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THE CONSOLIDATED MINING AND SMELTING COMPANY OF CANADA LIMITED
TRAIL, B.C.

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GEOLOGICAL REPORT ON
KINGFISHER NOS. 1-3 GROUPS AND BRIGHT STAR TRIO
NO. 3 GROUP - 50° 118° - VERNON M.D.

Located claims on which assessment work is requested:

Claim	Record No.	Date Recorded
BRIGHT STAR TRIO NO. 3 GROUP:		
Bright Star Trio No. 3	7043	July 30/63
" " " " 4	7044	"
KINGFISHER NO. 1 GROUP:		
Kingfisher No. 9	7109	Nov. 19/63
" No. 10	7110	"
" No. 11	7111	"
" No. 104	7139	"
" No. 105	7140	"
" No. 142	7374	May 29/64
" No. 143	7375	"
Barbie	7367	"
Rodney	7368	"
KINGFISHER NO. 2 GROUP:		
Kingfisher No. 108	7179	Nov. 25/63
" No. 110	7181	"
" No. 111	7182	"
" No. 112	7183	"
" No. 122	7143	Nov. 19/63
" No. 124	7145	"
" No. 133	7154	"
KINGFISHER NO. 3 GROUP:		
King No. 1	7481	Sept. 28/64
" No. 2	7482	"
" No. 3	7483	"
" No. 4	7484	"
" No. 6	7486	"

Work was done on the claims in the period September 1 to Nov. 15, 1964.

REPORT BY

R.G. GIFFORD
GEOLOGICAL ENGINEER

SUPERVISED BY

J. RICHARDSON
PROFESSIONAL ENGINEER

RGG:gmc

THE CONSOLIDATED MINING AND SMELTING COMPANY OF CANADA LIMITED
TRAIL, B.C.

GEOLOGICAL REPORT ON KINGFISHER NOS. 1-3 GROUPS AND BRIGHT STAR TRIO NO. 3 GROUP - VERNON M.D.

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RGG:gmc
Trail Expl'n Office, Western District
November 17, 1964

THE CONSOLIDATED MINING AND SMELTING COMPANY OF CANADA LIMITED
TRAIL, B.C.

GEOLOGICAL REPORT ON KINGFISHER NOS. 1-3 GROUPS AND BRIGHT STAR TRIO NO. 3 GROUP - VERNON M.D.

1. SUMMARY

This report details geological mapping undertaken on the Kingfisher Nos. 1-3 Groups and Bright Star Trio No. 3 Group during the period September 1 to November 15, 1964. As a result of geological work performed it is requested that two (2) years' assessment credit be applied to each of the following two (2) located claims in the Bright Star Trio No. 3 Group (revised):

Claim	Record No.	Date Recorded	Recorded Owner
Bright Star Trio No. 3	7043	July 30/63	W.C. Rotar
" " " " 4	7044	"	"

It is further requested that one (1) year assessment credit be applied to each of the following nine (9) located claims in the Kingfisher No. 1 Group:

Claim	Record No.	Date Recorded	Recorded Owner
Kingfisher No. 9	7109	Nov. 19/63	John Ens
" No. 10	7110	"	"
" No. 11	7111	"	"
" No.104	7139	"	"
" " 105	7140	"	"
" " 142	7374	May 29/64	"
" " 143	7375	"	"
Barbie	7367	"	"
Rodney	7368	"	"

It is further requested that one (1) year assessment credit be applied to each of the following seven (7) located claims in the Kingfisher No. 2 Group:

Claim	Record No.	Date Recorded	Recorded Owner
Kingfisher No. 108	7179	Nov. 25/63	D.M. Mills
" No. 110	7181	"	"
" No. 111	7182	"	"
" No. 112	7183	"	"
" No. 122	7143	Nov. 19/63	John Ens
" No. 124	7145	"	"
" No. 133	7154	"	"

It is further requested that one (1) year assessment credit be applied to each of the following five (5) located claims in the Kingfisher No. 3 Group:

