

# 2837

BRALORNE CAN-FER RESOURCES LIMITED

GEOLOGICAL SURVEY

of the

PJ GROUP OF MINERAL CLAIMS

LIARD M.D., BRITISH COLUMBIA

MAP SHEET 94K-3

(58° N. LAT.; 125° W. LONG. (S.E.))

<p>Department of Mines and Petroleum Resources ASSESSMENT REPORT NO. <u>2837</u> MAP .....</p>
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*R.K. GERMUNDSON*

R.K. GERMUNDSON, Ph.D.

SEPTEMBER 1970

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BRALORNE CAN-FER RESOURCES LIMITED  
GEOLOGICAL SURVEY OF THE PJ GROUP OF MINERAL CLAIMS  
LIARD MINING DIVISION, BRITISH COLUMBIA  
MAP SHEET 94K-3 (58° N. LAT., 125° W. LONG. S.E.)  
R.K. GERMUNDSON, Ph.D., SEPTEMBER 1970

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INTRODUCTION

The following report was prepared for Bralorne Can-Fer Resources Limited and is based on field material gathered between August 22nd and September 11th, 1970. The property had been thoroughly prospected previous to the writer's visit through a program conducted by Mr. Paul Weishaupt, Prospector.

LOCATION, ACCESS AND TOPOGRAPHY

The southeast corner of the claim group is intersected approximately by 58°8' N. latitude and 125°15' W. longitude. Many portions of the claims are inaccessible because of the rugged topography. The broad Gataga River Valley, which runs from east to west across the southern portion of the claims, is at about the 3,500 foot elevation. Certain of the peaks extend above 7,500 feet.

The base camp for the operation was on Chesterfield Lake some 35 miles south of the Gataga River. The secondary camp on the Gataga was serviced by helicopter. Chesterfield Lake was serviced from Prince George, 280 miles to the southeast.

The Churchill Copper road is about 16 air miles to the northwest from which the Alaska Highway is reached.

Timber line is at 4,700 feet and good timber is available on the flanks of the Gataga River Valley.

Glaciers extend down to 6,000 feet; water is abundant.

CLAIMS

The following 86 mineral claims comprise the PJ group. They have been properly staked with respect to the British Columbia Mineral Act.

The claims are recorded in the name of P.J. Weishaupt.

CLAIMS - Continued.

	<u>Claim Name</u>	<u>Record Number</u>	<u>Expiry Date</u>
PJ	1 - 26 inclusive	42043 - 42068	March 9, 1971
PJ	33 - 52 inclusive	42075 - 42094	March 9, 1971
PJ	54	42096	March 9, 1971
PJ	56	42098	March 9, 1971
PJ	58	42100	March 9, 1971
PJ	60	42102	March 9, 1971
PJ	77 - 110 inclusive	42119 - 42152	March 9, 1971
PJ	119 and 120	42161, 42162	March 9, 1971

HISTORY

No previous work has been done on the PJ claims. The Windermere property, immediately to the north and northwest, was staked for copper during 1969, however, some claims within the Windermere property had been held previously. Other activity immediately to the east has been undertaken during the 1970 field season (e.g., Beaumont and Fordson Channel).

The general geologic province extends from the Alaska Highway at Mile 436 for a distance of about 60 miles to the S.S.E. It is up to 40 miles wide.

Some of the showings in the area were known in the 1940's. M.M. Menzies provided descriptions of the deposits in 1951.

During 1958 - 1959 Magnum Copper undertook diamond drilling at the Churchill mine. Fort Reliance discovered scattered copper occurrences on the Toad River also by diamond drilling in 1958 - 1959. The Davis Keys discoveries were made in 1967 - 68. Churchill commenced production in 1970.

Windermere undertook a comprehensive silting program during 1969 and made several significant discoveries. By the summer of 1970 the increase of activity within the area was considerable.

