BRITISH COLUMBIA

PROSPECTORS ASSISTANCE PROGRAM

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PROSPECTING REPORT
HARRISON LAKE NICKEL BELT

Final Report
1999/2000

P 4

SUBMISSION TO THE PROSPECTORS ASSISTANCE PROGRAM

By:

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PROSPECTING REPORT
HARRISON LAKE NICKEL BELT
CONTENTS

A. SUMMARY OF PROSPECTING ACTIVITY *3*
B. TECHNICAL REPORT *7*
PROJECT LOCATION *8*
ACCESS *8*
PROSPECTING TARGETS *10*
COMMODITIES *10*
DEPOSIT TYPE *10*
GEOLOGY OF THE GIANT MASCOT DEPOSITS *12*
GEOLOGY OF THE PROSPECT AREA *13*
PREVIOUS WORK BY THE NICKEL SYNDICATE *13*
CLAIM LOCATIONS *14*
PROSPECTING RESULTS 1999 .... *14*
Access Reconnaissance *16*
Sample Descriptions and Classifications *16*
Chemical Analyses of Selected Samples *21*
Polished Thin Section Examination *23*
Reconnaissance Geology Map and Sample Location *23*
Ore Dogs in Sulphide Exploration *25*
Claims staked by Grantee *25*
Target Areas for Additional Work *34*
REFERENCES *35*
APPENDIX 1:REPORT ON PHOTOMICROGRAPHS *36*

FIGURES

Figure 1: Location Map - Outlined area indicates proposed prospect area. *9*
Figure 2: Minfile occurrences related to the prospect area. *11*
Figure 3: Claim locations in the Prospect Area. *15*
Figure 4: Geology Cogburn Creek-Talc Creek Area *24*
Figure 5: South Talc sample locations *26*
Figure 6: Settler Creek sample locations. *27*
Figure 7: Charles Creek sample locations. *28*
Figure 8: West Cogburn Creek sample locations. *29*
Figure 9: East Cogburn Creek sample locations. *30*
Figure 10: Daioff Creek sample locations. *31*
Figure 11: Talc Creek sample locations. *32*
Figure 12: Claim locations staked in 1999. .... *33*

TABLES

Table 1: Minfile Cu-Ni Occurrences within the Hope to Harrison Lake Ni Belt (92HW) *10*
Table 2: Field card notes listing sample descriptions and geological observations. *17*
Table 3: Geochemical analysis of selected samples. *22*

BRITISH COLUMBIA
PROSPECTORS ASSISTANCE PROGRAM
PROSPECTING REPORT FORM (continued)

B. TECHNICAL REPORT

- One technical report to be completed for each project area.
- **Refer to Program Requirements/Regulations 15 to 17, page 6.**
- If work was performed on claims a copy of the applicable assessment report may be submitted in lieu of the supporting data (see section 16) required with this TECHNICAL REPORT.

Name David R. Haughton Reference Number P4

LOCATION/COMMODITIES

Project Area (as listed in Part A) Harrison Lake Nickel Belt MINFILE No. if applicable

Location of Project Area NTS 92H (West Half) Lat 49° 28' to 49° 35' Long 121° 34' to 121° 46'

Description of Location and Access The area is accessed from Bear Creek which is the location of Pretty's Timber Co's log sorting yard. The yard lies approximately 28 km, by mainly gravel road, north of Harrison Hot Springs at the south end of Harrison Lake. The prospected area includes area accessible from logging roads along Cogburn and Talc Creeks.

Main Commodities Searched For Nickel, Copper, Platinum, Palladium, Gold.

Known Mineral Occurrences in Project Area Victor Ni, (Ni, Cu), Al (Cu, Ni), Settler Creek (Ni, Cu), Citation (Ni, Cu, Zn), Bea (Ni, Cu), Ni (Ni, Cu), Swede (Ni, Cu), Pride of Emory, Star of Emory, Choate (Ni, Cu, Au, Ag, Cr, Co)

WORK PERFORMED

1. Conventional Prospecting (area) Reconnaissance prospecting was done along & between Talc and Cogburn Creeks
2. Geological Mapping (hectares/scale) Geologic mapping at a scale of 1:20,000 was done covering 11,250 hectares
3. Geochemical (type and no. of samples) 126 rock samples (outcrop and float samples) were collected and described.
4. Geophysical (type and line km) No geophysical surveys were conducted
5. Physical Work (type and amount) Samples of outcrops and float samples were taken, no trenching, 12 claims staked.
6. Drilling (no. holes, size, depth in m, total m) No drill holes.
7. Other (specify) An ore dog trained to detect sulphide mineralization assisted in finding new Ni, Cu sulphides.

SIGNIFICANT RESULTS

Commodities Copper & Nickel in sulphides Claim Name Jason 1 to 12 inclusive

Location (show on map) Lat. 49° 33' 20" Long 121° 41' Elevation 692 metres

Best assay/sample type 0.22%Ni, 0.20% Cu, 0.14% Cr (three different samples) in Hornblendites surrounding a significant magnetic anomaly at higher elevation.

Description of mineralization, host rocks, anomalies Prospecting has located a new magmatic mineral occurrence which appears to show more potential than previous Ni - Cu mineralization in the same area. The zone of mineralization extends over an area of 2.0 km , may be concentric in shape and at a higher elevation has a centre associated with a magnetic anomaly. Commodity values are not high in the samples as sulphides are disseminated but are of magmatic origin and include, pyrrhotite, pentlandite, chalcopyrite and pyrite. No comparable discovery was reported in Minfile as a result of exploration by the Ni Syndicate in the years 1969 to 1974. The mineralization discovered is similar to that described as lacy ore (interstitial) by geologists who had worked at the Giant Mascot mine which is located at the eastern end of the Nickel belt.

Supporting data must be submitted with this TECHNICAL REPORT

PROSPECTING REPORT
HARRISON LAKE NICKEL BELT

PROJECT LOCATION

The prospect area outlined in Figure 1 is located in the New Westminster Mining Division, in the west half of NTS map sheet 92H. It is contained within an area lying northwest of Hope and which extends from Emory Creek (northwest of Pride of Emory Mine, Minfile # 092HSW004) (Giant Mascot Mine) to Harrison Lake. A rectangular area containing the prospected zone is bounded on the south by latitude 49° 28′ and on the north by latitude 49° 35′. The longitudinal limits are 121° 34′ on the east and 121° 46′ on the west.

The prospect area includes the area accessible from logging roads along Cogburn and Talc Creek and accessible area bounded by these two creeks. Both creeks drain westward into Harrison Lake.

ACCESS

Access from Harrison Hot Springs is via some 28 kilometres of winding mainly unpaved road, along the east shore of Harrison Lake to Pretty's Timber Company's Bear Creek log sorting yard and administration office. From there, logging roads run the length of both Cogburn Creek (28 km) and Talc Creek (14 km). However, during prospecting, 15 km of logging road is accessible by 4 wheel drive truck along Cogburn Creek and 4km along Talc Creek. The Talc Creek logging road was blocked by landslides across the road and by washout of culverts during spring runoff. Areas not accessed by 4x4 were accessed by walking. Much of the prospecting alongTalc Creek was done by "traverses on foot". Other areas, not including Talc and Cogburn Creek roads, but accessible by four wheel drive vehicle are listed below:

<u>South Talc</u> : An area referred to as South Talc lies south of the junction of Talc and Cogburn Creeks. This area was accessible by a logging road accessed directly east of the airstrip at Bear Creek camp. This road will be deactivated late in 1999.

<u>Settler Creek Road</u>: Settler Creek logging road runs off the Cogburn Creek road at 12.1km, where it crosses Cogburn Creek and then runs in a westerly direction along the south side of Cogburn Creek to the junction of Cogburn Creek and Settler Creek. From this point it runs along the east side of Settler Creek for about 6 km to the base of the Old Settler mountain. Beyond this point, the road continues, but at the end of July much of the road was still impassable because of deep snow on the road and snowmelt draining down portions of the road.

<u>Talc Creek Clearcut</u>: Two km down Talc Creek road a logging road accesses a 1999 clearcut on the ridge north of Talc Creek. This road runs in a northerly direction up the ridge between Cogburn and Talc creeks. It runs a length of 7.3 km to its highest elevation.

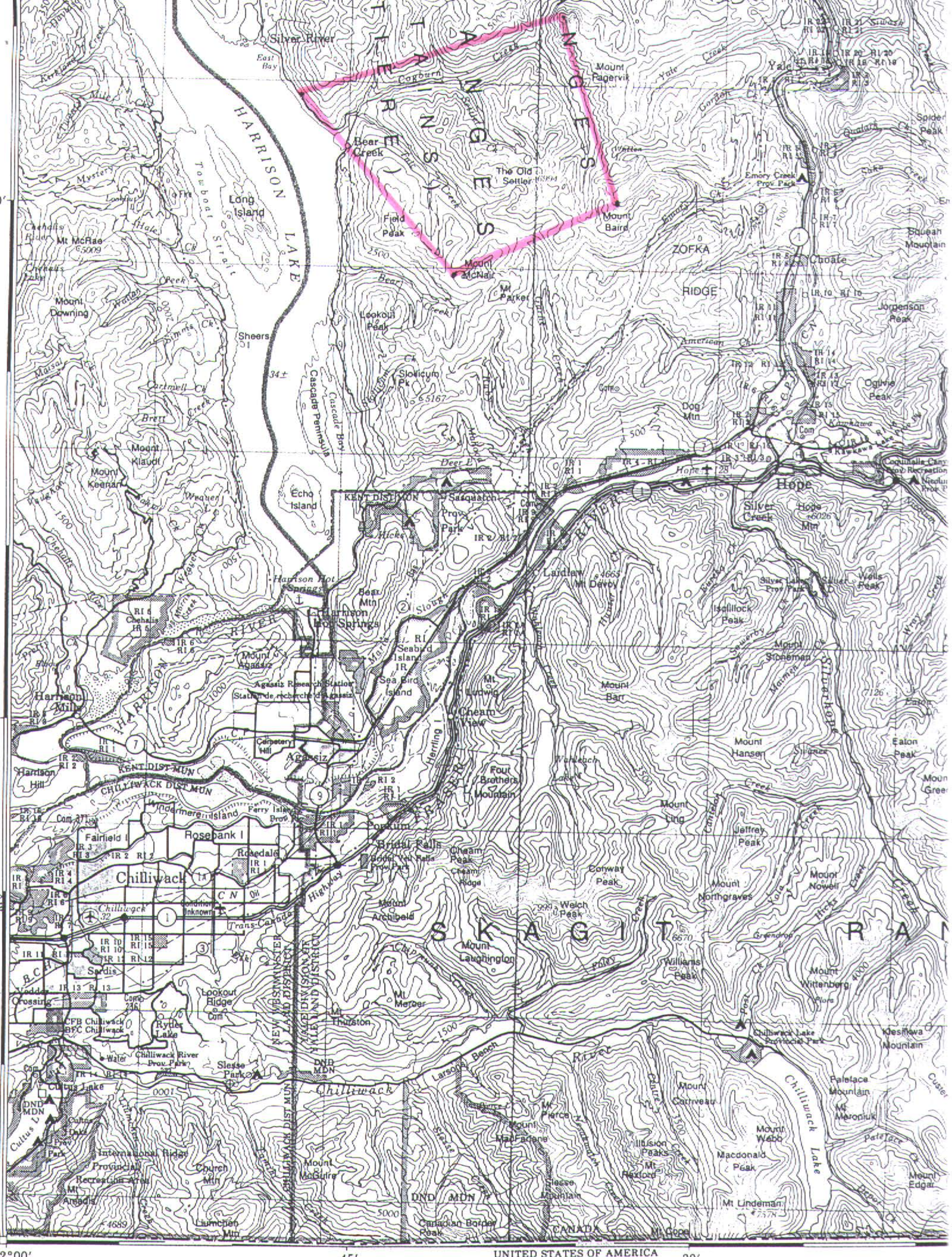
<u>Charles Creek Logging Road</u>: Fifteen kilometers along Cogburn Creek road from Bear Creek yard is located Charles Creek road. Charles Creek logging road is still being developed by Pretty's Timber Co. and was followed through a zone of diorite and anorthosite for a distance of approximately 5 kilometers.

Figure 1: Location Map - Outlined area indicates proposed prospect area.

Topographic Features from NTS Map 92H

Scale 1:250,000

1cm = 2,500 m = 2.5 km


Silver River
HARRISON LAKE
Mount Pagervik
Yale
Bear Creek
The Old Settler
Field Peak
Mount Baird
Mount McNair
Mt Parker
ZOFKA
RIDGE
Choate
Emory Creek Prov Park
Spider Peak
Squeah Mountain
Jorgenson Peak
Ogilvie Peak
Long Island
Mt McRae
Mount Downing
Sheers
Cascade Peninsula
Lookout Peak
Slollicum Pk
Dog Mtn
Mount Klaudt
Mount Keenan
Echo Island
KENT DIST MUN
Sasquatch Prov Park
Hope
Silver Creek
Hope Mtn
Laidlaw
Mt Devoy
Silver Lake Prov Park
Wells Peak
Isollillock Peak
Mount Stoneman
Harrison Hot Springs
Bear Mtn
Mount Agassiz
Seabird Island
Sea Bird Island
Mt Ludwig
Cheam View
Mount Barr
Agassiz Research Station
Station de recherche d'Agassiz
Harrison Mills
Harrison Hill
Cemetery Hill
Agassiz
Four Brothers Mountain
Mount Hansen
Eaton Peak
Mount Ling
CHILLIWACK DIST MUN
Rosebank
Rosedale
Fairfield I
Chilliwack
Popkum
Bridal Falls
Cheam Peak
Jeffrey Peak
Conway Peak
Mount Northgraves
Mount Nowell
Mount Archibald
Welch Peak
SKAGIT RAN
Mount Laughington
Williams Peak
Mount Wittenberg
Sardis
Vedder Crossing
CFB Chilliwack
BFC Chilliwack
Lookout Ridge
Mt Mercer
Mt Thurston
Ryder Lake
Chilliwack River Prov Park
Slesse Park
Chilliwack Lake Provincial Park
Klesilkwa Mountain
Paleface Mountain
Cultus Lake
International Ridge Provincial Recreation Area
Church Mtn
Mount McGuire
Mt Pierce
Mount MacFarlane
Mount Rexford
Mount Corriveau
Mount Webb
Macdonald Peak
Mt Meroniuk
Mount Edgar
Chilliwack Lake
Slesse Mountain
Mt Lindeman
Mt Amadis
Liumchen Mtn
Canadian Border Peak
CANADA
Mt Copeland
Cultus Lake Provincial Park
DND MDN
30'
15'
122°00'
45'
30'
UNITED STATES OF AMERICA

PROSPECTING TARGETS

The prospecting targets are pipe-like mineral deposits containing massive and disseminated nickel and copper bearing sulphides that have crystallized from a liquid sulphide melt immiscible with a host magmatic silicate liquid. These deposits are presumed identical to those found in the Giant Mascot Mine about 10 kilometres north of Hope at the eastern end of the Nickel Belt.

COMMODITIES

The commodities are identical to those found in the Giant Mascot Mine. They include, in order of greatest percent: nickel, copper, chromium, platinum, palladium and gold. Principal ore minerals, at the Giant Mascot, hosting nickel and copper are pyrrhotite, pentlandite and chalcopyrite.

DEPOSIT TYPE

The project area includes the northwest extension of the ultramafic intrusive units that host the Giant Mascot mine. Table 1 lists the Minfile occurrences related to this zone of ultramafics and therefore to the Giant Mascot Mine. These occurrences are scattered along a zone extending from American Creek (north of Hope) to the junction of Cogburn and Talc Creeks on the east shore of Harrison Lake.

Table 1: Minfile Cu-Ni Occurrences within the Hope to Harrison Lake Ni Belt (92HW)

MINFILE #	NAME	COMMODITIES	MINFILE CLASSIFICATION
092HNW039	VICTOR NI	Ni, Cu	Tholeiitic Intrusion –hosted
092HNW040	AL	Cu, Ni	Tholeiitic Intrusion –hosted
092HNW045	SETTLER CREEK	Ni, Cu	Tholeiitic Intrusion –hosted
092HNW046	CITATION	Ni, Cu, Zn	Tholeiitic Intrusion –hosted
092HSW004*	PRIDE OF EMORY*	Ni, Cu, Au, Ag	Tholeiitic Intrusion –hosted
092HSW005	BEA	Ni, Cu	Tholeiitic Intrusion –hosted
092HSW081	NI	Ni, Cu	Tholeiitic Intrusion –hosted
092HSW082	SWEDE	Ni, Cu	Tholeiitic Intrusion –hosted
092HSW093*	STAR OF EMORY*	Ni, Cu, Cr, Pt, Pd	Tholeiitic Intrusion –hosted
092HSW125*	CHOATE*	Ni, Cu, Cr, Co	Tholeiitic Intrusion –hosted
* MINE LOCATED ON ZOFKA RIDGE 9.6 KM NORTHWEST OF HOPE			

All of the Minfile occurrences listed are described as Tholeiitic Intrusion-hosted Ni-Cu deposits indicating the uniformity of mineralization associated with this zone of mafic intrusions. Three of these Minfile occurrences formed part of the Giant Mascot Mine. Figure 2 shows the location of the above Minfile properties.

Figure 2: Minfile occurrences related to the prospect area.

