GEOLOGICAL AND GEOCHEMICAL REPORT ON THE HL CLAIM GROUP

WATSON LAKE MINING DISTRICT, Y.T.
N.T.S. 105-B/6
Latitude 60°17'N; Longitude 131°20'W

FOR

SWIFT RIVER RESOURCES LTD.

BY

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J. D. Rowe, B.Sc., Geologist

SUPERVISED BY: O. S. Hairsine, P.Eng.

CORDILLERAN ENGINEERING
1418 - 355 Burrard Street
Vancouver, B.C. V6C 2G8

MARCH, 1980

CLAIMS:	HL 1-48	YA33483 - YA33530
	HL 49-52	YA35485 - YA35488
	HL 53-126	YA36447 - YA36520

WORK PERIOD: July 15 to September 29, 1979

090591

This report has been examined by the Geological Evaluation Unit and is recommended to the Commissioner to be considered as representation work in the amount of

$ 32,225.00

J A Morin

Geologist or
Registered Mining Engineer

Considered as representation work under Section 53 (4) Yukon Quartz Mining Act.

Commissioner of Yukon Territory

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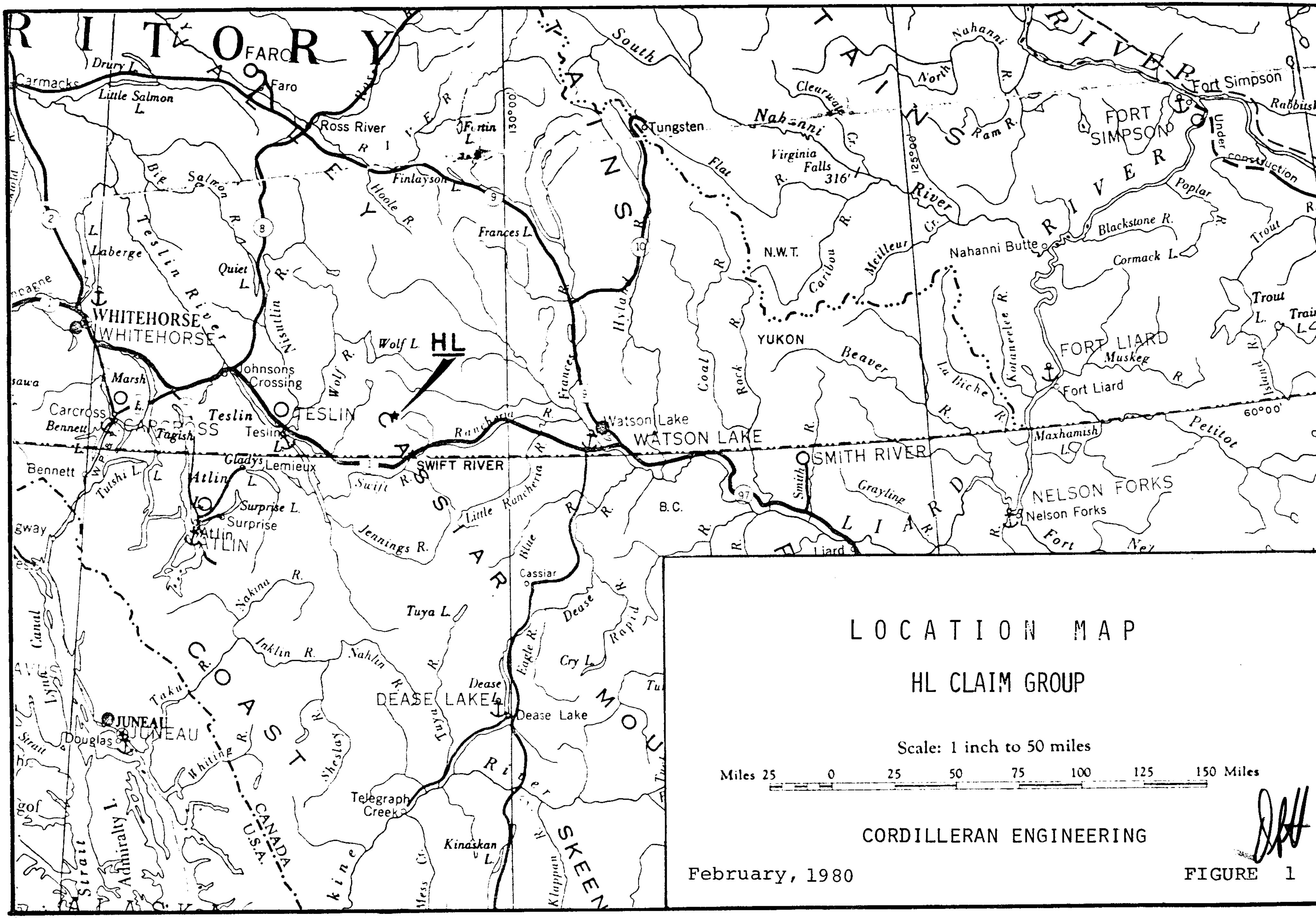
A D D E N D U M

GEOCHEMISTRY

Soil samples were collected at fifty metre intervals along grid lines and placed in numbered kraft bags. The sample sites were marked with plastic flagging. All samples were shipped to the North Vancouver laboratory of Bondar Clegg and Company, Limited for tungsten analysis.

The analytical method consisted of basic fusion, leaching, reduction with stannous chloride, complexing with ammonium thiocyanate and extraction by carbon tetrachloride. The concentration of tungsten was then measured by colourimetry.



LOCATION MAP

HL CLAIM GROUP

Scale: 1 inch to 50 miles

Miles 25 0 25 50 75 100 125 150 Miles

CORDILLERAN ENGINEERING

February, 1980

FIGURE 1

FIGURE 2: HL property, view looking southeast.

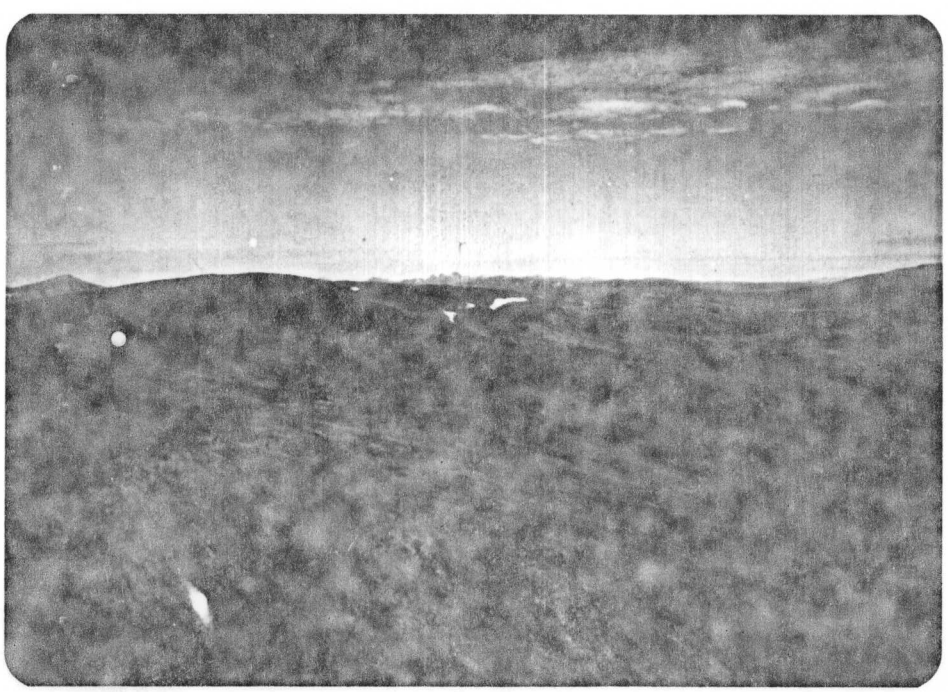


FIGURE 3: HL property, view looking northwest.

INTRODUCTION

The HL group (126 claims; Appendix "A") is located in the Watson Lake Mining District (N.T.S. 106-B/6), 34 kilometres (21 miles) north-northeast of Swift River, Y.T. The claims are situated at latitude 60°17'N and longitude 131°20'W and lie 11 kilometres (7 miles) from road end at Crescent Lake.

Initially staked to protect tungsten geochemical anomalies, forty-eight claims were acquired for Swift River Resources Ltd. by Cordilleran Engineering in June of 1978; four claims were added to the original block in September, 1978. A further seventy-four claims were acquired on ground adjoining the claim block in the early spring of 1979. Detailed prospecting has led to the discovery of significant tungsten mineralization on the HL.

