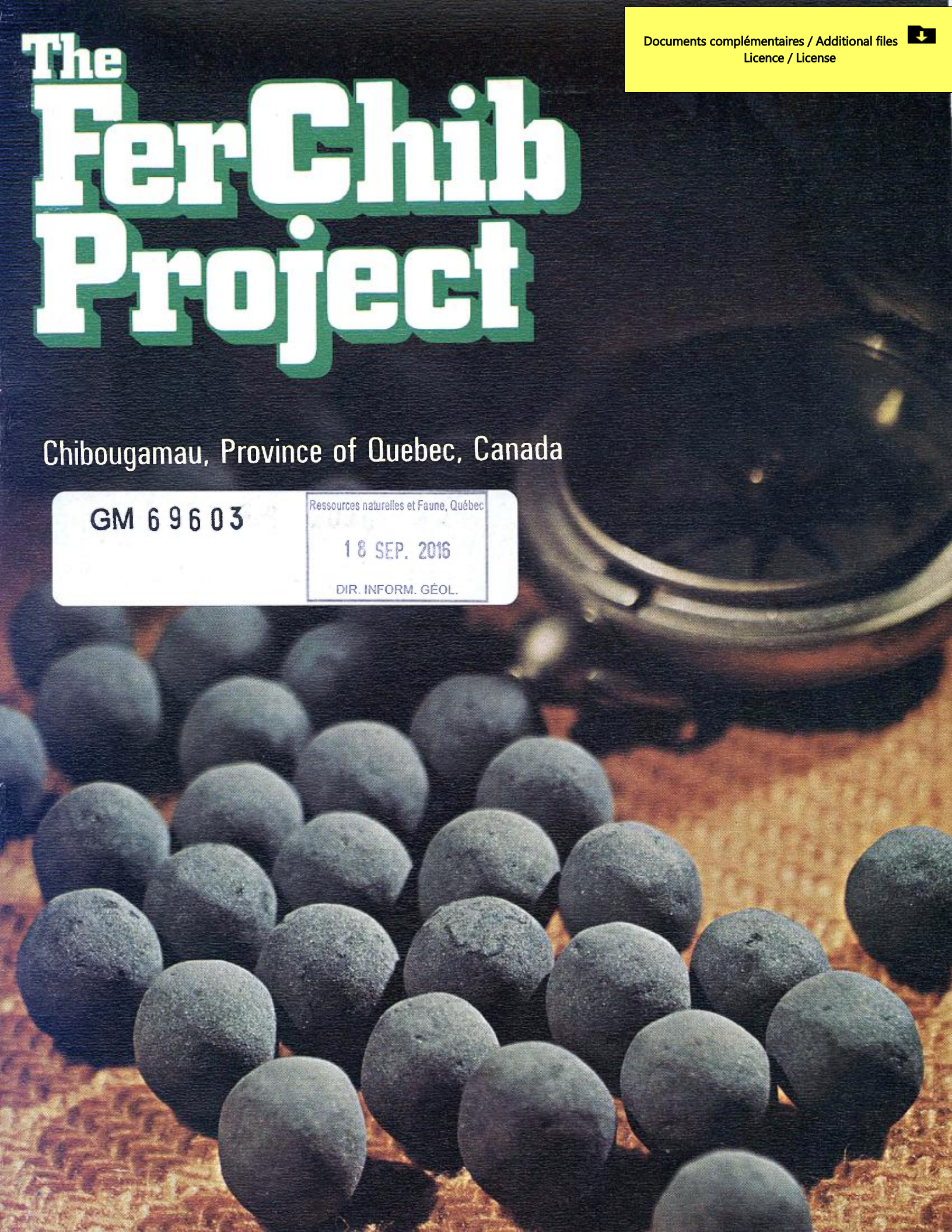
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The FerChib Project

Chibougamau, Province of Quebec, Canada

GM 69603

Ressources naturelles et Faune, Québec
18 SEP. 2016
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INTRODUCTION

Campbell Chibougamau Mines Ltd. projette de former une entreprise en participation afin de compléter une étude de rentabilité sur le project FerChib.

De grandes réserves de minerai de magnétite sont connues depuis plusieurs années à Chibougamau, dans la Province de Québec, au Canada. Des essais préliminaires sur une partie d'un gisement situé à Baie Magnetite ont indiqué que ce minerai se traite facilement par un procédé de concentration magnétique, et qu'un concentré plus élevé que la moyenne peut être produit. Les essais de bouletage et de durcissement ont produit des boulettes auto fondante de bonne qualité avec une basse teneur en silice.

Ce gisement est avantageusement situé près de la Ville de Chibougamau où tous les services de base tel que chemin de fer, route, aéroport, électricité, ainsi que urbains sont disponibles. De plus, le Gouvernement du Québec a annoncé récemment qu'une étude au coût de $500,000 sera faite afin d'établir la possibilité de construire une nouvelle voie ferrée pour déservir les gisements de fer de Chibougamau et Albanel.

Une production annuelle de 4.0 million de tonnes de boulettes est envisagée commençant à la fin de 1978 ou au début de 1979.

