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PT Mineral
claims

GEOLOGICAL REPORT

PLATINUM PROSPECTS

"PT" 1-34 MINERAL CLAIMS, HOPE, B.C.

NEW WESTMINSTER MINING DIVISION

for:

INTERNATIONAL CONSOLIDATED PLATINUM LTD.

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V6R 1W2 733-6902

February 15, 1987

Barry Price

GEOLOGICAL ASSOCIATION OF CANADA
B. J. PRICE, M.Sc.
FELLOW

GEOLOGICAL REPORT

PLATINUM POTENTIAL

"PT 1-34 CLAIMS", HOPE, B.C., NEW WESTMINSTER M.D.

SUMMARY

The Pt 1-34 claims, totalling 404 units, and situated between the head of Emory Creek north of Hope,and Harrison Lake,B.C, are held by International Consolidated Platinum Ltd. by staking and by contractual arrangement with Adola Mining Corp., Gabbs Resources Ltd., Prophesy Resources Ltd., and Colonial Oil and Gas Ltd.

The claims cover a large area of mafic and ultramafic intrusive rocks thought to be of Cretaceous age, which cut metasedimentary and volcanic rocks of the Chilliwack and Hozameen Groups (Devonian to Pennsylvanian) and appear to be engulfed and metasomatized by Late Cretaceous and Tertiary granitoid rocks of the Coast Range Complex.

At the southeast boundary of the Pt claim block, the Giant Nickel Mine, now owned by Mascot Gold Corporation, produced 4.7 million tons of copper-nickel ore containing 59 million pounds of nickel (0.627%) and 28 million pounds of copper (0.297%), from a ultramafic intrusion with some characteristics of "Alaskan" ultramafics, which contain Platinum Group metals in many parts of the world.

Preliminary sampling for Platinum by B.C.Department of Mines personnel at the Giant Nickel in 1966 revealed 7.2 grams per tonne Palladium and 2.0 grams per tonne platinum from a massive pyrrhotite vein. Earlier work by Aho indicated an average of 0.3 grams per tonne platinum metals, 0.1 % Cobalt and 0.7 grams per tonne gold in the ore, although it is doubtful if smelter credits were given for these important components.

Detailed exploration for copper and nickel only, in the area of the PT claim block was done from 1969 to 1975 by Giant Explorations Ltd. Work started with reconnaissance silt and soil sampling traverses on targets delineated by an aeromagnetic survey, which outlined strong magnetic anomalies of likely ultramafic origin trending northwesterly from the Giant Nickel mine. Geological mapping, ground geophysics, and soil geochemical grids outlined several areas of copper-nickel mineralization, some of which were subsequently drilled. One of the areas near Daioff Creek contains a large low-grade copper-nickel resource averaging about 0.20 % Nickel in sulphide form. Many additional areas with anomalous copper and nickel in soils overlying mafic to ultramafic rocks were never followed up. Most of these are within the PT 1-34 claims.

The recent increase in price of Platinum to the US $500-550 per ounce level and Palladium to US $125/oz. has caused a dramatic increase in exploration efforts for North American reserves of these metals. Several companies such as Technigen Platinum Corporation and Equinox Resources Ltd. are exploring for platinum in the PT Project area, and Mascot Gold Corp. anticipates exploration at the minesite and on several claim blocks that they have retained in the project area.

It is recommended that an initial heavy minerals, geological reconaissance and geochemical program costing $300,000 be commenced on the property as soon as weather and snow conditions permit.

Dependent on results of the initial program, a stage II program totalling $250,000. and a stage III (diamond drilling) program totalling $450,000. are recommended.

Barry Price, M.Sc.,FGAC.
Consulting Geologist.
February 15, 1987.

GEOLOGICAL ASSOCIATION OF CANADA
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"PT" PLATINUM EXPLORATION PROJECT, HOPE, B.C.
INTERNATIONAL CONSOLIDATED PLATINUM LTD.

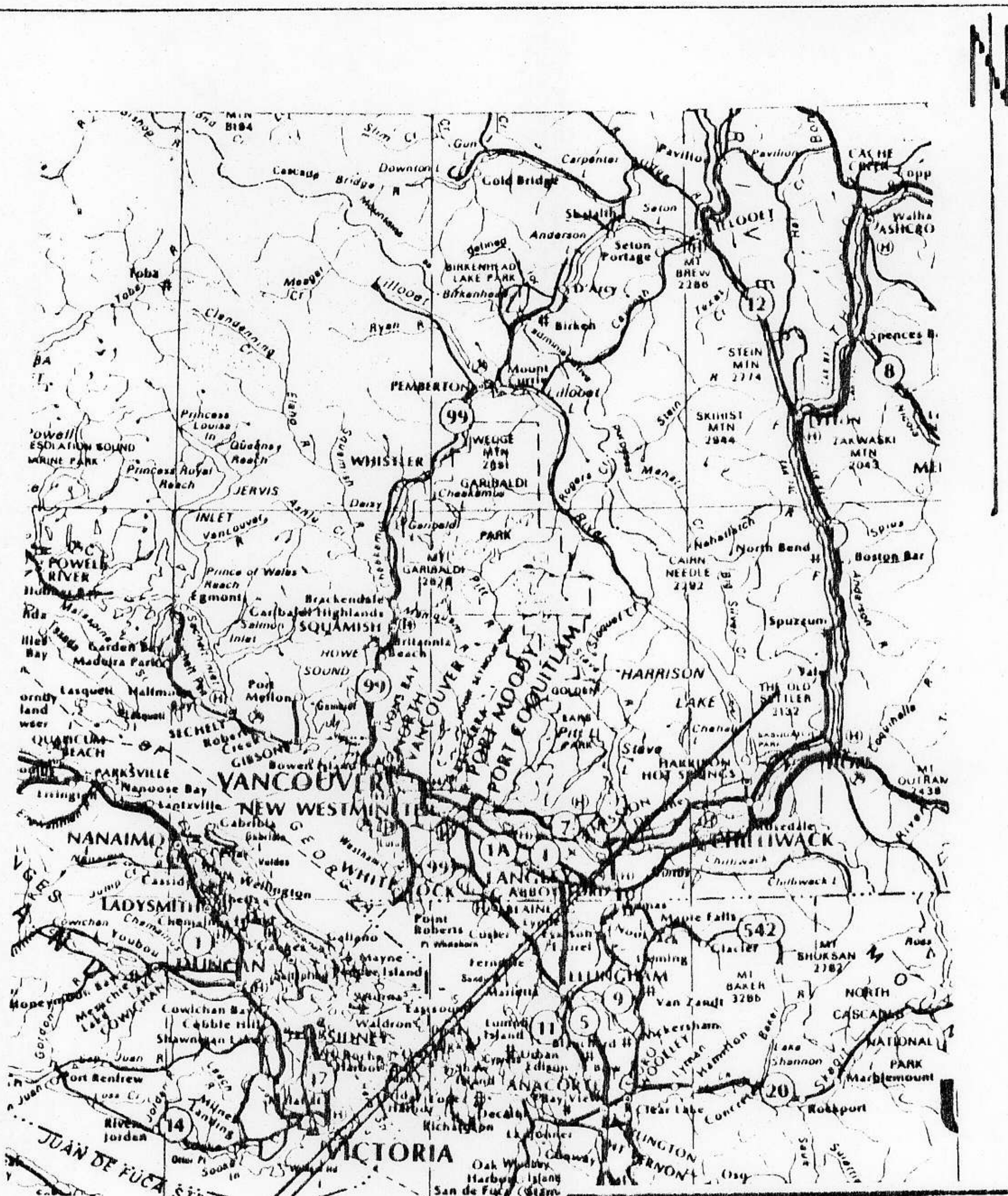
INTRODUCTION:

The recent dramatic increases in the price of platinum, partly attributed to concern over supplies of this strategic metal from South Africa and neighbouring countries, but also a result of increased industrial use, increased investment purchases, and decreased scrap recovery, has led to increased exploration efforts on known platinum sources and numerous "grass-roots" exploration programs for platinum group elements in favourable areas.

A large ultramafic belt near Hope, B.C. with potential for Platinum Group Metals has been staked by International Consolidated Platinum Ltd. as the "Pt" 1-34 claims, totalling 404 units.

B.C. Platinum has been produced from placer deposits in the Tulameen area of British Columbia, (about 20,000 oz.), and platinum group metals are common in heavy mineral concentrates from many streams of the province. In 1966, Platinum and Palladium were discovered in pyrrhotite in the "1500" orebody at the Giant Nickel Mine, 10 km. northwest of Hope, B.C., now owned by Mascot Gold Corp., of Vancouver.

Exploration in the Pt Project Area by Giant Explorations Ltd. in the 1970's in a belt extending from the head of Emory Creek, adjacent to the Giant Nickel Mine, toward Cogburn Creek near Harrison Lake, revealed large aeromagnetic highs, caused by



PT PROJECT

SCALE 1cm:20 km.

INT.CONS.PLATINUM LTD.

PT PROJECT LOCATION MAP

Figure

BARRY PRICE, M.Sc.,1987

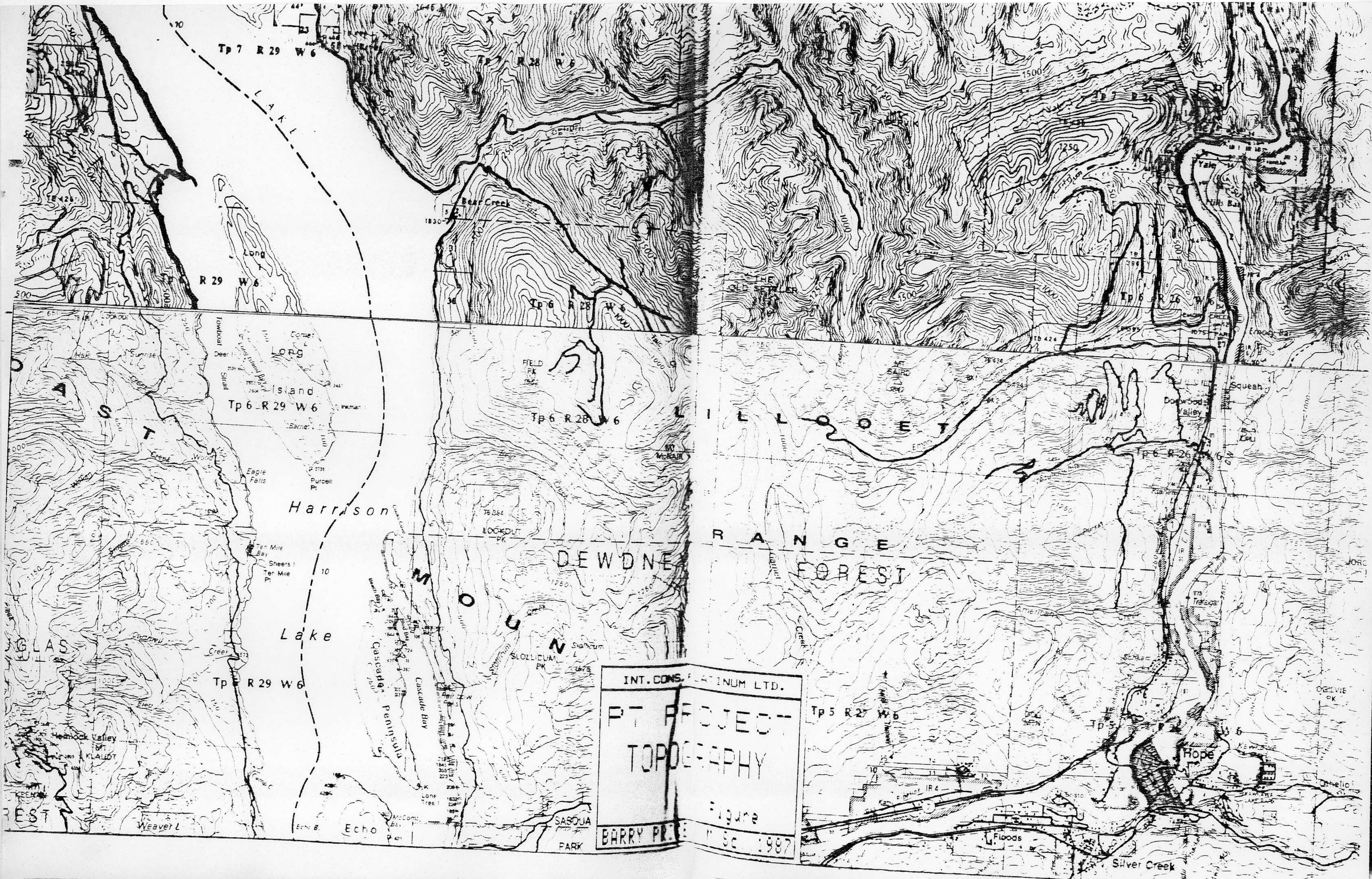
ultramafic bodies, some of which have undergone strong alteration to talc and carbonate. Copper and Nickel soil and rock geochemistry outlined several areas of interest, some of which are being explored by Mascot Gold Mines Ltd.

PROJECT GOAL:

The goal of the exploration project on the "Pt" claims is to locate Platinum Group elements in association with Copper-Nickel mineralization within "Alaskan" or "Alpine" ultramafic bodies adjacent to known Platinum- bearing mineralization at the Giant Nickel Mine. By careful sampling of previously mapped ultramafics, chances of discovering new Platinum Group sources are considered good. Gold-Silver mineralization in a variety of geologic environments is a secondary target.

LOCATION, ACCESS AND LOGISTICS:

The project area, as shown in Figures 2 and 3, extends from the Head of Emory Creek, 10 km. northwest of Hope, B.C. to the north side of Cogburn Creek, 30 km north of Harrison Hotsprings, B.C. Hope is a large community situated at the junction of Trans-Canada Highways 1 and 3, 120 km., (2 hrs driving time) east of Vancouver, B.C. Access to many of the claim blocks is by secondary gravel (logging) roads extending up major creek drainages of Emory Creek, Cogburn Creek, Settler Creek, and Talc Creek (via Harrison Hotsprings). Continuing logging will provide improved access; 4 wheel drive may be required in some areas. Access to the central claim blocks in the vicinity of Mt.Baird and The Old Settler will be by helicopter, based in Agassiz or Hope.



INT. CONS. PLATINUM LTD.
PT PROJECT
TOPOGRAPHY
Figure
BARRY PR.
1987
Harrison
Lake
Long
Island
LILLOOET
RANGE
FOREST
DEWDNE
MOUN
Cascade Peninsula
Cascade Bay
Hope
Silver Creek
Floods
Yale
Squeah
Dogwood Valley
Trafalgar
OGILVIE PK
Hemlock Valley
Weaver L
Echo
SASQUA PARK
Bear Creek
Tp 7 R 29 W 6
Tp 7 R 28 W 6
Tp 6 R 29 W 6
Tp 6 R 28 W 6
Tp 6 R 26 W 6
Tp 5 R 29 W 6
Tp 5 R 27 W 6
FIELD PK
LOOKOUT PK
SLOLLICUM PK
Eagle Falls
Purcell Pt
Ten Mile Bay
Sheers I
Ten Mile Pt
Lone Tree I

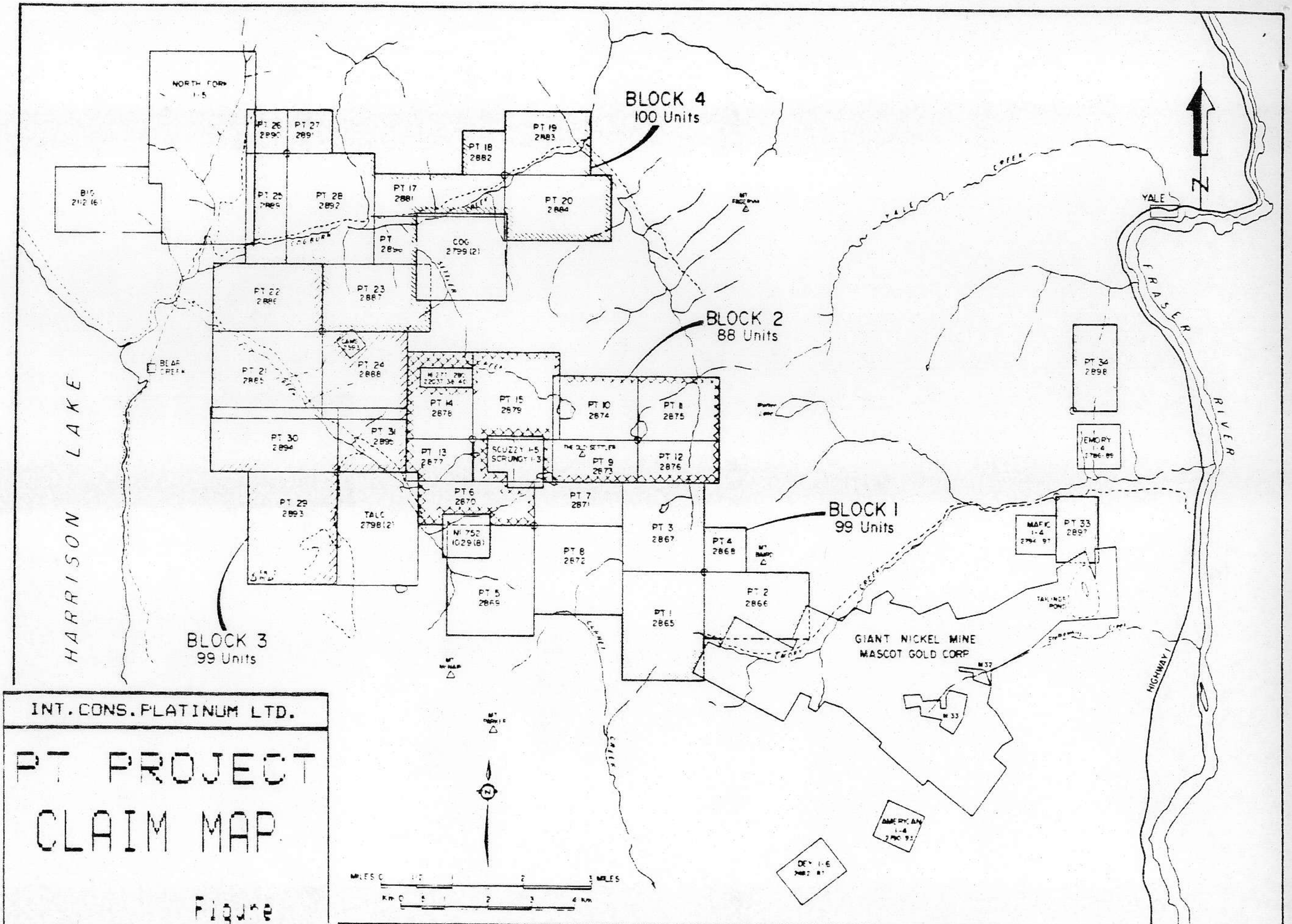
Supplies and services are available in Vancouver, Hope, or Agassiz.

