

ARIS SUMMARY SHEET

District Geologist, Kamloops

Off Confidential: 92.08.28

ASSESSMENT REPORT 21769

MINING DIVISION: Kamloops

PROPERTY: Rawhide

LOCATION: LAT 50 09 30 LONG 121 49 30  
UTM 10 5556677 583933  
NTS 092I04W

CLAIM(S): Rawhide 1-2

OPERATOR(S): Cardinal, D.G.

AUTHOR(S): Cardinal, D.G.

REPORT YEAR: 1991, 18 Pages

COMMODITIES

SEARCHED FOR: Gold, Silver, Magnesite, Talc

KEYWORDS: Ultramafic terrane, Faults, Serpentine, Talc, Magnesite

WORK

DONE: Geological, Physical

GEOL 200.0 ha

LINE 7.0 km

TREN 67.0 m 7 trench(es)

MINFILE: 092ISW051, 092ISW053

LOG NO: 911104	RD.
ACTION:	
FILE NO:	

Geological Assessment Report

on the

RAWHIDE 1 and 2 MINERAL CLAIMS

A Potential Talc Deposit

Located in the

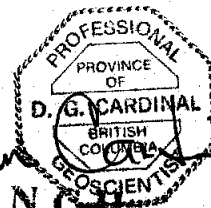
Kamloops Mining Division  
Latitude 50° 10' and Longitude 120° 50'  
NTS 92I/4E&4W

Report prepared on behalf of

HIGHLAND TALC MINERALS LTD.  
Hope, B.C.

by

D.G. Cardinal, P.Geo., F.G.A.C.  
Hope, B.C.  
October 25, 1991



GEOLOGICAL BRANCH  
ASSESSMENT REPORT

21,769

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## A. TERMS OF REFERENCE

### A.1 INTRODUCTION

Over the last several seasons D.G. Cardinal (the author) has carried out systematic geological and prospecting surveys on the Rawhide Claims 1 and 2 (the Property). The author was initially attracted to the area because of the geological setting which is favourable for precious metals and reports of old gold workings.

It was during one of these surveys in 1986, that talc float was first noted along a small stream. The next season follow-up work located the source to the talc. Also at this time, some preliminary background data search was conducted and talc was found to be an important industrial mineral. Published market surveys indentified talc as having varied uses in industrial sector.

In 1989, preliminary surveys were conducted over the recently discovered talc zone. Magnesite an other important industrail, was also found to be associated with the talc. During the field seasons of the 1990 and '91 detail mapping and trenching outlined a potentially significant deposit of talc and associated magnesite.

### A.2 SUMMARY

- a.1 The Property is located approximately 50 road-kilometres northwest of Boston Bar. Access is via a series of seasonally maintained forestry and log haulage roads. A logging road comes within 800-1000 metres of the talc zone.
- a.2 The Property consists of 35 contiguous claim-units. It covers mountainous topography which forms part of the Coast Range Mountains. For future development, Boston Bar and Hope areas can supply the required heavy equiment and experienced labour.
- a.3 Regional geology consists of northwest-southeast trending serpentinite-ultramafic belt. The belt is in fault-contact with andesitic greenstones and phyllites intruded by the coast range granites.
- a.4 The Property is underlain by a complex series of fault-imbricated serpentinite structures. The serpentinite hosts at least 3 separate talc zones. The main zone potentially hosts a significant deposit of talc and associated magnesite.
- a.5 Based on the detail mapping and trench-sampling, geological inferred reserves were calculated for the main zone. An in-situ deposit tentatively containing in the order of 8.7 million tonnes (9.6 million tons) of combined talc and magnesite has been preliminary outlined. Results from the trench samples assay between 41.6-57.6% talc and 33,9-52.9% magnesite.

### A.3 LOCATION AND ACCESS

The Property can be reached from Boston Bar-North Bend using well maintained gravel roads including a powerline right-of-way. This first section of road is about 30km in length. The remaining section follows a log haulage road along Kwioek Creek and North Fork Kwioek for a distance of some 20km. Clear-cut logging activity is within 800-1000m of the main talc zone.

The community of Boston Bar is situated on the Trans Canada Highway. The town of Hope is located some 60km south of Boston Bar.

### A.4 PROPERTY INFORMATION

The Property consists of 35 contiguous claim-units and covers some 875 hectares (2,162 acres). It is located within the Kamloops Mining Division. The map co-ordinates are, Lat. 50° 10' and Long. 120° 50', on the NTS map sheet 92I/4E&4W.