Claim	Record No.	Date Recorded	Recorded Owner
King No. 1	7481	Sept. 28/64	The Cons. Mining and Smelting Company of Canada Limited
King No. 2	7482	"	" "
King No. 3	7483	"	" "
King No. 4	7484	"	" "
King No. 6	7486	"	" "

The total value of assessment credit requested and the total cost of geological work performed on each of the above four claim groups is distributed as below:

Group	Value of assessment credit requested	Value of Geological work performed
Bright Star Trio No. 3	$ 400	$ 740
Kingfisher No. 1	900	1,230
Kingfisher No. 2	700	1,020
Kingfisher No. 3	500	870

This report, with accompanying maps and statement of expenditures, is hereby submitted to record the required assessment work.

2. INTRODUCTION

Geological mapping of the Kingfisher Nos. 1-3 Groups and Bright Star Trio No. 3 Group was undertaken to evaluate the economic potential of the Kingfisher prospect and determine its geologic setting. Field work was done between September 1 and November 15, 1964. Mapping of the King 1-11 claim area was done after the location of the claims, in the period September 23 - November 15, 1964.

The geological survey was conducted by R.G. Gifford (Geological Engineer, Univ. of British Columbia 1961) while under the supervision of J. Richardson (Geological Engineer, Univ. of Toronto 1940). Capable field assistance was given by A.B. Mawer, G.D. Jones, and G. Headley.

The claim groups are located 31 miles east of Enderby, in the Vernon Mining Division, 50° 118° N.W. They lie at elevation 2,600' on the east fork of Kingfisher Creek. Access is by gravel road, in good condition, 31 miles from Enderby. The terrain is moderate in relief and heavily forested. Rock exposures are fairly plentiful.

Reconnaissance mapping to establish the geologic setting of base metal deposits in the area was plotted on a base topographic map at a scale of 1" = 1,000' (see Plate I). As a rule, the outcrops were first positioned on vertical air photographs, scale 1" = 1/4 mi., in the field and then transferred to the base map by means of photogrammetrically located tie points.

More detailed mapping to further define the mode of occurrence of the mineral deposits was done in two specific areas of the prospect. One area, on Kingfisher 7 claim, was mapped at 1" = 100' by plane table survey (see Plate II). The other area, mainly on King 3 claim, was mapped at 1" = 100' with chain and compass survey control (see Plate III).

3. GEOLOGY

General Discussion

The Kingfisher zinc-lead prospect is in regionally metamorphosed rocks of the Monashee Group of believed Precambrian age. Most of the known ore deposits are in the intermediate unit of three metamorphic rock units that were mapped. This unit consists mainly of interlayered quartzite and marble. The intermediate unit is bounded on the west by a unit comprising interlayered gneiss, marble, and quartzite and on the east by a unit that is mainly gneiss. Numerous dikes and sills of pegmatite and dikes of feldspar porphyry and diorite cut the metamorphic rocks. A large body of syenite underlies the northernmost part of the area.

Several northwest-striking faults are found in the southernmost part of the area. Isoclinal folds, frequently recumbent, are common in the metamorphic rocks. The folds typically plunge south-southwestward at moderate angles.

Metamorphic Rocks

The metamorphic rocks, going from south to north, first trend northerly then northeasterly. Many local irregularities in trend are common. Dips are usually moderate to the east. The dominant metamorphic rocks at the prospect are gneiss, marble, and quartzite. Bedding is sometimes difficult to distinguish, and criteria for determining the superposition of beds is lacking.

Three metamorphic rock units were delineated during the mapping: a footwall unit that underlies the western part of the area, designated unit A; an intermediate unit, designated unit B; and a hanging-wall unit that underlies the eastern part of the area; designated unit C.

Unit B, which contains most of the ore deposits, is characterized by abundant calcareous rocks. These are principally marble and calcareous quartzite. Subordinate amounts of quartz-feldspar-biotite gneiss are present. The marble is coarsely crystalline and is variously pure, siliceous, felspathized, or silicated. Diopside is the most common alteration product in the calcareous rocks. Unit B is about 200' thick and is bounded by gradational contacts with unit A to the northwest and unit C to the southeast.

