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REPORT  
ON  
SOUP AND KLISUM  
MINERAL CLAIM GROUPS  
OF  
VITAL RESOURCES LIMITED  
OMINECA MINING DIVISION  
BRITISH COLUMBIA

BY  
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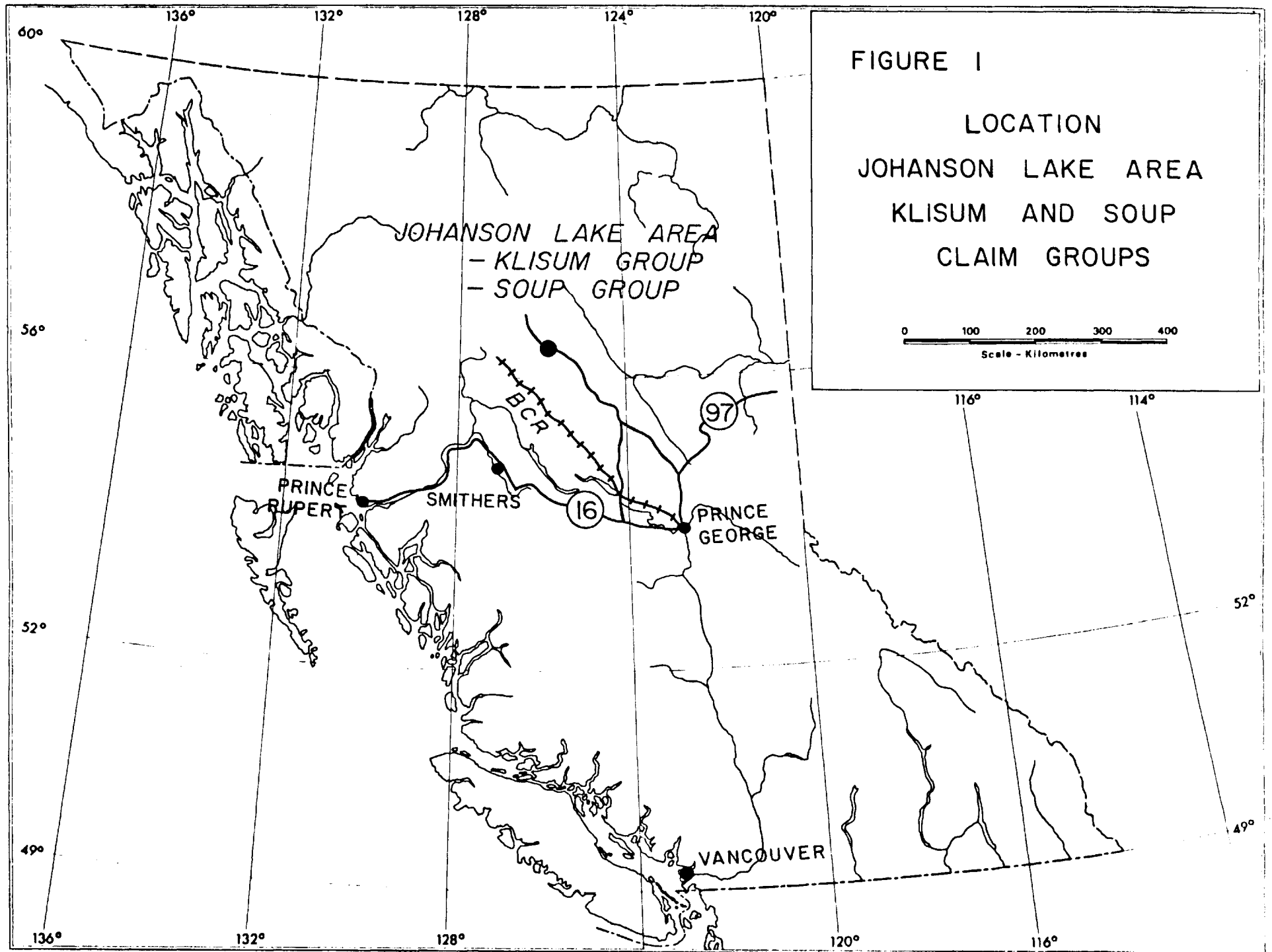
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SUMMARY

Vital Resources Limited holds the KLISUM and SOUP mineral claim groups in the Omineca Mining Division of north-central British Columbia.

