

929

PRELIMINARY
GEOLOGICAL REPORT
HOWSON BASIN
OMINECA MINING DISTRICT
BRITISH COLUMBIA
NORCAN MINES, LTD.
W. G. STEVENSON
AUGUST 24, 1966

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INTRODUCTION

Norcan Mines, Ltd., a private company with offices at 900 W. Hastings St. Vancouver, B. C., hold a block of 200 mineral claims and fractions in central B. C. centered over Howson Basin twenty two miles west of Telkwa ($54^{\circ} 27' N - 127^{\circ} 25' W.$)

Copper mineralization was first recognized and staked in this area during 1905 and subsequent exploration and development resulted in minor production in 1917. Cominco did some underground work in 1928 and Kennecott performed surface exploration in 1952. Except for subsequent cursory examinations there was no activity on this property until March 1966 when it was staked for the present owners.

Since that time officials of Norcan Mines have had Dr. Allan Fawley review the literature which has been published on this property and have had Mr. Stan Hunter prepare a qualifying report. Mr. W. D. Tompson has set up a camp on the claim group to accomodate 15-20 men, a geophysical program has been accomplished under the direction of Mr. Cal Selmsler and a diamond drilling contract awarded to Longyear Co. During the period August 14-21, 1966, I was engaged to map the geology within their claim block and to submit a report.

SUMMARY

Approximately 80% of the property is covered by soil and rubble which masks the underlying strata. The exposures that I observed and mapped were predominately volcanics and I have estimated that a thickness in excess of 3000' of these rocks occurs within the property. In addition to the volcanics a number of outcrops of intrusive rock were mapped.

A syncline bisects the property along Howson Creek from southwest to northeast. Strong faulting was observed parallel to this syncline and closely associated with it. A subsidiary pattern of east-west, northwest-southeast and north-south faulting was recognized and mapped.

The mineralization which I saw on the property was essentially iron sulfide and iron oxide with variable and subordinate amounts of copper and possibly some molybdenum. This mineralization appears to be associated with silicification and quartz veining. The mineralization that I saw occurs in conjunction with the subordinate faults and fissures and the concentrations of mineralization were found at the intersections of these fissure systems.

GEOLOGY

The geology which covers the claim group was compiled and published by the Geological Survey of Canada in 1944 on a map, drawn to a scale of 1" = 2 miles.

While there are numerous references to the mineralized zones, as far as I am aware, the mapping that I have accomplished on this property is the only geological work more detailed than that published by the G.S.C.

GEOLOGY

Lithology

The most abundant rock type on the property is volcanic which has been strongly altered with epidote and chlorite. A number of minor intrusive bodies have been mapped. While the relation of these intrusive bodies to the enclosing rock is not well understood, they appear to have a predominant trend of N 70 E with dips toward the north. These rocks have been classed as medium-grained felsites, fine-grained diorites and fine-grained rhyolites. A great many narrow dikes were observed, particularly within the mineralization on War Eagle Creek.

During the time I was on the property a series of seventeen rock specimens were collected. These specimens are from widely spaced locations on the property

GEOLOGY, Lithology, Cont.

and their position is shown on the attached maps to a scale of 1" = 200' and 1" = $\frac{1}{2}$ mile. Dr. Robert Thompson, Professor of Geology, University of British Columbia has written a description on each specimen and a copy of his report is attached.

GEOLOGY

Structure

The axis of a major syncline with associated faulting coincides with the location of the Howson drainage. This structure divides the property in a northwest-southeasterly direction. Most of my time was spent mapping in the southern part of the claim block in the vicinity of the War Eagle mineralization. Here, the attitude of the layering in the volcanic rocks is north-south with a moderate easterly dip. This attitude is remarkably consistent and suggests a thickness of some 3000' of volcanic rock. Across this syncline and on the northern half of the property the attitude of the volcanic horizons is east-west with a southerly dip, and again the attitude is remarkably consistent.