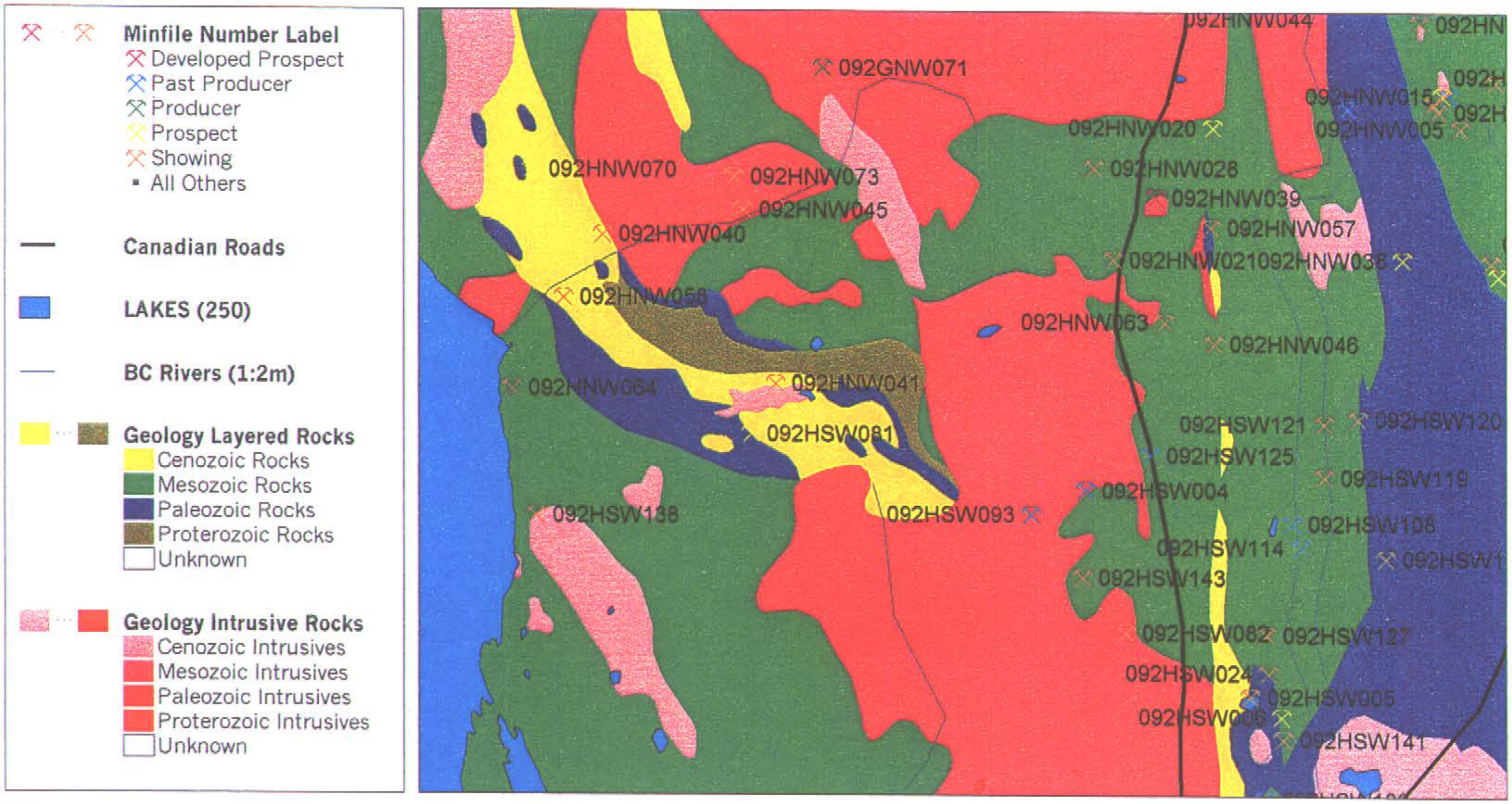
Note: The locations of the Minfile occurrences on this map from the "BC Ministry of Energy and Mines, Map Place" are not correct with respect to the location of Highway 1 through Hope. Therefore it should be considered only as a schematic map with knowledge that locations are not accurate with respect to highway location.

1) Victor Ni (092HNW039)
2) Al (092HNW040)
3) Settler Creek (092HNW045)
4) Citation (092HNW046)
5) Pride of Emory (092HSW004)
6) BEA (092HSW005)
7) NI (092HSW081)
8) Swede (092HSW082)
9) Star of Emory (092HSW093)
10) Choate (092HSW125)

All of the above are Cu-Ni deposits related to ultramafic intrusions.

11) North Fork-Besshi massive sulphide Cu-Zn in Chilliwack metasediments (092HNW070)
12) Cogburn Creek – Kyanite and sillimanite in schists (092HNW073)
13) Ox – Cu-Au-Ag skarn deposit (092HNW041)

B.C. Ministry of Energy and Mines



SCALE 1 : 233,484

2 0 2 4 6

MILES

N

http://webmap.ei.gov.bc.ca/minpot/map/pdac.MWF

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GEOLOGY OF THE GIANT MASCOT DEPOSITS

Knowledge of the origin of the deposit is embodied in its classification or type. A clear understanding of the origin of the targeted ultramafic deposits and their associated sulfides will greatly assist in the location of these deposits. The target deposit is a magmatic ultramafic intrusive containing sulfides which when emplaced had separated as an immiscible iron-sulphur-oxygen liquid (including economic elements: Ni, Cu, Cr, Pt, Pd, Au) from a basic or ultrabasic silicate melt. This type of deposit is classified simply as a Ni-Cu magmatic deposit. The deposits at the Giant Mascot Mine are crudely zoned, steeply dipping, intrusions which, in some cases are roughly concentric in cross section. Petrologic descriptions of associated rock types include: peridotite with associated gabbro, olivine pyroxenite, hornblende pyroxenite, pyroxenite and hornblendite. Crude zonation from peridotite (core) to hornblendite (rim) has been observed in some of the deposits. However, in some deposits reverse zonation also occurs. So that the core of the orebody may be olivine barren or else olivine rich (peridotite) (Muir, 1971). The ore bodies are close to vertical in orientation, are pipelike in form and have diameters of 10 to 50 meters.

Unlike Alaskan type intrusions, at the Giant Mascot the orebody contains abundant orthopyroxene in ultramafic rocks. Because of the orthopyroxene content, the gabbro present may be classified as norite as found in other Cu-Ni deposits such as the Sudbury or Lynne Lake deposits. Because of the presence of Ca poor pyroxene and orthopyroxene in ultramafic rocks, the lack of podiform chromite deposits and the high content of nickel sulphide, the deposit is not classified either as an Alpine ultramafic or as an Alaskan ultramafic complex. However, because of the pipelike form, the deposits of the Giant Mascot are structurally similar to the Alaskan type deposits emplaced in an orogenic environment. Nixon and Hammack, 1991, describe the Giant Mascot as a synorogenic-synvolcanic Cu-Ni gabbroid associated deposit. They state that Rana (Norway) and Moxie (U.S.A) are deposits in this same classification.

Review of the literature indicates that faulting exhibits some significant control on this type of deposit. Also brecciation has been mentioned briefly in some reports. Four fault systems have been recognized (Clarke, 1971). One fault group striking N45°-5°W and dipping 50°-75°NE is concluded to be pre-ore in age, with minor post ore movement. The second group of faults (N15°-30°E, 70°SE-70°NW) are closely associated with tabular ore bodies. The faults of group 3 (N10°W-10°E, 55°E-55°W) are considered related to the second group and are common to all mineralized zones examined. The above three fault systems are all considered pre-ore and are postulated, by Clarke, to have established complicated zones of fracturing favourable to ore deposition. A fourth fault system (N30°W-N30°E, 20-30°E or W) is considered to be post ore. It has been reported that certain ore shoots have terminated against this fault type.

The Giant Mascot mine lies within a northwest trending belt of basic to ultramafic intrusive rocks (hereafter referred to as the Hope to Harrison Lake Nickel Belt or simply the Nickel Belt). The mine has changed names during its evolution. Such names include: Pride of Emory, Giant Mascot, Giant Nickel, B.C. Nickel, Pacific Nickel, Western Nickel. The mine has the distinction of having been the only significant economic producer of Nickel within B.C. From 1958 to 1974, approximately 4,315,296 tonnes of ore was mined from this property. Nickel and copper were the prime metallic products with the ore grading 0.77 per cent nickel and 0.34 per cent copper with cobalt as a byproduct. However, chromium oxide, platinum, gold and silver are also present (Minfile Assessment Report 16553). Higher grades of both Ni and Cu occur within ore zones at the mine. For example, in 1936, 18 samples of ore were taken by the Mines Branch from several different sulphide bodies.

Analysis yielded an average of 18.38 per cent iron, 1.89 per cent nickel, 0.14 per cent cobalt, 0.31 per cent chromium, 10.87 per cent sulphur, 0.7 per cent copper and only a trace of arsenic (Minister of Mines Annual Report 1936, page F64). One 22.7 tonne bulk sample averaged 2.74 grams per tonne platinum and palladium and 0.68 gram per tonne gold. In 1937, B.C. Nickel Mines had developed 1.2 million tons of ore at 1.38 per cent nickel and 0.5 per cent copper (B.C.GEM, 1974, pg.105). Early records of samples of ore yielded 3.98 grms per tonne platinum and palladium and 7.89 grams per tonne gold. The chromium content of the ore averaged 0.2 to 0.4 per cent (Minfile report 092HSW004). Aho (1952) lists estimates of developed ore for the various orebodies in the mine. Percentage Cu ranged from 0.36 to 0.77. Percentage Ni ranged from 0.92 to 2.37. The mine closed in 1974 with reserves of 863,000 tonnes grading 0.75 per cent nickel, 0.3 per cent copper and 0.03 per cent cobalt. The cumulative nickel and copper production from the mine was 26.8 million kilograms of nickel and 14 million kilograms of copper (Nixon & Hammack, 1991) from 26 distinct orebodies.

GEOLOGY OF THE PROSPECT AREA

The regional geology of the target area is complex, containing unconsolidated surficial deposits and metasedimentary, acid-igneous and basic to ultrabasic intrusive rocks. The surficial deposits include alluvium, colluvium, glacial-fluvial and glacial deposits. Rock types are granodiorite, quartz diorite, diorite, gabbro, hornblendite, hornblende pyroxenite, peridotite, metavolcanics and metasediments.

Thick surficial deposits mantle more than sixty per cent of the bedrock with depths greater than 30 metres in the valley bottoms with much thinner deposits on higher slopes where outcrop is more abundant.

Dioritic rocks of the Spuzzum pluton surround the mafic and ultramafic intrusive rocks of the prospect area. The mafic and ultramafic igneous rocks intrude shale and slate, pyrite bearing metasediments. These latter rock types have been mapped in larger quantities south and north of the Nickel Belt.

The oldest rocks in the area are the metasediments and the metavolcanics. The metasediments have been assigned to the Chilliwack Group by Monger and are considered to be either Carboniferous or Permian in age. The specific age of the metavolcanics is unknown. The basic intrusive rocks which host the nickel and copper bearing sulphides are dated between 90 and 120 Ma and are considered to represent the earliest phase of the predominately dioritic Spuzzum pluton (Monger, 1989). The diorites of the Spuzzum Batholith are younger and were emplaced at 80 Ma. The Nickel belt is truncated on the west by the Harrison Lake fault and on the east by the Fraser River fault (25 Ma).

High magnetic relief occurs to over 3,500 gammas throughout the area and over the Giant Mascot deposit. Magnetite in the peridotite was observed by the Ni Syndicate geologists and was considered the probable cause of the high magnetic relief and the magnetic anomalies that they targeted. Metasediments and biotite phase diorite exhibit lower relief in the 1500 to 2000 gamma range.

PREVIOUS WORK BY THE NICKEL SYNDICATE

Previous work on the above Minfile Properties (Table 1), occurred primarily within the years from 1969 to 1975. Giant Mascot developed a Nickel Syndicate and conducted the largest single exploration program in the area (Minfile: Settler Creek). The Nickel Syndicate operated from 1969 to 1975 in the hope of discovering additional ore to expand and prolong mine operations. Following claim staking in 1969,over the present prospect area, the exploration program conducted an airborne magnetic survey (1970) which lead to the definition of significant magnetic anomalies. This lead to the definition (1971) of six target areas. Detailed ground magnetic and Turam–electromagnetic surveys were conducted on a sampling grid in conjunction with multi-media geochemical sampling (overburden, stream sediments, rock chips) and geological mapping (122 m (400 ft) separation on some lines). Two of the selected areas were diamond drilled. East of Settler Creek three diamond drill holes were emplaced to an aggregate length of 457 m (1500 ft). Southeast of Daioff Creek 17 holes were drilled to an aggregate length of over 1,219 m (4000 ft). At this site, Cu and Ni sulphides comprise weakly disseminated pyrrhotite and minor chalcopyrite. They were in part fracture controlled and hosted by pryroxenite and peridotite. Assays yielded 0.19 per cent nickel and trace copper. Drilling results did not indicate economic mineralization at either site. Therefore the program ceased in 1975.

CLAIM LOCATIONS
Figure 3 displays the claims held by others within the area as determined by the grantee on a visit to the Gold Commissioners office 1810 Blanshard St. in Victoria, in February 1999.

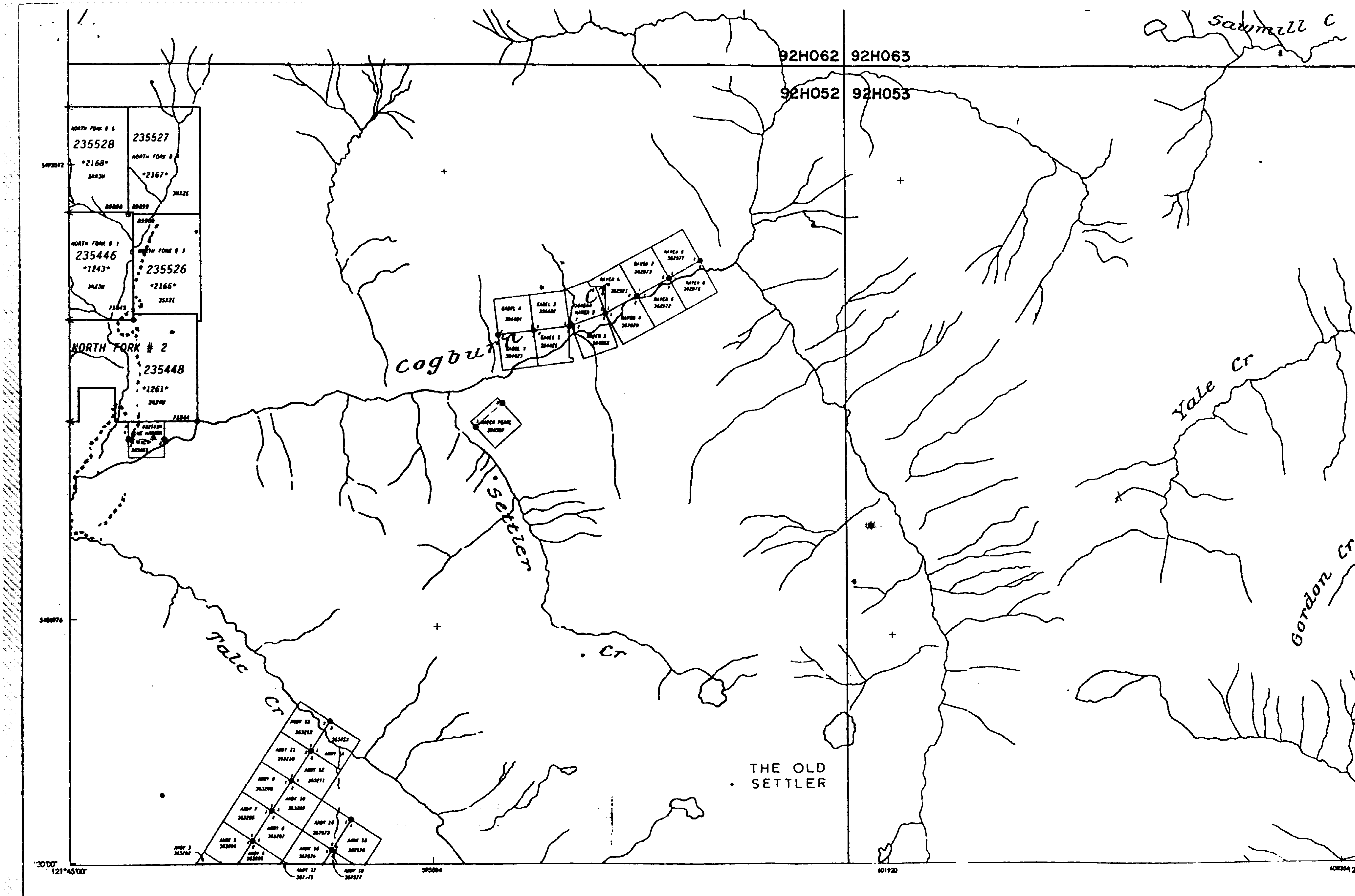
The claims groups staked by others are:
1) **North Fork 1 to 5 and Blue Harron** lying north of Cogburn Creek, north northeast of the junction of Talc and Cogburn Creek.
2) **Raven 2 to 9 and Eagel 1 to 4** lie east of Settler Creek and astride Cogburn Creek.
3) **Raven Pearl** lying on the east side of Settler Creek and the south side of Cogburn Creek at the junction of Cogburn and Settler Creeks.
4) **Andy 1 to 20** extending from Talc Creek in a south southwest direction.

