PROSPECTING REPORT

ECHO CLAIMS

Stewart Lake Area, Mapsheet 105A-10, Watson Lake, Y.T.

Latitude 60 33' N
Longitude 128 43' W.

ECHO 1-8 YB61720 - YB61727
9-10 YB63946 - YB63947
19-20 YB63956 - YB63957

for:

ALEX BLACK, PROSPECTOR
P.O Bag 5000
Watson Lake, Yukon Territory
Y0A 1C0
and:, 1040-Killarney St
[redacted]
Penticton, B.C., V2A [redacted] 4P7

Tel: 604-493-7134

093602

by:

B.J.PRICE GEOLOGICAL CONSULTANTS INC.
Ste 600 - 700 West Pender Street,
Vancouver, B.C., V6C 1G8
Tel: 604-682-4488 Fax: 604-682-8728

NOVEMBER 15, 1996

PROFESSIONAL
PROVINCE OF
B. J. PRICE
BRITISH COLUMBIA
GEOSCIENTIST

PROSPECTING REPORT

ECHO CLAIMS

Stewart Lake Area, Mapsheet 105A-10, Watson Lake, Y.T.

Latitude 60 33' N
Longitude 128 43' W.

for:

ALEX BLACK, PROSPECTOR
P.O Bag 5000
Watson Lake, Yukon Territory
Y0A 1C0
and: 1040-Killarney St
[redacted]
Penticton, B.C., V2A [redacted] 4P7

Tel: 604-493-7134

by:

B.J.PRICE GEOLOGICAL CONSULTANTS INC.
Ste 600 - 700 West Pender Street,
Vancouver, B.C., V6C 1G8
Tel: 604-682-4488 Fax: 604-682-8728

NOVEMBER 15, 1996

PROFESSIONAL
PROVINCE OF
B. J. PRICE
BRITISH COLUMBIA
GEOSCIENTIST

This report has been examined by the Geological Evaluation Unit under Section 53 (4) Yukon Quartz Mining Act and is allowed as representation work in the amount of $ 3600.

for Regional Manager, Exploration and Geological Services for Commissioner of Yukon Territory.

PROSPECTING REPORT

ECHO CLAIMS

Stewart Lake Area, Mapsheet 105A-10, Watson Lake, Y.T.

Latitude 60 33' N

SUMMARY

In 1996, Alex Black prospected the Echo claims, situated 7 kilometers south of Stewart Lake and 10 kilometers east of the Mt. Hundere lead-zinc-silver mine, 70 kilometers north of Watson Lake Yukon.

The prospecting program involved investigation of an eclogite occurrence previously described by Phillippe Erdmer. A small amount of sampling was done; total costs were about $10,000.

The eclogite occurrence lies within a belt of phyllite, tuff, and ultramafic rocks which are part of a Carboniferous-Permian allocthonous unit which has been tectonically draped over a domal Hadrynian and early Paleozoic sequence mapped in detail on Mt. Hundere by Grant Abbott and others.

Several of the rock samples exhibit a stockwork of finely crystalline grey and white silica. At least two generations of silica were seen in some specimens. Two rock samples assayed over 600 mppm arsenic, with up to 1193 ppm nickel and 97 ppb gold. The nickel content is not surprising considering the ultramfic bodies present in the assemblage. However, the gold and arsenic association is encouraging.

A further program of soil and rock sampling is recommended; at least 750 soil samples should be taken on a regular grid to evaluate the gold-arsenic potential of the area. A budget of $58,000 is outlined.

respectfully submitted
B.J.Price Geological Consultants Inc.

per ....

Barry J. Price, P.Geo.
November 15, 1996.

PROFESSIONAL GEOSCIENTIST
PROVINCE OF BRITISH COLUMBIA
B. J. PRICE

TABLE OF CONTENTS

PROSPECTING REPORT

ECHO CLAIMS

Stewart Lake Area, Mapsheet 105A-10, Watson Lake, Y.T.
Latitude 60 33' N and Longitude 128 43'

INTRODUCTION

This report, compiling the geology and prospecting results for the Echo property has been prepared at the request Alex Black, Prospector and property owner. The writer has not visited the property, but is familiar with the geology of the area, having worked on a number of prospects with 100 miles of Watson Lake over the years, including the Quartz Lake deposit, the Hyland River gold property, owned by Adrian Resources Inc., various properties in the Rancheria and Tungsten areas. This report is based on work completed by Mr. Black during the summer and fall of 1996.

LOCATION and ACCESS

The Echo claims are situated 7 kilometers south of Stewart Lake, between the headwaters of Stewart Creek and False Canyon Creek in Stewart Lake Mapsheet (105A-10) in the southern part of Yukon Territory. The property is approximately 70 kilometers north of Watson Lake, Y.T. The Mt, Hundere lead-zinc skarn property, (now closed), lies 10 kilometers to the west.

Access to the property is by helicopter or, in winter, by ski-doo along a trail from the Robert Campbell Highway. A 28 kilometer haul-road to the Mt. Hundere Mine from the Robert Campbell Highway allows access to within about 10 kilometers. Stewart Lake is accessible by float or ski-equipped aircraft.

Watson Lake is reached by daily or charter aircraft from Whitehorse. Charter helicop[ters are generally available in Watson Lake. Watson Lake is the service center for the southern Yukon; all supplies and services are available.

CLAIMS AND MINERAL TENURE

Alex Black is the registered owner of the Echo 1-10, and Echo 19 and 20 quartz claims as shown in more detail on the following pages. The claims are reported to be in good standing for a period of three years.

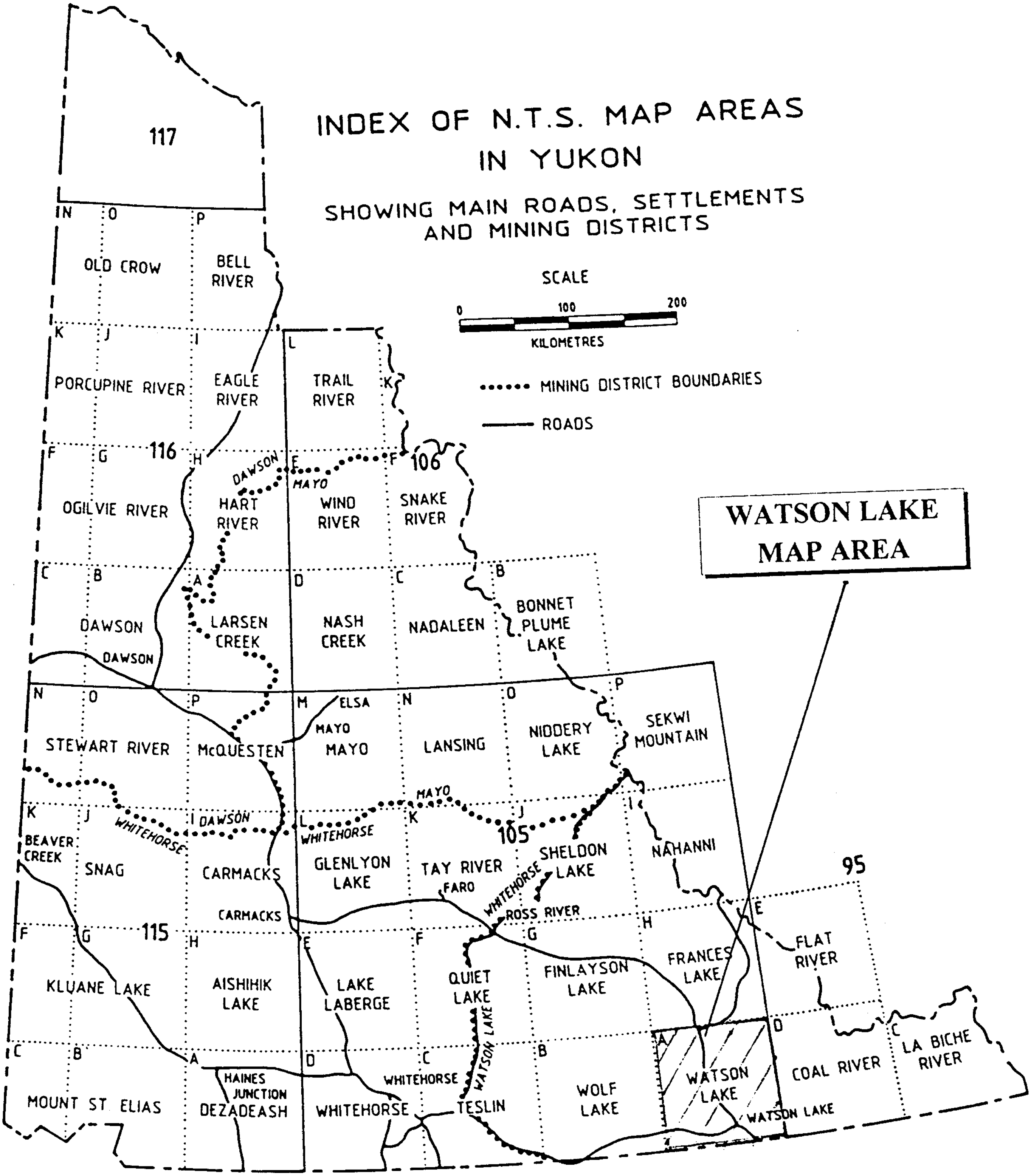
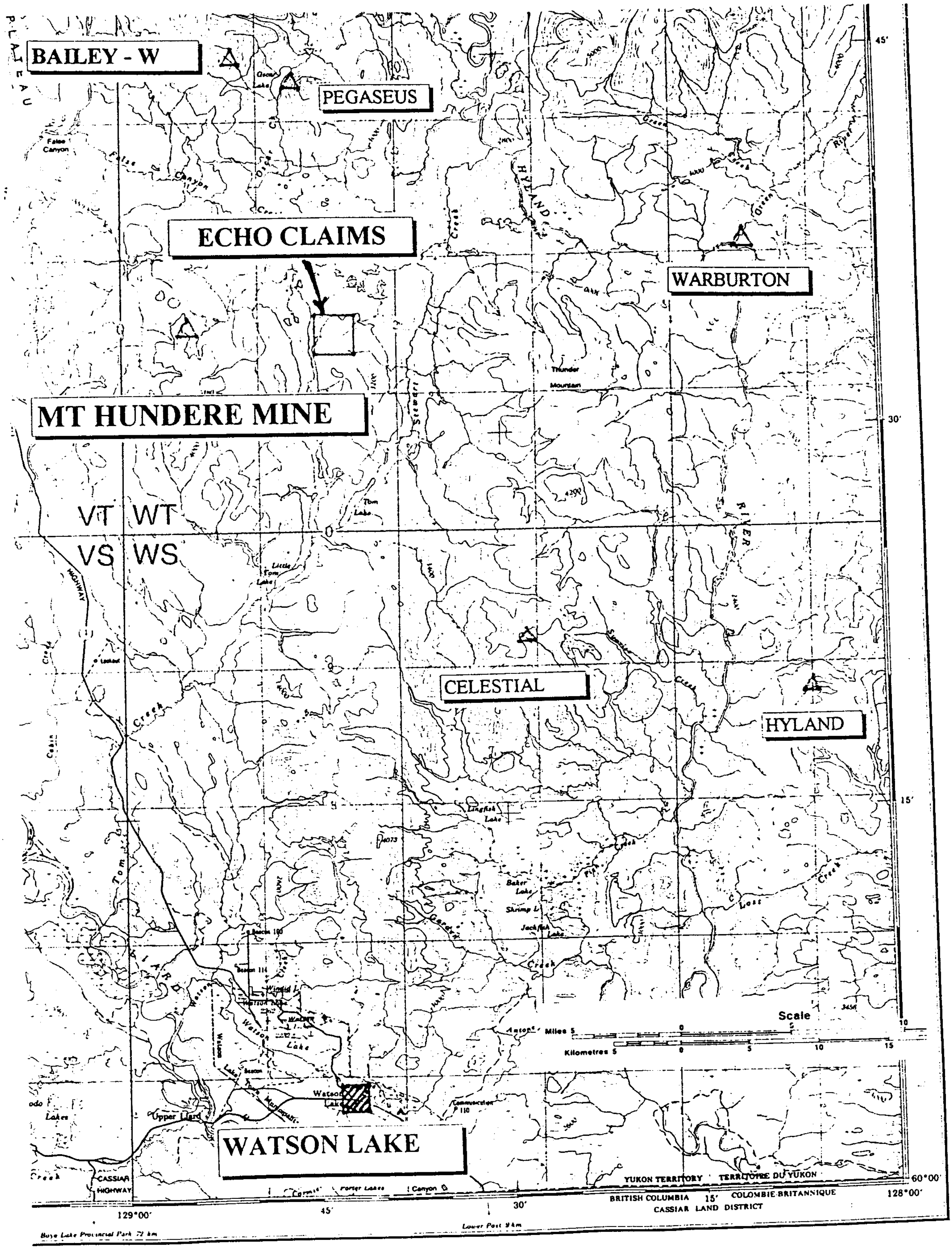


FIGURE 1 - LOCATION MAP - YUKON TERRITORY



WATSON LAKE

FIGURE 2 - LOCATION MAP -
WATSON LAKE - MT HUNDERE AREA

Claim Data - Echo Property, Alex Black.