Copper-gold mineralization on both claim groups is associated with magnetite-rich lodes and with basic volcanic rocks and diorite intrusions. While copper and gold grades indicated to date are relatively low, the potential for appreciable tonnage exists. Preliminary metallurgical work indicates that gold values are associated with sulfide minerals, principally chalcopyrite.

The writer recommends a preliminary exploration program to assess two recently acquired claims on the north part of the KLISUM group. Costs are estimated to be \$50,000.

A two-phase diamond drilling program is recommended for the northern SOUP claims, with the first phase consisting of 2500 feet with estimated costs of \$150,000. Contingent on the results of the first phase, phase two would include 3500 to 4000 feet of drilling at a cost of \$150,000.

## INTRODUCTION

Vital Resources Ltd. holds the SOUP and KLISUM groups of mineral claims in the Omineca Mining Division of British Columbia.

This report, prepared at the request of Vital Resources Ltd., is based on an examination of the SOUP property, September 28 and 29, 1982, and on published and unpublished reports and maps on public file. Additional information was provided by Vital Resources Ltd..

## LOCATION AND ACCESS

The SOUP and KLISUM properties are situated in north-central British Columbia 130 air miles, (200 km.), north-northwest of Smithers (Figure 1). The claims have been located 4 miles (6.5 km) apart, north and east of Kliyul Creek and between 6 and 10 miles (10 - 16 km) southeast of Johanson Lake (Figure 2), in NTS map-areas 94D/8E and 9E. The centre of the SOUP property is at latitude  $56^{\circ}28'$  North and longitude  $126^{\circ}03'$  West, and the central point on the KLISUM group is at  $56^{\circ}31'$  North and  $126^{\circ}07'$  West.

Access to the properties is by helicopter from Johanson Lake which is reached by wheel of float-equipped aircraft from Smithers or by the Omineca mining road (Figure 1). Two routes are available; via highway 97 north from Prince George to a point south of Mackenzie and logging roads and the Omineca mining road for a total distance of 310 miles (500 km), or north from Vanderhoof on highway 16 for a distance of 270 miles (430 km.).