A number of other faults and fissures were observed on the property and some of these can be projected on the surface for several thousand feet. A mineralized

GEOLOGY, Structure, Cont.

zone can be traced from War Eagle Creek northwesterly through the cirque toward the mineralization on the Joker Claim. A second zone which strikes east-west coincides with the position of the intrusive bodies recognized on the property, and the intersection of these two structures has provided the loci of the large, intensely altered, and bleached zone in the War Eagle drainage.

You will find attached a map drawn to a scale of 1" = $\frac{1}{2}$ mile which will illustrate my interpretation of the geology within the claim block.

GEOLOGY

Mineralization

The mineralized zones that I observed were, in almost every instance, associated with silicification or with quartz veins. Modest amounts of copper have been noted at widely spaced locations within the property limits. The Santa Maria vein which strikes north-south is approximately 6' wide and sufficient concentration of copper sulfides were found so that some 300 tons of ore were shipped from the property in 1917. While I did not visit the Duchess the mineralization there also occurs in a narrow vein.

GEOLOGY, Mineralization, Cont.

A number of reddish brown or tan gossan zones were observed on the property. Probably the widest and most prominent is found on War Eagle Creek. Mineralization here is localized at the intersection of a northwesterly trending structure and a series of narrow dikes within an easterly dipping structure. The visible mineralization is essentially iron sulfide which has partially altered to iron oxide, along with minor amounts of other sulfides and oxides.

A second pronounced gossan zone was observed approximately three miles northwesterly from War Eagle Creek and is called the Joker. Mineralization here is essentially iron sulfide which occurs associated with a silicified zone that appears to be controlled to some extent by the attitude of the volcanic horizons. I did not recognize any remnant copper minerals in this zone though I do suspect it might contain minor amounts of molybdenum.

These two gossans appear to be associated with the same northwesterly trending fault zone and each appears to occur at the junction of this zone with an intersecting zone.

CONCLUSIONS

As a result of my preliminary work it would appear that the mineralization on the Santa Maria prospect must have been distinct and easily discovered. The mineralization is associated with quartz which strikes north-south and dips 40-60° westerly. The vein has intrusive porphy on the hanging wall and appears to have volcanic rock on the footwall, although exposures are limited even in the old trenches across the vein.

During the time I was on the property I made several traverses to search for outcrops and it appears to me that the mapping accomplished by Mr. Will Tompson is accurate and complete, and the geophysical work by Mr. Selmsler has outlined the immediate areas of interest. Without further dozer trenching or diamond drilling I do not believe any additional information can be obtained by geological mapping in the vicinity of the Santa Maria Prospect.

The present exploration program does not have as its objective the discovery of narrow veins similar to the Santa Maria or the Duchess. These veins are only of interest in so far as they might provide data or information which will lead to large, low-grade disseminated deposits.

CONCLUSIONS, Cont.

I would expect that surface sampling of the gossan zones on War Eagle Creek or Joker Ridge would yield little encouragement. However, these gossan zones are large and significant and suggest a relationship with subsurface sources of mineralization which might lead to concealed ore deposits within the property limits.

The geophysical survey conducted by Mr. Selmsler has provided coinciding anomalies in a covered area that holds considerable promise, and I would expect that with additional work others will be found. The preliminary geological work which has been accomplished has indicated areas where structural conditions are favourable for ore deposition and where extensions of the geophysical program are deemed advisable.

RECOMMENDATIONS

After the completion of the topographic map, being prepared from existing photos, additional geological mapping should be accomplished. This should include detailed mapping at specific locations to include the War Eagle, the area surrounding the Duchess, the Evening Star and the Joker gossan zone north of Howson Creek, and reconnaissance geological mapping extending a

9.


RECOMMENDATIONS, Cont.

short distance beyond the limits of the property. Some sampling should also be accomplished.

The geophysical work which has been accomplished has included induced-polarization, electro-magnetic and self-potential surveys along with geochemical sampling for copper. I would recommend that these surveys be expanded to test responses on the ground with a magnetometer and with a scintilometer over the property. I would not expect these surveys to directly locate mineralization; rather, I would hope they might provide information which could be used to outline geological structures that could be used to indicate other areas of economic interest.

