

6364

CANADIAN SUPERIOR EXPLORATION LIMITED
GEOLOGICAL AND ROCK GEOCHEMICAL REPORT
ON THE
BIG ONION AREA CLAIMS

August 5, 1977

MINERAL RESOURCES BRANCH
ASSESSMENT REPORT
NO. _____

CANADIAN SUPERIOR EXPLORATION LIMITED

GEOLOGICAL AND ROCK GEOCHEMICAL REPORT

ON THE

BIG ONION AREA CLAIMS

LOCATION: Northeast, East, and South of Astlais
Mountain Nts. 93 L/15 W

Lat: 54°49' Long: 126°53'

CLAIM NAMES: Red 1, Red 2, GA, GB, GC, GD, GE,
GF, GG, GH, GI, GJ, GK, GL, and
GM (totaling 229 units)

WORK PERIOD: October 12, 1976 to July 30, 1977

G.C. Stock, P.Eng.
Smithers, British Columbia
August 5, 1977

TABLE OF CONTENTS

	Page
INTRODUCTION	1
SUMMARY	1
RECOMMENDATION AND CONCLUSIONS	1,3
PHYSIOGRAPHY AND ACCESS	3
HISTORY	3
REGIONAL GEOLOGY	4
PROPERTY GEOLOGY	5
1. Lithology	5,6
2. Structure	7
3. Alteration	7
4. Mineralization	8
ROCK GEOCHEMISTRY	9,10
BIBLIOGRAPHY	11
COST STATEMENT	12
CERTIFICATE	13
ILLUSTRATIONS:	
Figure 1 Location Map (1:50,000)	2
Figure 2 Claim Map (1"=½ Mi.) in pocket	
Figure 3 Geology Map (1"=¼ mi.) in pocket	
Figure 4 Alteration Map (1"=¼ mi.) in pocket	
Figure 5 Rock Geochemistry (Copper in PPM (1"=¼ mi.) in pocket)	
Figure 6 Rock Geochemistry (Molybdenum in PPM (1"=¼ mi.) in pocket)	

INTRODUCTION

The "G" and "Red" Group mineral claims are located in north central British Columbia approximately 12 miles east of the town of Smithers, B.C. (Fig. 1). The subject claims are comprised of 13 "G" Group mineral claims (totaling 213 units) owned outright by Canadian Superior Exploration Limited and 2 Red Group claims (a further 16 units) held under option from Len Cote of Smithers. (Fig. 2, in pocket)

