

#769

COMINCO LTD.

TRAIL, B.C.

GEOLOGICAL REPORT ON  
BRONSON CREEK NOS. 1-3 CLAIM GROUPS  
TWARD M.D. 56°, 131° NE  
N.T.S. 104 E-11

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GEOLOGICAL REPORT ON  
BRONSON CREEK NOS. 1-3 CLAIM GROUPS  
TARD N.D. 56, 9131° NE  
N.T.S. 104 B-11

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SUMMARY

This report details the geological mapping carried out on the Bronson Creek Nos. 1-3 Claim Groups during the period from June 12 to September 30, 1965. As a result of the geological work performed assessment credit is requested on claims in the various groups as follows:

Bronson Creek No. 1 Group:

<u>Claims</u>	<u>Record No.</u>	<u>Assessment Credit</u>	<u>Total</u>
Bron 1-6	13627-32	2 yrs. each claim	12 yrs.
Bron 9-12	13635-38	2 yrs. " "	8 "
Pang 9-14	18685-90	2 yrs. " "	12 "
Son 22-24	17945-47	2 yrs. " "	6 "
Son 47-48	17970-71	2 yrs. " "	4 "
Son 50	17973	2 yrs. " "	2 "
			<u>44</u> yrs.

Bronson Creek No. 2 Group:

Bron 7-8	13633-34	2 yrs. each claim	4 "
Bron 13-14	13639-40	2 yrs. " "	4 "
Bron 21-24	13647-50	2 yrs. " "	8 "
Bron 25	13651	1 yr. " "	1 "
Bron 26	13652	2 yrs. " "	2 "
Bron 37-40	13663-66	1 yr. " "	4 "
Son 11-15	17934-38	2 yrs. " "	10 "
Son 16	17939	3 yrs. " "	3 "
Son 17	17940	2 yrs. " "	2 "
Son 18	17941	3 yrs. " "	3 "
Son 19-21	17942-44	2 yrs. " "	6 "
Son 37-38	17960-61	2 yrs. " "	4 "
Son 39-46	17962-69	1 yr. " "	8 "
Don 41	18026	1 yr. " "	1 "
Don 47-48	18032-33	1 yr. " "	2 "
Don 57-58	18042-43	1 yr. " "	2 "
			<u>64</u> yrs.

<u>Claim</u>	<u>Record No.</u>	<u>Assessment Credit</u>	<u>Total</u>
<u>Bronson Creek No. 3 Group</u>			
Bron 15-20	13641-46	1 yr. each claim	6 yrs.
Bron 27-36	13653-62	1 yr. " "	10 "
Bron 41-42	13667-68	1 yr. " "	2 "
Bron 43-48	13669-74	2 yrs. " "	12 "
Don 1-4	17986-89	2 yrs. " "	8 yrs.
Don 21-24	18006-09	2 yrs. " "	8 "
Pang 1-8	18677-84	1 yr. " "	8 "
			<u>54 yrs.</u>

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

<u>Group</u>	<u>Requested Assessment Credit</u>	<u>Cost of Geological Work Performed</u>
Bron No. 1	44 years	\$ 4,420
Bron No. 2	64 years	6,475
Bron No. 3	54 years	5,475
Total	<u>162 years</u>	<u>\$ 16,370</u>

This report with accompanying maps and statement of expenditures is hereby submitted to record the above assessment credit.

#### INTRODUCTION

Geological mapping of the Bronson Creek No's 1-3 Groups was undertaken to evaluate the economic potential of the Bronson Creek prospect and determine its geologic setting. Field work was done during the period June 12, 1965 to September 30, 1965.

The geological survey was conducted by G. Parsons (Geologist, University of Vermont, 1962) while under the supervision of J. Richardson (Geological Engineer, University of Toronto, 1940). Capable field assistance was given by P. Delancy, (Geologist, University of Manitoba, 1965).

During the periods July 1-4, 1965 and September 26-28 the writer was also accompanied by Dr. P. H. Sevensma, Geologist and P. Eng.