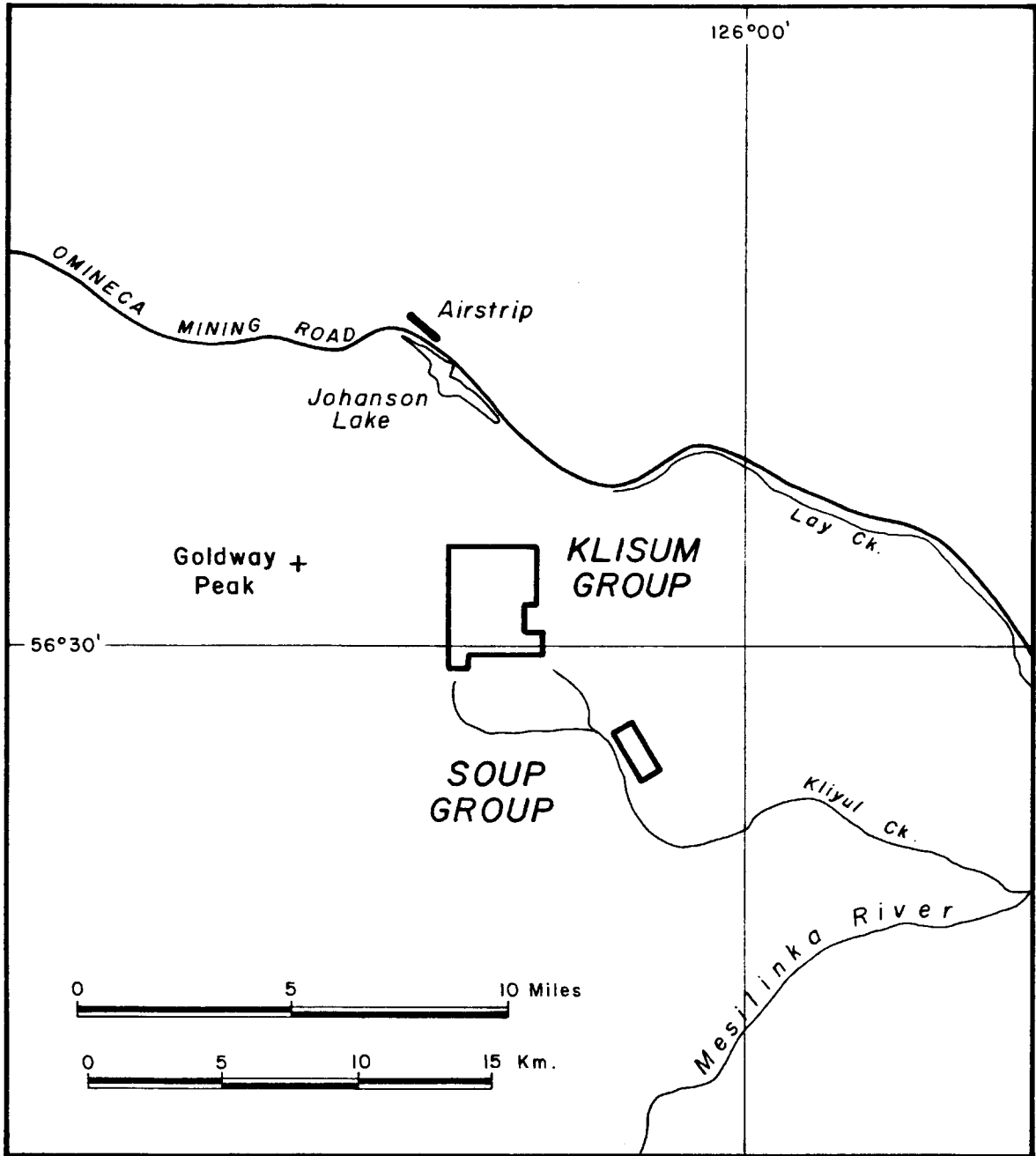


FIGURE 2 - LOCATION - KLISUM AND SOUP CLAIM GROUPS

The Dease Lake extension of the British Columbia Railway is operational between Prince George and Driftwood, 40 miles (65 km) in a direct line southwest of Johanson Lake.

MINERAL PROPERTY

Vital Resources Ltd. holds the following two groups of mineral claims (Figure 3):

SOUP Group

<u>Mineral Claim</u>	<u>Record No.</u>	<u>Expiry Date</u>
SOUP 1	26941	August 9, 1989
SOUP 2	26942	"
SOUP 3	26943	"
SOUP 4	26944	"
SOUP 5	26945	"
SOUP 6	26946	"
SOUP 7	26947	"
SOUP 8	26948	"
SOUP 9	26949	"
SOUP 10	26950	"
SCUP 11 Fractional Claim		August 13, 1989

These are 2-post mineral claims and fractional claims, comprising 11 claims (units) for assessment purposes.

KLISUM Group

<u>Mineral Claim</u>	<u>Record No.</u>	<u>Expiry Date</u>
KLI 1	89985	August 10, 1992
KLI 2	89986	" "
KLI 3	89987	" "
KLI 4	89988	" "
KLI 5	89989	" "
KLI 6	89990	" "
KLI 7	89991	" "
KLI 8	89992	" "
KLI 9	89993	" "
KLI 10	89994	" "
KLI 11	89995	" "
KLI 12	89996	" "
KLI 13	89997	" "
KLI 14	89998	" "
KLI 15	89999	" "
cont'd.		

<u>Mineral Claim</u>	<u>Record No.</u>	<u>Expiry Date</u>
KLI 16	90000	August 10, 1992
KLI 17	90001	" "
KLI 18	90002	" "
KLI 19	90003	" "
KLI 20	90004	" "
KLI 21	91832	September 11, 1992
KLI 25	91836	" "
KLI 26	91837	" "
KLI 27	91838	" "
KLI 28	91839	" "
KLI 39	99985	July 12, 1992
KLI 40	99986	" "
KLI 41	99987	" "
KLI 42	99988	" "
KLI 43	99989	" "
KLI 44	99990	" "
KLI 45	99991	" "
KLI 46	99992	" "
KLI 47	99993	" "
KLI 48	99994	" "
KLI 49	99995	" "
KLI 50	99996	" "
Uta 4	127781	August 29, 1992
Uta 6	127783	" "
Uta 8	127785	" "
CHRIS 1 (20 units)	4855	October 25, 1983
CHRIS 2 (20 units)	4856	" "

The group is comprised of 40 2-post mineral claims and 2 modified grid claims of 20 units each.

Claim posts were observed by the writer on the SOUP claims and both groups are believed to have been located in accordance with the regulations of the Mineral Act of British Columbia.

#### PHYSICAL FEATURES

The SOUP and KLISUM claim groups are located above tree line in alpine terrain of the Osilinka Ranges.