REFERENCES

- M.Y. Williams - G.S.C. Prelim. Paper 44 - 28A.
- M.M. Menzies - Master's Thesis, U.B.C., 1951.
- G. Taylor - G.S.C. Map 28-1963 (94-K-10). G.S.C. Paper 68 - 15.
- P.H. Sevensma - Windermere Exploration Ltd. Project 1969.

## REGIONAL GEOLOGY

The entire geologic province comprises a thick sequence of late Proterozoic fine-grained clastics with minor limey beds. In the southwest portion of the area there are moderately metamorphosed slates and argillites, which may represent the Windermere formation. The remainder of the Proterozoic is lithologically similar to the Purcell of southern British Columbia.

Within the S.W. part of the area the Proterozoic is overlain by red conglomerates and sandstones up to 3,000 feet thick. These are overlain by grey carbonates up to 6,000 feet thick which may be pre-Silurian in age. In the N.E. part of the area some thrust slices bring the carbonates into contact with Devonian-Mississippian black shales.

The Proterozoic high has been interpreted as a N.N.W. trending anticlinorium with minor overturning. The attitudes of the clastics are variable with the occurrence of broad folding.

The metamorphic lineamentation trends consistently to the northwest with moderate to steep dips to the southwest.

Numerous N.W. to N.E. trending dioritic to gabbroic dykes, with steep dips and varying in thickness from 10 to several hundred feet, intrude the fine-grained Proterozoic clastics. In fact, all known copper occurrences and dykes are restricted to the Proterozoic.

Although primarily persistent along strike, bulges in the dykes do exist. These bulges sometimes restrict the copper mineralization. In places, the dykes become braided or change attitude; this may produce favorable loci for copper deposition.

Generally, no contact metamorphism is present.

Pre-dyke faults probably control dyke intrusion as well as placement of the mineralization. Although many of the veins are associated with dykes, some do occur separately.

## ECONOMIC GEOLOGY

Quartz, carbonate and copper mineralization may occur as fissure veins, vein and veinlet swarms, quartz stockworks or as lenses confined to dykes. Chalcopyrite is the principal copper mineral. Bornite, pyrite and chalcocite are less common. Specular hematite, and occasionally galena, may be associated with the veins.

ECONOMIC GEOLOGY - Continued.

A high content of epidote in the dykes often indicates a better grade of adjacent copper mineralization. Those veins with chocolate-brown weathering and more malachite staining are generally of economic grade (i.e., 3 to 6+%).

It is noted that the best and most persistent veins trend northeasterly (i.e., Churchill, Davis Keays, and the Bronson vein at Windermere).

The veins are persistent but typically pinch and swell. Those with a high quartz content stand out from differential weathering. Changes in the character of the wall rock show little effect on the veins.

CLAIM GEOLOGY

A. General Geology

The contact between the Proterozoic clastics, slates and argillites with younger sandstones and limestones trends slightly north of west through the southern portion of the RJ claims. It is unconformable in nature. Nine claims are underlain by the younger beds, and no dykes or veins were noted in the area.

The remainder of the claims are underlain by the Proterozoic, numerous dykes and mineralized quartz-carbonate veins. Slaty cleavage within the Proterozoic maintains a remarkably constant attitude (N. 40° to 55° W. with dips constantly between 45° and 70° to the S.W.). Even the most well bedded clastics show similarly trending, but more indistinct, cleavage or tight jointing.

Bedding within the Proterozoic varies considerably in attitude and indicates broad folding. The dips of the bedding are always at a shallower angle than are those of the cleavage. Only adjacent to veins and some dykes is there minor tight folding.

Most of the dykes trend between N. 0° W. and about N. 20° W.; all dips are steep and towards the west. A few trend N. 25° to 35° E. These may aid in projecting long trends associated with copper mineralization. Some bulging in the dykes may adversely affect the continuation of mineralization, and the

CLAIM GEOLOGY - Continued.