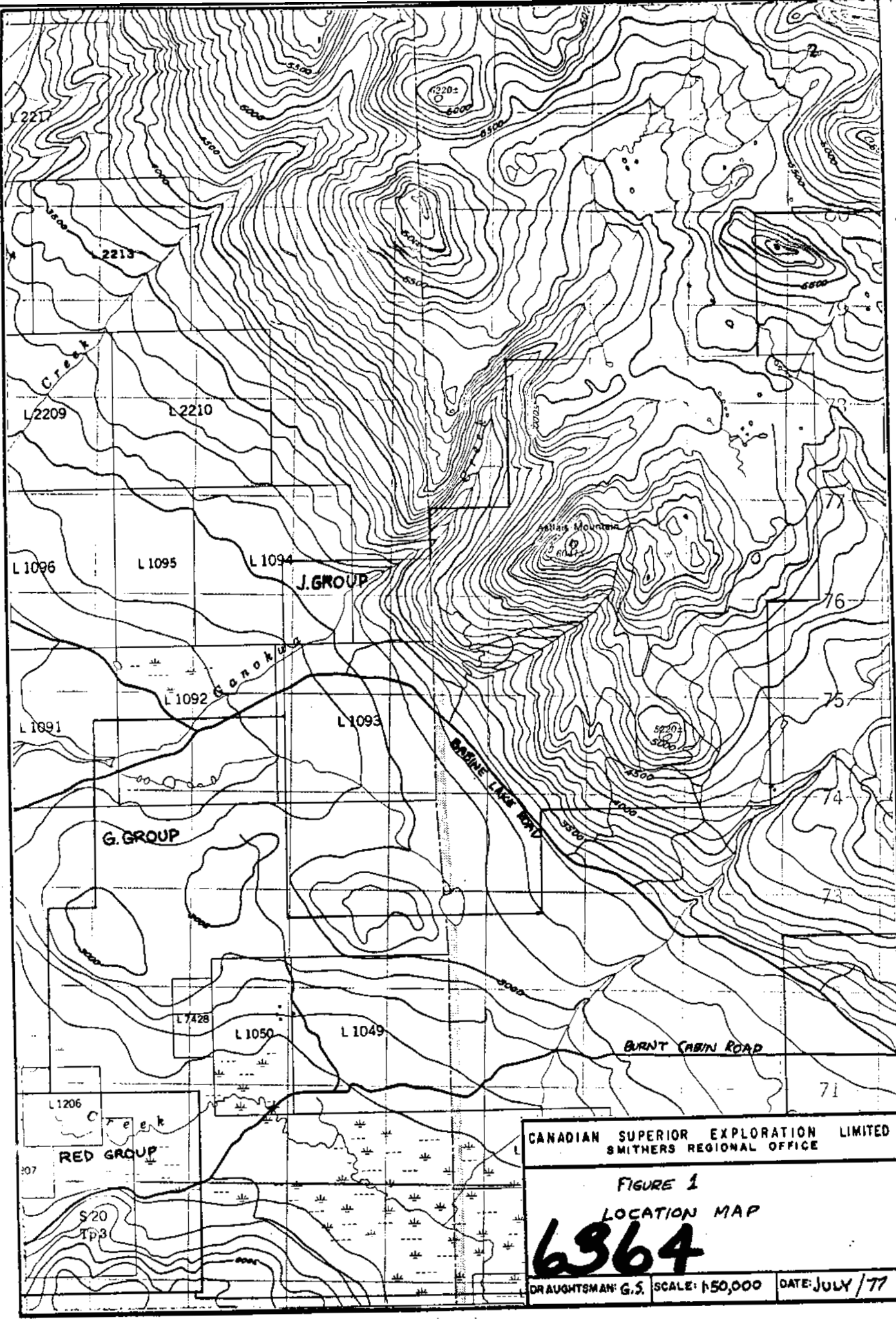
SUMMARY

During the past year the "G" and "Red" Groups of claims were explored in considerable detail using geologic mapping and rock geochemical techniques as well as I.P. surveys in areas of limited or no outcrop exposure (see assessment report by G. Depaoli). This report covers the geological aspects of the exploration activity.

The subject area is largely overlain by Jurassic volcanics and sediments of the Hazelton Group which have undergone variable metamorphism in response to regional deformation and local intrusive centres. These intrusive centres are believed to be Cretaceous in age and due to their environmental similarities to known copper/molybdenum mineralization on Astlais Creek provided a general focus for mineral exploration.

RECOMMENDATIONS AND CONCLUSIONS

Geological mapping, an alteration study and a rock geochemical program have defined two exploration targets within the area of study. Both of these are old prospects which were worked by other mining companies in years past. The direction of further exploration on these targets will be dependent upon final results of the rock geochemical



CANADIAN SUPERIOR EXPLORATION LIMITED
SMITHERS REGIONAL OFFICE

FIGURE 1
LOCATION MAP
6364
DRAUGHTSMAN: G.S. SCALE: 1:50,000 DATE: JULY / 77

program, results of the I.P. surveys planned later this month and further research into old assessment reports.

PHYSIOGRAPHY AND ACCESS

Access to the property is provided by 2 good, all weather, secondary roads, Babine Lake Road and Burnt Cabin Road, which depart east from Highway 16 south of Smithers. Networks of old logging roads, at the south end of the property, and old exploration roads, at the north end of the property, provide 4X4 access to nearly all parts of the property.

Vegetation in the area ranges from spruce, hemlock and poplar in the swampy southern section through pine and balsam on the mountain slopes and thence into alpine meadows and rugged rock faces above the 4800 foot level. The swampy southern areas are characteristically underlain by a large thickness of glaciofluvial overburden which locally is in excess of 350 feet.

HISTORY

The area has received some attention in the past with Tro Buttle working the alpine meadows and mountain slopes to the northeast and east of the Big Onion and Bethlehem drilling seven percussion holes in the swampy southern section of the property. McIntyre Porcupine held claims to the east of the Big Onion at one time but nothing is known about the extent of their exploration activity.

REGIONAL GEOLOGY

The "Red" and "G" Group claims are largely underlain by volcanic and sedimentary rocks of the Hazelton and Bowser Groups. These rocks were deposited throughout Jurassic Time in eugeosynclinal island arc environments as well as marine and non marine successor basin environments, respectively (Tipper and Richards 1976). Subsequent faulting, dominantly NE oriented, provided the plumbing systems along which a wide compositional range of intrusive plutons were emplaced in Cretaceous Time. Known copper/molybdenum mineralization associated with one of these plutons on Astlais Mountain provided the initial impetus to mount an exploration program to evaluate the mineral potential of these other plutons.

PROPERTY GEOLOGY

Outcrop exposures are variably distributed throughout the property with 90% outcrop exposure at the north end of the property grading southward to from 1-5 % in the lower swampy areas. Mapping and rock geochemical sampling was undertaken at a scale of 1" = ½ mile with the aid of airphotos and altimeters to facilitate the accurate location of sample sites. Mapping emphasis was placed on sulphide distribution alteration zoning and the more significant structural features.

1. Lithology

The oldest rocks observed on the property are green to maroon flows and tuffs of the Early Jurassic Telkwa Formation, the oldest member of the Hazelton Group. As seen on the property these rocks commonly contain porphyritic hornblende and plagioclase phenocrysts and are apparently dominantly flows (Fig. 3 in pocket). Locally within this unit, specifically on Astlais Creek, are several limey beds which combined with the interfingered green and maroon volcanics observed on the ridge east of Astlais Mountain and the minor red to maroon silt and sandstone sequences further east, indicate that this unit is part of the Babine Shelf Facies. (Tipper and Richards 1976)

The sedimentary units which dominate the property consist largely of very weakly metamorphosed dark grey to black shaley Mudstone with intercalated greywackes, feldspathic to quartzose sandstones and a very little chert pebble conglomerate. Locally within this unit there are layers or beds that contain significant amounts of euhedral pyrite and have been termed pyrite-bearing. Although many fossil localities were observed throughout the unit no detailed fossil study was undertaken in order to further divide the unit into the Smithers Formation

(Hazelton Group) and the Ashman Formation (Bowser Group). This unit spans the middle to late Jurassic Epochs.

Across the northernmost creek on the property, the rocks demonstrate a significant increase in metamorphism accompanied by a high degree of folding. Here rocks become low grade schists with biotite and very much lesser muscovite being dominant. Whether or not these rocks are part of the Red Rose Formation (Skeena Group of the Early Cretaceous Epoch) or are simply metamorphosed equivalents of the Ashman and Smithers Formations observed southward is beyond the scope of this report and will not be discussed further.

