

A GEOLOGICAL EVALUATION
of the
TULAMEEN RIVER PROPERTIES
N.T.S. 92-H/10
Latitude 49°31' North
Longitude 120°52' West
Yale District
Similkameen Mining Division
British Columbia

June 1, 1987

on behalf of
NORTHWIND VENTURES LTD.
Calgary, Alberta

by
J. R. Allan, P.Geol., F.GAC
TAIGA CONSULTANTS LTD.
#100, 1300 - 8th Street S.W.
Calgary, Alberta T2R 1B2

ABSTRACT

Northwind Ventures Ltd. recently acquired the Tulameen River properties located in the Similkameen Mining Division, 28 km west of Princeton, British Columbia. The claims encompass a portion of the Tulameen Ultramafic Complex, a compositionally zoned Late Triassic body intruded into the Nicola Group metavolcanic and metasedimentary rocks. Rock types on the properties vary from dunite and serpentinized dunite at the intrusion core to pyroxenites through to syenogabbro at the Complex margins.

The Tulameen Complex has been considered the ultimate source of the platinum placer deposits located in the Tulameen River valley. These were extensively exploited at the end of the last century. Since the turn of the century, it has been realized that chromite/magnetite cumulate layers within the dunitic core of the Complex contain high-grade but erratic platinum values. High-grade gold mineralization in quartz-flooded breccias zones has also been encountered along the margins of the Tulameen Complex.

In the past, the inherent costs and sampling difficulties of exploring for platinum mineralization have discouraged a thorough investigation of the Tulameen River properties. Additionally, most investigations in the area were carried out before the advent of modern exploration, particularly the very sensitive geochemical analytical techniques now in common usage.

A two-phase exploration program is herein recommended. Phase I will consist of reconnaissance geological mapping and limited soil and rock geochemical sampling. Contingent upon obtaining encouraging results, a more comprehensive and detailed program of ground magnetic and electromagnetic surveying and in-fill soil and lithochemistry is proposed.

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INTRODUCTION

At the request of Mr. Gerald Ross, President of Northwind Ventures Ltd. of Calgary, Taiga Consultants Ltd. has prepared a geological evaluation of the Tulameen River properties. The exploration history of the Tulameen River area is summarized and a preliminary geological evaluation is presented along with a recommended program of exploration and its proposed budget.

Property Status

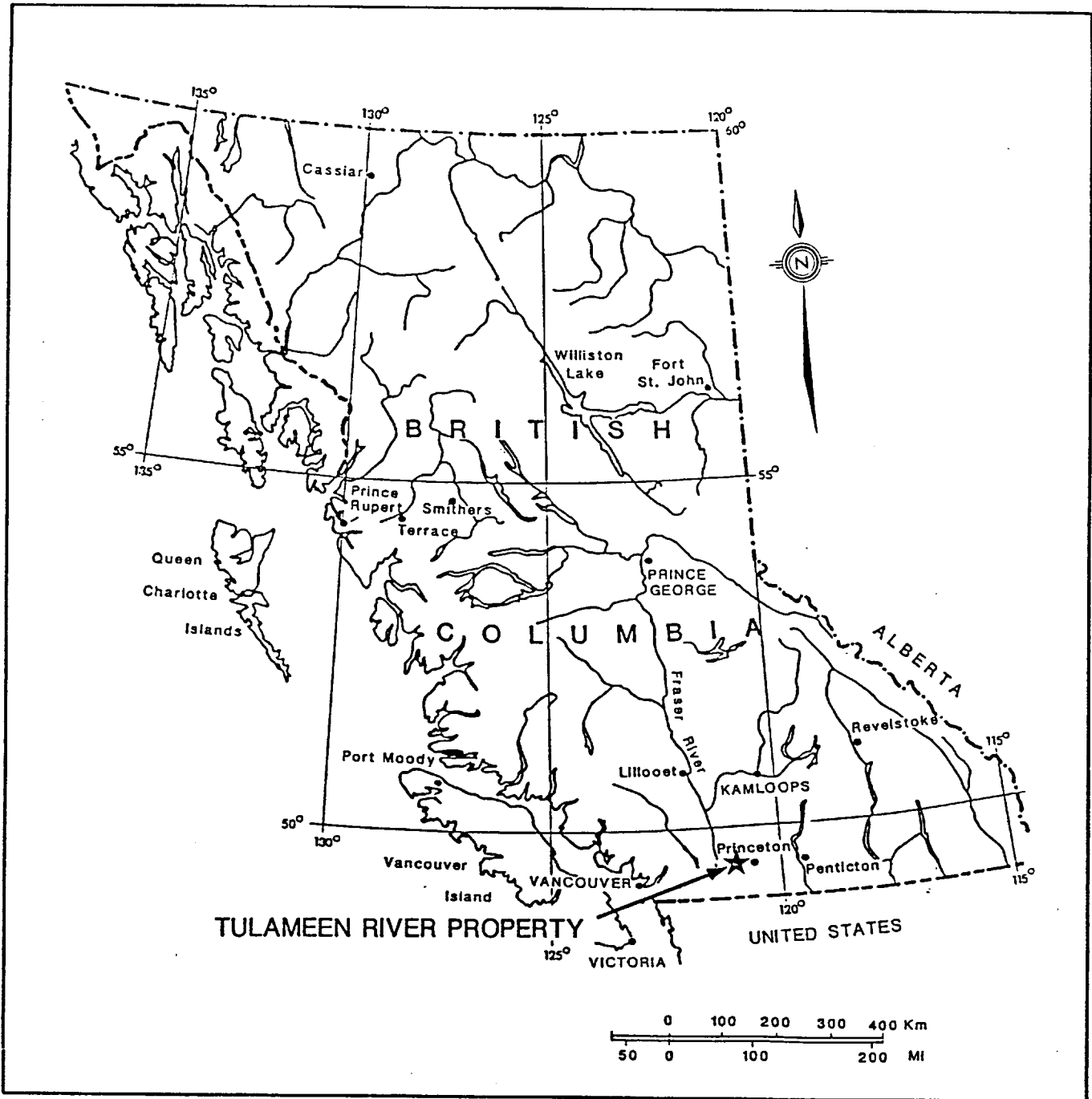
The Tulameen River properties are located within the Similkameen Mining Division of British Columbia (Figures 1 and 2) within N.T.S. 92-H/10. The property aggregates approximately 120.7 hectares (298 acres) in two blocks separated by a distance of approximately 1500 m. Details of the claims are shown in Table 1.