Le but de cette brochure est de résumer les informations connues sur le project FerChib, de décrire les travaux proposés, et de stimuler l'intérêt d'acheteurs possibles et/ou de participants pour le financement de l'étude de rentabilité (feasibility).

Campbell Chibougamau Mines Ltd. plans to form a joint venture to complete a feasibility study on the FerChib Project.

Large reserves of magnetite ore have been known in the Chibougamau area of the Province of Quebec in Canada for many years. Preliminary tests on part of one deposit at Magnetite Bay have indicated that the ore responds efficiently to a magnetic separation process to produce an above average grade concentrate. Balling induration tests have yielded good quality low silica self-fluxing pellets for blast furnace use or pre-reduction.

This deposit is favorably located near the Town of Chibougamau where all the basic services such as road, railroad, airport, electricity, schools, hospital, and other urban facilities are available. In addition, the Quebec Government has recently announced that it will undertake a $500,000 study on the feasibility of building a new railroad to connect the Chibougamau and Albanel iron ore deposits with tidewater on the Saguenay River.

An initial annual production rate of 4.0 million tons of pellets is contemplated for delivery, tentatively set at the end of 1978 or the beginning of 1979.

The purpose of this brochure is to summarize the known information on the FerChib Project, to outline the work proposed to be done and to stimulate interest from potential buyers and/or eventual participants in the financing of the feasibility study.

Fig. VIII — Aerial view of Magnetite Bay area





Fig. XI — Town of Chibougamau

THE MANAGER

CAMPBELL CHIBOUGAMAU MINES LTD.

Campbell Chibougamau Mines Ltd. is a Canadian Mining Company incorporated in 1950 in the Province of Quebec.

Most of its mining activities are centered in the Chibougamau area where the Company began milling copper ore from its Original Mine in May 1955. Subsequent expansion through exploration, development and acquisitions have brought the Company to its present size. Presently, four underground mines and one open pit are operated for a total annual production of 1,400,000 tons of copper ore, with gold and silver as by-products. To date, more than 16 million tons of ore have been produced, and ore reserves have been maintained at over 9,000,000 tons for the past 14 years.

All ore is processed at the concentrator located at the Original Mine Division. Concentrate is shipped by rail to Noranda, Quebec, for smelting with the copper anodes refined in Montreal.

The Company has approximately 700 employees in Chibougamau at the present time.

Shareholder's equity as reported at June 30, 1974, totalled $48,995,000, with $20 million dollars in working capital.

A mining operation at Magnetite Bay, whether undertaken by way of a joint venture or through an operating corporation, would have the advantage of Campbell Chibougamau's 20 years of mining and operating experience in the area.

On the FerChib Project, Campbell Chibougamau Mines Ltd., as owner of the iron ore property, proposes to:

1 — lease the property for a royalty;
2 — act as manager for a management fee;
3 — participate in the joint venture or operating corporation.