A Quartz Feldspar Porphyry intrusive localized along the strong shear zone paralleling Astlais Creek appears to be at a subvolcanic level and was the probable source of the welded ash flow units at the south end of the property. This intrusive which is believed to be of the Cretaceous Period is widespread on Astlais Mountain as dykes that cross cut both the volcanic and sedimentary sequences. The rhyolitic flow rocks at the extreme southend of the property may also have been derived from this source.

Subsequent undivided intrusions of largely plagioclase porphyry, diorite to quartz monzonite composition were emplaced as small plutons along structural weaknesses in the overlying rocks. Geologic mapping has outlined significantly more intrusive rock than was originally thought to be present in the map area. These rocks may be the result of discrete intrusions, but may quite possibly be bits and pieces of a larger deep seated intrusive mass of stock to batholithic dimensions.

2. Structure

The entire map area has undergone a large amount of fault deformation. Tipper and Richards in their 1976 map of the Smithers area have postulated a large number of thrust faults in the area. The one thrust fault plotted on the west side of Ganokwa Creek is clearly visible from Astlais Mountain, the remainder are not clearly visible and depend upon fossil evidence, therefore they have not been plotted on Fig. 3 (in pocket).

The area is dominated by NE trending structures with weaker NNW trending structures intersecting these. In general terms these structures tend to be reflected in the slaty cleavage and schistosity developed in the volcanics and sediments. Nowhere on the property does the fracturing compare in intensity with that observed along Astlais Creek.

3. Alteration

During the course of geologic mapping special emphasis was placed on the location and definition of hydrothermally altered areas as well as the sulphide distribution within them. The results of this study are shown in Fig. 4 (in pocket). Although several systems have been isolated there does not appear to be a significant increase in sulphides associated with the altered areas and to date very little copper mineralization has been noted. It appears then, that although some hydrothermal systems were active in the area they were for the most part relatively sulphide deficient.

4. Mineralization

Sulphide minerals found in the area include very minor fracture controlled galena, sphalerite, chalcopyrite and associated pyrite as well as minor amounts of fracture controlled and/or disseminated pyrite. The most widespread and significant zone of mineralization away from the Onion itself is along the west side of the GL claim, but here too, only rare copper mineralization was observed.

ROCK GEOCHEMISTRY

Large handspecimens were collected from each outcrop in the claim group area. The handspecimens were slabbed on a diamond saw with one half retained and the other half sent to Bondar Clegg and Company Ltd. for rock geochemical analyses.

All samples were analyzed for total copper and molybdenum by use of the following procedures. The analytical procedure for copper content involved crushing to minus 80 mesh, taking a representative sample, digesting with fuming perchloric acid followed by atomic absorption spectrophotometer analysis.

Analysis for molybdenum required 0.5 grams of sample crushed to minus 80 mesh which was digested in 1.5 ml of HNO_3 for a period of 35 to 45 minutes at the controlled temperature of 95°C . Digestion was completed with the addition of 0.5 ml of HCl which was then allowed to stand for 2 hours. The solution was then raised to a 20% acid concentration by the addition of aluminum chloride before analysis on the atomic absorption spectrophotometer.

The retained slabs were subsequently etched with Hydrofluoric Acid, then stained with Sodium Cobaltinitrate and further examined under a binocular microscope.

The results of the rock geochemical program are plotted in Fig. 5 (Copper in ppm) and Fig. 6 (Molybdenum in ppm) in the pockets at the end of the report.

In general terms rock geochemical response for copper/molybdenum conforms to the hydrothermally altered zones shown in Fig. 4 (in pocket) Although a statistical analysis has not been performed as yet, comparison with the known mineralized zone along Astlais Creek suggests that

values under 100 ppm and 10 ppm for copper and molybdenum respectively are unlikely to indicate the presence of significant mineralization. Indeed the rock geochemical program has only verified the exploration targets developed in the field.

As this is an ongoing project it should be noted that sample sites with no values indicate samples for which no geochemical data has yet been received. The alteration study which is complete would seem to indicate that all anomalies are essentially cut off.

The two targets developed by rock geochemistry are the strike extension of Astlals Creek and a potentially larger zone directly south over what was likely the O'Keefe Prospect. Both of these targets warrant further work but what that should be will depend on final results as well as the results of the I.P. survey planned to the north of the O'Keefe Prospect.

BIBLIOGRAPHY

H.W. Tipper and T.A. Richards, Jurassic Stratigraphy and History of North-Central British Columbia, Geological Survey Bulletin 270, 1976

COST STATEMENT as July 22, 1977

<u>CLAIM NAME</u>	<u>CLAIM GROUP</u>	<u># of UNITS</u>	<u>LINECUTTING COSTS</u>	<u>I. P. COSTS</u>	<u>CREW WAGES</u>	<u>GEOCHEMICAL COSTS</u>	<u>CASH IN LIEU</u>	<u>TOTALS</u>
RED 1 RED 2 GB	D	24	655.50	3525.64	100.00	34.43	--	4315.57
GA GE	E	36	1765.50	4074.44	200.00	56.34	--	6096.28
GD	-	20	1182.00	2261.73	300.00	--	--	3743.73
GC GG	F	40	1789.50	3941.41	300.00	18.78	--	6049.69
GF GH	G	30	711.00	1114.24	460.00	37.56	700.00	3022.80
GK	-	20	1483.50	--	260.00	--	300.00	2043.50
GI*								
GJ*								
GL*	H	39	303.75	--	900.00	281.70	100.00	1485.45
GM*	-	20	--	--	--	--	--	--