TABLE 1 - Claims Data

<u>Claim Name</u>	<u>Claim Number</u>	<u>No. of Units</u>	<u>Approx. Area</u>	<u>Date of Record</u>	<u>Next Anniversary Date</u>
Tula 2	1697	1	15.10 ha	82.08.27.	87.08.27.
Tula 3	1698	1	13.40 ha	82.08.27.	88.08.27.
Gloria Fr	2898	1	10.60 ha	87.05.04	88.05.04.
Browne CG	L.1138		12.32 ha		
Hetty CG	L.1139		11.37 ha		
Holm CG	L.1140		14.74 ha		
Cave CG	L.1141		16.66 ha		
Frances CG	L.1142		13.06 ha		
Maud CG	L.1143		<u>13.44 ha</u>		
			120.69 ha		

CG = Crown grant

The Crown-granted claims (L.1138 to L.1143) are currently registered in the name of New Jersey Zinc Exploration Company Canada Ltd. Northwind Ventures Ltd. has optioned the claims and a transfer of title is pending. The Tula claims are registered in the name of Darce Brown, and the Gloria fraction in the name of Gerald N. Ross. Transfers of title to Northwind are pending.



LOCATION MAP

FIGURE 1

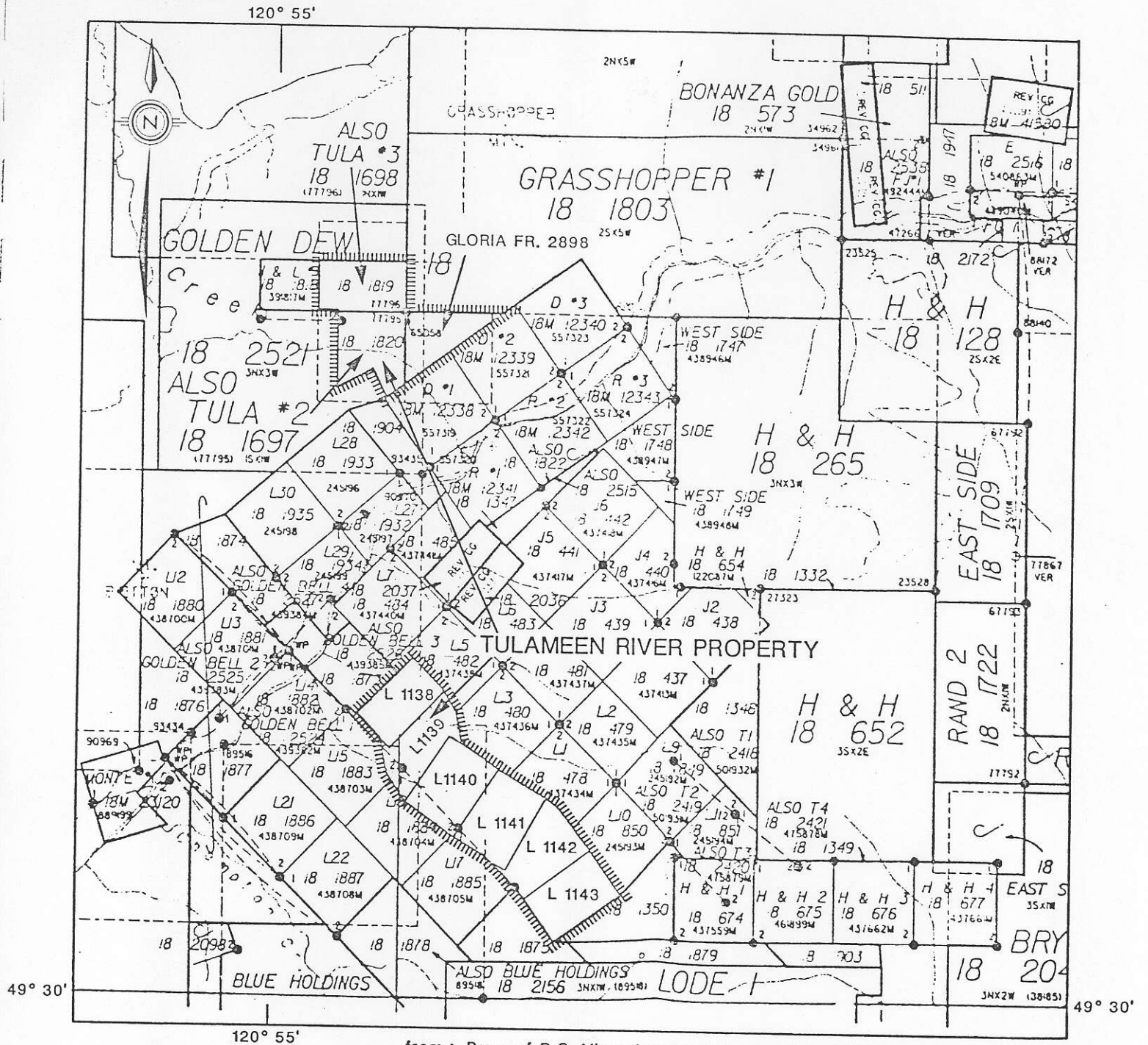


FIGURE 2

For the mineral claims, assessment expenditure requirements are \$100 per unit per year for the first three years, then \$200 per unit per year each subsequent year. In addition, a recording fee is levied of \$5 per \$100 value of work recorded. The present claims are all beyond three years of their initial recording date. Hence, assessment expenditure requirements now total \$1,000 per year. The Crown-granted claims require annual taxes of \$50.59.

Location and Access

The Tulameen River properties are located 28 km northwest of the town of Princeton, south of the Tulameen River. The properties are centered approximately about 49°31' North latitude and 120°52' West longitude.

The claims are accessible via the road west from Princeton for about 25 km to the village of Tulameen. From there, an unimproved gravel road continues west along the north side of the Tulameen River to Hines Creek, a distance of 12 km. A bridge (now unusable, except on foot or by motorcycle) crosses the Tulameen River near Hines Creek and a narrow 4x4 road climbs the north slope of Olivine Mountain to the northern boundary of claim H&H (#652). The claims are also accessible from a gravel road from the hamlet of Coalmont and via logging roads on the east side of Olivine Mountain.

Physiography

The claims are located on Olivine Mountain with elevations varying from 1035 m to 1798 m ASL. Slopes are steep but not precipitous and have relatively thick coverage of mature timber on the west side of the mountain. Hines Creek drains the H&H claims into the Tulameen River.

The region has been glaciated resulting in low rounded peaks; the valleys are filled with variable thicknesses of glacial deposits. The quantity of outcrop is quite limited with best exposures on peaks and along creek beds.