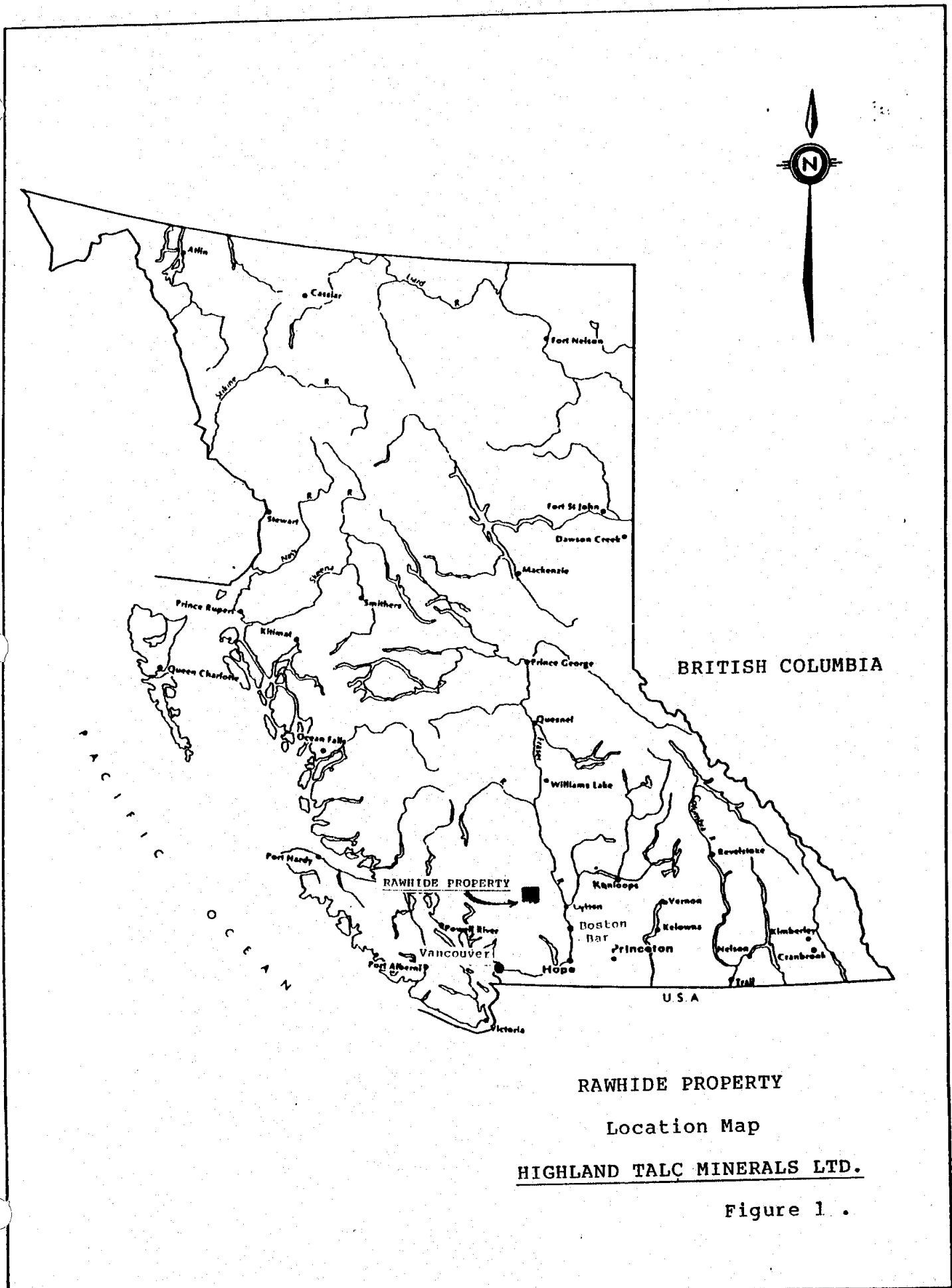
Highland Talc Minerals Ltd. holds 100% interest in the Property. Pertinent claim data is outlined as follows:

Claim Name	No.of Units	Record No.	Record Date	Expiry Date
Rawhide 1	15	5849	08/28/84	08/28/93
Rawhide 2	20	5850	08/28/84	08/28/93

### A.5 PHSIOGRAPHY AND INFRASTRUCTURE

The Property is situated along the eastern portion of the Coast Ranges. The deposit occurs at about 1800m A.M.S.L. (5900ft) adjacent to small tributary which forms part of the headwaters of Kwoiek Creek. The climate in this region is influenced by the dry interior-type weather conditions. The Property normally experiences hot, dry summers and usually free of snow between late June to early October.

For possible future development, the Property is near to the required infrastructure. It is within 20 road-kilometres of the Fraser Canyon which forms a major transportation corridor for railways, highways and including powerlines. It is accessible from Boston Bar which supports an experienced labour force including heavy machinery and a lumber mill.