Unit A is comprised of interlayered quartz-feldspar-biotite gneiss, marble, and calcareous quartzite. It is exposed through a stratigraphic thickness of 500'.

Unit C consists mainly of quartz-feldspar-biotite gneiss, and subordinate amounts of hornblende gneiss and biotite schist. It is exposed through a thickness of 1,000'. Garnet, and subordinate kyanite and sillimanite are minor constituents in the gneiss and schist of all three metamorphic-rock units.

Intrusive Rocks

Pegmatite, diorite, feldspar porphyry and syenite frequently intrude the metamorphic rocks of the area. Pegmatite is especially common, and is found in all three metamorphic rock units as both sills and dikes. Coarse intergrowths of quartz and feldspar characterize the pegmatite.

Syenite forms an extensive body underlying the northerly portion of the mapped area. Various basic phases are present within the main intrusive body. Satellitic intrusions of diorite and feldspar porphyry are much less common in the southern part of the area than in the north.

The mineral deposits are sometimes cut by intrusions of pegmatite, diorite, or feldspar porphyry.

Structure

The main structural features have different individual trends. Metamorphic rock units trend northeast, fold axes trend south-southwest, and faults trend northwest. Foliation is usually near-parallel with the bedding.

Small folds are common in all the metamorphic rock units. The folds are variously tight or isoclinal and commonly recumbent. Fold axes and lineations (mineral grains, quartz rods) generally plunge moderately south-southwest.

The main faults in the mapped area strike northwestward with offsets north-side east. They are best defined in the southern part of the area, and here have an apparent net offset in the order of 2,500' north-side east. A major north-northwest striking fault is present a short distance west of the mapped area.

Mineral Deposits

The ore deposits are largely confined to the intermediate unit (Unit B) of the three metamorphic-rock units. Low grade zinc and lead mineraliztion is traceable for four miles in this northeast-trending zone. Mineralization occurs in several members, either quartzite or marble, of Unit B. No ore minerals are observed in the intrusive rocks. Some of the deposits appear localized along minor folds; others are disseminated in the favorable host rock.

The ore sections are commonly between 1 and 3 feet thick and less commonly up to 20' thick. They are partly masked by secondary iron minerals and consist of sulphide minerals that form masses or disseminations or that are sometimes irregularly distributed in veins or breccia. Pyrrhotite is the most commom sulphide, and sphalerite is the principal ore mineral. Some galena is usually present and rarely chalcopyrite is observed. Masicot, the uncommon monoxide of lead, bright greenish yellow in color, forms an alteration product at some showings.

4. CONCLUSIONS

Mineralization is largely confined to Unit B. Sulphides occur in various quartzite and marble members of this unit which suggests the ore minerals were emplaced at some stage before or during regional metamorphism of the rock assemblage. Some deposits appear localized on fold crests.

The widespread base metal mineralization makes the area worth further attention. However, features of the mineralization presently exposed indicate the mineral deposits may be narrow, highly deformed, of limited continuity along strike, and low in grade.

Attachments:

(1) Geological Plan of Kingfisher Nos. 1-3 Groups and Bright Star Trio No. 3 Group; Index map. Plate I.

(2) Geological Plan of Kingfisher 7 mineral showings. Plate II.

(3) Geological Plan of King 3 mineral showings. Plate III.

(4) Statement of Expenditures.

(5) Statutory Declaration relating to Expenditures.

Attachments: (cont'd.)

(6) Statement of Qualifications.

Report by: R.G. Gifford

R.G. Gifford
Geological Engineer

Endorsed by: J. Richardson

J. Richardson
Professional Engineer

RGG:gmc
Trail Expl'n Office, Western District
November 17, 1964

Distribution:
Mining Recorder (Vernon)	(2)
Exploration Div., Montreal	(1)
Records Engr., Trail	(1)
Western Exploration, Trail	(2)

THE CONSOLIDATED MINING AND SMELTING COMPANY OF CANADA LIMITED
TRAIL, B.C.