The property is underlain by Lower Cambrian and

earlier (?) metasediments with minor metavolcanics (?). In contact with the metasediments, on the northeast side of the group, is the Cassiar Batholith. Tungsten mineralization occurs as scheelite disseminated in a stratiform habit in the metasediments. Vein and skarn-type mineralization are found in the sequence, but are believed to be of minor consequence. The stratiform scheelite and host rock to this mineralization strongly resemble that in economic stratiform tungsten deposits in the Eastern Alps of Austria.

Geochemical soil sampling conducted during the 1979 field season has outlined significant tungsten anomalies on the HL property. These soil anomalies considerably enhance the possibility of locating stratiform tungsten mineralization of economic potential on the claim group.

HISTORY

Extensive exploration work has been conducted in the vicinity of the HL since the mid 1940's. The BOM and ATOM groups (16 km, 10 mi. south of the HL) were located in 1946 by Hudson Bay Mining and Smelting Company for lead, zinc and silver in skarns. The Bastille claims (23 km, 14 mi. northeast of the HL) was acquired by Great Northern Exploration Company Ltd. in 1947 for zinc, lead and silver in skarn and veins. Minor tungsten and molybdenum are reported on this property which was restaked as the MID group in 1971 by the Wolf Lake Joint Venture (Rayrock Mines Limited, Ashland Oil Canada Limited and Canadian Industrial Gas and Oil Ltd.) and subsequently allowed to lapse. Intensive exploration has been conducted in the region immediately south and southwest of the HL in search for Mo, W, Sn during the past four seasons.

On the HL property skarn bands have been trenched by previous exploration companies. High grade stratiform tungsten mineralization the the HL was apparently overlooked by pervious exploration crews.

G E O L O G Y

(Plate 1, Appendix "C")

GENERAL

The HL group lies in the northern Cassiar Mountains of the Omineca Crystalline belt. The property lies in a narrow northwesterly trending slice of Lower Cambrian and earlier (?) metasediments (G.S.C. Map 10-1960). The Cassiar Batholith (mainly quartz monzonite to granodiorite) is in contact with the Lower Cambrian on the northeast. An apparently conformable sequence of lower Paleozoic sediments and volcanics form the presumably downdropped, southwest contact of the Lower Cambrian slice along the Ram Creek fault.

Physiographically the property is situated in very subdued alpine topography. Straddling a round ridge, elevations on the group range from just over 4,500 feet to

approximately 5,700 feet above sea level. Outcrop comprises less than 10 percent, but abundant rubble crop and talus are exposed.

LITHOLOGIES

(Figure 4)

Preliminary mapping of the HL group has subdivided the Lower Cambrian into 5 units and the Cassiar Batholith into 2 phases. Brief descriptions of these follow:

LOWER CAMBRIAN AND EARLIER (?)

UNIT €l:

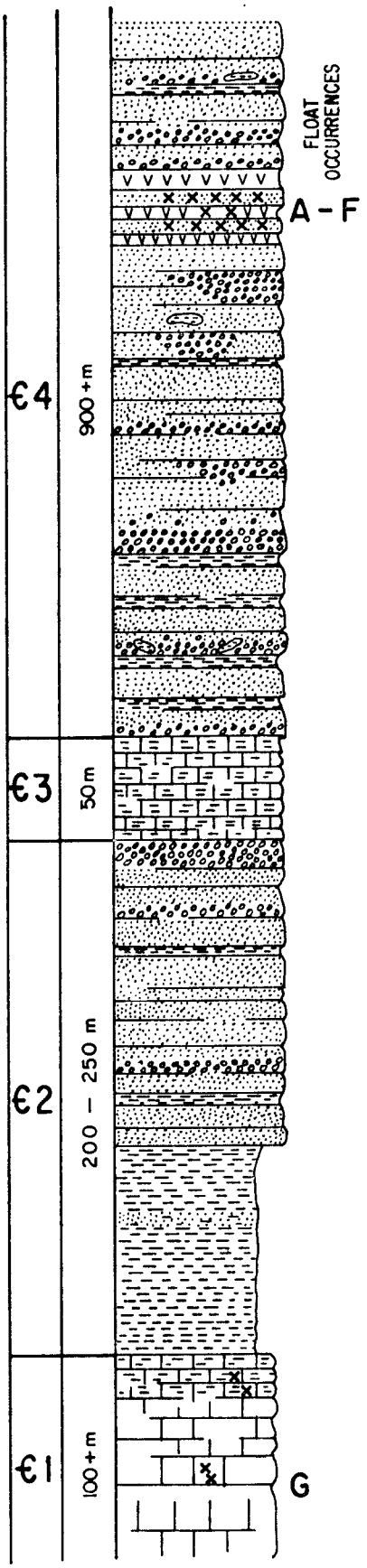
A sequence of thin-bedded medium crystalline grey argillaceous limestone grades down into thick-bedded to massive medium crystalline light grey limestone in the north corner of the property. This unit is in contact with and truncated by the Cassiar Batholith. Skarn bands consisting mainly of garnet and diopside (?) occur near the contact with a leucocratic dyke. Scheelite is found on fracture surfaces and in quartz veins cutting the limestone and skarn. Disseminated scheelite in the skarn bands is rare and presently appears to be of minor importance.

HYPOTHETICAL, PRE-METAMORPHIC STRATIGRAPHY

LOWER CAMBRIAN AND EARLIER (?) SECTION

HL PROPERTY

SCALE 1:3333



UNIT €4:

RELICT SEDIMENTARY STRUCTURES: BEDDING, CROSS-BEDDING, GRADED BEDDING, PEBBLE CONGLOMERATES, SHALE RIP-UP CLASTS, CHANNEL FILL DEPOSITS, INDICATE THIS SEQUENCE CONSISTED PREDOMINATELY OF QUARTZ PEBBLE CONGLOMERATES AND SANDSTONES. BASIC VOLCANICS (V) ARE INFERRED FROM AMPHIBOLITES TO COMPOSE APPROXIMATELY 5 PERCENT OF THE SECTION ALONG WITH POSSIBLE ANDESITES AND VOLCANICLASTIC SEDIMENTS. SCHEELITE OCCURS DISSEMINATED IN THE SEDIMENTS, ANDESITES (?) AND LESS COMMONLY IN THE AMPHIBOLITES (A,B,C,D,E,F SHOWINGS).

UNIT €3:

LIMESTONE: THIN-BEDDED, DARK TO MEDIUM GREY, MEDIUM CRYSTALLINE AND ARGILLACEOUS. THE BASE OF THIS UNIT GRADES INTO A DISTINCTIVE QUARTZ-PEBBLE CONGLOMERATE CEMENTED WITH CARBONATE.

UNIT €2:

QUARTZ-PEBBLE CONGLOMERATE AND SANDSTONES, SIMILAR TO UNIT €4, BUT APPARENTLY LACKING BASIC VOLCANICS AMPHIBOLITES. THE LOWER HALF OF THIS UNIT APPEARS TO CONTAIN A HIGHER PROPORTION OF FINE-GRAINED PELITIC ROCKS.

UNIT €1:

LIMESTONE: THIN-BEDDED, MEDIUM CRYSTALLINE, GREY, ARGILLACEOUS LIMESTONES GRADE DOWN INTO MASSIVE MEDIUM TO COARSE CRYSTALLINE LIGHT GREY LIMESTONE. SKARN IS DEVELOPED AT CONTACTS WITH THE CASSIAR BATHOUTH. SCHEELITE OCCURS ON FRACTURE SURFACES AND IN QUARTZ VEINS CUTTING THE SKARN.

GEOLOGY - Lithologies (cont'd)

UNIT €2:

Fine-to medium-grained biotite-muscovite-quartz-plagioclase schists form the bulk of Unit €2. Fine-grained andalusite-plagioclase-quartz schists, containing biotite and muscovite, appear to predominate in the lower half of this unit. Grain size and bedded character suggest these rocks are meta-psammites and metapelites. Thickness of this unit is in the order of 200 to 250 metres.

UNIT €3:

Thin-bedded, dark to medium grey, medium crystalline argillaceous limestone forms a sequence approximately 50 metres thick. The base of this unit grades into a distinct quartz-pebble conglomerate in which clasts are cemented with calcite. Weathered conglomerate exhibits a characteristic "warty" texture in which quartz pebbles protrude from the softer matrix.

