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REPORT ON THE GEOLOGY
GEOCHEMISTRY AND GEOPHYSICS
OF THE RABBITT MASSIVE SULPHIDE PROPERTY,
RABBITT AND BOULDER CLAIM GROUPS,
SIMILKAMEEN MINING DIVISION,
BRITISH COLUMBIA

By: L.E. Thorstad

Latitude: 49° 33' to 49° 37'30"

Longitude: 120° 47'30" to 120° 50'

NTS: 92H/10 Tulameen 1:50,000

Owner: Harold J. Adams

Operators: Ventures West Minerals Ltd. and Kenan Resources Ltd.

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SUMMARY AND CONCLUSIONS

Two types of mineralization are exposed in volcanic rocks of the Upper Triassic Nicola Group at the Rabbitt Property. Stratiform massive sulphide mineralization is exposed in several showings along a 6 km strike length on the property and quartz veins containing variable amounts of Pb and Zn are exposed on the northeast part of the property. Soil geochemistry indicates that both types of mineralization may extend beyond exposed occurrences. Grades in veins are highly variable but do show economic potential. Massive sulphide mineralization shows great potential for large tonnages with reasonable grades, 2.5 to 3% Cu

Extensive trenching, geologic mapping, diamond drilling and limited geochemical and geophysical surveys constitute work on the property. A detailed soil geochemistry sampling program is recommended followed by diamond drilling.

INTRODUCTION

Several potentally economic mineral showings are evident on Rabbitt and Boulder Mountains (Rabbitt Property) northwest of Tulameen, B.C. These occurrences have had a long history of work and exploration that dates back to the late 1800's. Two modes of mineralization are evident on the property: syngenetic, volcanogenic, massive sulphide mineralization hosted in rocks of the Upper Triassic Nicola Formation and Pb-Zn quartz veins that crosscut Nicola rocks. Mineralization in the north-south trending veins is somewhat erratic with values ranging from trace to 26.4% Pb and .7 to 19.1% Zn. Au values range from trace to .32 oz/ton and average .10 oz/ton and Ag from trace to 3.3 oz/ton with an average of .7 oz/ton. Massive sulphide showings appear to constitute one sulphide horizon that has a potential strike length of 6 km. Assay values for massive sulphide mineralization are highly variable. Cu is the dominant commodity with significantly lesser values for Pb and Zn. Ag values average .92 oz/ton and Au slightly less than .01 oz/ton. The mode of mineralization, Cu grades and proximity of the occurrence to a population centre make the deposit potentially economic.

SUMMARY AND CONCLUSIONS

Two types of mineralization are exposed in volcanic rocks of the Upper Triassic Nicola Group at the Rabbitt Property. Stratiform massive sulphide mineralization is exposed in several showings along a 6 km strike length on the property and quartz veins containing variable amounts of Pb and Zn are exposed on the northeast part of the property. Massive sulphide mineralization shows potential as a semicontinuous horizon with grades averaging 2.5 to 3% Cu. Vein mineralization is somewhat erratic but some high Pb and Zn assay values are encouraging. Soil geochemistry indicates that both vein and massive sulphide mineralization is likely to extend beyond exposed occurrences.

Work to date includes extensive trenching, geologic mapping, diamond drilling and limited geochemical and geophysical surveys. It is recommended that a detailed geochemistry sampling program followed by diamond drilling be conducted.

HISTORY

The Tulameen district has had a long history of mining and mineral exploration. Placer gold was discovered in 1885 and to date approximately 38,000 ounces of gold has been receovered from the Tulameen River and its tributaries. One such placer creek is Lockie (Boulder) Creek, an easterly flowing tributary of Otter Creek that bisects the Rabbitt Property. In the course of early placer mining on Lockie Creek the copper-pyrite showings on Rabbitt and Boulder Mountains were discovered,in the late 1800's.

In 1900, several claims were staked on showings of heavy pyrite-chalcopyrite mineralization in metavolcanic rocks on Boulder Mountain. By 1905 the Boulder Mining Company had developed several shafts and tunnels, and had applied for Crown Grants on the claims. Most of the work was on the COUSIN JACK (L263), FREDDIE BURN and INTERNATIONAL (SOUTH COPPER) claim groups. The major values of the mineralization were in gold, silver and copper.

By 1908, showings had been discovered on Rabbitt Mountain and near Elliot Creek, north of the COUSIN JACK. Operators had recognized by then that many of the scattered showings were correlative with respect to geologic setting and mineralogy.

Between 1908 and 1918 little work was carried out. In 1918 extensive surface and underground exploration resumed on the Rabbitt Mountain showings, including the SPOKANE-MOTHERLODE, RED BIRD and SHAMROCK groups. These occurrences were described as replacement bodies accompanied by silicification and were thought to be genetically related to a system of granite porphyry dykes.

Several "veins" had been discovered by this time, which could be traced along strike for hundreds of feet but average widths and grades were disappointing.

By 1928 numerous mineralized zones had been discovered and explored along a strike length of 4 miles. The concordant nature of the veins had been recognized and lower-grade fracture controlled mineralization was noted. Exploration was concentrated in the Rabbitt Mountain showings (SPOKANE-MOTHERLODE, REDBIRD, and LLOYD GEORGE-HILLTOP?).

In 1933 attention shifted to Boulder Mountain and the COUSIN JACK group. Old workings were cleared and mapped and four sub-parallel veins were noted in an area 2400 feet (732 metres) wide. Similar mineralization was discovered to the west on the OTTAWA (figure 2) group. These veins carried values in gold, silver, lead and zinc. By 1934, nearly 2500 feet (762 metres) of strike length had been developed, on the COUSIN JACK group, by numerous open cuts, shallow shafts and tunnels.

In 1937, detailed exploration on the COUSIN JACK had defined the four main zones and it had been recognized that mineralization (pyrite, sphalerite and galena) occurred in both concordant and discordant quartz veins and stringers in altered and silicified greenstone and that this mode of occurrence differed from the pyrite-chalcopyrite sulphide layers characteristic of other properties in the area.

There is no record of any further substantial exploration in the area until the early 1960's when Copper Mountain Consolidated carried out trenching near the old workings on Rabbitt Mountain and diamond drilled 5 holes totalling 2500 feet (762 metres). In 1966-67 this company continued to explore the LODE claims by bulldozer trenching, geophysical and geochemical surveys. In 1967, Nelway Mines acquired and explored the COUSIN JACK group with geochemical surveys and diamond drilling.

Between 1971 and 1974 Gold River Mines explored a large claim block on Boulder Mountain which included the SOUTH COPPER, MID COPPER, COUSIN JACK, MUG and JOSIE areas. (MUG and JOSIE areas are not shown on figure 2,) Extensive line cutting, soil sampling, magnetometer, and EM surveys were conducted, and 33 holes totalling 5800 feet (1768 metres) were drilled. Apparently some of this work was directed towards evaluation of the property as a porphyry copper prospect. The precious metal potential of the COUSIN JACK quartz veins was also tested.

In 1976, Harold Adams of Tulameen staked the large block of JOHN-X and JAME-X claims covering all known showings on Rabbitt and Boulder Mountains (except those on the old COUSIN JACK group Crown grants).

In 1977-78 Northern Lights Resources carried out geophysical surveys and drilled several holes on the Rabbitt Mountain showings.

Kenam Resources Ltd. optioned the claims from Mr. Adams in the autumn of 1979 and began a program of detailed geologic mapping and orientation geochemical and geophysical surveys in conjunction with Ventures West Minerals Ltd.

LOCATION, TOPOGRAPHY AND ACCESS

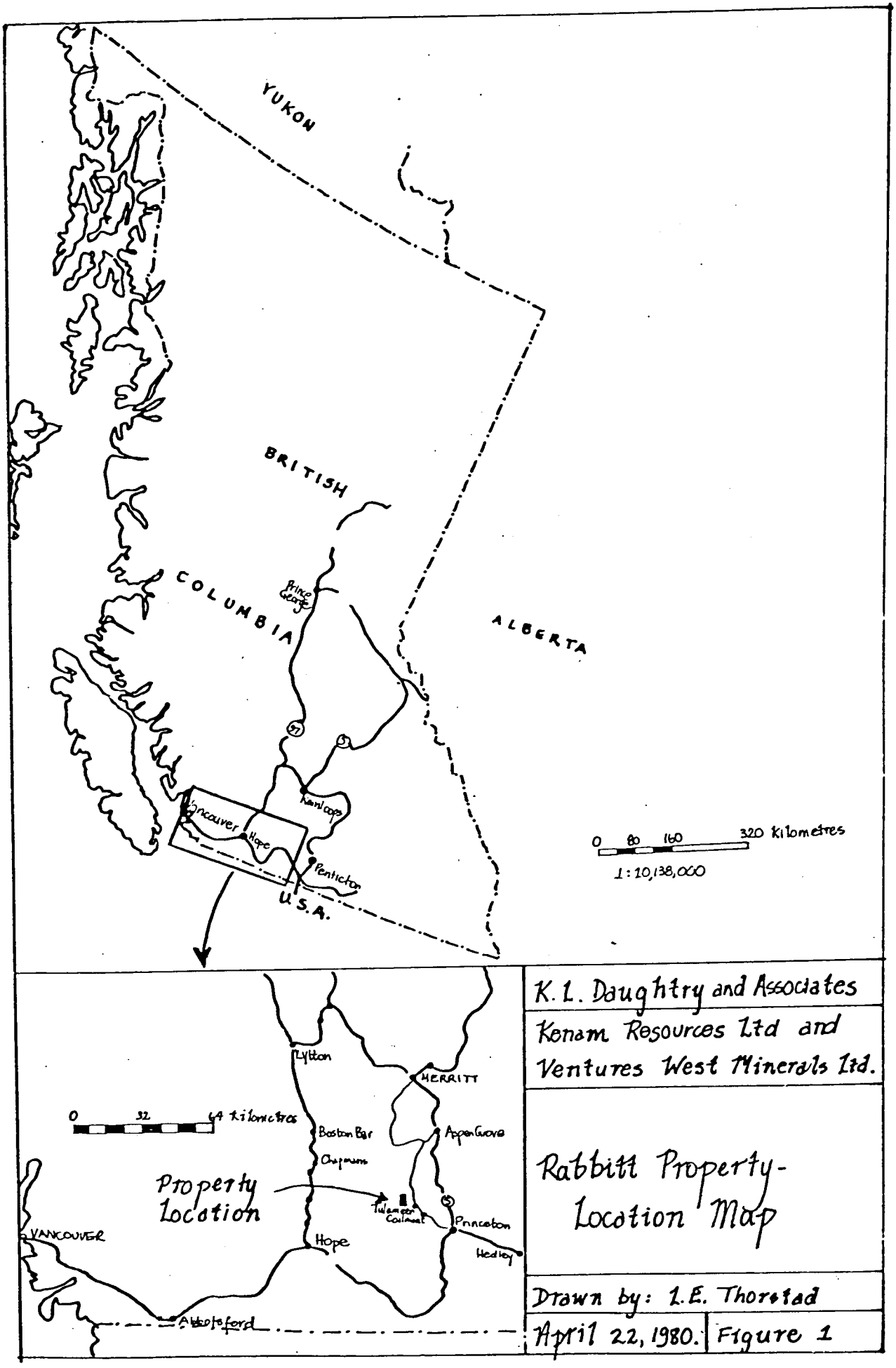
The Rabbitt property, northwest of Tulameen, B.C. is a large block of claims, totalling sixty-seven units, and ten crown grants that occupies the upland area immediately west of Otter Lake. (Figures 1 and 2). The southern part of the claims cover the crest and slopes of the southwesterly ridge between Rabbitt Mountain and Mount Riddell. The northern part of the property covers a large part of Boulder Mountain with the ten crown grants being located on the northwest flank of Boulder Mountain.