PROSPECTING RESULTS 1999
As indicated in the "prospecting proposal" for this area, the 1999 project was planned as a reconnaissance program to define target areas for more detailed work in this relatively large area. Rock samples (float and outcrop) were so abundant that they were collected as the primary sample type throughout the area. Sample type, location and description were recorded on field cards. Samples from areas of favourable rock type (ultramafic intrusions) and potential Ni-Cu mineralization were collected . From these samples a suite of samples from potential exploration targets were analyzed by ICP multi element analysis. Polished thin sections were made of samples from a new Ni-Cu mineral occurrence in ultramafic rocks. The sections were used to determine if the sulphides discovered were of magmatic origin or derived from some other process such as sulphurization or hydrothermal activity. These sections were examined by an independent expert in the microscopic determination of ore minerals, Dr. J. Lusk. Claims were staked in the area where new sulfide mineralization had been discovered. Results of the above mentioned evaluations are used to evaluate the potential for economic mineralization and to define a program for the year 2000.
As a result of the discovery of a new zone of magmatic Cu and Ni bearing sulphides in hornblendite, results of this years prospecting program exceeded the grantee's expectations.

The following paragraphs describe components of the prospecting program in more detail.

Figure 3: Claim locations in the Prospect Area.

Information obtained from the Gold Commissioner's office 1810 Blanshard St. Victoria, February 1999.



Sawmill C
92H062 92H063
92H052 92H053
NORTH FORK # 2
235528
"2168"
235527
"2167"
235446
"1243"
235526
"2166"
235448
"1261"
Cogburn Cr
Settler
Cr
Yale Cr
Gordon Cr
Talc Cr
THE OLD
SETTLER
121°45'00"
121°30'00"

Access Reconnaissance
On June 15 and 16, 1999, a reconnaissance trip was made to the area. Pretty's Timber Co'.s office in Agassiz was visited and John Gow of the Company Engineering staff was contacted. He provided information and directions regarding the Bear Creek area. Bear Creek was reached by proceeding north from Agassiz to Harrison Hot Springs, at the south end of Harrison Lake, then north on a gravel road for 28 km along the East side of Harrison Lake. Pretty's Timber Co. administration office is located at a log sorting yard and airstrip referred to as Bear Creek. The yard is located on the fluvial fan deposited by Cogburn Creek. Upon obtaining a key for the gates to logging roads in the area, access to the area and familiarization with the terrain began.

The timber company was logging in the Charles Creek area in the extreme northeast portion of the prospect area; consequently the logging roads along Cogburn Creek and another along Settler Creek, off Cogburn Creek road, were open and accessible. The southwest portion of the area, known locally as South Talc was accessible by logging roads which were to be deactivated towards the end of the summer of 1999. As a result of blockage by washout and landslides across the road, the southeast trending Talc Creek valley was only passable by 4x4 truck for 4 km. The remainder of the logging road accessing this area was readily traversed by foot for 14 kilometers.

Sample Descriptions and Classifications
In the prospecting proposal, it had been suggested that various sample types could be collected. However outcrop was readily available for sampling in all areas. Because this first year was of a reconnaissance nature it was judged that the most valuable information could be collected from samples of outcrop and float. This approach will be followed by detailed multi-media sampling, where required.

Approximately, 130 samples of outcrop and float were collected and their descriptions and classifications are listed in Table 2.
During traverses, petrographic examination resulted in the identification of the following rock types:

Metasediments
Slates, phyllites, metapelites, feldspar gneiss, biotite gneiss

Quartz Veins
Primarily in metasediments

Intrusive Rocks
Basic to ultrabasic rock types
Granodiorite, diorite, gabbro, hornblendite, amphibolite, pyroxenite, lamprophyre
Acid rocks
Granite

Extrusive Rocks
Metavolcanics, rhyolite

The field card information along with other field observations and notes was used to compile a reconnaissance geology map and to assist in the selection of samples for chemical analysis.

Table 2: Field card notes listing sample descriptions and geological observations.

NO.	SAMPLER	DATE	SOURCE	GRAIN SIZE	COLOUR	ROCK NAME	DESCRIPTORS	MINERALS	REMARKS
1	DH	28-Jun	outcrop	medium	medium green	diorite	brecciated, altered	pyrite	pyrite finely disseminated
2	DH	28-Jun	outcrop	medium	medium green	metavolcanic	brecciated, fresh		
3	DH	28-Jun	outcrop	medium	pale brown	quartz vein		pyrite	
4	DH	28-Jun	outcrop	coarse	white	quartz vein	altered	pyrite	
5	DH	28-Jun	outcrop	fine	dark green	metasediment	sheared, altered	pyrite	disseminated pyrite
6	DH	28-Jun	outcrop	medium	dark green	peridotite	massive, fresh		serpentine on fracture face
7	DH	28-Jun	outcrop	medium	dark green	altered mafic	sheared, altered		strike 130 deg., 65 deg. south
8	DH	28-Jun	outcrop	coarse	dark green, brown	altered mafic	massive		
9	DH	28-Jun	outcrop	coarse	dark green	peridotite	massive, fresh		
10	DH	29-Jun	outcrop	coarse	dark green	metasediment	brecciated		
12	DH	29-Jun	outcrop	medium	dark green	metasediment	sheared		
14	DH	29-Jun	outcrop	medium	dark green	metasediment	sheared		
15	DH	29-Jun	outcrop	all sizes	black	gabbro	massive		contains xenoliths of biotite diorite
16	DH	29-Jun	outcrop	all sizes	black & white	gabbro	massive		contains xenoliths of biotite diorite
17	DH	1-Jul	outcrop	medium	brown, black	metasediment	foliated, banded, altered	pyrite	meta-arkose
18	DH	1-Jul	outcrop	coarse	white	quartz vein	altered	pyrite	
19	DH	1-Jul	outcrop	coarse	dark green	diorite-gabbro	altered		weathered & gossanous,includes 19A,B,C
20	DH	1-Jul	outcrop	coarse	medium gray	pyroxenite	massive, fresh		possible bronzite pyroxene
20A	DH	1-Jul	outcrop	medium	dark gray	diorite	massive, fresh		
21	DH	1-Jul	outcrop	medium	medium gray	granite	massive, fresh		contains garnets
22	DH	1-Jul	outcrop	fine	dark gray	metasediment	massive, sheared	pyrite	metapelite
23	DH	1-Jul	outcrop	fine	black	metasediment		pyrite	shale
24	DH	1-Jul	outcrop	medium	dark, brown, black	metasediment	banded	pyrite	banded,
25	DH	1-Jul	outcrop	medium	black	metasediment	foliated, banded, altered	pyrite	pryritiferrous shale
26	DH	1-Jul	float	coarse	dark, green, black	amphibolite	massive, altered	chalcopyrite, pyrite	road to creek not main road
27	DH	1-Jul	outcrop	coarse	black	hornblendite	massive, fresh		
28	DH	1-Jul	outcrop	medium	gray	diorite	massive, fresh		
29	DH	3-Jul	outcrop	medium	medium brown	metasediment	brecciated, altered	pyrite	1km post on Settler Creek
30	DH	3-Jul	outcrop	medium	black	hornblendite	massive, altered		Settler Creek Rd 1.3 km
31	DH	3-Jul	outcrop	coarse	green & white	peridotite	massive, altered	pyrite	Settler Creek Rd 1.3 km

32	DH	3-Jul	outcrop	medium	dark, brown, black	gabbro	banded, altered		
33	DH	3-Jul	outcrop	medium	dark, brown, black	biotite gneiss	foliated, altered	pyrite	from Al property(old claim)
34	DH	3-Jul	outcrop	medium	brown, black	biotite gneiss	sheared, altered	pyrite	
35	DH	3-Jul	outcrop	medium	dark, brown, black	biotite gneiss	sheared, banded	pyrite	from Al property(old claim)
36	DH	3-Jul	float	fine	dark gray	metavolcanic	massive, altered	pyrite	road, below Al
37	DH	4-Jul	outcrop	medium	dark green	peridotite	sheared, altered		talc alteration
41	DH	4-Jul	outcrop	medium	dark gray	diorite	sheared, altered		no visible sulphides
42	DH	4-Jul	outcrop	coarse	dark green	peridotite	sheared, altered	pyrrhotite	blebs of pentlandite or pyrrhotite
43A	DH	4-Jul	outcrop	coarse	dark green	peridotite	massive, altered	pyrrhotite	blebs of pentlandite or pyrrhotite
43	DH	6-Jul	float	fine	dark gray	metasediment	foliated, banded, altered	pyrite	at Settler Ck bridge near lake
44	DH	6-Jul	float	medium	med gray	diorite			at outlet to Settler Lake
45	DH	6-Jul	float	medium	med gray	diorite			at outlet to Settler Lake
46	DH	6-Jul	float	medium	dark gray	diorite			at outlet to Settler Lake
47	DH	6-Jul	float			hornblendite			at outlet to Settler Lake
48	DH	6-Jul	outcrop	medium	medium gray	diorite			Settler Lake avalanche north side
49	DH	6-Jul	outcrop	coarse	black & white	hornblendite	massive, altered	pyrrhotite	on road paralleling Cogburn main
50	DH	5-Jul	float	medium	medium gray	gneiss	massive, banded	pyrite	100M north of Talc bridge near Daloff
51	DH	5-Jul	float	coarse	black & white	granite	massive, altered	pyrite	
52	DH	5-Jul	float	medium	medium brown	granite	massive, altered		near Daloff bridge
53	DH	5-Jul	float	medium	medium gray	metavolcanic		pyrite	contains abundant pyrite
54	DH	5-Jul	float	fine	dark, gray, black	peridotite		pyrrhotite	blebs of pyrrhotite
55	DH	5-Jul	float	fine	medium gray	metavolcanic		pyrite	
56	DH	5-Jul	float	medium	pale, brown, gray	feldspar gneiss	banded, altered	pyrite	
57	DH	5-Jul	float	coarse	black	hornblendite		pyrite	pyrite veinlets at boulder blockage
58	DH	6-Jul	outcrop			diorite	Massive, altered	chalcopyrite, pyrrhotite	50 ft seperating 49 & 58
59	DH	6-Jul	outcrop	coarse	black & white	hornblendite	pegmatitic	chalcopyrite	chalcopyrite in place in outcrop at stream
60	DH	6-Jul	float	coarse	black & white	hornblendite	pegmatitic	chalcopyrite, pyrrhotite	
61	DH	9-Jul	outcrop	medium	black & white	granite	massive	pyrite	grains of pyrite throughout
62	DH	9-Jul	outcrop	coarse	brown, black	hornblendite	pegmatitic, altered	pyrite	from talus at road
63	DH	9-Jul	float	medium	pale, brown, gray	diorite	altered	chalcopyrite, pyrrhotite	
64	DH	9-Jul	float			diorite		chalcopyrite, pyrrhotite	diorite intrudes mafics
65	DH	9-Jul	float	coarse	black & white	hornblendite		pyrrhotite	contains po in vein and dissem.
66	DH	9-Jul	float	coarse	dark green	hornblendite		pyrrhotite	from large angular float

67	DH	9-Jul	outcrop	medium	medium gray	diorite		pyrrhotite	vein of pyrrhotite 3mm thick
68	DH	9-Jul	float	coarse	dark green	hornblendite	pegmatitic	chalcopyrite, pyrrhotite	2 foot diameter float sample,angular
69	DH	9-Jul	float	coarse	dark green	hornblendite	altered	chalcopyrite, pyrrhotite	
70	DH	9-Jul	float	coarse	dark green	hornblendite	altered	pyrrhotite	
71	DH	9-Jul	float	coarse	dark green	hornblendite	pegmatitic	pyrrhotite	
72	DH	9-Jul	float	fine	gray	hornblendite	foliated	pyrrhotite	net texture = interstitial sulphides
73	DH	9-Jul	outcrop	coarse	green & white	hornblendite	massive, altered	chalcopyrite, pyrrhotite	abundant po & cp in place
73A	DH	9-Jul	float	coarse	dark green	hornblendite	altered	chalcopyrite, pyrrhotite	below outcrop of diorite
74	DH	15-Jul	outcrop	coarse	dark green	hornblendite	massive, altered	pyrrhotite	
75	DH	15-Jul	outcrop	medium	black & white	diorite	massive, fresh	pyrrhotite	specs of po in hornblende diorite
76	DH	15-Jul	float	medium	dark gray	diorite		chalcopyrite, pyrrhotite	DH 76 & 77 same locale
77	DH	15-Jul	float	fine	dark gray	granodiorite	altered	chalcopyrite, pyrrhotite	same as 76, hornblende mafics
78	DH	15-Jul	outcrop	medium	black & white	diorite	massive	chalcopyrite, pyrrhotite	hornblende mafics
79	DH	15-Jul	outcrop	medium	dark green	hornblendite	fresh	chalcopyrite, pyrrhotite	found in blast rock fill
80	DH	17-Jul	outcrop	coarse	dark green	hornblendite	altered	pyrrhotite	
81	DH	18-Jul	float	fine	medium, green, gray	peridotite		chalcopyrite, pyrrhotite	north of Talc bridge
82	DH	18-Jul	float	medium	medium gray	peridotite	foliated	pyrrhotite	same locale as DH 81
83	DH	18-Jul	float	medium	medium gray	peridotite	sheared	chalcopyrite, pyrrhotite	same locale as DH 81
84	DH	18-Jul	float	medium	medium gray	peridotite			
85	DH	18-Jul	float	medium	medium gray	peridotite	fresh	chalcopyrite, pyrrhotite	
86	DH	18-Jul	float	medium	black & white	granite		pyrite	abundant pyrite
87	DH	18-Jul	float	medium	medium gray	peridotite	foliated	chalcopyrite	first road north of bridge
88	DH	18-Jul	float	medium	medium gray	peridotite		pyrrhotite	cont. disseminated sulphides
89	DH	18-Jul	float	medium	medium gray	peridotite		chalcopyrite, pyrrhotite	same locale as DH90
90	DH	18-Jul	float	medium	medium gray	peridotite	fresh	pyrrhotite	same locale as DH 89
91	DH	19-Jul	float	fine	medium gray	peridotite	foliated	chalcopyrite, pyrrhotite	sulphides cover fracture face
92	DH	19-Jul	float	medium	medium green	peridotite		pyrrhotite	large angular float 1.5 ft in length
93	DH	19-Jul	float	coarse	dark green gray	metasediment	sheared, foliated, altered	pyrite	large 2 ft float
94	DH	19-Jul	float	medium	dark green	peridotite	altered	pyrrhotite	same locale as DH95
95	DH	19-Jul	float	coarse	dark gray	pyroxenite	massive fresh	pyrrhotite	
96	DH	20-Jul	outcrop	fine	dark green gray	metavolcanic	foliated, altered	pyrrhotite	small cubes of disseminated pyrite
97	DH	20-Jul	outcrop	fine	white & gray	metavolcanic	massive fresh		
98	DH	20-Jul	outcrop	fine	green gray	metavolcanic	massive fresh		
99	DH	20-Jul	float	coarse	black	hornblendite	sheared, altered	pyrite	biotite hornblendite below cliff
100	DH	20-Jul	float	medium	drk grn wht	metavolcanic		pyrite	abundant pyrite throughout

101	DH	20-Jul	float	medium	white & gray	metavolcanic	foliated	pyrite	same as DH100
102	DH	21-Jul	outcrop	medium	dark green	peridotite	massive fresh		sugary texture
103	DH	21-Jul	outcrop	fine	dark green	metavolcanic	foliated, altered	pyrite	abundant pyrite not magmatic
104	DH	22-Jul	outcrop	coarse	dark green	hornblendite		chalcopyrite, pyrrhotite	at discovery site up creek
105	DH	22-Jul	outcrop	coarse	dark green white	hornblendite	altered	chalcopyrite, pyrrhotite	at discovery site up creek
106	DH	22-Jul	outcrop	coarse	dark green	hornblendite	altered	chalcopyrite, pyrrhotite	at discovery site up creek
107	DH	22-Jul	outcrop	coarse	dark green	hornblendite	altered	chalcopyrite, pyrrhotite	at discovery site up creek
108	DH	22-Jul	outcrop	coarse	dark green	hornblendite	altered	chalcopyrite, pyrrhotite	at discovery site up creek
109	DH	22-Jul	outcrop	fine	pale green	rhyolite	massive, fresh		dike cuts hornblendite
110	DH	23-Jul	float	medium	dark gray	metasediment	fractured altered	pyrite	similar to sample DH91
111	DH	23-Jul	float	medium	medium gray	peridotite	fresh	pyrrhotite	
112	DH	23-Jul	float	medium	dark green	amphibolite	sheared	pyrrhotite	
113	DH	23-Jul	float	medium	white gray	peridotite	altered	pyrrhotite	fragment frm large boulder in bank
114	DH	25-Jul	outcrop	coarse	black & white	granite	pegmatitic, altered	pyrite	granite from contact zone
115	DH	25-Jul	outcrop	fine	dark brown	metasediment	altered	pyrite	
1	JH	13-Jul	outcrop	coarse	dark green	hornblendite	altered	chalcopyrite, pyrrhotite	
2	JH	13-Jul	float	coarse	dark green	hornblendite	altered	chalcopyrite, pyrrhotite	
3	JH	13-Jul	float	coarse	dark green	hornblendite	fresh	pyrite	contains fracture filled with pyrite
4	JH	13-Jul	float	medium	medium gray	diorite		pyrite	
1	NC	15-Jun	float	fine	dark green gray	gabbro	foliated, altered	pyrite	gossanous boulder
2	NC	15-Jun	outcrop	coarse	pale green	peridotite	pegmatitic, altered		SouthTalc road Microcline sample
3	NC	15-Jun	outcrop	fine	dark green gray	metavolcanic	altered		South Talc Road 2nd switchback
4	NC	15-Jun	outcrop	medium	medium green gray	peridotite	massive fresh		
7	NC	15-Jun	outcrop	coarse	black & white	granite	massive fresh		similar to Coast Range granite
8	NC	15-Jun	outcrop	coarse	black	lamprophyre.	massive fresh		
9	NC	15-Jun	outcrop	fine	dark gray	metavolcanic	massive, banded, fresh		
10	NC	15-Jun	outcrop	medium	black	hornblendite	massive fresh		0.2km west of Settler Creek Rd.
11	NC	15-Jun	outcrop	coarse	black	hornblendite	massive fresh	chalcopyrite	0.2km west of Settler Creek Rd.
12	NC	15-Jun	outcrop	coarse	black	hornblendite	massive fresh		

Chemical Analyses of Selected Samples

Fifty-five rock samples were sent to ACME Analytical Laboratories Ltd., in Vancouver, for chemical analyses. Twenty-nine of the samples were submitted for 30 element ICP analysis including nickel, copper, zinc and chromium. Twenty samples were submitted for 30 element ICP analysis and fire geochemical analysis for Au, Pt, and Pd. Six samples were submitted for 30 element ICP analysis and wet geochemical analysis for Au.