The claim groups are located at 56°, 131° NE in the Liard Mining Division on the west extensions of Snippaker Mountain (a ridge between the Iskut River and Bronson Creek) and Johnny Mountain (a ridge between Bronson Creek and the Craig River). The claims lie between elevations of 175' and 4,000'. The area is about 80 air-miles due south of Telegraph Creek, B.C.

Access to the area was by fixed-wing aircraft from Prince Rupert to the mouth of the Iskut River and then by river-boat or helicopter 30 miles upstream to the mouth of Bronson Creek. Helicopter travel to the high ridges provided the only feasible method of transportation of field crews on the property due to the precipitous terrain and heavy forest cover of devils club and alder.

Mapping to establish the geologic setting of the base metal deposits in the area was plotted on a topographic base map

at a scale of 1" = 1,000' compiled from vertical air photographs (plate 1). As a rule outcrops were first positioned on vertical air photographs, scale 1" = 3,000' and then transferred to the base map.

In conjunction with mapping, a drilling program was carried out in several selected areas. A total of 1,112' of drilling was done in 8 holes. All drilling was confined mainly to one lithological unit. Geological interpretations are based mainly on the results of surface mapping but this was supplemented locally at least by drilling results.

GEOLOGY

General Discussion

The Bronson Creek Claim Groups lie from seven to ten miles east of the east front of the Coast Range Batholith. The area is underlain by clastic, pyroclastic, and volcanic rocks ranging in age from mid-Paleozoic to mid-Mesozoic. The layered rocks have a general northwesterly strike with shallow to moderate dips to the northeast and southwest. The older rocks in the area show the effects of low-grade regional metamorphism.

Intrusive rocks in the area are represented by small stocks and dikes of acid to intermediate composition. On the property there is a dike of orthoclase porphyry apparently related to a larger stock to the northwest. Surrounding this dike there is an intense zone of alteration consisting of silicification, and sericitization.

Layered Rocks

The layered rocks within the claim area are described below in a stratigraphic sequence beginning with the lowest and apparently the oldest unit observed:

TABLE I

<u>Lithology</u>	<u>Age *</u>	<u>Approximate Thickness</u>
Andesite	Triassic	1,500' +
Black Argillite - Greywacke	Triassic	2,000' +
-	Unconformity?	-
Brown Argillite	Pre-Permian?	Unknown
Grey-Green Siltstone	Pre-Permian	2,000' +

\* Ages are taken from Kerr (1948) Lower Stikine and Western Iskut River Areas, British Columbia G.S.J. Mem. 246 - 94 pages.

The lithologic units are described below:

(a) Grey-Green Siltstone

The lowermost unit observed is the grey-green siltstone which outcrops along both sides of Bronson Creek. This unit is composed of three members. The lowest is a fine to medium-grained, light grey to green, hard, siltstone. The rock consists primarily of quartz grains with argillaceous matrix converted largely to epidote and sericite. Minor amounts of pyrite and molybdenite are also present. Minor quartz veining is present and is probably later than the mineralization.

Bedding is difficult to discern on the outcrop but in drill core the bedding is quite pronounced and fairly regular. The beds are apparently uniform in composition and commonly show graded bedding which indicates that the beds are upright.

The middle member of this unit is largely a green to greenish-black, fine-grained, soft argillite. Biotite is the common mafic mineral and it is the only essential mineral recognized in hand specimen. Magnetite is usually but not

always present as fine crystals or finely disseminated grains. Pyrite and chalcopyrite occur in irregular concentrations with the pyrite occasionally crystalline. The chalcopyrite occurs as veinlets, small blebs or lenses, and as very fine-grained disseminated material.