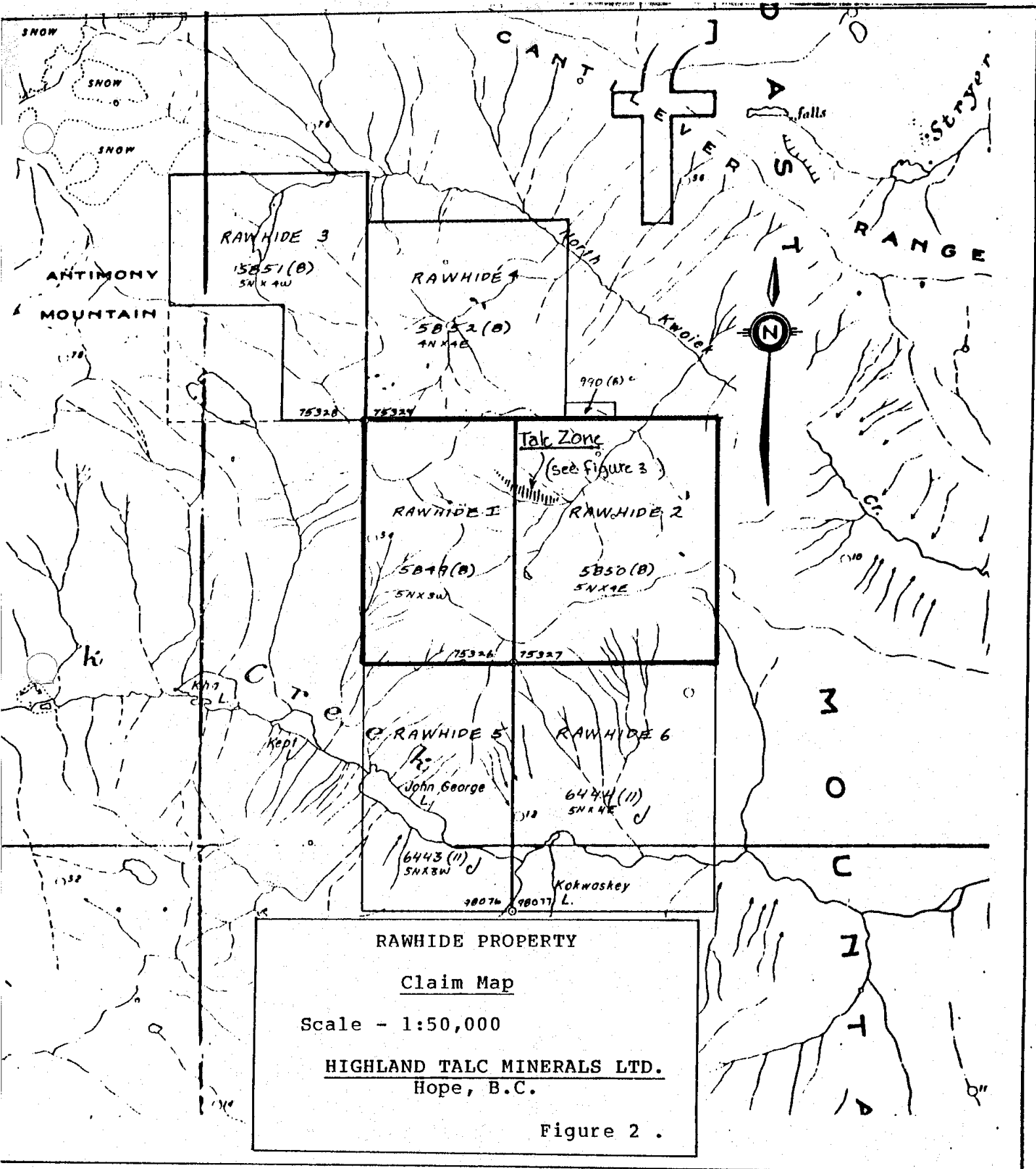


RAWHIDE PROPERTY

Location Map

HIGHLAND TALC MINERALS LTD.

Figure 1 .



## A.6 BRIEF BACKGROUND

In 1984, the Property was initially staked to cover a number of old gold workings. During the 1987 reconnaissance gold surveys, talc mineralization was identified. Subsequent surveys delineated a talc deposit.

Between 1989 and 1991, the author conducted detail geological surveys and trenching over the talc zone. During the 1990-91 detail surveys an extensive deposit of talc and associated magnesite was defined. Results from the trench sampling contained up to, 57.6% talc and 52.9% magnesite.

## B. FIELD WORK AND SURVEYS

### B.1 GEOLOGY

The Property covers the northwestern extension of a regional northwest-southeast trending alpine ultramafic terrane, referred to above as a serpentinite ultramafic belt.

The ultramafic terrane in this area is represented by a metamorphic complex consisting of faulted serpentine. The serpentine is marked by series of subparallel, imbricated fault structures. It is also fault bounded by a thick sequence of andesitic greenstone along its' eastern margin and a phyllite/slate sequence on its' western margin.

Regionally, the Coast Range granites partly enclose the serpentine-metamorphic complex to form in part a northwesterly-southeasterly trending roof pendant. The complex is believed to be Permian to Jurassic in age.

