. Peridotites are in evidence in diamond drill holes.

The most southerly claims are in relatively unmineralized Nicola andesites, and the remainder of the claims are underlain by fine to coarse-grained diorites and syenites.

#### MINERALIZATION

##### General

Copper deposits are found mainly at the periphery of the Iron Mask batholith. A few deposits, however, occur near the central part, with mineralization occurring both in the batholithic rock and in the overlying invaded rocks.

There are impregnations, veins, stockworks, and mineralized shear zones in the country rock and many of the impregnation deposits appear to have no solution channels. The principal minerals are chalcocite and bornite with some chalcocite, native copper, cuprite, azurite

and malachite. Chrysocolla, molybdenite and galena have also been reported. Magnetite and pyrite are both common, and occur as lenses, veins or as fine disseminations. Hematite is less common. Quartz is generally present but in minor amounts. Gold and silver values are generally low but a few deposits carry good gold values, which appear to decrease with an increase in pyrite.

Alteration of the wall rock is generally intense in the immediate vicinity of the mineral deposits but some altered rocks have been found at a considerable distance from known mineralization.

As mentioned previously, the known copper occurrences are generally associated with either Sugarloaf and/or Cherry Creek porphyries. It has been noted that the Cherry Creek breccia is seldom barren of chalcopyrite mineralization, apparently indicating a chemical composition that was favourable to the deposition of copper mineralization.

#### Local

On the Kimberley Copper Mines Ltd. property, four separate zones of copper mineralization occur in a northwesterly trending area approximately 2800' long and up to 800' wide. They are all found within or close to rocks of the Cherry Creek suite, near their contacts with Iron Mask rocks. The mode of occurrence of the copper mineralization (fracture coatings and disseminations) can best be described as irregular and unpredictable. The relatively small areas of copper mineralization are flanked by much larger zones containing abundant pyrite and magnetite; these tend to be strongest near, but not exactly at, the sites of copper mineralization.

The Galaxy Copper Ltd. group contains essentially the same minerals found on Kimberley ground but in an environment of altered volcanics surrounded by syenite. This postulated roof pendant varies from 100' to 350' deep; the lower portion is separated from the Cherry Creek intrusive by an intensely sheared zone of red hematitic mylonite. Mineralization within the volcanics is very irregular and difficult to correlate between diamond drill holes. Chalcopyrite is generally deposited as fine disseminations and in minor fracture fillings associated with varying amounts of pyrite. Several massive lenses of chalcopyrite are known.

#### PREVIOUS WORK AND SURVEYS

##### Kimberley Copper Mines Ltd.

The central (Crown granted) area of the claim group has been covered by most of the usual exploration tools: geological mapping, geochemical sampling, magnetometer and reconnaissance Induced Polarization. Detail IP on selected areas of the group, notably in the south central area has disclosed four zones of high chargeability. From the results available, it would appear that in the case of the known areas of copper mineralization, there is a flanking relationship wherein areas of high chargeability parallel mineralized zones, but with a displacement at right angles to the strike of the zones.

Trenching, diamond and percussion drilling in the best mineralized areas on the Charlotte, Last Chance and Kimberley Crown grants has indicated scattered mineralization of the order of less than

0.10% to .55% Cu over widths of up to 120'. Higher grade sections are present but are erratically distributed. It appears that it has not been possible, from results of trenching and drilling, to correlate the mineralized sections with any degree of assurance.

Galaxy Copper Ltd.

Extensive work has been conducted over the entire property. This has involved detailed geological mapping, magnetometer and induced polarization surveys and some geochemical soil work. A systematic drilling and trenching program on the mineralized zone on the Evening Star-Golden Star claims, plus limited underground development work from the Evening Star shaft, has reportedly proven reserves of 5,772,040 tons of 0.56% copper in irregular and erratically mineralized zones within the altered volcanic host.

Results from the IP survey have outlined other areas of high chargeability which warrant further investigation.