A. General Geology - Continued.

intersection of dykes may control the deposition of high grade pods of quartz and chalcopyrite. One dyke has a more westerly trend along a ridge.

B. Economic Geology

Four zones of copper mineralization were found by prospecting the PJ claims. In addition, the Book and Bronson veins of Windermere were visited. Silting and float material indicates the possibility of further mineralized zones under overburden:

1. The Northeast Zone

This zone is in PJ claim number 105. It trends N. 25° E. and has an exposed outcrop length of 200 feet. To the southwest it trends beneath a 300 foot ice patch followed by an extensive area of heavy talus. Float coming from under the ice shows that the vein may extend at least another 200+ feet to the southwest.

To the northeast it drops into heavy talus and is lost. Four hundred and fifty feet to the northeast is its projected intersection with a N. 45° W. trending dyke. Very close to the intersection the dyke bulges from 50 to 200 feet. If total projections hold true, the vein may extend for 850+ feet.

Visually this fissure vein is of the en echelon type with the quartz and massive chalcopyrite trending nearly north. It is up to 7 feet in width.

Five samples were chipped across the vein by Bralorne Can-Fer. The results follow:

<u>Sample</u>	<u>Width</u>	<u>% Cu</u>
1	5 feet	12.4
2	5 feet	5.0
3	4½ feet	12.4
4	7 feet	5.6
5	6 feet	8.0

CLAIM GEOLOGY - Continued.

2. Pelletier Zone

This zone has been traced from the ridge top in the southern end of the Book claims for a distance of 2,800 feet to the south where overburden and the tree line obscure it. It may continue at least another 900 feet S.S.E. where some copper and quartz mineralization are exposed downstream in the creek.

The northern 1,500 feet of the zone comprises a vein and veinlet swarm. Pinching and swelling are common. Rich pods and lenses of chalcopyrite, bornite and some galena occur.

This vein swarm is then displaced to the west for about 450 feet. Its continuation down slope is more related to quartz stockwork deposition. A true width of this part of the Pelletier zone is not known but it does reach 200+ feet. Within this part lenses, stringers and thin veins of quartz and chalcopyrite vary between 1 inch and 18 inches in thickness. The lenses and stringers vary between 6 inches and several feet apart. In claim 16 a band of chalcopyrite varying between 3 inches and 18 inches wide has so far been traced for over a hundred feet.

The projection of the Pelletier zone further south may intersect with a projected connection between the showings on PJ 12 and 14 and the number 2 zone.

Any of these projections are uncertain because of lack of exposures but evidence for them is given in the following.

3. Number 2 Zone

The number 2 zone is associated with quartz and chalcopyrite in or adjacent to a series of N.E. trending dykes. These extend from east of the PJ claims for a distance of 5,100 feet to the southwest where the main number 2 zone extends into overburden.

At the boundary of PJ claims 98 and 100 a northeasterly trending dyke intersects a northerly trending one. Chalcopyrite and quartz veins and lenses are controlled by northeasterly trending structures.



CLAIM GEOLOGY - Continued.

3. Number 2 Zone - Continued.

Samples taken by Bralorne Can-Fer assayed as follows:

<u>Trench</u>	<u>Width</u>	<u>% Cu</u>
1	2½ feet	13.0
2	3 feet	6.50
3	3 feet	7.10
4	2 feet	9.60
5	3 feet	1.45
6	1½ feet	8.30

These samples were taken from the exposed section north-east of the intersection of the dykes.

A zone of mineralization, indicated mainly by float but also by an occasional vein in place, extends to the southwest along a dyke for 1,000 feet and then is covered by overburden.

In claims 50 and 52, two northeasterly trending dykes line up with the general number 2 zone trend. These are at the head of a steep canyon which is 2,500 feet to the southwest of the end of the known number 2 zone. At the base of the canyon, near the dyke crossing the claim boundary between claims 50 and 93, a highly anomalous silt sample (292 ppm Cu) was obtained. Within the canyon, values are in the 40 ppm range, and these are probably anomalous; however, washing in the canyon would be great. Upstream, above the canyon, silt values (48 to 60 ppm) probably reflect the Book vein.