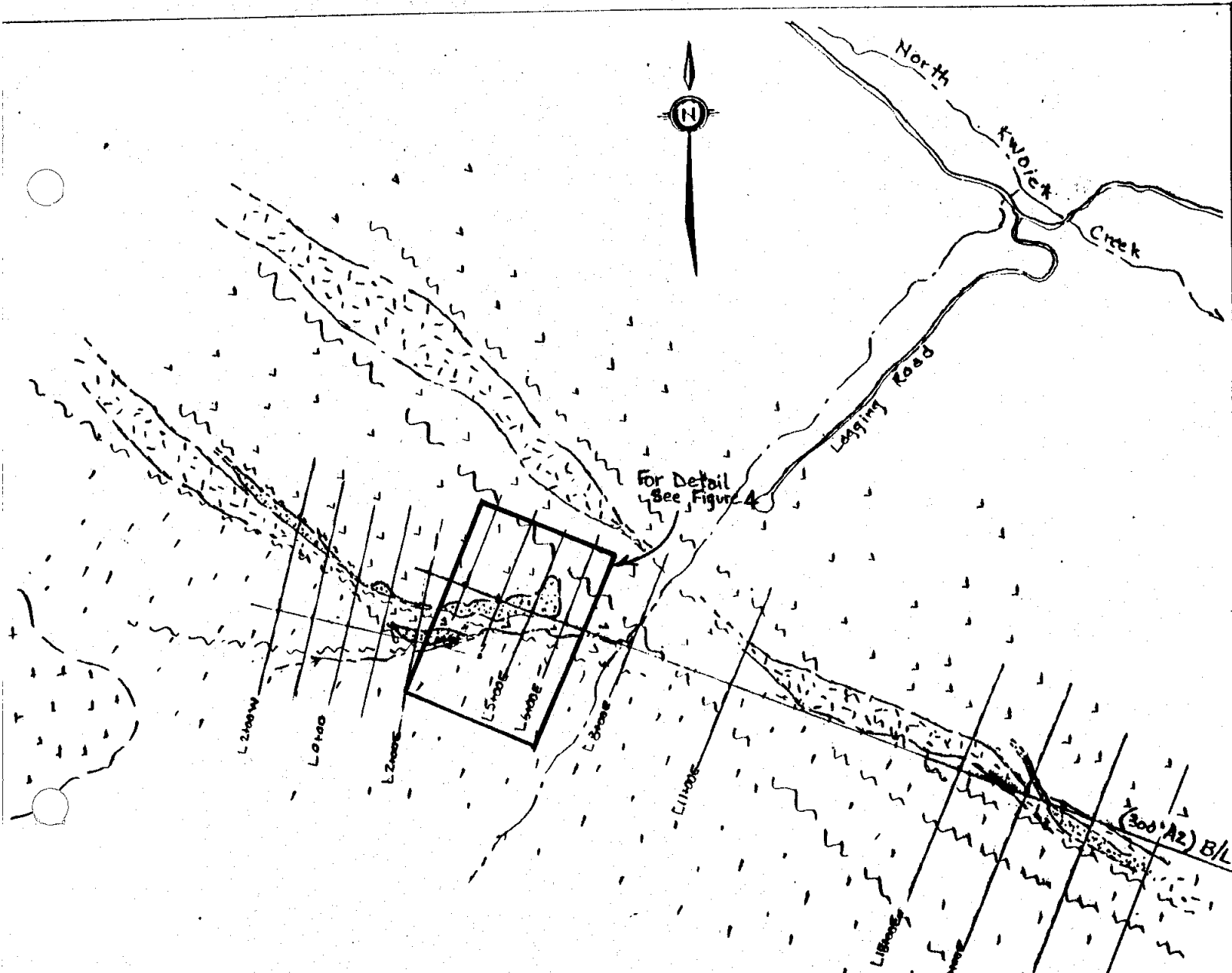
### B.2 FIELD PROCEDURES

A detail gridline was established over the main talc zone. The baseline runs approximately parallel to the strike of the zone with crosslines at every 100m and stations every 25m along crosslines. The baseline is 2400m in length. All geological mapping surveys and bedrock outcrops were tied into the grid.

A number of trenches of varying lengths were also tied to the grid system. Six (6) of the trenches were sampled in detail. A continuous chip sample representing the length of each sample trench was obtained for analysis.

The samples were shipped to the Alberta Research Council in Edmonton for quantitative analysis for talc, magnesite and related elements.















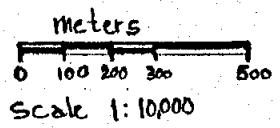
# HIGHLAND TALC PROJECT





## PROPERTY GEOLOGY - RAWHIDE CLAIM

GENERAL GEOLOGY - BASE MAP

### Legend:

-  Talc-Magnesite Mineralization
-  Talcose schist
-  Bridge
-  River
-  Complex
-  Volcanic, Andesitic Greenstone
-  Phyllite, schist
-  Coast Range
-  Granite
-  Granite, Granodiorite