The claims extend north from the Lawless Creek logging road, 2.5 to 5.0 km west of Tulameen to Elliot Creek. 1.5 km west of Frembd Lake in the Otter Valley, a total distance of 7 km, Lockie (Boulder) Creek, an easterly flowing tributary of Otter Creek, bisects the claim block. The RABBITT-1 to RABBITT-4 claims (formerly JOHN-X-1 to JOHN-X-8 claims) are located south of Lockie Creek and the BOULDER-1 and BOULDER-2 claims (formerly the JAME-X-1 and JAME-X-2 claims) and the ten reverted crown-granted claims are located north of the creek.

The upper slopes of Rabbitt and Boulder Mountains are gently sloping with some deeply incised canyons. The slopes of the valleys of Tulameen River, Otter Valley and Lockie Creek are steep to precipitous. Elevations vary from a minimum of 970 metres above sea level in Elliot and Lockie Creeks, and 1040 metres at the south end of the property, to slightly greater than 1500 metres on Rabbitt and Boulder Mountains.

A foot trail across Lockie Creek connects the two parts of the property. Access to the various showings is provided by steep four wheel drive roads at the north and south ends of the property. The Rabbitt Mountain area is accessible by a network of roads which leave the main road, Lawless Creek Road between 3.5 and 8.0 km west of Tulameen. The Boulder Mountain area is reached by a road which leaves the Tulameen-Aspen Grove highway 7.5 km north of Tulameen.

The nearest supply centre, the town of Princeton, which is on the Southern Trans Provincial Highway, is 27 km by paved highway southeast of Tulameen. Tulameen is on the Kettle River Branch of the Canadian Pacific Railway.



K. L. Daughtry and Associates
Kenam Resources Ltd and
Ventures West Minerals Ltd.

Rabbitt Property-
Location Map

Drawn by: L.E. Thorstad

April 22, 1980. Figure 1

CLAIM AND PROPERTY INFORMATION

The Rabbitt Property, located in the Similkameen Mining Division includes 6 claims, totalling 67 units: BOULDER-1, BOULDER-2 and RABBITT-1 to RABBITT-4, and 10 reverted Crown grants (L264 to L270, L373, L282 and L283). The RABBITT and BOULDER claims have been reloeated from the abandoned JOHN-X, JAME-X claim group, the original claims that existed when the property was acquired. The JOHN-X-1 to JOHN-X-8 and JAME-X-1 to JAME-X-2 claims, totalling 10 claims and 66 units, were located by H. Adams of Tulameen, B.C. between August 27 and December 4, 1976.

Pertinent information on the existing and pre-existing claims and the reverted Crown grants follows:

RABBITT and BOULDER CLAIM GROUP

Name of Claim	No.of Units	Record Number	Date of Record	Expiry Date
RABBITT 1	12	944	Nov. 29, 1979	Nov. 29, 1980
2	4	945	Nov. 29, 1979	Nov. 29, 1980
3	9	946	Nov. 29, 1979	Nov. 29, 1980
4	8	947	Nov. 29, 1979	Nov. 29, 1980
BOULDER 1	16	948	Nov. 29, 1979	Nov. 29, 1980
2	18	949	Nov. 29, 1979	Nov. 29, 1980

ABANDONED JOHN-X, JAME-X CLAIM GROUP

Name of Claim	No.of Units	Record Number	Date of Record	Expiry Date
JOHN-X-1	6	116	September 22, 1976	September 22,1980
2	4	117	"	"
3	9	118	"	"
4	4	119	"	"
5	1	164	November 9, 1976	November 9, 1980
6	1	165	"	"
7	1	166	"	"
8	10	178	December 10, 1976	December 10,1980
JAME-X-1	18	176	"	"
2	12	177	"	"

CROWN GRANTS - "THE COUSIN JACK PROPERTY"

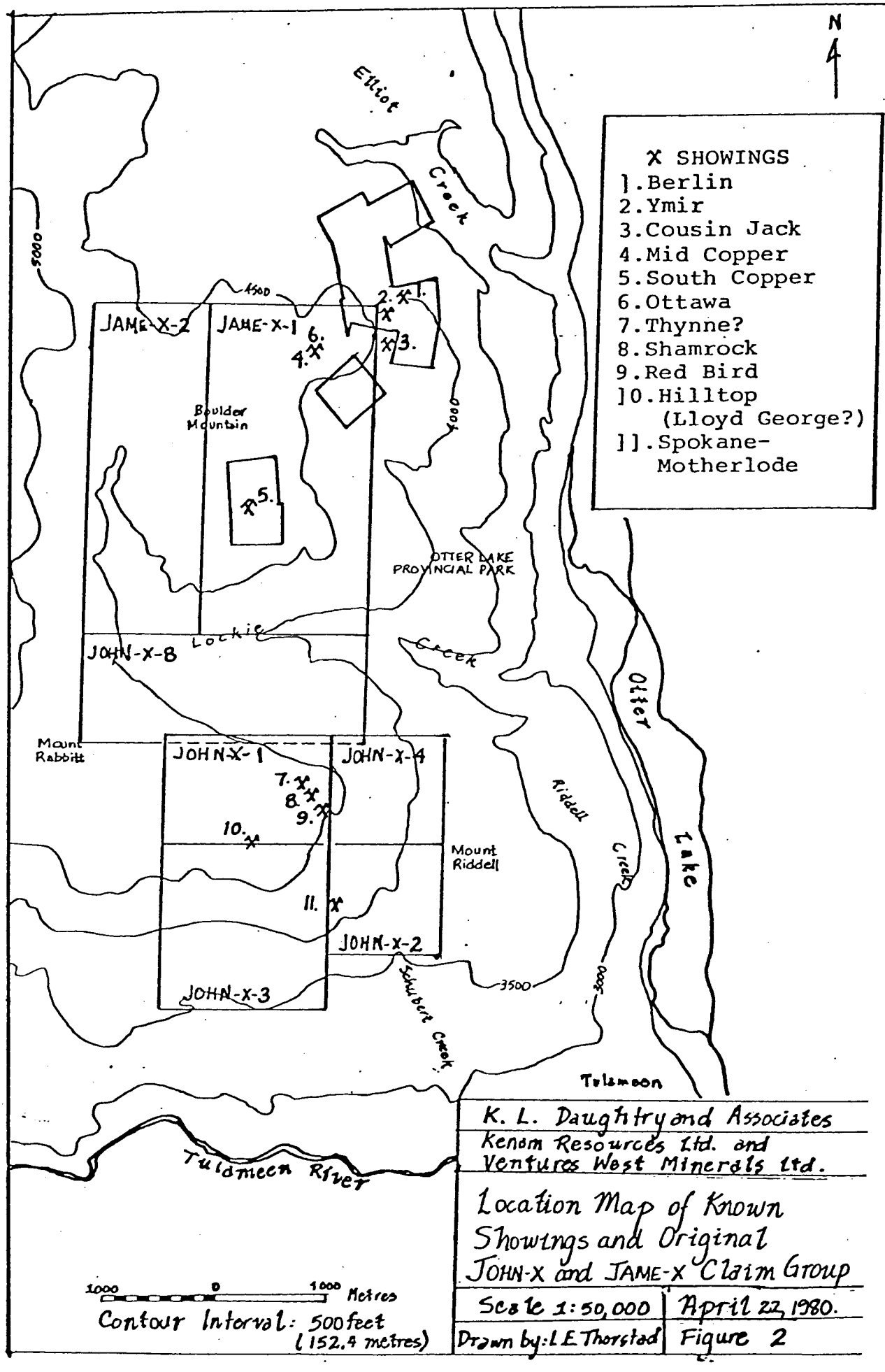
Name of Claim	No.of Units	Lot No.	Date of Record	Expiry Date
YMIR (L264)	1	105	August	August 26, 1980
MORNING (L265)	1	106	"	"
OSHKOSH (L266)	1	107	"	"
WINIBAGO (L267)	1	108	"	"
BLACKBIRD (L268)	1	109	"	"
BERLIN (L269)	1	110	"	"
FREDDIE BURN (L270)	1	111	"	"
CONSTITUTION (L282)	1	202	February	February 20, 1980
INTERNATIONAL (L283)	1	201	"	"
ANACONDA (L373)	1	112	August	August 26, 1980

An additional Crown grant, COUSIN JACK (L263) is not part of the acquired property.

At the time of property acquisition all expiry dates on the JOHN-X, JAME-X claim group were dated 1979. Assessment work, together with available assessment credit from drilling by previous operators, was recorded on September 21, 1979. Applying one year's work to each of the JOHN-X-1, JOHN-X-2, JOHN-X-5 and JOHN-X-6 claims and two years' work to each of the JOHN-X-3, JOHN-X-4, JOHN-X-7 and JAME-X-2 claims.