The only depositional features noted in outcrop or core were bedding planes and occasional graded beds. The argillite is usually thin to very thin bedded with the differences between beds very vague. Post-depositional features noted in the argillite member were intense plastic deformation, brecciation, local bleaching due probably to the breakdown of sulphides, and abundant veining of the argillite by small quartz-carbonate veinlets. The intricate small scale folding does not follow a recognizable pattern between outcrops or even within the same section of drill core. Brecciation was observed in several areas but it is not related to observed faulting. The brecciated rock is compact and well healed while faults in, crosscutting zones of brecciation commonly contain a narrow seam of muddy gouge and narrow zones of bleaching in both walls. The quartz-carbonate veins are commonly folded and offset in the argillite and usually are not associated with sulphide mineralization although in some cases sulphides are concentrated along the boundaries of these small veins.

Metamorphism is expressed in the argillite zone by the abundance of fine-grained green biotite, crystalline magnetite and typical metamorphic textures as noted in thin section.

Several small creamy yellow quartz-sericite-pyrite zones were observed in the upper portions of this argillite member. They are always associated with small shears and are usually weathered to a greater extent than surrounding argillite due to the breakdown of the pyrite.

The uppermost member of the grey-green siltstone unit is now a quartz-sericite-pyrite rock with a strong schistose fabric striking  $320^{\circ}$  and dipping moderately to the southwest. The rock is grey to creamy yellow in color, medium to fine-grained, and ranges between medium hard and soft, depending upon the quartz, sericite ratio.

#### (b) Brown Argillite

The brown argillite overlies the grey-green siltstone unit on the west end of Johnny Flats. Lithologically it consists primarily of dark brown to tan, thin bedded, medium hard to hard argillite with minor amounts of thick bedded arkosic sandstones and pebble conglomerates. These rocks were not found elsewhere in the area. This unit contains minor amounts of disseminated pyrite and chalcopyrite. Little is known of this unit because it is restricted almost entirely to a very steep slope with little outcrop and covered by Devils Club and slide alder.

#### (c) Black Argillite - Greywacke

The next unit is the black argillite-greywacke unit. The lowest member of this unit is a black, fine to very fine-grained, medium hard argillite or mudstone with thin to medium beds of greywacke occurring occasionally near the bottom of the member and with increasing frequency towards the top finally, grading into a massive greywacke unit.

Within the argillite the only minerals recognized are occasional grains of quartz and cubes of pyrite. Also small shears striking northwesterly may contain very narrow veins of galena and sphalerite in quartz.

Bedding within the argillite is usually poorly defined but where it is present the strike is northwesterly and the dips are moderate to steep to the northeast and southwest.

No ripple marks, current marks, fossils or any other indications of bedding tops were observed.

The upper member of this unit is a massive greywacke with thin interbeds of black argillite. The greywacke is a dark grey, well indurated, medium to coarse grained rock. Quartz, feldspars and either biotite or chlorite are visible. Minor amounts of pyrite are disseminated throughout the unit.

No internal structures other than bedding planes were noted and the tops of the beds could not be determined with certainty. Post-depositional features noted were minor mineralized shears containing galena, sphalerite, pyrrhotite and arsenopyrite. Also a large fault striking northwesterly and dipping southerly is mapped on the southern portion of Johnny Flats. The faulting is marked by a gouge zone from 2 feet to 20 feet wide and the displacement is apparently in a normal sense.

#### (d) Andesite

The uppermost unit of the area is exposed on Johnny Mountain. This unit is in excess of 2,000 feet thick and consists largely of andesitic agglomerates and flows. This unit is tentatively correlated with andesitic flows on the west end of Johnny Flats where the andesite is in fault contact with both the Brown and Green argillites. The basis for correlation is lithologic similarity.

The base of the unit on Johnny Mountain is marked by the agglomerate, this member was not observed elsewhere in the area. The agglomerate contains angular andesitic fragments commonly two to four inches in diameter in a dark green matrix of andesite, other rock types including granite and silicious bedded siltstones or tuffs are occasionally found as fragments. Epidote stringers and knots are a distinguishing feature of this unit.