1964 GEOLOGICAL EXPENDITURES - KINGFISHER NOS. 1-3 GROUPS AND BRIGHT STAR TRIO NO. 3 GROUP - VERNON M.D.

BRIGHT STAR TRIO NO. 3 GROUP:

Salaries

J. Richardson, Exploration Superintendent; 2 days (Sept. 1 - November 15) at $50 per day	$ 100
R.G. Gifford, Exploration Geologist; 12 days (Sept. 1 - November 15) at $35 per day	420
G. Headley, Field Assistant; 8 days (Sept. 1 - September 17) at $20 per day	160
	$ 680

Transportation

1 - Land Rover 300 mi. at 20¢ per mi.	60
TOTAL:	$ 740

KINGFISHER NO. 1 GROUP:

Salaries

J. Richardson, Exploration Superintendent; 2 days (Sept. 1 - November 15) at $50 per day	$ 100
R.G. Gifford, Exploration Geologist; 12 days (Sept. 1 - November 15) at $35 per day	420
A.B. Mawer, Exploration Technician; 13 days (Sept. 1 - November 15) at $30 per day	390
G.D. Jones, Field Assistant; 2 days (Sept. 18 - November 15) at $20 per day	40
G. Headley, Field Assistant; 9 days (Sept. 1 - Sept. 17) at $20 per day	180
	$ 1,130

Transportation

1 - Land Rover 500 mi. at 20¢ per mi.	100
TOTAL:	$ 1,230

KINGFISHER NO. 2 GROUP:

Salaries

J. Richardson, Exploration Superintendent; 2 days (Sept. 1 - November 15) at $50 per day	$ 100
R.G. Gifford, Exploration Geologist; 12 days (Sept. 1 - November 15) at $35 per day	420

Kingfisher No. 2 Group (cont'd.)

Salaries

A.B. Mawer, Exploration Technician; 6 days (Sept. 1 - November 15) at $30 per day	$ 180
G.D. Jones, Field Assistant; 11 days (Sept. 18 - November 15) at $20 per day	220
	$ 920

Transportation

1 - Land Rover 500 mi. at 20¢ per mi.	100
TOTAL:	$ 1,020

KINGFISHER NO. 3 GROUP:

Salaries

J. Richardson, Exploration Superintendent, 2 days (Sept. 23 - Nov. 15) at $50 per day	$ 100
R.G. Gifford, Exploration Geologist; 6 days (Sept. 23 - November 15) at $35 per day	210
A.B. Mawer, Exploration Technician; 10 days (Sept. 23 - Nov. 15) at $30 per day	300
G.D. Jones, Field Assistant; 10 days (Sept. 23 - November 15) at $20 per day	200
	$ 810

Transportation

1 - Land Rover 300 mi. at 20¢ per mi.	60
TOTAL:	$ 870

Endorsed by:

G. Hamson
Branch Accountant

This is Exhibit "A" to the Statutory Declaration of James Richardson, declared before me the 18th day of November, A.D. 1964.

James Richardson

A Commissioner for taking Affidavits for the Province of British Columbia.

CANADA) STATUTORY DECLARATION RELATING TO EXPENDITURES ON A GEOLOGICAL SURVEY OF CERTAIN MINERAL CLAIMS UNDER OPTION TO THE CONSOLIDATED MINING AND SMELTING COMPANY OF CANADA LIMITED

PROVINCE OF BRITISH COLUMBIA)

TO WIT:)

I, JAMES RICHARDSON, Professional Engineer, of the City of Trail, in the Province of British Columbia, DO SOLEMNLY DECLARE:

1. That I am the person who endorsed a geological report as the result of surveys carried out of certain mineral claims, under option to The Consolidated Mining and Smelting Company of Canada Limited, situated in Vernon Mining Division.