CLAIM NO	RECORD NO	EXPIRY
Echo 1	YB 61720	October 5, 1999
Echo 2	YB 61721	October 5, 1999
Echo 3	YB 61722	October 5, 1999
Echo 4	YB 61723	October 5, 1999
Echo 5	YB 61724	October 5, 1999
Echo 6	YB 61725	October 5, 1999
Echo 7	YB 61726	October 5, 1999
Echo 8	YB 61727	October 5, 1999
Echo 9	YB 63946	October 5, 1999
Echo 10	YB 63947	October 5, 1999
Echo 19	YB 63956	October 5, 1999
Echo 20	YB 63957	October 5, 1999

Information as supplied by the owner.

PHYSIOGRAPHY, CLIMATE and VEGETATION

The claims are situated in relatively low rolling hills south of Stewart Lake, between elevations of 2,800 feet (valley bottom) to 3,800 feet at the highest point. Non-commercial scrub forest covers the area. Climate is severe in winter and warm in summer. The claims can be explored from May through October.

HISTORY

The adjacent Mt. Hundere property has been explored since at least 1962, when prospectors Jake Hundere and Pete Ritco staked claims on Jewel Box Hill for the Frances River Syndicate, (the late Dr. Aro Aho). Several prospecting programs have been done over the years by Archer Cathro and Associates. The writer worked on one of these ventures in 1973 which included part of the Stewart Lake area but concentrated mainly on the Quartz Lake-Hyland River areas. Several other prospectss such as the Oscar Lake (Bailey) tungsten deposit near Oscar Lake and the Warburton polymetallic vein on Hyland River have recieved considerable exploration. The Echo claims were staked in 1995, on the basis of an eclogite found in Echo 2 claim area. .

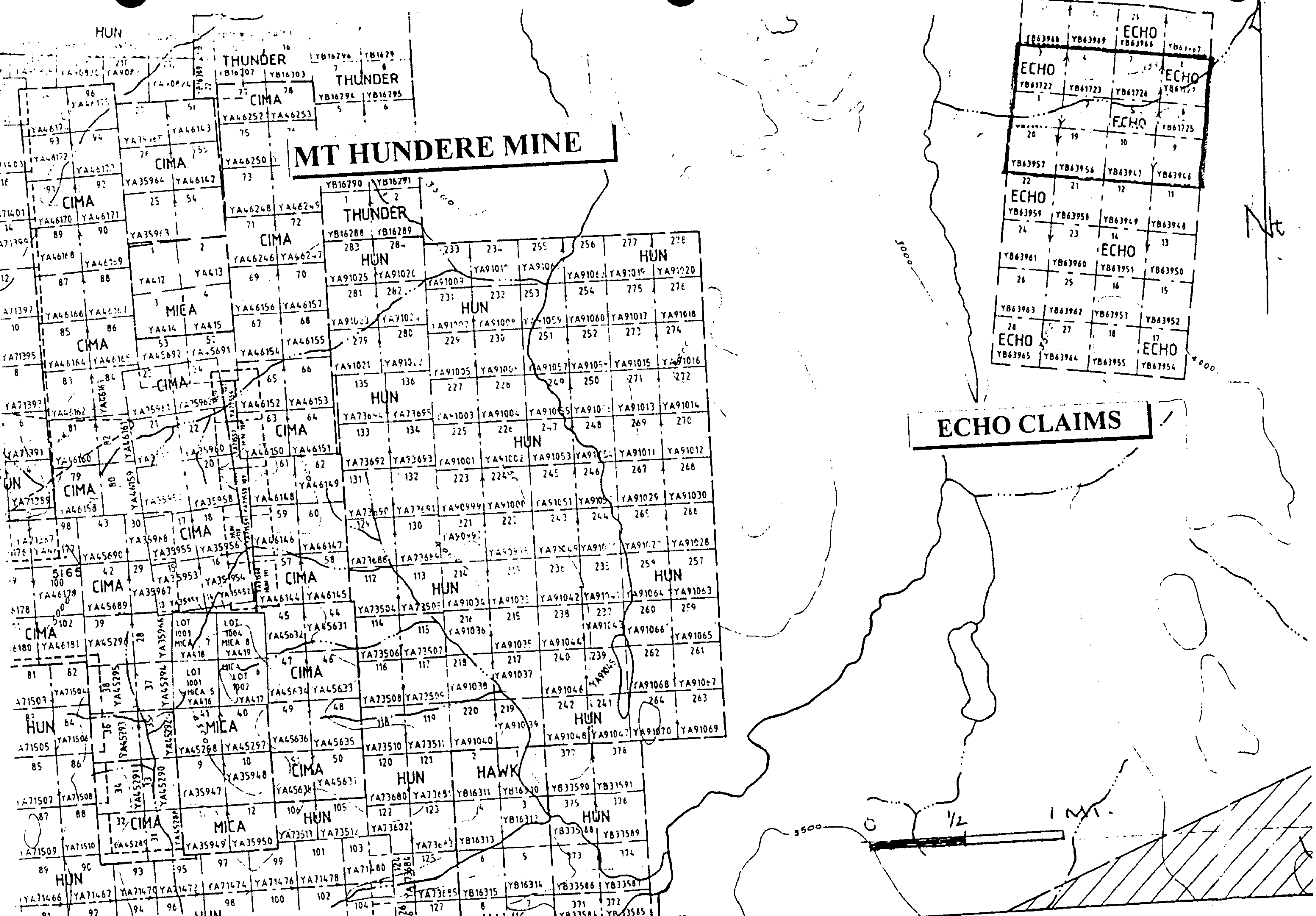


FIGURE 3 - CLAIM MAP SHOWING ECHO CLAIMS

Portion of Yukon Claim Map 105-A-10

TOTAL EXPLORATION EXPENDITURES

Total documented exploration expenditures stated by A.Black are $10,000. An itemized cost statement is provided in an Appendix, based on costs supplied to the writer.

REGIONAL GEOLOGY

The following account of the regional geology is provided by Grant Abbott, (1981)..:

> *"The area is underlain by one of the better exposed and more complete sequences of Paleozoic and Mesozoic rocks known within Cassiar Platform north of Tintina Fault. previous work includes preliminary 1:250,000 scale mapping by Gabrielse (1966). This study resulted in a more precise definition of the stratigraphy and style and timing of deformation within Cassiar Platform in southeastern Yukon.*
>
> *The geology Of Mt. Hundere is shown in Figure 1. A map of north central Watson Lake map-area that includes later work is shown in Figure 2, The description of rock units In the Table of Formations is based mainly on the earlier work. The stratigraphy is not detailed here. It is like that in other parts of Cassiar Platform and the reader is referred to reports by Gabrielse (1953), Gordey (in press) and Tempelman-Kluit (1977a,b) for descriptions.*
>
> *In central Watson Lake map-area, late Proterozoic through Triassic miogeoclinal strata of Cassiar platform are exposed in a window beneath a cover of late Paleozoic, transported, sheared sedimentary. volcanic and ultramafic rocks of the Anvil Allochthonous Assemblage, (Tempelman-Kluit, 1978). The window and cover are folded into a north trending arch. cored in the north by Cretaceous quartz monzonite. A smaller dome within the larger arch centered about Mt. Hundere may be cored by an intrusion at depth. Normal faults which localized uplift during granitic intrusion are prominent features within the Mt. Hundere arch and at the south end of Billings Batholith.*
>
> *The rock units have different styles of deformation. Cambrian and Ordovician phyllite are complesly deformed internally and are thermally metamorphosed. At least two sets of penetrative, small scale structures are developed. The oldest predate thermal metamorphism and are related to regional deformation, but the youngest are closely related to thermal metamorphism and developed during granitic intrusion arching and uplift. Silurian and younger rocks are deformed into broad open folds, accompanied by axial plane cleavage. The degree of development of cleavage within the Silurian and younger rocks is progressively weaker up section and Triassic rocks are internally undeformed. The folds and axial plane cleavage within the Silurian and younger rocks formed in response to the same stress that formed the older set of small scale structures within Cambro-Ordovician strata. The contrast*

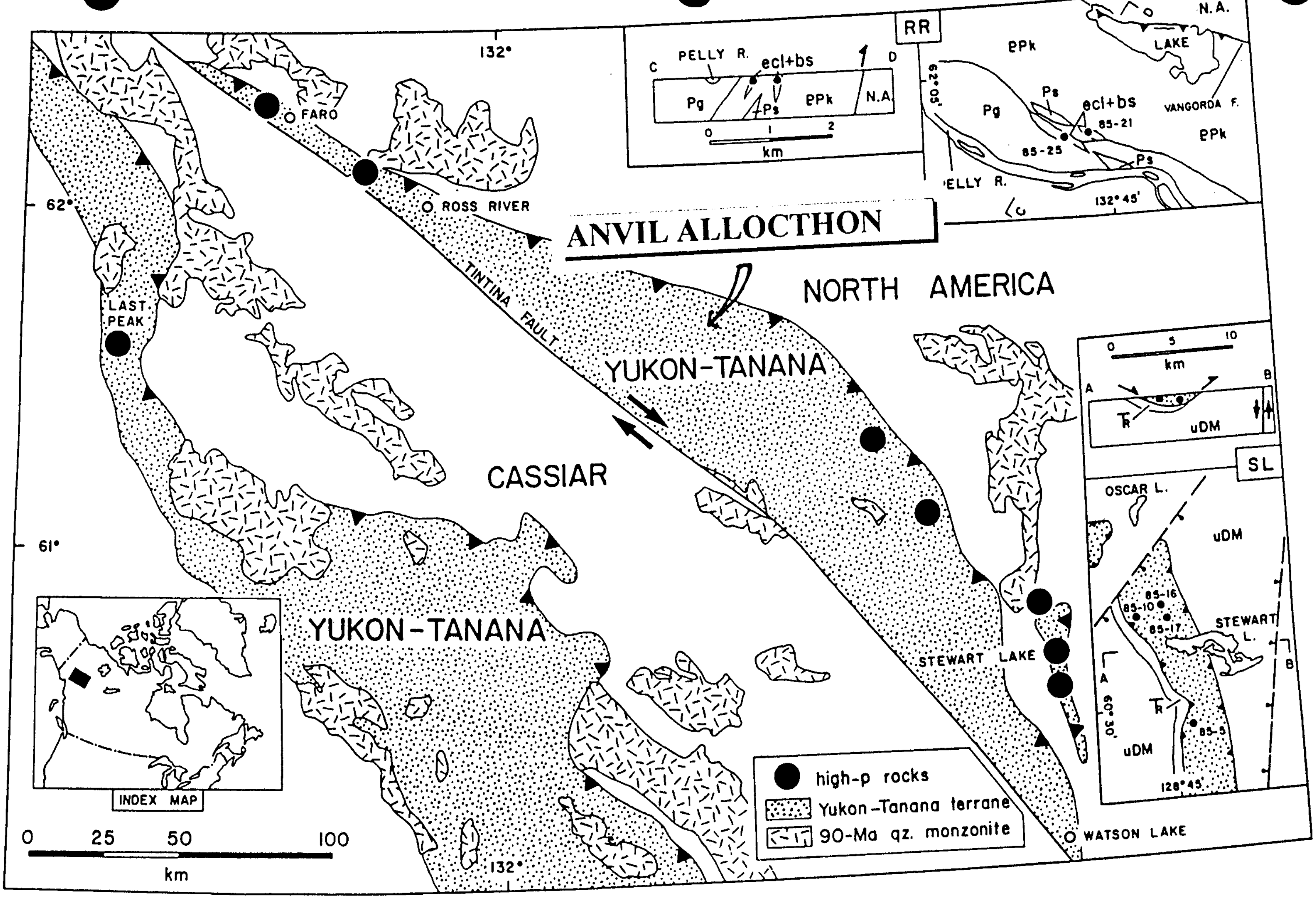


FIGURE 4 - REGIOJNAL GEOLOGY OF SOUTHERN YUKON

After Erdmer, 1987.

in style and intensity of deformation results from the competence difference and depth of burial of the older rocks, during regional deformation".

(Reproduced from: Yukon Geology and Exploration, 1979-80. INAC)

MINERAL DEPOSITS IN THE PROJECT AREA

Types of mineral deposits and showings in the mapsheet and vicinity are:

1. Lead-zinc-silver skarns
2. Tungsten Skarns
3. Epigenetic polymetallic quartz veins
4. Stratiform polymetallic massive sulphides (MacMillan or Quartz Lake)
5. Disseminated gold in Properozoic sediments (Hyland)
6. Eclogites with arsenic-gold geochemical anomalies.

Of these, the Mt Hundere zinc-lead-silver skarn deposits are, as yet, the most significant. A brief description of the more important showings is given below.

Mt Hundere

Previous work on the property was compiled by Archer, Cathro & Associates (1981) Ltd and is documented in the Yukon Minfile. The first claims on Jewel box Hill were staked in 1962 by prospectors Jake Hundere and Pete Ritco, on behalf of the Frances River syndicate (Dr A. Aho). A road to the property was built In 1963, and the claims were explored with bulldozer trenches and six diamond drill holes. The property was explored by Atlas Explorations and Cima Resources. Over the next 20 years, a number of Aho's companies surveyed the claim boundaries and explored the property with geochemical and geophysical surveys and bulldozer trenching, and 72 holes were drilled between 1979 and 1982, resulting in the discovery of the north and south zones about km apart. By 1982 the following reserves had been outlined.