UNIT €4:

Unit €4 hosts the stratiform scheelite mineralization on the HL. The bulk of the package consists of biotite-muscovite-quartz-plagioclase schists. Variations in mica content (1 to 40%) give the rock a variable developed schistosity. Relict sedimentary structures are well preserved (photographs, Appendix "B") suggesting original rock-types of quartz-pebble conglomerates, sandstones (greywackes?) and shales. Amphibolites (actinolite/hornblende-plagioclase rocks) forming approximately 5 percent of Unit €4 are intercalated with the metapsammitic rocks in bands varying from 15 cm to 60 cm in thickness. These basic rocks are believed to be

GEOLOGY - Lithologies (cont'd)

metabasalts. Commonly adjacent to the amphibolites are moderately well foliated rocks which contain siliceous layers (quartz and epidote) and aggregates of amphibole (actinolite and/or hornblende) varying from 3 mm to 10 mm in diameter and flattened parallel to foliation. These rocks are thought to have originally been volcaniclastic sandstones and tuffs, amphibole aggregates being fragments derived from basic volcanics, siliceous layers being the products of volcanic exhalations. Scheelite occurs disseminated in a distinctly stratiform habit in siliceous metapsammitic and volcaniclastic rocks. Quartz vein-hosted mineralization is common but vein density is low. Unit Є4 is exposed over a length of at least 9 kilometres on the property. The sequence has been subjected to tight folding but is estimated to have a true thickness of up to 600 metres.

LOWER CRETACEOUS - Cassiar Batholith:

Quartz Monzonite Kqm:

Coarse-grained, biotite quartz monzonite lies in contact with the Lower Cambrian strata on the northeast side of the property. The quartz monzonite has a well developed, wide spaced blocky jointing and generally appears foliated.

Leucocractic Phase Kʟ:

A pale grey, fine-to medium-grained porphyritic intrusive (quartz monzonite ?) forms dykes in the north part of the claim group as a border phase to the main quartz-monzonite

GEOLOGY - Lithologies (cont'd)

body. The groundmass has a sugary texture and contains accessory biotite and muscovite. Locally small pegmatitic zones occur in this rock.

TERTIARY (?)

Quartz porphyry Tqp:

A dyke of fine-grained quartz porphyry intrudes Unit €4 in the southeast part of the property. The dyke reaches a width of approximately 25 metres and is traceable over 100 metres. Small (1 to 2 mm) bipyramidal quartz phenocrysts are set in a fine-grained pale grey groundmass with accessory pyrite.

Float of fine-grained, dark grey, biotite lamprophyre(?) occurs near the baseline at 26E and probably represents a relatively young dyke.

GEOLOGY (cont'd)

STRUCTURE

The Lower Cambrian package on the HL is folded into a northwesterly trending synform. Minor folds are locally developed in the metasediments. Talus fragments exhibiting isoclinal folds indicate the intensity of deformation (Figure 12, Appendix "B"). Petrographic evidence suggests at least two stages of deformation.

A major fault, the Ram Creek fault, is inferred to lie immediately southwest of the claim group. This fault has moved the Lower Cambrian section upward adjacent to Lower Paleozoic sediments and metavolcanics. A fault is inferred to occur between the Cassiar Batholith and Lower Cambrian package (G.S.C. Map 10-196), but no evidence for this fault could be found on the property. Distinct northeasterly trending lineaments are evident on airphotographs of the property, as are, to a lesser extent, northerly, northwesterly and easterly trending lineaments. No displacement has been observed along these lineaments. Northwesterly trends may reflect lithologic variations within Unit $\epsilon 4$.

GEOCHEMISTRY

(Plate 2, Appendix "C")

Stream sediment sampling that defined the initial tungsten anomalies, was conducted during the 1977 field season. The results of this work indicate that sediments form streams draining the property contain 8 to 45 ppm W, and that values greater than 30 ppm W are strongly anomalous.

Reconnaissance soil lines were run on the HL group in 1978 to determine the geochemical response to mineralization. Results of the sampling indicated subtle anomalies exist and are spatially related to most of the float occurrences. Further soil sampling was therefore justified.

During the 1979 field season a grid was established on the claims and 2308 soil samples were collected over 116 kilometres of line. The -80 mesh fraction of the samples was analyzed for tungsten by Bondar-Clegg and Company, Limited.

GEOCHEMISTRY (cont'd)

Analytical results range from <2 to 60 ppm W. Estimated statistical categories are as follows:

Background	<7 ppm
Possibly anomalous	7-9
Anomalous	10-12
Strongly anomalous	≥13

The results outline significant soil anomalies in the vicinity of known mineralized float occurrences as well as in unprospected areas. At least eight parallel northwesterly trending anomalies are recognizable. Much of the anomalous ground is located between lines 32E and 48E. A large strongly anomalous area, between line 36E, 50 to 100N and line 39E, 150N is inferred to extend over a strike length of 1600 metres (5,248 feet) to lines 33E and 48E and may be related to an anomaly on line 14E. On the southeast part of the property a consistent anomaly between lines 77E and 83E has a northwesterly trend which parallels bedding.

The large anomaly located between lines 36E and 39E is presumed to be caused by underlying stratiform tungsten mineralization. If this is the case, then parallel anomalies

GEOCHEMISTRY (cont'd)

may represent one or more mineralized horizons that are exposed (below overburden) by repetition through folding. Anomalies occuring on the south side of the major synform axis are of particular interest as they support the notion that mineralization is hosted by specific beds and consistent over a large area.

The rocky alpine soil profile covering most of the property is a poor medium for sampling. At many sites adequate samples were difficult to obtain. Coarse talus predominates over soil at most scheelite-bearing float occurrences. In view of these problems it is believed that relatively high tungsten values in soils (100+ ppm) are lacking because of several factors which must be appreciated in order to properly assess the significance of soil anomalies. Mineralization is contained in a resistant, well indurated, quartzose rock which, therefore does not liberate abundant scheelite into soils. The poor soil development limits the amount of clay available for tungsten adsorption. Scheelite itself being resistant further limits the amount of tungsten available to clays in soils and streams. The -80 mesh fraction of samples used for analysis may contain less tungsten than coarser fractions because scheelite on the property is relatively

GEOCHEMISTRY (cont'd)

coarse-grained and resistant.

The above factors may account for the fact that float occurrences containing high grade scheelite mineralization (A.B,C showings) were not detected by soil geochemistry.

MINERALIZATION

Tungsten mineralization has three modes of occurrence on the HL group. The predominant mode is scheelite disseminations in a distinctly stratiform habit in regionally metamorphosed rocks. Less significant occurrences of scheelite are found in quartz veins and coating fracture surfaces or rarely, as disseminations in contact metamorphic skarn.

At the "G" occurrence scheelite is found in quartz carbonate veins and on fracture surfaces in float and cutting limestone and skarn over an area of 500 square metres. The limestone (Cl) is in contact with a leucocratic phase of the Cassiar Batholith (KL). Skarn development in the limestone appears to be most well developed in the upper (stratigraphically), thin-bedded section of this unit. Scheelite disseminated in skarn is rare. At present, mineralization at the "G" occurrence is of minor interest. Trenches across the skarn indicate other parties have investigated this occurrence.

Mineralization of prime interest is found at the A, B, C, D, E, F and H float occurrences. Scheelite occurs in a distinctly stratiform habit in quartzose foliated rocks which have tentatively been identified as metapsammites and metatuffs or metavolcaniclastic rocks. In some specimens beds with disseminated scheelite are cut by other beds suggesting cross bedding or channelling of mineralized horizons (Figure 14, Appendix "B"). The stratiform mineralization occurs sporadically along strike over a distance of 3000 metres and appears to be limited to a narrow stratigraphic interval of approximately 100 metres in thickness. The showings are approximately 600 metres from the intrusive contact.

Scheelite is found in tabular aggregates (up to 4 mm long) interstitial to silicate grains and parallel to foliation, suggesting it has been deformed. The euhedral scheelite grains are complexly zoned and are associated with pyrrhotite, quartz, plagioclase, epidote, garnet and sphene. Genetic relations between scheelite and other minerals are not clear. A reaction involving actinolite and plagioclase to form scheelite has been suggested, but there is little evidence to support this assertion.

Assays of representative chips from mineralized boulders at the A, B, C and D occurrences range from 0.59% WO_3

to 2.54% WO_3 (Table I). High grade (1%+ WO_3) mineralization is confined to areas of talus 3 to 5 metres in diameter. The restricted nature of the high grade talus suggests that this material has not been transported far from a bedrock source. Stratiform mineralization is found intermittantly in talus between the showings with concentrations of mineralized talus over 30 to 60 metres at the E and F showings. Boulders up to 60 cm across containing disseminated scheelite throughout have been located at the A float occurrence. Although no assays have been reported from the E and F float occurrences mineralization is similar to that at A, B, C and D, but is not as concentrated in the talus as at the latter showings. It is conceivable that mineralized horizons several metres thick and averaging 1% WO_3 may exist on the HL property.