The KLISUM group covers an area of relatively gentle relief with the southern KLI claims located in a broad, drift-covered



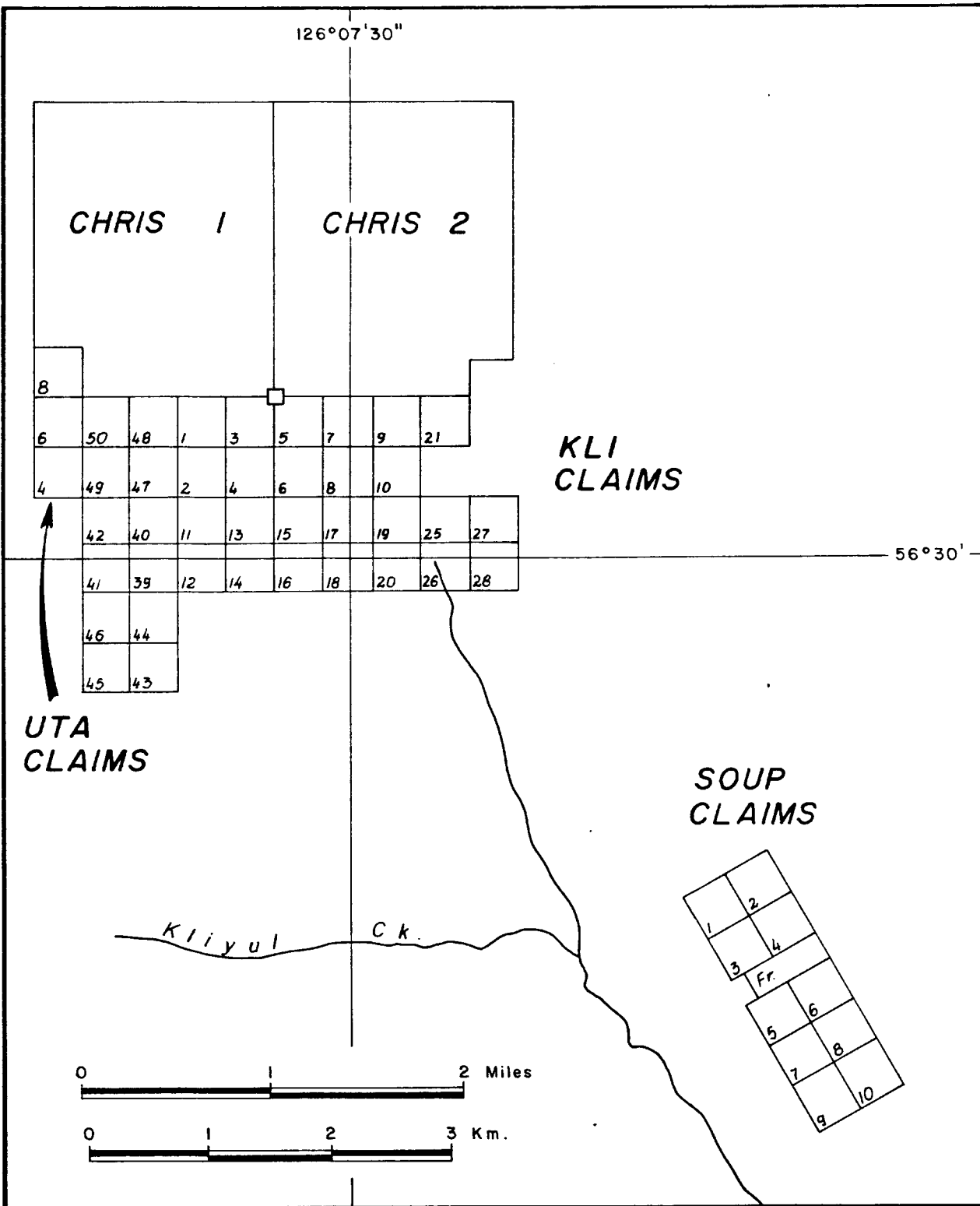


FIGURE 3 - KLISUM AND SOUP GROUP MINERAL CLAIMS

valley 5500 feet (1650 metres) in elevation north of the headwaters of Kliyul Creek (Figure 3). Elevations rise from the valley to a maximum of 7500 feet (2270 metres) and a small, permanent snowfield is situated on the north facing slope on the CHRIS 1 claim.

