Property Submission – Turnagain Property

brought in by Jessie James

NTS. 104I/07
826029
1992

TURNAGAIN PROPERTY

EXECUTIVE SUMMARY

A nickel-copper opportunity in
northern British Columbia

SOUTHGATE RESOURCE GROUP INC.
Suite 515 - 510 West Hastings Street
Vancouver, British Columbia,
Canada V6B 1L8
(604) 687-5064

INTRODUCTION

The Turnagain property is located 40 miles (65 km) east of the regional service centre of Dease Lake in northern British Columbia. Access to the property is by rough road and cat-track, or by aircraft to a 500 metre airstrip on the property. Helicopters are also available in Dease Lake. The property was staked by Southgate Resource Group Inc. in June, 1991, and consists of 3 mineral claims for a total of 22 units. These claims cover the southeastern half of the Turnagain River Complex, a zoned Alaskan-type ultramafic intrusion. This intrusion is unique in B.C. in that it is only Alaskan-type intrusion which is known to be sulphide rich. These sulphides, primarily pyrrhotite with pentlandite and chalcopyrite, are found as magmatic accumulations and disseminations in pyroxenite, wehrlite, and dunite rock units.

The property was first discovered in 1956 and was the subject of a detailed exploration program by Falconbridge Nickel Mines Ltd. during 1967-70. The work carried out by Falconbridge included airborne and surface geophysics, and 39 diamond drill holes for a total depth of 2866 metres. Few results of this program are in the public record, however it is known that there were intersections of massive sulphide lenses with values in excess of 1% nickel; and in one hole (DDH-10), there was an intersection of 32 metres with an average nickel content of 0.43% (with 10 metres averaging 0.6% nickel). This intersection occurred between 54 and 86 metres depth and is of interest as a bulk-mineable exploration target. Given the generally shallow nature of most of the holes drilled by Falconbridge (average 73.5 metres) and the limitations of 1960's geophysical techniques, their program can only be considered to have explored the top 100 to 150 metres of the property.

Southgate Resource Group Inc. is seeking a joint venture partner to explore and develop the property through this attractive exploration opportunity.

Sounds like Falconbridge evaluated this one fairly thoroughly.

LOCATION & ACCESS

The property straddles the Turnagain River 40 miles (65 km) east of the regional service centre of Dease Lake. It is centred at approximately 58° 28′ N. latitude, 128° 52′ W. longitude, in the NTS Cry Lake map sheet 104I. Access is by rough road to Boulder Creek, then by an old cat-track to the property. A 500 metre airstrip was built by Falconbridge on the property and it remains in good condition. Aircraft on wheels, and helicopters are available in Dease Lake.

PHYSIOGRAPHY

The property covers a gently sloped section of the Turnagain River valley. Elevations range from 1000 metres on the airstrip to 1300 metres on a hill side to the north. The general area, including the route in from Dease Lake, is covered with extensive deposits of glacial till and outwash. The valley floor in the vicinity of the Turnagain Property is covered with ablation moraine and typical features such as kames and kettles are common. Rock outcrops are surprisingly common, and there are good exposures along the river and along a series of ridges and benches. The property is sparsely forested with pine and spruce species.