The 292 ppm value may represent an extension of the number 2 zone crossing the canyon. (The 292 ppm value is associated with other values which decrease from 156 to 64 ppm at the mouth of the creek in claim 87).

4. PJ 12 and 14 Showings

Prospecting adjacent to a northeasterly trending dyke uncovered quartz with chalcopyrite. Little else is known about the relationships here except that they are in line with the number 2 zone and not too far removed from a possible extension of the Pelletier zone.

Any of these projections are possible and can only be tested by geophysics and geochemistry. The area considered is large and either mainly talus- or forest-covered.

CLAIM GEOLOGY - Continued.

5. Float

Float may be coming from a buried vein somewhere on claim 54.

6. Book Vein (Windermere Exploration)

The vein is of the fissure type, is off set and branching in nature, and appears to end at a bulge in a dyke.

7. Bronson Vein (Windermere Exploration)

This rich vein is mainly inaccessible, and is one of Windermere's prime target areas. It occurs just to the N.W. of the map-area.

SUMMARY

The PJ group of 86 mineral claims was mapped by the writer between August 22nd and September 11, 1970.

No previous work has been done on the PJ claims. Mineral showings in the geologic province have been known since the 1940's. Presently, Churchill Copper is in production and Davis Keays is developing an ore deposit. Windermere Exploration as well as several other companies are active throughout the area.

The entire geologic province comprises a thick sequence of late Proterozoic fine-grained clastics and limy beds. Dioritic-gabbroic dykes and quartz-carbonate copper mineralization are restricted to the Proterozoic. The dykes are primarily persistent along strike and, as is the mineralization, are probably controlled by pre-dyke faulting. Although many of the veins are associated with dykes, some do occur separately.

Quartz, carbonate and copper mineralization may occur as fissure veins, vein and veinlet swarms, quartz stockworks or as lenses confined to the dykes. The best and most persistent veins trend northeasterly.

Proterozoic clastics, slates and argillites underlie most of the PJ claims. Numerous dykes, some associated with mineralized veins, intrude the Proterozoics.

SUMMARY - Continued.

Slaty cleavage generally trends northwesterly. Bedding plains have variable attitudes.

Four zones of copper mineralization were found by prospecting.

The Northeast Zone trends N. 25° E., outcrops for 200 feet, with possible extensions of up to 850+ feet.

The Pelletier zone has been traced for 2,800 feet. It is in part a vein swarm and in part a quartz stockwork. It may intersect the projected connection between the RJ 12 and 14 showings and the number 2 zone.

The number 2 zone is associated with a northeasterly trending dyke system. It starts east of the claims and trends southwesterly for at least 5,100 feet and possibly all the way to the RJ 12 and 14 showings.

The RJ 12 and 14 showings have been little explored but are associated with a northeasterly trending dyke, in line with the number 2 zone.

CONCLUSIONS AND RECOMMENDATIONS

The RJ group of mineral claims have significant mineralized zones within their boundaries. Much of the key area is timber- or talus-covered. An extensive exploration program involving geophysics, geochemistry, rock trenching and diamond drilling should be undertaken during the 1971 field season. As this would be a float plane and helicopter operation and the field season is short, the logistics should be planned to involve winter transportation of basic materials to the claims area. One hundred thousand dollars should be allotted for the project which would include a continuation of general exploration of the geologic province.

R. H. Hermandson

September 22, 1970.

CERTIFICATE

I, ROBERT KENNETH GERMUNDSON, DO HEREBY DECLARE:

That I am a geologist with B.Sc. (1958) and M.Sc. (1960) from the University of Alberta, and a Ph.D. from the University of Missouri (1965).

That I have practised my Profession continuously since March of 1965.