* as of July 30, 1977

Based on: Linecutting @ \$150.00/line mile
 IP @ \$415.76/line mile
 Crew Wages @ Geologist \$60.00/day
 Geological Assistant \$40.00/day
 Geochemical Costs @ \$3.13/Sample

CERTIFICATE

I, **GEOFF C. STOCK**, of the town of Smithers, province of British Columbia, do hereby certify that:

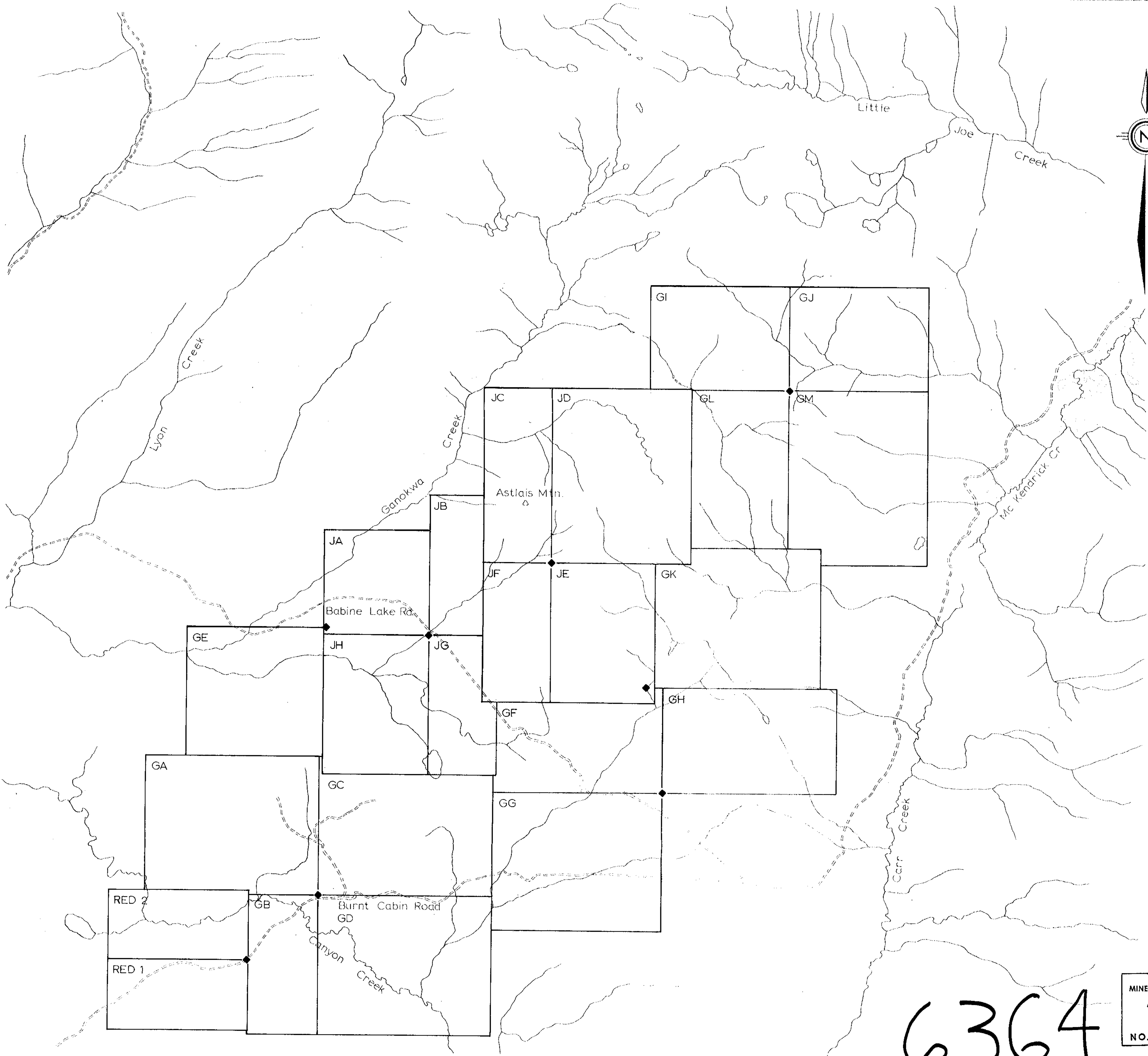
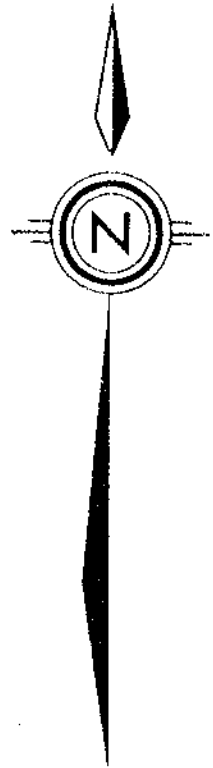
1. I am a Geological Engineer currently residing at 4083 North 3rd Avenue Smithers, British Columbia.
2. I am a graduate of the University of British Columbia with a B.App.Sc. in Geological Engineering. (1974)
3. I have been practicing my profession for 3 years.
4. I am enrolled as a Registered Member with the B.C. Association of Professional Engineers.

Dated at Smithers, B.C.

This 1st day of August 1977.