Respectfully submitted,

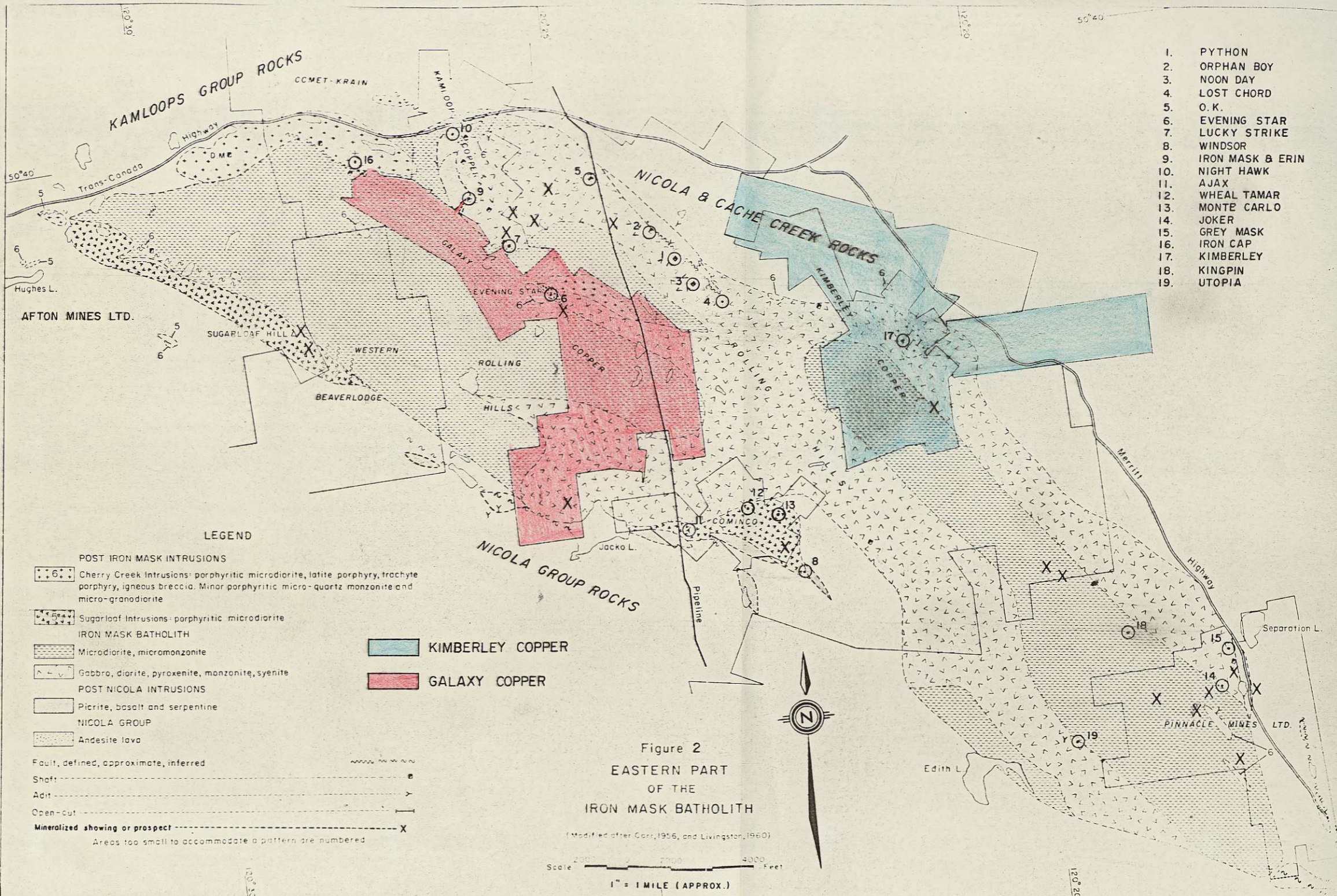
BACON & CROWHURST LTD.



J.W. Murton, B.Sc.



G.D. Delane, B.Sc.



1. PYTHON
2. ORPHAN BOY
3. NOON DAY
4. LOST CHORD
5. O. K.
6. EVENING STAR
7. LUCKY STRIKE
8. WINDSOR
9. IRON MASK & ERIN
10. NIGHT HAWK
11. AJAX
12. WHEEL TAMAR
13. MONTE CARLO
14. JOKER
15. GREY MASK
16. IRON CAP
17. KIMBERLEY
18. KINGPIN
19. UTOPIA

**LEGEND**

- POST IRON MASK INTRUSIONS
  - Cherry Creek Intrusions: porphyritic microdiarite, latite porphyry, trachyte porphyry, igneous breccia. Minor porphyritic micro-quartz monzonite and micro-granodiorite
  - Sugarloaf Intrusions: porphyritic microdiarite
- IRON MASK BATHOLITH
  - Microdiarite, micromonzonite
  - Gabbro, diorite, pyroxenite, monzonite, syenite
- POST NICOLA INTRUSIONS
  - Picrite, basalt and serpentine
- NICOLA GROUP
  - Andesite lava
- Fault, defined, approximate, inferred
- Shaft
- Adit
- Open-cut
- Mineralized showing or prospect
- Areas too small to accommodate a pattern are numbered

- KIMBERLEY COPPER
- GALAXY COPPER

Figure 2  
 EASTERN PART  
 OF THE  
 IRON MASK BATHOLITH  
 (Modified after Carr, 1956, and Livingston, 1960)  
 Scale 0 2000 4000 Feet  
 1" = 1 MILE (APPROX.)