2. That copies of the said report are being filed with the Mining Recorder in Vernon.

3. That attached hereto and marked with the letter "A", upon which I have signed my name at the time of declaring hereof, is a statement of expenditures incurred in connection with the geological survey of the said claims showing in addition the dates during which those making the said survey performed their work.

AND I MAKE this solemn declaration conscientiously believing it to be true and knowing that it is of the same force and effect as if made under oath and by virtue of the Canada Evidence Act.

DECLARED before me at the Municipality of Tadanac, in Province of British Columbia, this 18th day of November A.D. 1964.

James Richardson

A Commissioner for taking Affidavits for British Columbia

THE CONSOLIDATED MINING AND SMELTING COMPANY OF CANADA LIMITED
TRAIL, B.C.

STATEMENT OF QUALIFICATIONS

R.G. Gifford was responsible for conducting the geological survey described herein. Gifford is a graduate Geological Engineer of U.B.C. and has been employed in geological field work since 1951. During this time he has worked as a mine geologist and on various field projects as an exploration geologist. I consider him a competent and experienced geologist.

J. Richardson
Professional Engineer

JR:gmc
Trail Expl'n Office, Western District
November 17, 1964

To accompany Geological Report by R.G. Gifford, Consulting Engineer, on the Kingfisher Property on Kingfisher Creek, Vernon M.D., November 15, 1964

R.G. Gifford

Department of Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 579 MAP 1

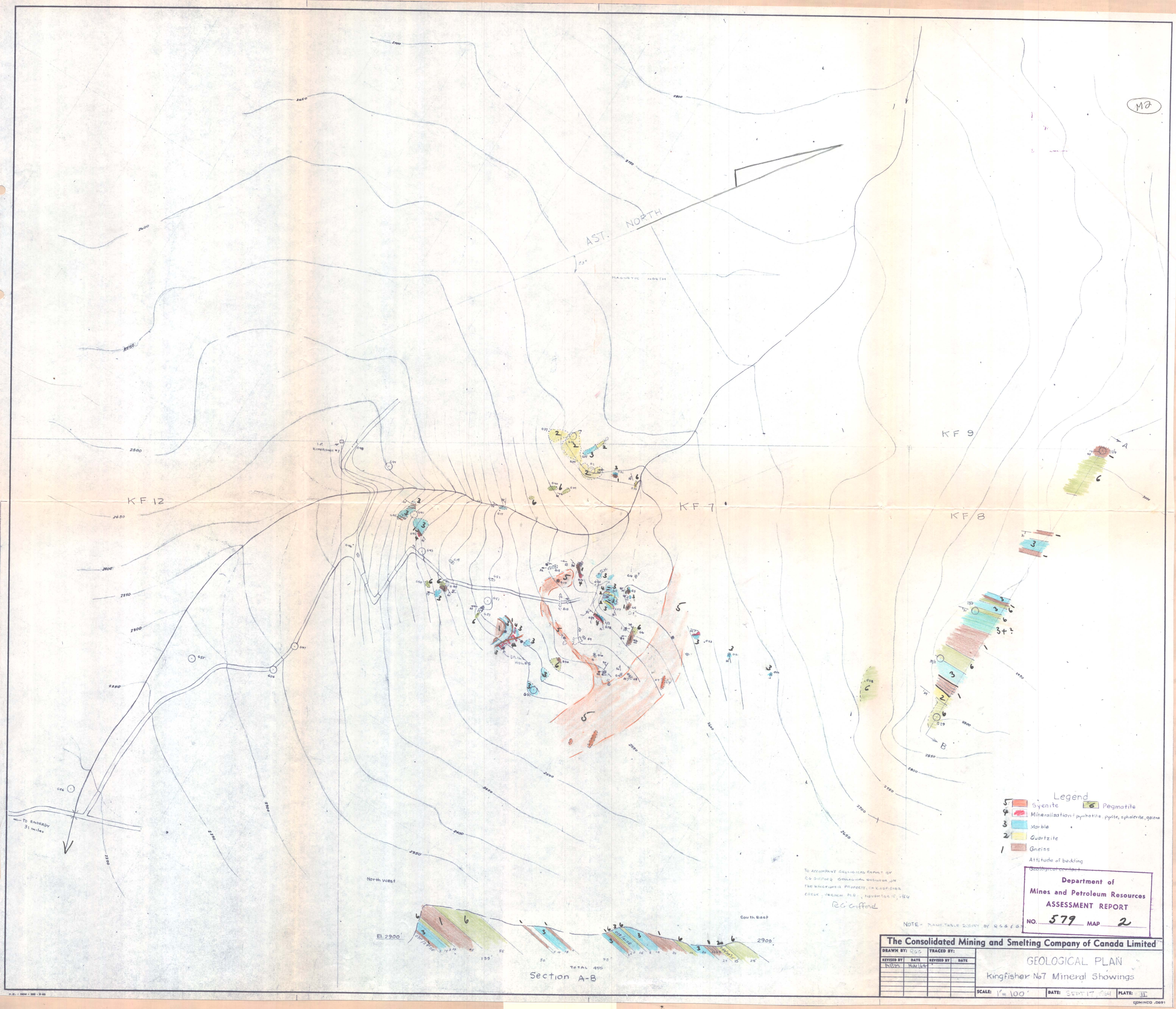
The Consolidated Mining and Smelting Company of Canada Limited