On October 23, 1979 all JOHN-X and JAME-X claims were abandoned. The JOHN-X-1 to JOHN-X-7 claims (36 units) were relocated as RABBITT 1 to RABBITT 4 claims (33 units) and the JOHN-X-8, JAME-X-1 and JAME-X-2 claims (30 units) were relocated as the BOULDER 1 and 2 claims (34 units).

Assessment work on the Constitution and International crown grants was filed March 18, 1980.



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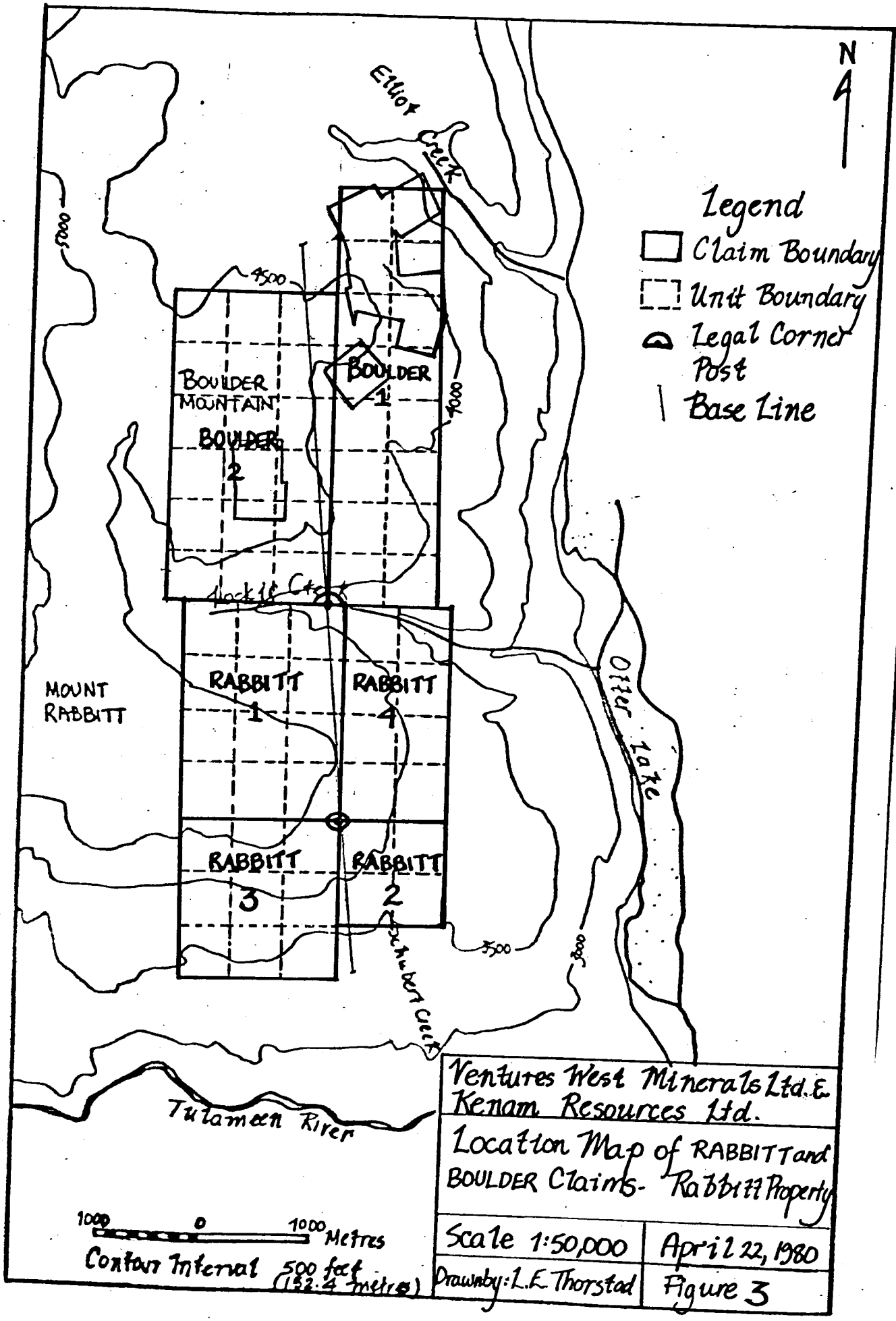
Location Map of Known Showings and Original JOHN-X and JAME-X Claim Group

Scale 1:50,000	April 22, 1980.
Drawn by: L.E. Thorstad	Figure 2



Ventures West Minerals Ltd. & Kenam Resources Ltd.	
Location Map of RABBITT and BOULDER Claims - Rabbitt Property	
Scale 1:50,000	April 22, 1980
Drawn by: L.E. Thorstad	Figure 3

REGIONAL GEOLOGY

The Nicola Group is a volcano-sedimentary assemblage probably formed in an arc or back arc basin that outcrops in the Intermonatane and Coast Crystalline Belts of the Cordillera (Preto, 1976). Within the Princeton to Merritt area three north trending, fault bounded, lithologically varied structural belts have been recognized (Preto, 1979). The Eastern Belt is dominated by lahars, basaltic flows and synenite stocks in the south and volcano-sedimentary rocks in the north and is both alkaline and calcalkaline in nature. Subaerial and submarine basalt to andesite flows, breccias, and lahars of alkaline and calcalkaline compositions and conglomerate characterize the Central Belt. The Western Belt includes andesitic to rhyolitic flows and volcaniclastic rocks, sandstone, volcanic conglomerate and limestone rocks of all belts are weakly foliated, metamorphosed to very low greenschist facies and are in fault contact with or unconformably overlain by younger rocks.

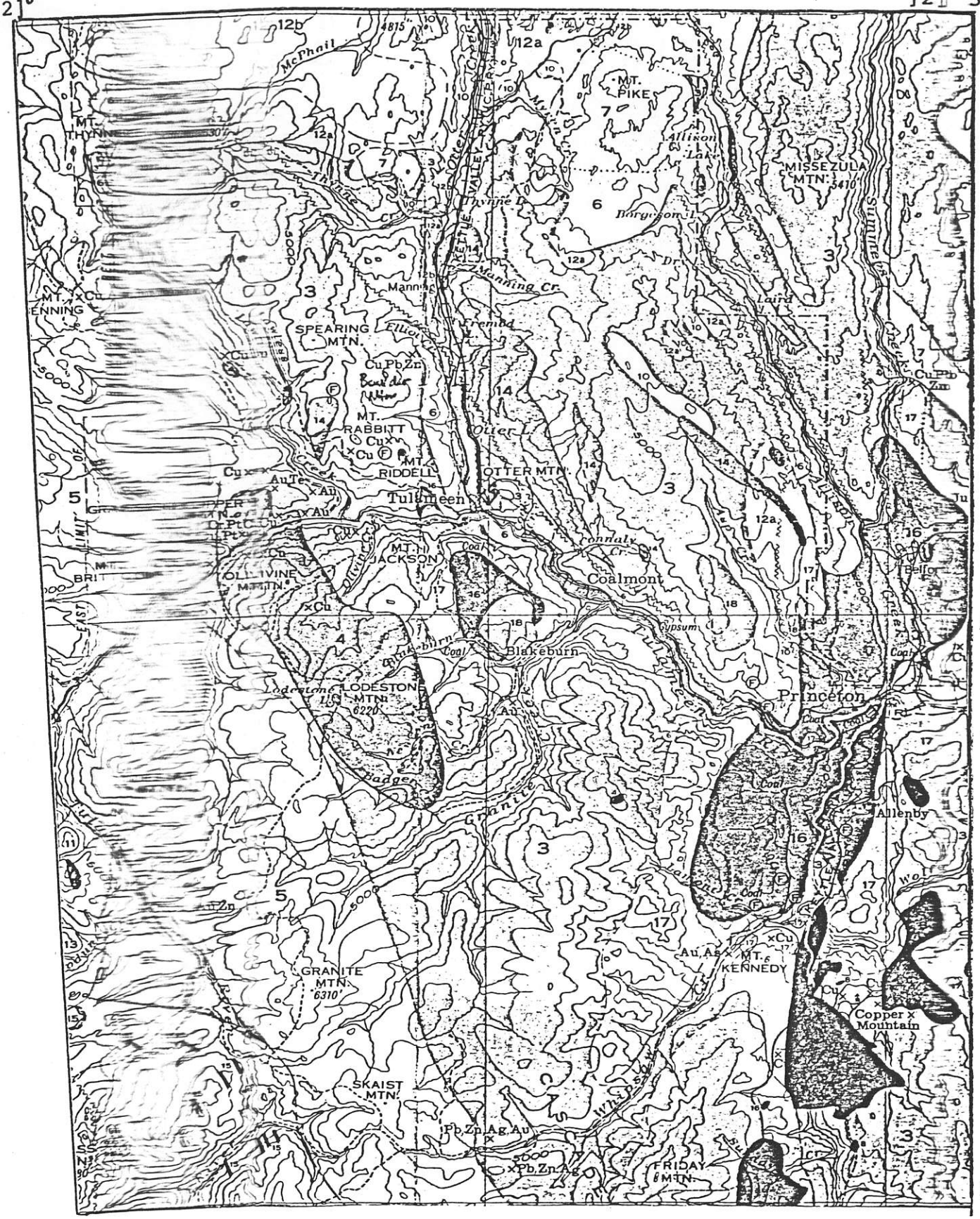
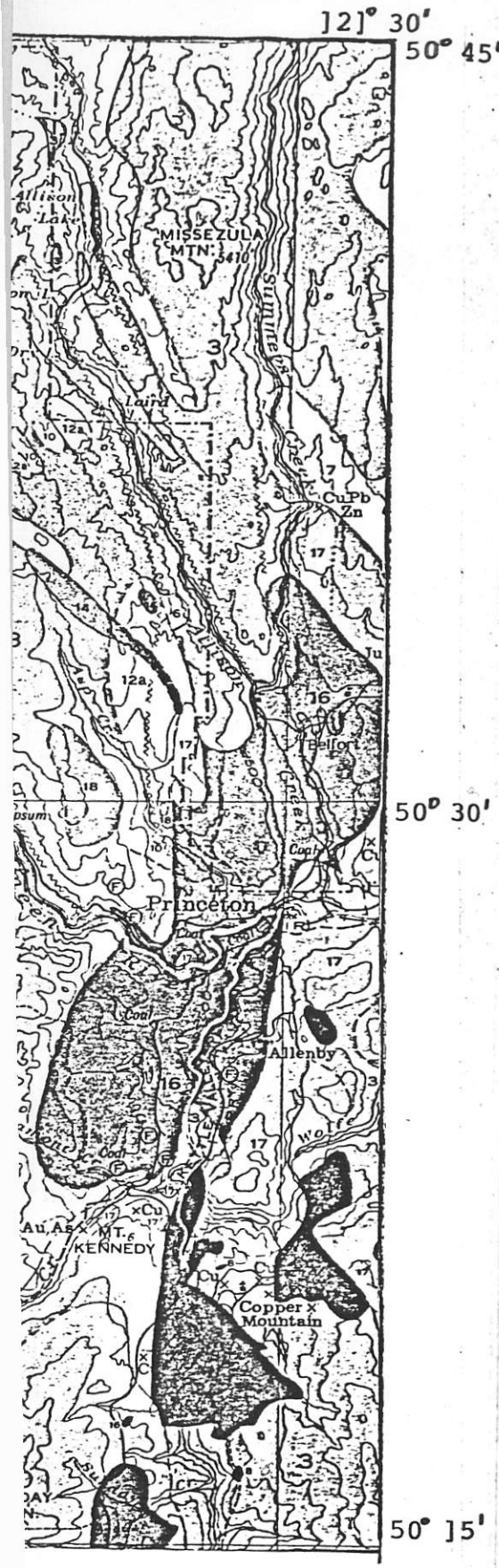