TABLE I A S S A Y T A B L E

Sample Number	Description*	WO_3 %	Sn ppm	Au ppb	Ag ppm	Cu ppm	Mo ppm	Bi ppm	U ppm
13786	A Showing: representative chips from mineralized float boulders	2.54	140	5	0.2	14	2	<1	0.8
13787	B Showing: representative chips from mineralized float boulders	1.20	32	5	0.2	26	3	<1	1.0
13788	C Showing: representative chips from mineralized float boulders	1.24	44	10	0.2	29	2	3	0.6
13789	Between B-C Showings: mineralized talus chips	0.52	32	15	0.2	20	2	<1	0.8
13790	D Showing: chip from mineralized talus boulder	0.24	23	10	0.2	19	3	<1	1.0
13791	D Showing: representative chips from mineralized talus	1.86	118	15	0.2	22	4	<1	1.0
13792	D Showing: chips from large mineralized float boulder	0.95	44	50	0.2	154	3	30	1.0
13793	D Showing: represenative chips from mineralized float boulders	0.59	46	5	0.2	23	3	<1	0.6
13794	East Cirque - talus chip thought to contain powellite	0.08	3	<5	0.2	26	4	<1	0.8
13795	A Showing: selected mineralized float specimen (equivalent to thin section HL 24)	1.08	5	1550	0.8	50	5	<1	0.6
13796	B Showing: selected mineralized float specimen (equivalent to thin section HL 25)	3.07	40	700	0.4	40	3	<1	0.6

*All samples are of metasediments

EVALUATION

The stratiform character of scheelite mineralization on the HL and the nature of the host rocks - metasediments and metavolcanics - strongly suggests that these occurrences are of the same type as those presently being mined in the Austrian Alps. The deposits near Mittersil, Austria, have ore widths in excess of 2 metres, grades average 0.8% WO_3 with a cut off of 0.3% WO_3 (Mining Magazine: June, October, 1978). Tonnages are estimated to be in the order of 10 million tons (in excess of $1 billion gross value at $6.50/lb WO_3 concentrate). Host rocks at Mittersil consist of amphibolites and metasediments: similar in many respects to host rocks at the HL. The tungsten-bearing sequence in Austria is Lower Paleozoic in age. The sequence on the group may be of a similar age. Rapid thickening of mineralized horizons into ore shoots occurs at the known stratiform tungsten deposits and, by analogy, is believed likely to happen on the HL property.

The grades of representative chip samples of mineralized float, i.e., representative samples which are believed to relfect the type of mineralization that may be found in place, range from 0.59 to 2.54% WO_3. Mineralized float boulders up to 60 cm across with scheelite disseminated throughout suggest that mineable ore widths may exist along a considerable strike length as evidenced by float occurrences extending up to 3000 metres. Significant geochemical anomalies on the HL suggest that there is excellent potential for locating further, near surface, stratiform tungsten mineralization, of economic importance, in place on the property. The gentle topography, favourable location of the property to major transportation routes, will facilitate rapid and easy development.

RECOMMENDATIONS

A two-phase exploration program is recommended to evaluate the HL group.

PHASE I:

1. Base Map Preparation: orthophoto base map of the claim group, scale 1:5000.
2. Additional Geological Mapping: 1:500 and 1:50 scale mapping of showings and trenches.
3. Detailed Prospecting: night lamping.
4. Trenching: of best float occurrences and geochemical anomalies.
5. Geophysics: IP and mag may be of use if it can be shown that disseminated pyrrhotite is related only to mineralization.

PHASE II: Diamond Drilling: of best showing/float occurrences.

Respectfully submitted
CORDILLERAN ENGINEERING

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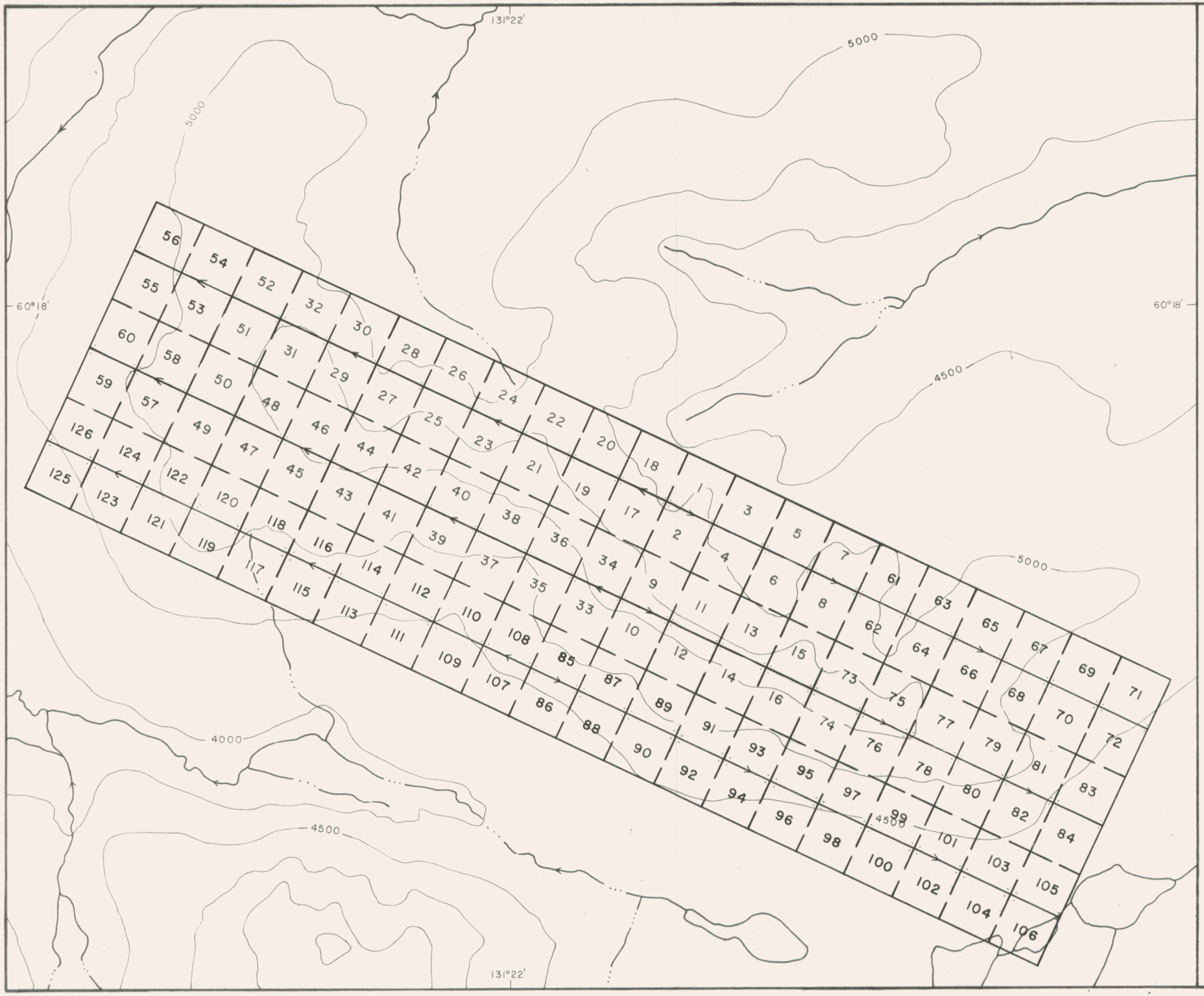
CGV,JDR/z

APPENDIX "A"

CLAIM MAP



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	GRANT No.	EXPIRY DATE
HL 1-48	YA33483-33530	DECEMBER 30, 1982
HL 49-52	YA35485-33488	DECEMBER 30, 1982
HL 53-104	YA36447-36498	DECEMBER 30, 1982
HL 105-106	YA36499-36500	APRIL 10, 1981
HL 107-126	YA36501-36520	DECEMBER 30, 1982

CLAIM MAP

HL PROPERTY

WATSON LAKE MINING DISTRICT, YUKON TERRITORY
N.T.S. 105 B-6

SCALE: 1 inch = 1/2 mile
CONTOUR INTERVAL = 500 feet

by

CORDILLERAN ENGINEERING

FEBRUARY, 1980

FIGURE 5

APPENDIX "B"

FIGURES 6 TO 15

(PHOTOS)