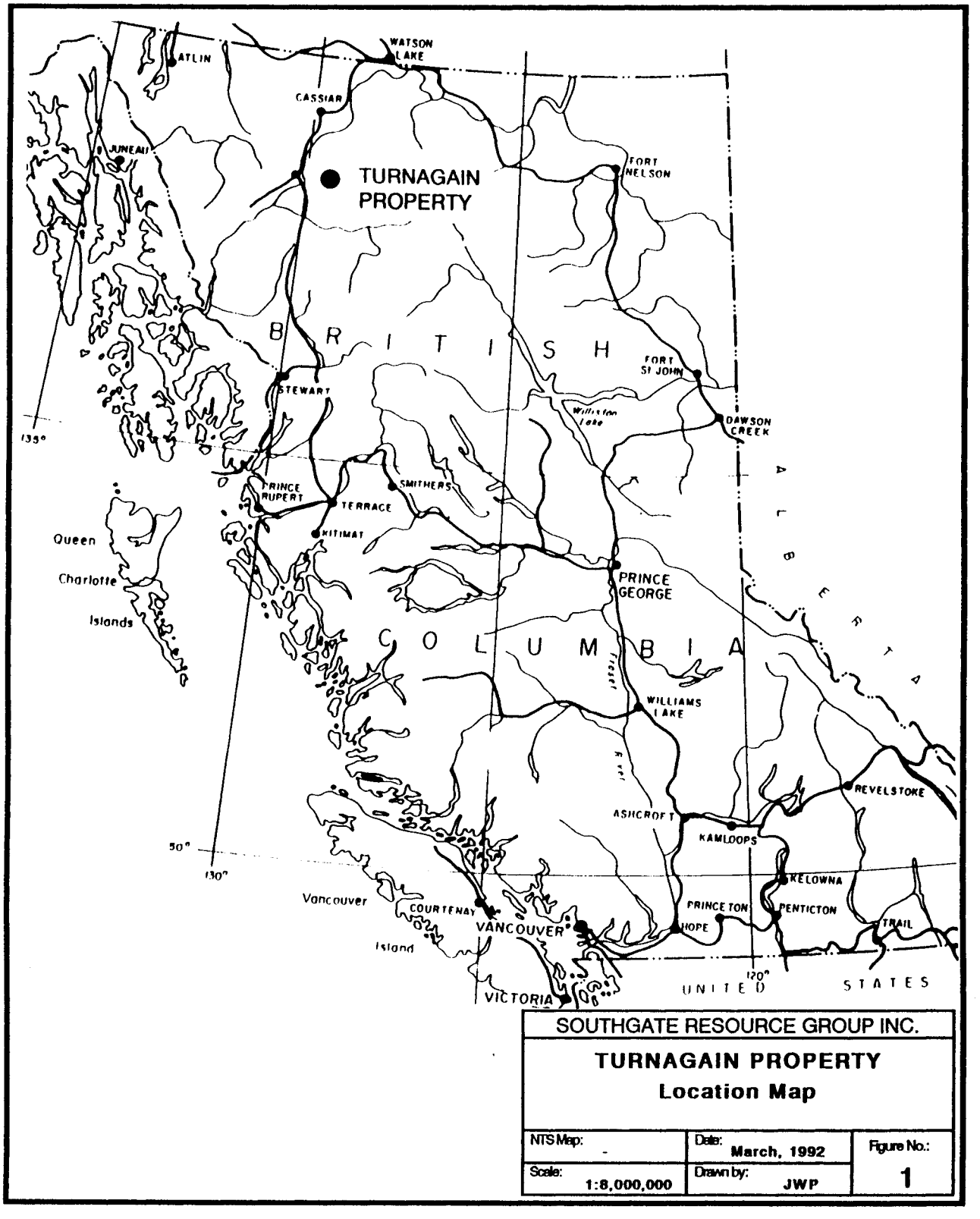
MINERAL TITLES

Southgate Resource Group Inc. holds a 100% interest in the following mineral titles:

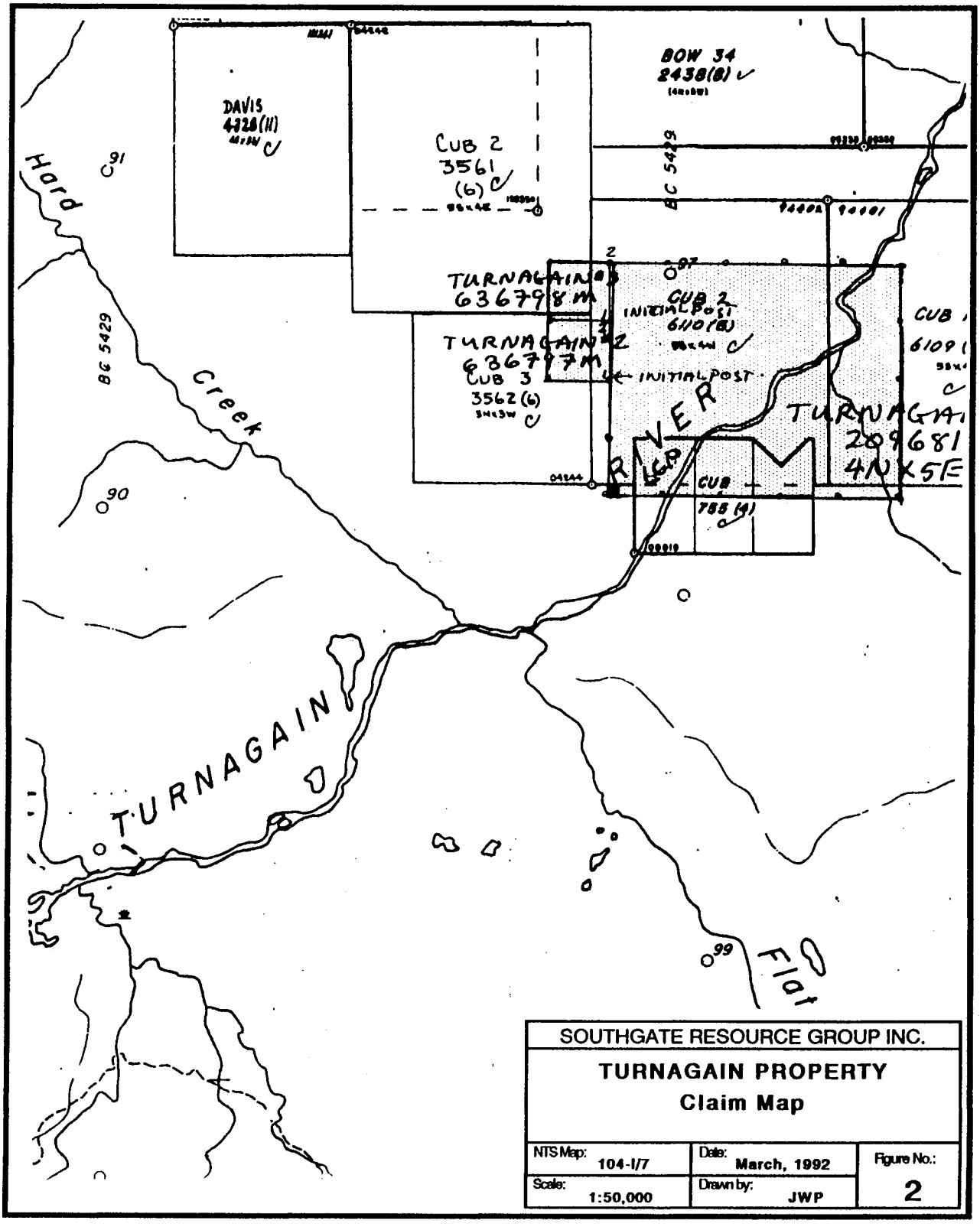
Property Name	Mining Division	Record No.	Record Date	Registered Name
TURNAGAIN	Liard	300385	June 12, 1991	Eric N. Mackenzie
TURNAGAIN 2	Liard	300389	June 12, 1991	Eric N. Mackenzie
TURNAGAIN 3	Liard	300390	June 12, 1991	Eric N. Mackenzie

PREVIOUS WORK

The property was discovered in 1956 by a local outfitter, B. Thompson, who staked it in the following year. In 1966, an airborne magnetometer survey was flown over the area by Cassiar Asbestos Corporation. Falconbridge first looked at the property in 1966, when nickel-copper mineralization was discovered over an extensive area. During the period 1967-70 the property was the focus of a detailed program by Falconbridge, who carried out geophysical surveys and drilled 39 diamond drill holes for a total of 2866 metres (average hole depth was 73.5 metres). Unfortunately, few results of this drill program are in the public record; however, two drill-logs from Falconbridge's program are reproduced in Clark's thesis and are shown below as figures 3 and 4. Diamond drill hole DDH-19 (figure 3) intersected approximately 5 metres of 0.81% nickel and 0.13% copper with 45 cm of 1.2% nickel at 100 metres depth. Diamond drill hole DDH-10 (figure 4) intersected 32 metres of 0.43% nickel and 0.1% copper with