Main zone	69,099 tonnes	15.6% lead	18.9% zinc	73.4 g/t silver
West Ext.	54,910 tonnes	11.5% lead	13.2% zinc	65.6 g/t silver
East zone	122,500 tonnes	4.6% lead	7.0% zinc	90.5 g/t silver

A feasibility study In 1982 recommended a small Open-pit operation and a 250 ton per day mill. In 1984, Canamax Resources Incorporated purchased and re-mapped the property and carried out more geochemical and airborne geophysical surveys, and drilled 37 more holes, identifying 3 separate deposits in the area:; the south zone (Jewel box Hill). By the end of 1988 Canamax had completed 188 drill holes and increased the reserves to approximate their present level. the Hundere joint Venture (Curragh

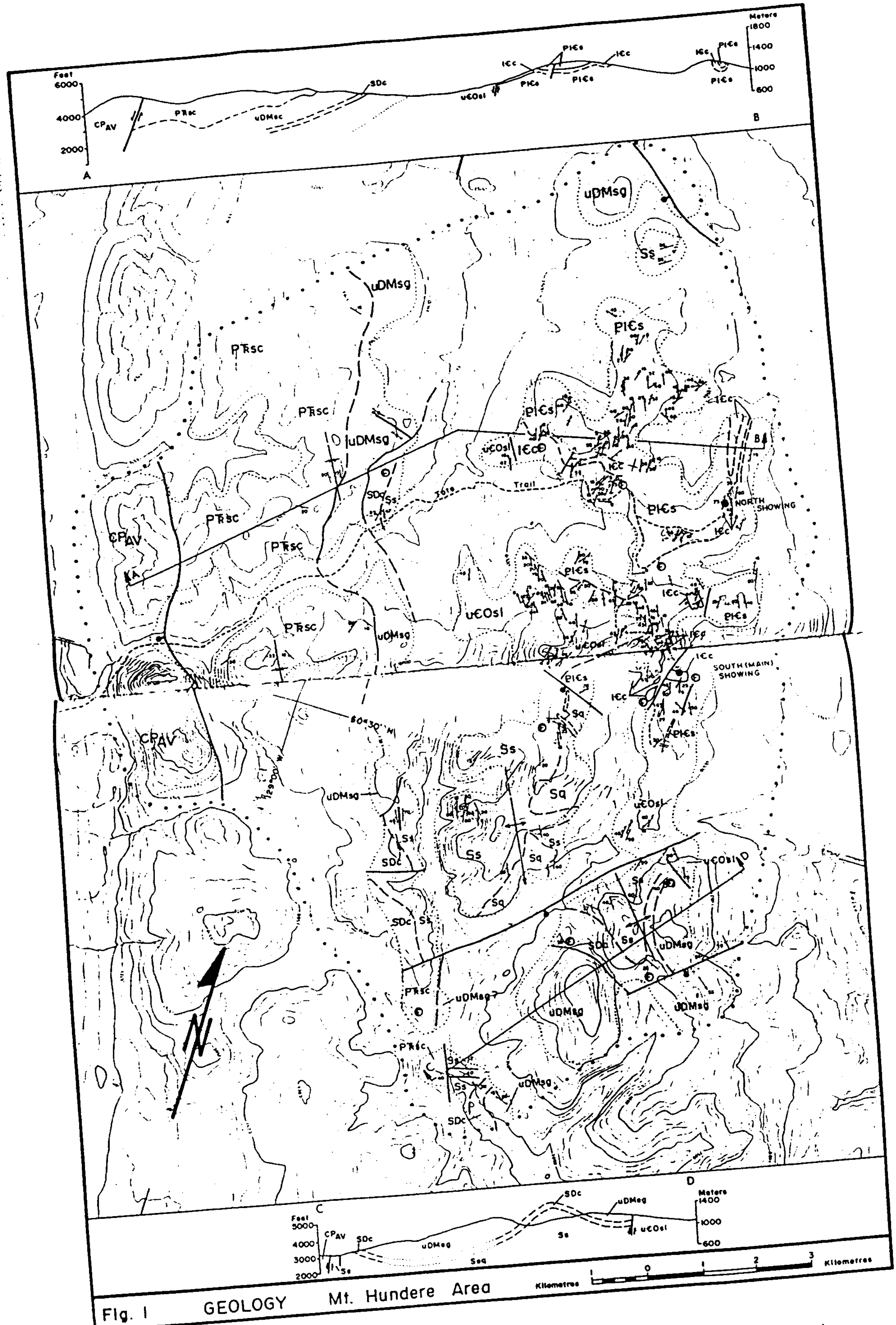


FIGURE 5- GEOLOGY OF MT. HUNDERE AREA

After Abbott. 1981

Resources - 80%, Hillsborough Resources - 20%) purchased the property from Canamax and the Kaska nation acquired a 5%% ownership in 1990.

Commencing In September, 1990, Infill drilling was completed on the main zone at Jewel box Hill. The drilling consisted of 25 diamond drill holes totalling 450 m, and brings the total number of holes on the property to 358. Construction began on a 70 x 22 m concentrator and tailings disposal facilities, and a 28 km haul road was completed from the mine site to the Campbell Highway. Underground work began with the collaring of an upper exploration and ventilation adit at the 1400 m level on the east side of Jewel Box Hill, and a lower development and haulage adit at the 1250 m level which will be accessible to 50 ton trucks. Mine construction was completed in 1991 at a cost of $70 Million, and production started July 1991.

Reserves at that time were:

Proven	75,000 tonnes	16.9% Pb	18.8% Zn	89 g/t silver
Probable	3,860,000 tonnes	3.9% Pb	12.7% Zn	58 g/t silver
Oxide prob.	500,000 tonnes	8.1% Pb	12.1% Zn	100 g/t silver

Production in 1991 was 45,000 tonnes with a combined grade of 20% Pb-Zn. The company went bankrupt in 1993.

High grade sphalerite and galena occur In skarn zones at the sheared contact between Lower Cambrian phyllite and limestone. Highly sheared graphitic phyllite lying immedlately above the main limestone body forms a major marker. Outside of the sheared zone, the phyllite is calc-silicate altered and lacks graphite, and the limestone has been altered to pale green andradite garnet-quartz-calcite skarn.

Proved reserves to date are confined to the main zone on Jewel Box Kill (Figure 1). A further 2 million tonnes of possible reserves occur in the AttIla and Burnick zones on North Hill, and a high grade mineralized skarn lens beneath Gribbler Ridge (between Jewel Box Hill and North Hill) is known from 1987 drilling. On Jewel box Hill the main ore type consists of coarse actinolite skarn with massive sphalerite and galena. Copper-iron skarns and replacements with magnetite, pyrrhotlte and pyrite also occur. The highest silver values on the property come from prograde diopside-rich skarn on east side of Jewel Box HillII. The mineralized skarns form lensoid and tubular bodies from 1 to 15 m thick in two sheared, brecciated limestone layers with extensively developed cavernous porosity. Some of the ore occcurs n horizontal tubular bodies and in a 50 m chimney of high grade material connecting the upper and lower limestone. Two vertical East-northeast-trending faults filled with quartz-fluorite breccia occur near ore, and some fluorite extends into in the ore (Figure 2).
(Source, Yukon Exploration 1990).

Oscar (Bailey)

The Oscar or Bailey tungsten property is situated about about 22 kilometers to the northwest of the Echo claims. The showings are west of Oscar Lake, within early or middle Paleozoic limestones at the margin of the Mt. Billings batholith. In 1981, Canada Tungsten Mining Co. had drilled 10 holes totalling 721.5 m in 1974 and 23 holes totalling 2361 m in 1975. A geological reserve was reported to be 405,450 tonnes grading 1.00% Wo3 with minor amounts (<0.10%) of copper.

Warburton

The Warburton property, named after the intrepid explorer Warburton Pike, who is reported to have discovered the mineralization, is located at the confluence of Green and Hyland River, in Mapsheet 105A-9, roughly 25 kilometers north-northeast of the Echo property. In 1983-84 the property consisting of about 80 claims was being explored by Warburton Minerals Inc. The area is underlain by the Hadrynian Grit unit and black argillaceous sedimentary rocks of Cambrian and Ordovician age. Tetrahedrite occurs in a 1.4 meter wide quartz-carbonate vein in interbedded limestones and shales. A grab-sample assayed up to 17.6% copper and 7,131 g/t silver, but over 60 centimeters, a chip sample assayed 4.6% copper and 1,817 g/t silver. Several types of quartz-carbonate veins may be cross-cutting or stratabound. The largest veins, up t 2 meters wide are stratiform and startabound, with quartz in the center and carbonate on the margins. Mineralization includes pyrite, galena, chalcopyrite, malachite, azurite, arsenopyrite and tetrahedrite. The veins are not of economic interest.

(Ref: Assessment report No. 091519 by D.G.Mark and No. 091520 by Harman Keyser.)

Pegaseus:

The Pegaseus claims were staked in 1978 by J.C Turner and optioned to Paymaster Mines Ltd. They are in the vicinity of Oscar Lake. No showings are known, but the target is assumed to be skarn-hosted tungsten deposits as at the Bailey deposit.

Celestial

The Celestial property consisting of the Sun and Moon claims, (64 claims in total), was situated in mapsheet 105A-8 about 20-25 kilometers south and east of the Echo claims. It is not known if the claims are still in good standing. This was one of several claims staked by Cyprus Anvil east and west of Hyland River.

The Sun claims were staked in 1978 to protect a stream-sediment anomaly obtained by Cyprus Anvil Mining. An Upper Cretaceous quartz-feldspar porphyry stock intrudes Hadrynian Grits and Lower

Cambrian sedimentary rocks in the center of the Sun claims. Two lead anomalies in soil were reported from 1981 work. One of the areas also had anomalous zinc, and spotty copper anomalies are present.

Hyland claims

Cordilleran Engineering staked the Hyland claims in 1978 to cover a regional stream-sediment anomaly. Additional claims were later staked by Cyprus Anvil, who optioned the original claims. A total of 2,365 soil samples were staked on 111 line-kilometers of grid. A coincident Cu-Pb-Zn anomaly is present. The rocks are Devonian to Missippian sedimentary rocks sandwiched between Triassic sediments to the west and Hadrynian-Lower Cambrian Grits to the east. (Note: the writer has seen copper-rich concretions and possibly authigenic specks of copper sulphides in this area)

(Ref: Assessment Report No. 090893 by D.Perkins and J.W.Mustard.

Much farther to the south, Kerr-Addison explored for massive sulphides with lkimited success, and Placer Dome has explored Coal leases near Watson Lake. The "Porker" disseminated gold deposit was outlined in Hadrynian-Cambrian rocks near Quartz Lake, and the Macmillan (Quartz Lake) polymetallic massive sulphide deposit is also situated near Quartz Lake. These are well east of the Echo Claims in a different geological terrane.

THE ECHO PROPERTY- 1996 PROSPECTING PROGRAM

During the 1996 field season a work program was completed with a total cost of $10,000. The program consisted of prospecting, sampling, cutting of a small grid in preparation for soil sampling.

On July 30th, 1996Mr. Black, accompanied by helper Jackie Jimmy flew out to the claim block and set up camp in a central location. The prospectors remained at the claims until August 31st, in total about 30 days, prospecting for kimberlite indicator minerals such as pyrope garnet, chrome diopsite and ilmenite. Kimberlites generally contain fragments of eclogite, which can be rich in diamonds or other indicator minerals. Six soil samples were taken across the eclogite occurrence, and a small geophysical grid was cut across an area which had returned low but interesting values of copper and nickel on previous visits. The grid totalled 3.6 kilometers and is shown on the accompanying sketch by Mr. Black. The prospective area is about 70 ft. wide, but is covered by extensive overburden. Rock exposures are confined to gullies and hill slopes at higher elevations. A magnetometer survey will be done during the coming season.

Mr. Black believes that a limestone unit exists on Echo No.5 and No.6, which may be more prospective.

