

92I/9W, 10E

A GEOLOGICAL REPORT

on the ZZ # 2-8, 15-20, 27-32, 39-44 & 50 claims

and the WILL # 1-7 & 11 fractions of

HORSESHOE MINES LTD (NPL)

Situated 7 miles west of Kamloops

In the Kamloops Mining Division

of British Columbia

N.T.S. 92 I/10(E), 9(W)

Lat: $50^{\circ}41'N$ Long: $120^{\circ}30'W$

on behalf of

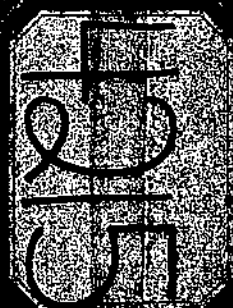
HORSESHOE MINES LTD (NPL)

by

D.R. Morgan, P. Eng

Dates of Survey: 1 June 1972 - 5 Dec 1972

Date of Report: 28 March 1973



4215

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Department of	
Mines and Petroleum Resources	
ASSESSMENT REPORT	
NO. 4215	MAP

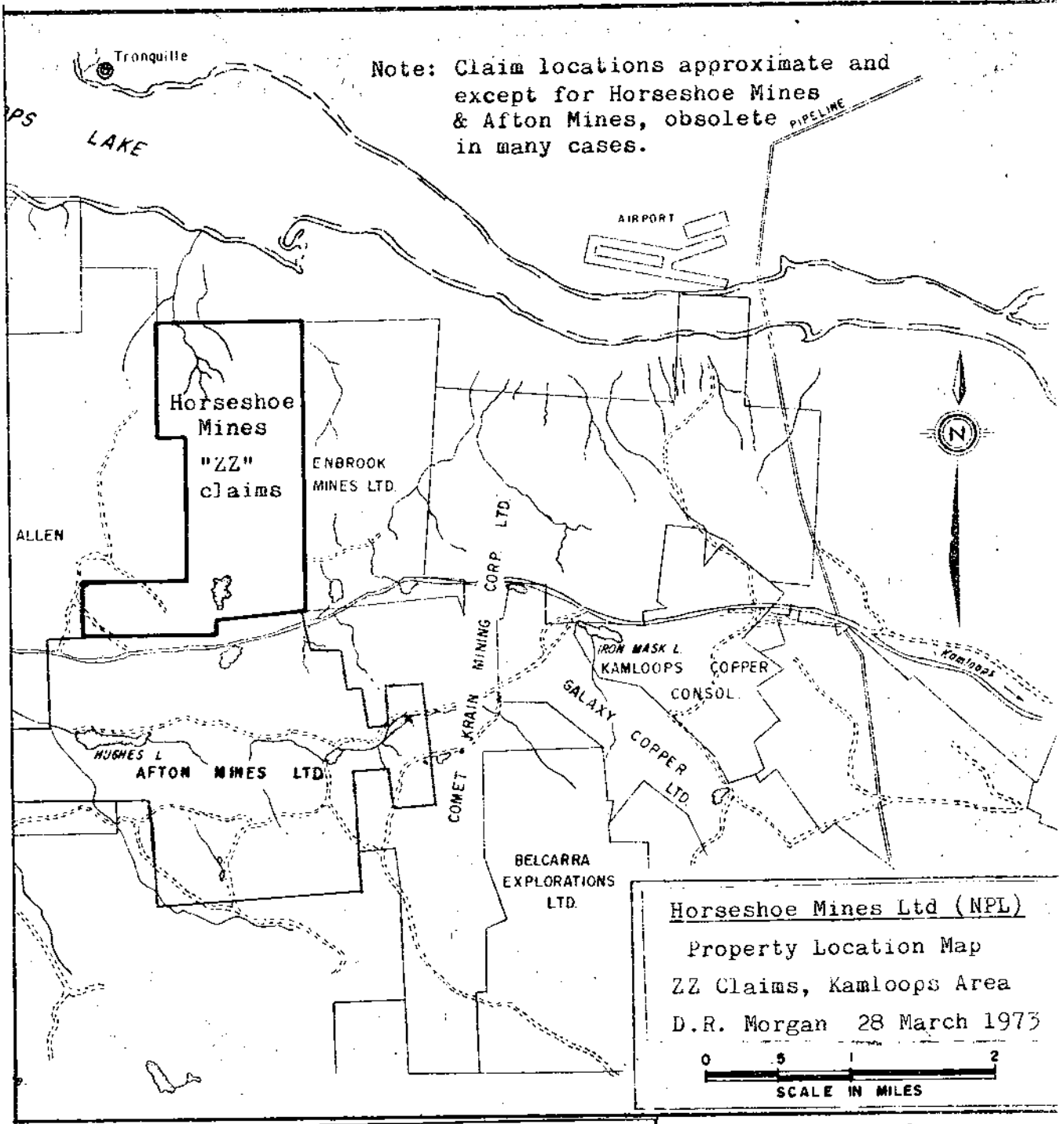


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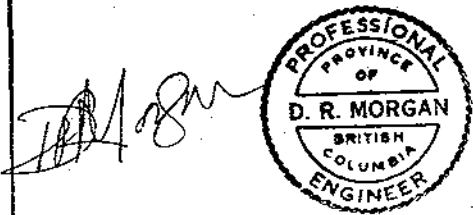
Maps Accompanying This Report

#1	"Property Location Map" - 1" - 1 mile	1
#2	"ZZ Claims Kamloops B.C. GEOLOGY - 1" to 400 feet	(pocket)



Horseshoe Mines Ltd (NPL)
 Property Location Map
 ZZ Claims, Kamloops Area
 D.R. Morgan 28 March 1973

Department of
 Mines and Petroleum Resources
 ASSESSMENT REPORT
 NO. 4215 MAP # 1



1 - 0 SUMMARY:

Geological mapping of 26 ZZ claims and included fractions was carried out by the writer in November and December 1972.

This mapping showed the property to be almost entirely underlain by Kamloops Group volcanics and Tranquille sediments with a shallow northerly dip.

In the extreme southeast corner of the property on ZZ #8 there is an outcrop of a fine grained pink and green diorite which probably belongs to the Cherry Creek Intrusions, however survey interpretations indicate that this ground may lie within the Afton Mines Ltd. property.

Minor copper mineralization (malachite) was observed in a fracture in an outcrop of purple fragmental andesite in the footwall of the Tranquille sediments on ZZ #20.

A dark green, hard splintery, pyritic andesite fragmental occurs in the southeast corner of the property on ZZ #7.

2 - 0 CONCLUSIONS:

The exploration potential of this property is seen to be in three areas:

1. Adjacent to the Afton Orebody: Three possibilities are seen here:

(a) Mineralized Iron Mask intrusives may lie at the base of the Kamloops Volcanics.

(b) Mineralized Nicola Group rocks may lie at the base of the Kamloops volcanics.

(c) The Kamloops Volcanics may themselves be pre-ore (See Livingston cited by Preto, M of M '67, p.137) and may therefore host mineralization.

2. Claim ZZ #20: Copper mineralization in the purple fragmental andesite should be carefully explored. Similar copper mineralization occurs in this rock type on Rayore ground approximately $\frac{1}{2}$ mile to the northeast, where it has been explored by a short adit. A similar showing also occurs about 1 mile east of the adit.

3. Claim ZZ # 7: The pyritic andesite fragmental exposed at two outcrops on this claim should be carefully explored.

3 - 0 INTRODUCTION:

3 - 1 Scope & Dates of Report: On May 31st 1972 the writer was asked by Mr. A. Joe, President of China Commercial Corporation Ltd., to make a geological examination of the Company's ZZ claims in the Kamloops area, B.C.

Geological field work was continued at intervals through the year and was halted on 5th December 1972 when the geological mapping of the property on a scale of 1 inch to 400 feet was complete.

3 - 2 Title: The property consists of 34 claims in which China Commercial Corporation Ltd holds a 75% interest and Horseshoe Mines Ltd a 25% interest. An application for a Certificate of Work was filed on 15th March 1973 as summarized below:

<u>Number</u>	<u>Name of Claims</u>	<u>Record Number</u>	<u>Years Applied</u>	<u>New C of W Due</u>
7	ZZ # 2 - 8	78062 - 78068	2 each	21 March 1975
6	ZZ # 15 - 20	78073 - 78078	2 each	21 March 1975
6	ZZ # 27 - 32	78083 - 78088	2 each	21 March 1975
6	ZZ # 39 - 44	78093 - 78098	2 each	21 March 1975
1	ZZ # 50	78103	3	21 March 1976
7	WILL # 1-7 Frs	119464-119470	2 each	7 June 1975
1	WILL # 11 Fr.	120994	2	26 July 1975

34 total

Of these claims, 33 have been grouped (on 15 March 1973) as the "Shoe" group. The one remaining claim - ZZ # 50 - was found by surveys carried out in 1972 to be separate from the other claims.