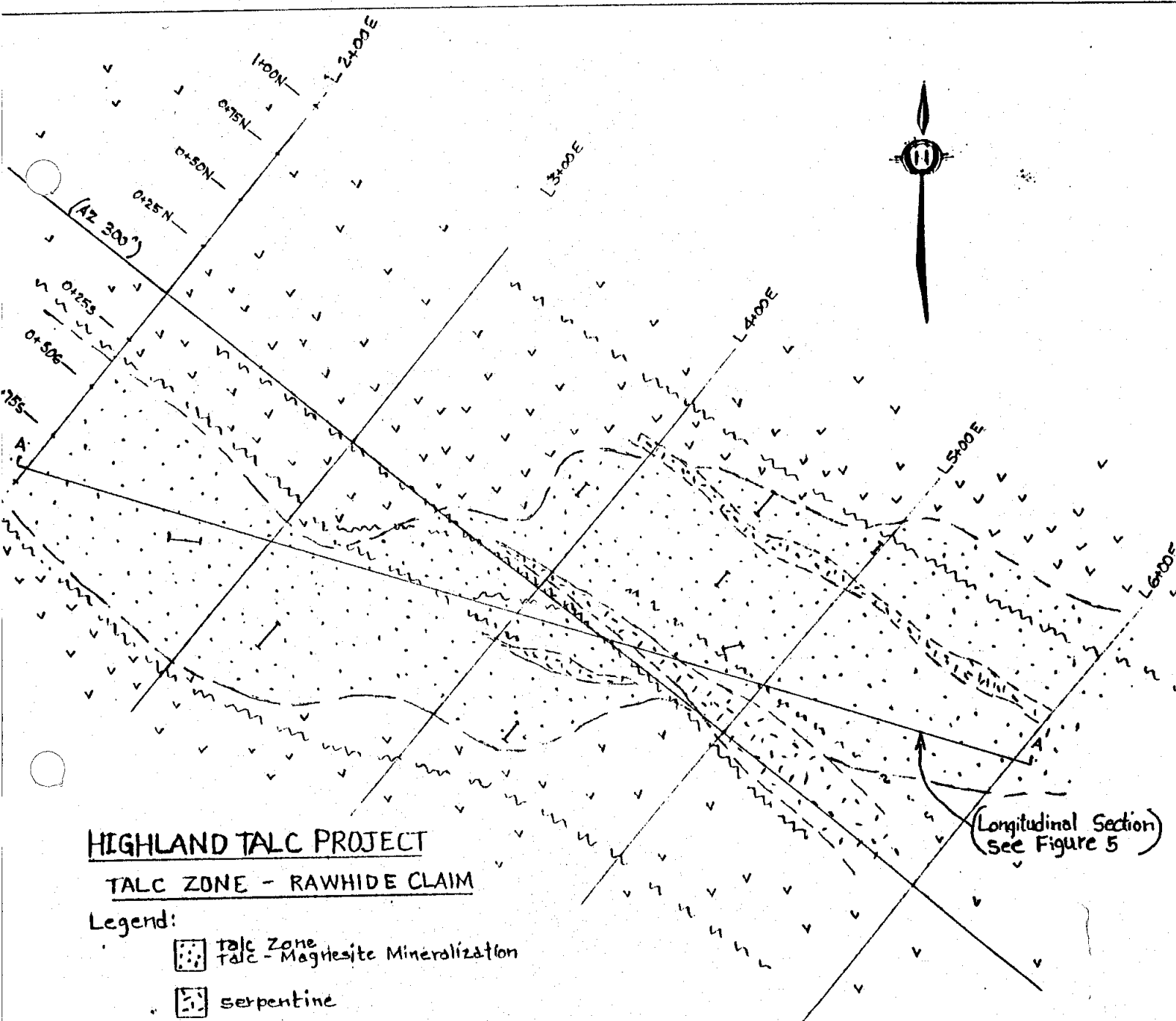


-  Fault
-  Inferred
-  Contact
-  Inferred

## HIGHLAND TALC MINERALS LTD.


Hope, B.C.

Figure 3.





**HIGHLAND TALC PROJECT**  
**TALC ZONE - RAWHIDE CLAIM**


Legend:


 Talc Zone  
 Talc - Magnesite Mineralization

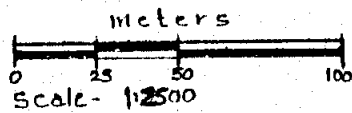
 serpentine

 Andesitic Greenstone

 contact  
 Inferred

 Fault  
 Inferred

 Trench



**HIGHLAND TALC MINERALS LTD.**  
 Hope, B.C.

Figure 4 ..

### B.3 TALC DEPOSIT

The main talc zone or deposit strikes west-northwest (Az.290-300) and is traceable by a series of outcrops for at least 450m and has widths ranging between 50-75m. Northwest of crossline L2+50E it is faulted and appears to be in semi-continuous lenses. Beyond L6+00E the deposit descends into a small valley where it is covered by thick under brush.

Typically the talc and associated magnesite outcrops display light, rusty-creamy oxidized coating, a crusty layer 1-3cm in thickness. In fresh open-cut or trenched areas, the deposit is massive and homogenous. It is occasionally cut by small remanent bodies of serpentine or incipient talc-serpentine.

Macroscopic minerals consist of light green, fine flake talc and subordinate light grey, crystalline magnesite. The magnesite is associated with iron carbonates of siderite and/or ankerite. Minor (1-2%) amounts disseminated accessory minerals can also be observed such as magnetite and pyrrhotite.

Between crosslines L18+00E and L24+00E and on strike with the above deposit are additional lenticular lenses of talc. These lenses have yet to be examined in detail.

### B.4 TRENCHING AND SAMPLING

In order to obtain fresh samples from the deposit, a total of 8 hand-blasted trenches were completed. The trenches are of varying lengths ranging between 7m to 10.5m and normally 1-2m wide and about 0.5-1.5m deep. A portable percussion drill was used and trenches blasted open with explosives.

Continuous-type chip sampling was conducted in 6 of the trenches. The composite samples represent a homogenous admixture of talc and magnesite. The samples are visibly very similar and are normally light-grey/green in color, dense and massive with at least 90% of the rock composed of talc and lesser magnesite. Talc can be identified by its softness, fine, green pearly lustre flakes and its soapy feel. The magnesite is usually light grey, translucent and is found with crystalline siderite and/or ankerite.