I would give some consideration to the advisability of performing an airborne geophysical survey over the property to include magnetic, radioactive and more detailed E. M. I would estimate that this could be accomplished for \$3,000.

Respectfully submitted,


W. G. Stevenson, P. Eng.
Consulting Geologist

Vancouver, B. C.
August 24, 1966

ATTACHMENTS

Geological Map Scale 1" = 2 miles * 3

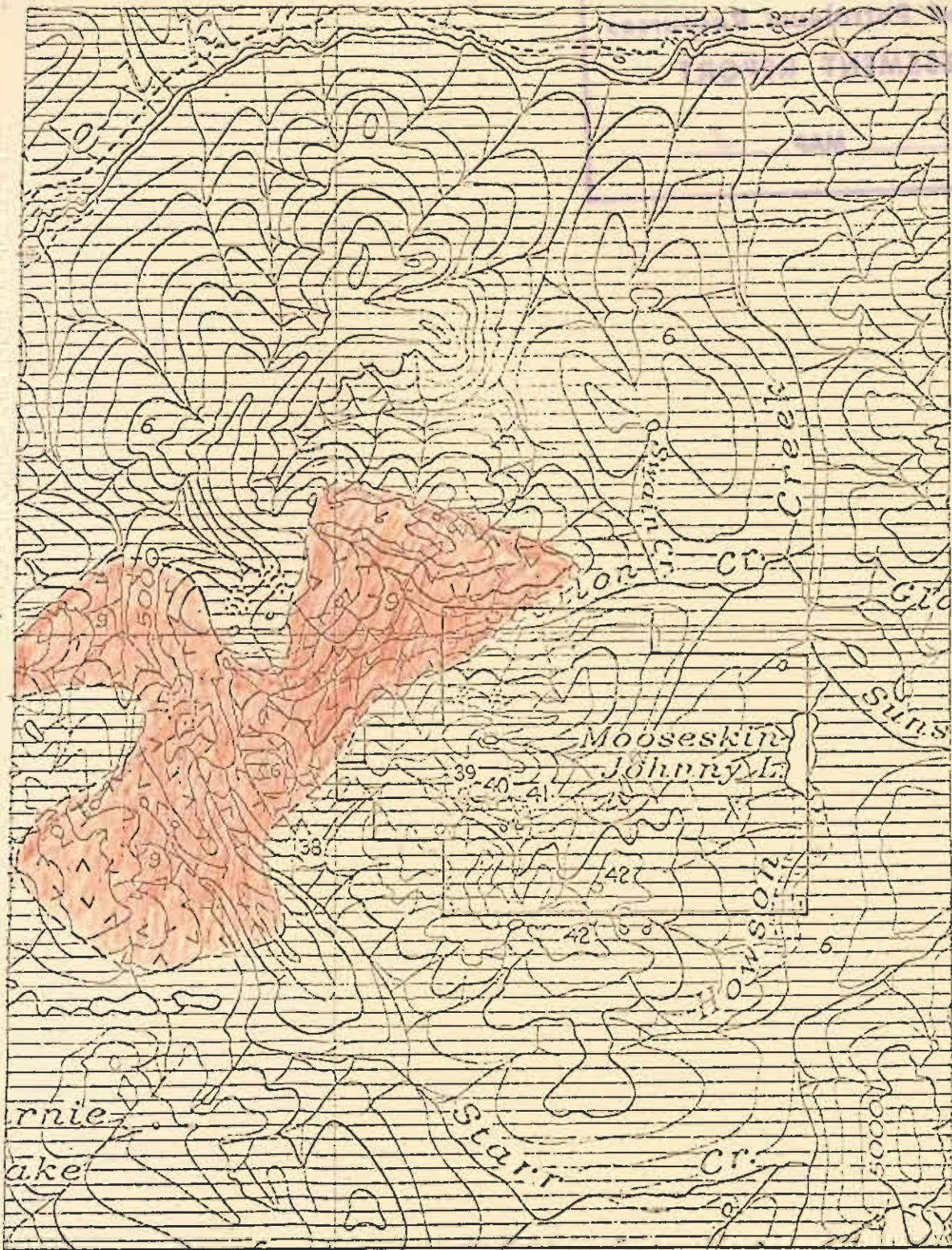
Geological Map Scale 1" = 1/2 mile * 2

Geological Map Scale 1" = 200' * 1

Report by Dr. R. M. Thompson, Professor, U.B. C.