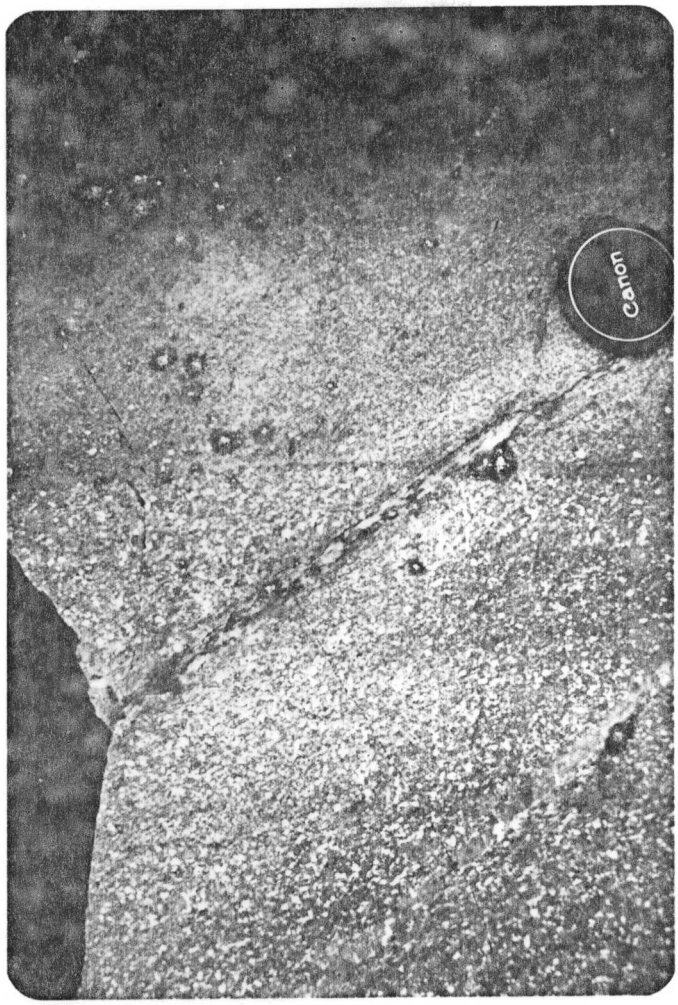


FIGURE 6:

Meta-quartz-pebble conglomerate grading into metapsammite.

(Unit €5)

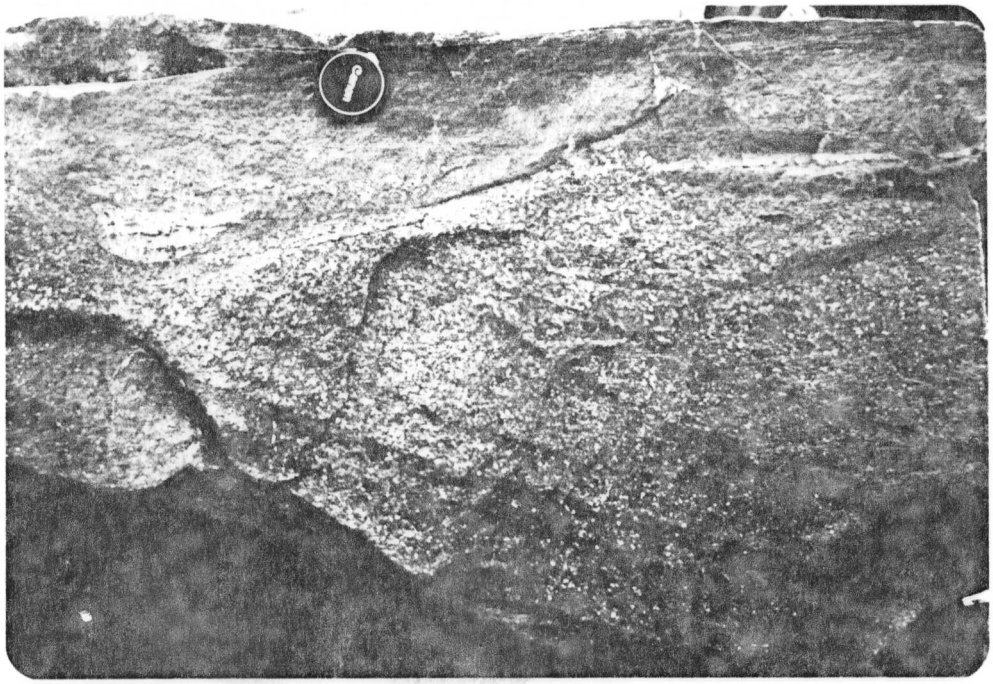


FIGURE 7: Metapsammitic layer overlying channel filling of meta-quartz-pebble conglomerate. (Unit €5)

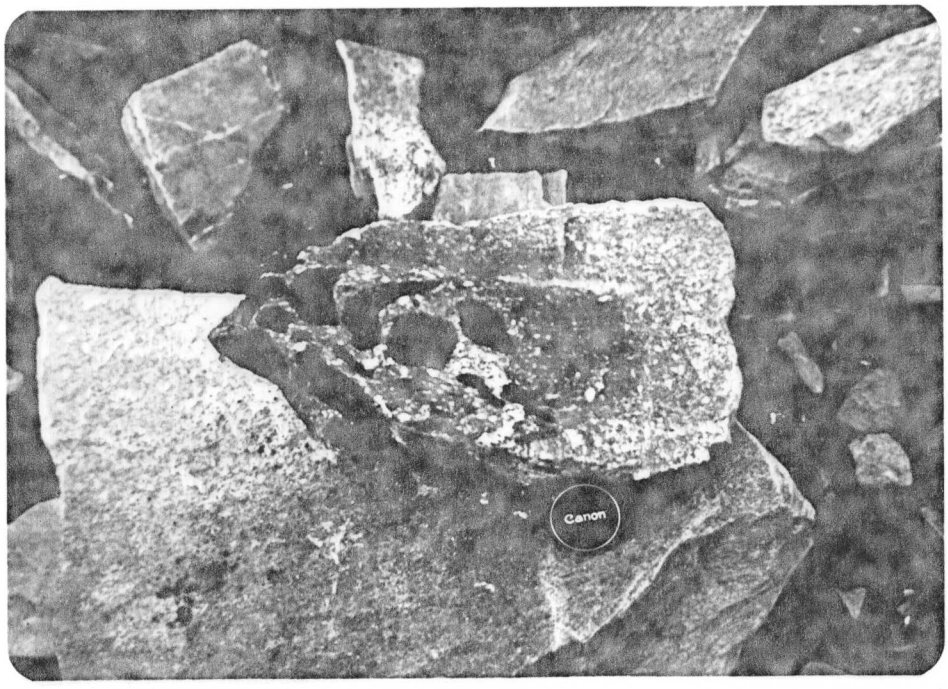


FIGURE 8: Shale rip-up clasts in meta-quartz pebble conglomerate (Unit Є5).

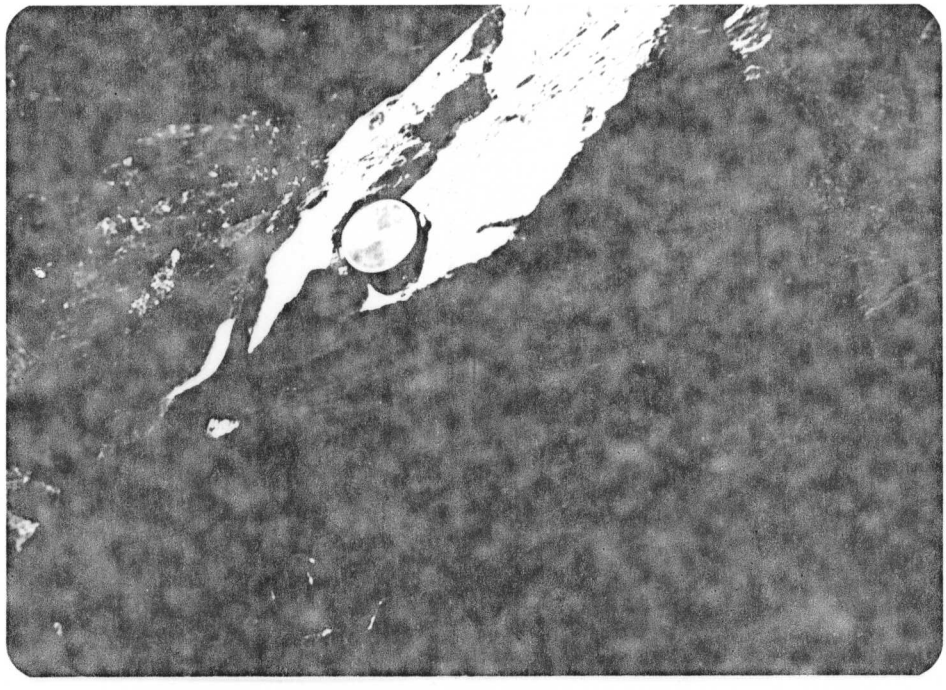


FIGURE 9: Metapelitic bed overlain by metapsammitic rocks (Unit Є5).

FIGURE 10: Amphibolite (Unit ϵ5).