PROPERTY DEFINITION:

The property consists of the "Pt" 1-34 claims, in 4 claim blocks, (arbitrarily designated Blocks 1 to 4 on the accompanying map), and Pt 33 and Pt 34 claims, totalling 404 units. Claim data are listed below:

CLAIM	RECORD NO.	UNITS	RECORD DATE	EXPIRY DATE
PT 1	2865	20	JULY 14/86	JULY 14/87
PT 2	2866	15	"	"
PT 3	2867	16	"	"
PT 4	2868	4	"	"
PT 5	2869	20	"	"
PT 6	2870	10	"	"
PT 7	2871	8	"	"
PT 8	2872	16	"	"
PT 9	2873	8	"	"
PT 10	2874	12	"	"
PT 11	2875	12	"	"
PT 12	2876	8	"	"
PT 13	2877	6	"	"
PT 14	2878	12	"	"
PT 15	2879	16	"	"
PT 16	2880	4	"	"
PT 17	2881	12	"	"
PT 18	2882	4	"	"
PT 19	2883	12	"	"
PT 20	2884	15	"	"
PT 21	2885	20	"	"
PT 22	2886	15	"	"
PT 23	2887	20	"	"
PT 24	2888	16	"	"
PT 25	2889	10	"	"
PT 26	2890	4	"	"
PT 27	2891	4	"	"
PT 28	2892	20	"	"
PT 29	2893	20	"	"
PT 30	2894	18	"	"
PT 31	2895	9	"	"
PT 32	2896	4	"	"
PT 33	2897	6	"	"
PT 34	2898	8	JULY 14/86	JULY 14/87

TOTAL 404 UNITS SOURCE: Claim Record Forms and Claim Maps.



INT. CONS. PLATINUM LTD.

PT PROJECT CLAIM MAP

Figure

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NOTE: The claims will have to be grouped into at least 5 separate groups for the purposes of filing assessment, with the exception of PT 33 and 34 claims, in the Yale area, on which work will have to be filed separately. (Figure 3). A minimum of $40,400 worth of work must be filed on the claims prior to July 14, 1987.

HISTORY OF EXPLORATION:

Exploration of the area around Hope undoubtably began with the placer gold discoveries on the Fraser River, but it was not until 1923 that nickel-copper sulphides were discovered in ultrabasic rocks by trapper Carl Zofka, who was attracted to the area by a reddish gossanous bluff. Claims were staked in 1923 and the prospect was examined first by C.E.Cairnes, for the Geological Survey of Canada, in July 1924, (Summary Rept. 1924-A). This was the first discovery staked primarily for its nickel content.

From 1923 to 1931 the property was prospected by B.C.Nickel Mines, Ltd., and in 1933, following a re-organization by the Smith, Spencer, Sloane syndicate as B.C.Nickel Mines Ltd, development began on a larger scale, and a road up Texas (Stulkawhits) Creek was commenced, from Choate, a siding on the C.P.Railway. By 1937, 1.2 Million tons of material had been outlined, averaging 1.38 % Nickel and 0.05 % Copper.

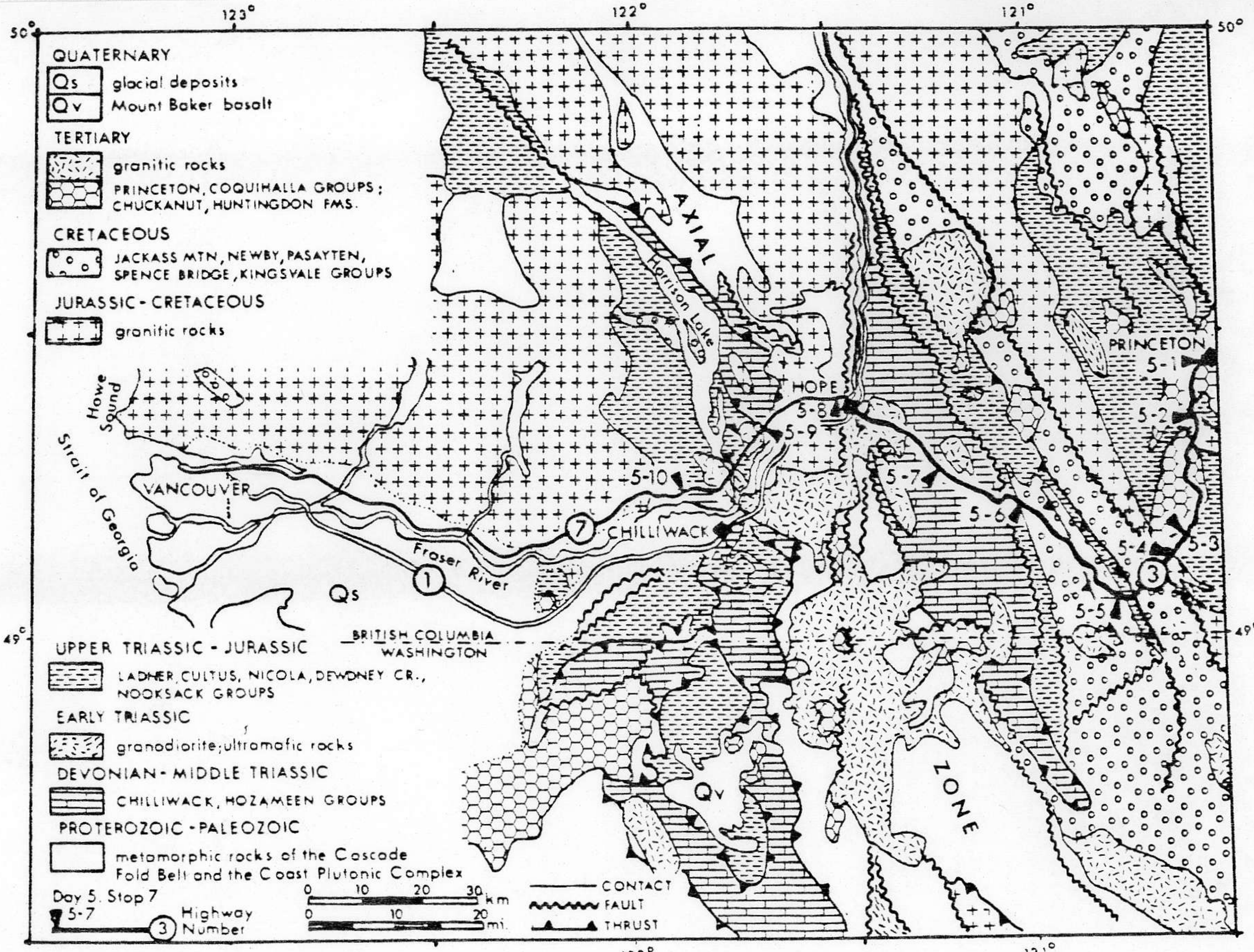
The mine was idle from 1938 to 1942, and assistance in exploration was provided by Western Nickel Ltd., a subsidiary of Newmont Mining Corp. It was not until 1958 that production began; 181,000 tons were mined under the management of Granby Mining and Smelting Company Ltd. Market conditions remained poor, and the mine only operated for a few months.

In 1959, Newmont's interest in the property was sold to Giant Mascot Mines Ltd., and the mine was opened again in July 1959. Production continued until August 1973, by which time 4.7 Million tons of ore, containing 59 Million pounds of nickel (0.627 %) and 28 Million pounds of copper (0.297 %) were recovered from 26 separate orebodies. In 1970 the entire mill and surface facilities were destroyed by fire. Reconstruction in 1971 ws hampered by a 34 foot snowfall during the winter, but the new mill was finished in May 1971. Reserves were depleted in 1974, and the mine closed.

From 1970 to 1975 an extensive exploration program was conducted by Giant Explorations Ltd. seeking new copper-nickel orebodies in the ultramafic belt extending northwestward from the mine-site toward Harrison Lake. Although ultramafic bodies were outlined by magnetometer surveys and geochemistry, platinum was not analyzed for in samples, and exploration ceased when the mine closed; several of the promising targets were retained by the successor company, Mascot Gold Corporation.

OTHER MINERAL DEPOSITS IN THE HOPE-HARRISON LAKE AREA:

Elsewhere in the belt, copper/molybdenite porphyry exploration in the 1960's resulted in discovery of the Gem molybdenum deposit at the head of Spuzzum Creek, and the Pipe Mo showing on Sawmill Creek, but several other obvious molybdenum targets were not discovered until 1980. Scattered gold, silver and copper occurrences in the area between Harrison Lake, Lillooet, and Fraser River have been prospected.



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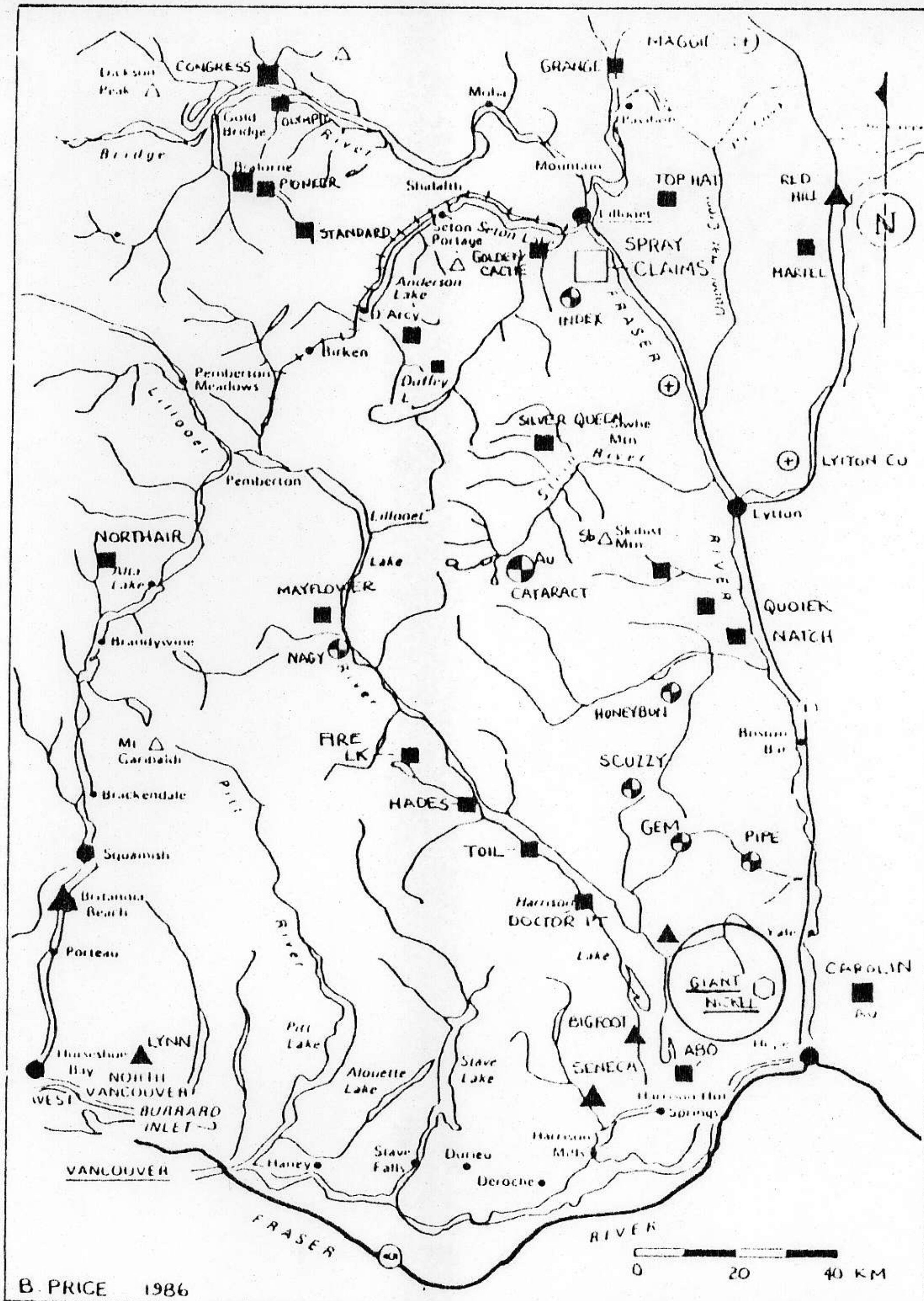
GEOLOGY OF SOUTHWESTERN BRITISH COLUMBIA AND NORTHWESTERN WASHINGTON.

FIGURE 4a



LEGEND

■	GOLD-SILVER DEPOSITS
⊕	COPPER PORPHYRIES
◐	MOLYBDENUM "
▲	MASSIVE SULPHIDES

INT. CONS. PLATINUM LTD.

PT PROJECT

MINERAL DEPOSITS

VANCOUVER - LILLOOET AREA

Figure 4b

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East of Hope, in 1973, Carolin Mines started exploring a large low-grade disseminated gold prospect, situated 10 km. northeast of Hope, from which at least 350 kg. of gold has been produced. Production has been suspended but low grade reserves remain.

At present, the major exploration projects in the belt are the RN gold deposit at Harrison Lake, just southwest of the "PT" project area, where Kerr Addison Mines Ltd. and Abo Resources Ltd. are exploring a significant gold deposit (native gold in a quartz stockwork in a quartz-dioritic intrusion), and the Spray gold prospect, near Lillooet, where Miramar Energy Corp. plan to re-drill a previous intersection of 21 meters of 0.11 oz./ton gold in a quartz molybdenum stockwork in a quartz-diorite sill.

The present price increase of platinum to US $500+ per ounce, palladium to $119 per ounce, and gold to US $400+ per ounce will encourage renewed prospecting efforts in this now relatively accesible belt. A brief discussion of properties being explored in the area follows:

COG, TALC, EMORY, MAFIC, AMERICAN:

Several small claim blocks within and adjacent to the PT claims are being explored by Technigen Platinum Corporation and Equinox Resources Ltd., Vancouver junior public companies. These claim blocks host known copper-nickel mineralization, and it is believed that initial evaluation for platinum content of these areas is under way

RN PROPERTY:

The RN property, situated south of the PT project area, adjacent to Harrison Lake, is a gold property, with native gold occurring in quartz stockworks adjacent to a quartz dioritic plug. Considerable drilling has been done by Kerr Addison Mines Ltd., for Abo Resources Ltd. Holes over 200 meters deep have significant, but as yet sub-econbomic gold grades. Economic material close to surface has been mined on a small scale. Underground evaluation and drilling is being done at present.

GEM PROPERTY:

The Gem property is a well explored "porphyry" molybdenite deposit, held by Canamax Resources. Reserves are quoted as 30 Million tons averaging 0.20 % MoS_2.

SCUZZY PROPERTY:

A large, low-grade molybdenum porphyry is situated west of Butler Creek and north of Big Silver Creek. The property was discovered by JMT Services and Territorial Gold Placers Ltd. in 1980, but has never been drilled.

PIPE PROPERTY:

The Pipe property, situated on Sawmill Creek, is a breccia pipe of rhyolite intruding quartz diorite of the Spuzzum Batholith. This molybdenum property is owned by Canamax Resources.

NORTHFORK:

The Northfork property, situated a short distance northeast of Bear Creek, is a copper-lead massive sulphide deposit in Chilliwack Group volcanic rocks, bounded by Upper Cretaceous quartz diorite. Mineralization is massive pyrite and pyrrhotite, with chalcopyrite and minor sphalerite. (Min.Inventory). A mineralized band has been traced by surface trenching and diamond drilling and geophysical work has just been completed for Falconbridge Ltd.