A legal survey of the property was carried out in 1972 by J.G. Cameron (BCLS) of Underhill & Underhill, 1646 W.7th Avenue, Vancouver, B.C. Lot numbers were assigned as follows:

<u>Lot #</u>	<u>Claims</u>	<u>Type of Survey</u>
1928	ZZ # 50	Claim Survey
1929	ZZ # 2,4,6,8, & WILL # 1,7 Frs.	Perimeter "
1930	ZZ # 3,5,7,15,16,17,18,19,20,28,30,32 & WILL # 2,3,4,5. Frs	Perimeter "
1931	ZZ # 27,29,31,39,40,41,42,43,44 & WILL # 6,11 Frs	Perimeter "

4 - 0 HISTORY:

As far as the writer is aware, no systematic exploration has been carried out on this property except by China Commercial Corporation and Horseshoe Mines Ltd. This work has been as follows: 1969; A geochemical survey of the entire property was carried out. A total of 5.2 miles of base line and 34.5 miles of crosslines were laid out. Sampling (soils) was carried out at 200 foot intervals along lines spaced at 400 feet. These samples were analyzed for copper.

This survey: "outlined a weakly anomalous zone measuring approximately 3200 feet long in the S.E. part of the claim group, and extending to the east of the group. Two slightly stronger areas of interest occur within the zone. Although outcrop occurs within the zone, no copper mineralization has been reported to account for the anomalous conditions." (Assessment Report # 2323)

1970: A magnetometer survey was carried out along the line grid. the results of this work are described in Assessment Report # 2866.

1971: Prospecting follow-up work was carried out by a two man prospecting team. No outcropping mineralization was found on the property, but since some copper mineralization occurred on a property adjacent and to the east a limited amount of bulldozer trenching was done there as it was considered the results might be useful. This work was carried out by Mr. Doug Bowyers, the rancher who owns the surface rights in this area. This trenching which was carried out approximately 5,000 feet east of the N.E. corner of ZZ # 19, exposed purplish andesites sheared at 140° and mineralized with minor malachite.

1972: A geological survey of the entire property was carried out by the writer. This survey forms the subject of this report.

In addition, a legal survey of the property was carried out by J.G. Cameron (BCLS) of Underhill & Underhill.

5 - 0 GEOGRAPHY:

5 - 1 Location: The property is located 7 miles due west of Kamloops, B.C. and adjoins and lies to the north of the Afton Mines property and the Trans Canada Highway. The property is in the Kamloops Mining District, straddles National Topographic System areas 92 I/10(E) and 92 I/9(W) and has a latitude of $50^{\circ}41'$ N and a longitude of $120^{\circ}30\frac{1}{2}'$ W.

5 - 2 Access: The property is accessible from the Trans Canada Highway which skirts its southern margin. Dirt roads provide access to much of the property and the open rangeland is mostly accessible to four wheel drive vehicles without roadbuilding.

5 - 3 Topography: The property covers an east-west ridge with gentle south facing slopes and steeper north facing slopes above Kamloops Lake. Elevations range from 1,600 to 2,800 feet above sea level.

6 - 0 REGIONAL GEOLOGY:

The oldest rocks in the area are the volcanics of the Upper Triassic Nicola Group. This group has been intruded by the north-westerly trending Iron Mask Batholith of Jurassic (and later) age, composed of a gabbro-diorite phase and a microdiorite-micromonzonite phase.

Two late stage intrusives occur within the batholith, generally concordant with its northwest trend. These are the Sugarloaf porphyritic microdiorite and the Cherry Creek porphyritic microdiorite, latite porphyry, trachyte porphyry and igneous breccia. These late stage intrusions appear to have been localized by three major northwesterly trending fracture systems within the batholith.