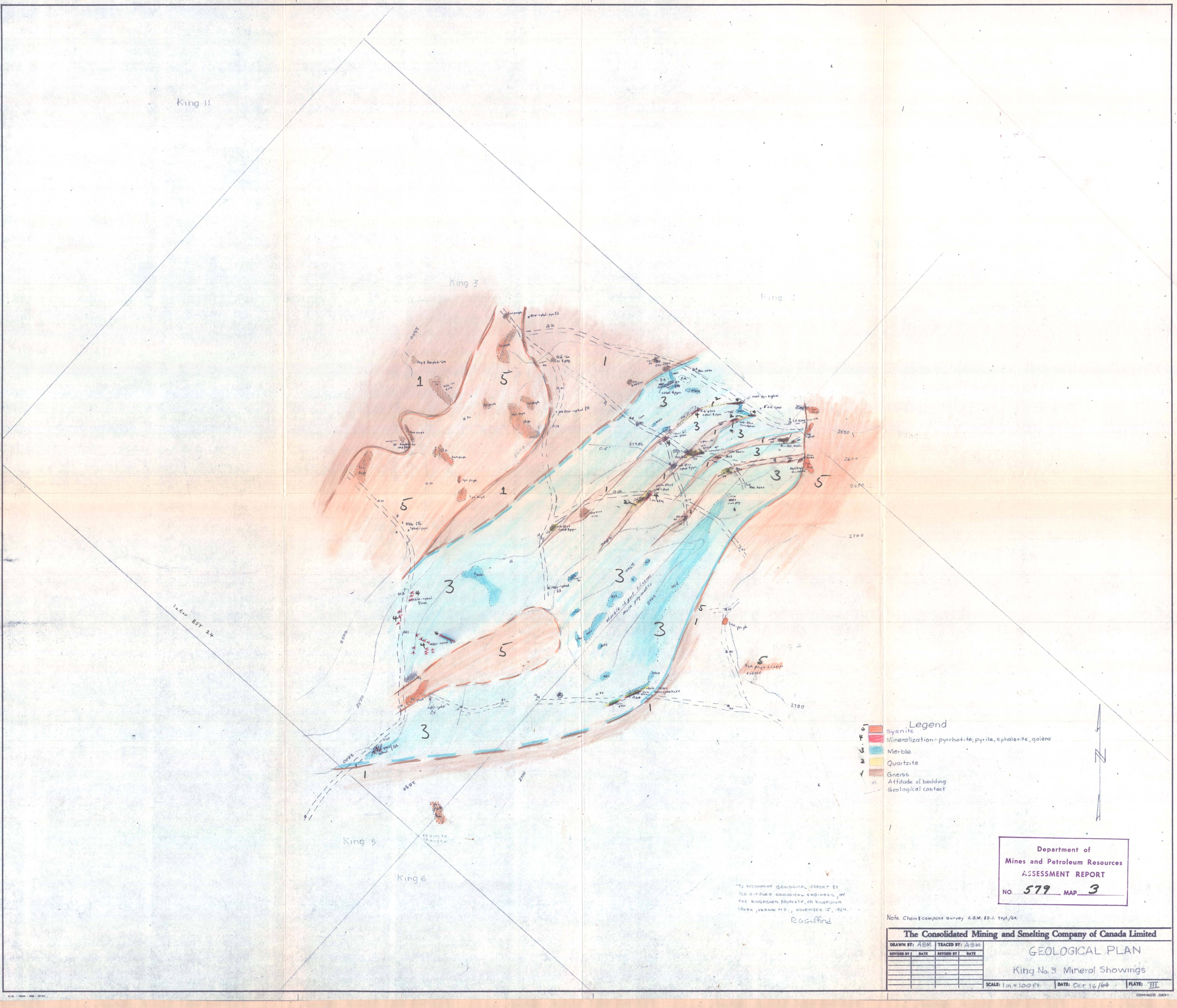
DRAWN BY: RGG A.B.M.		TRACED BY: A.B.M.	
REVISED BY	DATE	REVISED BY	DATE
A.B.M.	Nov/64		