The SOUP claims are located east of Kliyul Creek on a steep west-facing slope on which elevations range from 5000 to 7000 feet (1500 - 2100 metres). Ubiquitous blocky talus obscures much of the bedrock and a prominent rock glacier bisects the property.

#### HISTORY

Placer gold was discovered on McConnell Creek (20 miles or 32 km northwest of Johanson Lake) in 1899 resulting in a short-lived rush to the area. Gold-bearing quartz veins in the vicinity of the present KLISUM and SOUP claim groups were first investigated in the late 1940's. More recent activity in the 1960's and 1970's was directed to the search for porphyry copper-molybdenum deposits and volcanic-hosted stratabound copper, an example of which is the Sustut deposit of Falconbridge Nickel Ltd., 25 miles (40 km) west of Johanson Lake. Two drilling ventures on porphyry deposits were undertaken in the area in 1982 by Lornex on upper Lay Creek and by Getty Mines on Porphyry Creek, 2 miles (3 km) northeast of the SOUP claims.

The SOUP claims were located in 1964 and exploratory work over the next 10 years consisted of detailed geological mapping, surface sampling and the drilling of three short x-ray holes.

In the late 1970's mineralographic studies, two magnetic profiles and rock geochemistry were undertaken. The property was acquired by Vital Resources Ltd. in 1980 and additional geochemical surveys were carried out in 1981. Noranda Exploration Co. Ltd. held an option on the property in 1982 and conducted a detailed soil and limited rock sampling program. An estimated \$75,000 (1983 dollars) has been applied to assessment work on the claims to date.

The KLISUM group was first located in 1970 by Kennco Explorations (Western) Ltd., who carried out systematic silt and soil sampling, and geophysical surveys including magnetics and Induced Polarization. The Property was optioned to SUMAC Mines Ltd. in 1973 and three X-ray and 11 BQ holes were drilled over the next two years. The property was optioned from Kennco by Vital Resources Ltd. in 1980 and four NQ-sized holes were drilled in 1981. Some preliminary metallurgical testing showed gold to be associated principally with chalcopyrite. The CHRIS 1 and 2 mineral claims were staked by the company in the fall of 1982. An estimated \$250,000 (1983 dollars) has been spent on exploration work to date on the KLISUM group.

The principals of Vital Resources Ltd., through other companies have caused to be spent some \$1 million on various regional and property exploration programs in the general area over the past fifteen years.

#### REGIONAL GEOLOGY

The SOUP and KLISUM claim groups are situated in the Intermontane tectonic belt of the Canadian Cordillera near the

northern limits of the Quesnel Trough, and immediately west of a regional northwest fault separating predominantly Proterozoic rocks from younger sequences.

Layered rocks in the area of the claims consist of a predominantly volcanic sequence, part of the Takla Group of late Triassic age. These are intruded by granitic plutons, satellitic to the Hogem batholith, and ranging in age from late Triassic to early Cretaceous. Remnants of Paleozoic ultramafic intrusions are contained within some of the granitic bodies.

Principal rock types in the Johanson Lake area are augite porphyry flows and fragmental rocks with numerous comagmatic dioritic intrusions of similar composition.

Mineral occurrences are varied and include porphyry copper and molybdenum associated with granitic rocks and disseminated and fracture-filling copper in Takla Group volcanic rocks.

Gold-bearing quartz veins, with chalcopyrite and pyrite are numerous in the area between Kliyul and Lay Creeks and Goldway Peak (Figure 2). These veins are commonly adjacent to, or within, hornblende diorite sills, which have gradational contacts with Takla volcanic rocks, and are believed to be comagmatic with them.

Gold, associated with chalcopyrite, is also contained in magnetite-rich lodes or skarns, on the SOUP and KLISUM claim groups. Spatially related dioritic intrusions also carry gold mineralization on the SOUP claims and at other nearby occurrences (Roots, 1954).

PROPERTY GEOLOGY AND MINERALIZATION

KLISUM GROUP

Much of the KLISUM group is overburden covered. Principal rock types exposed include intermediate volcanic flows with some limy tuffs and minor sediments. Layered rocks are intruded by granodiorite sills in the central KLI claims and by a diorite stock on the CHRIS claims.

Within the volcanic sequence is an extensive sulfide-bearing unit up to 1000 feet (330 metres) wide and exposed over an apparent strike length of 12,000 feet (3600 metres). This unit, bounded on the south in part by a granodiorite sill, has a sinuous surface trace and extends easterly through the central KLI claims while to the east and west it has a northwesterly strike (Figure 4). Prominent gossans are developed over much of this unit.