CLOVER LEAF:

Adjacent to Ruby Creek, south of the project area, serpentinized ultramafics exposed in the creek have shear zones with talc and small amounts of pyrrhotite, with nickel and copper values.

GEOLOGY OF THE GIANT NICKEL PROPERTY:

The Giant Nickel Mine occurs in an irregular, roughly elliptical "Alaskan" type zoned ultramafic complex, Cretaceous in age (120 M.Y to 95 M.Y), enclosed in younger dioritic rocks that are part of the Spuzzum pluton. The ultramafic complex contains pendants of Paleozoic rocks of the Chilliwack Group, and is contained within a block of Chiiliwack Group metamorphics and Mesozoic Intrusives bounded on the East by the Fraser River Fault and on the west by the Shuksan Thrust Fault zone. A geological map of the Giant Nickel mine area by Vining is presented on the folowing page, (Figure 5)

The ultramafic mass, roughly two miles square, plunges northerly and comprises a variety of rock types, from peridotite, pyroxenite and rarer dunite, to hornblendite adjacent to the granitoid contacts. Hornblendite dykes are the youngest rocks.

The ore-bodies, 26 in number, are pipe-like in form, and are sub-circular, crescentic, or lenticular in cross-section. Cross-sectional area of the pipes is generally 2500 to 5000 square feet, with northerly plunges of 50 to 80 degrees. The largest deposit, the Pride of Emory pipe, has a plunge length of 1000 feet.

Pyrrhotite, pentlandite, and chalcopyrite are the most abundant sulphides, disseminated in hornblende pyroxenite and peridotite.

Production to August 1973, has been 4.7 Million tons of ore, containing 59 Million pounds of nickel (0.627 %) and 28 Million pounds of copper (0.297 %) recovered from 26 separate orebodies.

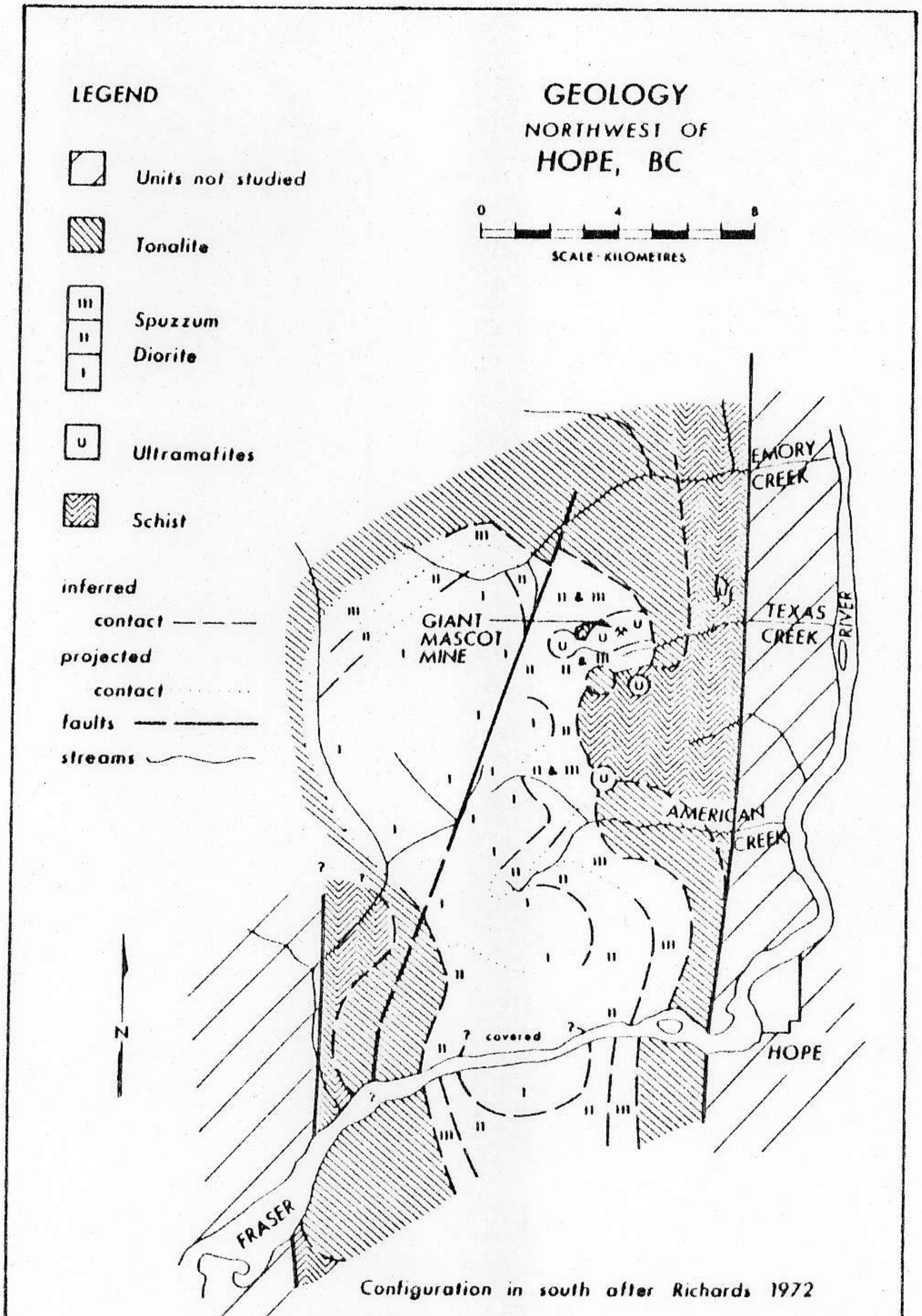
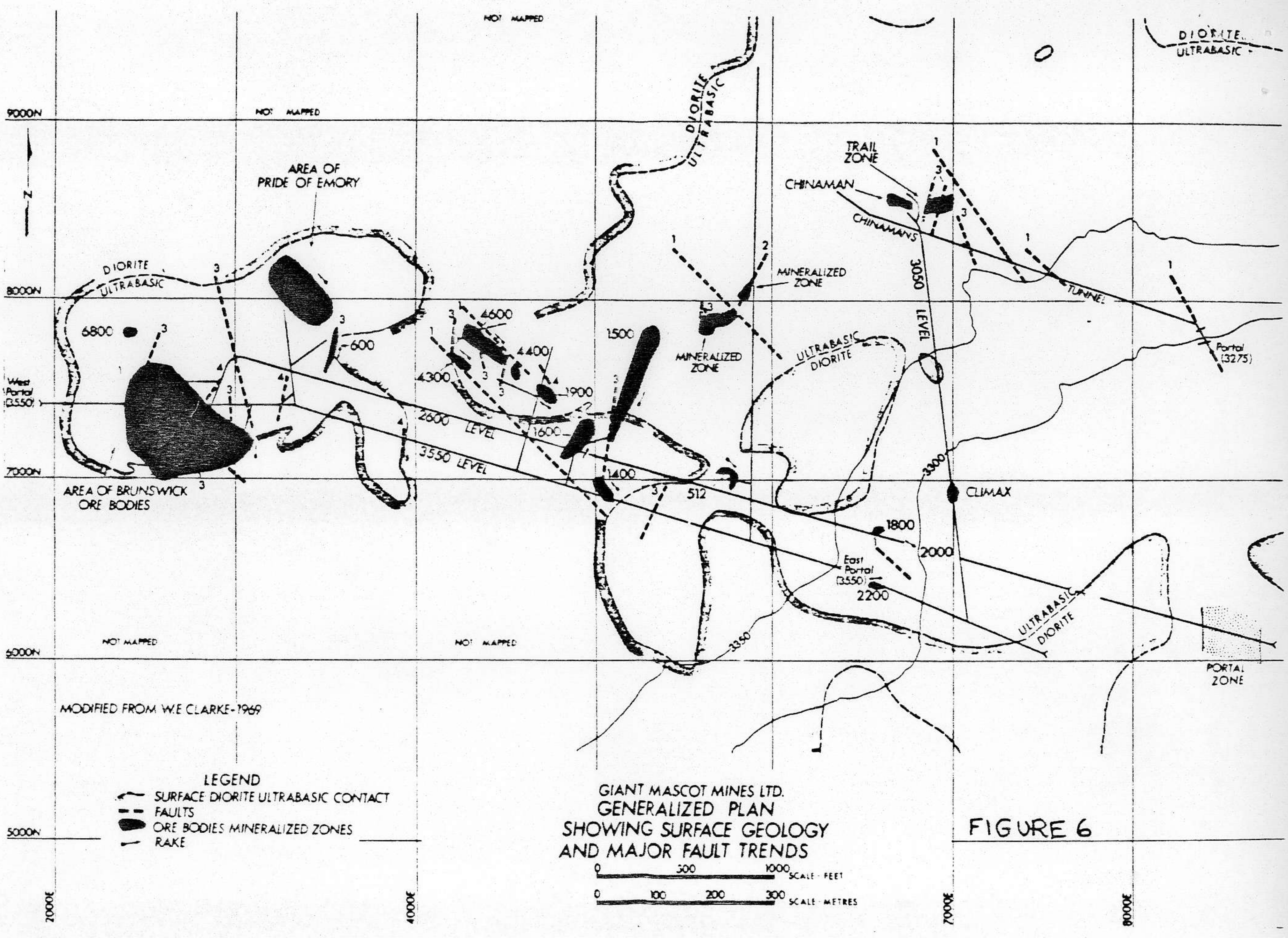


FIGURE 5

Geology northwest of Hope.



GIANT MASCOT MINES LTD.
GENERALIZED PLAN
SHOWING SURFACE GEOLOGY
AND MAJOR FAULT TRENDS

FIGURE 6

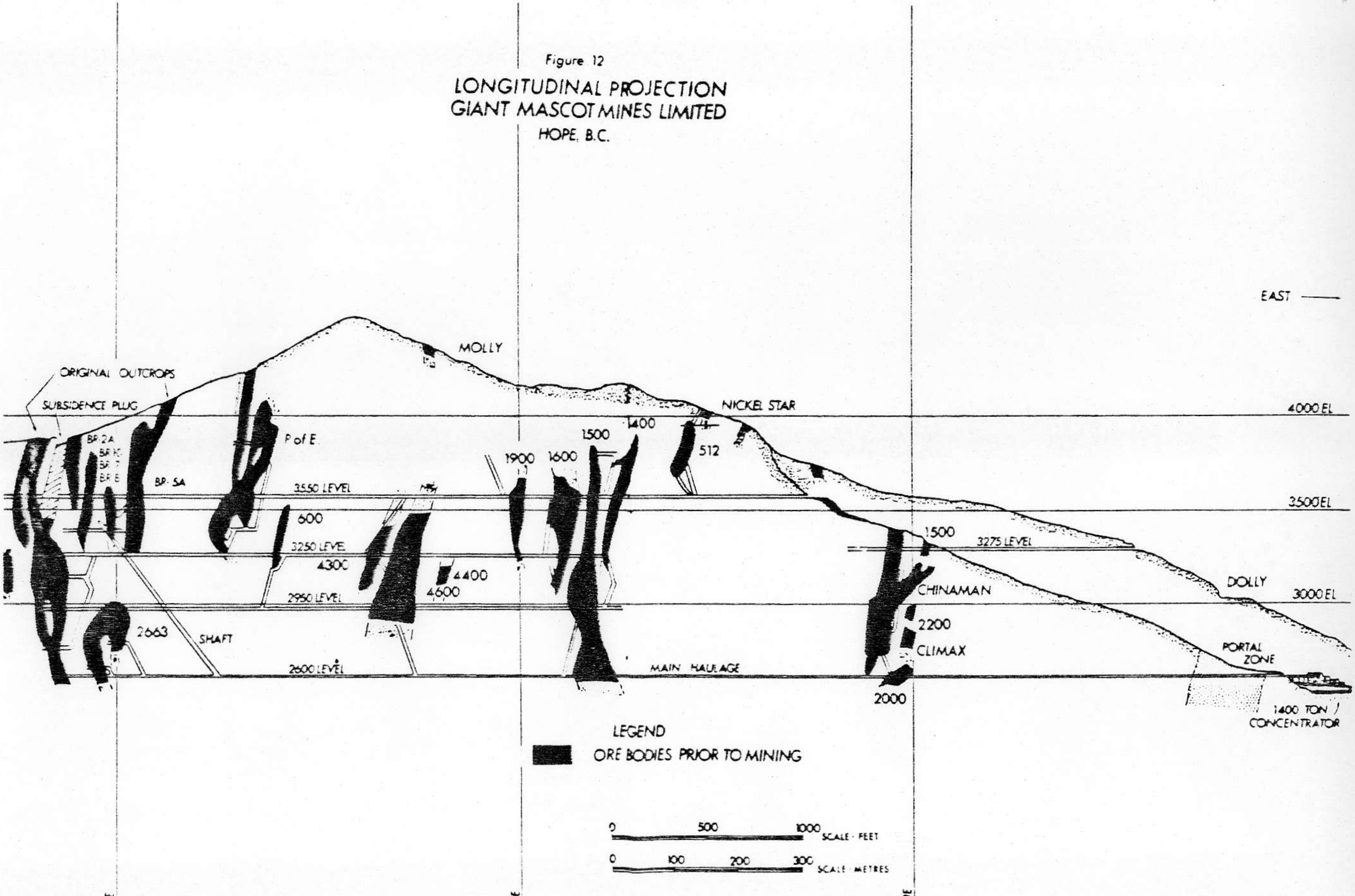


Figure 12
LONGITUDINAL PROJECTION
GIANT MASCOT MINES LIMITED
HOPE, B.C.
EAST
MOLLY
ORIGINAL OUTCROPS
SUBSIDENCE PLUG
NICKEL STAR
4000 EL
1400
1500
P of E
512
1900
1600
BP-2A
BP-SA
3550 LEVEL
3500 EL
600
1500
3275 LEVEL
3250 LEVEL
4300
4400
4600
CHINAMAN
DOLLY
3000 EL
2950 LEVEL
2200
2663
SHAFT
CLIMAX
PORTAL ZONE
2600 LEVEL
MAIN HAULAGE
2000
1400 TON CONCENTRATOR
LEGEND
ORE BODIES PRIOR TO MINING
0
500
1000
SCALE - FEET
0
100
200
300
SCALE - METRES
3000E
5000E
7000E

FIGURE 7

Ore controls are thought to be intersections of two fault systems that trend north 45 to 50 degrees west and north 10 to 30 degrees east. Three separate sets of fault trends provide ground preparation for mineralization and the fourth trend is post-ore and displaces ore-zones (Clarke, 1969). "Tectonic and intrusive breccia zones and agmatites are found to be spatially related to several orebodies and breccia fragments are found in some massive ores. (Christopher, 1974). Orebodies are of three types:

1). Zoned orebodies, with sulphides disseminated through one or more rock types, showing gradual change in tenor.
2). Massive orebodies, generally confined to fault or contact zones. , having sharp contacts.
3). Narrow tabular vein like bodies that enrich an ore zone but have limited tonnage potential themselves.

Alteration is present associated with orebodies; four types are recognized, although no established pattern can be relied upon as an ore indicator.

1). Pervasive shearing and crumbly phlogopite/chlorite
2). Talc-amphibole +/- magnetite.
3). Uralitization.
4). Hornblendization.

Plans and sections of the Giant Mascot orebodies are shown in the accompanying figures 6 and 7.

PLATINUM AT GIANT NICKEL MINE:

In 1966, samples taken from a pegmatitic massive pyrrhotite vein from the 1500 orebody assayed 2 grams per tonne Platinum, (0.058 oz./ton), and 7.2 grams per tonne palladium, (0.21 oz./ton), (Eastwood and Waterland, 1966).

Aho,(1956) indicated that average grade of sulphides at the mine was: 1.4% Nickel, 0.5% copper, 1 % chromium, 0.1% Cobalt, 0.7 grams/tonne gold (0.020 oz./ton), and 0.3 grams per tonne Platinum,(0.00875 oz./ton).

At this time, no other information is available on distribution of platinum at the Giant Nickel property, and relationship of platinum content to copper-nickel grades is suspected but untested. Sampling of outcrop and dump material, and correlation of PGM grades with rock type and copper-nickel grades would be a worthwhile exercise.

The presence of platinum in placer mining areas on the Fraser River and on the Coquihalla River, which crosses another serpentine belt, suggests that hard-rock occurrences of platinum will be found associated with "Alaskan" or "Alpine" type ultramafics within the project area. In the Tulameen area, nearby, there are indications that Pt,Ir,Rh, and Os are concentrated by the process of serpentinization, whereas Pd is concentrated in marginal phases and gabbroic wall-rock. (In Rublee, 1986).

GEOLOGY OF THE PT PROJECT AREA:

The area covered by G.S.C.Map 12-1969 is a compilation by J.W.Monger of previous mapping by Crickmay, Horwood, Snow, Cairnes and others, from 1924 onward. Regional geology is shown in Figure 4. Eastwood mapped part of the project area in 1972, and his map, which is a partial compilation of mapping by Gonzalez and Wehr, for Giant Exploration Ltd., is reproduced in Figure 9.