GEOFF STOCK



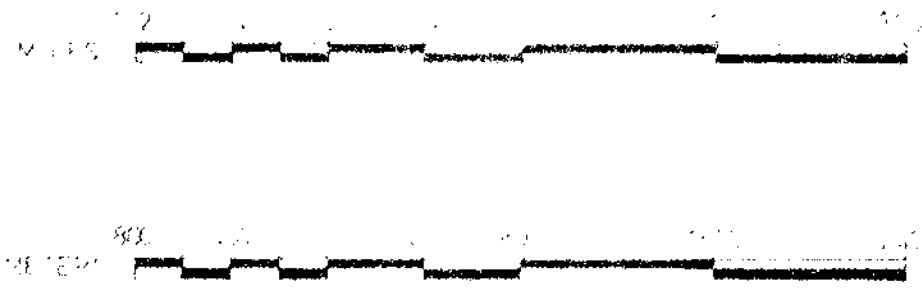
6364

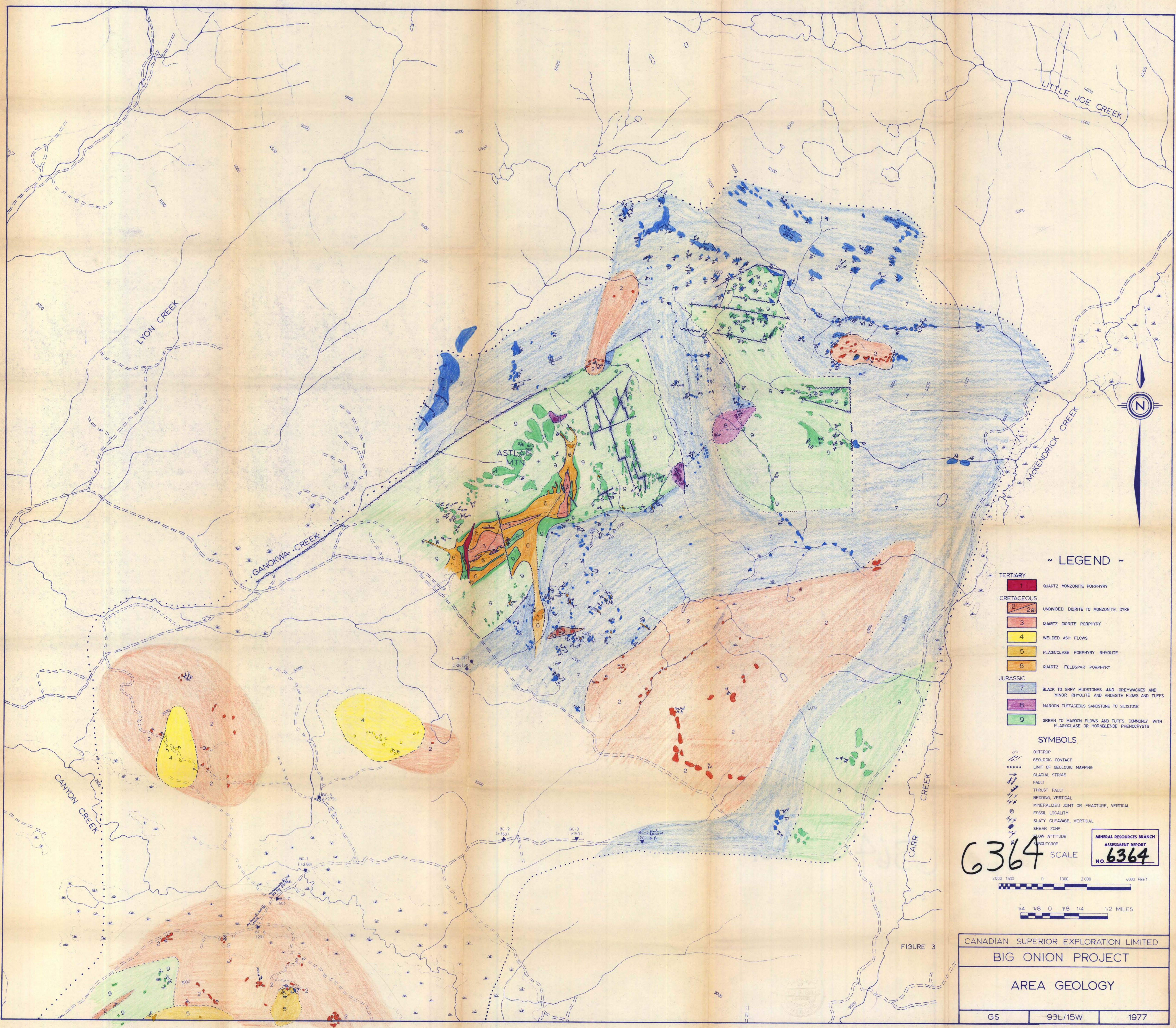
MINERAL RESOURCES BRANCH
ASSESSMENT REPORT
NO. 6364

FIGURE 2

CANADIAN SUPERIOR EXPLORATION LTD.
SMITHERS REGIONAL OFFICE

CLAIM MAP
BIG ONION AREA





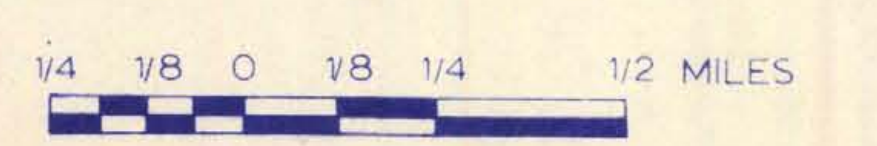
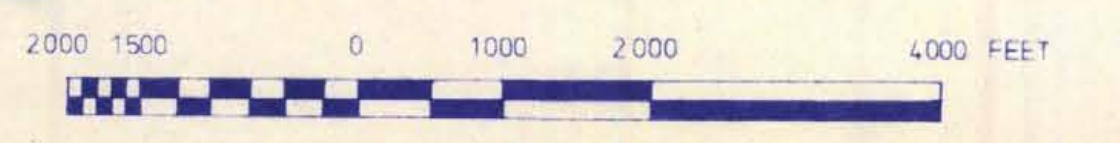
~ LEGEND ~