Figure 4 REGIONAL GEOLOGY- from Rice, 1947.



47.

ch to 4 Miles

8 12

LEGEND

CENOZOIC

TERTIARY

MIOCENE OR LATER

19 — *Valley basalt: vesicular, varicoloured basalt*

18 — *Plateau basalt: amygdaloidal, brown basalt*

MIOCENE OR EARLIER

PRINCETON GROUP

16, 17

16, *Mainly shale, sandstone, and conglomerate; coal*
17, *Varicoloured andesite and basalt*

CRETACEOUS OR TERTIARY

UPPER CRETACEOUS OR LATER

14,15

14, *OTTER INTRUSIONS: pink and grey granite and granodiorite*
15, *LIGHTNING CREEK INTRUSIONS: grey quartz diorite*

CRETACEOUS

LOWER CRETACEOUS

KINGSVALE GROUP

12a-b,13

12a, *mainly volcanic breccia;* 12b, *mainly andesite and basalt porphyry*
13, *Andesite and basalt porphyry and volcanic breccia*

PASAYTEN GROUP

11

Mainly grit and shale;
11a, *mainly purple lava, tuff, and breccia*

SPENCE BRIDGE GROUP

10

Hard, reddisn andesite and basalt

JURASSIC (?) AND CRETACEOUS

UPPER JURASSIC (?) AND LOWER CRETACEOUS

DEWDNEY CREEK GROUP

9

Tuff, volcanic breccia, grit, argillite; 9a, *mainly conglomerate*

MESOZOIC

JURASSIC OR LATER

8

COPPER MOUNTAIN INTRUSIONS: syenogabbro, augite diorite, pegmatite

5,6,7

COAST INTRUSIONS: 5, *grey, slightly gneissic granodiorite;* 6, *mainly reddish, coarse-grained, siliceous granite and granodiorite;* 7, *light coloured granodiorite, quartz diorite, and gabbro*

4

Peridotite, pyroxenite, gabbro

TRIASSIC

UPPER TRIASSIC

NICOLA GROUP

3

Varicoloured lava: argillite, tuff, limestone; chlorite and sericite schist

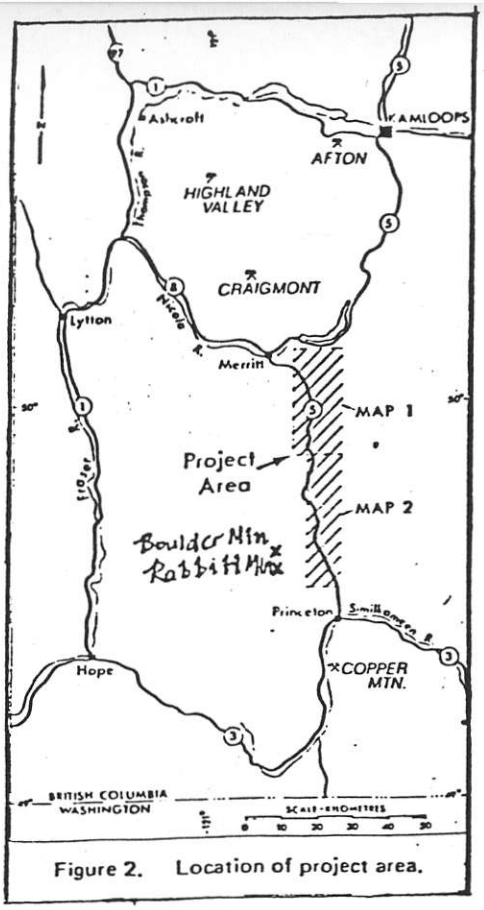


Figure 2. Location of project area.

LEGEND

- PRINCETON GROUP
- KINGSVALE GROUP
- POST–NICOLA INTRUSIVE ROCKS
- NICOLA MONZONITE–SYENITE
- NICOLA DIORITE
- NICOLA SUBAERIAL VOLCANIC AND RELATED ROCKS
- NICOLA SUBAQUEOUS VOLCANIC AND RELATED ROCKS
- FAULTS
- APPROXIMATE LOCATION OF FACIES CHANGE
- GEOLOGICAL CONTACT
- LOCATION OF ANALYSED ANALCITE BASALT PORPHYRY FLOWS A.

SCALE-KILOMETRES
0 5 10

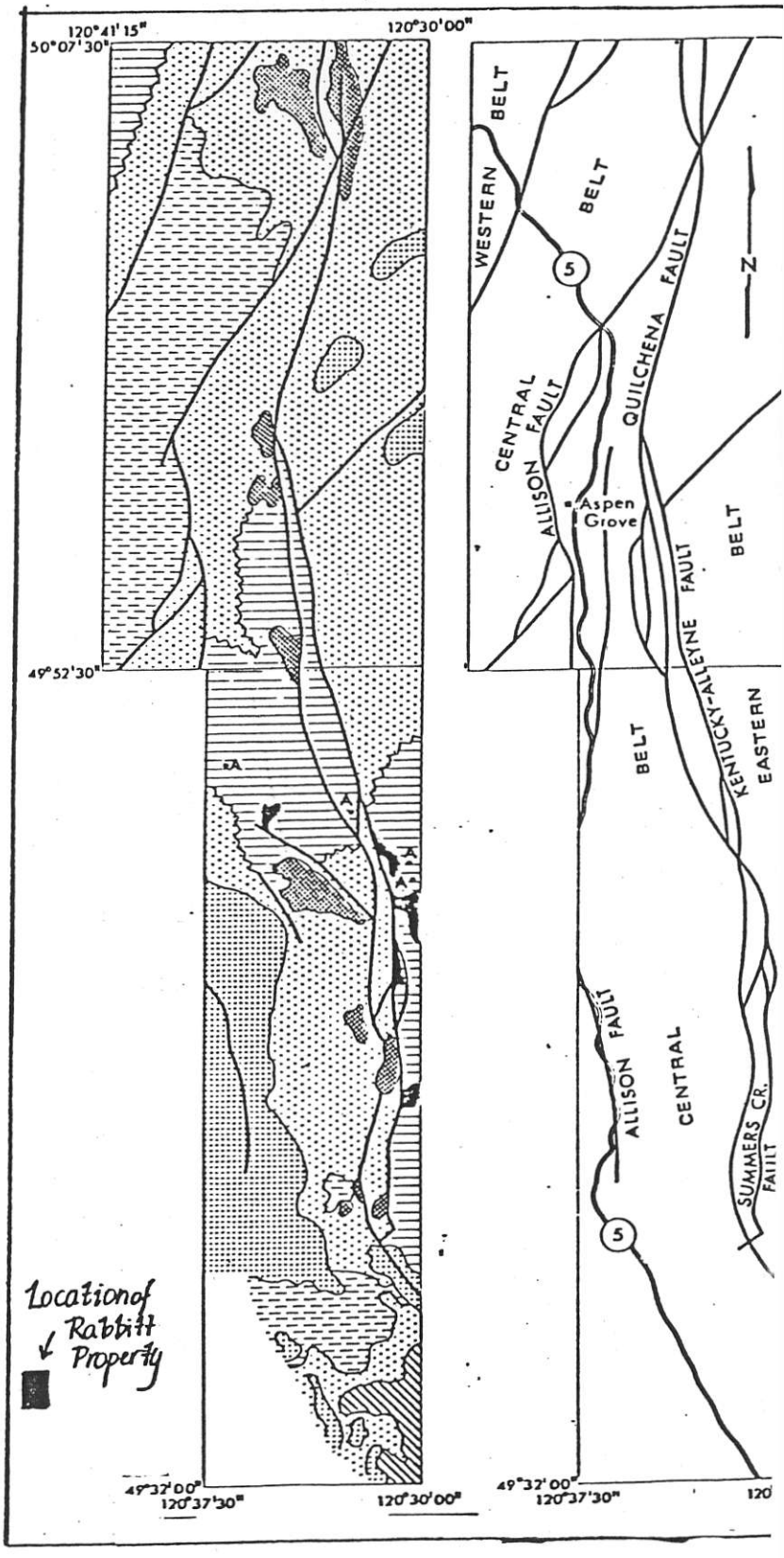


Figure 5: REGIONAL GEOLOGY - from Preto, 1979

GEOLOGY OF THE RABBITT PROPERTY

In the vicinity of the Rabbitt Property, rocks belong to the Upper Triassic Nicola Group, are dominantly andesitic to rhyolitic volcaniclastics, and appear to correspond to the "Western Belt" (Preto, 1976) of Nicola rocks. Intercalated andesitic to dacitic tuff and breccia dominate the assemblage and are interlayered with rhyolite to rhyodacite tuff and breccia. Contacts between rock units are commonly gradational and rapid changes in lithology are evident along strike and upsection. Mapping by Rice (1947) shows a fossil locality on the south flank of Rabbitt Mountain but no sedimentary rocks have been observed to date. A discussion of rock units defined in the "Rabbitt" Property follows.