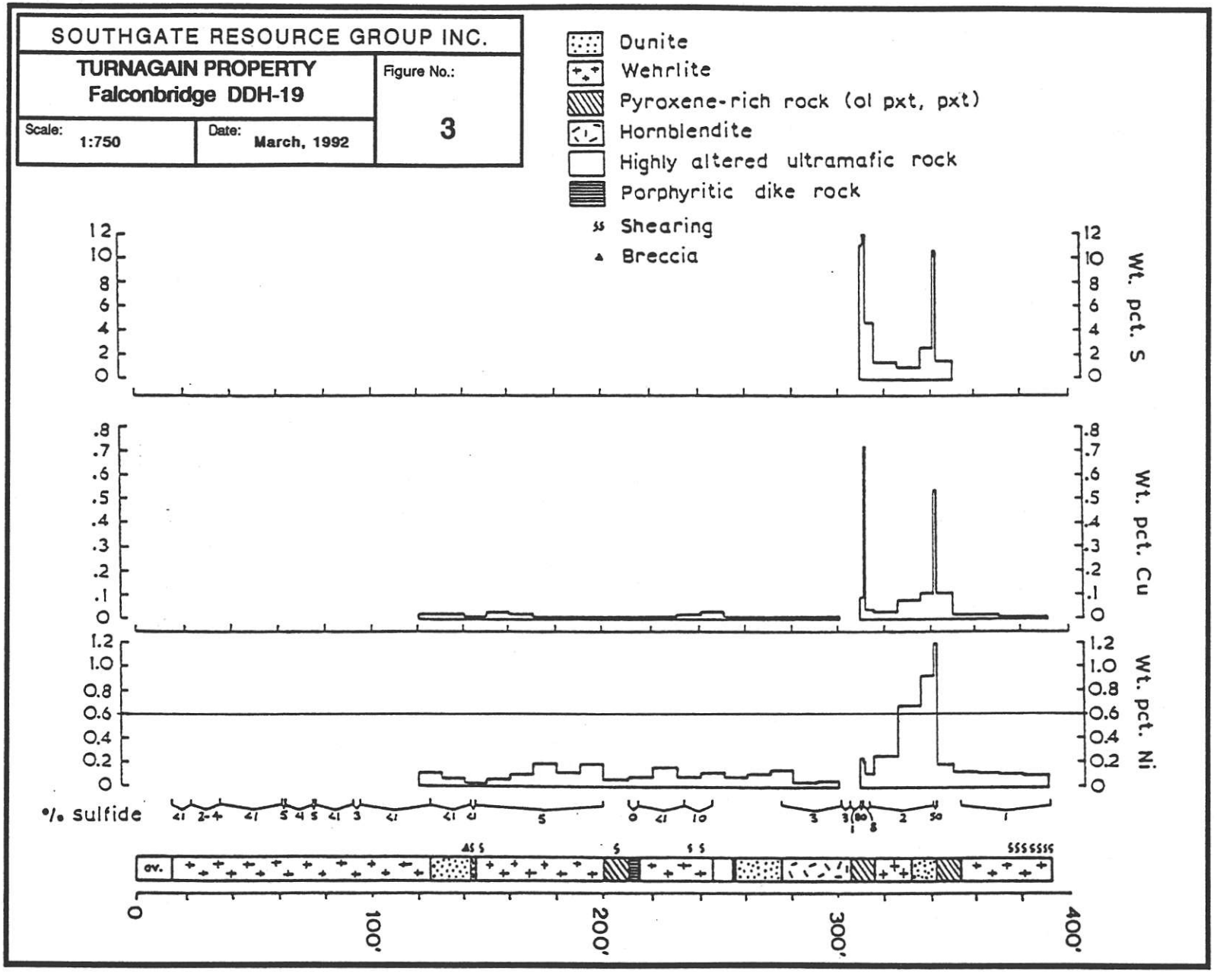
SOUTHGATE RESOURCE GROUP INC.		
TURNAGAIN PROPERTY **Location Map**		
NTS Map: -	Date: **March, 1992**	Figure No.: **1**
Scale: **1:8,000,000**	Drawn by: **JWP**	


DAVIS
4328(11)
CUB 2
3561
(6)
BOW 34
2438(8)
BC 5429
TURNAGAIN
636798M
TURNAGAIN 2
636797M
CUB 3
3562(6)
CUB 2
INITIAL POST
6110(8)
INITIAL POST
Hard
Creek
BG 5429
RIVER
TURNAGAIN
CUB
788(4)
91
90
99
Flat
SOUTHGATE RESOURCE GROUP INC.
TURNAGAIN PROPERTY
Claim Map
NTS Map: 104-I/7
Date: March, 1992
Figure No.: 2
Scale: 1:50,000
Drawn by: JWP

approximately 20 metres of 0.5% and 10 metres of 0.6% nickel between 54 and 86 metres depth. Jim MacDougal, project geologist for Falconbridge during 1966-70, suggests that the property was "put on the back burner" because of declining nickel prices and the dissimilarity of the Turnagain geology to the "Sudbury-type" nickel model that Falconbridge was using at that time. The following Table I summarizes the work history of the property and Table II summarizes analytical results of previous surface work. Both are largely drawn from the Archer, Cathro & Associates (1981) limited "Northern B.C. Mineral Inventory".