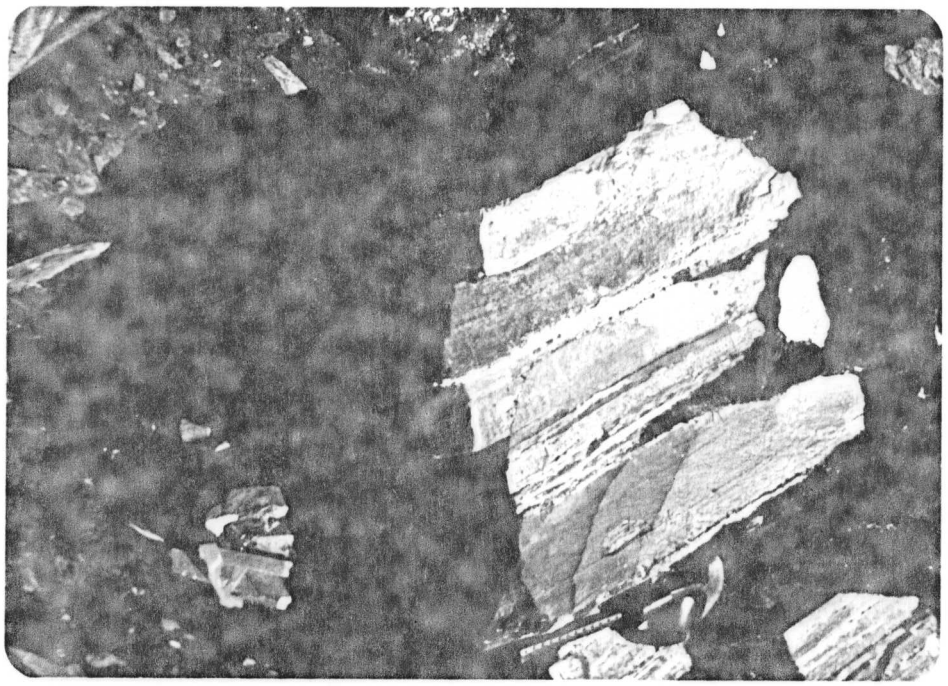


FIGURE 11: Amphibolite layer between metapsammitic layers (Unit ϵ5).

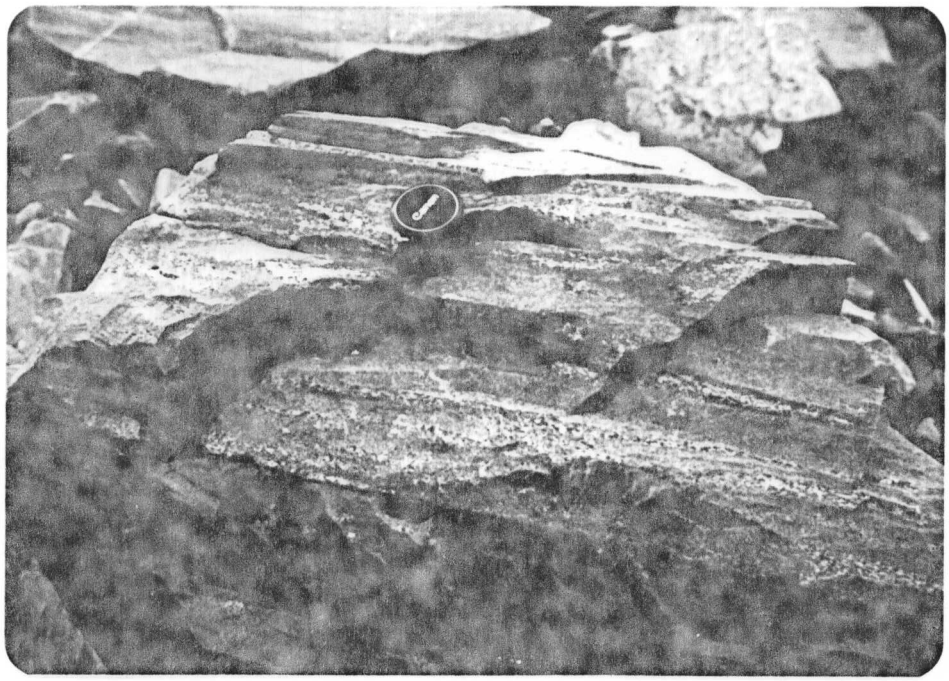


FIGURE 12: Metapsammitic rock with siliceous layers (tuffaceous?) containing amphibolite porphyroblasts (Unit €5).

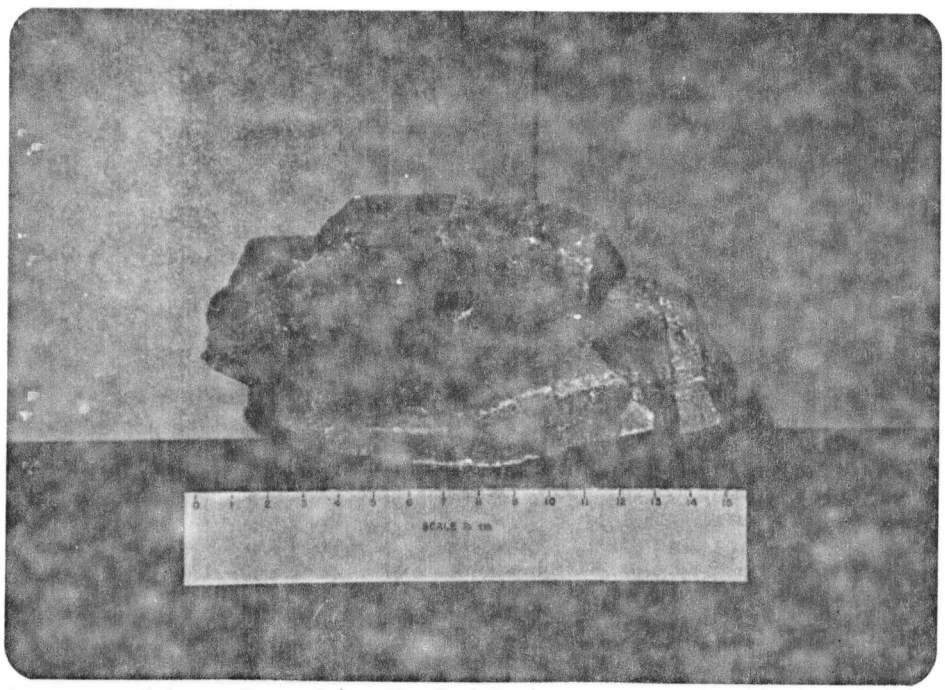


FIGURE 13: Isoclinal fold in metapsammitic rock. Note lighter coloured siliceous layer (tuff?), Unit €5.

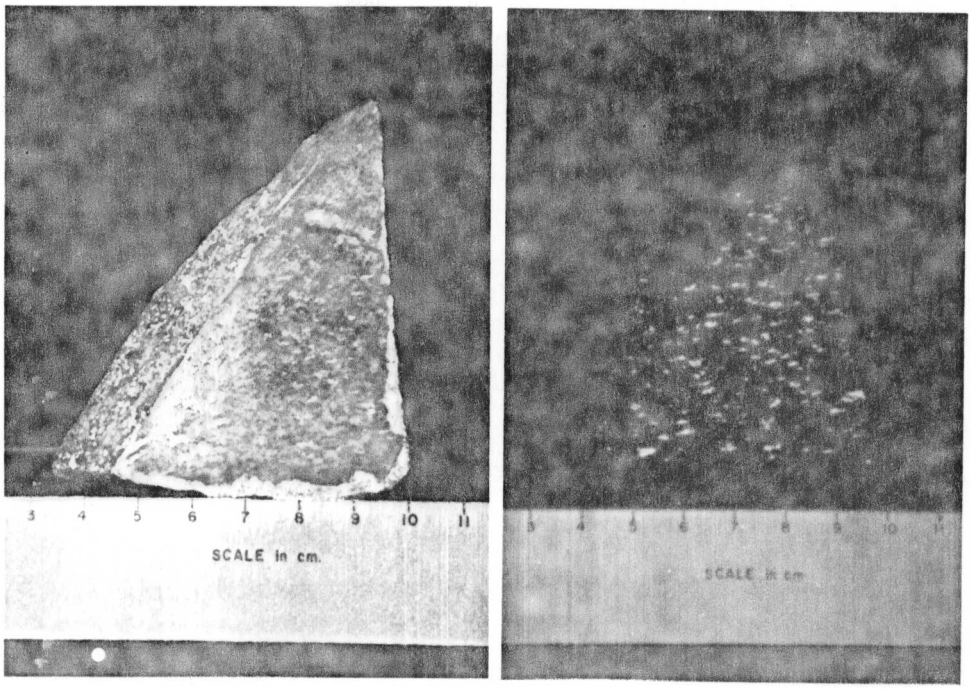


FIGURE 14: Specimen HL 25 in plain and UV light. Sample is metapsammitic and assays 3.07% WO3 (Unit €5).