Certificate

127° 30'



54° 30'

From G.S.C. Map 44-23
 Scale 1" = 2 miles
 showing property at
 Horcon Mines Ltd.
 Quineca M.D., B.C.

Wyo

THE UNIVERSITY OF BRITISH COLUMBIA

VANCOUVER 8, CANADA

DEPARTMENT OF GEOLOGY

AUG. 23, 1966

Mr. W.G. Stevenson, P.Eng.,
509 Stock Exchange Building,
475 Howe Street,
Vancouver 1, B.C.

Dear Bill:

Herewith a macroscopic description of the rock samples you recently left with me.

Number 1 A massive fine grained altered porphyritic lava with a few orange coloured plagioclase phenocrysts. Fine grained epidote alteration is pervasive. Hematite is present in accessory amount. The rock is malachite stained in part. One side is more even grained than the other. There may be more than one rock type here.

Number 2 A pinkish grey fine grained felsite with pronounced patches of orange coloured feldspar set in a grey aphanitic matrix. Yellow green veinlets of epidote and epidote after plagioclase is common.

Number 3 This is a fine grained black basalt. Plagioclase laths are barely visible with a hand lens. The rock contains a small amount of finely divided chalcopyrite.

Number 4 This is a black basalt similar to Number 3. It is non-porphyritic and non-amygdaloidal.

Number 5 This is a fine grained green andesite or basalt. Remnants of plagioclase and hornblende are visible. There is some alteration of feldspar to epidote and chloritic alteration of hornblende and or pyroxene.

Number 6 This rock can not be properly named without a thin section examination. The development of one or more lime silicate minerals is suspected.

Number 7 A fine grained pinkish grey rock with few nests of epidote needles as amygdale fillings, small pink feldspar phenocrysts and a few small phenocrysts of dark quartz. It may be an altered porphyritic dacite.

Number 8 The original characteristics of this rock have been obscured by extensive development of epidote. The rock is noticeably heavy. One would need field relations and or a thin section for a proper name.

Number 9 A dark fine grained volcanic with a few small phenocrysts of pink feldspar. A rather nondescript sample.

Number 10 A greenish grey altered amygdaloidal and porphyritic basalt. Relict phenocrysts of hornblende or pyroxene are chloritized. Calcite amygdules are common and epidote alteration is present.

Number 11 A grey coloured porphyritic and amygdaloidal basalt. The rock contains a few phenocrysts of pink feldspar, and many small ovoid amygdules of chloritic material. There is weak effervescence with hydrochloric acid.

Number 12 A purplish red aphanitic andesite or basalt. There are very few recognizable phenocrysts of feldspar. There is some alteration of the feldspar to epidote. Green epidotized plagioclase predominates over pink K feldspar.

Number 13 A dark grey carbonated and epidotized basalt. Amygdaloidal fillings are mainly epidote and calcite. There are a few altered feldspar phenocrysts (now epidote and calcite). Some mafic phenocrysts are chloritized.

Number 14 A light purplish grey aphanitic rock with porphyritic texture in traces. It is impregnated with pyrite.

Number 15 This is a flesh coloured porphyritic felsite with small phenocrysts of orange feldspar. There are a few small rock fragments and a little disseminated pyrrhotite.

Number 16 This is probably a fine grained brick red crystal tuff. The abundance of small yellow crystals represents altered (carbonated in part) feldspar. A minor amount of quartz is present.

Number 17 This is a quartz porphyry. Abundant clear phenocrysts of quartz are set in a creamy coloured aphanitic feldspathic groundmass.