The 6 trenches are identified by number and the trench samples also correspond to the same numbering system. More detail is given under the following section.

### B.5 DISCUSSION OF RESULTS

The samples were shipped to the Alberta Research Council in Edmonton and analysed for talc and magnesite. A series of tests were conducted by the research laboratory including chemical and physical analysis and quantitative elemental analysis. Following tables 1. and 2. show the results of the tests.

Also summarized below is a list showing trench sample, continuous chip sample length and, talc and magnesite assays. This table corresponds to figure 6.

Trench Sample No.	Chip Sample Length	% Talc	% Magnesite
TS12345	10.5m	46.8	45.8
T6100A	8.0m	41.6	52.9
T6040	8.5m	57.6	33.9
T6100	7.5m	51.0	39.1
T6490	9.0m	51.9	40.0
T6210	9.5m	52.9	41.2

Talc and magnesite assay up to 57.6% and 52.9% respectively. The weighted average grade from the above table is as follows: Talc, 50.3% and Magnesite, 42.2%.

### B.6 CONCLUSION

Trenching over the deposit exposed homogenous admixture of talc and magnesite. Results from the trench samples assay, 41.6% to 57.6% talc and 33.9% to 52.9% magnesite. The average grade for talc and magnesite is 50.3% and 42.2% respectively.

Based on surface detail mapping and natural exposure of the deposit and applying the following dimensions: length 400m X width 75m and projected depth of 100m (as shown by longitudinal section A-A, figure 5.) and specific gravity for talc of 2.9; a possible-geological inferred reserve was calculated.

A potential talc-magnesite deposit containing geological inferred in-situ reserves of 8.7 million tonnes has been tentatively outlined on the Property.

TABLE 1.

## QUANTITATIVE ELEMENTAL ANALYSIS

Moisture content and loss on ignition (LOI) determinations were done on approx. 1 g samples at 110°C and 1000°C respectively. The moisture content on all samples ranged from 0.05 to 0.08%. The elemental analysis was done by fusing 0.2 g of each sample with 1.0 g of lithium metaborate at 1000°C and then dissolving in 100 ml 5% nitric acid with the analysis being done on a ARL 3400 Inductively Coupled Plasma Spectrophotometer.

## QUANTITATIVE ELEMENTAL ANALYSIS

## ELEMENTAL ANALYSIS

ISL SAMPLE NO.	SAMPLE NO.	Mg as MgO	Si as SiO <sub>2</sub>	Fe as Fe <sub>2</sub> O <sub>3</sub>	Al as Al <sub>2</sub> O <sub>3</sub>	Ca as CaO	LOI	TOTAL
MT-89-CL-80.1	TS12345	37.89	30.00	6.24	0.49	0.23	25.14	99.99
MT-89-CL-80.2	T6100A	40.23	24.28	4.39	0.15	0.22	30.72	99.99
MT-89-CL-80.3	T6040	36.89	33.79	6.57	0.29	0.15	22.30	99.99
MT-89-CL-80.4	T6100	37.06	33.29	6.72	0.61	0.21	22.10	99.99
MT-89-CL-80.5	T6490	36.86	33.10	6.40	0.70	0.20	22.73	99.99
MT-89-CL-80.6	T6210	37.24	31.92	6.45	0.36	0.14	23.89	100.00