TABLE I - WORK HISTORY

Year	Property Data	Owner/Operator	Program
1956-66 (?)	Turn claims (2)	B. Thompson (?)	Prospecting
1966	Turnagain area	Cassiar Asbestos Corp.	Airborne magnetometer survey
1966	Turn claims	B. Thompson/Falconbridge Nickel Mines Ltd.	Prospecting, magnetometer & EM surveys, mapping
1967	Turn, etc.(78)	B. Thompson/Falconbridge	Magnetometer & EM-16 surveys Diamond drilling: 1313 metres in 13 holes.
1969	Turn, etc.(78)	Falconbridge	Airborne Magnetometer
1970	Turn, etc.(78)	Falconbridge	Magnetometer & EM-16 surveys Diamond drilling: 1553 metres in 26 holes, geological mapping.
1971	Turn, etc.(78)	Hard Creek/Falconbridge	Geological mapping (Clark).
1972	Turn, etc.(78)	Hard Creek/Falconbridge	Geological mapping (Clark).
1979	Cub (6 units)	S. Bridcut	Diamond drilling: 17 metres in 1 hole.
1986	Cub (6 units)	S. Bridcut/V. Cukor	Re-analysis of drill core for PGM's.
1986	Turn, Again (40 units)	Equinox Resources Ltd. / Technigan Resources Ltd.	Geochemical (rock & soil) surveys for PGM's.
1988	N/A	B.C. Geological Survey Br.	Geological mapping (Nixon), analysis for PGM's.


SOUTHGATE RESOURCE GROUP INC.
TURNAGAIN PROPERTY
Falconbridge DDH-19
Figure No.:
3
Scale:
1:750
Date:
March, 1992
Dunite
Wehrlite
Pyroxene-rich rock (ol pxt, pxt)
Hornblendite
Highly altered ultramafic rock
Porphyritic dike rock
Shearing
Breccia
Wt. pct. S
Wt. pct. Cu
Wt. pct. Ni
% sulfide
ov.
0
100'
200'
300'
400'