That I reside at 201 - 1025 Wolfe Avenue, Vancouver 9, British Columbia.

That the included report is based on field work undertaken by myself between August 22nd and September 11th, 1970.

*R. K. Germundson*

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R.K. Germundson, Ph.D.

September 22, 1970

CERTIFICATE

I, JAMES SCHOLLES THOMSON, of Delta, British Columbia,  
DO HEREBY CERTIFY:

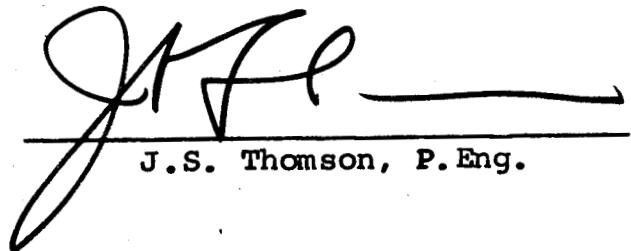
That I am a registered Professional Engineer in the  
Province of British Columbia.

That I hold the degree of B.A.Sc. in Mining Engineering  
(University of British Columbia 1950) and that I have been  
employed in this field since graduation.

That I am Vice President of Bralorne Can-Fer Resources  
Limited, in charge of mining operations.

That I am familiar with the work done on this project  
by Dr. R.K. Germundson and supervised the progress thereof.

That Dr. Germundson graduated in geology with degrees  
of B.Sc. (1958) and M.Sc. (1960) from the University of  
Alberta, and Ph.D. (1965) from the University of Missouri,  
and that I consider him fully competent to do the work.

  
J.S. Thomson, P.Eng.

February 1, 1971

ASSESSMENT WORK

Mapping was done by R.K. Germundson, Ph.D., assisted by P.J. Weishaupt, Project Manager, and D. Proudfoot, Junior Geologist, both employed by Bralorne Can-Fer Resources Limited.

Persons employed on the work were:

P.J. Weishaupt	Project Manager	August 27 to September 11, 1970
D. Proudfoot	Junior Geologist	" " " " "
W. Wiseman	Lab. Technician	" " " " "
J. Szakas	Prospector	" " " " "
T. Rendell	Prospector	" " " " "
W. Sliedrecht	Helper	" " " " "
D. Baker	Helper	" " " " "
W. Green	Cook	" " " " "
A. Pelletier	Helicopter pilot	" " " " "
R.K. Germundson, Ph.D.	Consulting Geologist	August 22 to September 11, 1970
J.S. Thomson	P. Eng., Supervision.	

Cost of Work (3 geological)

Salaries - 15 working days

P.J. Weishaupt	Monthly rate	\$840	
D. Proudfoot		600	
W. Wiseman		450	
J. Szakas		600	
T. Rendell		600	
W. Sliedrecht		600	
D. Baker		550	
W. Green		600	
		<u>4,840</u>	÷
			\$2,420

Field Maintenance - 240 man days @ \$7 1,680

Consulting fee for R.K. Germundson -  
\$60 per day = 21 x 60 1,260

Helicopter support 22½ hours @ \$130 2,925

Supervision by J.S. Thomson, P. Eng. 400

Total work to be credited \$8,685

Work is to be applied to the following three groups:-

GROUP #1 - 30 Claims

Claims PJ 16, 18, 20, 47, 49 to 52 inclusive.

Claims PJ 54, 56, 58, 60.

Claims PJ 93 to 110 inclusive.

GROUP #2 - 40 Claims

Claims PJ 5 to 15 inclusive.

Claims PJ 17, 19.

Claims PJ 21 to 26 inclusive.

Claims PJ 37 to 46 inclusive.

Claim PJ 48.

Claims PJ 83 to 92 inclusive.