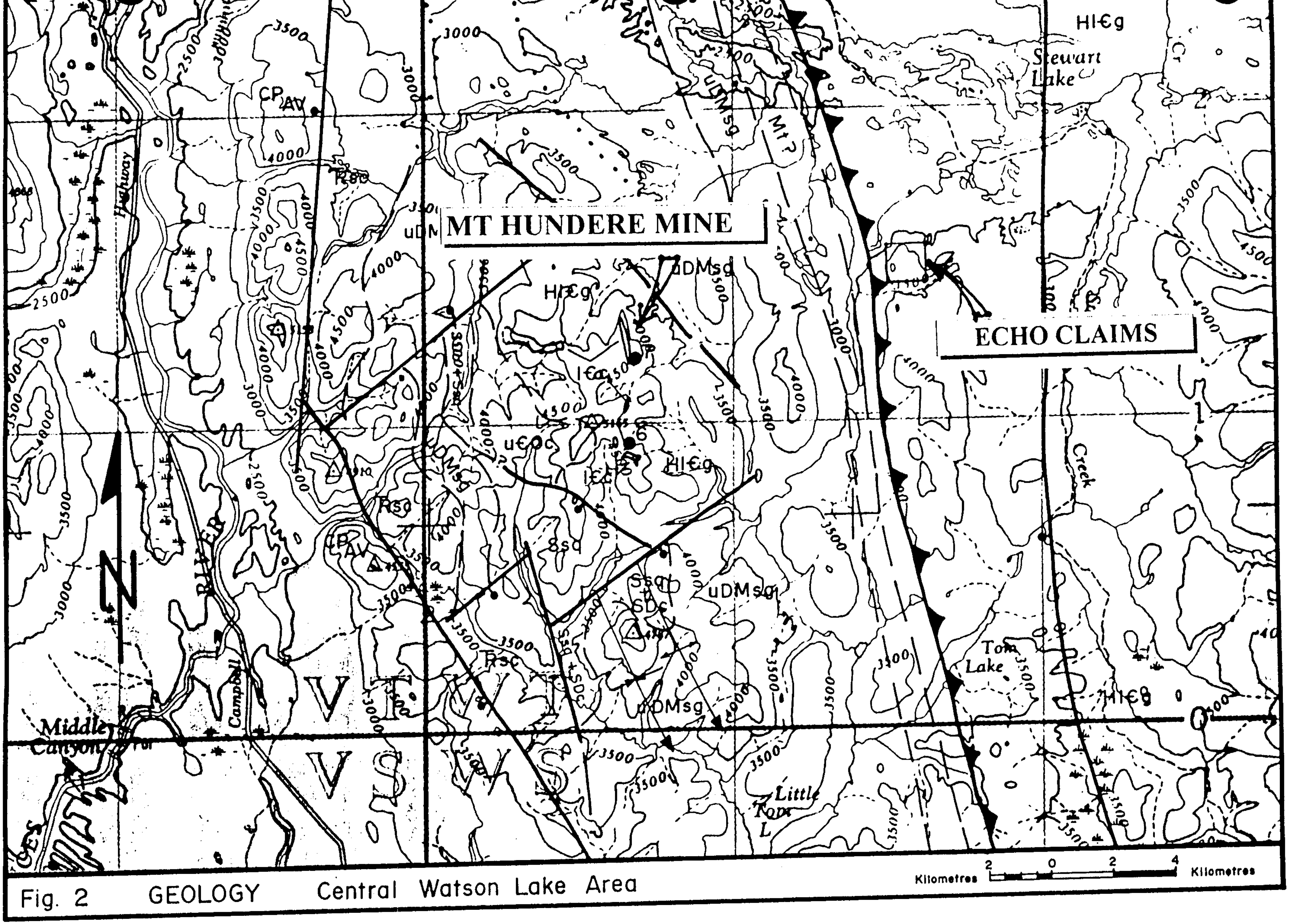


FIGURE 6 - GEOLOGY OF MT. HUNDERE-STEWART LAKE AREA

After Abbott, 1981

LEGEND TO ACCOMPANY FIGURES 1 AND 2 (MT.HUNDERE MAPSHEET).

CRETACEOUS

Kqmp Porphyritic biotite quartz monzonite
Kqm Equigranular biotite quartz-monzonite

CARBONIFEROUS AND/OR PERMIAN
ANVIL ALLOCHTHONOUS ASSEMBLAGE

Cpav Massive. resistant green and grey tuffaceous argillite, grey and white siliceous tuff.

TRIASSIC AND OLDER?

Ptsc Dark brown and grey weathering. calcareous shale, siltstone, silty limestone; may locally include unit Mt

MISSISSIPPIAN

Mt Recessive, reddish-orange weathering well laminated chert, cherty tuff

MIDDLE ? AND UPPER DEVONIAN MISSISSIPPIAN AND YOUNGER

uDMsg Black and rusty weathering shale, siltstone. quartz wacke, chert pebble conglomerate

UPPER SILURIAN ? AND LOWER DEVONIAN

Sdc Dark grey. fetid lat limestone, thick-bedded, buff weathering sandy dolomite; dolomitic quartzite

SILURIAN

Ss Thinly laminated, brown. grey and buff weathering calcareous or dolomitic siltstone, silty dolomite. dolomite
Sq Massive. resistant, blue-grey orthoquartzite

CAMBRIAN AND OR ORDOVICIAN

uCOc Thinly laminated or nodular calcareous, grey and brown h llite and silty limestone: alters to thinly laminated green and purple calc-silicate hornfels.
uCOsl Dark grey-brown weathering biotite-Muscovite schist.

LOWER CAMBRIAN AND OLDER ?

lEc Massive. blue-grey limestone
HlCs Silver, greenish-grey tuffaceous phyllite, brown and grey micaceous and/or calcareous phyllite, black quartzose phyllite. minor greenstone; may locally include COsl and COcsl

HADRYNIAN AND LOWER CAMBRIAN (?)- "Grit Unit"

HlCg Quartz feldspar grit, slate. massive siliceous limestone. maroon and green slate

The writer will describe Mr. Blacks samples briefly in a subsequent section.

PROPERTY GEOLOGY

As shown on the accompanying Geological map of the area, prepared by Grant Abbott, the Echo property is underlain by unit **Cpav, Carboniferous and/or Permian** massive, resistant green and grey tuffaceous argillite and grey and white siliceous tuff. This unit is part of the Anvil allocthonous Assemblage which originally covered all of the Domal Mt. Hundere area. The thrust plate on which the assemblage moved in to the area dips eastward underneath the valley of False Canyon Creek, roughly bisecting Tom Lake. On the west side of Mt Hundere, the same plate occupies the Valley of Frances and Simpson Lakes. To the east of this, in Stewart Creek valley, a separate fault exist, which juxtaposes the Hadrynian and Lower Cambrian "Grit Unit" on the east with the Anvil plate.

The Cpav unit was previously mapped by Gabrielse (Map 1-1966) as **Unit 8**, and described as follows: (from Map 19-1966): *"Several belts of volcanic rocks and associated sedimentary strata, probably of Mississippian age, (8), locally include bodies of ultramafic rocks (10). The distribution of volcanic and ultramafic rocks is well defined by aeromagnetic anomalies (See G.S. C. Map 7000 G)".*

Later mapping by Grant Abbott, (1977-78) shows that the unit referred to is part of the Anvil allocthonous terrane. The essential geology of the area is described in a previous section.

The writer has not been on the property to describe the geology in a first-hand manner. Fortunately, Erdmer, (1987) has inspected the geology of the Stewart Lake eclogite occurrence, (now ithin the Echo claims). An excerpt from his papaer which describes the occurrence follows:

"Introduction

***"In central Yukon, more than a dozen eclogite lenses in eight localities are known.** They occur over a strike length of several hundred kilometres in the immediate hanging wall of a regionally west~dipping fault that separates North American miogeoclinal rocks from siliceous mylonite, basalt, chert, ultramafic rocks, and granite of the Yukon-Tanana terrane. The accretion of the Yukon-Tanana terrane to North America has been attributed to Mesozoic arc-continent collision. and large partsof the terrane have been interpreted as trench material involved in subduction-zone tectonism (Tempelman-Kluit l979a). An alternative interpretation of the terrane as consisting mostly of an internally coherent depositional succession has recently been offered by Mortensen and Jilson (1985).*

The Yukon-Tanana terrane hosts several more lenses in adjacent Alaska, near the confluence of Cleary Creek and the Chatanika River north of Fairbanks. There, eclogites are interlayered with calcareous, pelitic, and quartz-rich schist (Swainbank and Forbes 1975): the combined resulting pressure-temperature (P - T) estimates from the latter rock types and the eclogites (Brown and Forbes 1986) are similar to those from the Yukon rocks, suggesting a common origin.

An early study of four Yukon eclogite lenses, near Faro and east of Last Peak (see Fig. 1; Erdmer and Helmstaedt 1983), showed that they possess characteristics typical of type-C (Coleman er at. 1965) rocks. However, contact relations of the eclogite with country rock were ambiguous, and the meta-morphic grade of the host could not be independently established. More specifically, it could not be proven that the host underwent the same metamorphism as the eclogite. Also, non-eclogitic high-pressure rocks along strike were unknown.

This study, involving the investigation of two previously undocumented localities near Ross River and Watson Lake, helps resolve three fundamental problems regarding the occurrence of high-pressure rocks in the Yukon-Tanana terrane:

(1) did the host rocks of the eclogites undergo high-pressure etamorphism, (2) are high-pressure rocks extensive enough to support the subduction-melange hypothesis of Tempelman-Kluit (l979a), and (3) do high-pressure rocks clearly overlie orth American strata along thrust faults?

The first occurrence, northwest of Ross River, offers examples of intimate, interlayering of eclogite lenses with a largely metasedimentary, blueschist-bearing host that is several hundred metres thick. Eclogite contacts are sharp and well exposed. The second occurrence, north of Watson Lake, displays eclogite within a clippe of diverse mylonitic rocks that covers an area of nearly 100? sq. km. There, fresh eclogite is in gradational contact with gabbro and serpentinite, and retro-graded eclogite occurs within a slice at least 100 m thick.

Stewart Lake Area - Setting and field relations

The second study area is approximately 60 km north of Watson Lake. It consists of two clusters of eclogite outcrops dispersed along several kilometres, centred 3 km south and 3 km northwest of Stewart Lake respectively. Eclogite outcrops are a few metres to a few tens of metres across and are separated by silvery grey phyllite and varied metabasic rocks. More eclogite occurs along strike 10 and 20 km to the south of Stewart Lake and 10 km to the northwest. All these rocks form part of a thrust sheet of late Paleozoic (?) ductilely sheared and metamorphosed sedimentary, volcanic, and ultramafic rocks (Anvil allochthon, Tempelman-Kluit l979a; Abbott 1981) emplaced above Triassic shale, siltstone, and silty limestone, and underlying Devono-Mississippian strata of the North American miogeocline. The eclogite occurrences that were investigated are in a part of the sheet preserved in the keel of a regional northwest-trending syncline, named here the Stewart Lake Klippe.

Near Stewart Lake, rocks in the clippe include silvery grey to green muscovite - quartz phyllite to fine-grained muscovite schist, graphitic quartzite, dark chloritic metaquartzite interpreted in part as metachert, dark green serpentinite, dark green fine-grained greenstone and chlorite schist, fine-grained grey marble, garnet-hornblende metabasite, amphibolitized gabbro, and pods of eclogite a few metres across, with flesh centres, that are largely retrograded and gradational with mafic meta-igneous rocks. At least one hill with more than 100 ft of relief is entirely underlain by garnet-amphibole metabasite with the coarse grain size and distinctive texture of fresh eclogite (see petrographic description).

All rocks in the area including the eclogite lenses are ductilely sheared and exhibit mylonitic fabrics (Fig. 6). Contacts are poorly exposed. It is likely that the intimate association of eclogite and other rock types is largely tectonic. Each rock type occurs as a discrete (fault-bounded?) lens with a north -northwest elongation; internal layering and schistosity conform to this strike. Dips are variable and moderate on average. A strong magnetic anomaly extending for the length of the klippe suggests that serpentinized ultramafic rock exposed in several outcrops is continuous at shallow depth. This anomaly strongly affects the magnetic compass, and hinders *accurate navigation on foot. Direct access to a few of the outcrops is possible by helicopter.*

It is clear from field associations that eclogite in the Stewart Lake Klippe is in an immediate host of basaltic, gabbroic, and ultramafic rocks, together with carbonate and inferred metachert. However, it is not clear whether all (or any) of the host was metamorphosed through the eclogite field. In contrast, the Ross River area displays rocks that are almost exclusively sedimentary, (largely graphitic quartzite and muscovite schist), and glaucophane schist that may have equilibrated with the eclogites. The two studied localities thus expose eclogites of contrasting associations and different protoliths.

Petrography and Mineral Compositions

Fresh eclogite near Stewart Lake consists of a light green, fine-grained matrix (65%) and abundant (30%) euhedral orange garnets averaging 5 mm across. Locally, the rock looks like garnetiferous amphibolitized gabbro. Thin sections show that the matrix is omphacite, with some altered grains of an unidentified prismatic mineral that may have been primary clinopyroxene. Garnets are optically unzoned and have increasing pyrope content from core to rim (Fig. 4). Garnets in the Stewart Lake eclogites have a compositional range that is different from that of the Ross River woks; this is interpreted as reflecting differing protoliths. Mylonitic texture in the omphacite groundmass, and barrier reef garnets (Fig. 7; double atoll garnets of Helmstaedt et al. 1972), are characteristic.

Altered eclogite includes several distinctive rock types. The most common resembles fresh eclogite in hand sample, but thin sections show that barroisite, actinolite, chlorite, and epidote replace most of the omphacite. Others are massive, serpentine-bearing muscovite - pyroxene - amphibole - garnet rock, and weakly layered garnet amphibolite with relict clinopyroxene, amphibole pseudomorphs of pyroxene, and nearly completely chloritized garnet crystals.

Garnet metabasite near Stewart Lake is medium-grained barroisite-actinolite-epidote -garnet rock with minor quartz, and rare relict clinopyroxene porphyroblasts about 1 mm across. Texturally, the rock resembles fresh eclogite. Complete gradation is seen between flesh eclogite, altered eclogite, and garnet metabasite. Nearly continuous exposure of at least 100 m of garnet metabasite is visible across the mylonitic foliation.

Pressure and temperature estimates

Jadeite in pyroxene from eclogite at Stewart Lake ranges from 25 to 57%; using Holland's (1980) expression, eclogite equilibrated between 12 and 15 kb (at 530-750oC: see below) near Stewart Lake. Selling the activity of jadeite equal to the mole fraction (Holland 1983) yields similar results.
Using the Ellis and Green (1979) expression, the eclogites at Stewart Lake are inferred to have developed at 530-750"C; these results are incorporated in Fig. 5.