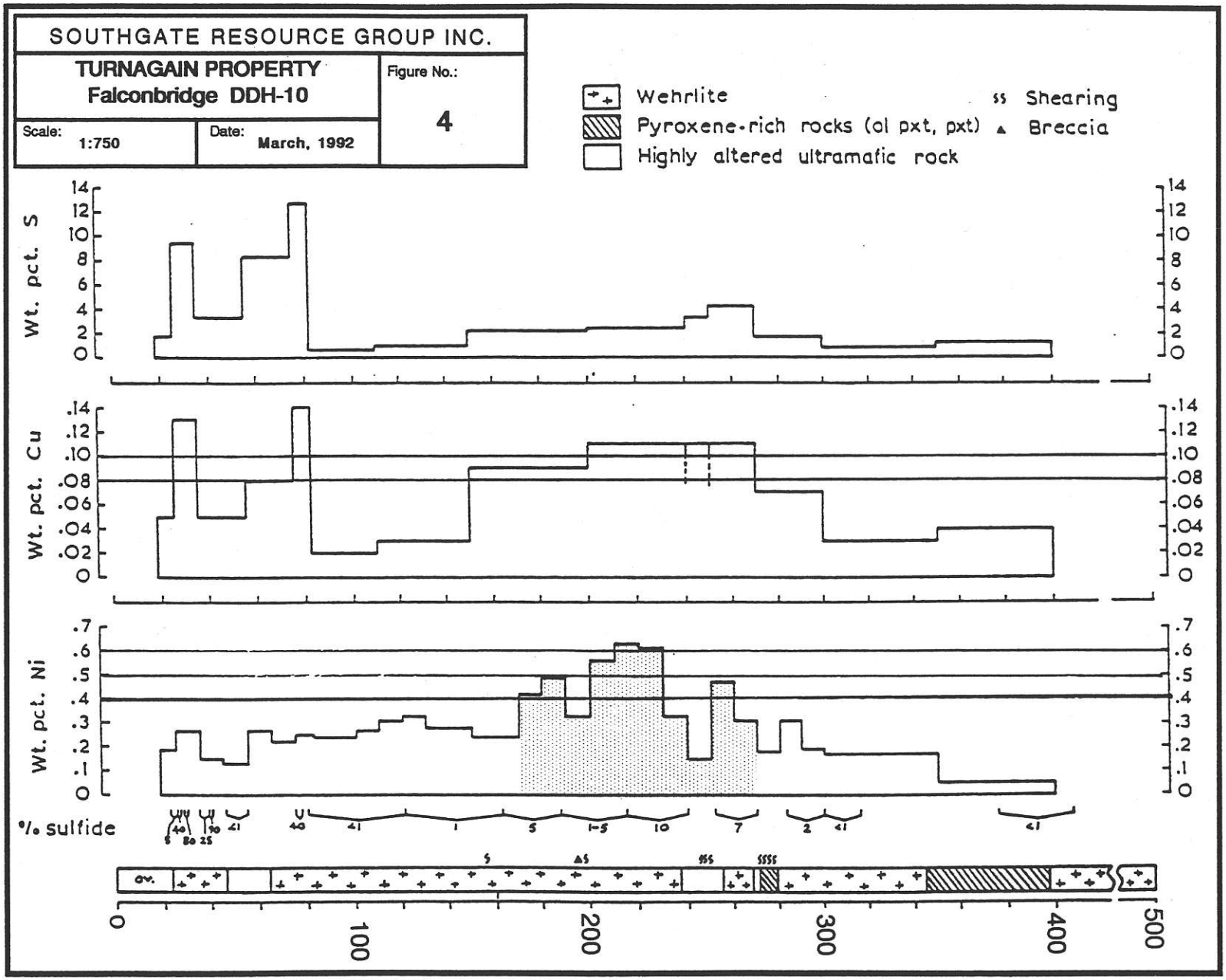

SOUTHGATE RESOURCE GROUP INC.
TURNAGAIN PROPERTY
Falconbridge DDH-10
Figure No.:
4
Scale:
1:750
Date:
March, 1992
Wehrlite
Pyroxene-rich rocks (ol pxt, pxt)
Highly altered ultramafic rock
ss Shearing
▲ Breccia
Wt. pct. S
Wt. pct. Cu
Wt. pct. Ni
% sulfide
ov.
0
100
200
300
400
500

TABLE II - SUMMARY OF PREVIOUS ANALYTICAL RESULTS

Sample #	Cu (%)	Ni (%)	Fe (%)	Pt (ppb)	Pd ppb	Sulphide type	Source
548	0.50	1.62	47.8	530	505	Massive	Archer, Cathro
550A	0.29	2.71	43.1	485	760	Massive	Archer, Cathro
550B	0.21	2.07	40.9	385	610	Massive	Archer, Cathro
CA88-0009	-	-	-	423	427	Net-textured	BCGSB