REGIONAL GEOLOGY

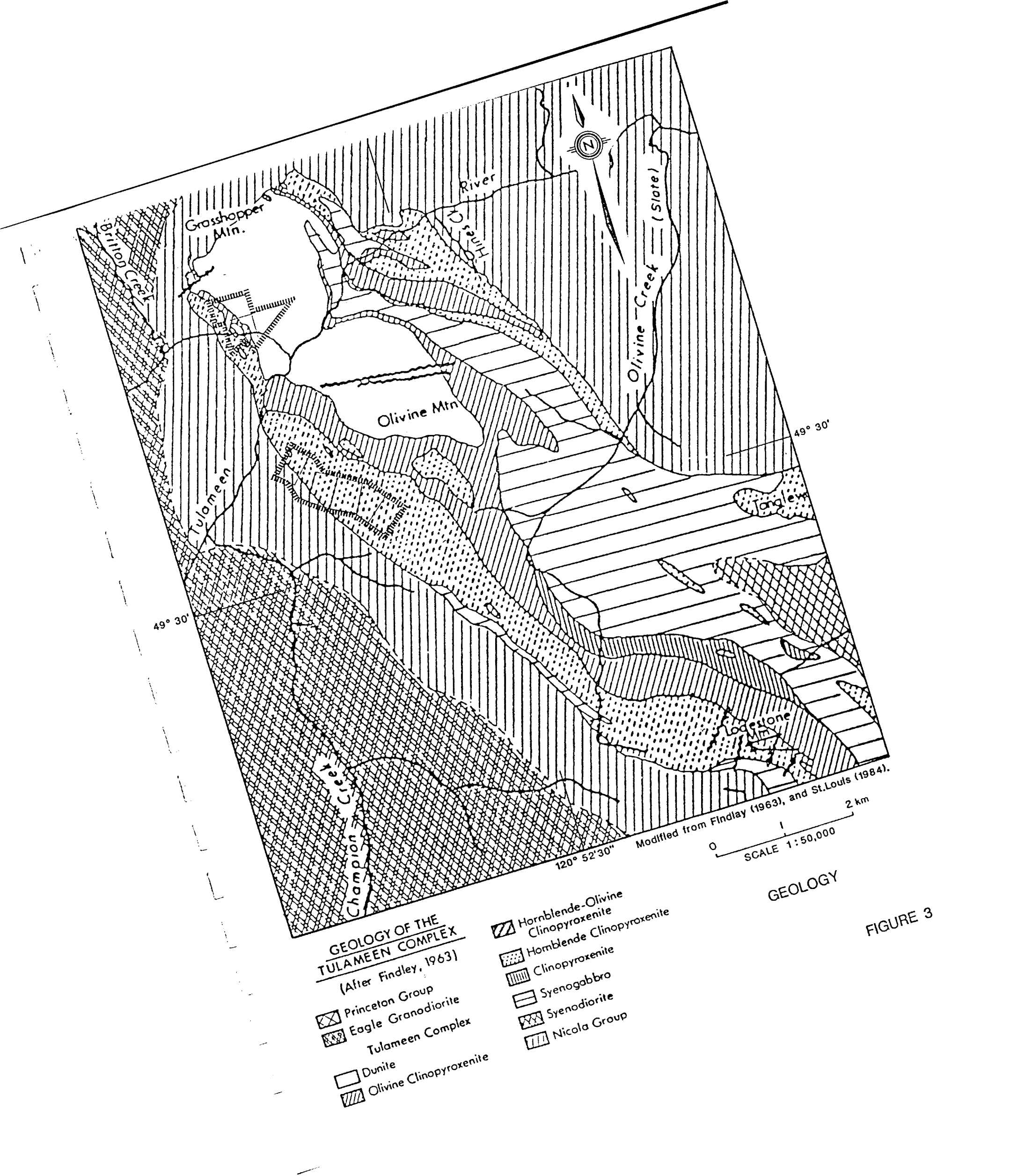
The first geological map of the Tulameen River area was prepared in 1913 by Charles Camsell (G.S.C. Memoir 26). A more detailed geological and mineral occurrence map was prepared by H. M. A. Rice in 1947 (G.S.C. Memoir 243). D. C. Findlay (1963) mapped the Tulameen Ultramafic Complex in detail as a part of his doctoral thesis, and an adaptation of his map is available in R. M. St. Louis' paper (1984), the latter having investigated the distribution of platinum group elements in the intrusion (Figure 3).

The Tulameen River claims are located within the boundaries of the Tulameen Ultramafic Complex, a late Triassic intrusion into the metasedimentary and metavolcanic rocks of the Triassic Nicola Group. Volcanic and terrestrial sedimentary rocks of the Tertiary Princeton Group unconformably overlie the eastern margins of the ultramafic complex. The Eagle Granodiorite, part of the Jurassic Coast Intrusion, forms a prominent range of mountains one mile to the west.





Findlay (1969) has speculated that the Tulameen complex is related to the Copper Mountain Intrusions, located south of Princeton, which are chemically similar but of more felsic composition.

PROPERTY GEOLOGY

The Tulameen Ultramafic Complex underlies an area 16 km long by 5 km wide, and strikes northwest subconformably to the surrounding Nicola Group strata into which it has been emplaced. The complex is imperfectly concentrically zoned, ranging in composition from dunite in its core sequentially outward through olivine clinopyroxenite, hornblende clinopyroxenite, syenogabbro, and finally syenodiorite at its margin. In general, the sub-units can be grouped into ultramafic and gabbroic units which have a volumetric ratio of approximately 1 to 2. Individual sub-units have gradational boundaries within their units whereas contact between ultramafic and gabbroic suites are very sharp.