Table 3 lists the results of the geochemical analysis of all samples submitted for analysis. As has been mentioned above, the elements of primary interest are Cu, Ni, Pt, and Pd. However, the multi-element ICP analysis provides information important to rock classification and also to detect anomalous element concentrations from other sources other than the ultramafic intrusions.

No massive sulphides were sampled in the area. However, many float samples and some outcrop samples showing gossanous surfaces or containing disseminated sulphides were collected. Because sulphides in the samples found were disseminated, no high values of elements of economic interest were expected. However, Ni and Cu found in sulphides in float or outcrop would define areas where these elements occurred in sulphides as opposed to silicates. Such areas are worthy of additional evaluation. This is particularly important considering that review of the assessment work suggests that the Ni syndicate, between 1969 and 1974, was not able to find any surface sulphides other than in one road cut. Assessment reports indicate that they assumed that if Ni and Cu anomalies were not coincident, that anomalous Ni values could be due to Ni in silicates.

Examination of the chemical analyses indicated the following aspects:
Maximum values in samples are listed below:
Ni : 2244 ppm (0.22%)in sample DH113 (peridotite containing pyrrhotite),
Cu: 1993 ppm (0.20 %) in sample DH76 (diorite containing chalcopyrite and pyrrhotite),
Cr: 1443 ppm (0.14 %)in sample DH37, (altered peridotite),
Zn: 215 ppm in sample DH103 (metavolcanic containing abundant pyrite),
Pt and Pd: 84 and 116 ppb in sample DH8 (altered mafic),
Au: 35 ppb in sample DH76 (diorite containing chalcopyrite and pyrrhotite).

Although none of these analyses are unusually high, sulphides are present, in these samples, for all chalcophile elements above. When samples contain high values of these elements in conjunction with the presence of magmatic sulphides, the element values in these samples and similar samples are considered anomalous and therefore warrant additional prospecting in the area where sampling occurred.

Some samples such as 19A, B and C (diorite-gabbro) were anomalous in Ni and Cr values but showed no visible sulphides. There is a possibility that such samples may contain Ni in silicates. Thin section study of such samples is warranted to evaluate this aspect. Some samples such as DH 42 are anomalous with respect to Ni (1023 ppm) and Cr (904 ppm) but are low in Cu (20 ppm). Nevertheless, here Ni may occur in sulphides if visible pyrrhotite was seen in the petrographic sample. Clearly there is a wide range of Ni:Cu ratios in these samples.

Table 3: Geochemical analysis of selected samples.

ACME ANALYTICAL LABORATORIES LTD. 852 E. HASTINGS ST. VANCOUVER BC V6A 1R6 PHONE(604)253-3158 FAX(604)253-1716
(ISO 9002 Accredited Co.)

GEOCHEMICAL ANALYSIS CERTIFICATE

Haughton, David R. PROJECT Project 2, 1999 File # 9902655

2760 Dooley Road, Saanichton BC V8M 1Y5 Submitted by: David R. Haughton

SAMPLE#	Mo ppm	Cu ppm	Pb ppm	Zn ppm	Ag ppm	Ni ppm	Co ppm	Mn ppm	Fe %	As ppm	U ppm	Au ppm	Th ppm	Sr ppm	Cd ppm	Sb ppm	Bi ppm	V ppm	Ca %	P %	La ppm	Cr ppm	Mg %	Ba ppm	Ti %	B ppm	Al %	Na %	K %	W ppm
DH 1	1	10	<3	10	<.3	17	14	398	1.10	5	<8	<2	<2	15	<.2	<3	<3	25	.63	.006	<1	16	.39	16	.09	<3	.86	.02	<.01	2
DH 9	<1	12	4	17	<.3	1446	74	656	5.33	6	<8	<2	<2	<1	.5	<3	<3	29	.02	.002	<1	1072	10.97	<1	.01	24	.21	<.01	<.01	<2
DH 15	1	19	3	56	<.3	28	13	552	3.14	8	<8	<2	<2	56	.3	<3	<3	73	.87	.052	5	48	1.27	138	.20	<3	2.15	.23	1.06	4
DH 19A	1	5	<3	9	<.3	1140	60	457	2.36	6	<8	<2	<2	<1	.3	<3	<3	6	.40	.002	<1	724	15.33	<1	<.01	10	.06	<.01	<.01	<2
DH 19B	<1	10	<3	6	<.3	1602	75	639	3.51	33	<8	<2	<2	3	.5	<3	<3	6	.35	.003	<1	219	20.52	7	<.01	75	.06	<.01	<.01	<2
DH 19C	1	40	<3	12	<.3	1519	91	985	4.29	9	<8	<2	<2	<1	.6	<3	<3	11	.14	.002	<1	706	22.24	<1	<.01	23	.07	<.01	<.01	2
DH 20	1	280	<3	7	<.3	259	74	62	2.80	<2	<8	<2	<2	7	<.2	<3	<3	37	.25	.015	<1	96	.73	86	.03	<3	.41	.03	.14	<2
DH 26	1	219	3	16	<.3	194	32	129	1.64	<2	<8	<2	<2	13	.4	<3	<3	33	.64	.052	1	116	.91	19	.10	<3	.65	.06	.02	<2
DH 28	2	31	<3	39	<.3	21	12	136	1.82	3	<8	<2	<2	61	.3	<3	<3	50	1.11	.246	1	17	.61	87	.05	<3	1.25	.13	.14	2
DH 31	1	221	<3	11	<.3	269	43	79	1.62	<2	<8	<2	<2	6	.2	<3	<3	25	.29	.004	<1	113	.62	13	.03	<3	.36	.03	.01	<2
DH 32	1	123	<3	10	<.3	84	38	71	1.80	2	<8	<2	<2	135	.5	<3	<3	33	.51	.015	1	128	.67	42	.12	<3	.70	.02	.09	<2
DH 37	<1	27	<3	22	<.3	906	66	624	3.09	8	<8	<2	<2	4	.2	<3	<3	28	.08	.011	1	1443	9.77	13	.01	6	.51	<.01	<.01	<2
DH 42	<1	20	<3	6	<.3	1023	81	1129	3.05	8	<8	<2	<2	1	.4	<3	3	15	.09	.003	<1	904	11.45	<1	<.01	19	.22	<.01	<.01	<2
DH 50	3	64	<3	49	.3	31	14	412	3.97	11	<8	<2	3	94	.3	<3	<3	96	1.38	.080	5	30	1.29	141	.03	<3	3.35	.28	.37	3
DH 54	1	136	9	24	.3	28	19	204	1.95	9	<8	<2	<2	272	.6	<3	<3	50	5.95	.001	<1	11	.71	78	.03	9	7.25	.36	.07	<2
DH 58	1	108	<3	27	<.3	19	20	185	2.30	<2	<8	<2	<2	61	.4	<3	<3	53	1.15	.178	2	13	.69	29	.07	<3	1.41	.19	.04	2
DH 62	<1	117	3	21	<.3	37	26	98	2.21	6	<8	<2	<2	400	.3	<3	<3	83	3.57	.021	1	24	.46	57	.05	5	5.27	.75	.08	<2
DH 63	1	75	3	13	.4	99	24	104	1.77	6	<8	<2	<2	591	.7	<3	<3	56	6.05	<.001	2	35	.20	54	.05	<3	8.33	1.26	.03	2
DH 64	9	175	5	25	<.3	97	32	129	2.39	2	<8	<2	<2	100	.5	<3	<3	74	.92	.004	1	49	.42	51	.05	<3	2.11	.29	.04	<2
RE DH 64	5	178	<3	27	<.3	100	32	135	2.44	3	<8	<2	<2	100	.6	<3	<3	75	.93	.003	1	49	.43	51	.05	<3	2.10	.30	.04	<2
DH 71	1	114	<3	13	<.3	80	18	95	1.69	2	<8	<2	<2	15	<.2	<3	<3	46	.50	.028	1	83	.62	19	.06	<3	.62	.07	.02	<2
DH 80	<1	95	<3	12	<.3	32	14	138	1.58	<2	<8	<2	<2	14	.3	<3	<3	34	.64	.012	<1	119	.99	70	.04	<3	.59	.07	.01	<2
DH 81	1	27	<3	28	<.3	1946	135	767	4.37	71	<8	<2	<2	<1	.4	<3	<3	7	.02	.003	1	491	22.74	7	<.01	46	.15	.01	<.01	2
DH 94	<1	33	<3	16	<.3	2200	85	422	4.00	10	<8	<2	<2	3	<.2	<3	<3	24	.27	.001	<1	1096	8.13	47	<.01	8	.29	<.01	<.01	<2
DH 99	1	371	<3	14	<.3	37	73	182	4.42	4	<8	<2	<2	13	.4	<3	<3	138	.86	<.001	<1	12	1.01	7	.08	3	1.33	.09	.02	<2
DH 103	4	266	<3	215	.3	45	18	269	2.90	2	<8	<2	<2	6	.4	3	<3	60	.98	.053	1	45	.84	32	.21	<3	1.00	.09	.11	<2
DH 105	1	197	<3	35	<.3	282	55	236	2.62	<2	<8	<2	<2	22	.6	<3	<3	50	.49	.007	1	307	2.24	83	.05	3	.56	.08	.02	<2
DH 107	1	573	<3	11	<.3	408	120	65	3.69	5	<8	<2	<2	5	<.2	<3	4	38	.19	.011	1	160	1.01	10	.02	<3	.56	.04	.01	<2
DH 112	1	444	<3	17	.7	36	64	380	6.93	13	<8	<2	<2	93	.9	<3	<3	275	2.88	<.001	1	40	1.15	17	.12	5	3.46	.35	.04	<2
DH 113A	2	1283	<3	14	.5	61	65	190	3.48	3	<8	<2	<2	43	.5	<3	<3	47	1.38	.007	1	14	.79	16	.03	5	1.60	.13	.03	2
STANDARD C3	26	64	32	164	5.5	37	12	786	3.46	56	20	4	20	31	24.4	20	25	78	.58	.090	18	167	.57	149	.08	17	1.91	.04	.16	15
STANDARD G-2	2	3	<3	43	<.3	7	5	550	2.09	<2	<8	<2	4	75	.3	<3	<3	41	.66	.099	7	78	.59	234	.13	<3	.98	.07	.51	<2

ICP - .500 GRAM SAMPLE IS DIGESTED WITH 3ML 2-2-2 HCL-HNO3-H2O AT 95 DEG. C FOR ONE HOUR AND IS DILUTED TO 10 ML WITH WATER.
THIS LEACH IS PARTIAL FOR MN FE SR CA P LA CR MG BA TI B W AND MASSIVE SULFIDE AND LIMITED FOR NA K AND AL.
ASSAY RECOMMENDED FOR ROCK AND CORE SAMPLES IF CU PB ZN AS > 1%, AG > 30 PPM & AU > 1000 PPB
- SAMPLE TYPE: ROCK <u>Samples beginning 'RE' are Reruns and 'RRE' are Reject Reruns.</u>

DATE RECEIVED: AUG 3 1999 **DATE REPORT MAILED:** Aug 11/99 **SIGNED BY**.............D. TOYE, C.LEONG, J. WANG; CERTIFIED B.C. ASSAYERS

 Data ___ FA ___

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GEOCHEMICAL ANALYSIS CERTIFICATE

Haughton, David R. PROJECT Project 2, 1999 File # 9902656

2760 Dooley Road, Saanichton BC V8M 1Y5 Submitted by: David R. Haughton

SAMPLE#	Mo ppm	Cu ppm	Pb ppm	Zn ppm	Ag ppm	Ni ppm	Co ppm	Mn ppm	Fe %	As ppm	U ppm	Au ppm	Th ppm	Sr ppm	Cd ppm	Sb ppm	Bi ppm	V ppm	Ca %	P %	La ppm	Cr ppm	Mg %	Ba ppm	Ti %	B ppm	Al %	Na %	K %	W ppm	Au** ppb	Pt** ppb	Pd** ppb
DH 6	<1	7	3	11	<.3	2015	82	826	4.33	16	<8	<2	<2	1	.4	<3	12	13	.23	.002	1	697	15.62	4	<.01	42	.08	.01	<.01	<2	1	7	6
DH 8	<1	711	<3	3	<.3	375	49	84	1.85	6	<8	<2	<2	2	.3	<3	3	17	.14	.001	<1	533	1.14	170	.01	5	.56	<.01	<.01	<2	2	84	116
DH 49	1	178	4	12	<.3	126	31	106	1.60	2	<8	<2	<2	55	.4	<3	3	25	1.03	.030	1	62	.52	26	.06	5	1.23	.09	.03	<2	<1	2	2
DH 57	1	158	4	17	<.3	3	37	270	4.27	4	<8	<2	<2	24	<.2	<3	<3	149	1.23	<.001	<1	8	.90	16	.10	<3	1.69	.14	.03	<2	<1	<1	2
DH 60	1	146	<3	14	<.3	159	24	125	1.65	<2	<8	<2	<2	11	<.2	<3	<3	32	.52	.007	<1	122	.93	26	.06	3	.56	.07	.01	<2	1	3	1
DH 65	1	165	6	29	.4	33	21	235	2.14	2	<8	<2	<2	328	<.2	<3	<3	65	3.14	.018	1	30	.78	40	.11	<3	4.25	.65	.03	<2	3	2	2
DH 68	<1	1607	<3	17	.4	1176	328	108	10.73	2	<8	<2	<2	15	<.2	<3	11	42	.47	.006	1	196	1.26	14	.06	3	.98	.12	.02	<2	18	3	2
DH 69	1	85	<3	11	<.3	64	20	99	1.71	<2	<8	<2	<2	11	<.2	<3	<3	45	.43	.010	<1	140	1.13	13	.05	<3	.73	.07	.01	<2	<1	2	2
DH 70	1	623	<3	15	<.3	546	79	102	2.85	<2	<8	<2	<2	9	<.2	<3	<3	34	.49	.024	1	95	.66	13	.05	4	.38	.07	.01	<2	8	2	3
DH 72	2	874	3	20	<.3	698	176	110	8.47	3	<8	<2	<2	57	<.2	<3	<3	49	.71	.078	1	104	.57	20	.04	4	.67	.13	.01	<2	15	7	4
DH 73	1	394	9	15	<.3	168	48	134	2.62	4	<8	<2	<2	107	1.1	<3	<3	47	1.18	.011	1	46	.88	26	.07	<3	1.66	.21	.04	<2	5	<1	7
DH 88	1	266	<3	4	<.3	731	52	110	2.16	3	<8	<2	<2	2	<.2	<3	<3	5	.16	.002	<1	108	.63	7	<.01	4	.11	.02	<.01	<2	1	10	12
DH 89	2	79	<3	11	.3	21	16	121	2.15	<2	<8	<2	<2	200	.2	4	<3	15	3.95	.094	5	16	.06	40	.07	<3	5.14	.45	.03	3	4	2	1
RE DH 89	2	81	<3	12	<.3	19	16	112	2.18	4	<8	<2	<2	203	<.2	3	<3	16	4.02	.096	6	17	.07	47	.07	<3	5.21	.46	.03	3	2	1	<1
DH 104	1	187	<3	9	<.3	226	50	94	1.94	4	<8	<2	<2	12	<.2	<3	<3	39	.46	.013	1	127	1.10	29	.04	3	.66	.07	.03	<2	2	4	6
DH 106	1	153	<3	10	<.3	224	36	143	1.70	2	<8	<2	<2	17	.2	<3	<3	23	.48	.014	<1	104	1.24	35	.03	<3	.30	.06	.05	2	1	3	2
DH 108	1	272	<3	11	<.3	332	49	161	2.18	<2	<8	<2	<2	19	.2	<3	<3	31	.49	.009	1	137	1.35	38	.04	<3	.36	.07	.04	2	1	<1	1
DH 111	<1	200	4	16	<.3	1866	102	770	5.60	21	<8	<2	<2	3	<.2	<3	10	9	.16	.002	<1	438	19.29	24	<.01	18	.16	<.01	<.01	<2	2	7	6
DH 113	2	12	<3	21	<.3	2244	103	662	4.79	5	<8	<2	<2	1	<.2	<3	7	2	.01	.002	<1	73	23.88	7	<.01	31	.02	<.01	<.01	2	<1	4	4
JH 01	<1	447	7	14	<.3	308	80	128	4.37	2	<8	<2	<2	13	<.2	<3	<3	46	.67	.053	1	91	.88	13	.06	<3	.46	.07	.01	<2	8	3	5
JH 02	1	697	3	15	<.3	199	84	150	5.34	2	<8	<2	<2	27	<.2	<3	<3	43	1.32	.337	6	43	.82	13	.06	<3	.54	.10	.02	<2	18	4	14
STANDARD C3/FA100	27	69	38	174	5.7	37	13	827	3.70	58	16	3	21	31	25.1	20	26	83	.59	.094	19	182	.61	166	.09	22	2.01	.04	.17	16	48	49	50
STANDARD G-2	2	3	9	43	<.3	6	4	557	2.12	<2	<8	<2	4	75	.2	<3	<3	41	.66	.101	8	80	.59	235	.13	<3	.98	.07	.51	<2	<1	<1	<1

ICP - .500 GRAM SAMPLE IS DIGESTED WITH 3ML 2-2-2 HCL-HNO3-H2O AT 95 DEG. C FOR ONE HOUR AND IS DILUTED TO 10 ML WITH WATER.
THIS LEACH IS PARTIAL FOR MN FE SR CA P LA CR MG BA TI B W AND MASSIVE SULFIDE AND LIMITED FOR NA K AND AL.
ASSAY RECOMMENDED FOR ROCK AND CORE SAMPLES IF CU PB ZN AS > 1%, AG > 30 PPM & AU > 1000 PPB
- SAMPLE TYPE: ROCK AU** PT** PD** BY FIRE ASSAY & ANALYSIS BY ULTRA/ICP. (30 gm)
Samples beginning 'RE' are Reruns and 'RRE' are Reject Reruns.