Magnetite-rich units with thicknesses of between 20 and 100 feet (6 to 100 metres) have been developed within the sulfide rich unit and may be products of skarnified syngenetic iron formation generated by granodiorite intrusions.

The discovery zone, on the boundary of the KLI 6 and 15 claims, has a positive magnetic response with values up to 10,000 gammas above background over an area of 2800 by 2400 feet (720 to 850 metres).

The zone, contained in an apparent synclinal structure with closure to the southeast, consists of 15 - 30% magnetite with pyrite, chalcopyrite, minor gold and reported scheelite. Diamond drilling in 1974 indicated reserves to 300 feet (90 metres) depth

of more than 1 million tons with an average grade of 0.06 ounces gold per ton, 0.22 ounces silver per ton and 0.43% copper (Michener and Pearson, 1981). 1981 drilling yielded lower values but with some core loss and two additional holes drilled to test the zone at greater depth failed to reach that objective. This additional drilling indicates a potential for 3 million tons of 0.3% copper, 0.03 ounces per ton gold and 0.2 ounces per ton silver.

Gold is present as fine grains,  $\frac{1}{2}$  to 1 micron in size, (Gasparrini, 1981) and is associated with sulfide minerals principally chalcopyrite, rather than magnetite. On the basis of limited testing, a 90% recovery of gold by way of flotation of sulfides could be expected.

Geochemical response over the Discovery zone is negligible and may be due to surface leaching. Highest values in soils were found east and southeast of the Discovery zone and ranged up to 3300 ppm Cu, 2.3 ppm Ag, 0.5 ppm Au, and 34 ppm Mo. Diamond drilling of one of these zones yielded low assays.

Aeromagnetic maps of the area show an elliptical magnetic high adjacent to the diorite stock on the CHRIS claims. The Ginger gold-bearing quartz vein (Lord, 1951) is on the south flank of this anomaly.

#### SOUP GROUP

The SOUP claims are situated on a steep 30° slope characterized by blocky talus and felsenmeer. The property is underlain by a northerly striking moderately east-dipping homoclinal succession of Takla volcanic rocks intruded by diorite