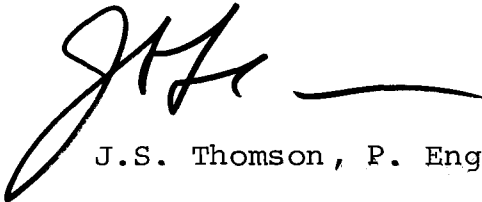
GROUP #3 - 16 Claims

Claims PJ 1 to 4 inclusive.

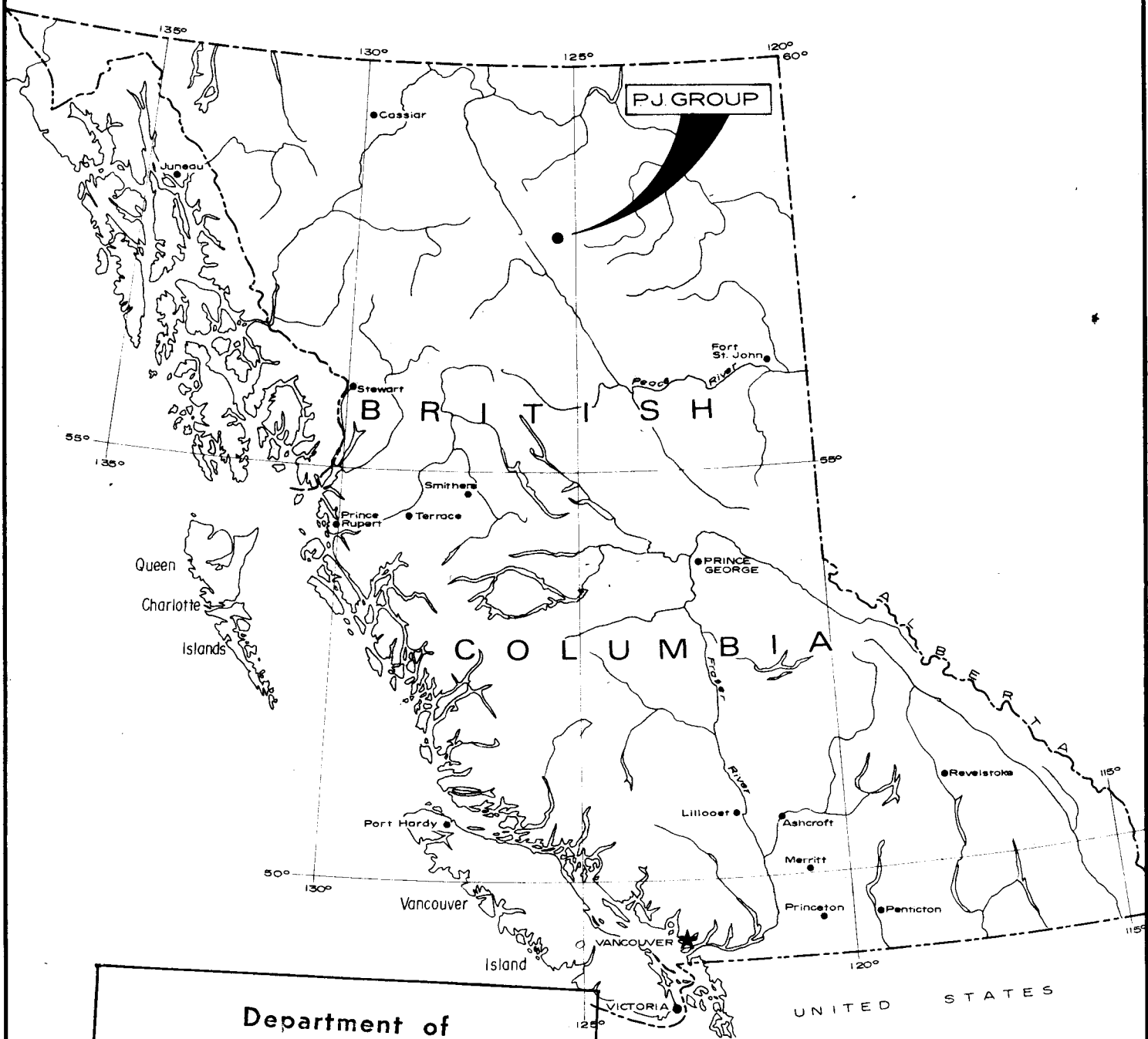
Claims PJ 33 to 36 inclusive.