Fig. VII — Campbell Chibougamau Mines Ltd. — Henderson Mine

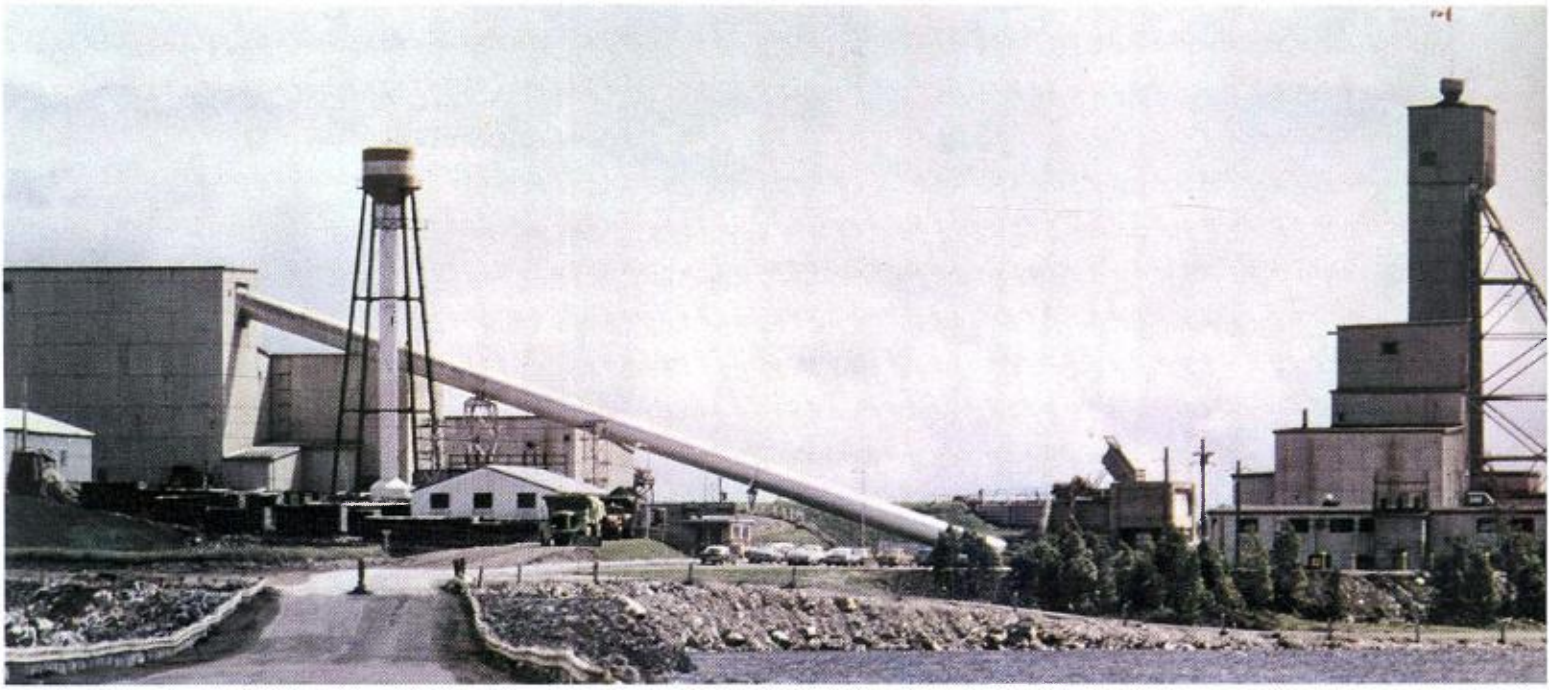


Fig. VI — Campbell Chibougamau Mines Ltd.
Original Mine



Fig. IX Outcrop of magnetite ore

THE OREBODY

LOCATION

The iron ore property is located at Magnetite Bay on the North shore of Lake Chibougamau, 12 miles (20 km) east of the Town of Chibougamau.

Chibougamau has a population of 12,000 people and serves nine base metal mines located in the area. Skilled labour, housing, commercial facilities, etc. . . . are at hand.

Highways, railways, an airport, and other urban facilities are also available.

Presently, there is ample electrical power in the area. In addition, with the development of the James Bay hydro-electric project, large quantities of additional power will become available.

Only 13.5 miles (22.5 km) of new railway are required to link the Magnetite Bay deposits to existing CNR lines, which connect with tidewater on the Saguenay River near Port Alfred, a distance of 250 miles, and with Quebec City, a distance of 360 miles.

GEOLOGY

At Magnetite Bay, two magnetite zones are found. The North Zone occurs at the top of an anorthosite complex, in contact with volcanic rocks. The South Zone, 4,000 feet further south, occurs in the anorthosite. Both zones are sub-parallel, roughly east-west in direction, and dip approximately 75° North. The magnetite occurs in highly serpentinized meta-dunite and meta-peridotite layers.

The South Zone is 12,800 feet long and approximately 300 feet wide. It outcrops approximately 50 feet above the lake elevation.

The North Zone is 13,000 feet long, with an average width of 500 feet. It outcrops on the top of the hill, 500 feet above the lake level.

EXPLORATION DONE

A magnetometer survey, conducted on the property in 1959, returned two major anomalies totalling 25,000 feet in length. Exploration diamond drilling, to date, has covered less than 75% of the total length of the anomalies. The South Zone was drilled on a 800-foot (along strike) by 100-foot (across strike) pattern and ten trench samples were taken from ten different sections. On the North Zone, diamond drilling was conducted following approximately a 1,600-foot (along strike) by 100-foot (across strike) pattern. All drill core and trench samples were assayed for Fe and TiO_2.

ORE RESERVES

The explored portions of the two zones have been calculated to contain 270,000,000 tons averaging 27.6% Fe, as outlined by 41,380 feet of drilling to a mining depth of 480 feet for the South Zone, equivalent to 450 feet below lake level, and to an average of 660 feet in the North Zone, equivalent to 240 feet below lake level. The reserves were calculated for lengths of 7,950 feet in the South Zone and 7,080 feet in the North Zone. Details are as follows:

SUMMARY OF ORE RESERVES

(as described above)

	Length in feet	Tons of Ore Millions	Tons of Waste Millions	W/O	%Fe	$\%TiO_2$	CONCENTRATE %Wt	CONCENTRATE %Fe	CONCENTRATE TiO_2
South Zone	7,950	103	94	0.91	26.0	1.0	34.2	66.6	1.0
North Zone	7,080	167	95	0.56	28.6	1.1	34.9	66.1	1.2
TOTAL:	15,030	270	189	0.69	27.6	1.1	34.7	66.3	1.1

Considerably more tonnage may be found by exploring both zones over their full strike lengths. Also, some of the drilling in the North Zone has reached a depth of 1,100 feet, and shown the zone to persist in size at that depth. This indicates that the Magnetite Bay deposits have a potential tonnage of more than 500,000,000 tons of ore, from which 175,000,000 tons of concentrate can be produced.

STRIPPING RATIO

In the North Zone a block of ore containing 46,000,000 tons of ore could be mined with a stripping ratio: waste/ore of 0.1:1 and would yield over 17,000,000 tons of concentrate. For the ore reserves calculated in the North Zone (167,000,000 tons), the waste/ore ratio would gradually increase to an average of 0.56:1. For both Zones with a 55° pit slope, the average waste/ore ratio is 0.69:1.