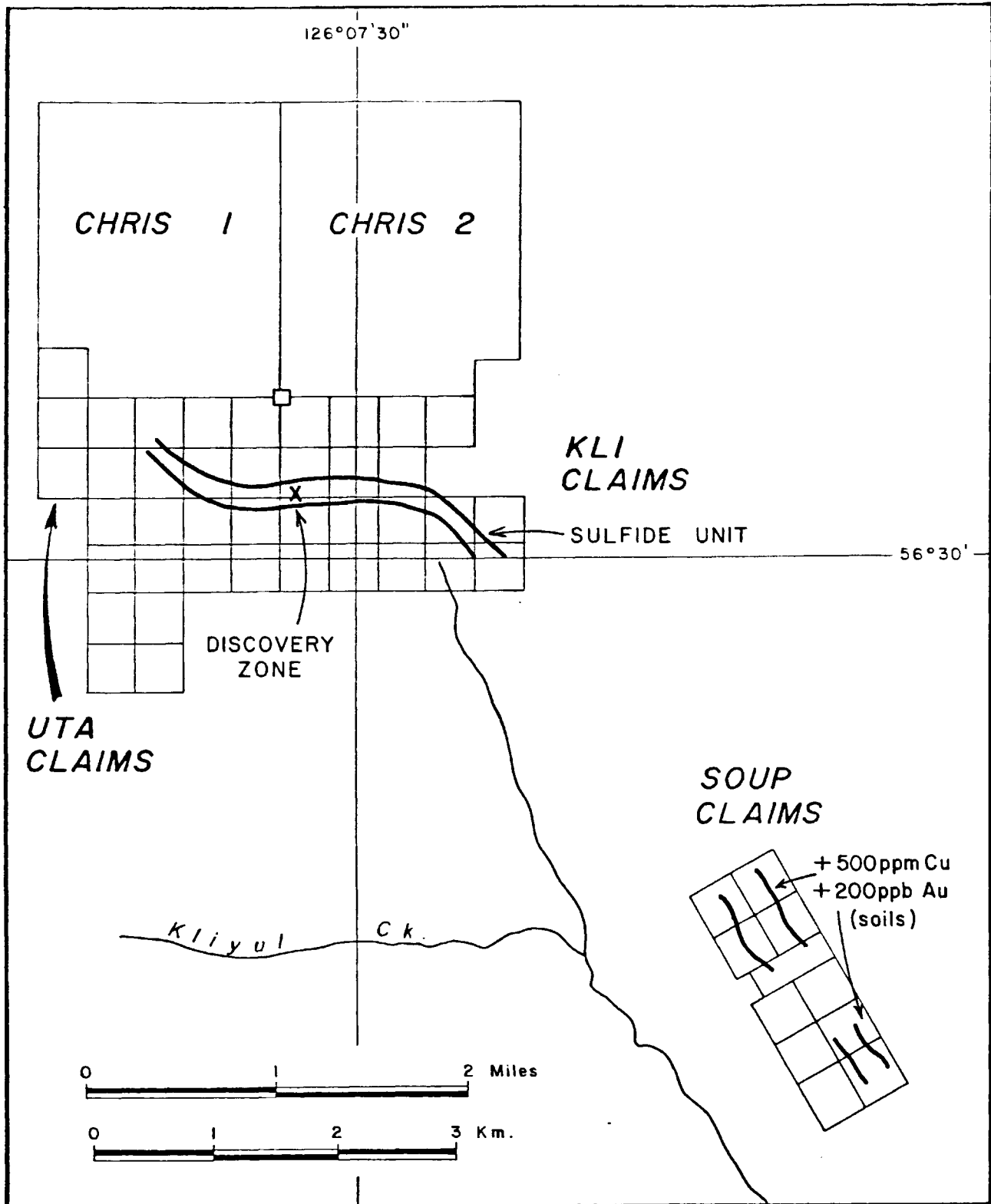


FIGURE 4 - PRINCIPAL ZONES - KLISUM AND SOUP GROUPS

dykes and sills and by quartz monzonite in the southern part of the claims. The Takla rocks include a basal sequence of intermediate flows which grade upward to augite porphyry and related fragmental rocks. (McTaggart, 1965).

At or near the contact between the two principal volcanic units are apparently conformable magnetite-rich deposits which are exposed <sup>n</sup>intermittently over a strike length of 8000 feet (2400 metres). Thicknesses range from 20 to 100 feet, (6 - 30 metres). McTaggart, (1965) estimated 27,000 tons per vertical foot for these zones. Two parallel magnetite zones, locally offset by faulting, are evident on the northern claims.

These iron-rich zones or skarn deposits contain up to 30% magnetite with coarse pyrite and finer-grained chalcopyrite. Intense oxidation has resulted in the formation of prominent gossans.

The conformable, stratiform nature of the magnetite-rich zones is borne out by magnetic profiles and modelling by Sinclair (1976) who reported a tabular body dipping 20 to 30° east. Magnetic surveys by Noranda in 1982 showed the zones to be up to 3000 gammas above background, suggesting the surrounding volcanic units also have an appreciable magnetite content.

Sampling of poorly developed soils by Noranda (Leahey, 1982) yielded exceptionally high values for gold and copper on claims north and south of the rock glacier on the SOUP 5 and 6 claims (Figure 4). Values exceeding 500 ppb Au over intervals of 700 feet (200 metres) with spot highs of 7000-9000 ppb Au and copper in excess of 2000 ppm with spot highs to 8000 ppm were found on the SOUP 8 claim.



Several anomalous zones were defined on the SOUP 2,3 and 4 claims, the most extensive of which is topographically above the known magnetite bodies indicating that the volcanic and dioritic rocks also are capable of hosting gold. Gold values of 1000 ppb and 1000 to 2000 ppm copper are common.

Rock sampling of known mineralized zones is hampered by the highly oxidized nature of surface exposures. Sampling of the magnetite zones by Bates (1977) gave an average of several hundred ppb gold, although higher values (up to 0.01 ounces per ton) were obtained in samples from actively eroding gullies by Mannard in 1964. Short packsack drill holes to depths of 25 feet (7.5 metres) did not penetrate the weathered zone and it could be postulated that surface leaching of metal values has taken place, although it should be noted that locally at least, some enrichment is also apparent.

Limited rock sampling by Noranda in 1982, (Leahey, 1982) indicates anomalous gold and copper values over an area 1600 feet (500 metres) in width on the northern or SOUP 1-4 claims and includes values both topographically above and below known magnetite zones, which corresponds with soil geochemistry in the same area.