Rocks of the Rabbitt Property are cut by Mosozoic and Cenozoic intrusives and have been subjected to regional low grade metamorphism. The Geology of the Rabbitt Property is shown on map accompanying the report.

STRUCTURE

Volcanic rocks of the Rabbitt Mountain property appear to occur as a relatively simple homoclinal sequence that is complicated by later (Tertiary ?) normal and strike slip faulting. North-south strikes and shallow to moderate westerly dips typify the sequence. A weak to moderately well developed foliation is ubiquitous and varies from 130° to 180° in strike (dominantly 160° to 170°) with shallow westerly dips. Intensity of foliation is variable and largely a function of lithology as finer grained fragmental rocks tend to be more schistose than their coarser counterparts. Layering is difficult to discern due to the massive nature of many of the rocks, but where observed is subparallal to the foliation.

Faulting, of probable Tertiary age (Rice, 1952) disturbs the volcaniclastic rocks. It is difficult to determine offset and movement on these faults due to poor outcrop, the relative homogeneity of rocks, lack of distinctive layering and marker horizons, and the lensoid nature of units within the sequence and faults are largely recognized by distinctive linear structures. North, north-east trends for faults are dominant but some east-west trends are also evident.

Structural features on the Rabbitt property are very similar to those of the entire belt of Nicola rocks, which are typified by large open folds cut by later faults (Rice, 1952).

ROCK UNITS

Volcano-Sedimentary Rocks

On the basis of field observation and thin section work, volcanic rocks have been divided into rock units. Due to rapid facies changes and gradational contacts it must be kept in mind that these subdivisions cannot be considered too rigorous.

Rock units include:

1. Andesite breccia and tuff, massive to poorly layered fragmental rocks characterized by their dark to epidote green colour and abundance of chlorite and altered plagioclase feldspar. Fragmental rocks range from five tuffs to coarse breccias.

2. Andesite breccia with acid volcanic fragments contains variable amounts of white, acidic fragments in a tuffaceous matrix of probable andesitic composition. This unit is very similar to andesite breccia and tuff and may be mapped as this unit where acid fragments are rare.

3. Rhyolite to rhyodacite tuff and breccia are commonly interlayered with andesitic to dacitic fragmental units. Metamorphosed acid tuffs occur as grey to white sericite schist and their coarser counterparts as more competent sericitic schists with fragmental textures preserved. These rocks are highly gossanous. A distinctive massive white weathering unit, described in the lithologic appendix, at "Mid Copper" appears to be an extensively recrystallized and silicified acid tuff.

4. Minor outcrops of grey feldspar, augite porphyries are characterized by a poorly foliated grey matrix mottled by fine white feldspars and rare, dark phenocrysts.

5. Epidotized feldspar porphyry, a probable autoclastic flow breccia, outcrops dominantly in the northern part of the property. This unit is typified by medium to coarse, epidotized feldspar phenocrysts in a dark grey green matrix and minor trachytic and fragmental textures.

6. Dacite breccia and tuff, interlayered and gradational with andesite fragmental rocks, are common throughout the volcanic sequence and are typified by a blue green, semiopaque matrix, carbonate-sericite altered feldspar phenocrysts, and fragmental textures. The division and/or separation of dacitic rocks from their andesitic counterparts is difficult due to poor outcrop and rapid facies changes.

7. Dacite porphyry or crystal tuff outcrops dominantly in the northern part of the property and is thought to be a facies equivalent of the sericite breccia and tuff. Fine pink to white feldspar phenocrysts in a semiopaque, blue-green matrix gives the unit a distinctive appearance that is easily recognized in the field.

8. Purple breccia outcrops in the northern part of the Rabbitt property. Breccia fragments range from 1 to 10 cm.

Detailed descriptions of these rocks are given in Appendix I.

Intrusive Rocks

Rocks of the Nicola Group are cut by intrusive rocks of various ages. In the vicinity of the Rabbitt property, intrusive rocks include the Jurassic or later Eagle Granodiorite; related dykes of the Coast Plutonic Complex, Jurassic or later peridotite, pyroxenite and gabbro dykes and plugs probably related to the Olivine Mountain body to the south (Rice, 1952) and pink to grey granite and granodiorite of the Upper Cretaceous or later Otter Intrusions.

These are all evidenced on the Rabbitt property by cross-cutting and concordant bodies of felsic to intermediate composition and by irregular? outcrops of basic to ultrabasic rock. Relations to other rocks are often obscured due to poor outcrop. Intrusive rocks are non-foliated and include fine quartz-eye feldspar porphyry, medium grained feldspar porphyry, pink feldspar-hornblende porphyry and fine, dark brown weathering basic rocks. Further descriptions of intrusive rocks may be found in Appendix 1.

Gangue

Massive to blebby quartz and sericite schist are the dominant gangue lithologies. Quartz associated with the massive sulphide horizon differs from quartz in veins (exposed at the north end of the property in the area of the Cousin Jack claim group) in its irregular distribution as blebs and stringers rather than as large masses. Irregular quartz blebs in the massive sulphide horizon give a very characteristic limonitic and knobbly appearance to weathered surfaces. Sericite schist occurs in layers and as elongate fragments that contain abundant disseminated pyrite in massive sulphide.

Texture

Massive, banded to disseminated textures characterize the sulphide horizon. Being the dominant sulphide, pyrite generally controls sulphide textures while chalcopyrite, sphalerite and galena are interstitial or occur in restricted blebs. Banded sulphides show varying degrees, thicknesses and modes of layering, being layered with sericite schist or more weakly banded exclusively with sulphides. Some sericite schist fragments are evident in massive sulphide.

Zoning

Insufficient work has been done to determine any metal or mineralogical zoning in the sulphide body.

VEIN MINERALIZATION

Mineralized quartz veins at the north end of the Rabbitt property cut rocks of dominantly acid composition. Veins trend in a north-south direction and are generally discordant, but some are concordant with the foliation. Widths are variable ranging from fine quartz stringers to veins up to 2.5 m wide and mineralized veins can be traced up to 380 m along trend.

Mineralization includes sphalerite, galena, pyrite and very minor chalcopyrite in a quartz gangue. Distribution of mineralization is somewhat sporadic as indicated by variable assay values in the following section. Sulphide mineralization is massive or occasionally weakly banded with quartz parallel to the selvedge of the vein. Banded mineralization shows evidence of folding, probably while material was partly crystallized.

SULPHIDE OCCURRENCES

Known sulphide occurrences include the Motherlode-Spokane, Red Bird, Shamrock, Thynne, and Hilltop (Lloyd George?) showings on the southern part of the property and the South Copper (Oro Fino, Constitution, International) and Mid Copper showings north of Lockie Creek. A group of crown grants herein designated the Cousin Jack Group including the Blackbird, Berlin Fraction, Freddie Burn, Anaconda, Winibago, Ymir, Osh Kosh, Morning and Cousin Jack crown grants, also expose sulphide mineralization that is of a different nature than aforementioned showings. The latter showings are vein-type deposits and will be discussed separately from other showings.

All massive sulphide showings show remarkable similarity and only minor differences. Perhaps the most obvious differences are variations in sulphide mineralogy which include the dominance of pyrite versus chalcopyrite and the presence or absence of visible sphalerite and galena. Detailed discussions of individual showings follow:

Motherlode-Spokane Showings

At the Motherlode-Spokane showings massive sulphide mineralization is exposed both east and west of main road access to the south part of the Rabbitt property, on the ridge and gully respectively. Trenching to the north and south of the known showings failed to expose additional sulphide mineralization. Exposed sulphide mineralization is approximately 1.5 metres thick and

has shallow west-southwesterly dips. Assuming the ridge and gully showings represent the same sulphide horizon the body has a length down dip of approximately 50 metres and along strike of 8 to 10 metres.

Pyrite is the dominant sulphide mineral with lesser chalcopyrite. The Motherlode-Spokane showing is somewhat unique in that it is the only showing in which sphalerite and galena are observed in the massive sulphide mineralization. Assay data published in B.C. Dept. of Mine Report, 1928 are as follows:

	Au	Ag	Cu
1.	trace	.60 oz./ton	2.46%
2	.02 oz./ton	.40 oz./ton	2.24%

Acid tuff envelopes the sulphide but is generally far less abundant than at other showings.

Red Bird Showing

The Red Bird showing has a long history of extensive work that includes two cross cut adits. The upper adit (Red Bird Shaft) is open, has a total length of 400 feet (122 metres) with a short winze 10 metres in from the portal. The portal of the lower adit is now partially covered so it cannot be accessed. Two thin sulphide lenses with a maximum thickness of .4 metres each are exposed at the portal of the Red Bird Shaft. They have a length down dip of 2 to 3 metres, an exposed strike length of 4 to 5 metres with potential for up to 50 metres (defined by small scattered exposures of sulphide mineralization along strike) and are separated by a .8 to 1 metre thick layer of massive dacitic tuff that is cut

by sphalerite, galena and chalcopyrite-bearing quartz veinlets. Pyrite is the dominant sulphide with small amounts of chalcopyrite being evident.

Assay values compiled from past reports are as follows:

Sample Assay	Cu	Pb	Zn	Au	Ag	Reference
				oz./ton		
Portal Sulphides	2.4%			.02	.8	BCDM. 1913
Dump from Winze	3.1%			t	.6	BCDM 1913
Winze	2.2%			t	2.6	BCDM 1924
Winze	3.38%			.02	1.1	BCDM 1928
Portal Sulphides	2.35%	.12%	.10%	.005	1.04	Unknown

Average copper values are 2.6%, Au and Ag values are low and Pb and Zn negligible.

White sericite schist and quartzose sericite schist both envelope and replace the sulphide horizon.

Shamrock Showing (Thynne)

The Shamrock showing north of the Red Bird showing, is the northerly most showing of massive mineralization south of Lockie Creek. Massive sulphide mineralization, including pyrite and chalcopyrite is exposed semi-continuously in north, northwesterly trending 175 metres long trench at the end of the road. Fragmental andesite to dacite hosts the mineralization. Thicknesses vary from 1 to 2.5 metres and sulphide mineralization appears to be split and/or replaced by andesitic tuff along the horizon. One assay value of 2.88% Cu, < .01% Pb, .01% Zn, .005 oz. Au and .42 oz. Ag is recorded.