- TERTIARY**
- 1 QUARTZ MONZONITE PORPHYRY
- CRETACEOUS**
- 2 UNDIVIDED DIORITE TO MONZONITE, DYKE
 - 2a
 - 3 QUARTZ DIORITE PORPHYRY
 - 4 WELDED ASH FLOWS
 - 5 PLAGIOCLASE PORPHYRY RHYOLITE
 - 6 QUARTZ FELDSPAR PORPHYRY
- JURASSIC**
- 7 BLACK TO GREY MUDSTONES AND GREYWACKES AND MINOR RHYOLITE AND ANDESITE FLOWS AND TUFFS
 - 8 MAROON TUFFACEOUS SANDSTONE TO SILTSTONE
 - 9 GREEN TO MAROON FLOWS AND TUFFS COMMONLY WITH PLAGIOCLASE OR HORNBLЕНDE PHENOCRYSTS

SYMBOLS

- OUTCROP
- GEOLOGIC CONTACT
- LIMIT OF GEOLOGIC MAPPING
- GLACIAL STRIAE
- FAULT
- THRUST FAULT
- BEDDING, VERTICAL
- MINERALIZED JOINT OR FRACTURE, VERTICAL
- FOSSIL LOCALITY
- SLATY CLEAVAGE, VERTICAL
- SHEAR ZONE
- LOW ATTITUDE
- OUTCROP