DATE RECEIVED: AUG 3 1999 DATE REPORT MAILED: Aug 11/99 SIGNED BY. D. Toye ...D. TOYE, C.LEONG, J. WANG; CERTIFIED B.C. ASSAYERS

Data / FA ____

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(ISO 9002 Accredited Co.)

GEOCHEMICAL ANALYSIS CERTIFICATE

Haughton, David R. PROJECT Project 2, 1999 File # 9902657

2760 Dooley Road, Saanichton BC V8M 1Y5 Submitted by: David R. Haughton

SAMPLE#	Mo ppm	Cu ppm	Pb ppm	Zn ppm	Ag ppm	Ni ppm	Co ppm	Mn ppm	Fe %	As ppm	U ppm	Au ppm	Th ppm	Sr ppm	Cd ppm	Sb ppm
DH 76	3	1993	11	23	1.8	89	109	105	12.07	<2	<8	<2	<2	272	.2	<3
DH 86	2	175	12	22	.9	21	17	227	5.00	28	<8	<2	2	107	.4	<3
DH 91	1	770	8	25	.7	17	35	195	4.30	7	<8	<2	<2	11	.5	3
DH 92	1	338	18	14	.8	20	37	153	3.47	<2	<8	<2	<2	38	.7	<3
DH 93	2	72	17	104	.5	38	23	459	4.96	<2	<8	<2	<2	131	.6	<3
DH 110	2	192	5	15	.6	19	35	158	5.34	5	<8	<2	<2	71	.4	<3
RE DH 110	2	187	6	15	.6	20	35	155	5.26	3	<8	<2	<2	69	<.2	<3
STANDARD C3/AU-R	28	62	37	175	6.0	34	12	819	3.65	57	20	3	21	30	25.1	21

SAMPLE#	Bi ppm	V ppm	Ca %	P %	La ppm	Cr ppm	Mg %	Ba ppm	Ti %	B ppm	Al %	Na %	K %	W ppm	Au* ppb
DH 76	<3	76	3.69	.070	1	118	.10	74	.07	3	5.18	.63	.03	4	35
DH 86	<3	137	1.54	.059	4	61	1.60	214	.29	<3	3.67	.56	1.00	3	6
DH 91	4	57	1.43	.192	1	9	.56	20	.27	<3	1.06	.09	.02	4	9
DH 92	<3	21	1.88	.087	2	10	.31	41	.16	<3	2.19	.31	.03	2	1
DH 93	3	144	1.93	.070	2	102	1.56	177	.22	<3	4.23	.58	.80	3	3
DH 110	6	51	1.42	.134	6	7	.48	35	.20	<3	1.71	.33	.09	2	3
RE DH 110	<3	50	1.39	.134	5	7	.47	24	.20	<3	1.68	.32	.09	3	2
STANDARD C3/AU-R	28	82	.59	.091	18	177	.60	155	.09	19	1.98	.05	.18	18	497

ICP - .500 GRAM SAMPLE IS DIGESTED WITH 3ML 2-2-2 HCL-HNO3-H2O AT 95 DEG. C FOR ONE HOUR AND IS DILUTED TO 10 ML WITH WATER.
THIS LEACH IS PARTIAL FOR MN FE SR CA P LA CR MG BA TI B W AND MASSIVE SULFIDE AND LIMITED FOR NA K AND AL.
ASSAY RECOMMENDED FOR ROCK AND CORE SAMPLES IF CU PB ZN AS > 1%, AG > 30 PPM & AU > 1000 PPB
- SAMPLE TYPE: ROCK AU* - IGNITED, AQUA-REGIA/MIBK EXTRACT, GF/AA FINISHED. (10 gm)
Samples beginning 'RE' are Reruns and 'RRE' are Reject Reruns.

DATE RECEIVED: AUG 3 1999 DATE REPORT MAILED: Aug 11/99 SIGNED BY ....D. TOYE, C.LEONG, J. WANG; CERTIFIED B.C. ASSAYERS

 Data ___ FA ___

A new mineral occurrence containing Ni and Cu in sulphides was located. Samples DH105, 107, 108 and JH1 (hornblendites) contain anomalous Ni, Cu, Co and Cr values. In addition, chalcopyrite and pyrrhotite were observed in hand specimens. Such specimens of these samples also showed net or interstitial textures in hornblendites similar to that described by geologists from the Giant Mascot Mine ("lacy texture"). Portions of three of these samples (DH68, DH72, JH1) were used to produce polished thin sections to determine if the sulphides were of magmatic origin as were the sulphides of the Giant Mascot mine.

Aho (1952) writes: "The northeastern half of the stock (at Giant Mascot) consists of pyroxenites and peridotites which are barren and contain little or no hornblende. (Note: Aho writes (1952) "all rocks containing about 10 to 90% hornblende are grouped together as hornblendic pyroxenites".) "The southwestern half of the stock, on the other hand is a highly variable hornblendic assemblage of peridotites and pyroxenites which are mineralized and contain all the known orebodies". This is encouraging information as the claim area contains hornblendites and disseminated sulphides. Aho (1952) further states, in reference to mineralized peridotites,: "The finely disseminated sulfides form isolated, widely scattered grains between silicates as they do in pyroxenites. This type of mineralization is widespread in the southwest half of the stock and does not indicate anything except *that sulfides have been concentrated somewhat in this general area. ....the grade of this mineralization* varies from less than 0.1 % (1000ppm) to about 0.2% (2000ppm)". Based on Aho's observation, the possibility may exist that the disseminated sulphides, found on the JASON claims, may indicate that more sulphide bearing rocks with greater percentages of Ni and Cu bearing sulphides may exist in the claim area.

Polished Thin Section Examination

Examination (J. Lusk, Ph.D., petrologic report, Appendix I) of polished thin sections shows evidence that sulphides from the claim area (Figure 12) are magmatic in origin. The photomicrographs clearly show sharp grain boundaries between pyrite, pyrrhotite, chalcopyrite, and pentlandite. Pentlandite grains and exsolution textures showing flame texture where pentlandite has exsolved from pyrrhotite are indicative that nickel is contained in sulphides rather than just in silicate minerals. Textures showing sulphides interstitial to silicate phases are clearly shown. In addition, circular cross sections of sulphides show clearly that immiscible sulphide globules have been trapped during quenching from a sulphur-saturated melt. These textural relationships are similar to those seen at Sudbury where sulphides are magmatic in origin. Consequently, the mineralogy and textural relationships confirm that the mineralogy at the site of the new sulphide occurrence is not secondary mineralization resulting from reactions with sulphur bearing sediments, but that the sulphide phases are magmatic in origin.

Reconnaissance Geology Map and Sample Location

The prospecting proposal included a map and geological explanation compiled from work by Eastwood (1971). In the preparation of his map Eastwood had used geological maps prepared by geologists of the Giant Mascot and the Nickel Syndicate. At the time of their work, no roads were mapped on the south side of Cogburn Creek west of Settler Creek. In addition, no logging roads *traversed the length of Settler Creek to The Old Settler mountain. During prospecting in 1999, for* this project, old logging roads provided access to portions of the south side of Cogburn Creek and rocks could be examined along the east side of Settler Creek. Some of the area directly west of the Old Settler was also accessible as a result of new logging roads recently established.

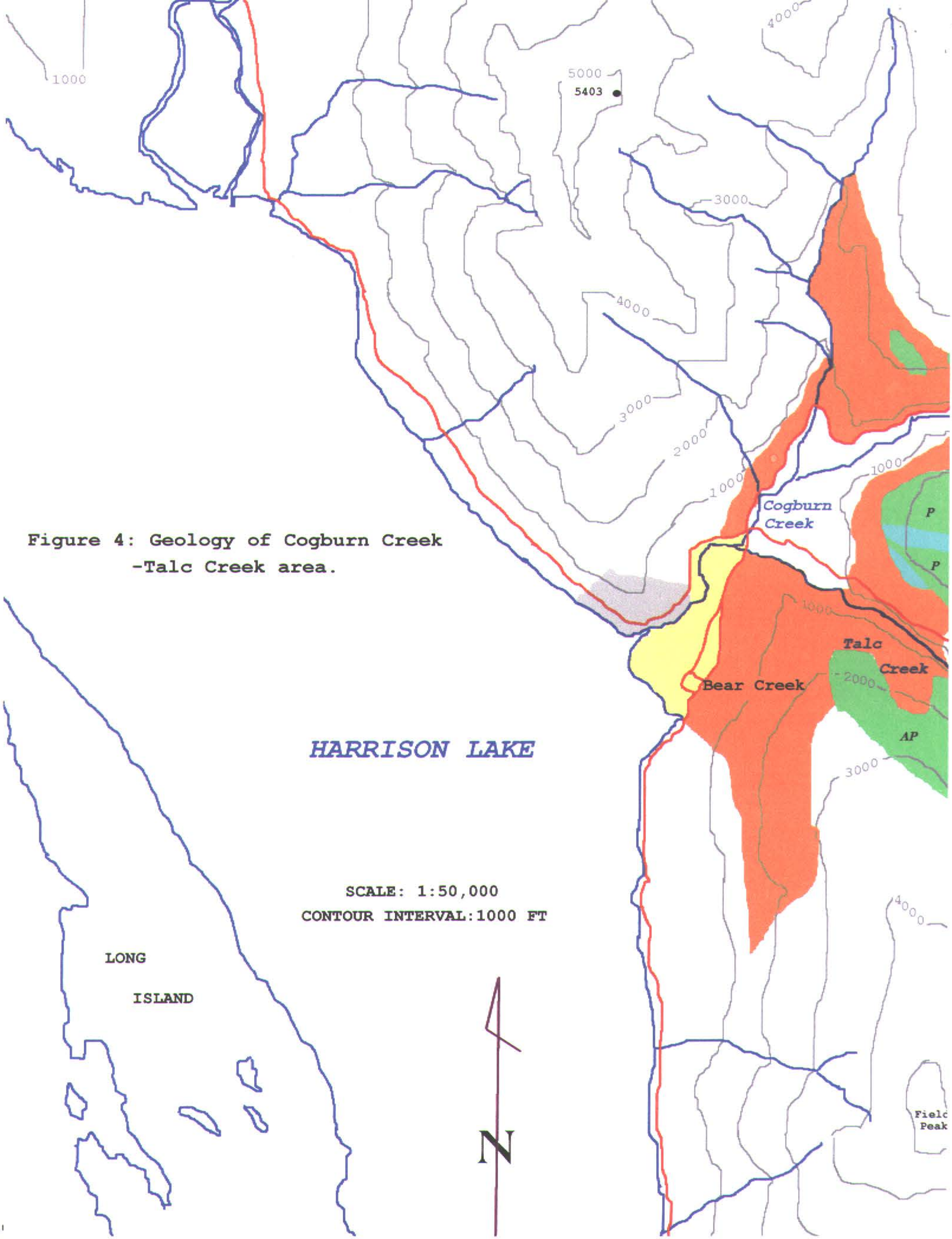
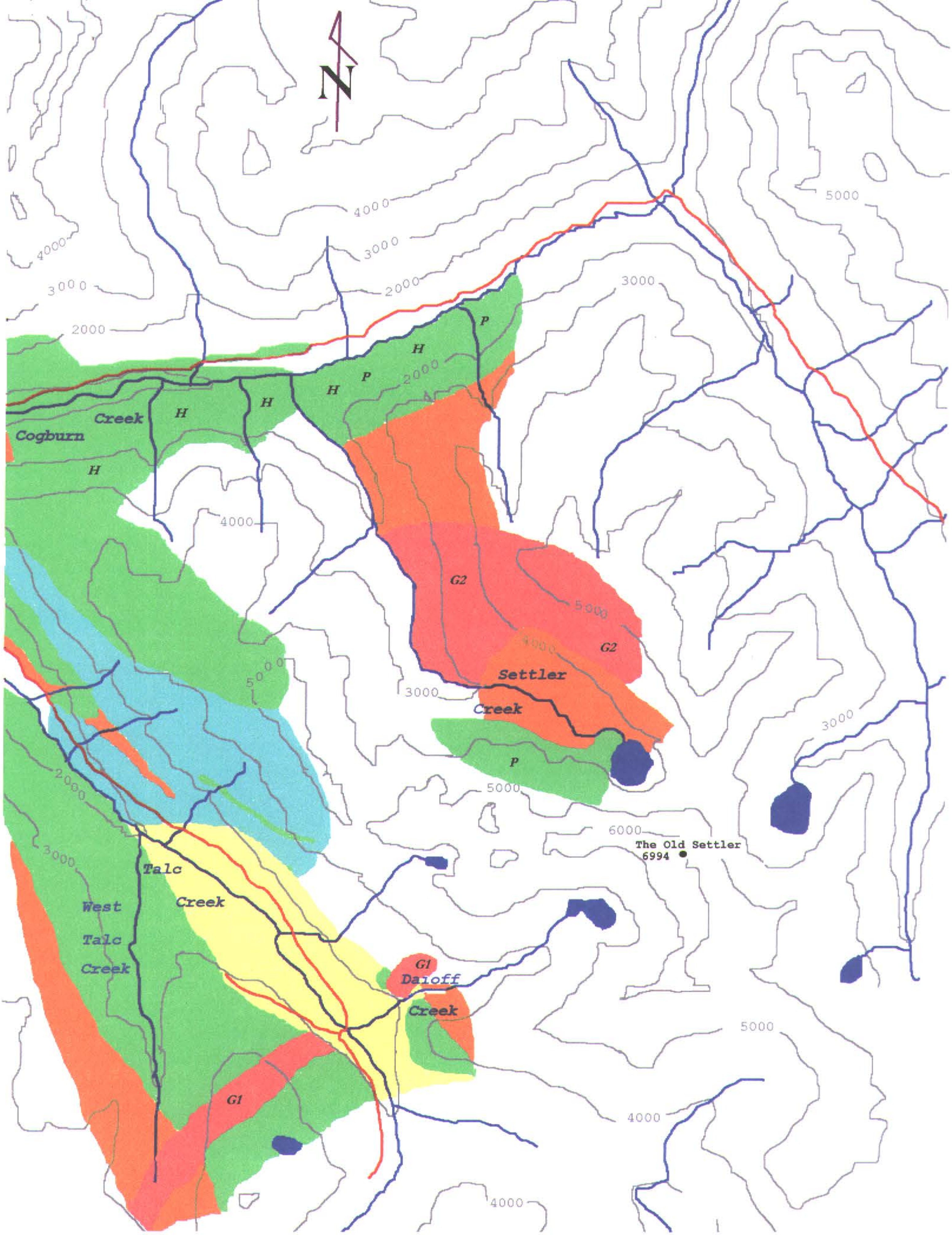


Figure 4: Geology of Cogburn Creek -Talc Creek area.



N
4000
3000
2000
5000
Cogburn
Creek
H
P
G2
Settler
Creek
6000
The Old Settler
6994
Talc
Creek
West
Talc
Creek
G1
Daioff
Creek

EXPLANATION: GEOLOGY TALC-COGBURN CREEK AREA

Recent and Quaternary Deposits

Alluvium or fluvial deposits, colluvium, glaciofluvial deposits, glacial till

Cenezoic: Tertiary Oligocene

G1

Granite, quartz diorite, diorite -Monger's Ogd (Chilliwack Batholith Granodiorite).

Mesozoic: Late Cretaceous to Cenezoic: Early Tertiary

Granodiorite, Granite, biotite - quartz diorite -Biotite-quartz diorite is light grey in colour similar to the diorite of the Coast Range intrusion. Mafics are biotite and chlorite instead of hornblende.

Mesozoic: Early to Late Cretaceous

G2

Quartz diorite and granodiorite -Monger's Kqd (Spuzzum Pluton), Early and Middle Cretaceous.

Ultramafic Rocks of the Nickel Belt (90 to 120 Ma)

H

Hornblendite, gabbro, diorite

P

Peridotite, pyroxenite, gabbro, diorite, some dunite

AP

Altered pyroxenite and peridotite -Monger's Pmu.

Paleozoic: Carboniferous or Permian(Chilliwack Group)

Metasedimentary rocks: include argillite, slate, phyllite. -Slate and phyllite contain abundant disseminated pyrite.

Metavolcanic rocks

Eastwood suggests these are metavolcanic rocks because of fine grain size.

Monger suggests metadiorite of the Yellow Aster Complex, (PPy) includes Baird Diorite of Settler Mountain.