The area is underlain by metamorphosed sedimentary and volcanic rocks, basic to ultramafic intrusions, granitic rock of the Coast range intrusions, and gneissic rocks, partly as pendants. Main rock units, in order of age (oldest to youngest) are:

GNEISS AND SCHIST: The oldest rocks in the project area occur on the eastern side of the range. These are gneissic rocks and schists occurring as xenoliths in tonalite and diorite. Staurolite, garnet and kyanite are present and near granitic contacts sillimanite may be seen. The rocks may be of Hozameen age (Devonian?)

CHILLIWACK GROUP: On the western side of the range, metasediments and metavolcanics are the oldest rocks. Metasediments are most commn, mainly light green to grey phyllites and schists. Garnet is present near intrusive contacts. The rocks are banded and probably isoclinally folded. They are thought to be of Carboniferous or Permian age.

MAFIC TO ULTRAMAFIC INTRUSIONS: Numerous small to large diorite, norite, pyroxenite, peridotite, dunite and hornblendite bodies occur cutting the metamorphic rocks. The ultramafics are mapped with the aid of airborne magnetic surveys, which outline the more mafic portions well, as shown in Figure 12 Eastwood discusses these intrusions in detail, and his discussion is included in the appendix.

SPUZZUM DIORITE: In the Giant Nickel area, several varieties of diorite are mapped by Vining (1975). Varieties approaching norite are present and these may be correlative with diorites on the west side of the range, in the Talc Creek area.

A full description of the area by Eastwood is given in appendix V.

DISCUSSION OF THE PT PROJECT AREA:

The PT 1-34 claims comprise 404 units,(10,100 Hectares = 24,958 Acres). Platinum is known to occur in copper-nickel mineralization on the Giant Nickel property, adjacent to the south-eastern Pt claims. Several copper/nickel showings occur within the Pt claim blocks.

Extensive work in the project area by Giant Explorations Ltd. has produced a wealth of geophysical, geochemical and geological data, contained in at least 13 Assessment reports written from 1970 to 1975. Total expenditures by previous operators in the project area encompassed by the claims is at least $164,469.00,

BLOCK 1:

Block 1 comprises 7 claims (99 units) adjoining the Giant Nickel mine claims on the northwest. Access is available approaching the claim block from logging roads to the head of Emory Creek, Talc Creek, and Garnet Creek. Helicopter support will be necessary to evaluate the claims

Targets on Block 1 are aeromagnetic anomalies with coincident Nickel soil anomalies prospected by Giant Explorations Ltd. Pt 5 claim adjoins the Ni 752 claim near Daioff Creek, owned by Mascot Gold Corp., on which diamond drilling of an ultramafic body outlined by magnetic, VLF, and soil surveys, resulted in discovery of a low-grade copper-nickel deposit. (The area was referred to as "Area 6" by Giant Exploration geologists io their reports).

A long, sinuous aeromagnetic anomaly extends from the head of Emory Creek toward The Old Settler Mountain, passing west of Mt.Baird. Spotted along the magnetic highs, corresponding to mafic and ultramafic intrusions, a number of areas with anomalous nickel in soil were discovered by Giant Exploration personnel. These represent the most immediate target for platinum exploration, as the rocks in this area are reported to resemble those at the Giant Nickel Mine.

Helicopter support will be required for much of the area in Block 1; the benefit of this may be discovey of new targets by aerial reconnaissance during exploration of known nickel anomalies. Old trenches are reported to be present on The Old Settler. Block 1 has the strategic advantage of proximity to the Giant Nickel Mine.

BLOCK 2:

Block 2 is the smallest block, (92 units), and contains several large aeromagnetic anomalies, some of which are known to be underlain by mineralized ultramafic rocks.

The Scuzzy and Scrungy 2-post claims cover an ultramafic body previously explored by Giant Explorations as the Ox claims. (A.R.#3356, 3615). Abundant massive and disseminated pyrite with minor pyrrhotite and trace chalcopyrite occurs in the diorite and pyroxenite. Geochemical anomalies are reported downslope. Some diamond drilling may have been done on this prospect.

Outside of the included claim block, several Nickel geochemical anomalies are known. On Pt 15 claim, a large area of diorite and pyroxenite occurs, and a circular area of peridotite.

On the east side of Grid 1, several nickel values in excess of 400 ppm and a large area of copper greater than 200 ppm occurs. This may be at the easternmost edge of the included claims.
On the south boundary of block 2, the low-grade copper-nickel deposit on Daioff Creek may extend northward into a large aeromagnetic anomaly presumed to be an ultramafic complex.

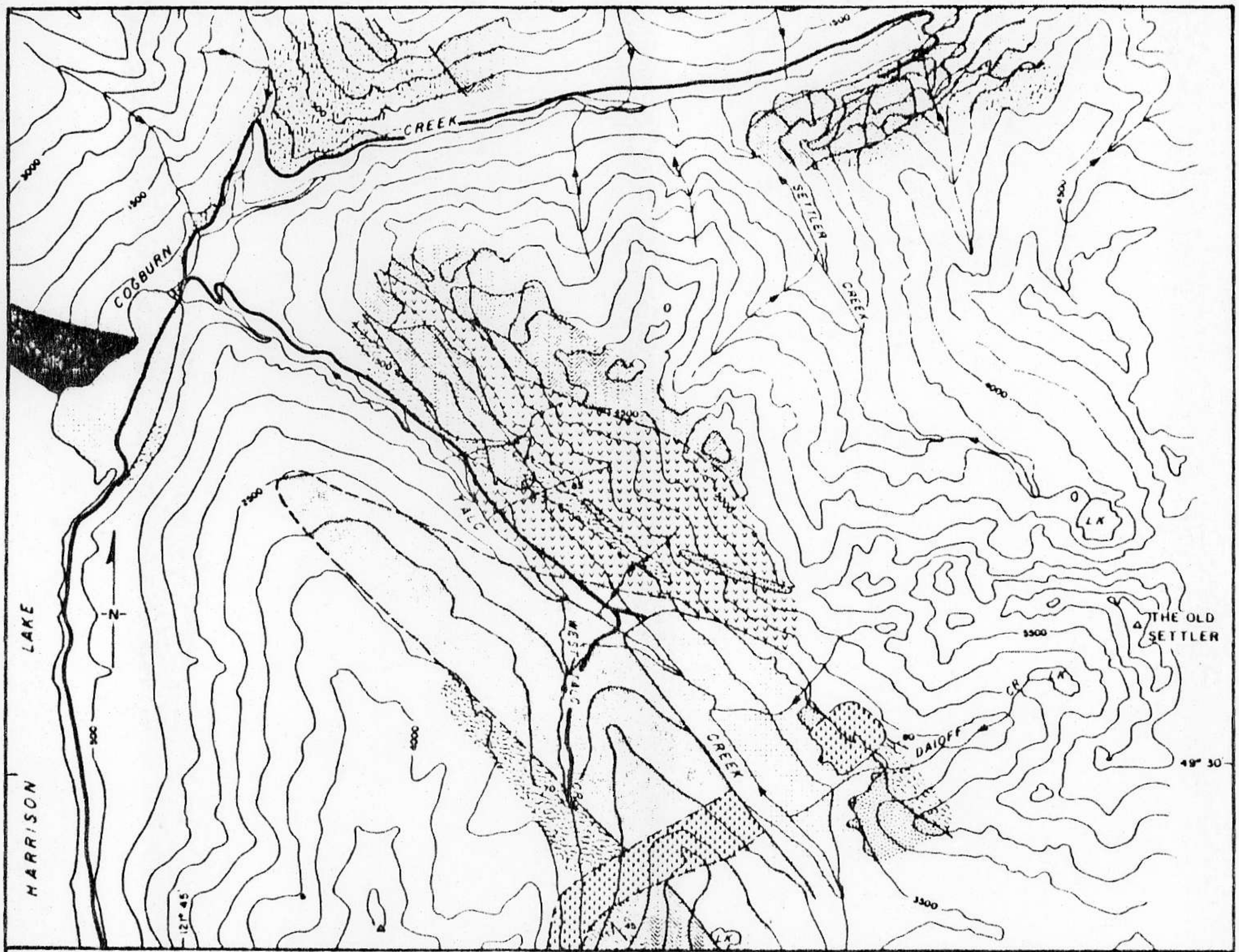
Considerable helicopter support will be needed in exploration of this block, and the higher areas, (up to 7000 feet A.S.L), may have snow cover in late September. Lower parts of the southwest corner should be accessible from the Talc Creek road, and can be left later in the year.

BLOCK 3:

Block 3, the westernmost block, has 99 units. Much of the area is accessible from logging roads extending from Talc Creek, but higher areas will require helicopter support.

A large aeromagnetic anomaly extends through much of the claim area south of Talc Creek. In 1970, initial silt and soil sampling disclosed a large area with higher than normal nickel values and scattered copper anomalies. The nickel anomaly needs considerable follow-up, but probably represents low-grade nickel/copper mineralization such as is present at Daioff Creek. Where concentrations of nickel and copper occur, platinum group metals may be expected to occur.

Northeast of Talc Creek, in an area referred by Giant Exploration as "Area 3", copper and nickel soil anomalies, (not coincident), occur in diorites and altered basic rocks adjacent to the road. The anomalies may bave moved downslope from pyroxenites and peridotites higher up on the slope. A strong Nickel anomaly is present higher on the slope. The geological map done by Giant Explorations is quite detailed. Soil lines were broadly spaced, 400-500 feet apart, and more closely-spaced sampling may be advantageous.



GEOLOGICAL SKETCH MAP OF THE COGBURN - TALC CREEKS AREA

Legend	
	Drift and alluvium
	Granodiorite, orbicular in part
	Quartz diorite, diorite
	Diorite, gabbro, norite, hornblendite Includes small patches of pyroxenite
	Pyroxenite, peridotite
	Altered pyroxenite and peridotite
	Metavolcanic (?) rocks
	Metasedimentary rocks
	Contact, defined, assumed
	Bedding
	Schistosity

Scale 1/2 0 1/2 1 1 1/2 2 Miles

Scale 1 0 1 2 3 4 Kilometres

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FIGURE 8

In the northeast corner of the block, a copper-iron showing is reported; this may occur on a small included claim block owned by others. Several scattered nickel anomalies are known at higher elevations.

The Block is one of the more easily worked blocks, and contains an attractive target for platinum exploration.

BLOCK 4:

Block 4, containing 100 units, extends along either side of Cogburn Creek, several miles east of Bear Creek. The claims are traversed by a main logging haul road and several overgrown logging trails, which could be cleaned out for walking or trail-bike access.

Two large aeromagnetic anomalies are known to correspond with mafic and ultramafic intrusions, and at least two areas have known copper and nickel mineralization. "Areas 4,5 and 7" were previously explored by Giant Explorations Ltd. in the 1970's.

In areas 4 and 7, south of Cogburn Creek, diorite, hornblendite, and pyroxenite are present. In the pyroxenite, lacy pyrrhotite interstitial mineralization occurs. "Impressive sulphides are present in both upper and lower areas",(of Area 4). Area 7 appears to be covered by claims owned by Technigen Platinum Ltd.

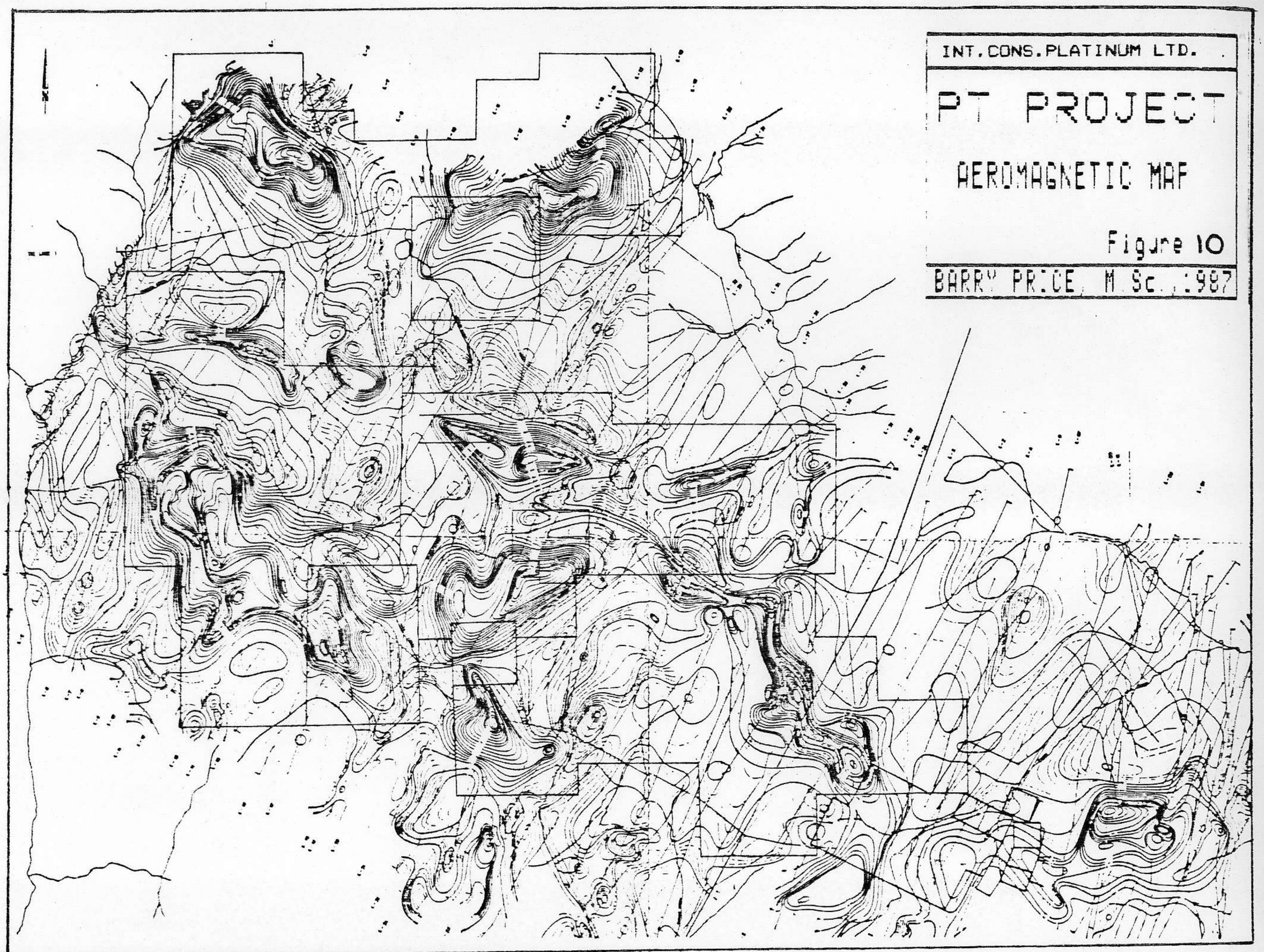
On the north side of Cogburn Creek, High values of Nickel in soils appear to have migrated downslope from a suspected source higher in the hill, within a large aeromagnetic anomaly. Diamond drilling is reported to have been done by Giant, on copper-nickel showings adjacent to the Cogburn Creek road. This area is significant and efforts should be made to determine assay grades, or, if core remains on the property, to locate it and relog and resample whatever is available.

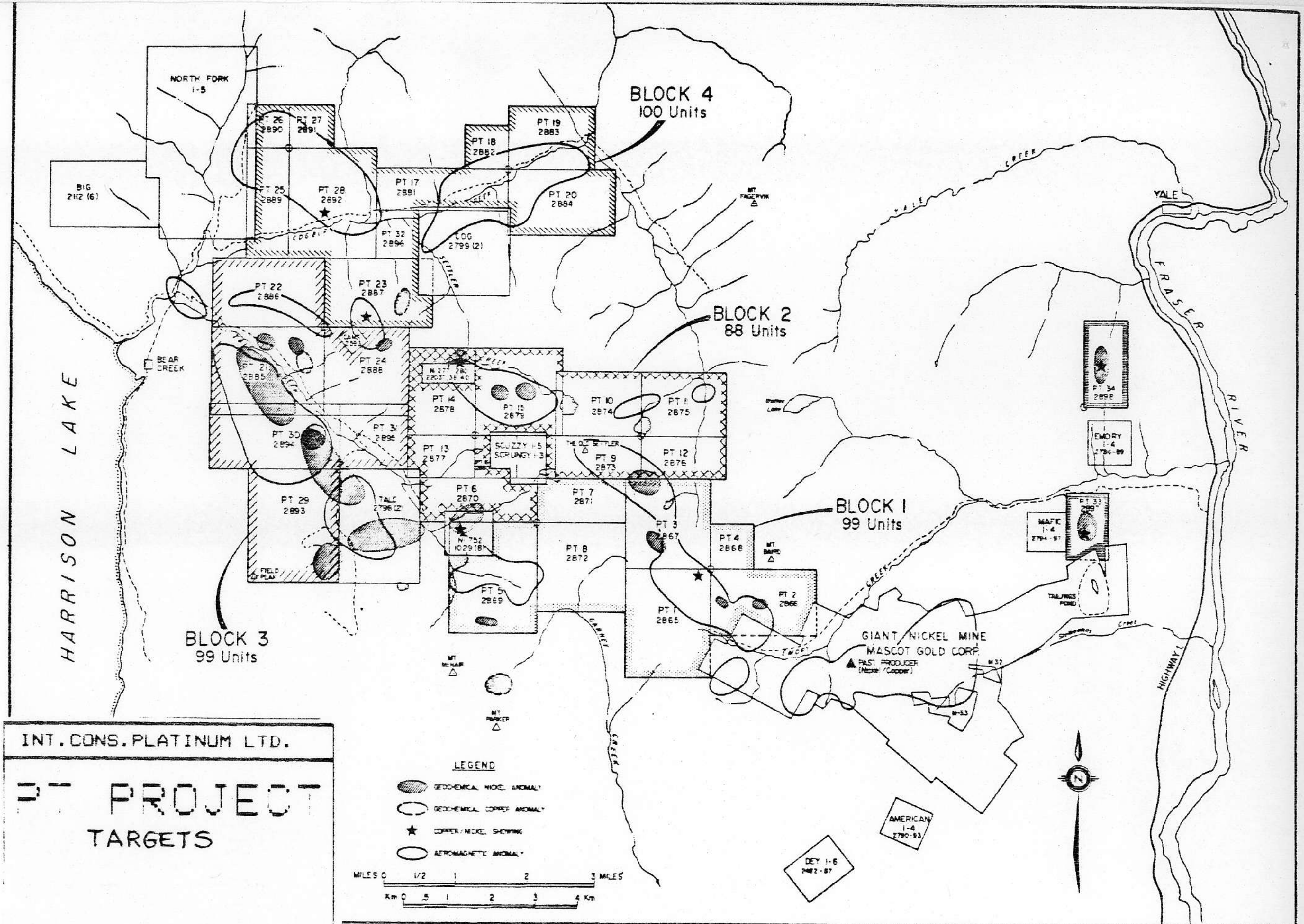
This block may be the most attractive and most easily explored target.