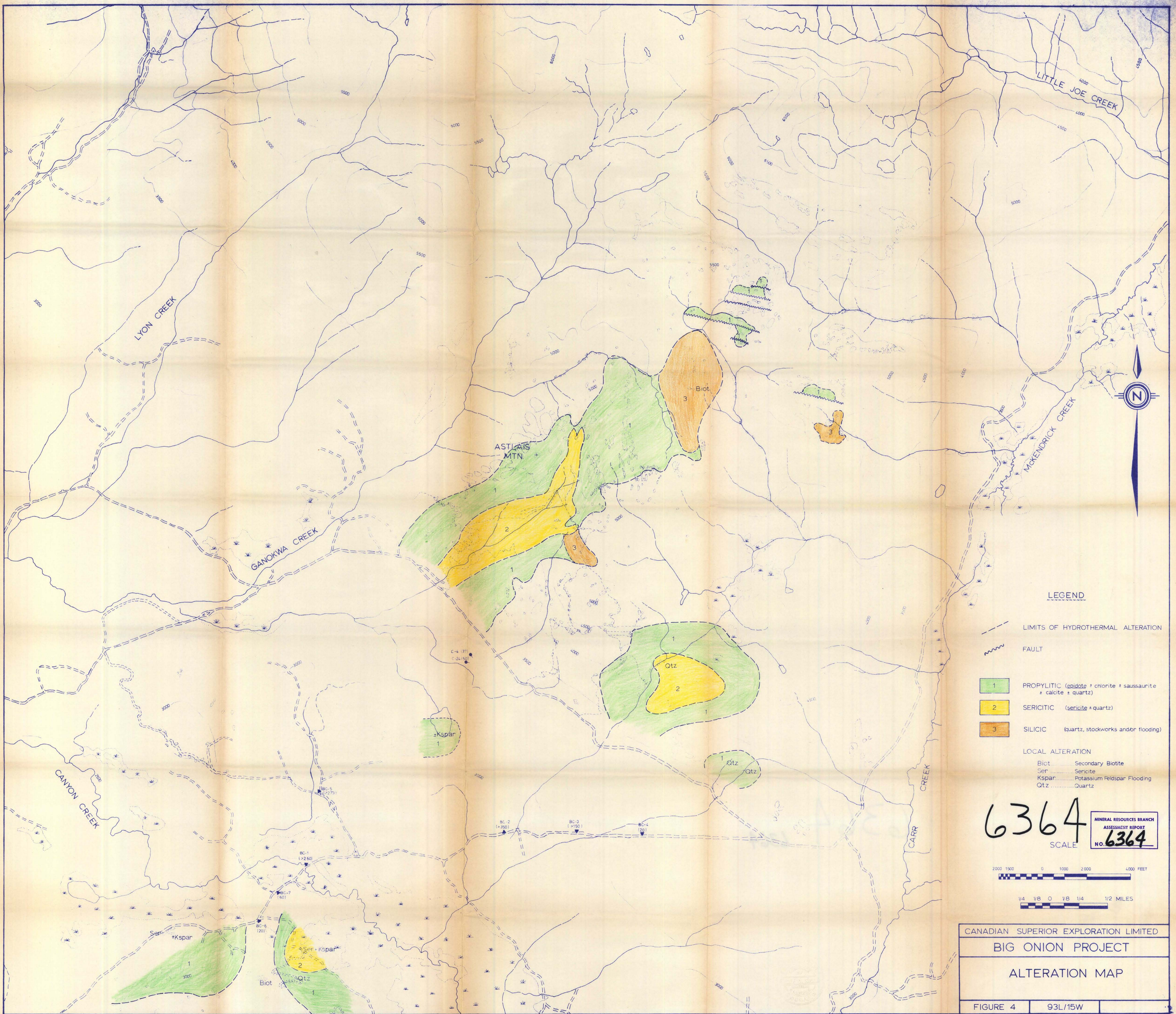
6364 SCALE



MINERAL RESOURCES BRANCH
ASSESSMENT REPORT
NO. 6364

FIGURE 3

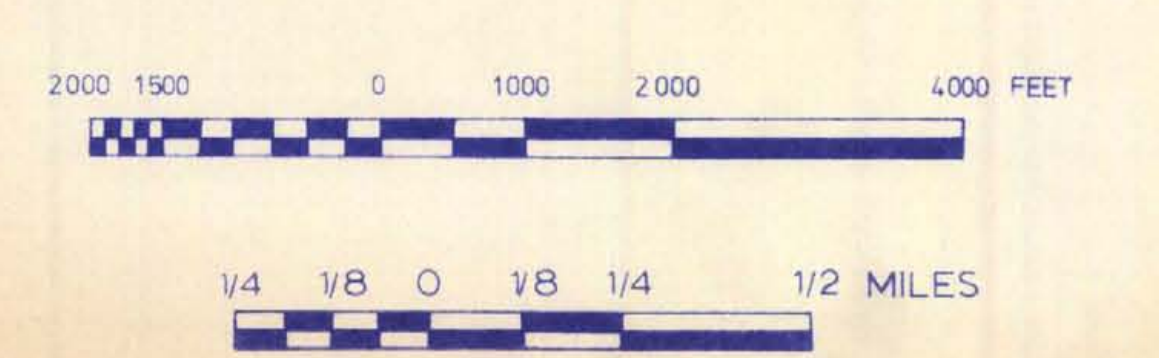
CANADIAN SUPERIOR EXPLORATION LIMITED		
BIG ONION PROJECT		
AREA GEOLOGY		
GS	93L/15W	1977



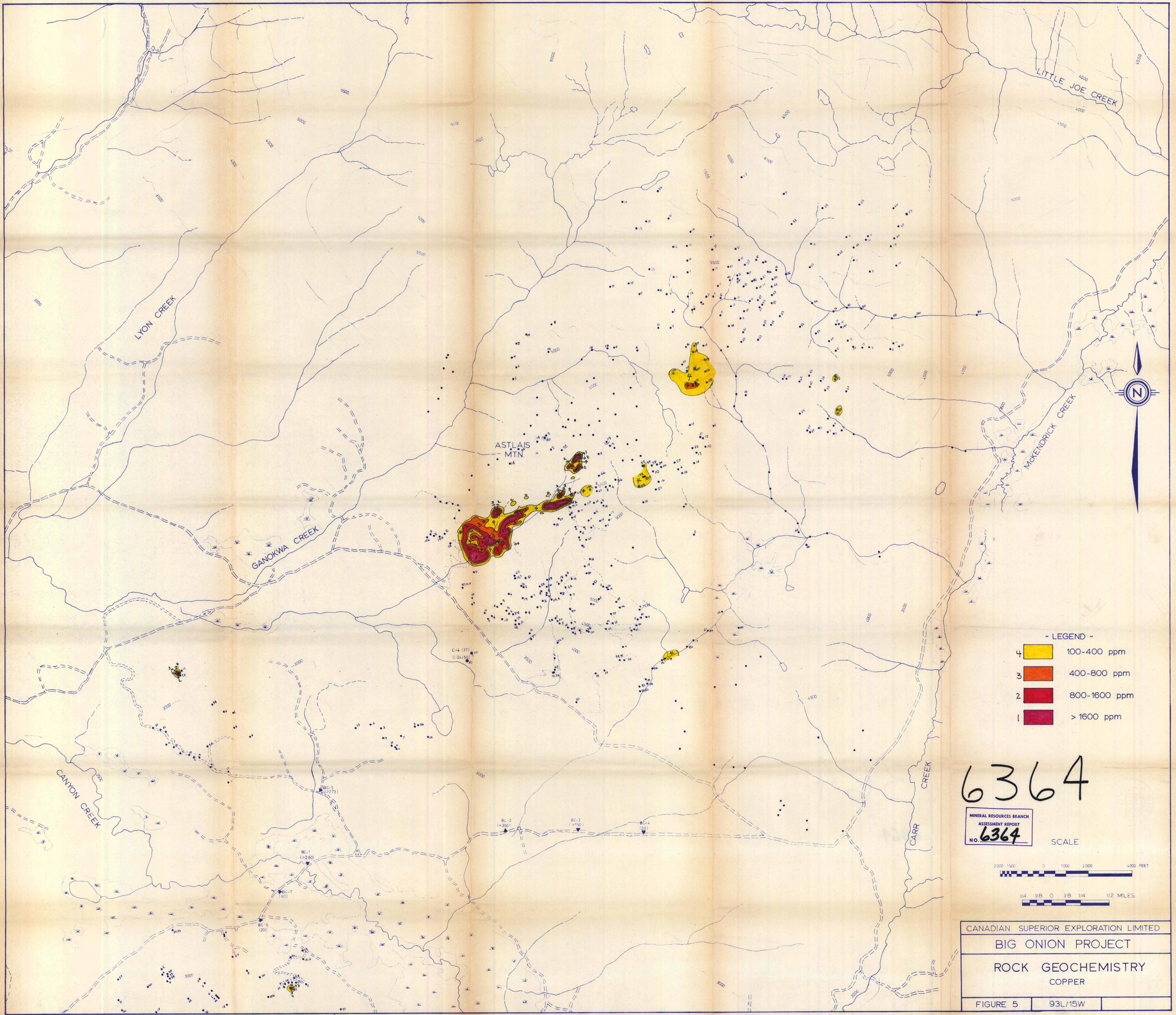
LEGEND

- LIMITS OF HYDROTHERMAL ALTERATION
- FAULT
- 1 PROPYLITIC (epidote + chlorite + saussurite + calcite + quartz)
- 2 SERICITIC (sericite + quartz)
- 3 SILICIC (quartz, stockworks and/or flooding)
- LOCAL ALTERATION**
- Biot Secondary Biotite
- Ser Sericite
- Kspar Potassium Feldspar Flooding
- Qtz Quartz

6364
 MINERAL RESOURCES BRANCH
 ASSESSMENT REPORT
 NO. **6364**



CANADIAN SUPERIOR EXPLORATION LIMITED
BIG ONION PROJECT
ALTERATION MAP
 FIGURE 4 | 93L/15W



LITTLE JOE CREEK

LYON CREEK

ASTLAJS MTN.