This enabled significant additions to the geological map presented in the prospecting proposal. The resulting map is presented in Figure 4. Sample location maps were prepared by tracing locations of rivers, lakes and logging roads from air photos. These maps are presented in figures 5 to 11.

Ore Dogs in Sulphide Exploration

In 1962, Dr. A. Kahma of the Geological Survey of Finland initiated the use of dogs to detect weathered sulphide bearing boulders. Since that time, dogs were trained in Finland, Sweden and Russia to detect sulphides during prospecting programs. Reports indicate that the governments of Finland and Sweden used dogs for about 20 years with great success. In 1972, J. Brock of Dynasty Exploration reported on the results of a program initiated in Canada in 1970 to train dogs to locate sulphide mineralization. The program was financed by Falconbridge Nickel Mines Ltd., Kennco Explorations (Western) Ltd., El Paso Mining and Milling Co., and Dynasty Explorations Ltd. Brock concluded that dogs could be used with success to locate sulphide bearing rocks if environmental conditions were favourable. Unfortunately, although some initial success was obtained in this Canadian program, the program was discontinued following the premature death of the two dogs trained for this study.

As part of the preparation for prospecting the project area, the grantee trained an Alsatian dog as an "ore dog". After initial reconnaissance of the prospect area, and after target areas were defined for prospecting, the ore dog was brought into the area and used as part of the prospecting team. Subsequently, the dog played an important role in detecting mineralized boulders that lead to the staking of 12 claims. It is anticipated that next year, the dog will be of great benefit in locating additional mineralization in the area, particularly as much of the area staked is heavily forested and covered by till and colluvium.

Claims staked by Grantee

As a result of the discovery of a new showing of sulphide mineralization which contained chalcopyrite and pyrrhotite containing Ni (dimethylglyoxime test applied in the field) 12 mineral claims were staked. These claims cover an area of mineralization that is located in hornblendites in outcrop and float extending intermittently over a distance of approximately 2000 metres. The location of the claims is illustrated in Figure 12. The justification of staking the claims was later confirmed by ICP analysis that indicated anomalous values of Cu, Ni and Cr in outcrop and float. The claim staking was also justified by examination of polished thin sections that identified pyrite, chalcopyrite, pyrrhotite, and pentlandite of magmatic origin. The mineralization located may extend in a crescent shape around a magnetic anomaly at higher elevation. The area of the magnetic anomaly has not yet been evaluated, as it is heavily forested and not readily accessible. This area should be evaluated in future work.

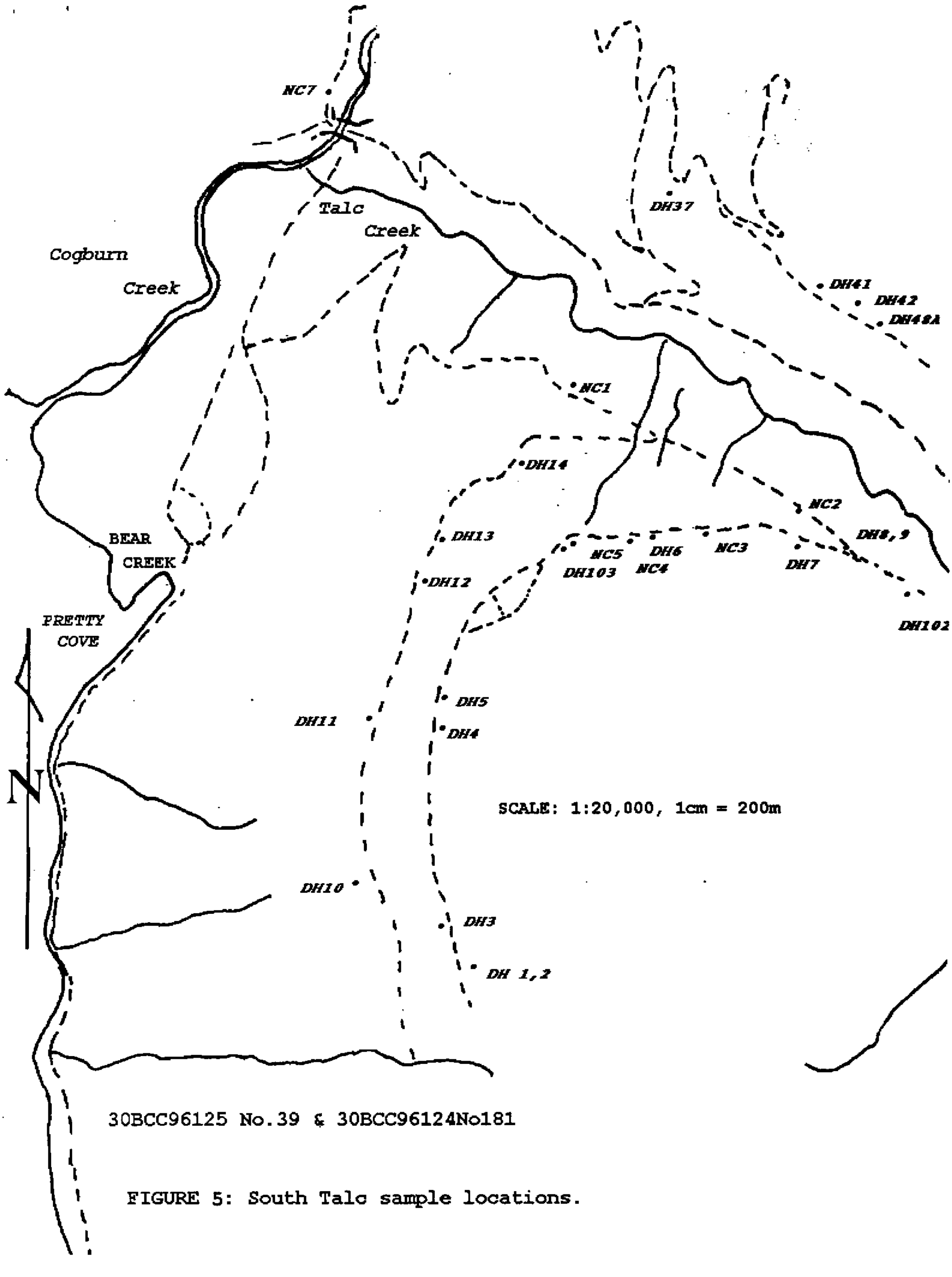


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FIGURE 5: South Talc sample locations.

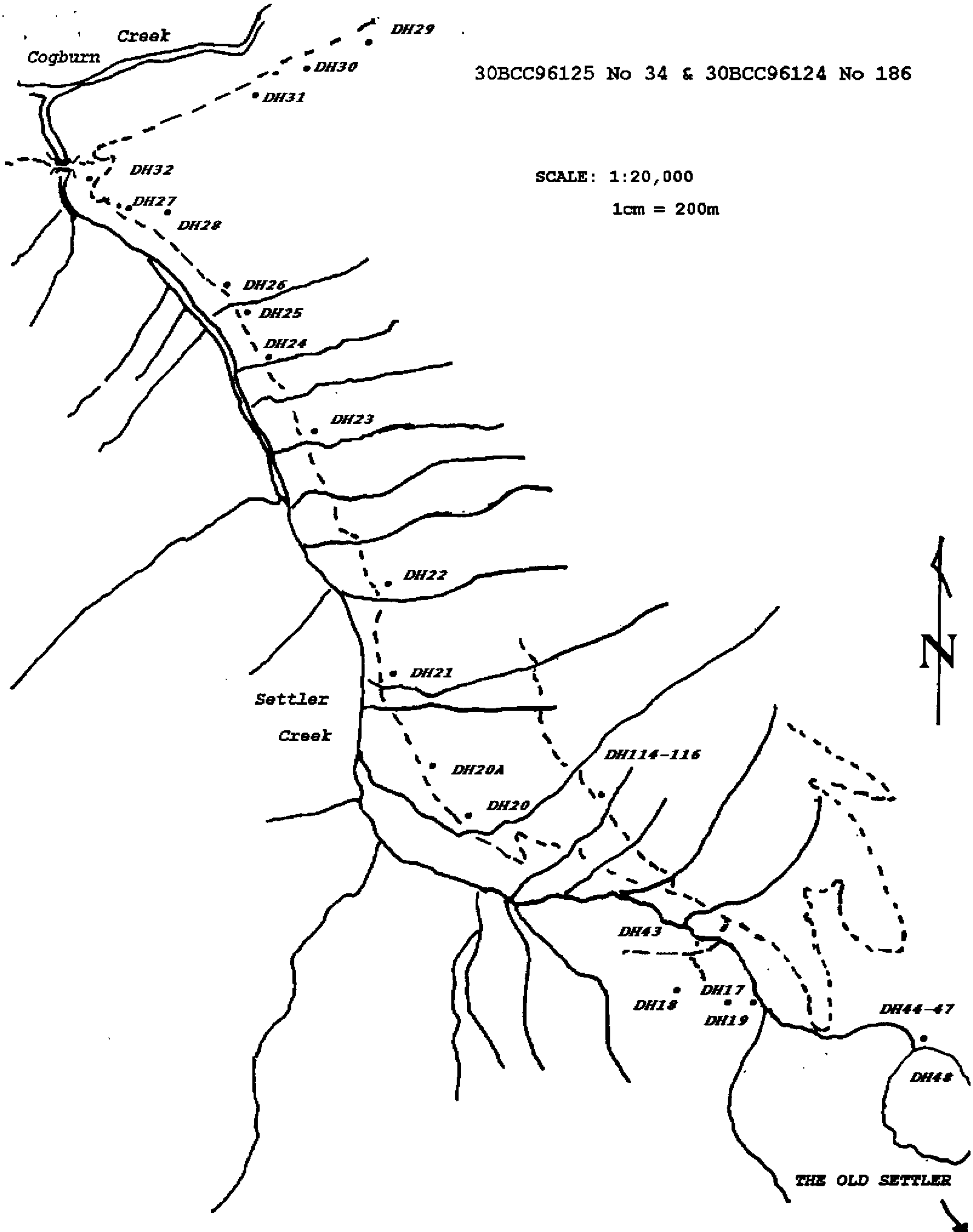


FIGURE 6: Settler Creek sample locations.

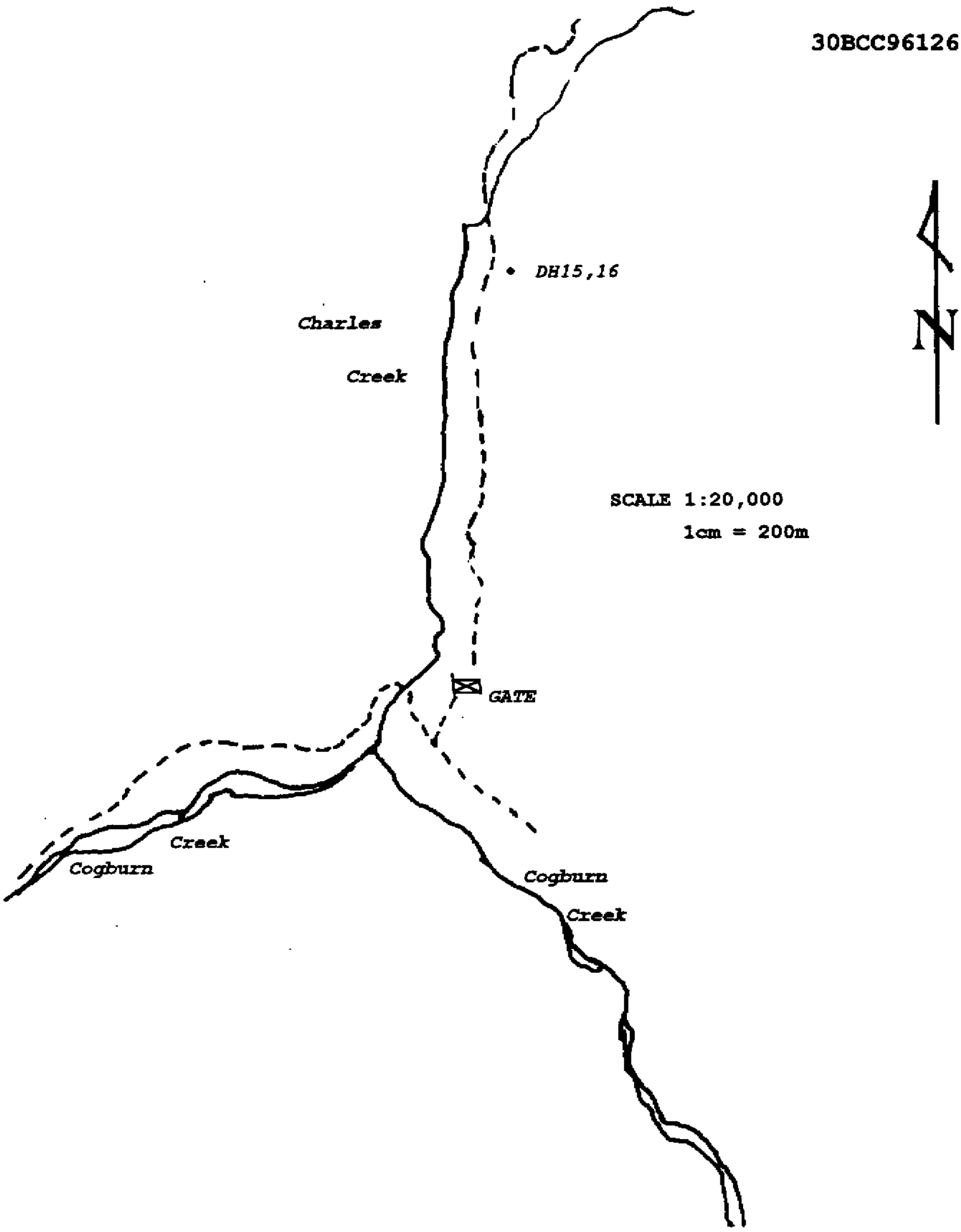


FIGURE 7: Charles Creek sample locations.

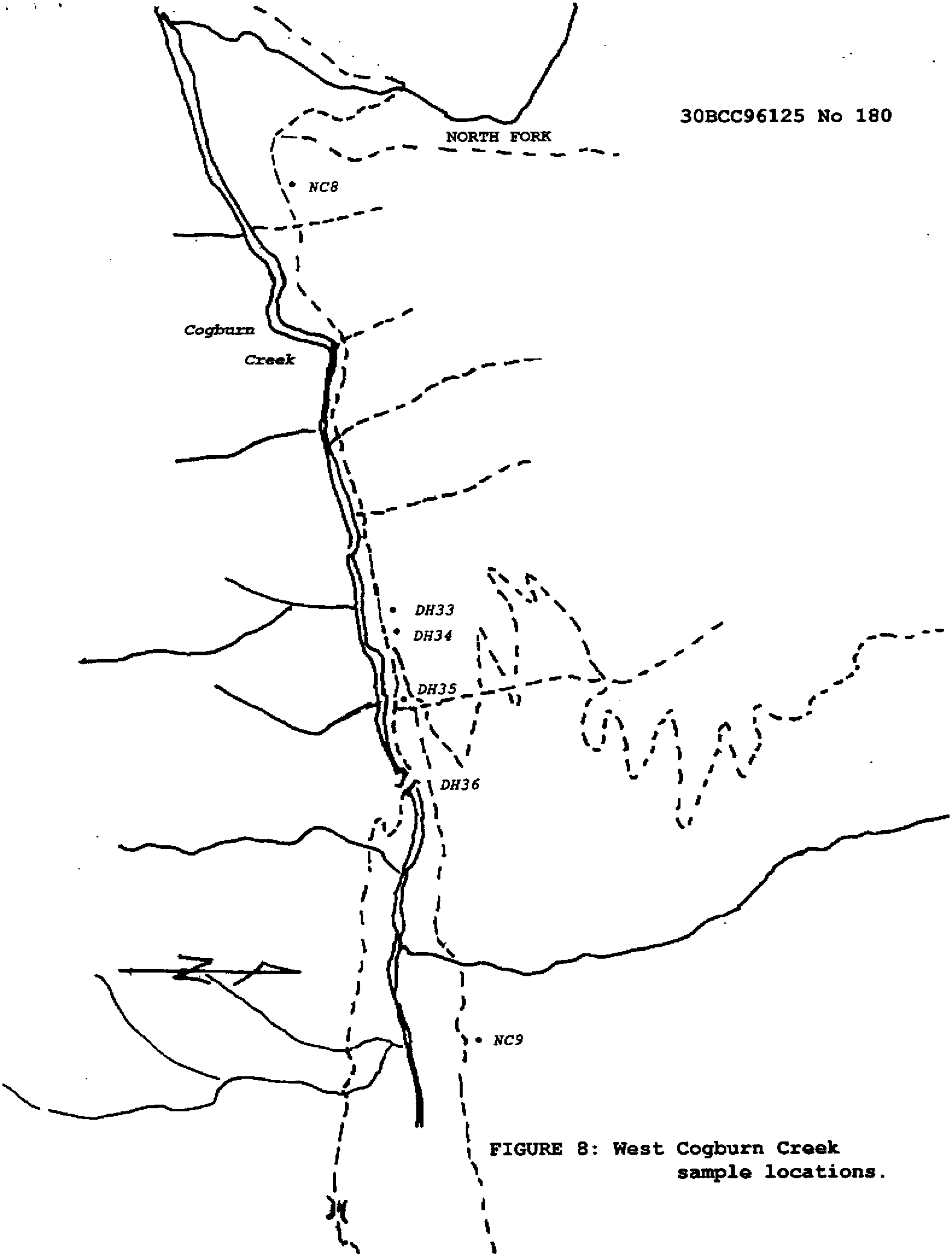


FIGURE 8: West Cogburn Creek sample locations.