South Copper

The South Copper showing (Consitution, L283 and International, L282 crown grants) is located on the south slope of Boulder Mountain. Extensive trenching and diamond drilling have been carried out by both Northern Lights Resources Ltd. (Betmanis, 1979) and Gold River Mines Ltd. (Sookochoff, 1973). Thirteen holes were drilled by Gold River Mines for a total of 3203 feet. Some drill logs and assay values are available, but the core is not available for examination. 2 Drill holes drilled for Northern Lights Resources intersected weakly mineralized andesite of the Nicola volcanics with a .3 metre thick band of massive sulphide (logged as 30% chalcopyrite and 20% pyrite) in appearing in one hole.

Mineralization at South Copper consists of massive chalcopyrite and pyrite in a shallow, undulating, west-dipping horizon hosted in andesitic fragmental rocks. Chalcopyrite is the dominant sulphide and according to Sookochoff minor silver values are associated with the chalcopyrite. The gangue is dominantly quartz and carbonate. Sookochoff also suggests that hematite and epidote alteration are coincident with pyrite mineralization. The mineralized horizon varies from 3.5 to 10.0 feet in drill holes.

Assay values for copper in drill intersections are .28% over 5', 1.74% over 5', .28% over 10', .11% over 5', .7% over 5', 1.74% over 5', 1.29% over 5' and 1.20% over 3.5' exposed at surface (sookochoff, 1973). A random assay of a high grade sample reported

values of 8.2% Cu, .06% Pb, <.05% Zn, 1.36 oz./ton Ag and .005 oz./ton Au. A B.C. Department of Mines Report (1901) gave values of 9.3% Cu, .76 oz./ton Ag and trace values for Au.

Hilltop (Lloyd George?) Showing

The Hilltop (Lloyd George?) showings consist of two groups of trenches that lie on the south slope but near the summit of Rabbitt Mountain. The more westerly trenches are designated "Hilltop One" trenches and the easterly ones "Hilltop Two" trenches. Exposed mineralization is massive pyrite and chalcopyrite ranging from .2 to .6 metres in thickness but the horizon appears to have no stratigraphic continuity as trenches immediately east and west of the showing do not expose mineralization.

Other than disseminated pyrite which is ubiquitous throughout the Nicola volcanic rocks on the property, no mineralization is observed in the Hilltop One trenches. An induced polarization survey for Copper Mountain Consolidated (Watson, 1967) showed a definite chargeability anomaly in the Hilltop One trenches. Due to the lack of a corresponding resistivity anomaly the former anomaly is interpreted as disseminated metallic sulphide or graphite rather than massive sulphide. One drill was apparently collared at the Hilltop One trenches, drilled to a depth of 15 feet and abandoned. (H. Adams, 1979, pers. comm.) Scattered drill core around the site is not from the hole.

The Lloyd George showings described by Rice (1954), and the B.C. Department of Mines Report (1937), as "chlorite and sericite schists that contain more intensely sheared zones that have been

somewhat silicified and mineralized with pyrite and a little chalcopyrite" is believed to be the same occurrence. Occasional zones show massive pyrite, but chalcopyrite is nowhere abundant and the copper content is quite small.

Mid Copper

The Mid Copper showing is exposed in a series of trenches on the northern flank of Boulder Mountain and consists of a horizon of massive pyrite and chalcopyrite in andesitic to dacitic fragmental rocks. Four drill holes drilled by Gold River Mines Ltd. (Sookochoff, 1973) all intersected a weakly mineralized horizon approximately 5' thick with assay described as "disseminated pyrite in silicified greenstone, schist and breccia"; "sulphides in quartz-carbonate veins"; "chalcopyrite and pyrite in silicified greenstone and schist" and "siliceous zone" respectively. A unique, massive, white weathering unit that appears to be a silicified acid tuff caps the ore horizon at the Mid Copper showings.

Crown Grant continuation	Width	Pb	Zn	Au	Ag	Reference
				oz./ton		
Cousin Jack		.20	.55	.16	.8	Millican, 1967
Cousin Jack		.18	1.50	.14	.8	" "
Cousin Jack		26.36	6.05	.21	3.3	" "
Cousin Jack		.29	.30	.08	t	" "
Cousin Jack		.8	.65	t	.8	" "

Zn ranges from 2.3 to 19.1%, Pb from 0 to 26.36%, Au from trace to .32oz./ton and Ag from trace values to 3.3oz./ton with principal values in Au and Zn.

The Cousin Jack showing, which cumulatively represents all the northern crown grants, has significant amounts of acid fragmental rocks. In other showings these acid rocks host massive sulphide mineralization suggesting there is potential for mineralization in acid rocks of the Cousin Jack showing. One large boulder of massive sulphide is found in a trench near the Ymir, Cousin Jack corner post.

GEOCHEMISTRY

Two soil sampling programs were carried out on the Rabbitt property by Gold River Mines. The first program was limited to sampling of new trenches in the Cousin Jack group (Millican, 1966) and the second was a grid sample survey over the same showings (Mitchell, 1971). No systematic silt sampling has been done on the property to date.

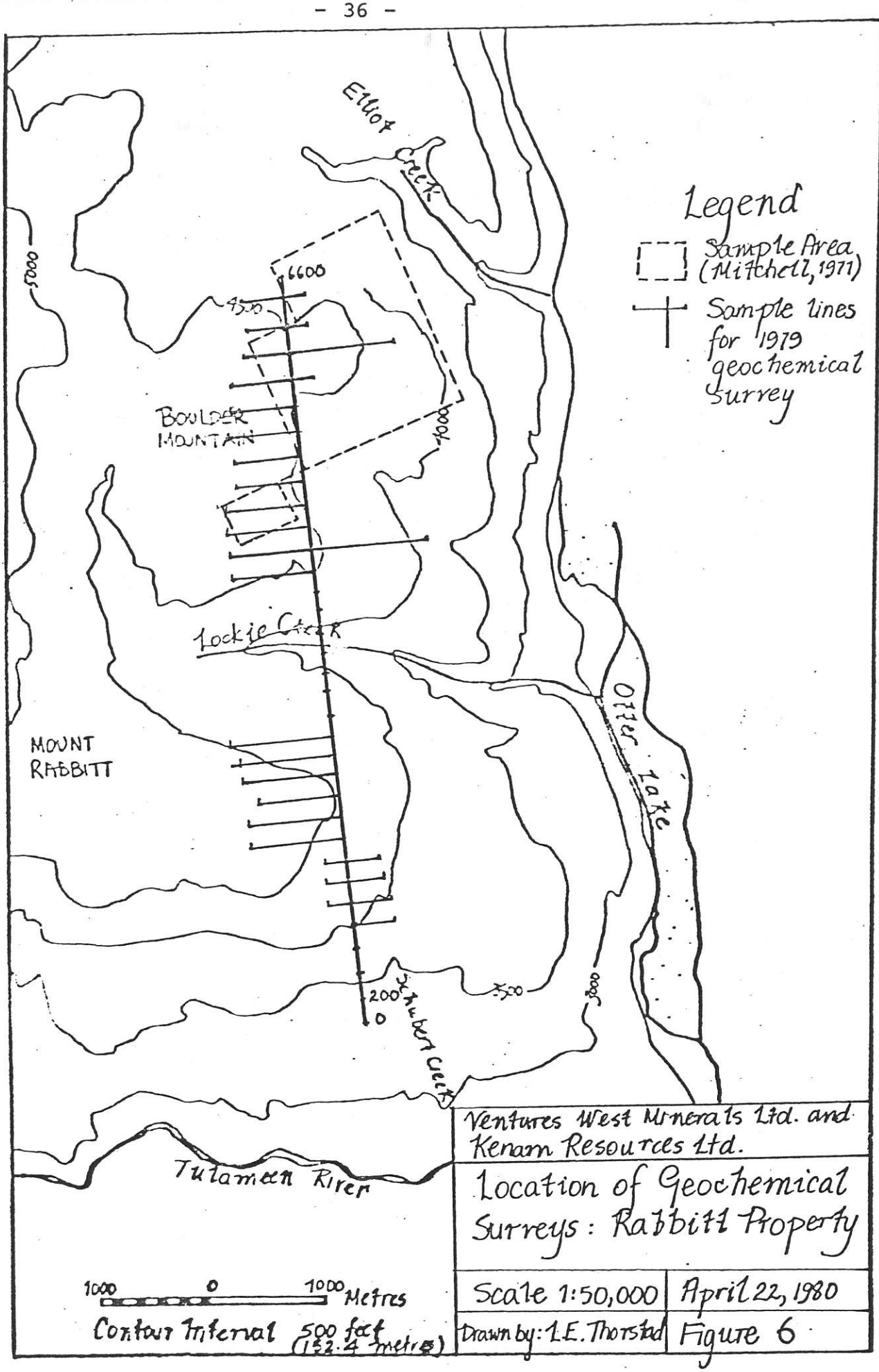
Soil geochemistry proved successful in defining anomalous zones over mineralized veins at the Cousin Jack showings. With the encouragement that soil geochemistry did define the vein mineralization, an orientation soil sampling program was conducted to determine the effectiveness of geochemistry to outline massive sulphide mineralization. Limited sampling was largely restricted to areas of known massive sulphide occurrences with some exploratory lines in areas where no sulphide mineralization is exposed. A total of 505 soil samples, taken from the "B" horizon, where possible, were collected during the initial survey. Samples were collected at 30 metre intervals along east-west lines spaced at 200 metre intervals along a north-south baseline.

Soil samples were analyzed for Cu, Pb and Zn by Chemex Labs using a strong acid extraction. Anomalous values were found for the three elements and threshold values of 50 ppm, 20 ppm and 250 ppm, respectively were determined. Two specific types of anomalies are apparent. Geochemical anomalies, dominantly for Cu and Pb and less commonly for Zn are coincident with known

massive sulphide mineralization and also appear roughly coincident with projected areas of potential mineralization.