GANOKWA CREEK

MCENDERICK CREEK

CANYON CREEK

CARR CREEK

- LEGEND -

- 4 100-400 ppm
- 3 400-800 ppm
- 2 800-1600 ppm
- 1 > 1600 ppm

6364

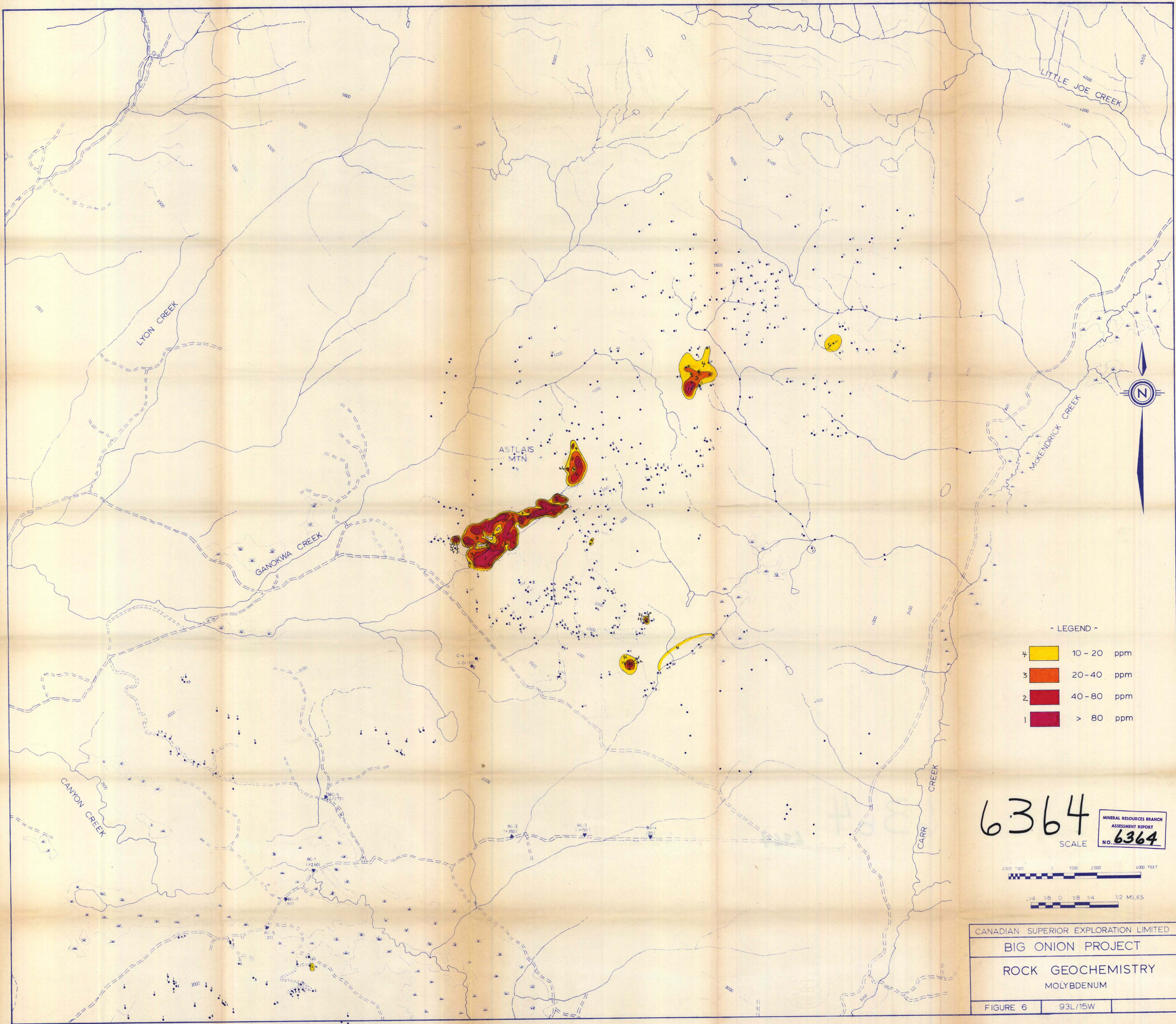
MINERAL RESOURCES BRANCH
ASSESSMENT REPORT
No. 6364

SCALE

2000 1500 0 1000 2000 4000 FEET

1/4 1/8 0 1/8 1/4 1/2 MILES

CANADIAN SUPERIOR EXPLORATION LIMITED	
BIG ONION PROJECT	
ROCK GEOCHEMISTRY COPPER	
FIGURE 5	93L/15W



- LEGEND -

4	10 - 20 ppm
3	20 - 40 ppm
2	40 - 80 ppm
1	> 80 ppm

6364
SCALE

MINERAL RESOURCES BRANCH
ASSESSMENT REPORT
NO. 6364



CANADIAN SUPERIOR EXPLORATION LIMITED		
BIG ONION PROJECT		
ROCK GEOCHEMISTRY MOLYBDENUM		
FIGURE 6	93L/15W	