A mineralograhic study by Sinclair (1975) showed sulfide grains could be easily separated from magnetite but that chalcopyrite (and associated gold) was finer grained than pyrite.

CONCLUSIONS AND RECOMMENDATIONS

1. Gold-copper mineralization on the KLISUM and SOUP claim groups is associated with magnetite-rich lodes developed in Takla Group intermediate to basic volcanic rocks. These lodes are commonly adjacent to dioritic sills, dykes and stocks which have a positive correlation with regional magnetic highs.
2. Recent surface sampling on the SOUP claims indicates that gold-copper mineralization is also present in Takla volcanic rocks and diorite sills stratigraphically above the magnetite lodes on the northern claims. The gold-copper association with dioritic rocks is not uncommon; an example in British Columbia is the Iron Mask batholith and Afton mine, other examples include the copper-gold deposits of Papua, New Guinea.
3. Preliminary metallurgical testing of cores from the KLISUM group and mineralographic work on SOUP mineralization shows gold to be associated with sulfides, principally chalcopyrite, suggesting relatively inexpensive recoveries.
4. Both mineralized zones could be potentially exploited by open pit mining methods.
5. The KLISUM claim group is known to host significant gold-copper mineralization associated with a magnetite-rich zone. Other, potentially larger zones may exist, possibly to the north on the CHRIS claims. A preliminary evaluation of these claims is recommended.
6. Highly anomalous soil geochem values for gold and copper have been recently obtained over widths up to 500 metres from the SOUP claims. Intense oxidation of mineralized exposures inhibits standard

surface sampling methods and the apparent depth of weathering makes the value of trenching questionable. Diamond drilling on the north claims is proposed to adequately sample the tenor of gold and copper mineralization.

#### RECOMMENDED PROGRAM

Geological mapping, soil, silt and rock geochemical surveys and a magnetometer survey are recommended as a preliminary investigation of the newly acquired CHRIS 1 and 2 claims.

Two vertical diamond drill holes, totalling 2500 feet (750 metres) are recommended for the northern part of the SOUP claims to properly sample the gold-copper-bearing magnetite zones at depth. This program will also provide a test of the potential gold-copper content of dioritic and volcanic country rocks. Additional drilling would be contingent on results of the first two holes.

The proposed drilling program will necessitate construction of drill pads on a steep slope. Water for drilling is available only from Kliyul Creek, requiring a vertical lift of about 2000 feet (600 metres). This will involve use of a high pressure pump and the laying of several thousand feet of steel pipe with helicopter support.

In view of the fact that access to the KLISUM and SOUP groups is by helicopter, the writer proposes the base camp for both projects be located at Johanson Lake. This should result in a significant reduction of camp maintenance costs.

COST ESTIMATE

1. KLISUM GROUP

Geological , geochemical and geophysical surveys	\$30,000.00
Helicopter support	10,000.00
Camp Costs	5,000.00
Contingencies	<u>5,000.00</u>
TOTAL	<u>\$50,000.00</u>

2. SOUP GROUP

Phase I:	
Mobilization and demobilization	\$20,000.00
Drilling water supply (includes pump rental, steel pipe, and construction of line)	18,600.00
Direct drilling costs - 2500 feet	75,000.00
Camp Costs	7,000.00
Helicopter support - 30 hours	15,000.00
Contingencies	<u>14,400.00</u>
	<u>\$150,000.00</u>
Phase II:	
Diamond drilling - 3500 feet to 4000 feet (mobilization, demobilization and water supply costs defrayed by first phase)	\$150,000.00
TOTAL	<u><u>\$300,000.00</u></u>

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CERTIFICATE

I, NICHOLAS C. CARTER, of Victoria, British Columbia,  
do hereby certify that:

1. I am a geologist registered with the Association of Professional Engineers of British Columbia since 1966.
2. I am a graduate of the University of New Brunswick with B.Sc. (1960), Michigan Technological University with M.S. (1962) and the University of British Columbia with Ph.D. (1974).
3. I have practised my profession in eastern Canada and the United States and in British Columbia over the past 23 years.
4. This report is based on a visit to the property September 28 and 29, 1982 and on research of published reports and maps and unpublished reports provided by Vital Resources Limited.
5. I have no interest, direct or indirect, in the SOUP or KLISUM groups of mineral claims or in Vital Resources Limited.

Victoria, B.C.  
March 22, 1983

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N.C. Carter, Ph.D., P.Eng.