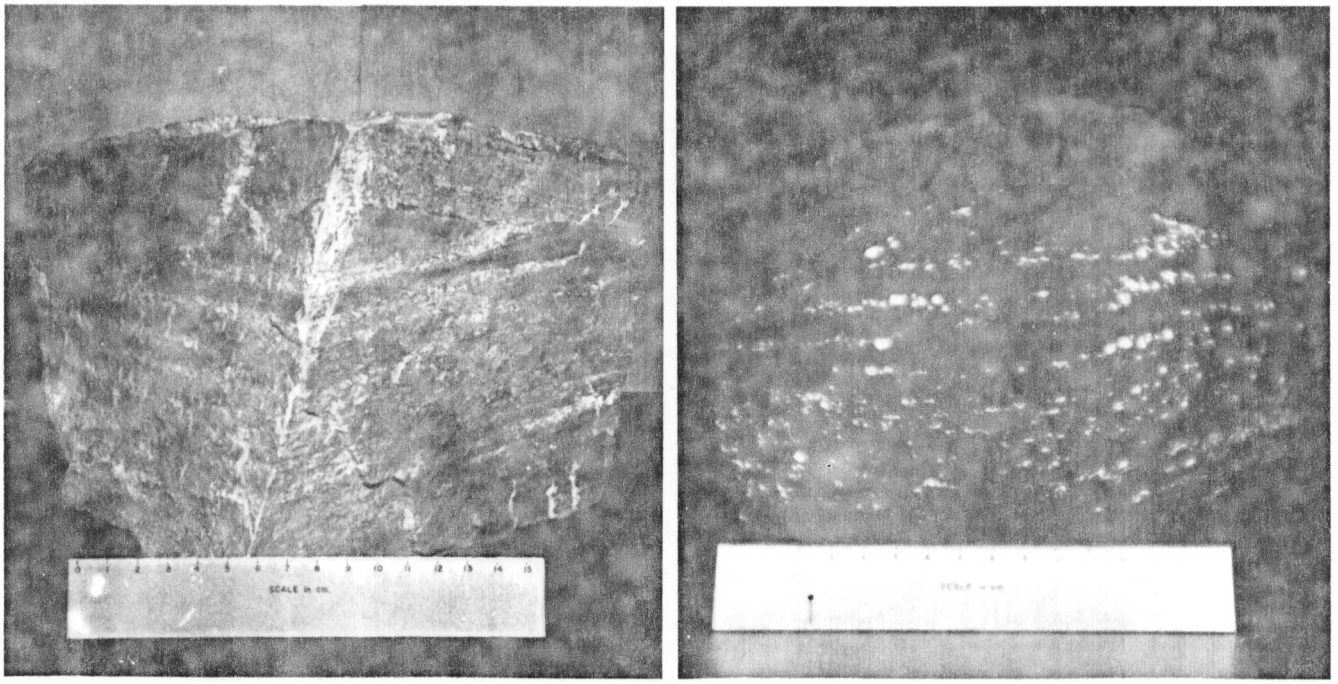


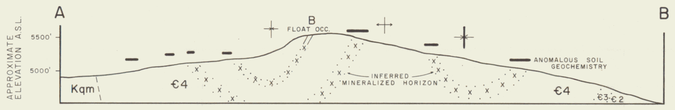
FIGURE 15: Mineralized metapsammitic rock in plain light and UV light (Unit €5). (not assayed).

APPENDIX "C"

PLATES

INFERRED STRUCTURAL CROSS-SECTION A—B

LOOKING SOUTHEAST



LEGEND

TERTIARY (?)

- Tqp — QUARTZ PORPHYRY DYKE. FINE-GRAINED, PALE GREY PORPHYRY WITH SMALL (1-2 mm) BIPYRAMIDAL QUARTZ PHENOCRYSTS

LOWER CRETACEOUS - CASSIAR BATHOLITH

- KL — LEUCOCRATIC PHASE. PALE GREY, FINE- TO MEDIUM-GRAINED PORPHYRITIC INTRUSIVE. POIKILITIC FELDSPAR PHENOCRYSTS (UP TO 15 mm) OCCUR IN A SUGARY-TEXTURED GROUNDMASS WITH BIOTITE AND MUSCOVITE. LOCALLY PEGMATITIC.
- Kqm — COARSE-GRAINED, BIOTITE-QUARTZ MONZONITE WITH SMOKY QUARTZ. WEAKLY FOLIATED WITH WIDE SPACED BLOCKY JOINTING.

LOWER CAMBRIAN AND EARLIER (?)

- €4 — PREDOMINANTLY BIOTITE-MUSCOVITE-QUARTZ-PLAGIOCLASE SCHISTS WITH VARIABLY DEVELOPED SCHISTOSITY. RELICT SEDIMENTARY STRUCTURES INDICATE THE ORIGINAL SEQUENCE CONSISTED OF QUARTZ-PEBBLE CONGLOMERATES AND SANDSTONES, AMPHIBOLITES (META-BASALTS?), META-ANDESITES(?) AND POSSIBLY VOLCANICLASTIC SEDIMENTS. METAMORPHOSED EQUIVALENTS OF MINERALIZATION (?) ARE DISSEMINATED IN THE METASEDIMENTS, META-ANDESITES(?) AND LESS COMMONLY IN THE BASIC SCHISTS. (A,B,C,D,E,F SHOWINGS). A THICKNESS OF 900 METRES IS ESTIMATED TO OCCUR ON THE PROPERTY.
- €3 — LIMESTONE: THIN-BEDDED, DARK TO MEDIUM GREY, MEDIUM CRYSTALLINE AND ARGILLACEOUS. THE BASE OF THIS UNIT GRADES INTO A DISTINCTIVE META-QUARTZ-PEBBLE CONGLOMERATE CEMENTED WITH CARBONATE. APPROXIMATELY 90 METRES THICK.
- €2 — BIOTITE-MUSCOVITE-QUARTZ-PLAGIOCLASE SCHISTS. SIMILAR TO UNIT €4, BUT LACKING AMPHIBOLITES. FINE-GRAINED ANDALUSITE-MICA-QUARTZ-PLAGIOCLASE SCHISTS PREDOMINATE IN THE LOWER HALF OF THIS UNIT. 200-250 METRES THICK.
- €1 — LIMESTONE: THIN-BEDDED, MEDIUM CRYSTALLINE, GREY, ARGILLACEOUS LIMESTONES GRADE DOWN INTO MASSIVE, MEDIUM TO COARSE CRYSTALLINE LIGHT GREY LIMESTONE. SKARN BANDS CONSISTING MAINLY OF GARNET AND DIOPSIDE (?) OCCUR ALONG THE UPPER CONTACT. SCHEELITE OCCURS ON FRACTURE SURFACES AND IN QUARTZ VEINS CUTTING THE LIMESTONE AND SKARN. (6 SHOWINGS). 100 METRES ARE EXPOSED.

- RIDGE ESCARPMENT
- STREAM
- OUTCROP
- LITHOLOGIC CONTACT: DEFINITE, INFERRED, ASSUMED
- 34 — STRIKE AND DIP OF BEDDING
- 52 — STRIKE AND DIP OF CLEAVAGE IN METAPELITES
- MAJOR SYNCLINE
- MINOR SYNCLINE / ANTICLINE
- 42 — TREND AND PLUNGE OF MINOR FOLDS
- xA — SCHEELITE MINERALIZATION (PRIMARILY FLOAT)
- LINEAMENTS
- INFERRED TREND OF TUNGSTEN SOIL ANOMALIES

NOTE: MAGNETIC DECLINATION: 35° EAST

SWIFT RIVER RESOURCES LTD.