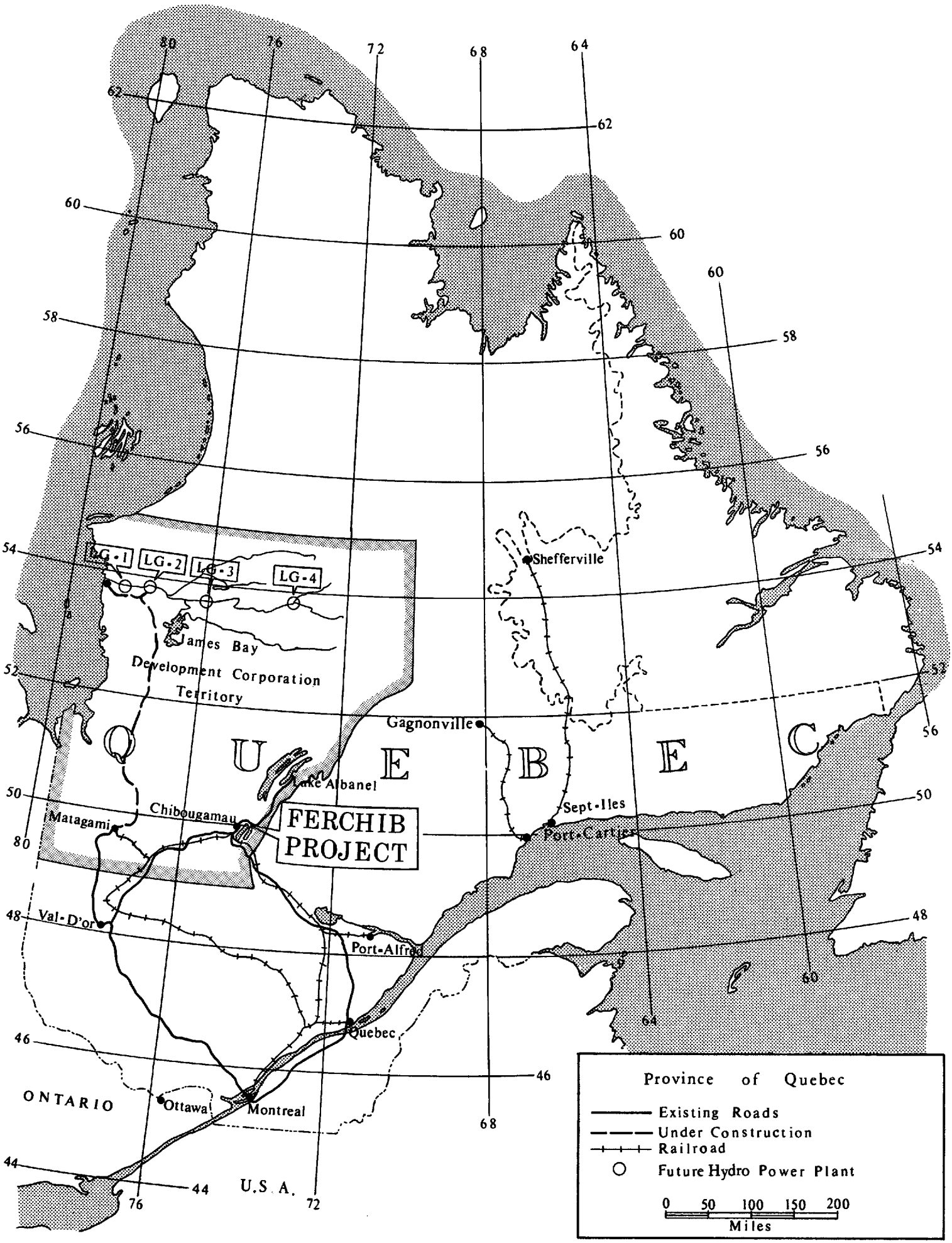


Fig. I — Province of Quebec

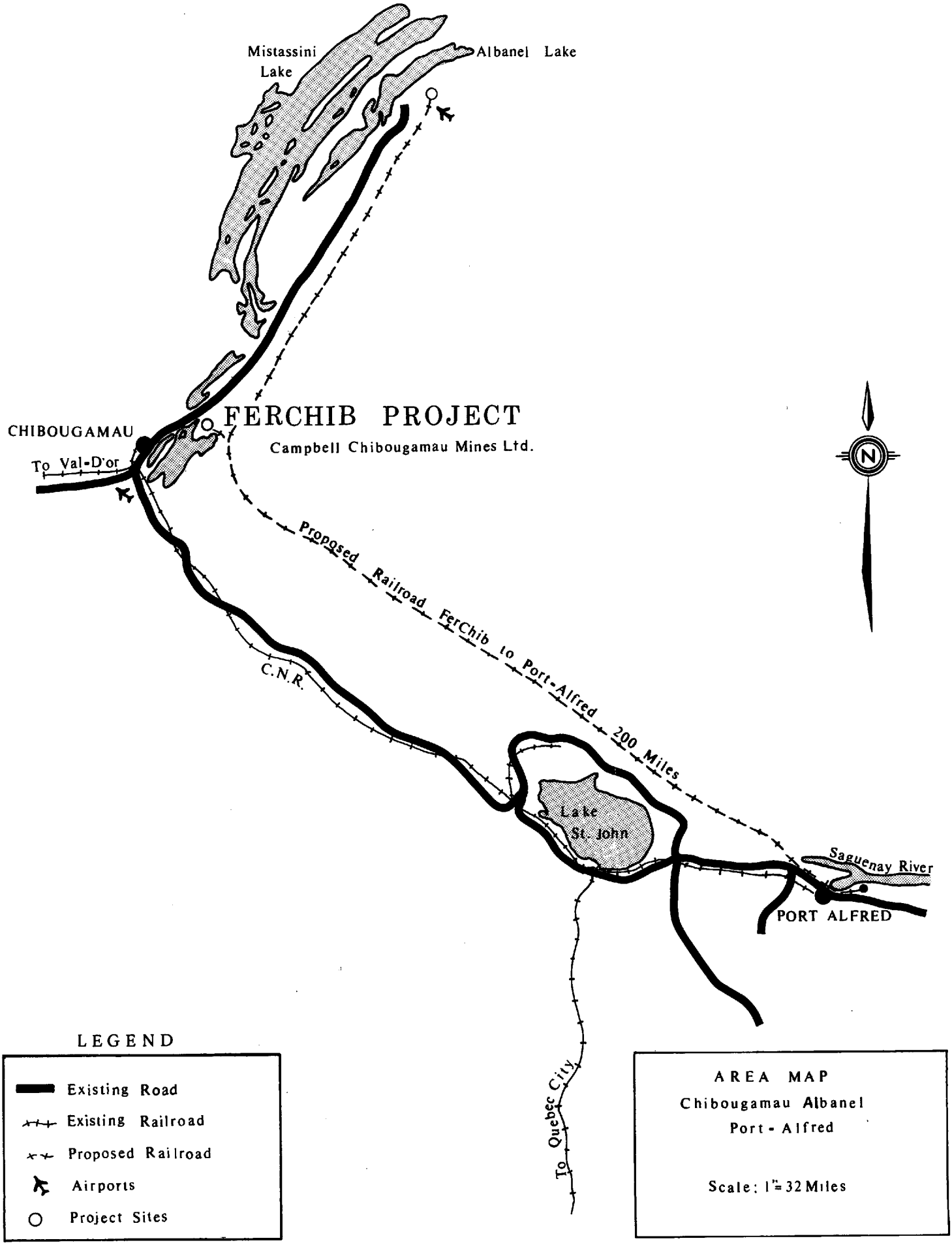


Fig. II — Chibougamau — Albanel — Port Alfred area

THE PRODUCT

DAVIS TUBE TESTS

The recoverable magnetite content of the orebody was determined by over 150 Davis Tube Tests conducted on the mineralized drill core intersections obtained from diamond drilling. Davis tube products were assayed for Fe and TiO_2. The weighted average of the results obtained was then calculated for each zone. Results are summarized in the following table.

WEIGHTED AVERAGE OF DAVIS TUBE TEST RESULTS ON DRILL CORE

	HEADS		CONCENTRATE		
	%Fe	$\%TiO_2$	Weight	%Fe	$\%TiO_2$
South Zone	26.0	1.0	34.2	66.6	1.0
North Zone	28.6	1.0	34.9	66.1	1.2
TOTAL	27.6	1.0	34.7	66.3	1.1

This work was carried out partly in the Campbell Chibougamau Mines mill laboratory and partly at the Quebec Department of Natural Resources pilot plant.

A fine grind of 95% minus 325 mesh is required to produce an acceptable concentrate grade of 66% Fe.

By regrinding to 98% minus 325 mesh, the grade of the concentrate may be increased to 68.5%-69.0% Fe.

BULK SAMPLES

Two 35-ton bulk samples were taken on surface on the South Zone, and were sent to Lakefield Research, and to the Quebec Department of Natural Resources for beneficiation test work in their pilot plants.

Lakefield Research used a 6′ x 2′ cascade type autogenous mill in closed circuit with a vibrating screen for primary grinding to minus 10 mesh. Magnetic cobbing of the screen underflow rejected 50% of the crude ore with a 10% loss of magnetic iron. The cobber concentrate was reground in a 3-ft. diameter Hardinge conical mill to 95% minus 325 mesh. The reground concentrate was upgraded in two stages of magnetic cleanings. A siphonsizer was used between the stages to remove fine slimes and asbestos fibre. In one series of tests the finisher concentrate was reground to 98.0% minus 325 mesh and cleaned in a further stage of magnetic separation.

A 30″ × 36″ rod mill was used in the testwork at the Department of Natural Resources for primary grinding. The rod mill feed was crushed to ⅜″. The rod mill discharge was cobbed for removal of waste. The cobber rejected about 35% of the crude ore with magnetic iron loss of 1%. The cobber concentrate was reground in a ball mill and cleaned in three stages of magnetic separation. The first stage concentrate was again reground in a ball mill before final cleaning. No desliming stage was employed. The test results are summarized in the following table.