#### INTRUSIVE ROCKS

The intrusive rocks of the area are, in order of importance, orthoclase porphyry, felsite and lamprophyre dikes. The orthoclase porphyry outcrops to the west of the sharp bend in Eronson Creek as a stock, along the steep northerly slope south of Eronson Creek as dikes and (as a small irregular stock?) on the southeast end of Johnny Flats.

This porphyry typically consists of large pink to reddish brown, euhedral, twinned orthoclase phenocrysts (10 x 30 mm) some of which display resorption and contain inclusions of plagioclase. Small hornblende phenocrysts (1 x 4 mm) occur in the stock but are rare in the dike. The phenocrysts are set in pale green very fine-grained to aphanitic matrix. Magnetite grains are always present and in places constitute 5% - 10% of the rock. Minor amounts of chalcopyrite, pyrite, and molybdenite are also found. Thin section studies of this rock show that the large feldspars are largely altered to sericite with concentrations of epidote around the original crystal boundaries. The notable feature of the rock is that the phenocrysts are largely altered while the matrix made up of albite, orthoclase and quartz with subsidiary biotite is virtually unaltered.

Felsite occurs as an elongate mass striking northwesterly on Johnny Flats. It is a fine-grained white to pale pink rock with less than 1% mafic minerals and no metallic minerals other than rare flecks of hematite. Thin section studies showed this rock to consist of quartz and subhedral to euhedral orthoclase with minor sericite and fluorite. Several dark dikes were observed in the area, all less than five feet in width, and three different types were noted. The three types are minette, vogesite and a very fine-grained to

aphanitic black lamprophyre (?). No mineralization is associated with the dikes and they are the latest geological feature as they intrude all rock types and are not cut by any observed faults. They are probably associated with the Quaternary Hoodoo Formation.

#### STRUCTURE

Faulting is present throughout the claim area but only one fault appeared to be of significant size. This fault strikes northwesterly across Johnny Flats and dips steeply to the south, the zone of disturbance is from two to twenty feet wide and is marked by gouge and occasional horses / wallrock. Near the northwestern end of the observed trace of the fault occurs a zone of quartz-sericite pyritic rock similar to that which occurs near the porphyry dikes just south of Bronson Creek. No economic mineralization is known to be associated with this zone.

A few minor folds were observed but no major folds were recognized. The axes of these minor folds strike northwesterly and have shallow plunges to the northwest and the axial planes dip to the southwest steeply.

The other structure of significance is a possible unconformity between the Black Argillite-Greywacke sequence above and the underlying rocks. The evidence for this unconformity is based on a marked difference in the degree of regional metamorphism and the divergence of strikes and dips on the western end of Johnny Flats.

#### MINERALIZATION

##### (a) Mineralogy

The most common ore mineral in the area is chalcopyrite which occurs as stringers, small lenses, and blebs disseminated in the argillite zone of the Grey-Green Siltstone unit. Chalcopyrite also occurs elsewhere in quartz-pyrite veins with sparse galena and sphalerite. Sub-ore grade concentrations are also found in the epidote-rich silty sections of the Grey-Green Siltstone just south of Bronson Creek.

##### (b) Ore Controls

No structural ore controls for the disseminated chalcopyrite mineralization are recognized. However, there has been extensive movement in the host argillite as previously mentioned and this movement may have influenced or be associated with the deposition of chalcopyrite although it is in part post-ore as indicated by smeared chalcopyrite on slip-surfaces within the argillite.

The main ore control appears to be of a lithologic nature with one particular facies preferred. However, this is not the only control as within the biotitic zone of the argillite the copper concentration varies more than a hundred fold. Various other factors influencing or correlative with the concentration of chalcopyrite were considered. They are: feldspathization, biotitization, intensity of fracturing or brecciation, abundance of quartz-carbonate veins, the amount of lime, and the amount of pyrite. Only the last factor appeared to vary with the concentration of the chalcopyrite. The pyrite concentration varies inversely as that of the chalcopyrite indicating perhaps that during deposition of the sulphides only a limited amount of sulphur was available.