TABLE 2.  
CHEMICAL AND PHYSICAL SEPERATIONS

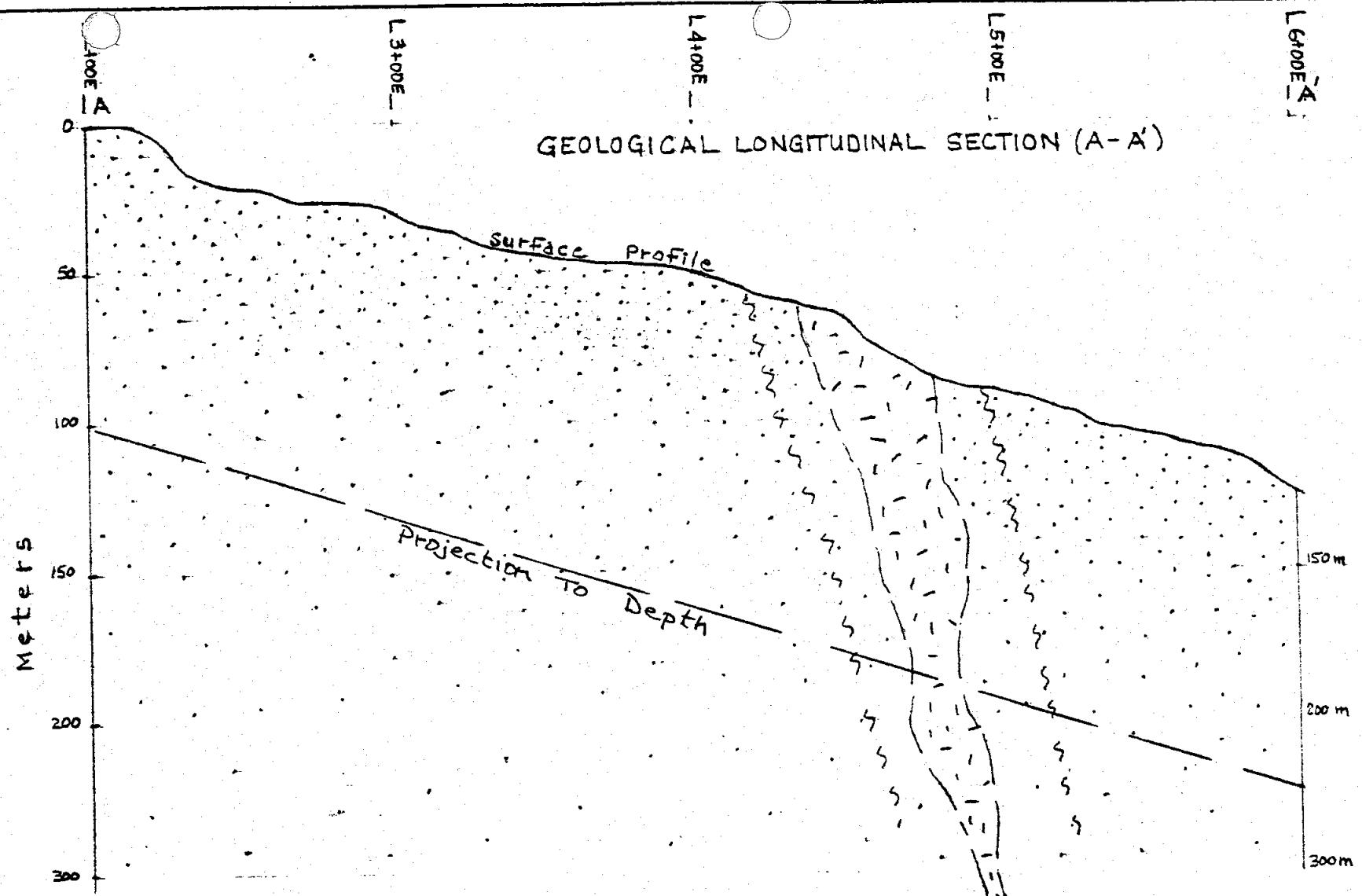
ISL SAMPLE NO.	SAMPLE NO.	MAGNESITE <sup>1</sup>	HCl SOLUBLES <sup>2</sup>	TALC(+) <sup>3</sup>	DISPERSION <sup>4</sup>
MT89CL-80.1	TS12345	45.8	7.4	46.8	41.1
MT89CL-80.2	T6100A	52.9	5.5	41.6	36.6
MT89CL-80.3	T6040	33.9	8.5	57.6	45.7
MT89CL-80.4	T6100	39.1	9.9	51.0	34.8
MT89CL-80.5	T6490	40.0	8.1	51.9	32.9
MT89CL-80.6	T6210	41.2	6.4	52.9	32.2

<sup>1</sup> Based on CO<sub>2</sub> loss at 600° C.

<sup>2</sup> Digested with 200 mls 1 N HCl - 4 hrs.

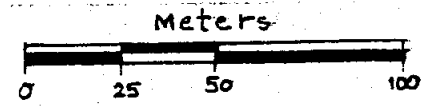
<sup>3</sup> Calculated from the wt. difference after Magnesite and HCl extractables removed.

<sup>4</sup> Calculated from the amount of material removed by dispersion in water with a Warin Blender for 1 min. and allowed to settle for 0.5 min. before liquor removed. Repeated 4X on each sample.