PT 33 CLAIM:

Pt 33 claim (8 units) is a partial relocation of claims originally known as the Morgan 1-16, owned in 1972 by Starletta Mines Ltd. A portion of the original area is staked as the Mafic 1-4 claims owned by Equinox Resources Ltd. and currently being explored by Technigen Platinum Corporation.

A large magnetic anomaly discovered by Starletta in 1972, corresponds with strong nickel and copper anomalies in soil, making this a very attractive target for platinum, considering the similarities to the nearby Giant Nickel mine.
(Reference: A.R.# 4422)


INT. CONS. PLATINUM LTD.
PT PROJECT
AEROMAGNETIC MAP
Figure 10
BARRY PRICE, M.Sc., 1987



INT. CONS. PLATINUM LTD.

PT PROJECT

TARGETS

Figure 9

BARRY PRICE, M Sc. 1987

PT 34 CLAIM:

The Pt 34 claim is staked over a copper and nickel bearing ultramafic body explored by Starletta Mines Ltd. in 1972. Two short diamond drill holes placed in 1972 encountered copper and nickel sulphides. The best section in DDH HC-1 was from 47 to 52 feet, assaying 0.10 % copper and 0.22 % Nickel. No assaying for platinoid metals was done in 1972, but this target is a priority target for investigation in 1986.

(Reference: A.R.# 4422)

ECONOMIC CONSIDERATIONS:

The price of platinum at present is in the range $500-520 U.S. per ounce, and market demand/supply conditions indicate favorable prices may continue. As yet, North America has no primary platinum producer, although by-product sources, such as Sudbury area copper-nickel mines provide a small portion of North America's requirements.

Many metals analysts predict that the industrial and retail demand for platinum will exceed production this year by about 200,000 ounces. Demand for platinum increased 19 % in 1984 and is expected to increase 17 % from 1985 to 1986. (Northern Miner, August 18, 1986). Current price for platinum and palladium on spot markets are $US 508 and $US 119 respectively (Feb 17/87).

At this time, no "Minimum Reserve/Grade Target" has been constructed, as this would be influenced by whether platinum is present as a major product or as a co-product or by-product. However, during the initial phase of exploration, careful consideration of a minimum target should be given.

CONCLUSIONS AND RECOMMENDATIONS:

The writer concludes that there is a reasonable chance of finding platinum group metals in mafic to ultramafic plutons delineated by mapping and airborne magnetic surveys within all four blocks of the "PT" project area. Platinum in significant amounts has been found within the same belt of rocks at the Giant Nickel Mine, which produced 59 million pounds of nickel and 28 miilion pounds of copper from 4.7 million tons of ore in 28 pipe-like ore-bodies.

It is recommended that data compilation, basemap preparation, and reconnaissance sampling be done on the claim blocks described in this report. Initial Heavy mineral sampling of drainages and rock geochemical sampling of favorable rocks as outlined by previous mapping will determine if platinum group metals are present. Geological mapping and geophysical surveys will further define target areas, to be followed by cat trenching, blast-trenching and sampling. Diamond drilling will be done on selected targets with merit, chosen on the basis of surface sampling.

SPECIFIC RECOMMENDATIONS:

The following specific recommendatios are made concerning the initial exploration program:

1). Obtain airphotos, as recent as possible, from which streams and roads, structures and vegetation anomalies can be plotted. Airphoto mosaics or orthophotos would be useful.

2). Try and obtain topographic maps with logging road networks from B.C.Forest Service or logging companies in the area.

3). All previous assessment report maps shouyld be copied from the originals and geology compiled on one base map if possible. The microfiche assessment maps are all at different scales and are almost impossible to restore to a useful scale by photography or xerox enlarging because of distortion.

4). All major streams should be sampled for heavy minerals; large samples where possible of screened material. Road accessible samples could be done with a "Long Tom"; less accessible sites can be screened and panned. A small Heavy Liquid lab could be assembled for use in base camp. All sites adjacent to known ultramafics or soil anomalies should have at least a preliminary microscopic check for platinoids. A reference set of samples could be made up from known placer streams, (e.g.Fraser River and Tulameen areas).

5). Treatment of samples should be as uniform as possible. Even a rough pan sampling program can be useful qualitatively.

6). Orientation surveys should bve done near the Giant Nickel Mine, for heavy mineral samples and rock geochem samples.

7) Platinum Group Metal assays should be done by a laboratory with previous experience in this technique.

8) Attention should be paid to other elements. Elements which should be analayzed are Cu, Ni, Co, Fe, Cr, As, Ag, Au. Rocks could be done initially by ICP analysis. ($6-7.50 per sample).

9) Results of the B.C./Federal geochem program for the map area should be obtained to aid in planning the program.

10) The program should be done by an experienced geologists and prospectors. Chip sampling of favorable areas can be done simultaneously with the heavy minerals program.

Respectfully submitted

Barry Price, M.Sc.,FGAC.
Consulting Geologist.
February 15, 1987.

B. J. PRICE, M.Sc.
GEOLOGICAL ASSOCIATION OF CANADA
FELLOW

SUGGESTED EXPLORATION BUDGET:

STAGE I: Reconnaissance, Geology, Sampling: Apr-June 1987:
(Cost for all claims)

Geologists: 2 x 90 days @ $300/day	54,000.00
Helpers 4 x 90 x $150/day	63,000.00
Air Photos, Basemaps.(Recopy all property maps)	3,000.00
Vehicle Rentals, 2 x 4-Wheel Drive, 90 days	8,100.00
Helicopter Support, 30 hrs @ $550/hr	16,500.00
Camp,Equipment and rentals	9,000.00
Food and Fuel, 6 men x 90 days x $20/man day	10,800.00
Expendable Field supplies,(sample bags etc.)	6,000.00
Heavy Mineral analyses, 1,000 samples @ $30/ea	30,000.00
Rock analyses (ICP), 1,500 @ $7.50 ea	11,250.00
Rock assays, PGM, 500 @ $20	10,000.00
Cat work - roads, trenches,	8,000.00
Blasting, materials and labour	10,000.00
Radio, Telephone etc.	1,000.00
Work application	10,000.00
Reports, Drafting etc.	12,500.00
Subtotal	263,150.00
Contingency	36,850.00
TOTAL STAGE I	$300,000.00

STAGE II: Follow-up, July-Sept, 1987:
(Contingent on previous results)

Geologist: 1 x 60 days @ 300/day	18,000.00
Assistants, 2 x 60 days x $175/day	21,000.00
Cook 1 x 60 days x $2500/mo	5,000.00
Line-cutting	40,000.00
Geophysics, (Magnetometer, I.P.Surveys)	20,000.00
Surveying	5,000.00
Environmental bonds	10,000.00
Vehicle Rentals, 4-Wheel Drive,	8,000.00
Cat-trenching, 200 hrs @ 100/hr, fuel etc.	20,000.00
Hand Trenching, blasting, rentals etc.	10,000.00
Helicopter Support, 20 hrs @ $550/hr	11,000.00
Camp Construction and supplies	10,000.00
Misc Rentals, powersaws, pluggers etc	5,000.00
Food and Fuel, 8 men x 60 days x $20/man day	9,600.00
Expendable Field supplies,(sample bags,pickets etc)	5,000.00
Trench assays 1000 samples @ $25/ea	20,000.00
Radio, telephone etc.	1,000.00
Drafting, reproduction	3,000.00
Report preparation	3,000.00
Subtotal	219,600.00
Contingency	30,400.00
TOTAL STAGE II	250,000.00

(continued on next page)

STAGE III: Diamond Drilling (September-October 1987)
(Contingent on previous results)

NW Diamond drilling,10,000 feet @ $35/ft all incl.	350,000.00
Geology, Reports, map drafting, assays, etc.	50,000.00
Camp construction, rentals, cat work, radio-tel	50,000.00
TOTAL STAGE III	**$450,000.00**

TOTAL ALL PHASES $ 1,000,000.00

It is anticipated that with success in the three stages in 1987, a program of continued drilling, underground exploration and feasibility studies will be recommended with a budget in the order of $2 Million for 1988. The budget for 1988 will be constructed only when results of 1987 exploration have been reviewed.

Respectfully submitted

Barry Price

BARRY J.PRICE,M.SC.,FGAC.
Consulting Geologist.
Feb 15, 1987

GEOLOGICAL ASSOCIATION OF CANADA
B. J. PRICE, M.Sc
FELLOW

REFERENCES

AHO, A.E., (1957), Pacific Nickel Property, Structural Geology of Canadian Ore Deposits, Vol II, p.27-36. C.I.M.

AHO, A.E., (1956), Geology and Genesis of Ultrabasic Nickel-Copper Pyrrhotite Deposits at the Pacific Nickel Property, Southwestern British Columbia. Economic Geology, V.51, p444-481, 1956.

BOYLE, R.W.; (1982), Gold, Silver, and Platinum Metal Deposits in the Canadian Cordillera. Association of Exploration Geochemists. Proceedings "Precious Metals in the Northern Cordillera". p.1-20.

CABRI, LOUIS J., (1982), Classification of Platinum Group Element Deposits with Reference to the Canadian Cordillera. Association of Exploration Geochemists. Proceedings "Precious Metals in the Northern Cordillera". p.21-32.

CABRI, LOUIS J., (1976), Glossary of the Platinum Group Minerals. Econ Geol. v.71, pp1476-1480.
CHRISTOPHER, P.A., (1970), Giant Mascot Mine, B.C.Department of Mines, Report of Activities, p.17-21.

DESBOROUGH,G.A. AND LEONARD, B.F.,(1976); An issue devoted to the Platinum Group Elements. Econ.Geol v.71, pp.1129-1480.

MERTIE, J.B.,(1969); Economic Geology of the Platinum metals. U.S.G.S Prof.Paper #630.

NALDRETT,A.J.,(1981), Platinum Group Elements: Mineralogy, Geology, Recovery. CIM Special Volume # 23,

NALDRETT,A.J.,(1979), Nickel Sulphide and Platinum Group Element Deposits. Can Mineralogist. v.17, pp 141-554

O'NEILL,J.J. AND GUNNING,H.C.,(1934); Platinum and Allied Metal Deposits of Canada. G.S.C. Econ Geol Series #13.

ROSE, A.W., HAWKES. H.E., AND WEBB, J.S., (1979), Geochemistry in Mineral Exploration. 2nd Edition., Academic Press, 657 pp.

RUBLEE, V.J., (1986); Occurrence and Distribution of Platinum Group Elements in British Columbia. Open File Report 1986-7, B.C.-Canada Mineral Development Agreement.

WRIGHT, T.L., and FLEISCHER, M.,(1965), Geochemistry of the Platinum Metals. U.S.G.S.Bull 1214-A.

ASSESSMENT REPORTS

BERG, N.W.,(1971); Geological, Geochemical and Geophysical Report, NI claim groups, Harrison Lake Area. Giant Explorations Ltd., A.R.# 3155.

BERG, N.W.,(1971); Geological, Geochemical and Geophysical Report, NI claim groups, Harrison Lake Area. Giant Explorations Ltd., A.R.# 3356.

BERG, N.W.,(1971); Reconnaissance Geochemical Report, NI claim groups, Harrison Lake Area. Giant Explorations Ltd., A.R.# 3442.

BERG, N.W.,(1972); Geological, Geochemical and Geophysical Report, NI claim groups, Harrison Lake Area. Giant Explorations Ltd., A.R.# 3615.

CROSBY, RICHARD O.,(1970); Report on Airborne Geophysical Survey, Nickel Syndicate, Hope Area, B.C. Giant Mascot Mines Ltd. A.R.# 2583.

GAYFER, E.R.,(1970); Geochemical Report on NI claims, Harrison Lake Area. Giant Explorations Ltd. A.R.# 2469.

GAYFER, E.R.,(1970); Geochemical Report on NI claims, Harrison Lake Area. Giant Explorations Ltd. A.R.# 2801.

GONZALEZ, R.A.,(1972); Geological, Geochemical and Geophysical Report, 316 Group, Harrison Lake Area. Giant Explorations Ltd., A.R.# 4071

GONZALEZ, R.A.,(1973); Geological, Geochemical and Geophysical Report, 336 Group, Harrison Lake Area. Giant Explorations Ltd., A.R.# 4070

ROTE, IRA S.,(1972); Geochemical and Geological Report, NI-440 to NI-447 Claims, Harrison Lake Area, B.C. Giant Explorations Ltd., A.R.# 3901.

ROTE, IRA S.,(1973); Geochemical and Geophysical Report, NI-83 and NI-85 Groups, Harrison Lake Area, B.C. Giant Explorations Ltd., A.R.# 4536.

ROTE, IRA S.,(1975); Geophysical Report on the Daioff Claim Group, Harrison Lake, B.C. Giant Explorations Ltd., A.R.# 5527

SHARP, W.M.,(1972); Geological and Geochemical Report, Al Claim Group, Western Standard Silver Mines Ltd., (NPL), A.R.# 4370.

CERTIFICATE

I, Barry J.Price, with business address at 3447 W.7th Avenue, Vancouver, B.C. do hereby certify that:

1) I am a Consulting Geologist registered with the Geological Association of Canada as a Fellow and I am entitled to use their seal, which has been affixed to this report. I am a member of the Canadian Institute of Mining, the Society of Exploration Geologists, and several other professional organizations.

2) I hold a B.Sc. (Honors) Degree in Geology (1965) and a M.Sc. in Geology (1972), both from the University of British Columbia., Vancouver, B.C.

3) I have practised my profession as a geologist continuously since 1965, having worked in Canada, The United States of America, Mexico, and the Republic of the Phillipines, for a number of large and small companies and consulting firms, including Manex Mining Ltd., J.R.Woodcock and Associates, Archer Cathro and Associates and P.A.Christopher and Associates.

4) I have based this report on available geological data on the property and adjacent properties and mineral deposits, and on my personal knowledge of the property and the area, accumulated since 1974.

5) I have no interest in the claims described in the report nor in the securities of International Consolidated Platinum Ltd., and will receive only normal consulting fees for the preparation of this report.

6) I do not have any interest in any mineral claims within 10 km. of the Pt. property.

7) I consent to the use of this report by International Consolidated Platinum Ltd. for whatever purposes they deem necessary.

Barry Price

Barry James Price,M.Sc.
Consulting Geologist.
Feb 15, 1987.

GEOLOGICAL ASSOCIATION OF CANADA
B. J. PRICE, M.Sc
FELLOW

LETTER OF RELEASE

3447 W.7th. Avenue,
Vancouver, B.C.,
V6R 1W2
February 15, 1987.

INTERNATIONAL CONSOLIDATED PLATINUM LTD.,
Ste 427 - 470 Granville St.,
Vancouver, B.C.,
V6C 1V5.

Dear Sir or Madam,

I, Barry James Price, M.Sc., F.G.A.C. hereby consent to the use of my report on the Pt Property in the vicinity of Hope, B.C., in the New Westminster Mining Division, dated February 15, 1987 in any Filing Statement, Statement of Material Facts, or Prospectus to be issued by your company.

Dated at Vancouver, B.C. this 15th day of February, 1987.