#### DIAMOND DRILLING RESULTS

Diamond drilling was carried out mainly for the purpose of sampling copper mineralization localized within the Grey-Green Siltstone unit. The drill core provided local information as to the attitude of bedding, fractures, contacts and the manner in which chalcopyrite occurs as well as its associations. The location of the holes was governed largely by surface showings, terrain and the availability of water.

Although drilling indicated widespread copper mineralization, no significant widths of ore grade material were observed.

CONCLUSIONS

The geologic mapping and diamond drilling program on the Bronson Creek property gave disappointing results with respect to finding ore grade mineralization. However, the widespread, submarginal copper mineralization and extensive areas of intense alteration make this region worthy of further study.

ATTACHMENTS:

- (1) Surface Geology, Bronson Creek Area. Scale 1" = 1,000'.
- (2) Plan of Bronson Creek Claim Groups, Scale 1" = 3,000'.
- (3) Statutory Declaration relating to expenditures.
- (4) Statement of Expenditures.
- (5) Statement of Qualifications.

Report by:

G. Parsons  
G. Parsons,  
Exploration Geologist

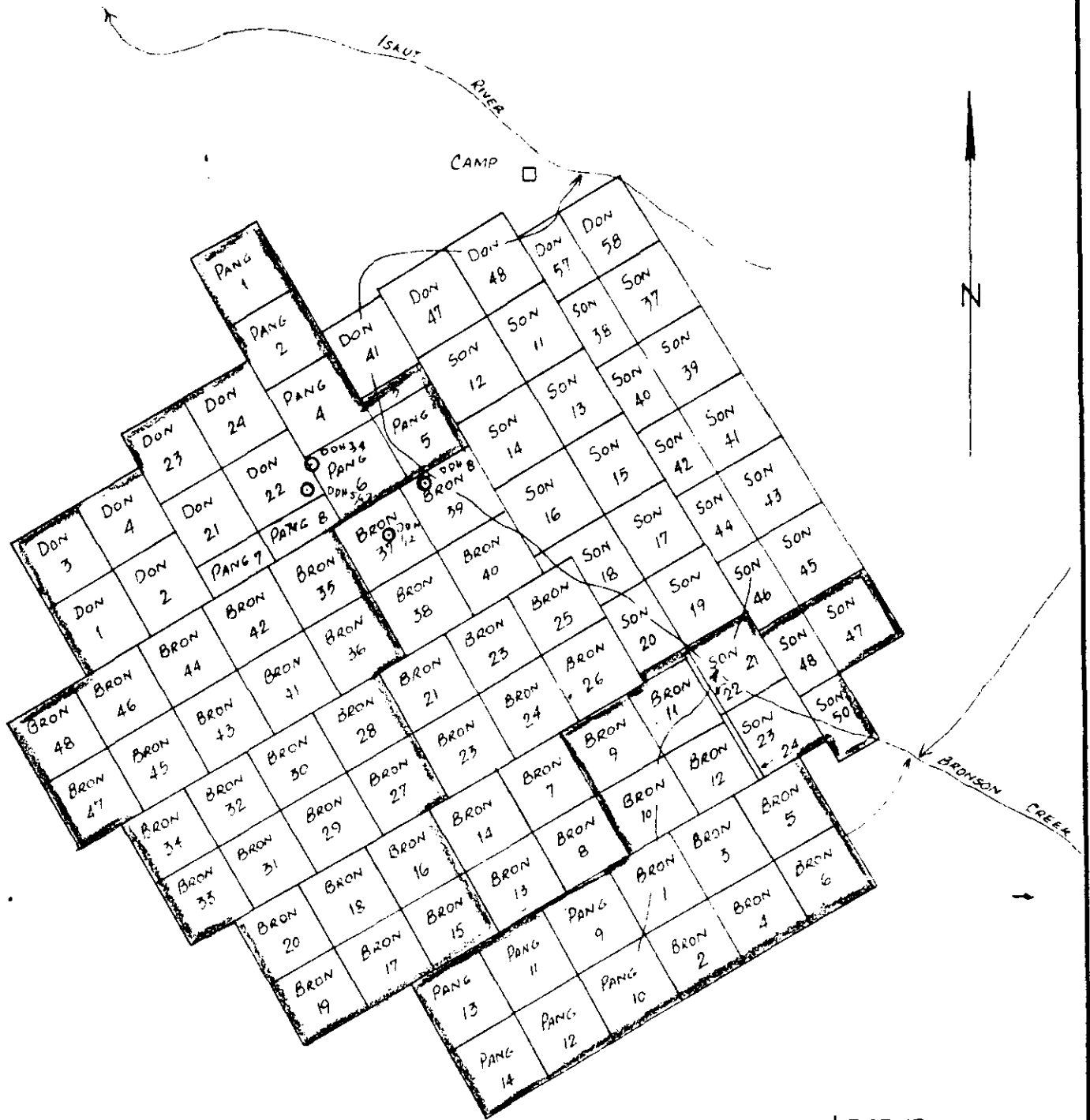
GP:ss

Trail Expl'n Office, Western District

May 18, 1966




Distribution: Gold Commissioner, Victoria (2)  
Western Expl'n, Trail (2)





DDH 1	198'
DDH 2	174'
DDH 3	220'
DDH 4	83'
DDH 5	154'
DDH 6	15'
DDH 7	108'
DDH 8	161'
Total	1112'

**LEGEND**

-  BRONSON CREEK No. 1 GROUP
-  BRONSON CREEK No. 2 GROUP
-  BRONSON CREEK No. 3 GROUP

TOTAL DRILLING BRONSON CREEK No 2 GROUP 530'

TOTAL DRILLING BRONSON CREEK No 3 GROUP 580'

To accompany Geological Report on Bronson Creek Nos. 1-3 Groups by G. Parsons.

**The Consolidated Mining and Smelting Company of Canada Limited**

SCALE	1" = 3000'	TRACED BY: A. ATAL