As I mentioned to you on the telephone, Numbers 6 and 8 are probably full of lime silicates. Trusting the above may be of some assistance, I am

Yours sincerely,

R.M. Thompson
R.M. Thompson

CERTIFICATE

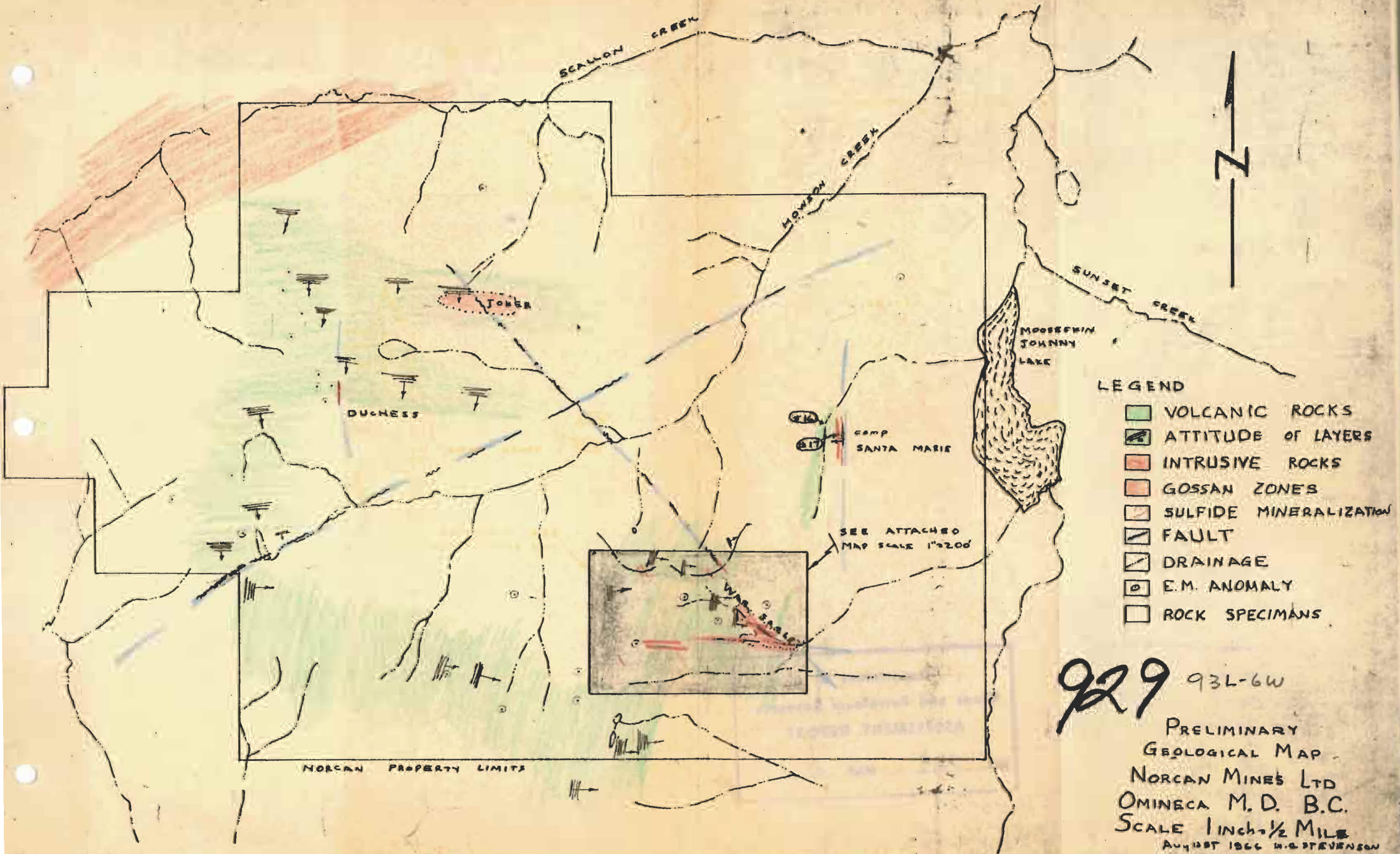
I, William G. Stevenson, do hereby certify:

1. That I am a Consulting Geological Engineer residing at Suite #9, 3750 Edgemont Blvd., North Vancouver, B. C.
2. That I am a graduate of University of Utah, 1946, with a Bachelor of Science degree.
3. That I am a registered Professional Engineer in the Association in British Columbia.
4. That I have practised my profession for twenty years.
5. That I have no direct, indirect or contingent interest in the property of Norcan Mines, Ltd.
6. That this preliminary report, dated August 24, 1966, is based on a personal examination which was accomplished August 14-21, 1966.

Dated in Vancouver, B. C.

This twenty fourth day of August, 1966


W. G. Stevenson, P. Eng.



- LEGEND**
- VOLCANIC ROCKS
 - ATTITUDE OF LAYERS
 - INTRUSIVE ROCKS
 - GOSSAN ZONES
 - SULFIDE MINERALIZATION
 - FAULT
 - DRAINAGE
 - E.M. ANOMALY
 - ROCK SPECIMANS

929 93L-6W

PRELIMINARY
 GEOLOGICAL MAP
 NORCAN MINES LTD
 Omineca M. D. B.C.
 SCALE 1 inch = 1/2 MILE
 AUGUST 1966 H.G. STEVENSON

film

SUMMARY COSTS - GEOLOGICAL SURVEY

Details of Costs:

<u>Personnel</u>	<u>Period</u>	<u>Rate</u>	<u>Total</u>
W. G. Stevenson, P. Eng.	Aug 14-24	\$100/day	\$ 950.00
M. Pete	Aug 14-24	\$700/mo.	262.50
A. Crout	Aug 14-24	\$700/mo.	<u>262.50</u>
Total labour charges			\$1475.00
Helicopter charges: 4 hr. at \$130/hr.			<u>525.00</u>
Total charges			\$2000.00

DOMINION OF CANADA:
PROVINCE OF BRITISH COLUMBIA.

To Wit:

In the Matter of costs of the geological survey of the Howson Basin property of norcan mines Ltd by W. Stevenson P. Eng during 1966.

I, Stanley John Hunter

of 6476 Churchill Street, Vancouver, B.C.

in the Province of British Columbia, do solemnly declare that the following costs from the geological survey of W. Stevenson, P. Eng. are applied as assessment work as follows:-

Charges :- W. Stevenson - \$ 950.00
Norcan mines - labour \$ 525.00
Helicopter \$ 525.00
Total charges \$ 2000.00

Distribution

Claims	Cost	Group
PR 14, PR 76A.	\$ 500	DUCHESS
PR 73	\$ 500	SANTA MARIA
CARY 14, CARY 13	\$ 500	MOOSESKIN SUMMIT
SQ 18, SQ 20 SQ 19	\$ 500	WAR EAGLE
	\$ 2000	

Details of Costs :-

Personnel	Date	Rate	Total
W. S. Stevenson, P. Eng.	Aug 14-24/66	\$ 100/day	\$ 950.00
M. Pete	" " "	\$ 200/mo.	262.50
A. Crowl	" " "	\$ 200/mo.	262.50
			\$ 1475.00

Helicopter Charges
4-hrs @ \$ 130/hr
= \$ 525.00

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

Declared before me at the city of Vancouver, in the Province of British Columbia, this 13th day of March, A.D.