Claims PJ 77 to 82 inclusive.

Claims PJ 119, 120.



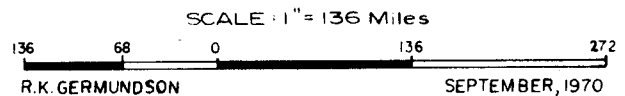
J.S. Thomson, P. Eng.



Department of  
 Mines and Petroleum Resources  
 ASSESSMENT REPORT  
 NO. 2837 MAP #1

*R.K. Germundson*  
 BRALORNE CAN-FER RESOURCES LTD.  
 LOCATION MAP  
 P. J. GROUP OF MINERAL CLAIMS

TO ACCOMPANY A REPORT BY R.K. GERMUNDSON, Ph.D.  
 SEPTEMBER, 1970





WINDERMERE

BOOK CLAIMS  
(WINDERMERE)

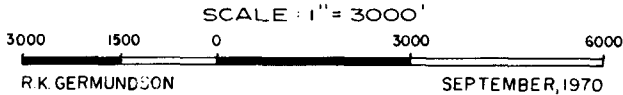
42068 25 42067	26			109 42151	110 42152
42066 23 42065	24			107 42149	108 42150
42064 21 42063	22			105 42147	106 42148
19 42061	20			42102 103 42145	104 42146
	42062	51	42093	42100 101 42143	102 42144
17 42059	18 42060	49 42091	50 42092	56 42098	99 42141
15 42057	16 42058	47 42089	48 42090	54 42096	97 42139
13 42055	14 42056	45 42087	46 42088	52 42094	95 42137
11 42053	12 42054	43 42085	44 42086	93 42135	94 42136
9 42051	10 42052	41 42083	42 42084	91 42133	92 42134
7 42049	8 42050	39 42081	40 42082	89 42131	90 42132
5 42047	6 42048	37 42079	38 42080	87 42129	88 42130
3 42045	4 42046	35 42077	36 42078	85 42127	86 42128
1 42043	2 42044	33 42075	34 42076	83 42125	84 42126
				81 42123	82 42124
				79 42121	80 42122
				77 42119	78 42120
				119 42161	120 42162