It was observed that no systematic relation exists between the calcium content of garnet and ln Kd(Fe/Mg) (garnet - pyroxene) in the analyzed samples (Fig. 8). This casts doubt on the applicability of Ellis and Green's expression to Ca-rich garnets. It supports Brown and Forbes' (1986) conclusion that this thermometer's results are probably too high for grossular-rich garnets. However, as the average grossular content of garnet in the Yukon eclogites is low (0.20), the effect of Ca is considered to be minimal".
(Excerpted from Can. J- Earth Sc. v. 24. 1439-1449(1987))

GEOCHEMISTRY

Six soil samples and 5 rock samples were analysed for 32 elements by ICP method and gold by Fire-assay by Min-En Laboratory Ltd., Vancouver, B.C. Results are as follows:

ROCK SAMPLES

ULTRAMAFIC ASSOCIATION ELEMENTS AND PRECIOUS METALS

Sample	Ag ppm	Au ppb	As ppm	Co ppb	Cr ppm	Cu ppm	Ni ppm
1	0.1	12	1	7	129	34	24
2	0.1	31	1	6	121	30	20
3	0.1	10	1	10	49	11	28
4	1.3	8	645	71	202	58	1193
5	1.8	97	636	31	230	63	435

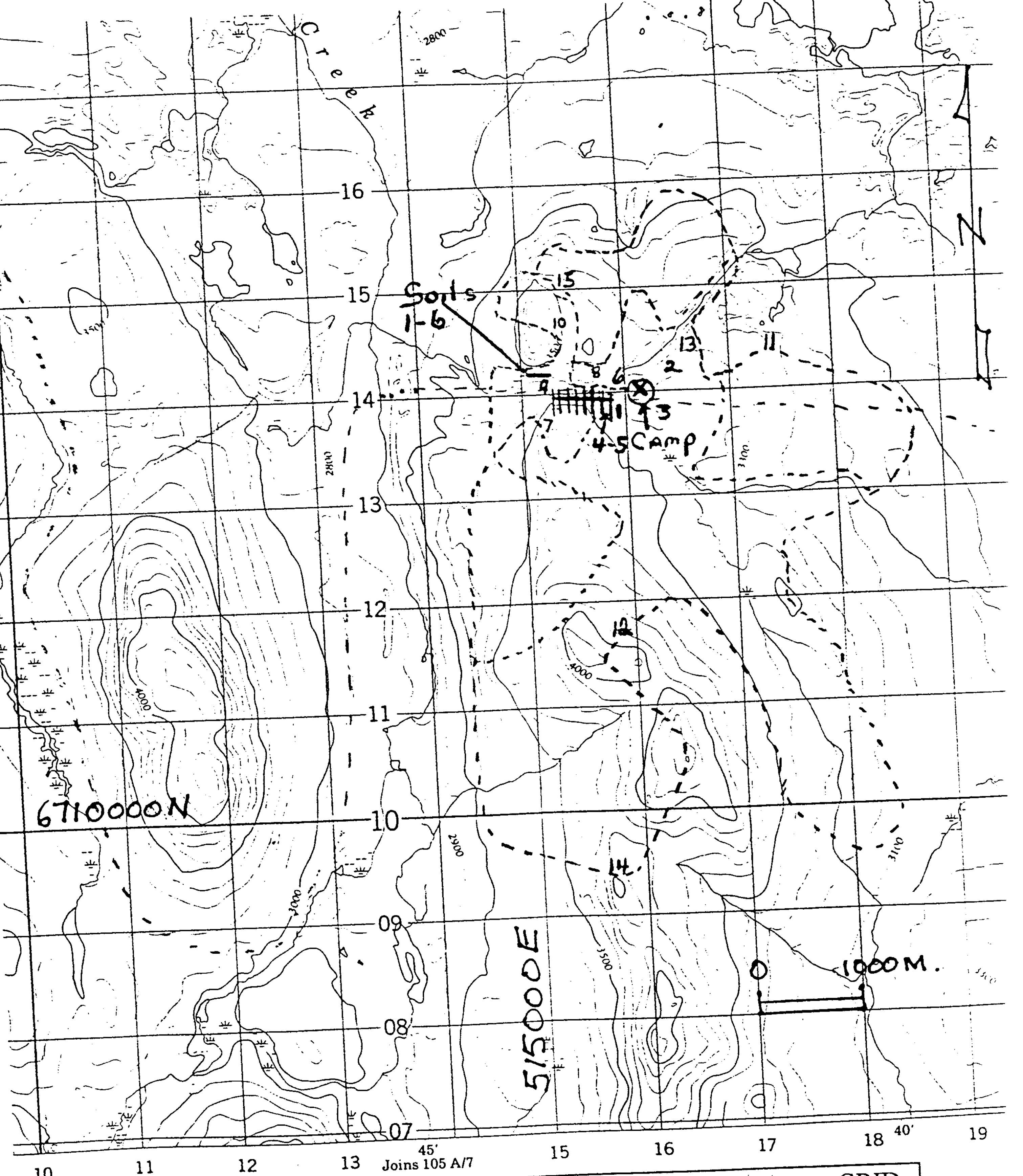
Analyses by Min-En Labs, Vancouver B.C. Samples taken by Alex Black.
Note: Dissolution is incomplete for Cr

ROCK FORMING ELEMENTS

Sample	Al %	Ba ppm	Ca %	Fe %	Mg %	Mn ppm	Sr ppm
1	.32	114	.11	3.19	.18	158	13
2	.07	101	.73	3.74	.05	308	3
3	2.00	130	.54	4.05	.86	348	26
4	.13	6	.03	2.70	>15.00	402	16
5	.10	13	5.46	2.42	13.12	1378	189

Analyses by Min-En Labs, Vancouver B.C. Samples taken by Alex Black.
Note dissolution is incomplete for Ba

Rock sample #4 was analysed for Platinum (Pt); this contained <0.01 g/t



ARGO TRAIL			GRID
TRAVERSES		1-6	SOIL SAMPLES
		2-15	ROCK SAMPLES

FIGURE 7 - SAMPLE LOCATIONS AND GRID - ECHO CLAIMS

SOIL SAMPLES:

Sample	Ag ppm	Au ppb	As ppm	Co ppb	Cr ppm	Cu ppm	Ni ppm
1	.1	11	98	18	111	58	60
2	1.3	21	201	29	233	185	116
3	.8	18	204	34	230	211	128
4	1.0	42	140	35	120	311	62
5	.4	6	85	17	115	127	47
6	.5	15	126	23	117	184	83

Analyses by Min-En Labs, Vancouver B.C. Samples taken by Alex Black.
Note: Dissolution is incomplete for Cr

SOIL SAMPLES:

Sample	Mo ppm	Pb ppm	Zn ppm
1	12	1	56
2	14	1	80
3	13	1	108
4	14	1	123
5	12	1	64
6	15	1	92

Analyses by Min-En Labs, Vancouver B.C. Samples taken by Alex Black.

The soil samples are **moderately anomalous for copper** (max value 311 ppm) and **strongly anomalous for arsenic,** (max value 204 ppm). **The gold results in soil should be regarded as weakly to moderately anomalous.** Two of the silver values in excess of 1.0 ppm are anomalous.

In comparison, the rocks are not anomalous in copper. However, two samples, labelled numbers 4 and 5 are strongly anomalous in nickel (up to 1100 ppm) and arsenic, (>600 ppm) and one sample moderately anomalus in gold, (97 ppb). These results are consistent with the amount of alteration and silica veining seen in the eclogite and related ultramafic rocks. On the basis of the limited 1996 sampling, additional prospecting is warranted.

SUGGESTED EXPLORATION EXPENDITURES:

PHASE I. TRENCHING AND SAMPLING

Geological supervision, 5 days x $300/day	$1,500
Prospecting, soil sampling	$20,000
Sampling, assaying	$10,000
Mobilization, camp, food costs	$5,000
Helicopter	$10,000
Vehicle	$2,000
Radio, telephone etc	$500
Field supplies	$500
Reports	$1,500
Subtotal	$50,500
Contingency 15%	$7,500
TOTAL OF PHASE I	**$58,000**

respectfully submitted
B.J.Price Geological Consultants Inc.

per: ....
Barry J.Price, M.Sc., P.Geo
October 31, 1996

BIBLIOGRAPHY:

Abbott, Grant; (1981); A new geological map of Mt. Hundere and the Area North. In Yukon Geology and Exploration, 1979-80. pp 45-49.

Abbott, G.J., (1987); Structure and stratigraphy of the Mt Hundere area, southeastern Yukon; unpublished MASc Thesis, Queen's University, Kingston, Ontario.

Black, A., (1996); Field Notes, Echo Project.

Erdmer, Philippe, (1983); Eclogitic from central Yukon, a record of subduction at the western margin of ancient North America. Canadian Journal of Earth Science, V.20, pp.1389-1408.

Erdmer, Philippe, (1992); Eclogitic rocks in the St.Cyr klippe, Yukon, and their tectonic significance. Canadian Journal of Earth Science, V.29, pp1296-1304.

Erdmer, Philippe, (1987); Blueschist and Eclogite in mylonitic allocthons, Ross River and Watson Lake areas, southeastern Yukon. Canadian Journal of Earth Science, v. 24, pp. 1439-1449.

Gabrielse, H., (1966); Geology, Watson Lake Mapsheet. GSC Map 19-1966.

INAC, (various years); Yukon Exploration.

Tempelman-Kluit, Dirk, (1981); Geology and Mineral Deposits of Southern Yukon. In Yukon Geology and Exploration, 1979-80. pp. 7-31.

CERTIFICATE: - B.J. PRICE, M.Sc., P.Geo.

I, Barry James Price, M.Sc., hereby certify that:

I am an independent Consulting Geologist and Professional Geoscientist residing at 820 East 14th Street, North Vancouver B.C., with my office at Ste. 600 - 700 West Pender St, Vancouver, B.C. (Telephone: (682-4488)

I graduated from University of British Columbia, Vancouver B.C., in 1965 with a Bachelors Degree in Science (B.Sc.) Honours, in the field of Geology, and received a further Degree of Master of Science (M.Sc.) in Economic Geology from the same University in 1972.

I have practised my profession as a Geologist for the past 30 years since graduation, in the fields of Mining Exploration, Oil and Gas Exploration, and Geological Consulting.

I have worked in Canada, the United States of America, in Mexico, in The Republic of the Phillippines, In Indonesia, Nicaragua, Ecuador, Cuba, and in The Republic of Panama.

I am a Fellow of the Geological Association of Canada, and registered as a Professional Geoscientist (P.Geo.) in the Province of British Columbia, (No. 19810), and I am entitled to use the Seal, which has been affixed to this report. I am a member of the Canadian Institute of Mining, and Society of Mining Engineers.

I have based this report on a review of data for the Echo property and on previous work on other prospects in this and adjacent mapsheets. I did not visit the subject property and have relied on information and samples supplied by the prospector, as well as general literature for the mapsheet, to prepare this report.

I have no direct or indirect interest in the property which is the subject of this report. I do not hold any interests in mineral claims within the Yukon Territory.

I will receive only normal consulting fees for the preparation of this report.

Dated at Vancouver B.C. this 31 st day of October, 1996.

respectfully submitted

Barry James Price, M.Sc.,FGAC, P.Geo.
Consulting Geologist.

PROFESSIONAL GEOSCIENTIST PROVINCE OF B. J. PRICE BRITISH COLUMBIA

APPENDIX II - 1996 SAMPLE DESCRIPTIONS AND ASSAYS

ROCK SAMPLE DESCRIPTIONS

#4 **Host Rock, Main showing, Ni-Cr:** This rock is a dense finely crystalline olive green-colored rock that may be an olivine diabase. Some effects of shearing are noted in a weak foliation. The rock has fine specks of possible pyrrhotite. Some serpentinization is likely. One specimen has pronounced slickensides indicating faulting or shearing. Another specimen shows advanced serpentinization of what can only be now described as an ultramafic rock with probable olivine content. There is no readily visible garnet. One specimen has a white limy coating, others have minute lath-like scaly gypsum?? on the surface. This rock does not visually resemble a typical eclogite, but rather a serpentinized ultramafic - harzburgite or dunite.

Eclogite and host-rock in area of Soil-samples 1-6:

One sample is labelled "host" This rock is a very dense and heavy olive or pistachio green rock that has been strongly altered. At least two generations of secondary grey-white silica are present, and lime silicates may have replaced original (ultramafic ?) components. One patch of bright green fuchsitic mica was seen and smaller specks of possible white mica. Secondary garnet may be present, but is very fine. This rock resembles a diopside-epidote skarn.

The Eclogite specimen, (slabbed) is a dense, finely crystalline ultramafic with grains or crystals of brownish-red garnet and irregular crystals of possible diopside all in a fine, dark green matrix that likely is mostly serpentine. Garnet, in grains up to 2-3 mm in size makes up about 20% of the rock. Secondary calcite occurs as about 10% of the rock in bright white crystals. Secondary silicxa veinlets are present, as are in the host rock.

Specimen 7: A dense green foliated rock composed of bright green chlorite or green mica of metamorphic ? origin and finely crystalline groundmass that may be brown grey secondary garnet and olive to light green lime-silicates and possible serpentine. Secondary calcite is suspected.