"Known occurrences of copper mineralization also follow these active zones (fracture systems), and in virtually every instance they are accompanied by the presence of Sugarloaf and/or Cherry Creek intrusions which can be seen either at the surface or in diamond drill core." (Preto - Min. of Mines An. Rep. 1967, p.140)

"Afton's Lake Zone is located in an area of structural intersections that have undergone intensive brecciation and fracturing. The rocks range from quartz diorite through diorite and monzonite to syenite. The alteration is generally so intense that the original character of the rocks is not readily discernible.

Mineralization occurs primarily along fractures and within brecciated areas in the form of native copper, chalcocite, bornite, and chalcopyrite. Magnetite and hematite are pervasive.

Strong suggestions have been made regarding the presence of Nicola volcanics which are mineralized." (Bell, C.W. & Saleken, L.W. quoted by Chester Millar, Western Miner, Feb.'73)

7 - 0 GEOLOGY OF THE PROPERTY:

7 - 1 General Statement: In general, mapping showed the property to be underlain by basalts, andesites and sediments of the Kamloops Group with a northerly dip of about 30°. In the extreme southeast corner of the property there is an outcrop of Cherry Creek microdiorite. This outcrop and the Afton orebody 4,000 feet to the west, are separated from the volcanics to the north by a regional east - west fault.

Minor copper mineralization was observed in a purple volcanic fragmental underlying the (Tranquille) sediments. Similar mineralization occurs in this volcanic to the east and northeast on an adjacent property.

7 - 2 Rock Types: No microscopic examination of the rocks on this property was made. The following descriptions are based on examination in the field and from specimens.

Cherry Creek Intrusions:

Microdiorite (1): Very fine grained and apparently equigranular, the brownish pink feldspars are interspersed with dark green flecks of an altered mafic. There are occasional pale subhedral phenocrysts and magnetite appears to be a finely dispersed accessory. This intrusive is probably the oldest rock type on the property.

Kamloops Group Volcanics:

Latite & Quartz Latite (2): An aphanitic brownish grey volcanic in which subhedral very fine grained feldspars are sometimes visible

quartz is scarce (outcrops # 46-49, 51 & 53) and finely dispersed limonitic cavities are common. Quartz is present up to about 10% (ocps # 36 & 37) in what is probably a separate flow of quartz latite. These volcanics are here described as latites solely on the basis of appearing richer in interstitial mafics than a typical rhyolite and poorer than a typical andesite or dacite.

Andesite (3): A dark green, splintery and weakly pyritic volcanic in which pale green subhedral, fine grained feldspar phenocrysts are fairly abundant. (Ocps # 44 & 52)

Andesite (4): A purple sometimes pinkish fragmental, usually much decayed and weathered. Fragments range in size up to 5 inches (ocp # 55), but are typically $\frac{1}{2}$ inch in size. Under the lens, white or greenish feldspar phenocrysts are often abundant (20%) in an aphanitic pink or reddish groundmass. Fine grained olivine phenocrysts are also abundant (5-10%) and occasional euhedral phenocrysts up to 2 mm are seen. This rock is probably an agglomerate.

(Ocps # 42, 43, 55-61, 63 & 64)

Quartz Diabase, Latite (5): Lying immediately to the west of and on strike with the purple andesites (4) is an area underlain by: A dark grey fine grained quartz diabase with prominent olivine phenocrysts altered to a waxy brown serpentine (ocp # 39), a very fine grained phase of this (ocp # 28), and a grey splintery latite (ocp # 41).

Siltstones, Shales (6): These are the Tranquille Beds mapped by Cockfield and appearing on G.S.C. map # 886A (Nicola). They consist here of thin bedded ($\frac{1}{2}$ - 2 inch) creamy white siltstones with lesser (5%) interbedded black shales. The siltstones are very crumbly and poorly consolidated while the shales are well consolidated. (Ocps # 22, 29, 33, 38, 50 & 62)

Basalt (7): Generally dark grey to black, hard, splintery and aphanitic (ocps # 18-20, 25) but sometimes buff coloured (ocp # 24) and carrying abundant olivine altered to serpentine (ocp # 23)

Andesite (8): A dark greenish grey volcanic with prominent white amygdules (3-4mm) of milky quartz.