GEOLOGY OF THE TULAMEEN COMPLEX
(After Findlay, 1963)

-  Princeton Group
-  Eagle Granodiorite
-  Dunite
-  Olivine Clinopyroxenite






-  Hornblende-Olivine Clinopyroxenite
-  Hornblende Clinopyroxenite
-  Clinopyroxenite
-  Syenogabbro
-  Syenodiorite
-  Nicola Group

FIGURE 3

Findlay (1963) classified the Tulameen Complex as Alaskan Peridotites which are a sub-variety of the more common Alpine Peridotites. The former are characterized by the relative lack of orthopyroxene and feldspar as well as the high magnesium composition of their olivines. The Tulameen Ultramafic Complex varies from the classic Alaskan type in having a strong potassic composition rather than the more common tholeiitic composition.

The property area is underlain predominantly by dunite and olivine clinopyroxenite, as well as lesser amounts of hornblende clinopyroxenite, syenodiorite, and syenogabbro.

Dunite contains between 2% and 20% chromite as well as significant amounts of magnetite and minor chalcopyrite and pyrite. Approximately 50% of the dunite has been serpentized with alteration being especially intense adjacent to crosscutting structures.

Findlay (1963) mapped two major east-west trending structures on the north facing slope of Olivine Mountain and the structures crosscut just north of the H&H mineral claims.

Findlay (1969) states that compositional layering related to cumulate phases is rare and so it is difficult to establish the present orientation of the Complex with regard to its original position. He speculates that the whole Complex has been deformed into broad folds and tilted on its side around its northwest-southeast axis. This is consistent with the orientation of cumulate layering measured by Ryback-Hardy (1983).

EXPLORATION TARGETS

The Tulameen / Similkameen River area was worked in a desultory fashion as early as 1860 (Camsell, 1913) by placer gold miners on their way to the Cariboo gold rush. It was not until 1885 that a small gold rush was started as a result of a chance discovery of coarse gold at the mouth of Granite Creek on the Tulameen River, 14 km downstream from the present property. Placer production of gold and platinum peaked in 1886 with an overall quantity of 20,000 ounces of platinum and a much greater quantity of gold being produced by 1910.

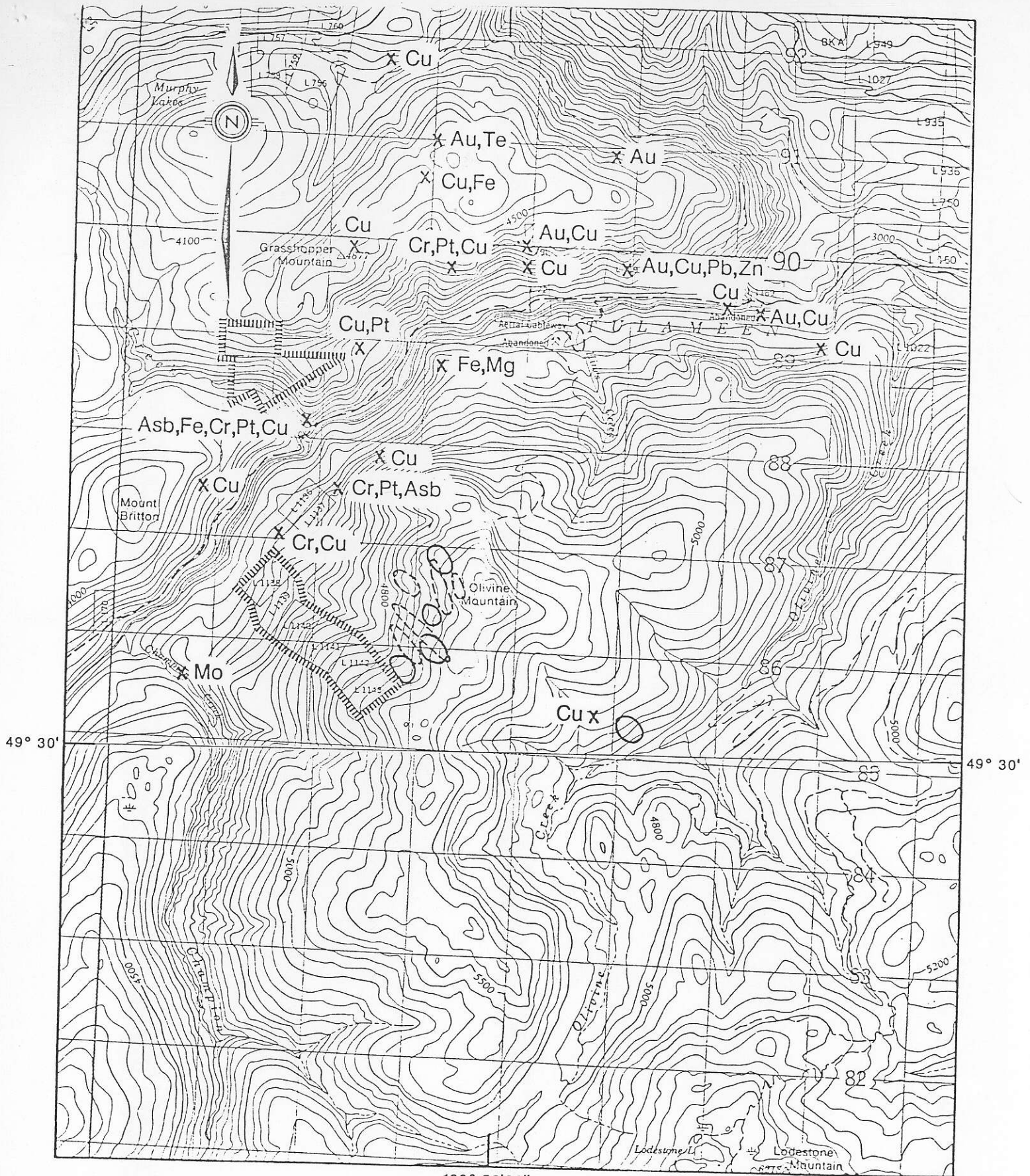
Camsell (1913) reports that many attempts were made to follow up placer platinum deposits to their hardrock source. Camsell recounts that no placer platinum was found in the Tulameen River or its tributaries above Champion Creek (Figure 4) and very little was produced below Granite Creek. The fragile shape of platinum nuggets and the fact that some nuggets incorporated fragments of ultrabasic rock suggested to earlier workers (Camsell, 1913; Poitevin, 1924) that placer platinum originated from the weathering of the Tulameen Ultramafic Complex.