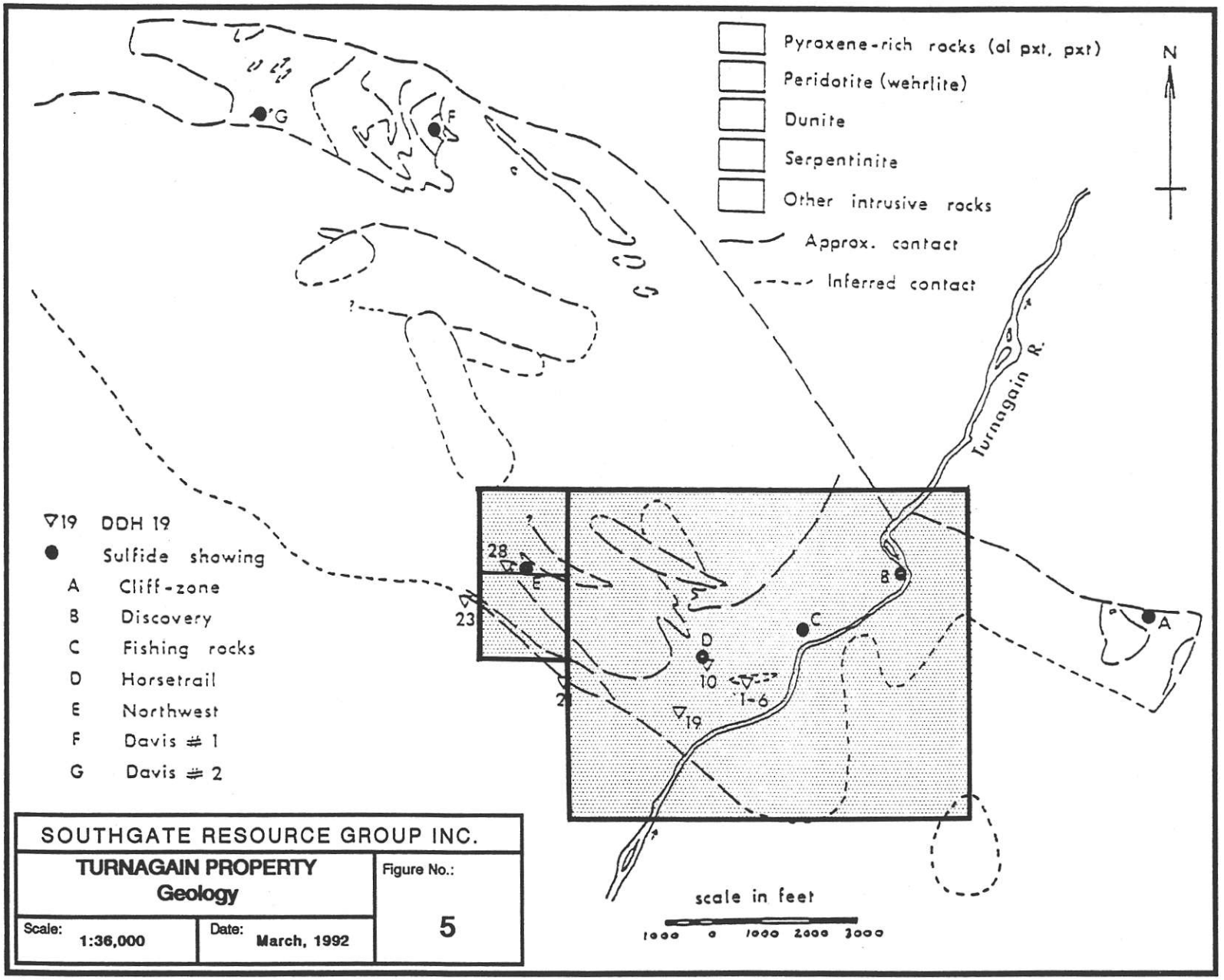
GEOLOGY

During Falconbridge's program, Thomas Clark mapped the geology of the Turnagain River Complex for a Ph.D. thesis (Queen's, 1975) and the following summary is taken from his thesis.

The Turnagain River Complex is a zoned "Alaskan-type' ultramafic intrusion that was emplaced, probably in the Upper Triassic, into northwesterly-striking Permo-Carboniferous metavolcanic and metasedimentary rocks (Cache Creek Group) of the Atlin Terrane. In the vicinity of the complex, these rocks have been regionally metamorphosed to the greenschist facies, and consist of carbonaceous slates and phyllites, and the recrystallized equivalents of chert, greywacke, and calc-alkaline tuffs and sill-like intrusive rocks.

The complex is 8 x 3 km in maximum dimensions, and is elongated parallel to the regional structural trend. The complex is almost completely fault-bounded, and shows no evidence of contact metamorphism adjacent to its northeast contact. Against the southwest contact, however, the country rocks are spotted, and have been metamorphosed to the albite-epidote hornfels facies. The complex is crudely zoned, with a large core zone of dunite partially surrounded by a peripheral zone of interlayered (in order of abundance) wehrlite, olivine clinopyroxenite, clinopyroxenite, dunite, and minor hornblendite. A small amount of hornblende and plagioclase-bearing rocks intrude olivine and pyroxene-bearing rocks along the southwest margin of the complex. Two small plutonic bodies, both of which are quartz-bearing, penetrate the centre of the complex, and are probably related to rocks of the Cassiar batholith.

Dunite, wehrlite, olivine pyroxenite, and pyroxenite consist of varying proportions of olivine (cumulus), clinopyroxene (inter-cumulus or cumulus), chromian spinel (cumulus), phlogopite (inter-cumulus), and hornblende (intercumulus or a reaction product). Hornblende consists of hornblende, apatite, ilmenite (no magnetite), and locally, clinopyroxene and epidote. Plagioclase occurs only in some hornblende-rich marginal rocks; orthopyroxene is totally absent.