Stanley John Hunter

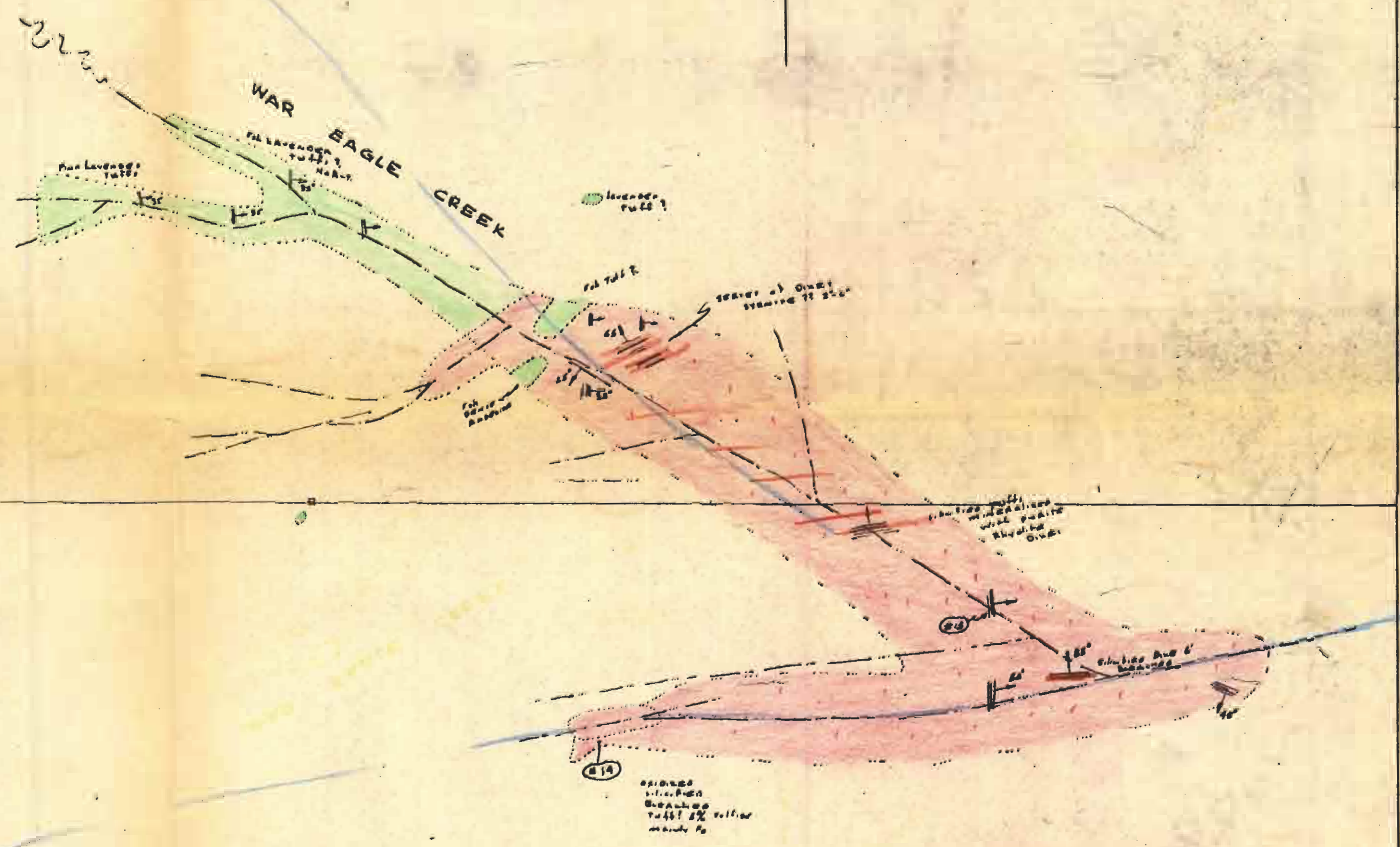
1967

[Signature]

A Commissioner for taking Affidavits within British Columbia or A Notary Public in and for the Province of British Columbia.



- LEGEND
- VOLCANIC ROCK
 - ATTITUDE OF LAYERS
 - INTRUSIVE ROCKS
 - GOSSAN ZONES
 - SULFIDE MINERALIZATION
 - ROCK SPECIMANS
 - FAULT
 - DRAINAGE
 - CIRQUE



929

PRELIMINARY
 GEOLOGICAL MAP
 NORCAN MINES LTD
 OMINCA M.D. B.C.
 SCALE 1 inch = 200ft.
 August 1966 W.G. STEVENSON