Known mineral occurrences have been compiled onto Figure 4.

Camsell states that in 1900, Prof. J. F. Kemp of the U.S.G.S. was able to obtain platinum assays from the Tulameen Complex of up to 2 oz/ton from peridotite and serpentinite which were rich in chromite. These results were confirmed by Camsell (p.154) from outcrops on the northwest slope of Olivine Mountain.

Findlay (1963, 1965) obtained values for platinum of up to 0.225 g/ton in dunite on Olivine Mountain, and 7.34 g/ton from chromite segregations on Grasshopper Mountain, north of the Tulameen River.

St.Louis (1984) studied the distribution of Platinum Group Elements (PGE) in the Tulameen Complex and found that PGE's were concentrated in chromite-rich portions of dunitic rocks. In general, for rocks which did not contain



LEGEND :

- X MINERAL OCCURRENCE
- GOLD SOIL ANOMALY
- PLATINUM SOIL ANOMALY

MINERAL OCCURRENCES AND SOIL ANOMALIES

FIGURE 4

appreciable chromite, the best values were found in serpentine, serpentized dunite, and hornblende clinopyroxenite. The weighted mean value of platinum from six samples of chromite-rich dunite collected by St. Louis was 837.5 ppb (i.e., quite anomalously high but not yet of an economic grade). Considering the difficulties inherent in locating and ascertaining the extent of platinum ore bodies, it is not discouraging that St. Louis did not locate high-grade platinum mineralization as a result of his rather casual sampling program.

Gold, magnetite, molybdenum, and copper mineralization have also been located in the immediate vicinity of the present claims. Camsell (1913) notes that small quantities of diamonds have also been found within chromite concentrations within the Tulameen Complex.

Gold-telluride mineralization has been discovered in quartz-flooded breccias zones in Nicola Group rocks at the margins of the Tulameen Complex, and in quartz veins in Nicola Group volcanics (Camsell, 1913; Rice, 1947).

A number of open cuts and trenches have been completed on the Mary Jensen copper occurrence on the eastern slope of Olivine Mountain at an elevation of 5,500 feet (B.C. Annual Reports; Rice, 1947). Discontinuous and disseminated chalcopyrite mineralization is found within shear zones and quartz veins within a pyroxenitic host. Values ranged from 0.5 to 3% copper. The trenches appear to fall within the boundaries of mineral claim H&H 4 (#677).

A considerable amount of exploration for gold and platinum has been carried out in recent years on and in the vicinity of the present claims.

Consteel Exploration Ltd. (Coveney, 1970) carried out a corrected magnetometer survey over what is now the western half of the H&H claims and over portions of the Crown grants. A narrow band of strongly magnetic material was identified striking northwest down the centre of the Crown grants. Coveney also geologically mapped the area at a scale of 1 inch = 600 feet. Only the maps from this report were available to the present author.

In 1983, Tarnation Mining Ltd. (Jones, 1983) carried out soil geochemical surveying and geological mapping on the H&H claim group. They concentrated their efforts on the area just north of the present claim group and did not obtain significant results.