Specimen 6: Is a brown to green mixture of finely crystalline lime silicates with minor fine sulphides - possibly arsenopyrite ?? The rock resembles a fine-grained skarn.

Specimen 8: Is a dense rock composed of sheared and foliated lime-silicates and calcite with about 30-40% brownish to orange colored (secondary?) garnet. The rock resembles a garnet skarn, but could be a sheared and altered eclogite.

Specimen 9: Is a strongly altered rock composed of a foliated and banded green altered volcanic ?? and crumpled and broken lenses and layers of grey chert. This may be a metamorphosed and sheared tuffaceous rock.

Specimen 10: This rock is a dense, altered ultramafic now a mixture of epidote, calcite garnet, chlorite ? and possibly serpentine. It resembles a skarn, but may be an altered eclogite.

Specimen 11: This rock is less dense, and is a crenulated, foliated chlorite schist, with secondary silica veinlets. The rock may have originally been a tuff.

Specimen 12: This rock is a dense vaguely foliated mixture of green lime silicates, (possibly diopside) and rounded grains up to 5 mm of red-brown garnet. The rock could be a sheared altered eclogite, but could be mistaken for a skarn.

Specimen 13: Is a foliated grey-green fine-grained tuff. Light colored layers visible in minor folds amy be quartz or carbonate.

Specimen 14: This rock is a strongly serpentinized ultramafic, possibly originally a peridotite or dunite. An orange-brown weathering rind is typical of weathered serpentine.

Specimen 15: Is a mixture of indeterminate grey to green lime-silicates, probable serpentine, and probable secondary garnet. The rock resembles a andradite skarn. No sulphides are present, but some white mica is seen.

The samples were submitted by Alex Black from the Echo property. Sample numbers correlate with location numbers on the accompanying map.

APPENDIX III- ECLOGITES

ECLOGITES

Definition and Varieties

Eclogite is relatively rare. It was originally described in 1822 by A. J. Hauy as a rock composed of a grass-green pyroxene called omphacite and pink garnets. This definition has been considerably modified since then, following studies on eclogites by P. Y. Briere, L. Hemer, P. Eskola, C. E. Tilley and others. From strictly bimineralic assemblages of pyroxene and garnet, the name has extended to polymineralic assemblages, with plagioclase, amphibole, kyanite, and other minerals. However, many authorities consider omphacite, a member of the diopside-jadeite series, a critical mineral for establishing a rock as an eclogite (see Table 10-10). The magnesian garnets are rich in pyrope and almandine molecules; garnets in true eclogites are more pyropic than those in gabbros and granulites. It is believed that many rocks carrying almandine-garnets and described as eclogites may be only granulites or high-grade amphibolite. The chemical composition of eclogites is shown in Table 10-9.

Most eclogites have a granoblastic fabric without conspictious foliation. The rude alignment of prismatic amphiboles and pyroxene, studded with porphyroblastic pinkish-red garnets, describe the fabric of eclogite. Varieties may be designated by prominent characteristic minerals, such as bronzite-garnet eclogite, bronzitic eclogue, homblende ectogite, plagioclase ectogite and normat ectogite (omphacite-garnet rock).

Origin and Occurrence

The striking mineral composition and exceptional density (4.2 to 3.35 g per cu cm) of eclogites are an indication of the anhydrous and high-pressure environment under which the original parent rocks, probably gabbroic in composition, have been crystallized. The origin of eclogites is a subject of much debate. Eskola, in his study of the eclogites of Norway, summarizes four principal modes of occurrence: (1) inclusions in kimberlites, hasalts, and garnet-bearing ultramafic rocks; (2) streaks and bands enclosed in dunites, passing into garnetiferous granulites; (3) lensoid masses enclosed in migmatite-gneisses, interpreted as fragments from deep-seated masses moved upward by igneous intrusions; and (4) bands in rocks of lower facies associated with amphibolites, mica schists, and the like, in regions of alpine folding and deformation. Yoder in 1950 outlined six schools of thought on the origin of eclogites: (1) direct crystallization from a magma under high hydrostatic pressure, (2) high-grade metamorphism of igneous or sedimentary rocks, (3) metasomatism of igneous or sedimentary rocks, (4) dynamic metamorphism of preexisting rocks, (5) hydrothermal contact metamorphism, and (6) migmatization.

From field occurrence and the restricted chemical range of eclogites, it is likely that most eclogites have been transported from the site of origin to environments where the rock has undergone metamorphism. Examples are the eclogite inclusions in gneiss and migmatite in Norway and California and the blocks of eclogite caught up in serpentinite and glaucophane schists in California localities. Perhaps most eclogites have originated at great depth where only mafic and ultramafic material is present. whether eclogite should be regarded as igneous rather than metamorphic is immaterial, for at great depth igneous and metamorphic processes presumably grade into each other.

The eclogite in the glaucophane-schist belt of the California Coast Ranges and the eclogite-amphibolite series of the Adirondacks of New York are well known. European examples occur in the Tyrol, Norway, Greenland, France, and the Fichtelgebirge of Bavaria. Eclogites also occur in the Sittampundi complex in Madras of southern India (Fig. 3-6, p.67).

From: Huang, Walter T., Petrology. McGraw-Hill Book Company 1962. pp 423-424.

APPENDIX IV - ECHO PROJECT SAMPLES

COMP: ALEX BLACK
PROJ: ECHO-S.LAKE
ATTN: Alex Black

MIN-EN LABS — [illegible]CP REPORT

8282 SHERBROOKE ST., VANC[illegible]R, B.C. V5X 4E8
TEL:(604)327-3436 FAX:(604)327-3423

FILE NO: 6V-0987-RJ1
DA[illegible]96/11/14
* * [illegible]ACT:F31)

SAMPLE NUMBER	AG PPM	AL %	AS PPM	BA PPM	BE PPM	BI PPM	CA %	CD PPM	CO PPM	CR PPM	CU PPM	FE %	GA PPM	K %	LI PPM	MG %	MN PPM	MO PPM	NA %	NI PPM	P PPM	PB PPM	SB PPM	SN PPM	SR PPM	TH PPM	TI %	U PPM	V PPM	W PPM	ZN PPM	Au-fire PPB
ROCK SAMPLE ECHO#1	.1	.32	1	114	.1	1	.11	.1	7	129	34	3.19	1	.09	3	.18	158	9	.01	24	200	142	4	4	13	1	.01	1	6.8	5	24	12
ROCK SAMPLE ECHO#2	.1	.07	1	101	.1	1	.73	.1	6	121	30	3.74	1	.03	1	.05	308	7	.01	20	80	1	1	4	3	1	.01	1	15.1	4	4	31
ROCK SAMPLE ECHO#3	.1	2.00	1	130	.1	1	.54	.1	10	49	11	4.05	1	.06	29	.86	348	14	.02	28	390	1	3	6	26	1	.01	1	23.7	1	52	10
ROCK SAMPLE ECHO#4	1.3	.13	645	6	.5	1	.03	.1	71	202	58	2.70	1	.01	1	>15.00	402	1	.01	1193	10	1	1	7	16	1	.01	1	11.0	1	29	8
ROCK SAMPLE ECHO#5	1.8	.10	636	13	.2	1	5.46	.1	31	230	63	2.42	1	.01	1	13.12	1378	1	.01	435	10	1	1	7	189	1	.01	1	20.6	1	29	97

COMP: ALEX BLACK
PROJ: ECHO-S.LAK
ATTN: Alex Black

MIN-EN LABS — ICP REPORT

8282 SHERBROOKE ST., VAN ER, B.C. V5K 4E8
TEL:(604)327-3436 F (604)327-3423

FILE NO: [illegible]
DATE: 96/11/14
* ACT:F31)

SAMPLE NUMBER	AG PPM	AL %	AS PPM	BA PPM	BE PPM	BI PPM	CA %	CD PPM	CO PPM	CR PPM	CU PPM	FE %	GA PPM	K %	LI PPM	MG %	MN PPM
ECHO 1 SOIL	.1	1.89	98	189	.1	1	.34	.1	18	111	58	3.00	1	.03	12	1.77	287
ECHO 2 SOIL	1.3	2.27	201	121	.1	1	.83	.1	29	233	185	3.85	1	.04	15	3.06	518
ECHO 3 SOIL	.8	2.08	204	92	.1	1	1.80	.1	34	230	211	3.83	1	.03	17	3.03	613
ECHO 4 SOIL	1.0	2.18	140	70	.1	1	2.67	.1	35	120	311	4.31	1	.03	14	2.59	662
ECHO 5 SOIL	.4	1.68	85	64	.1	1	.49	.1	17	115	127	2.95	1	.04	10	1.62	373
ECHO 6 SOIL	.5	2.10	126	187	.1	1	.40	.1	23	117	184	3.95	1	.07	16	2.01	538

SAMPLE NUMBER	MO PPM	NA %	NI PPM	P PPM	PB PPM	SB PPM	SN PPM	SR PPM	TH PPM	TI %	U PPM	V PPM	W PPM	ZN PPM	Au-fire PPB
ECHO 1 SOIL	12	.01	60	10	1	1	5	12	1	.01	1	73.5	1	56	11
ECHO 2 SOIL	14	.01	116	10	1	1	6	17	1	.01	1	92.8	1	80	21
ECHO 3 SOIL	13	.01	128	90	1	1	7	21	1	.01	1	78.7	1	108	18
ECHO 4 SOIL	14	.01	62	70	1	1	7	17	1	.01	1	109.6	1	123	42
ECHO 5 SOIL	12	.01	47	40	1	1	5	15	1	.02	1	72.4	1	64	6
ECHO 6 SOIL	15	.01	83	70	1	1	6	17	1	.01	1	81.9	1	92	15

MINERAL
·ENVIRONMENTS
LABORATORIES
(DIVISION OF ASSAYERS CORP.)

SPECIALISTS IN MINERAL ENVIRONMENTS
CHEMISTS · ASSAYERS · ANALYSTS · GEOCHEMISTS

VANCOUVER OFFICE:
8282 SHERBROOKE STREET
VANCOUVER, B.C., CANADA V5X 4E8
TELEPHONE (604) 327-3436
FAX (604) 327-3423

SMITHERS LAB:
3176 TATLOW ROAD
SMITHERS, B.C., CANADA V0J 2N0
TELEPHONE (604) 847-3004
FAX (604) 847-3005

Geochemical Analysis Certificate

6V-0988-SG1

Company: ALEX BLACK
Project: N.B
Attn: Alex Black

Date: NOV-13-96

We hereby certify the following Geochemical Analysis of 2 SOIL samples submitted NOV-05-96 by ALEX BLACK.

Sample Number	Au-fire PPB	CU PPM
N.B. SOILS 1	21	191
N.B. SOILS 2	10	154

Certified by ____________

MIN-EN LABORATORIES

MINERAL
·ENVIRONMENTS
LABORATORIES
(DIVISION OF ASSAYERS CORP.)

SPECIALISTS IN MINERAL ENVIRONMENTS
CHEMISTS • ASSAYERS • ANALYSTS • GEOCHEMISTS

VANCOUVER OFFICE:
8282 SHERBROOKE STREET
VANCOUVER, B.C., CANADA V5X 4E8
TELEPHONE (604) 327-3436
FAX (604) 327-3423

SMITHERS LAB:
3176 TATLOW ROAD
SMITHERS, B.C., CANADA V0J 2N0
TELEPHONE (604) 847-3004
FAX (604) 847-3005

Geochemical Analysis Certificate

6V-0987-RG1

Company: **ALEX BLACK**
Project: ECHO-S.LAKE
Attn: Alex Black

Date: NOV-15-96

We hereby certify the following Geochemical Analysis of 5 ROCK samples submitted NOV-05-96 by Alex Black.

Sample Number	Pt g/tonne
ROCK SAMPLE ECHO#1	
ROCK SAMPLE ECHO#2	
ROCK SAMPLE ECHO#3	
ROCK SAMPLE ECHO#4	<.01
ROCK SAMPLE ECHO#5	

Certified by ______________________

MIN-EN LABORATORIES

TOTAL P.02

APPENDIX V - MT HUNDERE DEPOSIT OUTLINE.

MT, HUNDERE, Y.T. YT MINFILE #12

Trevor Bremner, Dennis Ouellette

NTS:	105 A 10
Coordinates:	80031'N. 128053'W
Area:	Watson Lake Access; Road
Company;	Curragh Resources Incorporated,Hillsborough Resources Limited
Commodities;	Zinc, lead, silver

INTRODUCTION

In 1990, Curragh Resources announced its intention to spend $70 mill onto develop a high-grade zinc-lead-silver mine at Mt Hundere. 54 km north of Watson Lake. The deposit has formed by the replacement of limestone at the sheared contact between Lower Cambrian limestone and phyllite. Proved reserves are approximately **4 million tonnes in 4 zones, with an average grade of 8.45 % Pb, 13.2% Zn and 50 g/t Ag**. A further **1.2 million tonnes of possible sulphide reserves grading 5.2%Pb and 12.5% Zn** have also been identified. The ore is coarse grained and free of Impurities, and the waste will be non-acid generating due to the limestone host rock and the relatively low amount of waste sulphides. Production is estimated at 100,000 to 150,000 tonnes of concentrate per year over a mine life of 8.5 years.