7 - 3 Structures: The major structures on the property are as follows:

1. The Attitude of the Kamloops Volcanics: This is most clearly expressed by the enclosed Tranquille sediments, but is also sometimes seen in flow contacts. Attitudes measured ranged as follows:

<u>Outcrop</u>	<u>Feature</u>	<u>Strike</u>	<u>DIP</u>
4	Flow contact	300°	22° N
14	" "	325°	35° N
18	" "	270°	23° N
22	Tranquille sediments upper contact	275°	33° N
33	" "	270°	29° N
38	" "	257°	28° N
40	" "	255°	32° N
58	" "	260°	29° N

2. The Regional Fault at the south margin of the property: The location of this fault is inferred by the abrupt change in rock types from Iron Mask intrusives on the south to Kamloops volcanics on the north. In the vicinity of the property the fault is followed closely by the Trans Canada highway.

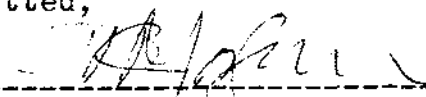
7 - 4 Mineralization: At outcrop # 60 a prominent bluff of reddish volcanic fragmentals lies on the north side of the valley about 200 feet from the dirt road. Calcite or ankerite filled fractures up to $\frac{1}{4}$ " and striking 355° with a vertical dip, cut a very much decayed purplish volcanic fragmental. Adjacent to one of these fractures the volcanics are stained with malachite across approximately two inches. This minor showing was the only mineralization seen in outcrop on the property during mapping.

As noted in section 2 - 0 on page 1, a similar showing occurs in this purple andesite fragmental on an adjacent property approximately 230 feet E.N.E. of outcrop # 60. At this point a short adit has been driven at 058° just below a rock cut which exposes a fracture stained with malachite and chrysocolla across about 2 inches. This fracture strikes 125° and dips vertically.

As noted in section 4 - 0 on page 3, a similar showing on adjacent ground lies 5,000 feet east of the N.E. corner of ZZ # 19 where purplish andesites sheared at 140° and mineralized with minor

malachite have been exposed by bulldozer trenching carried out by the Company in 1971.

Respectfully Submitted,



David R. Morgan, geologist, P. Eng.

Vancouver, 28 March 1973



8 - 0 DECLARATION OF COSTS:

DOMINION OF CANADA:

PROVINCE OF BRITISH COLUMBIA.

To WIT:

In the Matter of the geological survey on the
ZZ # 2-8, 15-20, 27-32, 39-44 & 50 and the
WILL # 1-7 & 11 fractions held by Horseshoe Mines
Ltd (NPL) 7 miles West of Kamloops, B.C. ,

I, David R. Morgan, geologist, P. Eng

of 3424 West 6th Avenue, Vancouver 8, B.C.

in the Province of British Columbia, do solemnly declare that the following costs were incurred
in carrying out the work:

Personnel:

David R. Morgan, Geologist: June 1,2,15,20. July 21.
October 18,19. November 28-30. December 1-5 plus
5 days compilation & report writing, 23 days at
\$125/day: 2,875.

Transportation:

590 miles @ 10¢/mile, 8 days at \$10/day	139.00	
U - Drive	85.00	
120 miles @ 15¢/mile	18.00	
540 miles @ 15¢/mile	<u>81.00</u>	323.

Room & Board:

Meals & groceries	53.36	
Motels	<u>66.80</u>	120.16

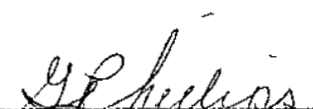
Survey Supplies, Drafting Expenses,
Report Typing expenses

101.44
3,419.60

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 30th
day of March 1973 A.D.