Barry James Price, M.Sc.,F.G.A.C.
Consulting Geologist

GEOLOGICAL ASSOCIATION OF CANADA
B. J. PRICE, M.Sc
FELLOW

APPENDIX I

PLATINUM MINERALOGY AND OCCURRENCES:

Platinum Group Metals (PGM) include the following members with their Atomic Numbers, and Weights:

ELEMENT	ATOMIC NUMBER	ATOMIC WEIGHT
RUTHENIUM	44	101.07
RHODIUM	45	102.90
PALLADIUM	46	106.40
OSMIUM	76	190.20
IRIDIUM	77	192.20
PLATINUM	78	195.09

Members of the group are rarely pure in nature; many alloys and platinoid mineral compounds are known, (About 85 named species in 1979). The characteristics of native platinum are listed below.

NATIVE PLATINUM: Pt(Fe,Os,Ir,Pd,Ru,Rh).

Light grey to white, (generally black in nature), with metallic luster, Hardness 4-4.5, Sp.G. 14-19.0 (Pure metal is 21.5), Hackly fracture and no cleavage. Malleable and ductile, sometimes magnetic. Common in placer concentrates as scales and grains. (Fraser and Tulameen Rivers, etc.). Occasionally as nuggets or lumps up to 10 kg. May contain grains of chromite and/or magnetite.

Numerous other Platinum Group compounds are known, such as osmiridium, Laurite, Stibiopalladinite, Cooperite, Braggite, Sperrylite, Michenerite, Irarsite etc.; detailed description of these is beyond the scope of this brief discussion. In most platinum lode or placer mines, identification of minerals is done by microscopic or electron micro-probe work.

APPENDIX II

TYPES OF PLATINUM DEPOSITS AND OCCURRENCES:

Several major types of Platinum Group Metals occurrences are classified by Cabri,(1981) as follows:

PGM DOMINANT DEPOSITS

1. MERENSKY TYPE:

These deposits are characterized by their occurrence in very large bodies of rock which originally had the composition of Basalt, generally intruded through stable continental rocks. These layered complexes have narrow PGM-rich bands (10 to 200 cm thick) that may be continuous for 10's of kilometers. Examples are the Bushveld Complex, South Africa, where six platinum mines were operating in 1981, and the Stillwater Complex in Montana, U.S.A., where North Americas first Platinum-Palladium Mine is scheduled to begin production in 1987. Other Canadian Examples are the Lac des Iles complex, Ontario, and the Muskox Complex, N.W.T.

In this type of deposit, PG elements are distributed between solid solutions in major sulphides (pyrrhotite, Pentlandite) or as discrete minerals, (Cooperite, Braggite, Vysotskite, Laurite, and Sperrylite, Pt-Fe alloys and Pt-Pd Tellurides. Copper and Nickel are major by-products and Gold and Silver are minor by-products. Grades are generally 3-20 grams per tonne (ppm), and recoveries average about 75%.

The most remarkable characteristic of Merensky type deposits is the lateral continuity of the PGM horizons; at Stillwater, a 2 meter thick horizon can be traced over 39 kilometers.

2. LAYERED CHROMITITES:

In the same layered igneous complexes such as the Bushveld and Stillwater complexes, chromitite layers contain comparable grades of PG metals as Merensky type layers. As yet no metallurgical process has been developed, but chromite may eventually be recoverable as a by-product of PG metals recovery.

3. ALASKAN (URAL) TYPE ZONED ULTRAMAFIC COMPLEXES:

Concentrically zoned ultramafic complexes intruded in active orogenic zones or stable platforms, generally have dunite cores surrounded by shells of olivine rich peridotites, magnetite-rich peridotites/pyroxenites, and hornblendites. They generally have very irregular PG element distribution and close association with chromite. Platinoids are generally Pt-Fe alloys, and Pt-Ir alloys. Often the platinoid production is from associated placer deposits, with dredging grades of 0.3 to 3.0 grams per yard.

The Tulameen ultramafic complex is a Cordilleran example, comparable with some of the deposits in the Ural Mountains of the U.S.S.R

CO-PRODUCT AND BY-PRODUCT DEPOSITS:

1. ALPINE TYPE ULTRAMAFITES AND ASSOCIATED PLACERS.

As described by Cabri,(1981), "Alpine" type ultramafics may be the refractory residue of the primitive mantle from which partial melts have been extracted. They are characterized by orthopyroxene-bearing dunites (harzburgites) and peridotites. The major platioids are Osmium-Irirdium-Ruthenium alloys, in close association with chromite. Where serpentinization has taken place, PG minerals are sulphides and sulpharsenides. PG grades are generally up to 0.3 grams per tonne (ppm.)

Alpine ultramafics are common in British Columbia and the Yukon. The Giant Mascot ultramafic appears to have Alaskan and Alpine characteristics; those in the PT Project area are of metasomatized Alaskan and also Alpine type. Osmium-Iridium-Ruthenium in Cariboo and Atlin area placers are derived from these ultramafics.

Examples are also given by Cabri in China, Tasmania, Papua New Guinea and some of the Urals deposits.

2. MAGMATIC NI-CU DEPOSITS

Four main Locality Types of deposits are classified by Naldrett (1981) as:

I. Sudbury: deposits in Noritic rocks, possibly associated with an astrobleme. Major PG metals are Michenerite, Sperrylite, Moncheite, and PG element solid-solutions in arsenides or sulpharsenides. Grade averages 1 gram/tonne.

II. Duluth/Norilsk: Deposits in intrusive equivalents of flood basalts (Gabbros). At Norilsk there are important platinum deposits up to 10 grams/tonne.

III.a Lynn Lake/Pechenga: Deposits are in Precambrian Greenstones (Tholeiites) with low PGM contents in Sperrylite and Pt-Fe alloys, or

III b. Kambalda/Thompson/Ungava: Deposits in Precambrian greenstones (Komatiites). Grades are from 0.1 gram/tonne at Thompson to 1 gram/tonne at Kambalda.

IV. Rana: Deposits associated with Phanerozoic orogenic belts.

3. MISCELLANEOUS DEPOSITS:

Platinum Group metals are also associated with a broad variety of mineral deposits:

a). Copper Sulphide deposits, such as Temagami, where there is a Pd-Te-Hg-Ag association.

b) Porphyry Copper Deposits: About 55% of U.S.production is from Copper refining in Arizona.

c) Copper Molybdenum porphyries: PGE are associated with Molybdenite or with associated alteration.

d) Carbonatites: As at Palabora, where Rh>Pt>Pd.

e) Pegmatites: Associated with the Bushveld complex. Grades are up to 30 grams/tonne.

f) Hydrothermal deposits: As at New Rambler and Messina, where Pt is associated with pyrite.

g) Black Shale (Kupferschieffer/Zechstein: Sedimentary copper deposits where Pt and Pt may be associated with organic compounds.

h) Fossil Placers: Os-Ir-Ru occur as by-products in Witwatersrand gold deposits in Precambrian conglomerates.

i) Miscellaneous Cu-Ni sulphide deposits in Ultramafics:

APPENDIX III

OUTLOOK FOR PLATINUM
(EMJ., March 1986)

E.M.J. MAR 1986

Table 4—Inventories at trading exchanges
(million tr oz as of Dec. 31 for indicated year)

	1983	1984	1985
Commodity Exchange	127.4	118.5	155.2
Chicago Board of Trade	25.7	19.1	17.8
London Metal Exchange	45.4	51.6	50.9
Total	198.5	189.2	223.9

tronics has been growing slowly, with better than average growth in Japan. Significant overall growth seems unlikely, primarily because of continued miniaturization. Usage for jewelry and silverware remains lackluster in spite of the lower prices, possibly because of a change in consumer attitudes in the past several years.

In summary, it seems likely that demand for silver in the next few years will probably increase in the range of 2%-3%/yr.

Inventories. In addition to the "visible" stocks on the exchanges (Table 4), there are additional stocks (including about 135 million tr oz held by the US government) that total about one full year's consumption when combined with inventories held by the exchanges. In addition to these, there are the so-called "twilight" stocks—the Indian hoards and coins, bullion, and sterling ware in the US. It is likely that these two categories of "twilight" stocks total over 5 billion tr oz.

As shown in Table 5, supply will again exceed consumption in 1986. Again the question remains, "What price is required to mate the supply and demand through additions to private bullion stocks?" As can be seen in the table, the amount of investment injected into the silver market to purchase the excess supply has declined markedly over the past few years. In 1980, for instance, 118 million tr oz were acquired at an average price of $20.65. Total funds required to take up this material were almost $2.5 billion. In 1984 and 1985, the corresponding funds required to take up the excess inventory were only about $0.5 billion and $0.35 billion, respectively.

Commentary. Based on the preceding data, one must conclude that market fundamentals do not indicate that silver prices will move substantially higher in the near future. But fundamentals may not be the whole story. Speculators, perceiving trends and long-term cycles, may well venture forth. In addition, those investors that were well rewarded in financial markets, may, at some point, switch back to tangible assets. The timing of such an event is, however, impossible to predict. As stated in the Handy & Harman 69th Annual Review: "For the past several years, attempts to forecast short-range price movements have been largely unsuccessful because of the actions of investors and speculators who have dominated the market." No doubt this will continue to be so, but that's all the more reason why those individuals (companies and governments as well) that are seriously impacted by changes in the silver market should make an effort to apprise themselves of silver fundamentals and possible perceptions regarding future events.

In that vein, one should figure that 1986 will likely be a year in which the investor/speculator dominates the market. Fundamentals won't move the market, but speculators and investors may. Those with an interest in the market should remain on their toes. Through the years much of the action in silver has taken place when least expected, in spite of rational forecasts to the contrary.

Last year when silver was at $5.60, we concluded that "it's near the low for the year . . . The range for the year (1985) could well be from $5 to $9." Although last year's forecast was somewhat optimistic with regard to the high (which in our view could well have been reached had not the Hunt's sales occurred), it did prove to be reasonably accurate on the downside. We'd be surprised if the lows of 1985 were seriously penetrated in 1986. In terms of the purchasing power of the 1967 dollar, present silver prices in the range of $6 (less than $2 basis 1967) would appear to be a bargain for the long-term investor.

Our outlook for 1986 reveals once again an irregular, choppy market. The doldrums of late 1985 are probably drawing to a close. The world's financial and political problems, including budget deficits, trade deficits, international debts, hijackings, asset freezing, etc., all continue to move across the stage in varying lights and speeds. On the other hand, the long-term disinflationary trend remains in force because of lower commodity prices (particularly oil) and is not likely to reverse itself soon. With US producer prices still increasing at very modest rates—less than 2% in 1985—there is no hard evidence that inflation will ignite again in 1986. Most economists seem to feel that the US consumer prices will climb 3% to 5%, which is high by long-term standards but not alarming. As the arguments intensify over which elements will prevail—inflation/deflation, calm/chaos, and growth/recession, etc.—we can look forward to a more interesting (and, hopefully, more profitable) market in 1986.

Our guess for 1986 is for a higher high and a lower low than in 1985 but not necessarily in that order. We believe that 1986 will provide more opportunities for participants in the silver market. Our outlook calls for a wider range in price during the year and we expect a return to the volatility seen prior to mid 1985.

Table 5—Free World silver supply-demand balance[1]
(million tr oz)

	Supply	Consumption	Change	Average price
1970-79 avg.	423	440	(17)	$ 4.23
1980	486	368	118	20.65
1981	442	346	96	10.53
1982	437	362	75	7.95
1983	476	367	109	11.43
1984	444	383	61	8.15
1980-84 avg.	457	365	92	12.60
1985	446e	389e	57e	6.14
1986	442e	397e	45e	?

1 Compiled from data provided by Handy & Harman, Drexel Burnham Lambert, and J. Aron & Co. e—Estimated

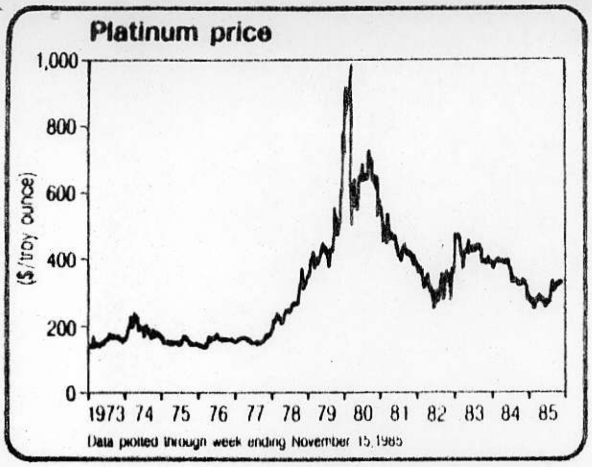
PLATINUM GROUP

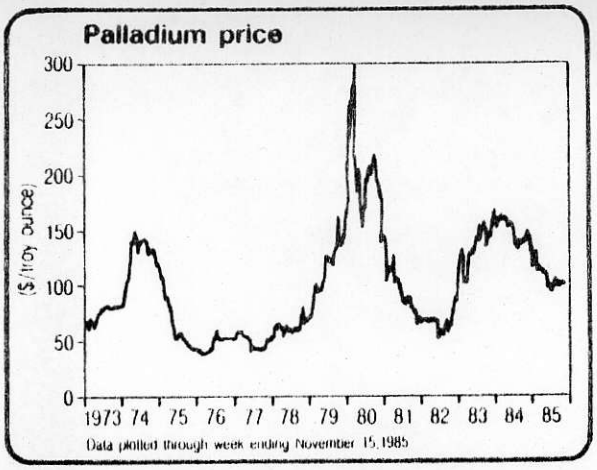
PLATINUM DEMAND STRENGTHENS, SUPPLY TIGHTENS, PRICES RISE

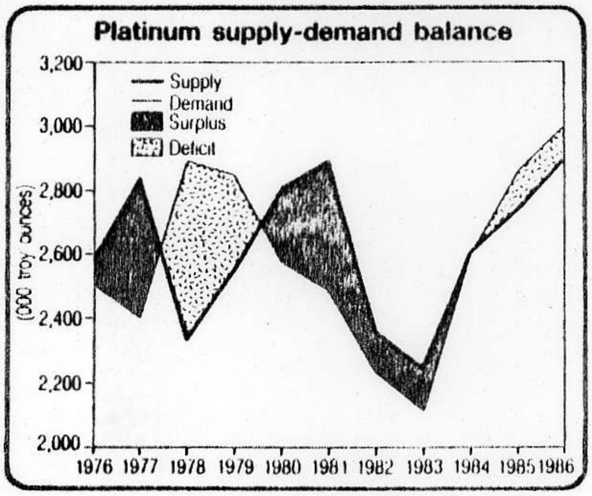
Jeffrey M. Christian, vice president, commodities research, J. Aron/Goldman, Sachs & Co.

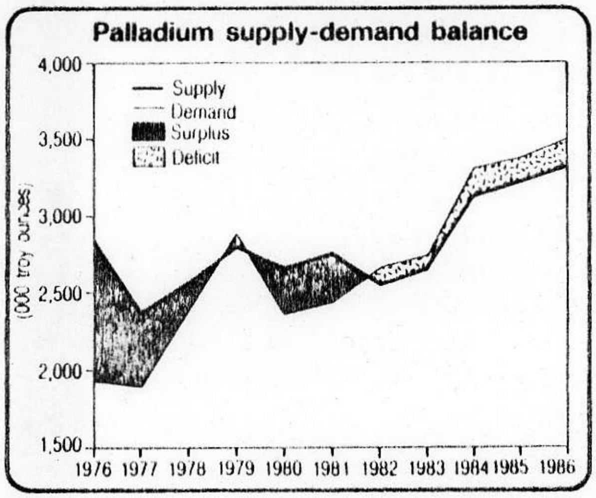
The supply/demand balance for platinum tightened progressively throughout 1985, a trend made readily evident by a 36% increase in prices from $257/oz in late June to about $350/oz in August, a subsequent consolidation to above $310/oz, and an upward return to around $350-$360/oz at year end. All monetary and quantity figures in this report are in $US per troy ounces and in troy ounces, respectively, unless otherwise stated.

The major force behind the tighter market was and continues to be unexpectedly strong industrial and investment demand. Also, supplies of platinum increased less rapidly in 1985, when higher mine output was largely offset by a 22% cutback in secondary recovery and lower exports from the Soviet Union.









Industrial demand for platinum rose an estimated 10% from nearly 2.6 million oz in 1984 to a projected 2.86 million oz in 1985. At this level, world platinum fabrication demand is about equal to the peak offtake of 1978-1979. More importantly, platinum offtake has been increasing in nearly every end use and nearly every major country. Further increases are anticipated in 1986, with fabrication demand possibly reaching or exceeding 3 million oz. US demand, excluding the automotive industry, rose 27% in the first half of 1985 over the same period in 1984. For the entire year, US industrial demand is expected to have risen about 14%, from 1.03 million oz in 1984 to 1.17 million oz in 1985.

Japanese industrial demand rose an estimated 8% from 1.18 million oz in 1984 to 1.28 million oz in 1985. Offtake by Western European fabricators also was up by about 7% from 303,000 oz in 1984 to 325,000 oz in 1985.

In the US, platinum consumption rose sharply in every industry except the petroleum industry. Auto industry consumption rose an estimated 6%-7%, and demand from chemical, glass, and jewelry and dental alloy applications also rose sharply. Even the electronics industry, which is suffering from a slump in demand for its products and is consuming significantly smaller amounts of other metals, used an estimated 20% more platinum in the US and 13% more worldwide in 1985.