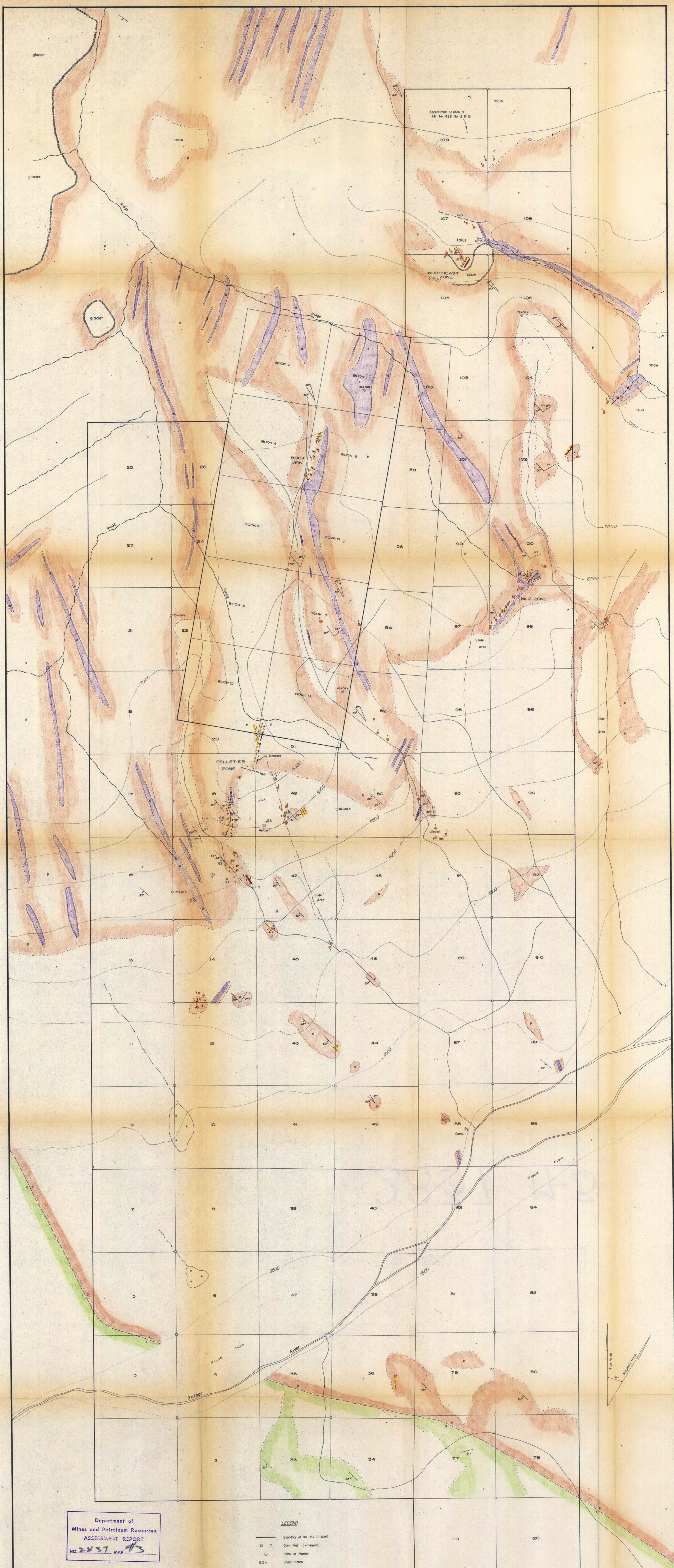
Department of  
Mines and Petroleum Resources  
**ASSESSMENT REPORT**  
NO. 2837 MAP #2



*R. K. GERMUNDSON*

BRALORNE CAN-FER RESOURCES LTD.  
**CLAIM MAP**  
P.J. GROUP OF MINERAL CLAIMS  
LIARD M.D., BC  
Map 94K-3-W





Department of  
Mines and Petroleum Resources  
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BRALORNE CAN-FER RESOURCES LTD.  
GEOLOGICAL SURVEY  
of the  
PJ GROUP OF MINERAL CLAIMS  
LIARD MINING DIVISION  
BRITISH COLUMBIA  
Map Sheet 94 K-3-W  
58°00' N. Latitude ; 125° 15' Longitude (S.E.)

SCALE 1" = 500'  
500 250 0 250 500 1000 1500  
R.K. GERMUNDSON SEPTEMBER, 1970

- LEGEND**
- Boundary of the PJ CLAIMS
  - □ □ □ Claim Plot (with/without)
  - ○ ○ ○ Cairn or Marker
  - ○ ○ ○ 0.5 m Chain Station
  - Ridge
  - x Pts.
  - Altitude (cleavage, bedding)
  - Quartz Vein or Stringer
  - Copper Mineralization
  - Copper Mineralized Plot
  - Diatitic - Gabbroic Dykes
  - Northern Limit of Quartzites and Limestone
  - Proterozoic Clastics (includes ridges)

2837 M-3

Contour interval 500 feet. Traced from blow-up of 1:250,000 scale and lines are only approximately positioned.  
TO ACCOMPANY A REPORT BY R.K. GERMUNDSON, Ph.D.