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

Sub-mining Recorder

In the Matter of

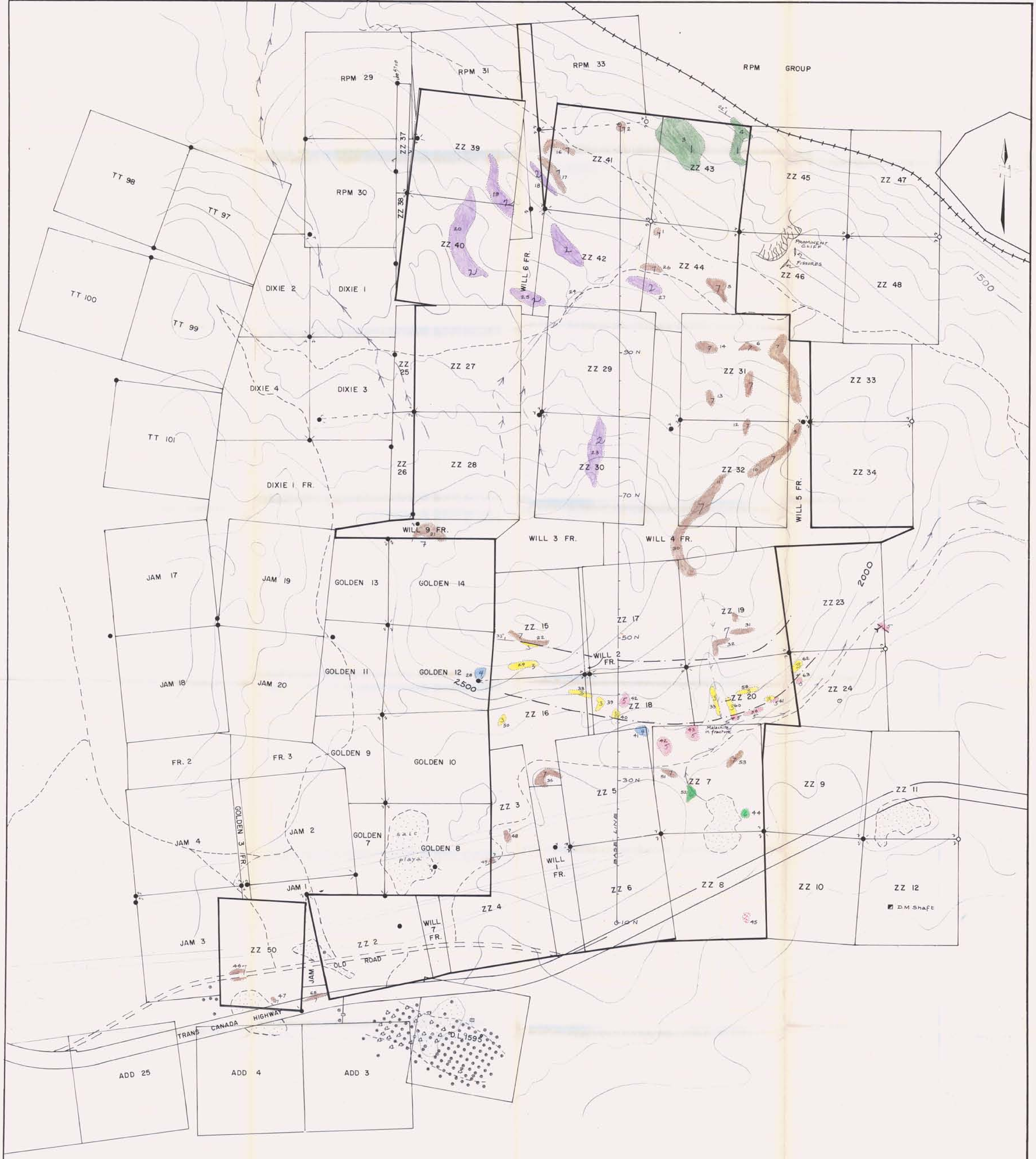
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Statutory Declaration
(CANADA EVIDENCE ACT)



LEGEND

	Andesite, amygdaloidal (Ocp. 3,4)
	Basalt (Ocp. 18-20, 23-26)
	Siltstones, shales (Ocp. 22, 27, 33, 38, 50, 42)
	Quartz diabase, latite (Ocp. 28, 32, 41)
	Andesite fragmental (Ocp. 42-43, 55-61, 63, 49)
	Andesite, pyritic (Ocp. 44, 52)
	Latite (Ocp. 1, 2, 8-15, 16, 17, 21, 24, 25, 30-32, 34, 37, 40-41, 43, 23)
	Microdiorite (Ocp. 49)
	Contact
	Rotary-Percussion-Diamond drill holes

TRANQUILLE
KAMLOOPS
CHERRY CREEK

4215 M-2

HORSESHOE MINES LTD (N.P.L.)	
"ZZ" Claims Kamloops B.C.	
GEOLOGY	
Scale: 1" to 400 feet	To Accompany a Geological Report on the "ZZ" Claims, Kamloops B.C., by D.R. Morgan, P.Eng., Dated 28 March 1973
Date: 28 March 1973	
By: D.R. Morgan, P.Eng.	
Survey: Amex	