Pb and Zn anomalies are distinct in their lack of a coincident corresponding Cu anomaly, their linear trend (i.e. there is no apparent topographic effect) and their easterly position with respect to Cu-Pb +Zn anomalies. Pb-Zn anomalies appear specifically related to the system of mineralized veins exposed at the Cousin Jack showings. Previous geochemistry defined similar coincident Pb and Zn anomalies (Mitchell 1971). This zone is open to the north and apparently continuous much further south than the 1971 survey outlined.

Soil geochemistry does appear successful in indicating massive sulphide mineralization.


Elliot Creek
5000
6600
4500
BOULDER MOUNTAIN
4000
Lockie Creek
MOUNT RABBITT
Otter Lake
3500
3000
2000
0
Schubert Creek
Tulameen River
Legend
Sample Area (Mitchell, 1971)
Sample lines for 1979 geochemical survey
1000 0 1000 Metres
Contour Interval 500 feet (152.4 metres)
Ventures West Minerals Ltd. and Kenam Resources Ltd.
Location of Geochemical Surveys: Rabbitt Property
Scale 1:50,000
April 22, 1980
Drawn by: L.E. Thorstad
Figure 6

GEOPHYSICS

Geophysical techniques have thus far proven of little use in locating and evaluating massive sulphide mineralization on the Rabbitt Property. Airborne Magnetic Survey Maps published by the B.C. Department of Mines and Petroleum Resources give no indication of the presence of anomalous body. Induced potential (Watson, 1967) and magnetometer surveys (Phendler, 1978) did not give any positive results. An induced polarization survey was carried out on the Lode Claim (now Boulder 1) in the vicinity of the Hilltop showings. A weak chargeability anomaly with no corresponding resistivity anomaly was interpreted as disseminated particles of some conductive material.

A magnetometer survey restricted to the John-X-1 (Boulder 1) claim gave only weak "highs" (in excess of 450 gammas) compared with background values ranging from 367 to 474 gammas. These high values appear to correspond to areas where disseminated pyrite and chalcopyrite were exposed in trenches. A magnetic survey run concurrently with a geochemical survey was begun by K.L. Daughtry and Associates for Ventures West Minerals Ltd. such that survey lines ran across areas of known massive sulphide mineralization. No response was noted on initial survey lines so the magnetic survey was deleted from the program.

DIAMOND DRILLING

A total of 33 diamond drill holes have been drilled on the Rabbitt property. 73 holes for a total of 3,203' were drilled on the South Copper Zone and 5 holes totalling 526' on Mid Copper were drilled for Gold River Mines (Sookochoff, 1973) from November, 1972 to March, 1973 and 33 holes on the Cousin Jack showings.

Drilling in the South Copper showing "revealed the presence of underlying schist zones which are usually heavily pyritized and intercalated, narrow, usually heavily pyritized sections of flow breccia". Drilling indicates mineralization veins from 1 to 7 ' wide and has a shallow (10 to 20°) dip.

Drill hole assays are as follows:

South Copper	Footage	Feet	% Cu	Comments on Mineralized Sections
72-1	1-110	110	1.47	CP in quartz veins and disseminated pyrite in greenstone.
72-4	314-335	21	.28	Disseminated pyrite in porphyritic greenstone
73-1	12-19	7	1.29	CP in quartz carbonate veins.
	145-150	5	.15	
73-2	32.5-42.5	10	.08	CP in quartz carbonate "veins".
	42.5-48.5	6	.28	
73-3	54-59	5	1.74	CP in quartz carbonate "veins".
73-8	8-13	5	.70	Py-CP in quartz carbonate veins.
73-10	14-19	5	.30	CP in quartz carbonate veins.
73-13	68-73	5	.43	CP in quartz carbonate veins.
	101-106	5	.11	
73-14	117-122	5	.11	Py and minor CP in quartz carbonate veins.

Diamond drilling at the Mid Copper showing suggested that extension of the mineralized zone below surface showed a "pronounced decrease in chalcopyrite mineralization" (Sookochoff, 1973). Assay data from drill holes.

Mid Copper	Footage	Feet	% Cu	Comments on Mineralized Zones
73-4	29.5-34.5	5	.04	"sulphides in quartz carbonate vein
73-5	31-36	5	.31	Disseminated Py in siliceous zone.
73-6	9-14	5	.01	Disseminated Py in siliceous greenstone and schist.
73-7	1-6	5	.21	CP and disseminated Py in silicified schist.

Assay data at both the South and Mid Copper showings indicate negligable gold values and only minor silver values that are associated with chalcopyrite.

Drill hole locations and sections (Sookochoff, 1973) are shown in Figures

Two diamond drill holes (Betmanis, 1979) were drilled for Northern Lights Resources Ltd. in 1978 on the Mid Copper showings? Disseminated pyrite and numerous quartz stringers were evident in "andesite" but no massive sulphide mineralization was intersected. Rocks from both holes were assayed at 5' intervals for MoS_2, Cu, Pb, Zn, Ag and Au and results are found in Appendix 1 and summarized below:

	MoS_2	Cu %	Pb %	Zn %	Ag oz/ton	Au oz/ton
Average concentration	.001	.012	.01	.018	.012	.001
Maximum concentration	.002	1.25	.01	.06	.22	.002
Minimum concentration	.001	.01	.01	.01	.01	.001

One drill hole on the Hilltop One showing was collared for Northern Lights but drilling was not completed. Drill core scattered in the vicinity of the "hole" was brought from the northern part of the property (Adams, pers. comm, 1979).

The Cousin Jack showing has been quite extensively drilled for Gold River Mines during the mid 1970's. No reports, drill hole plans, logs or core are available from this program.

No drill core is available from any of the drill programs conducted on the property. Drill core from the two Northern Lights holes has been preserved but, due to lack of co-operation on the part of Northern Lights Resources and Acme Labs, drift logs for all but the Cousin Jack program are appended.

RECOMMENDATIONS

The Rabbitt Property is only in initial stages of development. Work to date includes geological mapping, limited soil geochemistry and geophysical surveys and diamond drilling. Unfortunately, a large amount of data from diamond drill holes is not accessible. Limited work does indicate the presence of what may be a significant body of massive sulphide mineralization and the property deserves more attention. Recommended work includes:

1. Detailed soil geochemistry sampling to further delineate vein and massive sulphide mineralization.

2. Further geological mapping away from main mineralized zones.

3. An induced potential survey in areas of known and projected massive sulphide mineralization. The previous survey by Copper Mountain Consolidated was conducted on the hilltop showings where limited massive sulphide mineralization is observed.

4. A diamond drilling program to determine extent, grade and tonnage of mineralization should follow if results from the geochemical survey are favourable.

CERTIFICATION

I, Linda E. Thorstad, do hereby certify that:

1. I am a geologist residing in British Columbia at 3529 West 3rd Avenue, Vancouver, B.C.

2. I attended Vancouver City College for one year and the University of British Columbia for five years.

3. I have had six summers' experience in both regional and detailed mapping, and mineral exploration in Northern British Columbia, the Northwest Territories and the United States.

4. My report, dated April 28, 1980, is based on compilation of available literature on past work and showings and work on the property, September 19-21 and October 17 to November 2, 1979.

5. I have no personal interest, direct or indirect in the property covered by the submitted report.

Respectfully submitted,

Linda E. Thorstad

April 11, 1980
Vancouver, B.C.

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APPENDIX 1.

DETAILED PETROLOGY / PETROGRAPHY

OF EXTRUSIVE AND INTRUSIVE ROCKS

RABBITT PROPERTY

will be discussed separately following this section. Fragments range from grey-green feldspar ± augite porphyries, purple fine grained dacitic porphyries, fine grained silicic rocks and augite porphyries in heterolitholigic breccias.

Tuffaceous rocks are similar to the matrix of breccias and range from very fine chloritic tuffs with no apparent crystals to fine feldspar ± augite crystal tuffs. Some tuffs have a very distinctive epidote green colouring.

Only one andesitic flow was recognized in the sequence and is exposed at the Spokane-Motherlode showings. It is 1 to 1.5 metres thick, amygdaloidal and well foliated.

In thin section plagioclase is the dominant phenocryst, commonly replaced by epidote, carbonate with lesser amounts of sericite and chlorite and is generally albitic in composition. Up to 30-35% epidote is not uncommon. Sericite in ranging amounts up to 5-6% replaces feldspar phenocrysts and the fine matrix. Fine quartz grains are observed and are considered to be secondary as alteration products of other minerals. Subordinate amounts of K-feldspar are evident in the matrix. Carbonate, as irregular blebs replacing the matrix and phenocrysts, ranges from 3-10%. Chlorite replaces matrix grains, feldspar phenocrysts and pseudomorphs mafic minerals. Fine, disseminated pyrite is ubiquitous.

EXTRUSIVE ROCKS OF THE NICOLA GROUP

Andesite Breccia and Tuff

"Andesite Breccia and Tuff" represent a compositionally homogeneous, but lithologically heterogeneous, sequence of rocks. An andesite composition (used as a field and petrological term) is the main criteria for grouping the rocks.

Main field and petrological criteria used to distinguish "andesitic" fragmental rocks include: a generally dark green to epidote green, opaque matrix; the presence of abundant chlorite in the matrix; plagioclase as the dominant feldspar commonly altered to epidote and/or carbonate giving the grains a green colour (as opposed to the dominantly sericitic alteration of plagioclase in dacitic rocks); the presence of fine augite crystals or chlorite pseudomorphs after mafics and an overall brown to dark green colour to outcrops.

Andesitic lithologies vary from fine crystal or lapilli tuffs to breccias with fragments up to 8-12 cm in size, and are thought to be facies equivalents of epidotized feldspar porphyries that occur in the northern part of the property. The rocks are variably foliated with finer tuffaceous rocks exhibiting a greater degree of foliation than coarse fragmental rocks.

Coarse andesite fragmentals vary from monolithologic to hetero-lithogic breccias. One distinctive heterolithologic breccia

Andesite Breccia with Acid Volcanic Fragments

A distinctive heterolithologic breccia characterized by the presence of white, acidic volcanic fragments in a tuffaceous, andesitic matrix is interlayered and gradational with andesite and dacite fragmental rocks. Acid volcanic fragments are less abundant in certain exposures and it is possible that some outcrops may be mapped as andesite breccia. MacMillan, 1977, describes a lithologically similar unit in the Merritt area.