EXPLORATION HISTORY

Previous work on the property was compiled by Archer, Cathro & Associates (1981) Ltd and is documented in the Yukon Minfile. The first claims on Jewel box Hill were staked in 1962 by prospectors Jake Hundere and Pete Ritco, on behalf of the Frances River syndicate (Dr A. Aho). A road to the property was built In 1963, and the claims were explored with bulldozer trenches and six diamond drill holes. Over the next 20 years, a number of Aho's companies surveyed the claimboundaries and explored the property with geochemical and geophysical surveys and bulldozer trenching, and 72 holes were drilled between 1979 and 1982, resulting in the discovery of the north and south zones about km apart. A feasibility study In 1982 recommended a small Open-pit operation and a 250 ton per day mill. In 1984, Canamax Resources Incorporated purchased and re-mapped the property and carried out more geochemical and airborne geophysical surveys, and drilled 37 more holes, identifying 3 separate deposits in the area:; the south zone (Jewel box Hill). By the end of 1988 Canamax had completed 188 drill holes and increased the reserves to approximate their present level. the Hundere joint Venture (Curragh

Resources - 80%, Hillsborough Resources - 20%) purchased the property from Canamax and the Kaska nation acquired a 5%% ownership in 1990.

CURRENT WORK

Commencing In September, 1990, Infill drilling was completed on the main zone at Jewel box Hill. The drilling consisted of 25 diamond drill holes totalling 450 m, and brings the total number of holes on the property to 358. Construction began on a 70 x 22 m concentrator and tailings disposal facilities, and a 28 km haul road was completed from the mine site to the Campbell Highway. Underground work began with the collaring of an upper exploration and ventilation adit at the 1400 m level on the east side of Jewel Box Hill, and a lower development and haulage adit at the 1250 m level which will be accessible to 50 ton trucks.

GEOLOGY AND MINERALIZATION

High grade sphalerite and galena occur In skarn zones at the sheared contact between Lower Cambrian phyllite and limestone. Highly sheared graphitic phyllite lying immedlately above the main limestone body forms a major marker. Outside of the sheared zone, the phyllite is calc-silicate altered and lacks graphite, and the limestone has been altered to pale green andradite garnet-quartz-calcite skarn.

Proved reserves to date are confined to the main zone on Jewel Box Kill (Figure 1). A further 2 million tonnes of possible reserves occur in the AttIla and Burnick zones on North Hill, and a high grade mineralized skarn lens beneath Gribbler Ridge (between Jewel Box Hill and North Hill) is known from 1987 drilling. On Jewel box Hill the main ore type consists of coarse actinolite skarn with massive sphalerite and galena. Copper-iron skarns and replacements with magnetite, pyrrhotlte and pyrite also occur. The highest silver values on the property come from prograde diopside-rich skarn on east side of Jewel Box HillII. The mineralized skarns form lensoid and tubular bodies from 1 to 15 m thick in two sheared, brecciated limestone layers with extensively developed cavernous porosity. Some of the ore occcurs n horizontal tubular bodies and in a 50 m chimney of high grade material connecting the upper and lower limestone. Two vertical East-northeast-trending faults filled with quartz-fluorite breccia occur near ore, and some fluorite extends into in the ore (Figure 2).

DISCUSSION AND CONCLUSIONS

The mineralization at Mt Hundere Is epigenetic and appears to be structurally controlled. Examination of the area around the upper portal on Jewel box Hill shows that the footwall other mineralization consists of 10 m of mylonitic graphitic phyllite and clay gouge, cut by curving low-angle shear surfaces which strike about 0050 and dip 27 W (Figure 3). Lenticular quartz boudlns lie along these shear surfaces. Examination of the area around the Discovery showing on Jewel Box Hill shows low-angle fault duplexes in the limestone immediately overlying actinolite-sphalerite skarn. Both of these fabrics are consistent with eastward-directed thrust faulting. The upper and lower limestones may represent imbricated tectonic slices, with zones of fault breccia controlling the emplacement of the sulphides.

Abbott (1977) described several episodes of deformation in the area. His D2 deformation produced the strong shear fabric seen In the host limestone and adjacent ar-gillite. This deformation consists of low-angle shearing and drag folds with subhorizontal axes. Abbott also referred to thermal metamorphism which was contemporaneous with and/or post-dated the D2 structures and produced the mineralized skarns. On the basis of a dome-shaped uplift in the Mt Hundere area and quartz-albite porphyry dykes on the property, Abbott proposed that the mineralization was related to a buried intrusion, probably of Cretaceous age. However, a whole rock Ar age of 50 Ma was reported by Slnclair from a quartz porphry dyke on North Hill, suggesting that both the igneous activity and the late structures in the area may be Tertiary rather than Cretaceous (Grant Abbott, personal communication).

EXPLORATION POTENTIAL

All of the ore zones remain Open. The Attila and Burnick zones on North ill are not presently being developed a 5% they are contain about half the reserves of the Jewel Box Hill deposit, are lower grade and are lead-poor. However, potential for further reserves exists between t e North Hill deposits.

ACKNOWLEDGEMENTS

Bill Mann (Curragh Resources Inc.) provided information and a tour of the property. Grant Abbott contributed this knowledge of the regional geology and the structure of the property and edited the manuscript. The contributions of these two people are gratefully acknowledged.

REFERENCES

ABBOT, J.G,, 1987. Structure and stratigraphy of the Mt Hundere area, southeastern Yukon; unpublished MASc Thesis, Queen's University, Kingston, Ontario.

APPENDIX VI -NEW GEOLOGICAL MAP OF MT. HUNDERE AND THE AREA NORTH by G. Abbott

This summary of geological studies in the Mt. Hundere area of central Watson Lake map sheet (105 A) was undertaken as part of a Master's thesis completed at Queen's University in 1977 (Abbott, 1977). Field work was carried out for five weeks in 1973 and one week in 1974 while the writer was employed by the Geological Survey of Canada. Mapping was extended during August, 1978 while the writer was employed by Archer, Cathro and Associates and CUB Joint Venture (Cassiar Asbestos Corporation Ltd,, Highland-Crow Resources Ltd,. and Union Carbide Canada Ltd.). These companies have given permission to publish information obtained during the period.

The area is underlain by one of the better exposed and more complete sequences of Paleozoic and Mesozoic rocks known within Cassiar Platform north of Tintina Fault. previous work includes preliminary 1:250,000 scale mapping by Gabrielse (1966). This study resulted in a more precise definition of the stratigraphy and style and timing of deformation within Cassiar Platform in southeastern Yukon.

The geology Of Mt. Hundere is shown in Figure 1. A map of north central Watson Lake map-area that includes later work is shown in Figure 2, The description of rock units In the Table of Formations is based mainly on the earlier work. The stratigraphy is not detailed here. It is like that in other parts of Cassiar Platform and the reader is referred to reports by Gabrielse (1953), Gordey (in press) and Tempelman-Kluit (1977a,b) for descriptions.

In central Watson Lake map-area, late Proterozoic through Triassic miogeoclinal strata of Cassiar platform are exposed in a window beneath a cover of late Paleozoic, transported, sheared sedimentary. volcanic and ultramafic rocks of the Anvil Allochthonous Assemblage, (Tempelman-Kluit, 1978). The window and cover are folded into a north trending arch. cored in the north by Cretaceous quartz monzonite. A smaller dome within the larger arch centered about Mt. Hundere may be cored by an intrusion at depth. Normal faults which localized uplift during granitic intrusion are prominent features within the Mt. Hundere arch and at the south end of Billings Batholith.

The rock units have different styles of deformation. Cambrian and Ordovician phyllite are complesly deformed internally and are thermally metamorphosed. At least two sets of penetrative, small scale structures are developed. The oldest predate thermal metamorphism and are related to regional deformation, but the youngest are closely related to thermal metamorphism and developed during granitic intrusion arching and uplift. Silurian and younger rocks are deformed into broad open folds, accompanied by axial plane cleavage. The degree of development of cleavage within the Silurian and younger rocks is progressively weaker up section and Triassic rocks are internally undeformed. The folds and axial plane cleavage within the Silurian and younger rocks formed in response to the same stress that formed the older set of small scale structures within Cambro-Ordovician strata. The contrast in style and intensity of deformation results from the competence difference and depth of burial of the older rocks, during regional deformation.

Reproduced from: Yukon Geology and Exploration, 1979-80. INAC.

APPENDIX VII - NOTES FROM MAP 19-1966

DESCRIPTIVE NOTES - MAP 19- 1966
WATSON LAKE, YUKON TERRITORY, 105-A

H.Gabrielse, 1966

Fixed-wing aircraft equipped with floats are available for charter at Watson Lake, a community serviced by scheduled airline flights. Rotary-wing aircraft can be chartered at Watson Lake Wye, on Alaska Highway, a supply and communications centre for the region. Good gravel roads run northerly from Watson Lake to Ross River on Canol Road and to the Canada Tungsten Mine near the headwaters of Flat River. Rapids in Hard Canyon present the only obstacle to navigation on Hard River. Frances and Hyland Rivers have long stretches of easily navigable water but these are interrupted by several dangerous rapids.

A thick sequence of Proterozoic rocks (1) (possibly Including Lower Cambrian strata In the upper part) is composed of three units, from oldest to youngest as follows: interbedded slates and feldspathic gritty rooks of apparently great, but unknown thickness; limestone and limestone breccia of variable thickness but locally between 500 and 600 feet thick; and fine-grained phyllitic and slaty rocks possibly more than 1,000 feet thick. The clastic rocks in Simpson Range (ic, Id) are highly sheared and northwest of Hasselberg Lake are strongly metamorphosed.

Lower Cambrian clastic and carbonate rocks (2, 3) in the southwest part of the map-area are characteristic of the Atan Group to the south in Mc Dame map-area. Lower Cambrian limestone (3) containing archaeocyathids in the central part of the map-area appears to range from zero to as much as 200 feet thick. The limestone overlies crinkled, non-calcareous, finely laminated, phyllitic argillite and is overlain by calcareous phyllitic slate and wavy banded limestone.

Cambrian and Ordovician strata (4), probably more than 1,000 feet thick, are typically buff weathering in the southwest part of the map-area and in Hard Canyon but are grey weathering elsewhere. The rocks are highly incompetent and commonly display well developed cleavage.

Silurian and Devonian strata (6), containing Middle Devonian fossils in an uppermost unit of black, fetid limestone, are possibly as much as 1,000 feet thick along the Canada Tungsten road west of Hyland River and appear similar in lithology and thickness to correlative rocks in McDame map-area. Middle Devonian fossils wore also collected from platy argillaceous limestone (included in 5) 3% miles southwest of the unnamed peak, elevation 5,165 feet, in the central part of the map-area. There, however, the sequence includes very little carbonate.

The basal non-volcanic clastic rocks of the Devono-Mississippian assemblage (7) are characterized by chert pebble conglomerates that locally form resistant members several hundred feet thick.

Several belts of volcanic rocks and associated sedimentary strata, probably of Mississippian age, (8), locally include bodies of ultramafic rocks (10). The distribution of volcanic and ultramafic rocks is well defined by aeromagnetic anomalies (See G.S. C. Map 7000 G). A limestone member (9a) southeast of Sambo and Marten lakes may be as much as 500 feet thick. In Middle Canyon on Frances River well bedded limestones contain interbeds of sheared limestone and polymictic conglomerate generally less than 10 feet thick. Massive and, in places, highly sheared conglomerate on the east side of Simpson Lake (9c) contains well rounded to sub-angular pebbles and cobbles of greenstone, vein quartz, quartz-muscovite gneiss, serpentinite, phyllitic slate, and limestone.

Granitic bodies In the northeast part of the map-area (12) have a fairly uniform composition. An isolated granitic plug (12a) east of Oscar lake contains crystals of quartz, feldspar and biotite in a fine-grained, buff weathering matrix. Granitoid rocks north of Tuchitua River and In Simpson Range (11) have been highly metamorphosed and those in Simpson Range include much granitic gneiss.

Steeply-dipping Paleocene or Eocene sediments (13) containing lignitic coal outcrop along Liard~River near the mouth of Rancheria River. The best exposed coal seam is about 4 ft thick.

Small exposures of flat-lying vesicular olivine basalt (14) occur in the southwest part of the map-area. Aeromagnetic anomalies suggest that these rocks underlie a fairly extensive area along and near Little Rancheria River. An outcrop of basalt along the Ross River road north of Tuchitua River contains some medium-grained gabbro.

The entire map-area was covered by one or more advances of ice. The last major advances were southeasterly along Liard River, westerly from Cassiar Mountains, southerly down the upper Frances River valley and northerly and north-easterly up the valleys of Hyland and Green Rivers. Glacial lake silts underlie a large area from north of Simpson Lake southerly and easterly beyond Stewart Lake to north of Hyland River.

Poorly consolidated, flat-lying sands and pebbly sands containing logs and fragments of wood are exposed in a cut bank on the east side of Hard River about 4 miles southeast of the mouth of Allan Creek. The sediments may be of intra- or pre-Pleistocene age as they underlie boulder till. Radiocarbon dating
of the wood indicates an age of greater than 40,800 years B. P.

A layer of white weathering volcanic ash, about -21 inch thick, occurs beneath the humus layer along Liard River south of the mouth of Allan Creek and also near Simpson Lake.