HIGHLAND TALC PROJECT

LONGITUDINAL SECTION - TALC/MAGNESITE


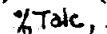





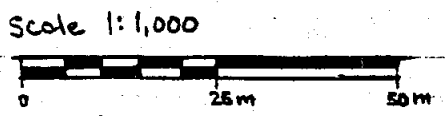
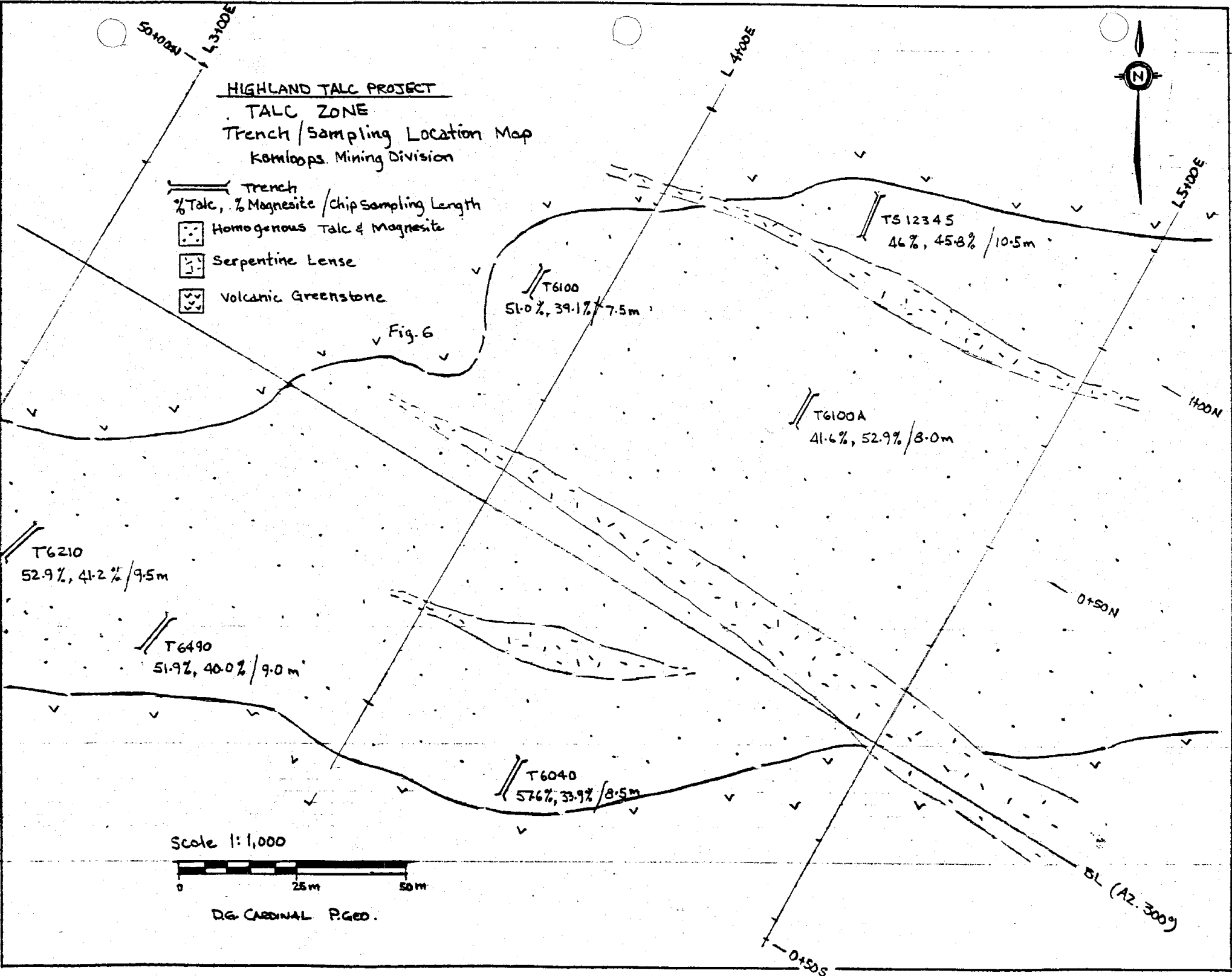
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HIGHLAND TALC MINERALS LTD.  
HOPE, B.C.

Figure 5

**HIGHLAND TALC PROJECT**  
**TALC ZONE**  
**Trench/Sampling Location Map**  
 Kamloops Mining Division

-  Trench
-  %Talc, %Magnesite / chip Sampling Length
-  Homogenous Talc & Magnesite
-  Serpentine Lense
-  Volcanic Greenstone



DG. CARDINAL P.GEO.



## C. COST BREAKDOWN

## FIELD WORK: Geological Surveys

Geologist/Supervisor, 20 days @ \$200/d	\$ 4,000.00
Gridlines, 2 linecutters, 9 days @ \$250/d (includes chain saw + fuel & oil)	2,250.00

## Trenching:

Percussion Drilling & Blasting 2 men (blaster & assistant), 14 days @ \$300/d (includes Atlas Copco drill & explosives)	4,200.00
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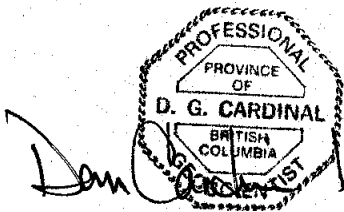
## FIELD SUPPORT:

5-man Camp and Field Related Expenses 35 days @ \$70/d (includes groceries, fuel, propane, autotel field telephone & misc.)	2,450.00
--	----------

## Transportation:

Jet Ranger Helicopter, 3 hours @ \$550/hr.	<u>1,650.00</u>
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Total Expenses Incurred	<u><u>\$ 14,550.00</u></u>
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D.G. Cardinal, P.Ge.  
Geologist

APPENDIX I Professional Certificate

I, Daniel G. Cardinal of the municipality of Hope, British Columbia, do hereby certify that:

I'am a professional geoscientist residing in Hope, B.C., mailing address - P.O. Box 594, Hope, B.C., VOX 1L0.

I'am a graduate of the University of Alberta (1978) and hold a BSc. degree in Geology.

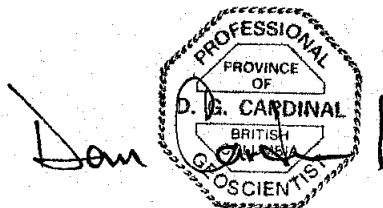
I'am registered as a Fellow of the Geological Association of Canada (F.G.A.C.); a member in good standing with the Association of Professional Engineers, Geologist and Geophysicists of Alberta (P.Geol.) and; a member in good standing with the Professional Engineers and Geoscientists of B.C. (P.Ge.).

I have been practicing my profession for the past thirteen years.

I'am the principle owner of the mineral property described in this report.

I have supervised the geological field surveys and trench sampling conducted in 1990 and 1991 field seasons.

I'am the author of this report.



D.G. Cardinal, P.Ge., F.G.A.C.

## APPENDIX II Bibliography

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