DATE		

LOCATION MAP  
Bronson Creek Claim Groups  
Nos. 1, 2 & 3.

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

STATEMENT OF EXPENDITURES  
GEOLOGICAL SURVEY BRONSON CREEK  
NOS. 1-3 GROUPS 56°-131°  
LIARD MINING DIVISION

SALARIES

G. Parsons, Exploration Geologist, for 90 days, field work during the period June 12 to Sept. 30, 1965 and 10 days map and report preparation Oct. 4-8, 1965 and March/1966 at \$50.00 per day 7-11	\$ 4,500
P. Delancy, Geology Graduate for 90 days field work during the period June 12 to Sept. 30, 1965 at \$35.00 per day	3,150
P. H. Sevensma, P.Eng. Senior Geologist for 7 days field work July 1-4 and Sept. 21-23, 1965 at \$75.00 per day	525
J. Richardson P. Eng., District Superintendent for 3 days field supervision, Sept. 21-23 and 2 days supervision during Map Interpretation and report preparations at \$110.00 per day	550

CONSULTANT FEES (1)

H. Carswell for preparation and interpretation of 17 thin sections	\$ 196
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TRANSPORTATION (2)

<u>North Coast Air Service Ltd.</u> Fairchild Husky (16.8 hrs. @ \$90/hr.)	\$ 1,513
<u>Coast Range Airways Ltd.</u> Beaver (6 hrs. @ \$80/hr.)	480
<u>Klondike Helicopters Ltd.</u> Hiller 12-E (38.7 hrs. @ \$88/hr.)	3,396
<u>Riverboat and Motor Rental</u> 28' riverboat (15 days @ \$20/day)	300
2 only 40 hp outboard motors 15 days @ \$16/day	240
Aviation Gasoline 18 drums @ \$45/drum	810

<u>TOPOGRAPHIC MAP</u> (cost prorated according to claim area)	500
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EQUIPMENT

Miscellaneous exploration, mountain climbing and safety equipment used up on project	260
TOTAL:	\$ 16,420

1) Owing to the extremely fine grained nature of the ore bearing rocks, the origin and proper identification could not be made by ordinary field methods.