Meanwhile, the amount of platinum entering the market from secondary sources and Soviet exports has been declining. Scrap recovery of platinum is projected to have declined from 179,000 oz in 1984 to 140,000 oz in 1985. Soviet sales were running 15% below their pace during the first half of 1984, at a rate of approximately 200,000 oz/yr. Platinum mine production, the largest source of the metal, is projected to have risen nearly 10% from 2.2 million oz in 1984 to 2.4 million oz in 1985.

Total supply in 1985 is projected at 2.74 million oz, up 5% from 1984. A further increase of 5%-6% to around 2.9 million oz is projected for 1986, assuming that mine production will rise and that supplies from both scrap and Soviet sales will rebound at least partially.

The result of rapid demand increase and more moderate supply expansion in 1985 has been a shift in the platinum market from a large surplus in the early 1980s to a deficit of about 115,000 oz in 1985. This condition has been accommodated by a drawdown in platinum inventories. The supply shortfall is expected to continue in 1986, possibly reaching 100,000 oz for the full year.

The tight supply in the platinum market is compounded by one final factor, namely investor demand. Tight market fundamentals have aroused significant demand from investors, and the potential for disruption of South African supply provides fuel for further speculative interest. The advent of auto emissions standards in Europe, with requirements for catalytic converters, may also be a significant new source of platinum demand that would not be easily met in the current market. Lethargic gold and silver prices in 1985 also drew precious metals investors to platinum. Platinum's dual character as a precious commodity of investment quality and an industrial metal that is basically a rare commodity appear to increase its potential for near-term price appreciation.

The outlook for the platinum market in 1986 seems rather straight forward. Industrial demand probably will continue to grow in step with overall economic expansion in the US and elsewhere. Supply is likely to increase at about the same pace, and the current degree of market tightness may not be alleviated much on a year-to-year basis.

The combination of these trends should push platinum prices higher in 1986, attracting increased investment demand, further tightening supplies, and possibly creating a sharp upward price spiral. Ultimately, higher metal prices should encourage increased platinum production from mines and scrap, which would help contain the upward price pressure. The price should not be expected to rise steadily. An irregular pattern of sharp advances coupled with downward corrections is more likely.

During 1986, the platinum market will continue to focus on two major factors: 1) political conditions in South Africa; and 2) the advent of automobile emissions control catalysts in the European Economic Community. Present plans call for European emission standards to be phased in beginning with the 1988 model year for large-engined cars and extending through the 1993 model year. Based on current catalyst and engine technology, this program will initially absorb 55,000-60,000 oz/yr of platinum and scale up to as much as 450,000-500,000 oz/yr by the mid-1990s.

Mine capacity, primarily in South Africa, does not exist to meet this new demand; however, the fact that emission standards will be phased into the European auto market over six years should allow ample time for the completion of the major mine expansions needed to meet these requirements.

Palladium. Just as platinum showed surprising strength in 1985, market participants were caught unprepared by the relative weakness in palladium. After rising more sharply over a longer period of time than the other major precious metals in 1982-1984, palladium prices declined to about $100/oz and have remained relatively steady at that level since mid-1985. While stronger than expected demand for platinum pushed palladium's price higher, the major reason behind its relative stability has been a virtually flat industrial demand.

From 1980 to 1984, industrial demand for palladium rose sharply, climbing from 2.36 million oz/yr to 3.31 million oz/yr. The largest increase was in 1984, when estimated palladium use rose nearly 21%. Even allowing for a statistical quirk in the 1984 data for US auto industry consumption, it is quite clear that industrial demand for palladium was up sharply. Electrical industry demand rose 33% in 1984, while use in dental amalgams increased 9% and in chemical process and petroleum refining catalysts jumped by more than 31%.

In 1985, however, palladium industrial offtake followed a different course. Usage in the electrical industry—the largest consumer—fell 16% from 1.18 million oz in 1984 to a projected 995,000 oz in 1985. Consumption in the automobile industry rose a moderate 7%, while dental use was up about 7.8%. In the US and Japanese chemical and petroleum industries, palladium use in 1985 appears to have fallen about 7%. In total, 1985 industrial demand is projected to have risen only 1.5% to 3.35 million oz.

While the increase in industrial demand for palladium slowed dramatically in 1985, total new palladium supplies were relatively stable. Total supply is estimated to have risen from 3.13 million oz in 1984 to 3.23 million oz in 1985.

While the palladium market remained in a "deficit" in 1985, the size of the annual shortfall of new supply to industrial demand declined from 175,000 oz in 1984 to 131,000 oz in 1985. The reduced tightness allowed palladium prices to drop from $131/oz to $91/oz in early 1985 and then to stabilize around $100/oz for the rest of the year.

In 1986, we anticipate another 3% increase in total palladium supply to around 3.32 million oz, while industrial demand may revive 4% to 3.5 million oz. Should these trends emerge, the deficit in palladium would once more widen to about 180,000 oz. This would exert renewed upward pressure on prices and encourage increased supply from most major sources.

A summary of other platinum group metals will appear next month.

IRON AND STEEL

LITTLE HOPE FOR IMPROVEMENT

William T. Hogan, S.J. professor of economics, Fordham University

There was a great deal of hope at the end of 1984 that the steel industry would witness a substantial revival in 1985. This did not happen. Both on a world basis and in the US, there was very little change as output was quite close to the 1984 figure. At the International Iron and Steel Institute meeting in London in October 1985, most chief executives felt that the industry had stabilized, and they did not look forward to any great growth or decline in the future, particularly in the industrialized countries. In the US, raw-steel production for the year was somewhat below 1984, falling to 88 million st compared with 91 million st in 1984. Shipments were also somewhat below the previous year, retreating to 72 million st vs. 73 million st in 1984. Looking ahead to 1986, there is little hope for a significant improvement. In fact, the prognosis is for about the same tonnage of raw steel and, perhaps, a slight improvement in shipments.

The year 1985 witnessed a number of dramatic events in the steel industry which have a bearing on 1986.

Corporate developments. A merger was agreed to by which Bergen Brunswig Corp., a drug distributing corporation in California, would absorb National Intergroup, which owns 50% of National Steel. This was approved by the stockholders of both companies; however, in a most unusual turn of events, Bergen Brunswig cancelled the merger.

Another corporate development involved Wheeling-Pittsburgh Steel Corp, which entered into a Chapter 11 relationship as it declared bankruptcy in April. When the judge in the bankruptcy court declared the labor contract void, the company offered a new wage level of $15/hr, a substantial reduction from the $22/hr that had been in effect. A strike followed that lasted 98 days, and a settlement was finally reached in which the union agreed to an $18/hr wage rate. This settlement could pose a problem since most of the companies that will negotiate with the union in 1986 hope to get the same reduction in their wage schedule. As a result of the bankruptcy and the strike, Wheeling-Pittsburgh is in the process of restructuring. Final decisions have not yet been made; however, the Monessen plant will be substantially altered.

Other significant changes in corporate structure involved some of the smaller companies. Ohio River Steel, a nonintegrated producer of structural steel, went into Chapter 11 but was rescued by North Star Steel, a subsidiary of Cargill. North Star also purchased the assets of Hunt Energy, which was in bankruptcy. The latter company constructed a plant in Youngstown, Ohio, to produce some 300,000 st of oil-country tubular goods. The enterprise was unsuccessful and, while it was in bankruptcy, North Star purchased the company for $22 million. The new owner will commit some $85-$90 million to build a seamless-pipe mill. As a result of these acquisitions, North Star now has six plants, five of which are considered mini-mills, and the sixth will roll structural shapes from semifinished forms.

Another transfer in ownership came when Bayou Steel Corp., owned by Voest-Alpine of Austria, was sold to the RSR Corp. of Dallas, Texas. Bayou is located south of New Orleans and has a capacity to produce between 600,000 st and 650,000 st of raw steel.

APPENDIX IV

GEOLOGICAL SETTING - GIANT NICKEL MINE
(BCDM Rept.Activities, 1975)

REGIONAL SETTING OF GIANT MASCOT MINE
(92H/5W, 6E)

By Mark R. Vining

(Graduate Student, University of British Columbia)

Field mapping was carried out between American and Emory Creeks (Fig. 9) in an attempt to determine the relationship between the Spuzzum batholith and the Giant Mascot ultrabasic complex. The study will be completed as a Master of Science degree at the University of British Columbia and field costs were supported, in part, by the British Columbia Department of Mines and Petroleum Resources.

Work began in mid-June at American Creek and had been extended northward to Emory Creek by mid-September. Heavy forest cover extends to elevations of 1 430 metres, above which open areas are thickly overgrown with brush. Age relationships between the ultrabasic rocks and surrounding dioritic rocks in the Giant Mascot mine area have been the subject of study by a number of previous workers. Ultrabasic rocks and the surrounding diorites and norites in the mine area were described by Aho (1956) as being roughly contemporaneous, although they exhibit ambiguous contact relationships.

GENERAL GEOLOGY

Schist

The oldest rocks in the area are schists, which occur as xenoliths in tonalite and diorite. They are mainly pelitic schists with interbeds of calc-silicate rock and quartzite, numerous synkinematic dykes and sills of aplite, and rare ultrabasic pods. The schists contain sillimanite in contact aureoles and abundant staurolite, garnet, and kyanite away from igneous contacts. Ultrabasic pods contain directionless talc and radiating clots of acicular anthophyllite or tremolite. These rocks are tentatively correlated with the Hozameen Group by McTaggart and Thompson (1967).

Ultramafites

Aho (1956) described a suite of ultrabasic rocks on the Giant Mascot property ranging from pyroxenite at the periphery to several cores of dunite in a crudely concentrically zoned complex. All phases of the complex have varying amounts of sievy hornblende. Angular xenoliths of peridotite and pyroxenite, with sharp contacts are found in diorite, and dykes of diorite cut peridotite and pyroxenite at the perimeter of the complex. Small stocks and a sill-like mass of ultrabasic rocks intrude schists, south and east of the mine.

Hornblendite rims the complex and grades to gabbro and diorite with increasing amounts of plagioclase. Fine-grained dykes or veins of hornblendite and hornblende gabbro cut the less hydrous ultrabasic rocks. Hornblende is generally the only mafic mineral, but some dykes contain hypersthene or biotite phenocrysts. McLeod (1975) reported K-Ar ages of 95 to 119 m.y. for various ultramafites from the Giant Mascot property.

Spuzzum Diorite

A zoned suite of diorites intrudes the schists and ultramafites.

Richards (1972) described three types of diorites in the Spuzzum intrusions south of American Creek including: hypersthene-augite diorite, augite-hypersthene-hornblende diorite, and biotite-hypersthene-hornblende diorite. These three types have roughly constant proportions of hypersthene and plagioclase. Other types seen north of American Creek include: hornblende diorite, with or without biotite and with no pyroxene, hornblende diorite, with small to very large (several centimetres) euhedral crystals of hornblende in a finer grained matrix of white plagioclase which grades to a gabbro or to plagioclase-bearing hornblendite, and 'noritic' diorite in which the most common mafic mineral is hypersthene.

Foliation and lineation are common in these rocks, imparted by the alignment of plagioclase and hornblende crystals and locally by the alignment of elongate pyroxenes or biotite flakes. The structural continuity is broken near the North Fork of American Creek, and is perhaps due to a large reentrant of schist from the east.

Hornblendite Inclusions

Richards (1972) described two tpyes of ultramafic bodies, pyroxenite and hornblendite, found only in diorite. The form of these bodies is most commonly lenticular, but some hornblendite 'dykes' up to 5 feet across have sharp to gradational contacts with diorite. The origin of both types of ultramafic bodies is attributed by Richards (1972) to metasomatic removal of SiO_2, Na_2O, and CaO by hydrothermal fluid.

Field observation during the present study suggests that their mechanism of formation is not simple. Pyroxenite bodies are of small size and occur only locally. Hornblendites in diorite are seen as irregular rounded bodies ranging in size from several centimetres to somewhat under 1 metre, in what appears to be an interconnected three dimensional net within hornblende diorite. The foliation of the diorite at a contact with hornblendite body is either truncated, somewhat contorted, or concordant, but generally rather obscure. Contacts are generally very sharp. This type of relationship may grade to another in which the hornblendite veins consist of very coarse hornblende crystals, usually with skeletal plagioclase cores, and with or without minor interstitial plagioclase. These could be termed pegmatitic hornblendite dykes or veins and are suggestive of a very volatile-rich environment. Hornblendite occurs also as narrow veins, usually under 5 centimetres, commonly associated with nearly pure plagioclase 'veins' or 'segregations.'

Tonalite

Tonalite intrudes diorite, truncating the zoning pattern in many places, and also the foliation of the diorite visibly in at least one locality (Richards, 1972). Xenoliths of granofels and hornfelsed schist occur in the tonalite. Granofels is thoroughly recrystallized, but appears more mafic than tonalite with lesser or no quartz. It is thought, therefore, to be Spuzzum diorite.

The composition of the tonalite is fairly constant and averages plagioclase, 55 to 60 per cent; quartz, 15 to 20 per cent; and hornblende plus biotite, 25 to 30 per cent. The greatest visible variation is in the ratio of hornblende to biotite, which ranges from 0.5 to 2. These rocks are quite strongly foliated and in places lineated, as expressed by the alignment of hornblende and biotite. Protoclastic textures are common. The tonalite has yielded K-Ar ages of 79, 81, 83, and 103 m.y. (Richards and White, 1970).

Late Phases

A late differentiate of the tonalite, a plagioclase-quartz-tourmaline-mica-pegmatite, fills joints in older rocks. Possibly contemporaneous with this pegmatite are quartz veins which cut most of the rock units. Lastly, a garnet-bearing, strongly foliated, leucocratic dyke-rock cuts the above-mentioned pegmatite and tonalite.

Breccias containing fragments of virtually all units older than tonalite have a fine-grained matrix of plagioclase and hornblende. The texture of the matrix appears to be metamorphic.

REFERENCES

Aho, A. E. (1956): Geology and Genesis of Ultrabasic Nickel-Copper-Pyrrhotite Deposits at the Pacific Nickel Property, Southwestern British Columbia, *Econ. Geol.*, Vol. 51, pp. 444-481.

McLeod, J. (1975): The Giant Mascot Ultramafite and its Related Ores, unpublished M.Sc. Thesis, *University of British Columbia.*

Richards, T. A. (1972): Plutonic Rocks between Hope, British Columbia, and the 49th Parallel, Ph.D. Thesis, *University of British Columbia.*

Richards, T. A. and White, W. H. (1970): K-Ar Ages of Plutonic Rocks between Hope, British Columbia, and the 49th Parallel, *Cdn. Jour. Earth Sci.*, Vol. 7, No. 5, pp. 1203-1207.

APPENDIX V

GEOLOGY, NI CLAIM GROUP
(PT PROJECT AREA, 1986)

G.E.P.Eastwood, BCDM, G.E.M., 1974)

CLAIMS: BEA, GIANT, SWEDE, MARY G, PAT, P, totalling 136 full claims and fractions.

ACCESS: By logging road from Hope, 1 to 6 miles.

OWNER: KELSO EXPLORATIONS LTD., 411, 470 Granville Street, Vancouver 2.

METALS: Nickel, copper.

DESCRIPTION: Disseminated sulphides of chalcopyrite, pyrite, and nickeliferous pyrrhotite occur in fractured pyroxenite, peridotite, and ultrabasic rocks. Also a nickel saprolite deposit occurs near Schkam Lake.

WORK DONE: Surface geological mapping, 1 inch equals 400 feet covering Bea and Mary G; underground geological mapping, 1 inch equals 400 feet covering the old adit (Mary G claims); geochemical soil survey, 57 samples covering Bea and Mary G; minor trenching and stripping on Mary G and Bea.

REFERENCES: *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1970, p. 249; Assessment Report 3366.

NI (No. 171, Fig. E) By G.E.P. Eastwood

LOCATION: Lat. 49° 27'-34.8' Long. 121° 34.5'-45.6' (92H/5E, 12) NEW WESTMINSTER M.D. Between Harrison Lake and Fraser River, around The Old Settler.

CLAIMS: Approximately 583 NI full-sized and fractional claims, adjoining the Pride of Emory property on the west and extending northwesterly to the east shore of Harrison Lake.

ACCESS: By paved road through Harrison Hot Springs to Greenpoint Park, thence north along Harrison Lake by logging road to Bear Creek camp at mouth of Cogburn Creek. Logging roads extend up the valleys of Cogburn, Talc, and West Talc Creeks.

OWNER: Giant Explorations Limited.

OPERATOR: NICKEL SYNDICATE (joint exploration venture between Giant Explorations Limited and Giant Mascot Mines Limited), 1131 Melville Street, Vancouver 6.

METALS: Nickel, copper.

DESCRIPTION:

The area of the claims lies within the Coast Mountains, immediately east of Harrison Lake where the topography is generally steep to rugged. Drainage is mostly into Harrison Lake via Cogburn and Talc Creeks. The area is thickly forested, but recent logging has denuded large sections of the floors and lower walls of Cogburn, Talc, and West Talc Creek valleys. Undergrowth is light to moderate.