D.K. Platinum Corporation (Ryback-Hardy, 1983) carried out a limited soil geochemical survey as well as very limited geological mapping and rock chip sampling in the area north of and surrounding the present Crown grants. They partially defined coincident gold/platinum soil anomalies west of and adjacent to the H&H claims. On Line 0 North, the best soil values returned were 651 ppb Pt and 646 ppb Au. A separate gold value on the same line was very anomalous at 1237 ppb.

Galit Resource Corporation (Livgard, 1983) carried out limited magnetic and soil geochemical surveys on the BRY claims located immediately to the east of the H&H claims. They defined several areas of moderately anomalous gold values in soils adjacent to claim H&H 4 (#677). Values did not exceed 230 ppb Au. No platinum analyses were carried out.

CONCLUSIONS

The Tulameen River properties of Northwind Ventures Ltd. are underlain by dunitic and pyroxenitic rocks of the Tulameen Ultramafic Complex. This Complex has probably been the ultimate source of the platinum produced from placer deposits of the Tulameen River and its tributaries between Champion Creek and Granite Creek. A number of workers have shown that the Tulameen Complex is enriched in platinum group elements within chromite concentrations in dunite and serpentized dunite. At least two east-west shear zones have been mapped adjacent to the H&H mineral claims owned by Northwind. These zones have been shown to contain quartz veining and sulphide mineralization.

Past exploration work has delineated a number of gold and gold/platinum soil geochemical anomalies adjacent to the H&H claim group (see Figure 4). In addition, a linear magnetic high was partially delineated within the present Crown grants, indicating the presence of a magnetite/chromite cumulate layer.

In conclusion, the Northwind Ventures Ltd. Tulameen River properties have good exploration potential for the discovery of small high-grade platinum deposits in magnetite/chromite cumulate layers. Also, the property has potential for the discovery of small tonnage, high-grade gold deposits in quartz-flooded breccias in shear zones.

RECOMMENDATIONS

The acquisition of additional claims within the boundaries of the Tulameen Ultramafic Complex, especially to the north and northwest of the H&H claim, is strongly recommended. Pending a revision to the land holdings of Northwind Ventures Ltd., a two-phase exploration program is proposed. Phase I will consist of reconnaissance geological mapping and limited soil and rock geochemical sampling. Contingent upon obtaining encouraging results from these preliminary investigations, a more comprehensive program of flagged grid emplacement, magnetic and VLF-electromagnetic surveys, in-fill soil geochemical sampling, detailed geological mapping, and prospecting is herein recommended. The goal will be to delineate possible magnetite/chromite cumulate layers and crosscutting shear zones within the Tulameen Complex by geophysical means, and to rock-chip sample these features where they crop out. Soil geochemical surveys should delineate possible mineralization covered by overburden.

Approximately 2 to 3 km of 4x4-passable road should be constructed from the present logging road on the east side of Olivine Mountain to the property to allow for more economical access.

Contingent upon the success of Phase II, consideration should be given to budgeting for trenching and/or diamond drilling of outlined targets.

The proposed budget is set out overpage.

PROPOSED 1987 BUDGET
NORTHWIND VENTURES LTD.

PHASE I (July 1987)

<u>Pre-Field Preparation:</u> crew and equipment assembly, purchase of disposable supplies, base map preparation		1,000
<u>Mob/Demob. Camp Set-Up</u>		
Personnel	2 men x 3 days @ various rates	2,490
4x4 vehicle	3 days @ \$75/day	225
Accommodation	2 men x 2 days @ \$50/day	200
Travel expenses and meals		<u>400</u>
		3,315
<u>Field Costs</u>		
<u>Personnel</u>		
Project Supervisor	2 days @ \$400/day	800
Project Geologist	12 days @ \$325/day	3,900
Samplers/Prospectors	12 days @ \$190/day	<u>2,280</u>
		6,980
<u>Support Costs</u>		
Camp Rental & Food	24 man days @ \$50/man day	1,200
Disposable Supplies		<u>300</u>
		1,500
<u>Transportation</u>		
4x4 truck rental	12 days @ \$75/day	900
<u>Equipment Rentals</u>		
FM radio-telephone	12 days @ \$10/day + calls	150
VLF-EM unit	12 days @ \$18/day	<u>216</u>
		366
<u>Geochemistry and Assays</u>		
Rocks: for Pt,Pd,Au	50 samples @ \$19.25/each	965
Soils: for Pt,Pd,Au	250 samples @ \$16.90/each	<u>4,225</u>
		5,190
<u>Post-Field</u>		
Data Compilation and Final Report		1,625
Drafting and Reproduction of maps		475
Secretarial services, supplies, photocopying report		300
Handling charges, accounting, etc.		<u>349</u>
		2,749
Contingency Allowance		<u>3,000</u>
		TOTAL PHASE I
		<u>\$25,000</u>

PHASE II (August 1987)