SUMMARY OF PILOT PLANT TEST RESULTS

HEADS	GRIND	CONCENTRATE				RECOVERY	
%MgFe	%−325	%Wt	C.R.	%SolFe	$\%TiO_2$	%SolFe	%MgFe
(Single Regrind)							
27.3	94.1	36.5	2.74	66.5	1.13	83.0	87.2
26.8	95.5	36.1	2.77	66.7	1.12	84.3	88.5
(Two regrinds)							
25.3	98.0	32.7	3.06	68.5	1.12	82.4	87.4
–	98.8	34.9	2.87	68.5	1.10	81.3	–
29.0	94.8	38.3	2.61	66.7	0.84	89.5	96.3

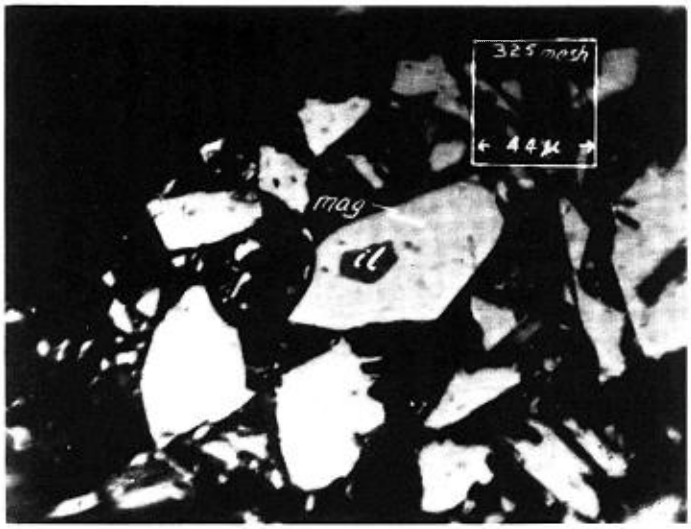


Illustration 1.
Magnetite (mag) with ilmenite (il), Nicols partially crossed. Magnification 600X. Oil immersion.

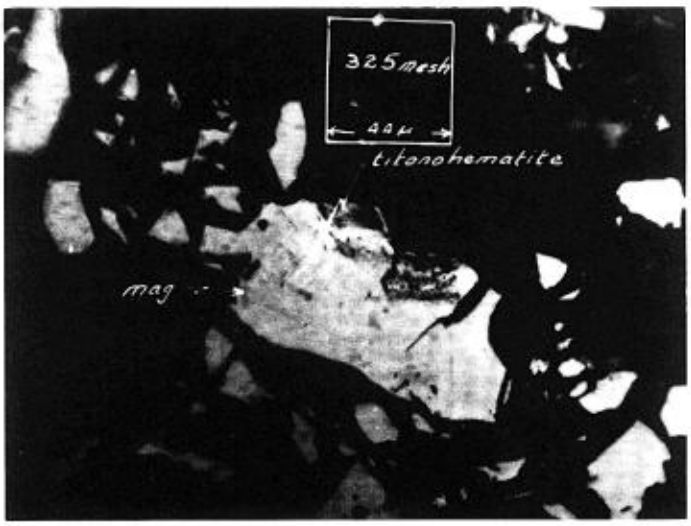


Illustration 2.
Magnetite (mag) with "titanohematite" (labelled). Black inclusions in magnetite are spinel. Magnification 600X. Oil immersion.

Fig. X — Photomicrographs of polished concentrate sample.

CONCENTRATE QUALITY

Chemical and spectrographic analysis of concentrates produced from parts of the North and South Zones have given the following results:

ANALYSIS OF CONCENTRATES

	STANDARD GRADE	HIGH GRADE
Fe	66.3% (Avg.)	68.5-69.0%
SiO_2	2.5% (Avg.)	1.5%
TiO_2	1.1% (Avg.)	0.8%
V_2O_5	0.5% to 0.9%	0.5% to 0.9%
MgO	3.0% (Avg.)	1.4%
Al_2O_3	0.5% (Avg.)	
CaO	0.05 to 0.15%	
P_2O_5	0.039%	
S	0.066 to 2.30%	
Mn	0.05 to 0.5%	
Cu	0.01 or less	
Ni	0.01 to 0.1%	
Cr	Not detected	
As	Not detected	
Sb	Not detected	
Zn	Not detected	

The silica content is significantly lower than in most concentrates produced at the present time. In fact, the concentrate produced would be self-fluxing, or basic in nature.

The high sulphur assay was found in a concentrate produced from one drill hole in the North Zone. Some areas in this zone contain up to 10% sulphides, including in some cases up to 0.2% Cu over substantial widths. More information is required to determine the extent of the sulphur distribution, the amount that could be eliminated by selective magnetic separation, and the effect of pelletizing on the sulphur content. It is expected that all the sulphur will be eliminated by pelletizing.

In the South Zone, there are no visible sulphides.

It should be noted that the samples used were not necessarily representative of either the North or the South Zones.