GEOLOGICAL PLAN of Kingfisher No. 1, 2 & 3 & Bright Star Trio No. 3 Groups

SCALE: 1 inch = 1000 feet | DATE: Nov. 15, 1964 | PLATE: I

COMINCO 210-0670


M2
AST. NORTH
MAGNETIC NORTH
KF 12
KF 7
KF 9
KF 8
TO ENDERBY 31 miles
North West
South East
EL 2900'
2900'
Section A-B
TOTAL 455
Legend
5 Syenite
6 Pegmatite
4 Mineralization: pyrrhotite, pyrite, sphalerite, galena
3 Marble
2 Quartzite
1 Gneiss
Attitude of bedding
Geological contact
TO ACCOMPANY GEOLOGICAL REPORT BY
R G GIFFORD GEOLOGICAL ENGINEER ON
THE KINGFISHER PROPERTY, ON KINGFISHER
CREEK, VERNON M.D., NOVEMBER 15, 1964
R G Gifford
NOTE - PLANE TABLE SURVEY BY R G G & G
Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 579 MAP 2
The Consolidated Mining and Smelting Company of Canada Limited
DRAWN BY: RGG
TRACED BY:
REVISED BY
DATE
ABM
Nov 64
GEOLOGICAL PLAN
Kingfisher No7 Mineral Showings
SCALE: 1" = 100'
DATE: SEPT 17, 1964
PLATE: II
COMINCO .0691


King 11
King 3
King 1
King 2
King 4
King 5
King 6
later BST 24
2500
2550
2600
2650
2700
Marble in part siliceous much pegmatite
Syn porph
Mble-sphal flt
Mble-sphal float
Syn porph & Gneiss rubble
Mble - Skarn some sphalerite
I.P. King 1-2-3-4
Elev 2600
Legend
5 Syenite
4 Mineralization - pyrrhotite, pyrite, sphalerite, galena
3 Marble
2 Quartzite
1 Gneiss
Attitude of bedding
Geological contact
"To accompany geological report by R.G. Gifford geological engineer, on the Kingfisher property, on Kingfisher Creek, Vernon M.D., November 15, 1964.
RGGifford
Department of Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 579 MAP 3
Note. Chain & compass survey A.B.M. & D.J. Sept./64.
The Consolidated Mining and Smelting Company of Canada Limited
DRAWN BY: ABM
TRACED BY: ABM
REVISED BY
DATE
GEOLOGICAL PLAN
King No. 3 Mineral Showings
SCALE: 1 in = 100 ft
DATE: Oct 16/64
PLATE: III
COMINCO .0691