Structural information is fragmentary and no coherent picture of structural style of the bedrock formations has been obtained. Proterozoic (?) rocks on Hyland River above the mouth of Green River and southeast of the mouth of Green River are strongly cleaved and tightly folded with axial planes dipping
moderately to the east, The overlying incompetent Cambro-Ordovician strata appear to be much less deformed and form relatively open folds. Similarly, the strongly sheared Proterozoic rocks and associated granitic rocks in Simpson Range are more intensely sheared than those of the adjacent levono-Mississippian sequence to the northeast.

The distribution of map-units in the mountain range northwest of Tom Lake suggests a domal structure. In this area thin-bedded strata of map-units 4 and 5 are cut by a well developed, northerly trending strain-slip cleavage which is in turn folded.

The major structure in southeastern Simpson Range appears to be a syncline with a gently dipping southwestern limb and a steeply dipping to slightly overturned northeastern limb. Farther northwest in Simpson Range gneissic structures in granitic and metasedimentary rocks generally dip at low angles.

An important fault separates the gneissic terrain from considerably less deformed Devono-Mississippian strata northwest of Sambo Lake. Northerly and northwesterly- trending faults such as those exposed along Little Rancheria River are probably abundant in the southwest part of the map~area, where, combined with tight folds, they cause considerable repetition of strata.

Folding of Paleocene or Eocene strata along Hard River demonstrates deformation during the interval between deposition of these beds and the extrusion of flat-lying basalt.

A relatively high-grade lead-zinc showing containing minor silver has been discovered about one mile southeast of the unnamed peak, elevation 5,165 feet, sixteen miles northwest of Tom Lake. There, several trenches reveal coarse-grained galena and sphalerite associated with a spectacular garnet-diopside-
hedenbergite (?) skarn in Lower Cambrian limestone. Trenching has also been carried out on a similar occurrence near the crest of a ridge two miles farther north.

A prospector has reported the presence of scheelite along the east contact of the granitic batholith four miles northwest of the north end of Oscar Lake.

From Mapsheet 19-1966

APPENDIX VIII - ERDMER ECLOGITE PAPER - EXCERPTS

Blueschist and Eclogite in Mylonitic Allochthons, Ross River and Watson Lake areas, southeastern Yukon Phillippe Erdmer

Introduction

In central Yukon, more than a dozen eclogite lenses in eight localities are known. They occur over a strike length of several hundred kilometres in the immediate hanging wall of a regionally west~dipping fault that separates North American miogeoclinal rocks from siliceous mylonite, basalt, chert, ultramafic rocks, and granite of the Yukon-Tanana terrane. The accretion of the Yukon-Tanana terrane to North America has been attributed to Mesozoic arc-continent collision, and large parts of the terrane have been interpreted as trench material involved in subduction-zone tectonism (Tempelman-Kluit 1979a). An alternative interpretation of the terrane as consisting mostly of an internally coherent depositional succession has recently been offered by Mortensen and Jilson (1985).

The Yukon-Tanana terrane hosts several more lenses in adjacent Alaska, near the confluence of Cleary Creek and the Chatanika River north of Fairbanks. There, eclogites are interlayered with calcareous, pelitic, and quartz-rich schist (Swainbank and Forbes 1975); the combined resulting pressure-temperature (P - T) estimates from the latter rock types and the eclogites (Brown and Forbes 1986) are similar to those from the Yukon rocks, suggesting a common origin.

An early study of four Yukon eclogite lenses, near Faro and east of Last Peak (see Fig. 1; Erdmer and Helmstaedt 1983), showed that they possess characteristics typical of type-C (Coleman er at. 1965) rocks. However, contact relations of the eclogite with country rock were ambiguous, and the meta-morphic grade of the host could not be independently established. More specifically, it could not be proven that the host underwent the same metamorphism as the eclogite. Also, non-eclogitic high-pressure rocks along strike were unknown.

This study, involving the investigation of two previously undocumented localities near Ross River and Watson Lake, helps resolve three fundamental problems regarding the occurrence of high-pressure rocks in the Yukon-Tanana terrane:

(1) did the host rocks of the eclogites undergo high-pressure etamorphism,
(2) are high-pressure rocks extensive enough to support the subduction-melange hypothesis of Tempelman-Kluit (l979a), and
(3) do high-pressure rocks clearly overlie orth American strata along thrust faults?

The first occurrence, northwest of Ross River, offers examples of intimate, interlayering of eclogite lenses with a largely metasedimentary, blueschist-bearing host that is several hundred metres thick.

Eclogite contacts are sharp and well exposed. The second occurrence, north of Watson Lake, displays eclogite within a clippe of diverse mylonitic rocks that covers an area of nearly 100? sq. km. There, fresh eclogite is in gradational contact with gabbro and serpentinite, and retro-graded eclogite occurs within a slice at least 100 m thick.

Stewart Lake Area - Setting and field relations

The second study area is approximately 60 km north of Watson Lake. It consists of two clusters of eclogite outcrops dispersed along several kilometres, centred 3 km south and 3 km northwest of Stewart Lake respectively. Eclogite outcrops are a few metres to a few tens of metres across and are separated by silvery grey phyllite and varied metabasic rocks. More eclogite occurs along strike 10 and 20 km to the south of Stewart Lake and 10 km to the northwest. All these rocks form part of a thrust sheet of late Paleozoic (?) ductilely sheared and metamorphosed sedimentary, volcanic, and ultramafic rocks (Anvil allochthon, Tempelman-Kluit l979a; Abbott 1981) emplaced above Triassic shale, siltstone, and silty limestone, and underlying Devono-Mississippian strata of the North American miogeocline. The eclogite occurrences that were investigated are in a part of the sheet preserved in the keel of a regional northwest-trending syncline, named here the Stewart Lake Kiippe.

Near Stewart Lake, rocks in the clippe include silvery grey to green muscovite - quartz phyllite to fine-grained muscovite schist, graphitic quartzite, dark chloritic metaquartzite interpreted in part as metachert, dark green serpentinite, dark green fine-grained greenstone and chlorite schist, fine-grained grey marble, garnet-hornblende metabasite, amphibolitized gabbro, and pods of eclogite a few metres across, with flesh centres, that are largely retrograded and gradational with mafic meta-igneous rocks. At least one hill with more than 100 ft of relief is entirely underlain by garnet-amphibole metabasite with the coarse grain size and distinctive texture of fresh eclogite (see petrographic description).

All rocks in the area including the eclogite lenses are ductilely sheared and exhibit mylonitic fabrics (Fig. 6). Contacts are poorly exposed. It is likely that the intimate association of eclogite and other rock types is largely tectonic. Each rock type occurs as a discrete (fault-bounded?) lens with a north -northwest elongation; internal layering and schistosity conform to this strike. Dips are variable and moderate on average. A strong magnetic anomaly extending for the length of the klippe suggests that serpentinized ultramafic rock exposed in several outcrops is continuous at shallow depth. This anomaly strongly affects the magnetic compass, and hinders accurate navigation on foot. Direct access to a few of the outcrops is possible by helicopter.

It is clear from field associations that eclogite in the Stewart Lake Klippe is in an immediate host of basaltic, gabbroic, and ultramafic rocks, together with carbonate and inferred metachert. However, it is not clear whether all (or any) of the host was metamorphosed through the eclogite field. In contrast, the Ross River area displays rocks that are almost exclusively sedimentary, (largely graphitic quartzite and muscovite schist), and glaucophane schist that may have equilibrated with the eclogites. The two studied localities thus expose eclogites of contrasting associations and different protoliths.

Petrography and Mineral Compositions

Fresh eclogite near Stewart Lake consists of a light green, fine-grained matrix (65%) and abundant (30%) euhedral orange garnets averaging 5 mm across. Locally, the rock looks like garnetiferous amphibolitized gabbro. Thin sections show that the matrix is omphacite, with some altered grains of an unidentified prismatic mineral that may have been primary clinopyroxene. Garnets are optically unzoned and have increasing pyrope content from core to rim (Fig. 4). Garnets in the Stewart Lake eclogites have a compositional range that is different from that of the Ross River woks; this is interpreted as reflecting differing protoliths. Mylonitic texture in the omphacite groundmass, and barrier reef garnets (Fig. 7; double atoll garnets of Helmstaedt et al. 1972), are characteristic.

Altered eclogite includes several distinctive rock types. The most common resembles fresh eclogite in hand sample, but thin sections show that barroisite, actinolite, chlorite, and epidote replace most of the omphacite. Others are massive, serpentine-bearing muscovite - pyroxene - amphibole - garnet rock, and weakly layered garnet amphibolite with relict clinopyroxene, amphibole pseudomorphs of pyroxene, and nearly completely chloritized garnet crystals.

Garnet metabasite near Stewart Lake is medium-grained barroisite-actinolite-epidote -garnet rock with minor quartz, and rare relict clinopyroxene porphyroblasts about I mm across. Texturally, the rock resembles fresh eclogite. Complete gradation is seen between flesh eclogite, altered eclogite, and garnet metabasite. Nearly continuous exposure of at least 100 m of garnet metabasite is visible across the mylonitic foliation.

Pressure and temperature estimates

Jadeite in pyroxene from eclogite at Stewart Lake ranges from 25 to 57%; using Holland's (1980) expression, eclogite equilibrated between 12 and 15 kb (at 530-750oC; see below) near Stewart Lake. Selling the activity of jadeite equal to the mole fraction (Holland 1983) yields similar results.
Using the Ellis and Green (1979) expression, the eclogites at Stewart Lake are inferred to have developed at 530-750"C; these results are incorporated in Fig. 5.

It was observed that no systematic relation exists between the calcium content of garnet and ln Kd(Fe/Mg) (garnet - pyroxene) in the analyzed samples (Fig. 8). This casts doubt on the applicability of Ellis and Green's expression to Ca-rich garnets. It supports Brown and Forbes' (1986) conclusion that this thermometer's results are probably too high for grossular-rich garnets. However, as the average grossular content of garnet in the Yukon eclogites is low (0.20), the effect of Ca is considered to be minimal.

Excerpted from Can. J- Earth Sc. v. 24. 1439-1449(1987)

QA24821

Costs Ech claims

Helicopter	1100.00
Food	856.14
ALEX BLACK	
30 days @ 50.00	1500.00
Jackie Charlie	
30 days @ 100.00	3000.00
Assays (Approx)	400.00
Miscellaneous	
Tape. Soil Sample Bag ect	125.00
Gas and Oil	123.00
Total	7104.14

RECEIVED
SEP 25 1996
MINING RECORDER
WATSON LAKE, Y.T.
I.N.A.C.

Camp-Ground Services Ltd.

FOOD MARKET — IMPORTED DELICATESSEN — MAGAZINES

TIRES - HUSKY GASOLINE & OIL

BOX 345 - PHONE 536-7448 - FAX (403) 536-7971 - WATSON LAKE, Y.T.

SOLD TO ALEX BLACK DATE July 28 1996

Bag 5000 YOUR ORDER NO. ________

Watson Lake TERMS ________

	QTY.	DESCRIPTION	PRICE	AMOUNT
1				
2		Bush Supplies		856 14
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14		"Stewart LK"		
15				
16		Project		
17				
18				
19				

15618 ________ SIGNATURE

SUB TOTAL	
G.S.T.	
TOTAL	856.14

G.S.T. NO. R 100749811

QA24821

REMIT PAYMENT TO:
TRANS NORTH AIR
TRANS NORTH TURBO AIR LTD
AIRPORT HANGAR "C" • WHITEHORSE • YUKON • Y1A 3E4
TELEPHONE (403) 668-2177 FAX (403) 668-3420

ACCOUNT NUMBER:
INVOICE NUMBER 09597
INVOICE DATE:
AREA: BC / YUKON / NWT / ALTA

CHARTERER: ALEX BLACK
BILLING ADDRESS:

A/C TYPE: 206
AIRCRAFT REGISTRATION C: FCHO
FLIGHT DATE: DAY 31 MONTH 07 YEAR 96
PURCHASE ORDER NO:

FUEL & OIL-X: TNTA / | CUST
TNTA FUEL USED | HRS / LITRES | FROM

FROM / TO	HOURS	REMARKS - NO. OF PASS - FREIGHT Kg
FROM Y2M TO STEWART LK x2	1.3	2

paid by cheque # 007

SUB	G.L.	AMOUNT
0000	323	

@			
@			
HOLDING TIME: @ / HR.			
FUEL @ / LITRE			
FUEL @ / LITRE			
MEALS & LODGINGS			
OTHER			
OTHER			
SUB TOTAL			
GOODS & SERVICES TAX REGISTRATION NO. R121483135			

TOTAL $ 1100.00

TERMS: PAYABLE UPON RECEIPT OF INVOICE.
2% INTEREST PER MONTH (24% PER ANNUM) WILL BE CHARGED ON ALL OUTSTANDING AMOUNTS OVER 30 DAYS. IF INTEREST IS NOT PAID, FUTURE FLIGHTS WILL BE ON A CASH BASIS

X Alex Black
CHARTERER'S SIGNATURE

CHARTERER'S NAME (PRINTED)

INITIALS
PILOTS SIGNATURE
ENGINEER'S NAME

CARRIAGE SUBJECT TO TERMS OF PUBLISHED TARIFF.
TARIFF AVAILABLE TO PUBLIC VIEW AT TRANS NORTH OFFICE.

BASE COPY