2) Owing to the extremely rugged topography dense undergrowth occurring on these remote claims and rough water on the Iskut River the extensive use of helicopter, fixedwing aircraft and riverboat was absolutely essential.

Endorsed by: J. Richardson  
J. Richardson,  
Professional Engineer.



CANADA	)	STATUTORY DECLARATION RELATIVE TO
	)	EXPENDITURES ON A GEOLOGICAL SURVEY
PROVINCE OF BRITISH COLUMBIA	)	OF CERTAIN MINERAL CLAIMS THE PRO-
	)	PERTY OF COMINCO LTD. AND OF CERTAIN
TO WIT:	)	MINERAL CLAIMS THE PROPERTY OF THE
	)	COPPER SOO MINING COMPANY LIMITED
	)	AND TUKSI MINING AND DEVELOPMENT
	)	COMPANY LIMITED

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 a survey conducted by personnel of Cominco Ltd. on behalf of itself and The Copper Soo Mining Company and Tuxsi Mining and Development Company Limited on certain mineral claims situated in the Liard Mining Division.

2. THAT copies of said report are being filed with the Gold Commissioner in Victoria, B.C.

3. That attached hereto and marked with the letter "A", upon which I have signed my name is a statement of expenditures incurred by Cominco Ltd. on behalf of itself and The Copper Soo Mining Company Limited, and Tuxsi Mining and Development Company Limited in connection with the geological survey of the said claims, and showing in addition the dates during which those making the 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  
the Province of British  
Columbia, this 20 day of  
May, A.D. 1966.  
A Commissioner for taking Affidavits for British Columbia


*J. Richardson*

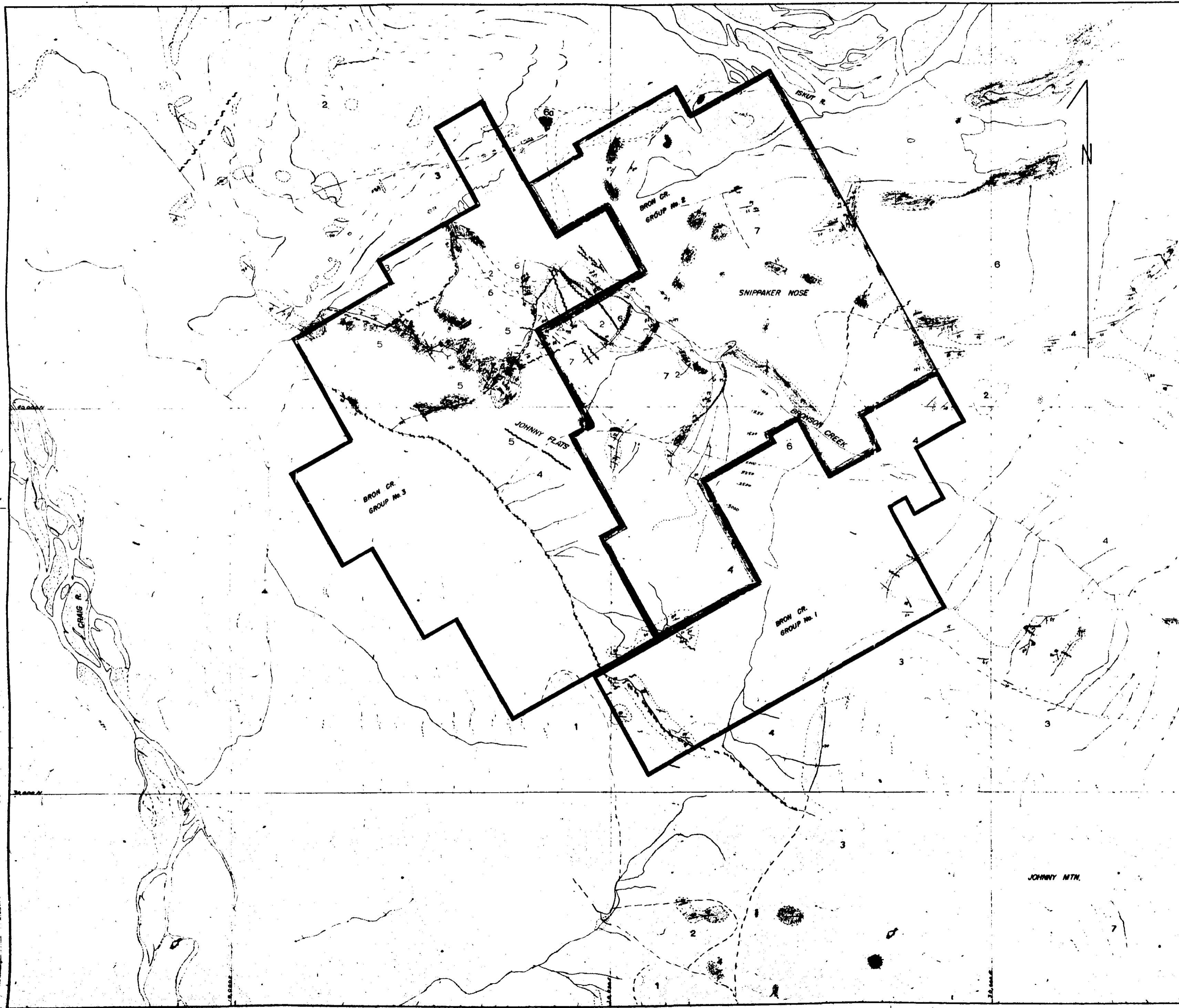
GEOLOGICAL REPORT ON THE  
BRONSON CREEK NOS. 1-3 CLAIM GROUPS  
LIARD N.D. 56°, 131° NE  
N.T.S. 104 E-11