MICROSCOPIC EXAMINATION OF CONCENTRATES

Lakefield Research and the Quebec Department of Natural Resources have conducted a microscopic examination of a concentrate from composite samples of drill holes Fe-6, Fe-3 and Fe-11, all in the South Zone.

Magnetite and ilmenite occur in a highly altered serpentine. The only distinct titanium mineral is ilmenite. It occurs chiefly as an exsolution intergrowth in the magnetite with the lamellae varying from 3 to 15 microns in thickness.

Lakefield Research reported that about 30% of the ilmenite occurs in this concentrate as free grains. See fig. X.

PELLETIZING TESTS

1. In 1966, a sample of concentrate produced in the Lakefield Research pilot plant was sent to the Process Research and Test Centre of the Allis Chalmers Company for pelletizing tests using the grate-kiln process. Excellent quality pellets were produced. Firing in the kiln for 15 minutes at a temperature of 2,400°F. produced pellets with an average strength of 558 lbs. and a tumble index of 3.6% minus 28 mesh. Increased kiln temperature to 2,450°F. with the same retention time gave an average pellet strength of 623 lbs. with a tumble index of 3.2%. The addition of ½% by weight Wyoming bentonite was required to produce adequate dry pellet strength.

   The physical test results on the pellets were as follows:

Swelling 8%		Reasonable
Reductibility		Good after 1 hour
Hot Abrasion	12%/5mm	Average
Cold Compression	236 kg.	Average
Compression after Reduction	35-40 kg.	Average
Slumping T°	Starts at 1000°C.	
	25% at 1185°C.	Low

2. In 1973, a 150-lb. sample of diamond drill core from holes Fe-6, Fe-7 and Fe-13 all located in the South Zone, and averaging 26.5% Fe, were separated magnetically at the Quebec Department of Natural Resources, to give 40 lbs. of concentrate grading 67.4% Fe, 0.73% TiO_2, and 0.66% V_2O_5.

   After grinding to 97.5% minus 325 mesh, pellets were produced at the Mines Branch of the Canadian Department of Energy, Mines and Resources with the following chemical analysis. These assays were checked by Usinor in France.

GRADE OF PELLETS

	OTTAWA	FRANCE
% Fe Total	65.2	65.6
% SiO_2	1.84	2.04
% Al_2O_3	0.43	0.50
% MgO	2.42	2.16
% Mn	Not determined	0.065
% TiO_2	0.78	0.77
% V_2O_5	0.55	0.60
% CaO	0.32	Not Determined
% Cu	0.004	Not Determined
% S	0.01	Not Determined
% P	0.016	Not Determined
L.O.I.	0.015	Not Determined
% Fe ††	0.26	0.26

The results of these two tests show that very little bentonite (½% by weight) was needed to produce pellets having excellent properties both at the green and hardened stage.

REDUCTION TESTS ON PELLETS

1. In 1968, the Research Department of Lurgichemie carried out reduction tests on both prehardened and burnt pellets from the Magnetite Bay concentrate. The concentrate was easily reduced and pellets with a metallic iron content of 92.5% were produced using an ore/coal ratio of 1:0.55. A high volatile lignite coal was required for adequate reduction. Anthracite coal gave a much lower degree of metallization under similar conditions.
   Reduction tests were carried out in an electrically heated laboratory kiln at a temperature of 1,100°C. with a retention time of one hour.
2. Approximately at the same time, Midrex carried out laboratory reduction tests to study the reducibility of the pellets with gaseous reductants in a shaft furnace. The tests were carried out in a Burrell Tube Furnace using an Rx type of gas.

Reduction levels of 90% and 93.6% were obtained with 6-hour retention time at 1,350°F. and 1,450°F. respectively.

PRODUCTION

The Magnetite Bay ore can be mined by conventional open pit methods. Initially, a production rate of 4.0 million tons per year of standard grade pellets for blast furnace feed or high grade pellets for pre-reduction is contemplated. This should be sufficient for the start of an economical iron mining operation in Chibougamau.

This basic operation could eventually be expanded in the future, to produce pre-reduced pellets if a market for this product develops.

THE PROFITABILITY

In 1966, reports on the Magnetite Bay iron property were prepared by Neil and Riddell, and by Kaiser Canada. Both reports indicated that the project had a good potential, but as noted in Neil and Riddell's report, more studies and test work were required.

In 1971, Hatch Assocates Ltd. prepared a Review of Campbell's Iron Properties with Relation to Markets and Profitability.

CAPITAL INVESTMENT

The study made by Hatch indicated that the following ranges of capital investment would be needed for a production rate from 0.75 to 3.0 million tons of pellets per year.

PRODUCTION RATE (in million tons of pellets per year)	RANGE OF CAPITAL INVESTMENT in $ million
0.75	23.0 to 31.0
1.5	52.5 to 67.5
3.0	82.5 to 112.5

For the 0.75 million tons per year production, pelletizing facilities are not included. For 1.5 to 3.0 million tons per year production, the estimates include $7.5 million for shiploading facilities.

The above estimates are now due to be revised. However, because of the existing facilities in the area, we believe that it would not be unreasonable now to estimate a capital cost of $40.00 per long ton of annual capacity for a 4 million ton per year installation in Chibougamau.