MAPPING AND EXPLORATION: Parts of the area were geologically mapped by C. H. Crickmay in 1924 and 1926, by H. C. Horwood in 1935, and by W. E. Snow in 1938-39, and their maps were incorporated by C. E. Cairnes in Map 737A of the Geological Survey of Canada. Mapping in 1969 by B. E. Lowes for a thesis at the University of Washington was incorporated by J.W.H. Monger in Map 12-1969, which is a revision of 737A. In 1966 the writer examined some of the ultramafic stocks shown on Map 737A, and in 1971 returned briefly to examine nickel discoveries and do more reconnaissance.

The NI claims were located in 1969 and 1970. The Nickel Syndicate conducted an airborne magnetometer survey and extensive reconnaissance soil sampling in 1970, and selected six areas for detailed investigation in 1971. Five of these areas were subjected to grid-controlled geological mapping, soil sampling, and magnetometer surveying, and a grid was laid out on the sixth area. I. S. Rote made a geological reconnaissance of the property at 1 inch to 1,000 feet, and prospecting and reconnaissance soil sampling were conducted in parts of the claims area not covered in 1970. Mineralization found in two of the selected areas was diamond drilled.

GENERAL GEOLOGY: Figure 41 is a compilation of the writer's mapping at a scale of 1:50,000 and mapping by R. Gonzalez and R. Wehr of the selected areas at a scale of 1 inch to 200 feet, with some additional information taken from Monger's compilation at a scale of 1:250,000. Generalizations of the company mapping were necessitated by the reduction of scale, and some re-interpretation was required by the writer's mapping adjacent to the selected areas.

The area is underlain by metasedimentary rocks, probable metavolcanic rocks, and a complex array of intrusive rocks. The metavolcanic rocks occur, as far as is known, only in the middle part of Talc Creek valley and on the ridge to the northeast, whereas metasedimentary rocks occur extensively in the western and northern parts of the area. Some metasedimentary rock was mapped by Gonzalez and Wehr east of Settler Creek. The intrusive rocks occur as many separate intrusions through the area, the largest being along Cogburn Creek and extending north beyond the area.

The metasedimentary rocks are phyllites and schists which are predominantly light green and dark grey in colour. Light grey and light buff quartz-muscovite schists are exposed immediately southeast of the Bear Creek camp and again 1.5 miles to the northwest. Pink garnet is developed in the rock near some intrusive contacts. Along Cogburn Creek and West Talc Creek the rock is markedly banded, mostly in grey and green tones. Prominent partings parallel to the banding define beds one-half to 2 inches thick. The banding is generally parallel to a pervasive schistosity, but was seen to cross it in one exposure, suggesting that the rocks may be isoclinally folded. The measured attitudes of banding and foliation range from a strike of 320 degrees and dip of 45 degrees northeast to a strike of 290 degrees and dip of 85 degrees northeast, and are generally steeper and more westerly toward the northwest. Monger assigned most of these rocks to the Chilliwack Group, of Carboniferous or Permian age.

Scattered outcrops of fine-grained green hornblende and feldspar-hornblende schist occur in the bed of Talc Creek and on the hillside to the northeast and east. The rock appears to be correlative with Monger's unit Bb and with the 'altered basic' of Gonzalez and Wehr. The mineral composition suggests that the rock is of igneous rather than sedimentary derivation, and the fine grain size suggests that it was volcanic rather than intrusive. The age is not known.

The intrusive rocks include mafic and ultramafic rocks and two relatively small areas of felsic rocks. The felsic rocks were seen in contact with metasedimentary rocks only, whereas the others appear to intrude both metasedimentary and probable metavolcanic rocks. The relative ages of the intrusive rocks are uncertain.

A northwesterly trending body of grey to dark grey ultramafic rock crosses Talc Creek between West Talc Creek and the upper forks as the foot of Mount McNair. An extension northwest of West Talc Creek is sketched from Monger's compilation. The width of the body near Mount McNair suggests that it should continue to the southeast. It was not observed in actual contact with any other rock, but two small dykes of similar composition transect the banding in metasedimentary rocks some 200 feet southwest of the contact on West Talc Creek. The outline of the body is also transgressive to the structural trend in the metasedimentary and the probable metavolcanic rocks. The rock is fractured to varying degrees, but generally does not show much foliation. Southeast of Daioff Creek, however, it shows a pervasive schistosity which is pronounced in some drill core. Brown pyroxenite was identified in a few outcrops near the northeast contact, but generally the rock appears to be strongly altered, and its original nature is not apparent macroscopically. However, a thin section of a specimen from southeast of Daioff Creek consists predominantly of colourless pyroxene; tremolite, talc, and trace chlorite are visually estimated to make up 15 per cent of the rock. The pyroxene is crushed and altered along crystal boundaries and along weak microshears, and tremolite needles penetrate deeply into the crystals from these crush zones. Accessory magnetite appears to have been interstitial to the pyroxene. An estimated 1 per cent pyrrhotite and trace chalcopyrite occur as small blebs generally strung out along the microshears. Southwest of Talc Creek the rock contains sporadic serpentine and near the southwest contact is strongly serpentinized. This alteration appears to be controlled by fractures with lengths of several feet or tens of feet. A thin section of typical rock near the contact consists, as visually estimated, of 30 per cent colourless pyroxene, 50 per cent antigorite, 13 per cent carbonate, and 7 per cent magnetite. The section is crossed by several carbonate-antigorite microshears, and the intervening pyroxene is criss-crossed by antigorite. It contains no sulphides and no relics or ghosts of olivine.

Two irregular bodies and scattered lenses of mafic rock trend northwest along the northeast slope of Talc Creek and appear to correspond to unit 8d on Monger's compilation. The rock consists mainly of dark green diorite with minor gabbro and norite. Patches of fairly fresh pyroxenite and peridotite are enclosed in the northeast body. A small patch of somewhat altered peridotite is adjacent to and contains inclusions of diorite where the main road crosses the second tributary of Talc Creek. The evidence is thus conflicting as to which rock is enclosed in which. To the southeast, two outcrops of pyroxenite appear to define a narrow, west-northwest trending band in green schist.

North of Cogburn Creek, Nickel Syndicate mapping shows a large patch of peridotite in metasedimentary rocks, and farther east, a contact between metasedimentary rocks and diorite. This contact coincides approximately with the southwest contact of a large mass of quartz diorite on Monger's compilation. However, the rock is uniformly quartz-free, dark, and mafic, with black hornblende predominating over white feldspar. Pyroxene occurs sporadically, and locally the rock grades to hornblende pyroxenite. The rock is fine to medium grained. It is cut by narrow dykes of very coarse-grained black hornblendite, which in turn are cut by feldspar-rich dykelets.

South of Cogburn Creek and east of Settler Creek the Nickel Syndicate has mapped an area of diorite and minor gabbro and norite which encloses irregular patches of pyroxenite. The area is crossed by several dyke-like bodies of green pegmatitic hornblendite and diorite. The writer examined a section of these rocks toward the end of the logging road in the course of sampling. The ordinary diorite is medium grained and consists essentially of white plagioclase and black hornblende, with the hornblende generally predominating. It is fresh save for some chloritization along shear zones. A striking coarse-grained phase, consisting of equal proportions and equi-sized grains of the two minerals, occurs about 900 feet from the end of the road. The dyke-like bodies also consist essentially of plagioclase and hornblende, but the hornblende is green rather than black and the grain size ranges from coarse to pegmatitic. The plagioclase is generally very subordinate, but locally forms pegmatitic segregations in which 'float' euhedral hornblende crystals up to 3 centimetres long. The pyroxenite is medium grained and dark grey-brown in colour. A thin section discloses at least three varieties of pyroxene constituting about 90 per cent of the rock: pale pink hypersthene, brown clinopyroxene, and colourless clinopyroxene. Accessory magnetite and pyrrhotite were visually estimated at 3 and 4 per cent in this slide. The pyrrhotite forms small elongated blebs interstitial to the pyroxene crystals. Minor chlorite has formed along fractures. Traces of chalcopyrite were noted in a few places in the pyroxenite.

Generally the mafic and ultramafic rocks are spatially associated, with a few exceptions already noted, but age and genetic relations are not clear. The most likely possibilities are (1) that they are differentiates from the same magma, or (2) that a dioritic magma engulfed and partially assimilated earlier formed ultramafic bodies, producing minor gabbro and norite as hybrids. Neither explanation is wholly satisfactory, and other possibilities cannot be excluded. The age of these intrusions can only be said with certainty to be post-Chilliwack and pre-Pleistocene.

A dyke-like body of quartz diorite is shown on Monger's compilation intruding Chilliwack metasedimentary rocks northeast of Talc Creek and extending just to the contact of the large ultramafic body. Actually, this body appears to transect the northeast contact of the ultramafic body. A small body of quartz diorite is shown west of West Talc Creek on Monger's compilation. It was not examined, but as seen from across the valley it appeared to be a dyke-like body dipping gently northward. Granitic rock is exposed in a road cut at 3,500 feet elevation on the east side of the valley and also occurs as lenses in metasedimentary rock 1,200 feet to the south. The observed outcrops suggest a dyke-like body extending from east of Talc Creek to west of West Talc Creek, as shown on Figure 41. However, mapping by the Nickel Syndicate on the ridge between the creeks shows only a few widely scattered outcrops of diorite, gabbro, and peridotite across the trend of the granitic rock. The outcrop on the road on the west slope of this ridge is marked by a magnetic low, and it is likely that sporadic similar lows across the ridge represent small areas of thinly covered granitic rock. It is suggested that the main body continues beneath the ridge, but that erosion has exposed only apophyses at higher elevations. The rock northeast of Talc Creek is coarse grained and weakly foliated. On the fresh surface it is speckled with abundant mafic minerals, giving it an overall grey appearance, but it weathers distinctively white. It consists of feldspar, quartz, hornblende, biotite, chlorite, relatively abundant accessory magnetite, and traces of pyrite and chalcopyrite. In places two feldspars can be distinguished by colour, suggesting that there is appreciable K-feldspar and that the rock is actually granodiorite. The rock at 3,500 feet elevation east of West Talc Creek is weakly foliated, very coarse grained, and contains orbicular nests of biotite 1 to 2 inches wide. The matrix of the orbicules consists of feldspar, quartz, and biotite which is largely altered to chlorite.

North of the Cogburn Creek delta, diorite and quartz diorite intrude the Chilliwack metasedimentary rocks. The proportions of feldspar and mafic minerals are reversed as compared with diorites elsewhere in the area, and the mafics are largely biotite and chlorite instead of hornblende. These rocks appear to be related to the common Coast Range quartz diorite intrusions rather than to the mafic diorites.

STRUCTURAL GEOLOGY: Schistosity in the metasedimentary rocks and the green schists and banding in the metasedimentary rocks strike northwest to west northwest and dip northeast, generally steeply. Isoclinal folding is suggested by banding crossing the schistosity in a road ditch outcrop near West Talc Creek and by the slim wedge of metasedimentary rocks in the green schists northeast of Talc Creek. Plunging folds could explain the absence of green schists north of Cogburn Creek; however, a major fault along Cogburn Creek could be postulated on present knowledge.

Shear zones and numerous fractures are evident in areas of good exposure. Along the branch logging road east of Settler Creek the dominant narrow shear zones strike 060 degrees and 015 degrees and dip 70 and 80 degrees easterly respectively, although the dominant topographic linears strike slightly west of north. Near the southwest contact of the large ultramafic body, serpentinization appears to be controlled by fractures striking 145 and 075 degrees and dipping 35 and 60 degrees southerly respectively. These fractures and the schistose character of the ultramafic body southeast of Daioff Creek are probably indicative of some movement along the contacts, but there is no necessity, on present knowledge, to postulate large-scale faulting.

MINERALIZATION: Pyrite, pyrrhotite, and chalcopyrite have been found in various parts of the area. Pyrite is sparingly distributed through most of the rocks of the area, but appears to be lacking in parts of the large ultramafic body. Pyrrhotite occurs widely but sparingly in the large ultramafic body, in pyroxenite east of Settler Creek, and to a lesser extent in some diorite bodies. It occurs as grains and blebs interstitial to pyroxene crystals, as scattered grains along microshears, and as narrow fracture veinlets less than an inch long. A small copper showing is reported to occur just above the Cogburn Creek road 1.8 miles in direct line northeast of the mouth of Talc Creek; it was not seen by the writer. Chalcopyrite is sparsely disseminated in the pyroxenite on the spur logging road east of Settler Creek, and in short sections of core from diamond-drill hole 71-8 in altered pyroxenite southeast of Daioff Creek.

Four grab samples were taken by the writer in 1966 and assayed for total nickel. Ten chip samples were taken in 1971 and assayed for both total and acid-soluble nickel, using aqua regia extraction for the latter determination. Spectrochemical analyses were made of all samples, and the one showing the highest copper was assayed for that metal. The locations and results are given in the following table. The 1971 sampling southeast of Daioff Creek was done by selecting four identifiable points and collecting chips from available edges within a radius of 10 or 20 feet from the point. The chips were cleaned of most of their weathered surface and combined as a single sample. On the logging road spur east of Settler Creek, 118 feet of the road cut was sampled, covering the section with reported mineralization. Chips were taken every 2 feet in sections of variable lithology and every 3 or 4 feet in sections of uniform lithology. A new sample was started after each major change in lithology.

The acid-soluble nickel represents the nickel contained in sulphides plus an unknown but probably small amount leached from silicates. The results show that even if an extreme assumption of leaching of 50 per cent of the silicate nickel is made, three of the samples from southeast of Daioff Creek contained only 0.02 per cent silicate nickel, and therefore contained 0.19 to 0.22 per cent sulphide nickel. Sample No. 7 evidently contained a larger proportion of silicate nickel as well as a smaller total amount; it was taken next to the northeast contact of the body. These results are to be compared with Nickel Syndicate averages of 0.22 per cent nickel obtained from systematic rock chip sampling over an area of approximately 80 acres and 0.20 per cent from diamond-drill core. The results from east of Settler Creek show low total nickel and indicate a high proportion of silicate nickel. The company made flotation tests on bulk samples taken from southeast of Daioff Creek, but the results are not known.

WORK DONE:

Prospecting and reconnaissance geological mapping of the claims area was essentially completed in 1971. More than 100 miles of surveyed grid lines was laid out in six selected areas, and five of these areas were subjected to detailed geological mapping, soil sampling, and magnetometer surveying. Additional reconnaissance soil and stream sediment sampling was done in 1971, and more than 3,000 samples were collected and analysed for nickel and copper. The magnetometer surveying totalled 104 line-miles. Mineralization found in two areas was investigated further. East of Settler Creek three holes were diamond drilled to an aggregate length of over 1,500 feet, and 10.6 line-miles of induced polarization surveying was done over adjacent covered ground. Southeast of Daloff Creek 17 holes were diamond drilled to an aggregate length of over 4,000 feet.

REFERENCES: Crickmay, C. H., 1930, *Natl. Mus. Canada*, Bull. 63, pp. 33-113; Horwood, H. C., 1936, *Geol. Surv., Canada*, Paper 36-4; *Geol. Surv., Canada*, Map 737A; Paper 69-47 (with Map 12-1969); *B.C. Dept. of Mines & Pet. Res.*, G.E.M., 1970, p. 248; Assessment Reports 2469, 2683, 2801, 3155, 3280, 3356, 3442, 3580, 3614, 3615, 3635.

ASSAYS OF SAMPLES FROM COGBURN-TALC CREEKS AREA

Sample	Location	Lithology	Total Nickel *per cent*	Soluble Nickel *per cent*	Copper * *per cent*
1	West Talc Cr., 0.65 mile above mouth	Altered ultramafic	0.21	—	trace*
2	Ridge summit, 1.3 miles NE. of mouth West Talc Cr.	Rusty coarse-grained hornblendite	trace*	—	X*
3	Bed of Talc Cr., 1,200 ft. below mouth West Talc Cr.	Hornblende pyroxenite, partly serpentinized	0.18	—	trace*
5†	2,300 ft. east of mouth of Daioff Cr.	Altered pyroxenite	0.25	—	trace*
7	Southeast of Daioff Cr., around DDH 71-7	Altered ultramafic	0.18	0.15	trace*
8	Same area, base of outcrop NE. of talus slide	Altered ultramafic	0.21	0.20	trace*
9	Same area, around DDH 71-9	Partly altered pyroxenite	0.24	0.23	trace*
10	Same area, around DDH 71-4 and 71-5	Altered ultramafic	0.23	0.22	trace*
11	East of Settler Cr., 0 to 8 ft. from end of spur rd.	Altered pyroxenite	0.03	0.01	trace*
12	East of Settler Cr., 8 to 18 ft. from end of spur rd.	Mostly medium-grained diorite	0.01	0.01	trace*
13	East of Settler Cr., 18 to 26 ft. from end of spur rd.	Mostly medium-grained diorite	0.03	0.02	X*
14	East of Settler Cr., 26 to 47 ft. from end of spur rd.	Pyroxenite	0.03	0.02	X*
15	East of Settler Cr., 47 to 64 ft. from end of spur rd.	Pegmatitic and medium-grained diorite	0.02	0.01	X*
16	East of Settler Cr., 64 to 118 ft. from end of spur rd.	Pyroxenite	0.08	0.06	0.033

* Spectrochemical determination only
X Present in small but measurable amount
† Approximately same area as sample 10