HL PROPERTY

GEOLOGY

WOLF LAKE MAP AREA, N.T.S. 105 B/6

WATSON LAKE MINING DISTRICT, YUKON TERRITORY

200 0 200 400 600 800 METRES

1 : 10,000

BY

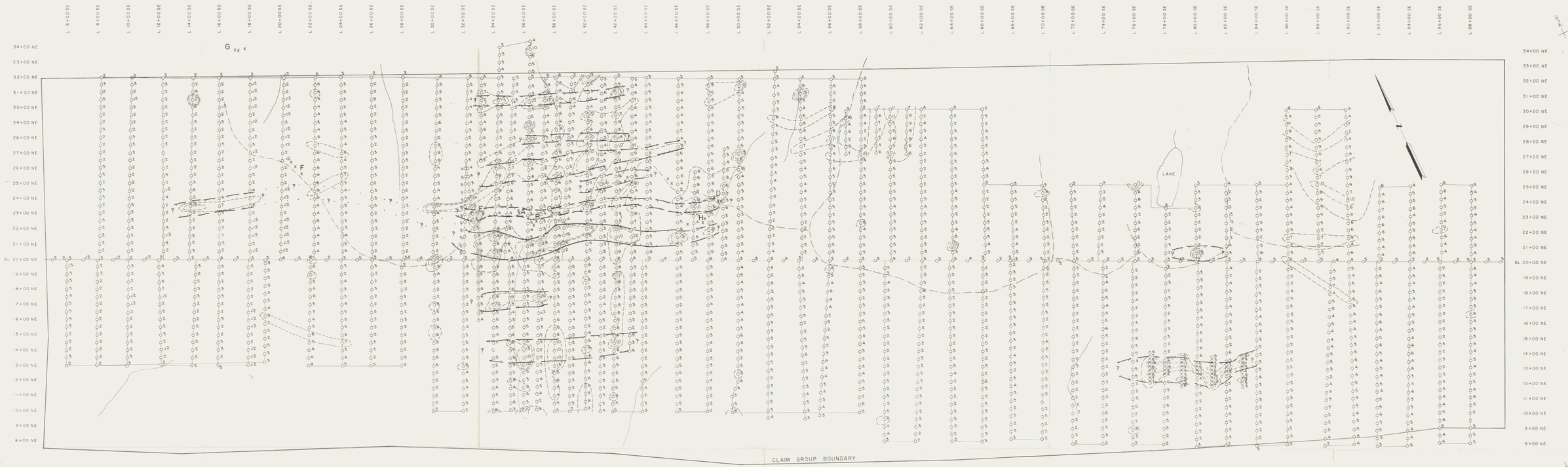
CORDILLERAN ENGINEERING

1418-355 BURRARD STREET

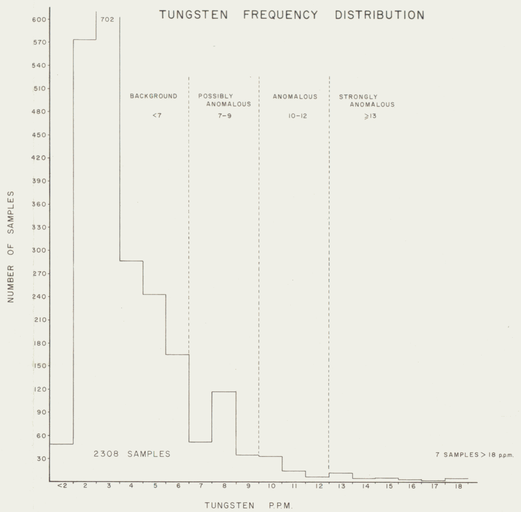
VANCOUVER, B.C. V6C 2G8

FEBRUARY, 1980

PLATE I



TUNGSTEN FREQUENCY DISTRIBUTION



LEGEND

- STREAM
- RIDGE ESCARPMENT
- ○6 SOIL SAMPLE LOCATION AND TUNGSTEN CONTENT IN PPM. (PARTS PER MILLION)
- xA SCHEELITE MINERALIZATION (PRIMARILY FLOAT)
- INFERRED TREND OF TUNGSTEN SOIL ANOMALIES

TUNGSTEN CONCENTRATION IN SOILS

○	BACKGROUND	<7 p.p.m.
○	POSSIBLY ANOMALOUS	7–9 p.p.m.
○	ANOMALOUS	10–12 p.p.m.
○	STRONGLY ANOMALOUS	≥13 p.p.m.

ANOMALOUS AREAS

- POSSIBLY ANOMALOUS
- ANOMALOUS
- STRONGLY ANOMALOUS

SWIFT RIVER RESOURCES LTD.

HL PROPERTY

SOIL GEOCHEMISTRY—TUNGSTEN

WOLF LAKE MAP AREA, N.T.S. 105 B/6
WATSON LAKE MINING DISTRICT, YUKON TERRITORY

200 0 200 400 600 800 METRES
1:10,000

BY
CORDILLERAN ENGINEERING
1418–355 BURRARD STREET
VANCOUVER, B.C. V6C 2G8

FEBRUARY, 1980

PLATE 2

APPENDIX "D"

C E R T I F I C A T E S

CORDILLERAN ENGINEERING

1418 MARINE BUILDING, 355 BURRARD STREET, VANCOUVER, BRITISH COLUMBIA V6C 2G8 TEL: (604) 681-8381

WRITER'S CERTIFICATE

I, Carl G. Verley of Vancouver, British Columbia hereby certify that:

1. I am a geologist residing at 301-1867 West 3rd Avenue, and employed by Cordilleran Engineering of 1418 - 355 Burrard Street, Vancouver, B.C. V6C 2G8.

2. I am a graduate of the University of British Columbia, B.Sc., in 1974, and have practiced my profession since that time.

3. I am an engineering pupil with the Association of Professional Engineers of the Province of British Columbia.

4. I am the co-author of this report which is based on work conducted on the HL #1-126 mineral claims during the period July 15 to September 29, 1979. This work included geological mapping and geochemical sampling, undertaken on behalf of Swift River Resources Ltd.

CORDILLERAN ENGINEERING

Carl G. Verley

Carl G. Verley, B.Sc.,
Geologist

March, 1980
Vancouver, B.C.

CORDILLERAN ENGINEERING

1418 MARINE BUILDING, 355 BURRARD STREET, VANCOUVER, BRITISH COLUMBIA V6C 2G8 TEL: (604) 681-8381

WRITER'S CERTIFICATE

I, Jeffrey D. Rowe of Vancouver, British Columbia hereby certify that:

1. I am a geologist residing at 121 E 27th St., North Vancouver, B.C., and employed by Cordilleran Engineering of 1418 - 355 Burrard Street, Vancouver, B.C. V6C 2G8

2. I received a Bachelor of Science degree from the Faculty of Geology at the University of British Columbia, Vancouver, B.C. (1975).

3. I am the co-author of this report which is based on field work conducted during July 15 to September29, 1979 on behalf of Swift River Resources Ltd.

CORDILLERAN ENGINEERING

Jeffrey D. Rowe

Jeffrey D. Rowe, B.Sc.
Geologist

March, 1980
Vancouver, B.C.

CORDILLERAN ENGINEERING

1418 MARINE BUILDING, 355 BURRARD STREET, VANCOUVER, BRITISH COLUMBIA V6C 2G8 TEL: (604) 681-8381

SUPERVISOR'S CERTIFICATE

I, Owen S. Hairsine, of Burnaby, British Columbia hereby certify that:

1. I am a geological engineer residing at 1165 Ridley Drive, Burnaby, B.C.

2. I am employed by Cordilleran Engineering of 1418 - 355 Burrard Street, Vancouver, B.C. V6C 2G8

3. I received a Bachelor of Science degree from Michigan Technological University, Houghton, Michigan in 1969 and have practiced my profession since that time.

4. I am a member of the Association of Professional Engineers of the Province of British Columbia.

5. I supervised the writing of this report and the field work upon which it is based.

CORDILLERAN ENGINEERING

O. S. Hairsine

Owen S. Hairsine, P.Eng.
Geological Engineer

March, 1980
Vancouver, B.C.

APPENDIX "E"

PERSONNEL

PERSONNEL

O.S.Hairsine	.....	Supervisor
J.D.Rowe	.....	Geologist
C. G. Verley	.....	Geologist
H. E. Ewen	.....	Field Assistant
S. S. Jones	.....	Field Assistant
T. Turner	.....	Field Assistant
B. Goodacre	.....	Field Assistant

APPENDIX "F"

STATUTORY DECLARATION

CANADA)
)
TO WIT :)

I, Carl G. Verley agent for Cordilleran Engineering

of 1418-355 Burrard St., Vancouver, B.C. V6C 2G8

do solemnly declare, - that geological mapping and geochemical sampling were conducted on the HL #1-126 (inclusive) mineral claims, Watson Lake Mining District, Y.T., during the period July 15 to September 29, 1979. Expenditures for this work include:

Salaries, Management Fees, Consulting, Expediting	11,245.41
Helicopter, Fixed wing, and fuel	9,011.30
Assays and analysis	7,757.05
Vehicle, radio and equipment rental	1,100.00
Accommodation, food, telephone, freight, supplies	4,300.24
TOTAL:	$33,414.00

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 Vancouver)
)
in the Prov. of B.C. this)
)
19th day of March 1980)

Carl G. Verley

A Notary Public in and for the
~~Yukon Territory~~
A Notary Public in and for the
Province of British Columbia