30BCC96125 No 181

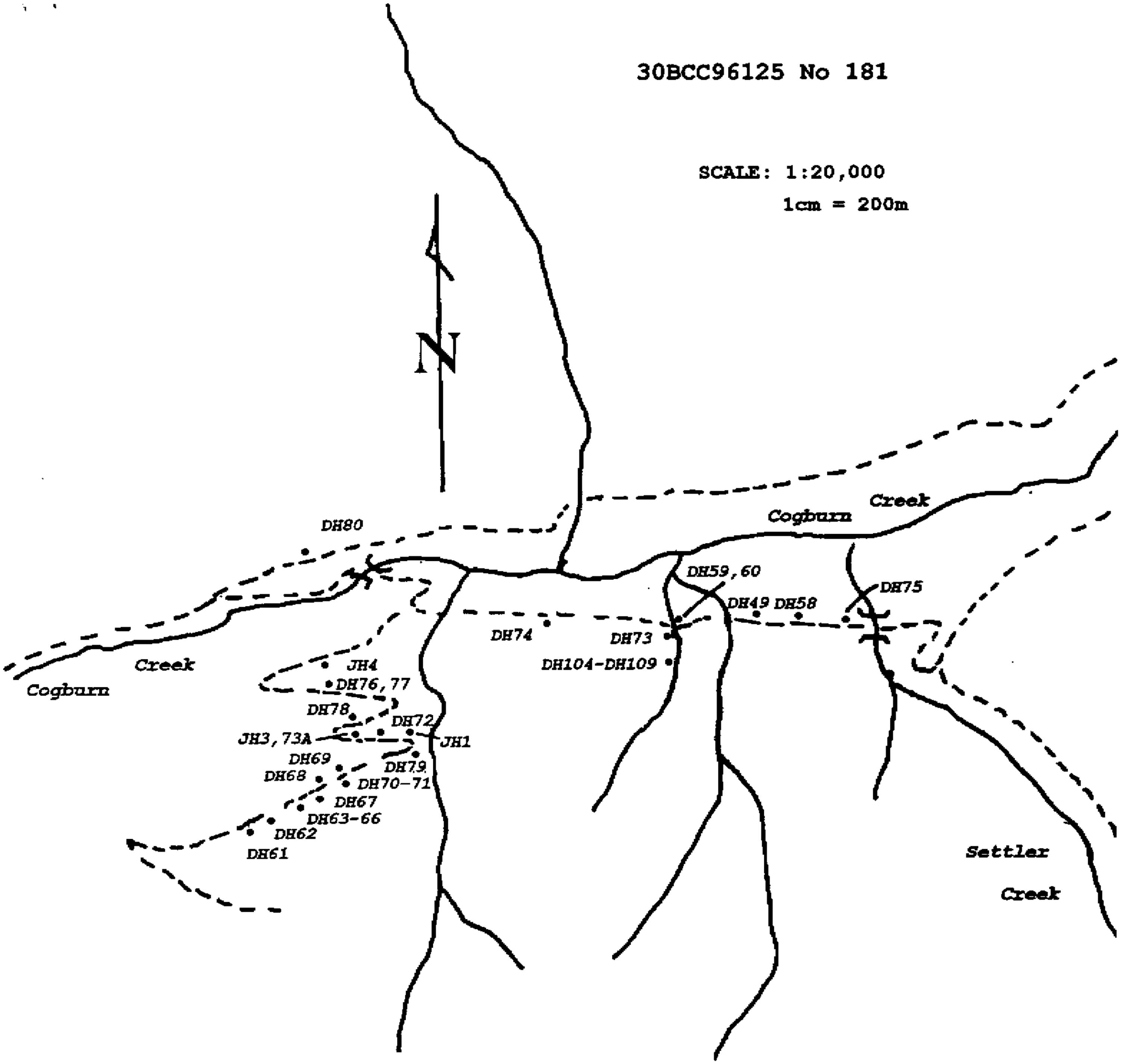
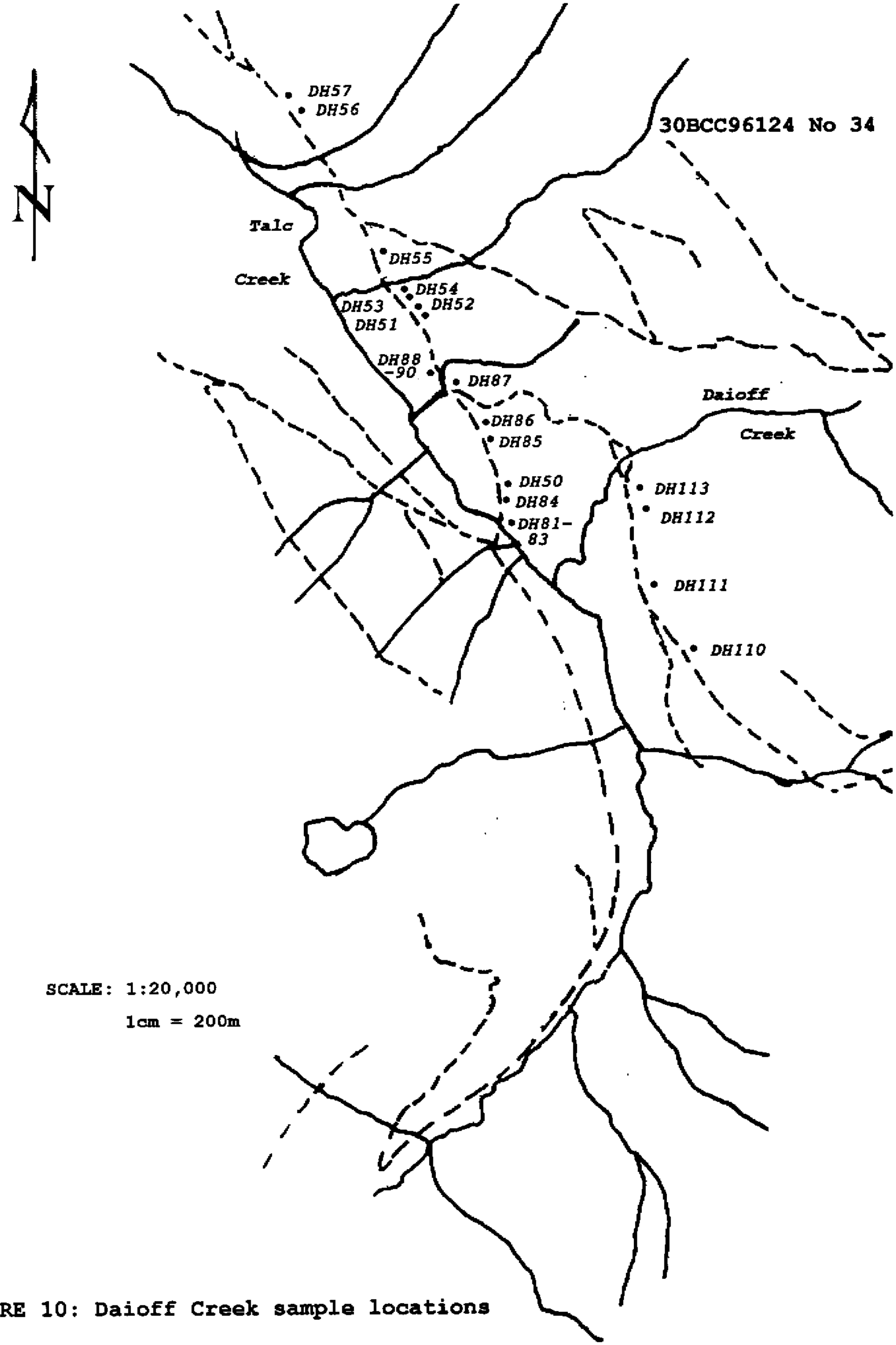


FIGURE 9: East Cogburn Creek sample locations.

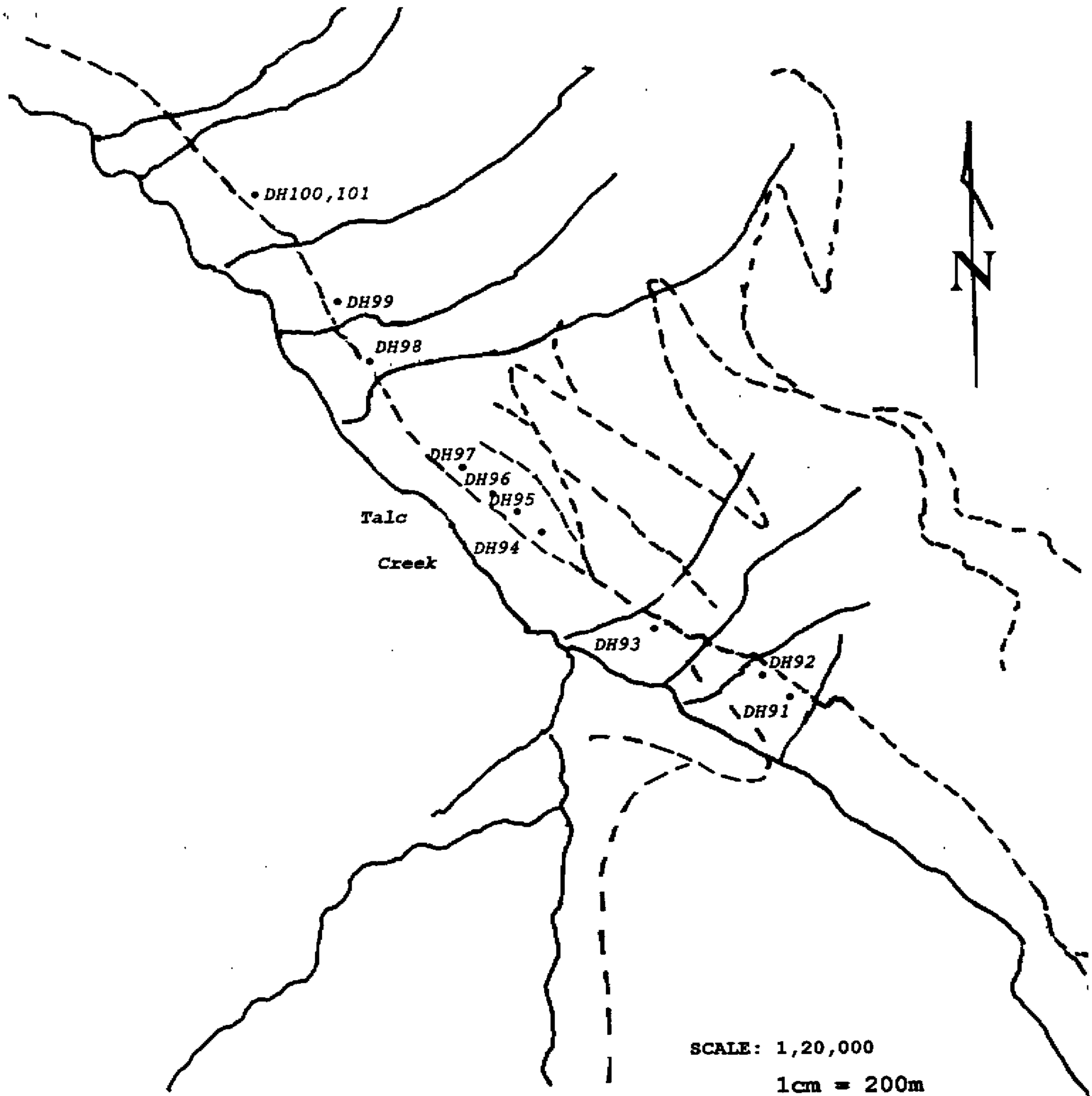
30BCC96124 No 34



SCALE: 1:20,000

1cm = 200m

FIGURE 10: Daioff Creek sample locations



30BCC96123 No 183

FIGURE 11: Talc Creek sample locations.

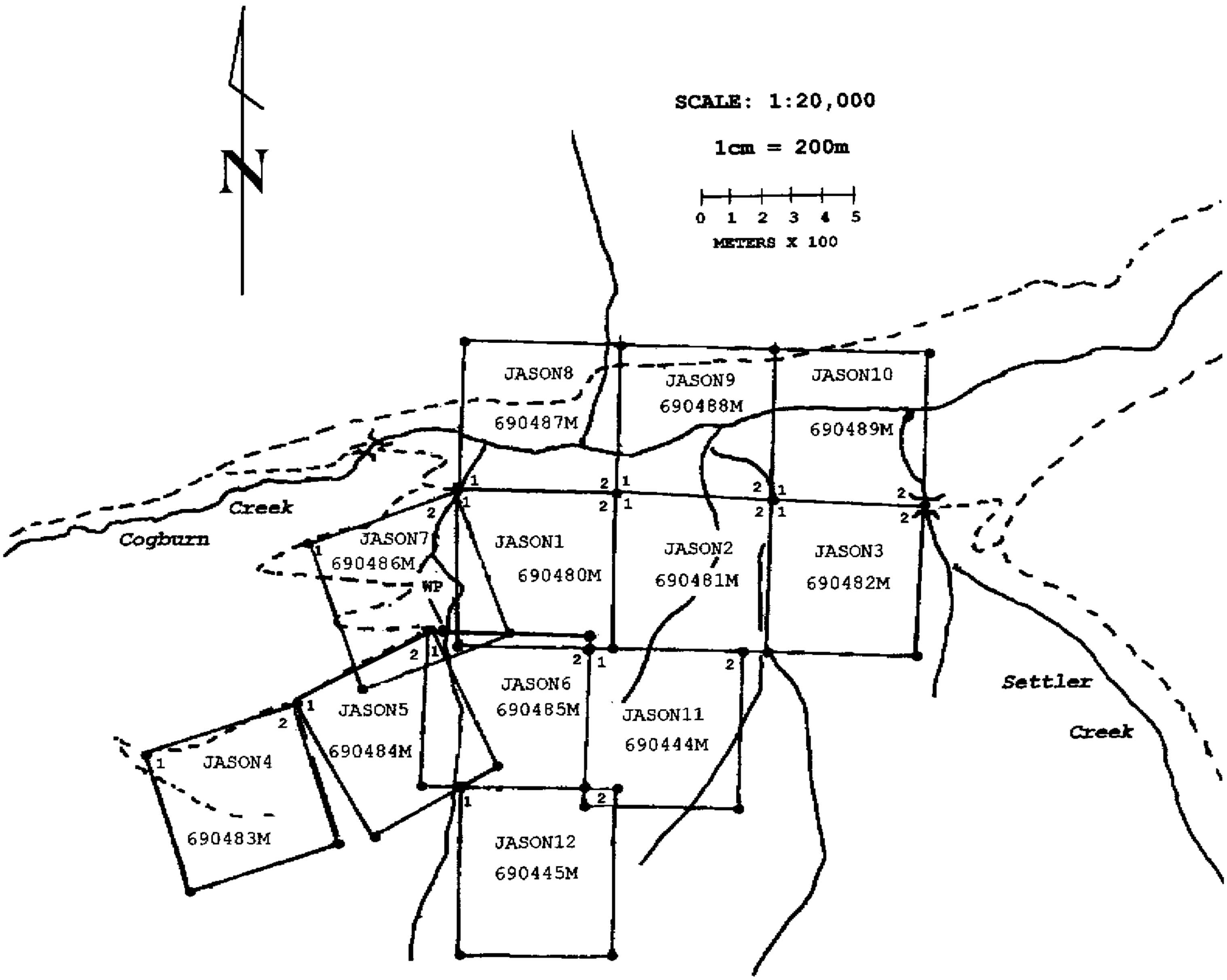


FIGURE 12: Claim locations, staked in 1999.

Target Areas for Additional Work

The primary target area is the area over which 12 mineral claims have been staked. The mineralization that has been discovered in this area was far more abundant and extensive than any of the other areas examined by the grantee in the prospect area. Because of the presence of magmatic Cu and Ni sulphides in hornblendites, at this site, similar to those of the Giant Mascot Mine, additional sampling and geological mapping should be done. Sampling in the Cogburn Creek valley should be concentrated in this area. This area is especially important, as it is a new mineral occurrence. In addition, no detailed geological mapping, geochemical sampling, or geophysical studies appear to have been done in this area by the Nickel Syndicate or others. Minfile (B.C. Energy and Mines) contains no reports of any mineralization from this area. Consequently, the new occurrence and lack of previous mineral exploration in this locale warrants additional detailed evaluation of this area for economic concentrations of Cu and Ni sulphides.

Peridotites in the area of the old Settler mountain should be re-examined to ascertain the potential for sulphides in this area and additional thin sections should be made and examined to ascertain if the anomalous Ni values found in reconnaissance samples are primarily in silicates or in sulphides.

Additional sampling should be done in the southern portion of the Talc Creek Valley as time limitations and restricted access permitted only limited prospecting in that area.

Sample DH 103 (metavolcanic containing abundant pyrite) contained 266 ppm Cu and 215 ppm Zn. This sample was from the South Talc area. Since volcanic massive sulphides have been located by others on the nearby North Forks claims, the South Talc area should be prospected for additional anomalous samples.

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APPENDIX 1:REPORT ON PHOTOMICROGRAPHS

REPORT ON PHOTOMICROGRAPHS
taken of polished section JH #1

Microscopy.

Photomicrographs were taken with Kodak Gold 100 (100/21) color film using a Leitz Orthoplan research microscope in conjunction with a Leitz Orthomat(automatic) camera. 12.5x eyepieces were used with 5x and 20x reflected light objectives yielding final print widths approximating 1.7mm and 0.45mm, respectively. Viewing conditions were in polarized light in transmitted and reflected light modes. Nicols were variously uncrossed, partly crossed or fully crossed.