The matrix is augite and epidotized feldspar crystal tuff with feldspar dominant over augite. Fragments are generally acidic and vary from fine feldspar porphyries, rhyolitic(?) pumice to acid fragmental tuffs.

In thin section chlorite, carbonate and epidote commonly replace the feldspathic matrix. Carbonate and sericite also extensively replace silicic fragments. The matrix is dominantly a fine grained mass of feldspar, chlorite, opaques and lesser sericite.

Rhyolite to Rhyodacite Tuff and Breccia

Rhyolite tuff and breccia, metamorphosed to sericite schist and grey to white sericite schist with fragmental textures occur in more than one horizon and are very closely associated with exposed massive sulphide mineralization.

Andesitic to dacitic breccias are common both above and below the acid fragmental unit. Estimated thicknesses of silicic schists range from 1 to 20 metres and the units tend to be quite lensoidal.

Sericite schists tend to be white, gossanous and highly recessive. Some coarse fragments are evident in the schists but are difficult to discern due to the highly schistose nature of the rock.

Coarser silicic fragmental rocks vary from lapilli tuffs to breccias and the fragmental nature of these rocks is more easily detected due to their greater competency relative to their fine grained counterparts. Fragments range from 1 to 8 cm in size and commonly have diffuse borders. Both sericite schist and coarse fragmental schists are interlayered and gradational and their degree of foliation appears to be a function of fragment size and abundance, increasing in intensity with decreasing clast size and abundance.

In thin section "sericite schist" is a fine aggregate of quartz, K-feldspar and plagioclase extensively altered to sericite. Sericite composes 15-20% of the rock and a crude layering is defined by sericite abundance. Pyrite is ubiquitous ranging from 10-50%.

The matrix of coarser rhyolite fragmentals is similar to that of sericite schists. Fragments within the breccia contrast with the matrix in having abundant plagioclase phenocrysts and aggregates with only limited sericite + carbonate alteration. Fragments then are dominantly plagioclase, feldspar porphyries.

A distinctive, massive, white weathering unit occurs at the "Mid Copper" showing. In hand specimen and outcrop it is characterized by an almost complete lack of recognizable textures or features, by its gossanous white colour and by extensive, subparallel, limonite-filled fractures. In thin section fine feldspar and quartz grains, commonly with indistinct grain boundaries, constitute a large percentage of the rock. Plagioclase twins are bent, fractured and altered to fine sericite. Carbonate with limonite and disseminated pyrite occurs in fractures. Due to recrystallization and silicification masking original textures, the origin of this rock is somewhat enigmatic. General textures, including the presence of quartz-feldspar crystal aggregates and of apparent phenocrysts in a finer matrix, are suggestive of an altered acid tuff.

Grey Feldspar-Augite Porphyry

The grey feldspar, augite porphyry is known to occur only in the northern part of the property. It has a characteristic grey colour mottled with 1 mm white felspars and rare, dark

phenocrysts that are probably augite on both the fresh and weathered surfaces. The rock is only moderately foliated and minor disseminated pyrite is present.

Epidotized Feldspar Porphyry

Epidotized feldspar porphyry occurs dominantly in the norhtern part of the Rabbitt property and is thought to be a facies equivalent of andesite breccia and tuff. Although textures are generally suggestive of a massive, crystalline flow rock some fragmental textures are observed and the rock is probably an autoclastic flow breccia (Parsons, 1967).

Outcrops tend to be competent and dark green to brown weathering. Medium to coarse (2-6 mm) epidotized, lime green, subhedral to anhedral feldspars in a dark, grey-green matrix characterize the unit. Some samples show weak trachytic textures. Fragments, where observed, range from 3-6 cm in size and generally constitute less than 50% of the rock. Rare disseminated pyrite is also noted.

In thin section plagioclase phenocrysts are extensively saussuritized, being almost completely replaced by epidote and lesser amounts of carbonate. Plagioclase is albitic. Epidote commonly occurs as elongated blades and is probably zoisite. Chlorite and sericite (10-15% and 10-12% respectively) replace much of the fine feldspar matrix.

Chlorite also occurs as clots pseudomorphous after a mafic mineral that was probably augite. Quartz (1-2%) occurs as fine grains in the matrix and is probably secondary. Bent and fractured feldspar twins, undulose quartz and feldspar extinction and a moderately well developed foliation all point to some deformation.

Dacite Breccia and Tuff

Dacitic breccia and tuff are common throughout the volcanic sequence. The term dacite is used in this paper as a field term and is, therefore, defined on the basis of field criteria rather than stringent chemical criteria. The division and/or separation of dacitic rocks from their andesitic counterparts is difficult at best due to poor outcrop, abundant facies changes and lack unit continuity.

Dacite fragmental rocks are distinguished from andesitic rocks dominantly by matrix colour. Although colour is not commonly considered a good parameter for distinguishing rock types it does appear useful in dealing with these fragmental rocks. Dacitic rocks have a characteristic blue green, semiopaque matrix (similar to the matrix of the dacite crystal tuff, which is considered to be a facies equivalent) as opposed to the green to moss green, opaque matrix of andesitic rocks. This difference can be largely attributed to the abundance of chlorite in the matrix. Feldspar alteration products are also a useful parameter

for distinguishing the compositional changes. Plagioclase feldspar is commonly altered to sericite and carbonate in dacitic rocks while epidote and carbonate with significantly less sericite are characteristic of andesitic rocks.

Dacitic units tend to be quite resistant to weathering. Outcrops are variably foliated with finer fragmental layers and lenses being more schistose. In the southern part of the property dacitic fragmental rocks occur as both hangingwall and footwall to a thin acid horizon that hosts massive sulphide.

Fragmental rocks vary from fine tuff to coarse breccia. Fragments are generally fine feldspar porphyries of varying composition. Disseminated pyrite is abundant.

In thin section feldspars are the dominant mineral and are altered to carbonate and sericite. Fine quartz grains are evident throughout the matrix, which is a fine grained mass of quartz, sericite and feldspar with only minor amounts of chlorite.

Dacite Porphyry or Fragmental

The dacite crystal lapilli tuff has a distinctive appearance that allows easy recognition of the unit in the field. Outcrop tends to be quite competent and locally gossanous with some malachite staining. It is characterized by fine 1-3 m pink to white feldspar crystals in a fine, distinctive, blue-green matrix.

Under a hand lens the matrix has a semiopaque appearance. On a fresh surface fine feldspar crystals are cream to pink and generally show well developed cleavage faces. Matrix to crystal ratios and average crystal sizes are highly variable. Fine white to cream blebs of carbonate are evident replacing both matrix and crystals. Foliation is generally only poorly developed. Disseminated pyrite is ubiquitous and may be as abundant as 20%. Malachite staining suggests the presence of copper but no visible chalcopyrite is observed.

In thin section the rock appears fragmental (i.e. crystal lapilli tuff) rather than porphyritic. Supportive of this is the presence of heterogeneous crystal aggregates - (apparently tuff fragments) and the lack of crystalline texture in the matrix. Both plagioclase and K-feldspar are present, with the former being the dominant feldspar. Both feldspars show extensive carbonate and sericite alteration and plagioclase is albitic. The fine matrix of quartz and feldspar is slightly altered to chlorite and sericite. Carbonate occurs along fractures and as irregular blebs replacing feldspar. Pyrite, commonly associated with carbonate in fractures also occurs as cubic and as flattened blebs. Evidence suggestive of tectonism includes undulose quartz and K-feldspar, development of a poor foliation and bent and brlken albite twins on plagioclase.

Dacite crystal tuff appears to be more abundant in the northern part of the property and in this area is generally associated with acid volcanic fragmental units (i.e. rhyolite breccia tuff) and in particular with the sulphide horizon. In the southern part of the property dacite crystal tuff appears to be replaced dominantly by dacite breccia.

Purple Breccia

The purple (andesitic ?) breccia is only known to occur in the northern part of the property in the vicinity of the Cousin Jack showings. It has a very limited occurrence and is interlayered with andeistic fragmental rocks.

The breccia has a distinctive purple colour on both fresh and weathered surfaces. Fragments range from 1 to 10 cm in size and are generally feldspar porphyries with varying phenocryst percentages. The matrix is apparently a finer grained equivalent of the fragments. Numerous carbonate veinlets cut the rocks.

INTRUSIVE ROCKS

Feldspar ± Hornblende Porphyry

Feldspar porphyry occurs as dykes and sills throughout the property. It is commonly slightly gossanous and is characterized by a medium grained porphyritic texture with 1-3 mm pink to white subhedral feldspar crystals in a fine matrix. Some porphyries also contain abundant hornblende phenocrysts. Size and concentration of phenocrysts is variable, outcrops fan to pink and tend to be somewhat resistant to weathering.

Quartz-eye, Feldspar Porphyry

A fine, white weathering, quartz-eye, feldspar porphyry has a very limited occurrence on the property. Due to poor outcrop, relations to other rocks are obscured and it is difficult to determine whether the rock is a synchronous volcanic porphyry or a later intrusive. The complete lack of foliation in this rock in an otherwise foliated sequence in conjunction with the presence of tertiary granitic intrusives adjacent the property suggests a later, intrusive origin for the rock.

In hand specimen the rock is very white, pyritic and limonitic and has fine visible quartz and feldspar phenocrysts.

In thin section fine quartz-eyes exhibit some fracturing, undulose extinction, resorbed edges, embayments and some carbonate replacement. Plagioclase appears to be the dominant phenocryst, is

albitic, forms some phenocryst aggregates and is altered to sericite and carbonate. The matrix is a fine crystalline mass of plagioclase, K-feldspar and quartz with some sericite alteration. Pyrite occurs as fine cubes and irregular masses. No alignment of mineral grains is evident in thin section.

Basic Intrusive

A small outcrop of basic intrusive rock is exposed in trenches in the westerly hilltop showings. It is characterized by a pocked, brown to dun weathering surface. Contacts between the basic body and other rocks are not exposed and its configuration is therefore not defined. The rock is a fine to medium grained crystalline mass of feldspar and mafics. No distinctive crystal forms are visible to allow identification of the mafic minerals. Disseminated pyrite is abundant. The massive, non-foliated, crystalline nature of the rock is suggestive of a later intrusive origin. Rice (1952) reports a number of small basic and ultra-basic bodies that are probably related to the Olivine Mountain body.