<u>Pre-Field Preparation:</u> crew and equipment assembly, purchase of disposable supplies, base map preparation		1,000
<u>Mob/Demob. Camp Set-Up</u>		
Personnel	4 men x 3 days @ various rates	2,940
4x4 vehicle	3 days @ \$75/day	225
Accommodation	4 men x 2 days @ \$50/day	400

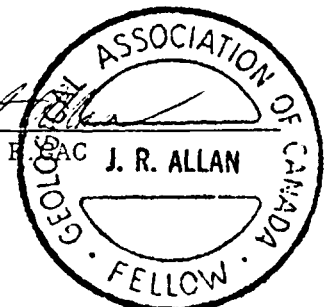
Travel expenses and meals		460	
Freight		300	
Miscellaneous (culvert, disposable supplies, fuel)		<u>1,175</u>	5,500
<u>Field Costs</u>			
<u>Personnel</u>			
Project Supervisor	2 days @ \$400/day	2,000	
Project Geologist	14 days @ \$325/day	4,550	
Junior Geologist	14 days @ \$275/day	3,850	
Samplers/Prospectors	2 x 14 days @ \$190/day	<u>5,320</u>	15,720
<u>Support Costs</u>			
Camp Rental	56 man days @ \$15/day	840	
Camp Food	56 man days @ \$25/day	<u>1,400</u>	2,240
<u>Transportation</u>			
4x4 truck rental	14 days @ \$75/day		1,050
<u>Equipment Rental</u>			
FM radio-telephone	14 days @ \$10/day + calls	208	
VLF-EM unit	14 days @ \$18/day	252	
Proton magnetometer with base station	14 days @ \$50/day	700	
Generator	14 days @ \$15/day	210	
Rock saw	14 days @ \$20/day + blades	680	
Tractor (D-6 'cat')	50 hours @ \$80/hour	<u>4,000</u>	6,050
<u>Geochemistry and Assays</u>			
Rocks: for Pt,Pd,Au	200 samples @ \$19.25/each	3,850	
Soils: for Pt,Pd,Au	550 samples @ \$16.90/each	<u>9,295</u>	13,145
<u>Post-Field</u>			
Data Compilation and Final Report		2,275	
Drafting and Reproduction of maps		1,390	
Secretarial services, supplies, photocopying report		500	
Handling charges, accounting, etc.		<u>1,130</u>	<u>5,295</u>
TOTAL PHASE II			<u>\$50,000</u>

PHASE III

Contingent upon the success of the Phase II program, provision should be made for a combined trenching and diamond drilling investigation.

\$150,000


 J. R. Allan, P.Geol., F.G.S.C.



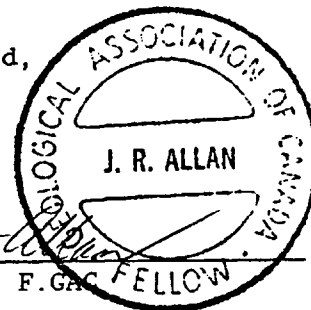
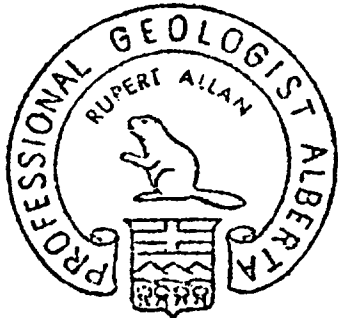
CERTIFICATE

I, James Rupert Allan, of 3609 - 1A Street S.W. in the City of Calgary in the Province of Alberta, do hereby certify that:

1. I am a Consulting Geologist with the firm of Taiga Consultants Ltd. with offices at Suite 100, 1300 - 8th Street S.W., Calgary, Alberta.
2. I am a graduate of the University of Alberta, B.Sc. in Geology (1969), and have practised my profession continuously since that date.
3. I am a member in good standing of the Association of Professional Engineers, Geologists and Geophysicists of Alberta; and I am a Fellow of the Geological Association of Canada.
4. I am the author of the report entitled "A Geological Evaluation of the Tulameen River Properties, Similkameen Mining Division, British Columbia", dated June 1, 1987.
5. I have not visited the property. This report is based on information contained in the reference cited in the Bibliography.
6. I do not own or expect to receive any interest (direct, indirect, or contingent) in the property described herein nor in the securities of NORTH-WIND VENTURES LTD., in respect of services rendered in the preparation of this report.

DATED at Calgary, Alberta, this 1st day of June, A.D. 1987.

Respectfully submitted,



James Rupert Allan
J. R. Allan, P.Geol., F.G.A.C. FELLOW

PERMIT TO PRACTICE
TAIGA CONSULTANTS LTD.

Signature *James Rupert Allan*

Date *June 7 1987*

PERMIT NUMBER: P 2399

The Association of Professional Engineers,
Geologists and Geophysicists of Alberta

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