General comments.

The opaque mineralogy in this slide comprises minor proportions of sulfides and oxides contained in predominant amphibole with some orthopyroxene. This association represents oxy-sulfide mineralization. The mineralogy and microstructures are consistent with a high temperature magmatic origin for the sulfides/oxides and the containing silicates.

The minor sulfides are interpreted to be sub-solidus (i.e. ≤ 900 C) exsolution products of Fe-rich monosulfide solid solutions which contained Ni and Cu. Pyrite can form from sulfur-rich solid solutions at ≤ 743 C, and "first generation" pentlandite unmixes to form "net" textures at ≤ 650 C. Second generation pentlandite (occurring as pentlandite "flame" texture) develops around 200 C towards the end of cooling.

The sulfide minerals occur as rounded inclusions in silicate host minerals, and also as interstitial space fillings which were formed by earlier crystallizing silicates when silicate and oxy-sulfide melts coexisted. Textural evidence suggests that oxide minerals, comprising ilmenite and titaniferous magnetite (?), formed in close association with the sulfides.

The sulfides and oxides are in intimate association with amphibole, which in turn invades and replaces (?) orothopyroxene. The occurrence of younger amphibole implies an evolving magma having an appreciable water content. The latter would have reduced melting points and lowered viscosity in the silicate melt. The abundance of amphibole in this sample suggests that magmatic hydrothermal and/or hydrothermal activity/remobilization may have occurred locally, as has been observed at Sudbury. Overall, there is compelling evidence that this oxy-sulfide mineralization is essentially magmatic in origin. Indeed, this sample shares key mineralogical and textural similarities with amphibole-containing ores from Sudbury, Ontario.

Brief descriptions of Photomicrographs.

Nos. #1-#3 - reflected and transm. light; 12.5 x 5 obj.)

Sulfides occur trapped interstitially in dominant silicates (i.e. amphibole in #2 and #3). A trace of medium grey oxide (magnetite or titaniferous-magnetite (?)) is present near the centre of the photo. Note the straight and smoothly curving boundaries between sulfides and the surrounding silicates. The largest "immiscible" sulfide globule consists mainly of pyrrhotite with minor yellow chalcopyrite and a pyrite crystal.

Nos. #2 and #3 show transm. light with nicols partly and fully crossed. The local host silicate is amphibole.

Nos. #4-#6

The centrally located sulfide occurs as interstitial/immiscible sulfide globule in greenish amphibole. The sulfide is mainly pyrrhotite with minor chalcopyrite and a trace of pentlandite (as flames, but not evident in the photo).

Nos. #7-#9; and #10-#12.

Show high relief orthopyroxene apparently being replaced/consumed by amphibole (cf. Bowen's reaction series).

Nos. #13-#16.

Show interstitial texture involving a large sulfide golbule where higher temperature silicate crystallization determined the overall volume shape in which the sulfide liquid was accommodated. Note the smooth, rounded boundaries. The sulfide is predominantly pyrrhotite with major proportions of pyrite (brightest) and pentlandite (creamy - brightness intermediate between pyrite and pyrrhotite). Both pyrite and pentlandite unmixed as sub-solidus products (i.e. pyrite at $\leq$ 743 C and pentlandite at $\leq$ 650 C) from a pyrrhotite-rich monosulfide solid solution. The enclosing silicate is amphibole.

Nos. #17-#20 (12.5 x 20 obj.).

Show crystallized pyrite surrounded by chalcopyrite, and the chalcopyrite surrounded in turn by pentlandite. Perhaps this represents a paragenesis of sub-solidus events, namely, a pyrrhotite-rich monosulfide solid solution solidified around 900 +- C, pyrite crystallized around 740 C (it may form crystals through high temperature annealing due to its high surface tension). Nos. #19 and #20 show pyrrhotite-pentlandite "net" texture where exsolved pentlandite migrated to grain boundaries in the pyrrhotite host. A few low temperature (around 200 C) pentlandite "flames" are evident in #18.

Nos. #21-#23 (same magn.)

Show rounded/equidimensional to rod-shaped (i.e. exsolved at high temperature) oxide inclusions in the amphibole host. Note in #21 (i.e. reflected light) a larger oxide inclusion (i.e. slightly darker and brownish) attached to a lighter oxide. The darker is ilmenite, and the lighter is probably Ti-magnetite; both oxides are common in Sudbury ores.

Nos. #24-#27 (same magn.)

Show a rounded, pyrrhotite-dominant globule in an orthopyroxene (?) host. The pyrrhotite contains a pentlandite flame (#26, #27). Note that the higher relief pyroxene host appears to be invaded by late greenish amphibole.

Nos. #28-#31 (same magn.)

Exsolved oxide "rods" (or sheets ?) aligned in amphibole host. A spherical opaque globule is seen near the edges of #29-#31. A small bright sulfide globule is evident in #28.

Nos. #32-#35 (same magn.)

Show rounded sulfide globules (i.e. pyrrhotite with exsolved pentlandite flames, but not evident in photo #35) associated with late (?) amphibole that appears to have invaded orthopyroxene (showing "striated" relief (#32)). Towards the centre of #32, note the small elliptical globule of opaque mineral(s) contained in amphibole, surrounded by pyroxene in turn.

Nos. #36-#38 (same magn.)

Show the intimate association of sulfide (i.e. pyrrhotite) and grey oxide contained within amphibole - hence the justification for the label oxy-sulfide mineralization, which characterizes Sudbury, Ontario, ores.

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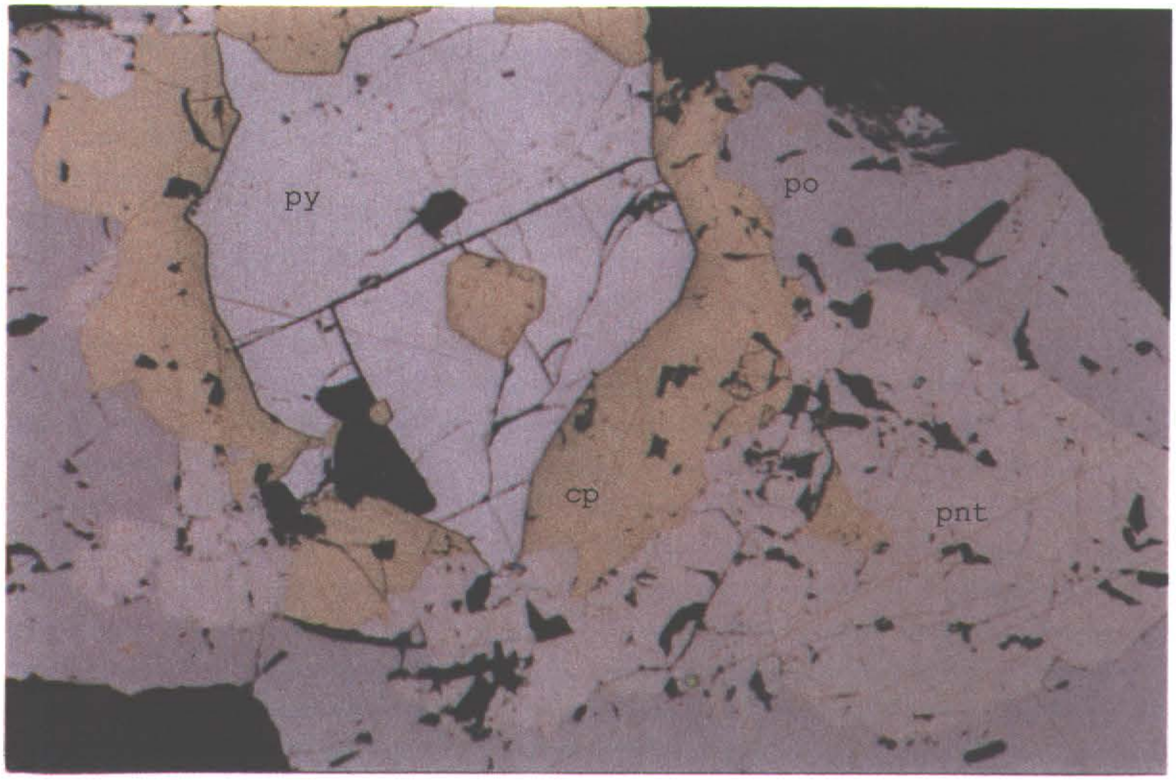
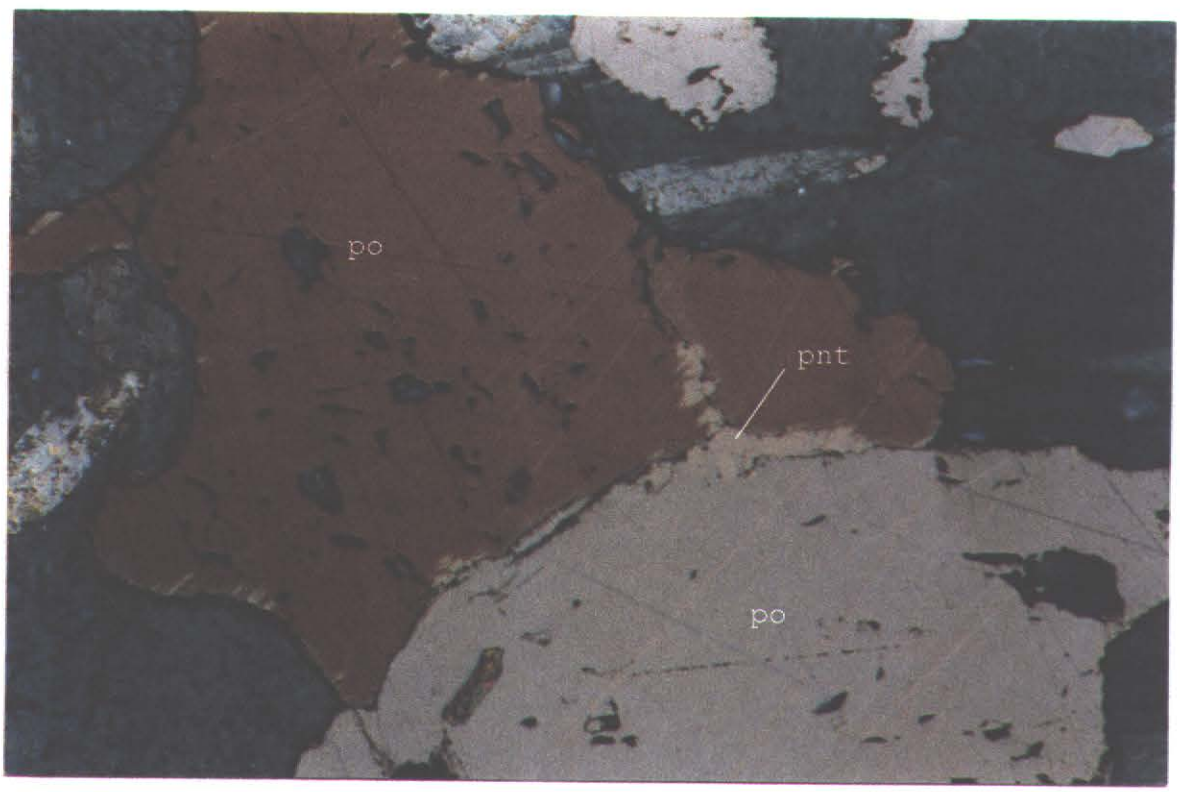
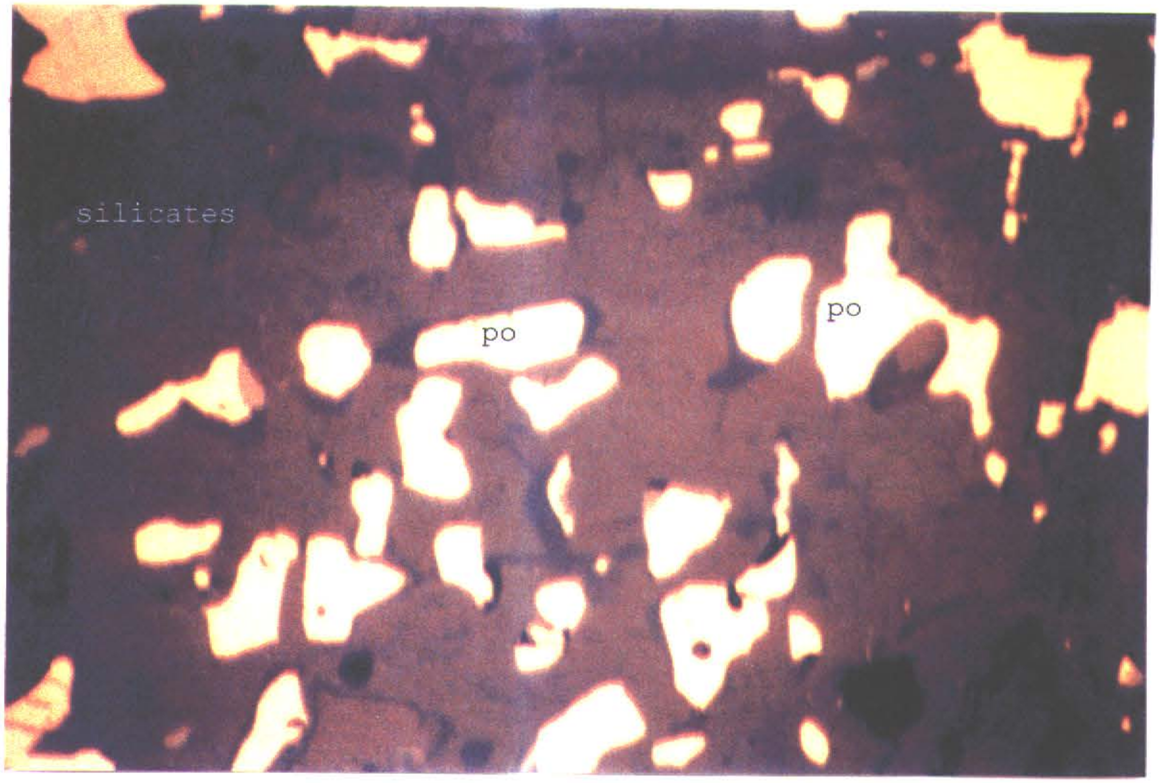
October 6, 1999



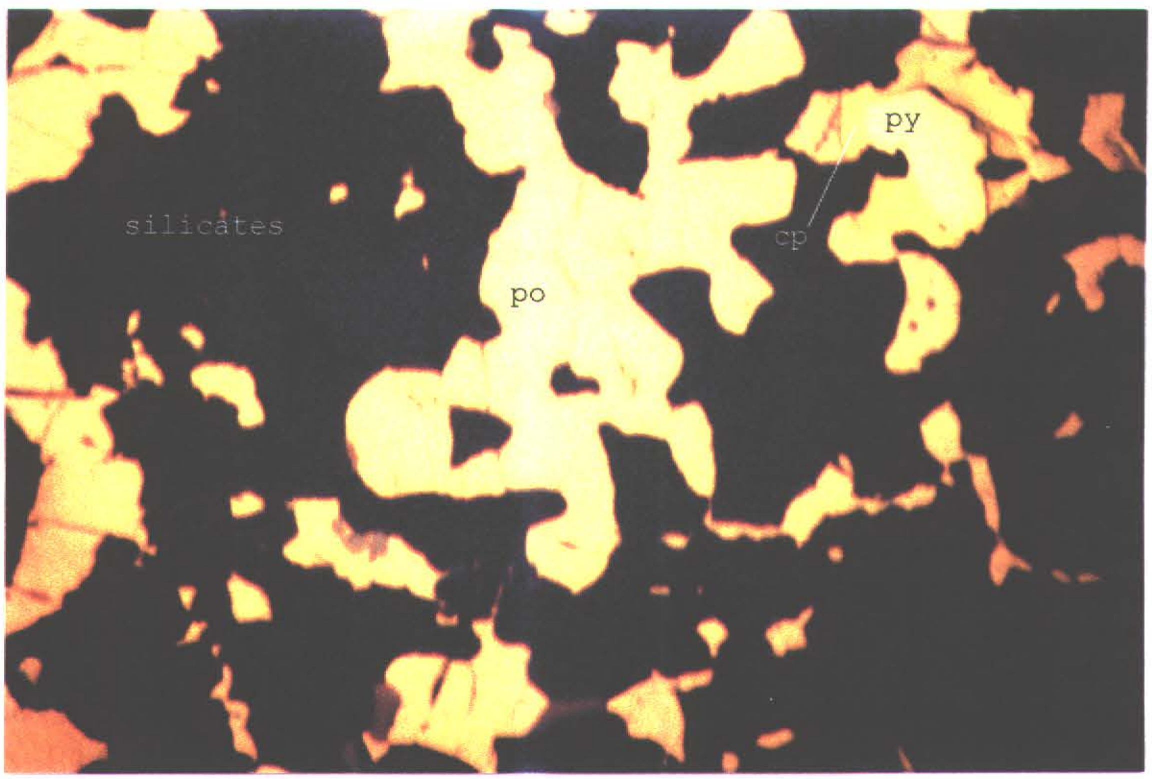
Sample JH1 showing pyrite (py), chalcopyrite (cp), pentlandite (pnt) pyrrhotite (po).



#18 Sample JH1 showing exsolution texture resulting from exsolution of ~~pyrrhotite~~ pentlandite from ~~pentlandite~~ pyrrhotite.



Sample DH72 showing globules of pyrrhotite (po) among crystallized silicates.



Sample DH72 showing interstitial texture of pyrrhotite (po), pyrite py) and chalcopyrite (cp) among silicates. This texture is indicative of magmatic origin.