SOUTHGATE RESOURCE GROUP INC.		
TURNAGAIN PROPERTY **Geology**		Figure No.: **5**
Scale: **1:36,000**	Date: **March, 1992**	

Although the dunite core is essentially barren of primary sulphides, the peripheral zone of pyroxene-bearing rocks contains intercumulus disseminations and networks, and thin massive bands of pyrrhotite, pentlandite, and chalcopyrite. Textures indicate the sulphides crystallized from immiscible sulphide droplets. During serpentinization, primary sulphides were attacked and remobilized, and locally, nickel-poor sulphides were added from an external source. The rocks of the complex originated by fractional crystallization in a subvolcanic magma chamber. Locally conspicuous rhythmic layering probably is the result of crystal deposition by magmatic turbidity currents. The existence of rock sequences analogous to the cyclic units of some stratiform intrusions is suggested by the local presence of phase contacts, by rock and mineral composition trends, and by the concentration of sulphides in the most olivine-rich rocks of some sequences. It is interpreted that crystallization of batches of magma periodically introduced into the magma chamber gave rise to the cyclic units. The earliest magma batches were the most primitive and later batches more differentiated due to magmatic differentiation in a postulated deeper magma chamber. The most primitive magma probably had the composition of a hydrous, highly magnesian, picritic ankaramite, and differentiation appears to have followed an alkalic trend. The magmas become saturated in sulphide at about the same time as pyroxene became a cumulus mineral.

Originally, the complex had a horizontal stratification, the lowermost rocks being dunitic, and the uppermost being wehrlitic and olivine pyroxenitic. Late in the accumulation of the ultramafic rocks, the complex experienced an upward doming of the lowermost dunites, and this caused the gross lithological zoning and the cross-cutting nature of the dunite core in the northwestern part of the complex. Approximately synchronous with this, the complex along with its country rocks was folded about northwesterly-striking, southwesterly-dipping axial planes. Faulting along the margins of the complex, which occurred during these deformations, displaced some rock units out of view. At a late stage, some plagioclase-bearing, hornblende-rich rocks were emplaced along the faulted margins, and porphyritic dike rocks intruded the interior of the complex.

EXPLORATION PROPOSAL

There are two attractive exploration targets on the property. There is the open pit potential indicated in diamond drill hole DDH-10, and there is the prospect of high-grade nickel mineralization at depths below that explored by Falconbridge.

The nickel grades and the near surface intersections in DDH-10 suggest a bulk mineable exploration target. These nickel grades of 0.43 to 0.8% are comparable to the grades of other open-pit, nickel-sulphide mines, such as the Mt. Kieth deposit under development in Australia. Preliminary financial modelling of an open-pit mine at this location suggests an attractive return could be realized for a deposit of 20 million tons of 0.55% nickel and 0.1% copper, and at metal prices of $4.50 for nickel and $1.00 for copper with a 0.84 CAN/US dollar.

The high-grade potential of the property could be explored with modern geophysical techniques - Falconbridge's program can only be considered to have evaluated the upper 100 to 150 metres of the property, especially when the limitations of 1960's geophysical technology is taken into account. Falconbridge's geophysical program was limited to an airborne magnetometer survey and on the ground, flux-gate magnetometers and the EM-16 electromagnetic unit. The Turnagain Property has high-grade potential which could be readily tested by modern deep-penetrating EM systems such as the UTEM. Financial modelling suggests that a reserve of 4.8 million tons of 1.4% nickel and 0.23% copper would be economically feasible.

The exploration opportunities described above can be evaluated through a simple two-stage program of geophysics and diamond drilling. The first stage should consist of a UTEM survey, supplemented by detailed magnetometer surveys and core re-logging. In stage two, those conductors identified by the geophysics should be the focus of a diamond drill program. The bulk tonnage potential around DDH-10 can be evaluated by drilling several holes in this area. This program is estimated to cost $125,000 for the geophysical surveys, and $375,000 for a 1000 metre diamond drill program. The entire program is estimated to cost $500,000.

JOINT-VENTURE TERMS

Southgate Resource Group Inc. offers a joint-venture opportunity to explore the Turnagain Property. Interested parties can earn a 65% interest in the property by spending at least $500,000 on the property over a 5 year period and by making the following payments to Southgate:

Upon signing		$10,000
End of year	1	10,000
" "	2	20,000
" "	3	35,000
" "	4	50,000
" "	5	100,000
		$225,000

The work program must include a UTEM and magnetometer survey to be completed by the end of year 3, and a diamond drill program of not less than 1000 metres to be completed by the end of year 5. After meeting these conditions, the joint-venture partner will have earned a 65% interest in the property, while Southgate will hold a 35% interest plus a 1% NSR. Further work will be funded according to each partner's pro rata share in the property or their interest will increase/dilute. Southgate will have the right to convert its interest into an additional 2% NSR.