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STATEMENT OF QUALIFICATIONS

G. Parsons was responsible for conducting the geological survey described herein. Parsons is a graduate Geologist of the University of Vermont and has been employed in geological field work since 1960. During this time he has worked as an Exploration Geologist on various field projects. I consider him a competent and experienced geologist.

  
F. Richardson,  
Professional Engineer



Department of  
Mines and Petroleum Resources  
ASSESSMENT REPORT  
NO. 769 MAP #1

- LEGEND
- 1 Felsite
  - 2 Orthoclase Porphyry and related rocks
  - 3 Andesite
  - 4 Greywacke, argill. grey and black
  - 5 Arg.ite, thin bedded, brown, Arkose, massive to bedded, locally calcareous
  - 6 Arg.ite, thin bedded, grey-green to greenish-black, locally calcareous, no limestone
  - 6a Quartz-Sandstone-Pyrite laterally, yellow to green, schistosity of varying degree
  - 8 Mineralization

- Au Gold
- asp Arsenopyrite
- cpy Chalcopyrite
- gn Galena
- mag Magnetite
- mal Malachite
- mlc Molybdenum
- py Pyrite
- prn Pyrrhotite
- sp Sphalerite

- Strike and dip of bedding vertical
- Strike and dip of joints vertical
- Fault located, inferred
- Geological contact located, inferred
- Synclastic
- Adit
- Diamond drill hole, vertical, holed
- N6 1 Group
- N6 2 Group
- N6 3 Group

CONTOUR INTERVAL 250 FEET

To accompany Geological report on Bronson Creek Nos. 1-3 Groups by G. Parsons.

769

The Consolidated Mining and Smelting Company of Canada Limited			
DRAWN BY: GP	TRACED BY: GP		
DESIGNED BY: DATE	REVISED BY: DATE		
BRONSON CREEK General Geology and Claim Boundaries		L. Ward, M.C.	
SCALE: 1" = 1000'	DATE: Dec. 1965	PLATE	