If 75% of the capital cost is in the form of loans, the cost per ton at 12% interest for a 20-year loan would be $3.90 per year, or $0.06 per L.T.U. pellets (65% Fe).

OPERATING COSTS

1. For a production of 3.0 million long tons per year, Hatch in 1971 estimated the following direct mining costs:

OPERATING COST ESTIMATE FOR PELLETS BY HATCH IN 1971

	$/Ton All Material	$/Ton Ore	$/L-Ton Pellets
Mining	0.31	0.62	1.86
Milling		0.79	2.38
Pelletizing			1.93
Loading at Mine			0.02
		Sub Total	$ 6.19
Freight to Port Alfred			4.28
Unloading dock, shiploading, etc.			0.44
Overhead			0.25
		Sub Total	$11.16
Royalty			1.00
Management Fee			0.25
Total f.o.b. ship Port Alfred — per long ton			$12.41
— per L.T.U. (65% Fe)			.19

2. Early in 1974 Caron & Dufour prepared a revised estimate of operating costs for a production of 4.5 million long tons of pellets per year.

OPERATING COST ESTIMATE FOR PRODUCTION OF OXIDE PELLETS
4,500,000 L.T.P.Y.
by Caron & Dufour — 1974

	$/Ton of Oxide Pellets
Mining	2.41
Milling	2.84
Pelletizing	2.17
Rail transportation	3.02
Handling at Port	0.54
Sub Total	$10.98
Royalty	1.00
Management Fee	0.25
Total f.o.b. Port Alfred — per long ton	$12.23
— per L.T.U. (65% Fe)	.19

In the above estimate mining costs are for an average waste to ore ratio. In the first 5 years of production, the waste to ore ratio will be lower, and consequently, production mining costs will probably be $1.00/ton lower. Also, it is expected that negotiated rail transportation rates will be at least $0.50/L.T. lower. Taking these two factors into account, and a slightly smaller rate of production at 4,000,000 L. Tons per year, it is expected that operating costs for the first 5 years of production would average $11.00 per long ton, or $0.17 per L.T.U., f.o.b. Port Alfred.

TRANSPORTATION

Freight mileage is approximately 250 miles between Chibougamau and tide water on the Saguenay River. Canadian National Railways has already offered its services to transport the iron oxide pellets from Magnetite Bay to a suitable site on the Saguenay River near Port Alfred. The existing line would have to be up-graded, and two 16-mile branch lines would need to be built, one at the Chibougamau end, and the other at the Port Alfred end. In 1973, the C.N.R. provided the following estimated rates:

1. C.N.R. operates and provides all the capital for the up-grading, rolling stock, and branch lines.
   Transportation cost — $3.02/L.Ton.
2. C.N.R. operates, but all capital comes from governmental subsidies.
   Transportation cost — $2.14/L.Ton.

However, this renovated and extended railroad would not be adequate for the transportation of more than 10,000,000 tons/year of iron concentrate or pellets. In order to be able to service the Albanel iron district which is 90 miles north of Chibougamau, the Quebec Government is studying, as an alternative, the possibility of constructing a complete new line from Albanel and Chibougamau to Port Alfred.

Presently, the Saguenay River can accommodate, year round, ships up to 100,000 tons in capacity. Relatively minor deepening, at the mouth of the Saguenay, would open navigation to 200,000-ton capacity ships from all parts of the world.

The contemplated location for port facilities would be near Port Alfred as the water depth in the area (300 to 600 feet) can accommodate 200,000-ton capacity ships.

The topography in this area is relatively flat and would permit stockpiling of large tonnages of iron ore products for shipment to world markets.

PROPOSED WORK AND CURRENT PLANS

1. ADDITIONAL DIAMOND DRILLING

Fifteen thousand feet (15,000') of additional diamond drilling is planned on the North Zone to outline the orebody on sections at 800-foot intervals. This drilling will also establish more accurately the mineralogical composition of the North Zone. Timing, 3 months.

2. REVISION OF PIT PLANNING & ORE RESERVES CALCULATIONS

Following the results of diamond drilling, pit planning and ore reserve calculations will be revised.

3. METALLURGICAL TESTS

A representative sample of drill core in the North Zone will be prepared, and a bulk sample will be taken to obtain information on the following subjects:

a) Cobbing characteristics, grindability, and autogenous grinding of the ore.

b) Quality of concentrate and pellets produced.

c) Possibility of recovering copper concentrates as a by-product from part of the North Zone.

4. FEASIBILITY STUDY

It is also proposed to hire a recognized firm of Consultants to update and revise our feasibility studies. Items 2, 3 and 4 should be completed in 6 months.

5. TRANSPORTATION STUDY

Regional Planning Authorities have in the last few years been recommending to the Quebec Government that a new railroad and port facilities should be built in the Albanel-Chibougamau-Port Alfred area to facilitate the development of natural resources in the mid-northern part of the Province.

The Quebec Minister of Natural Resources, Mr. Gilles Massé, has recently stated that the Government is seriously studying participation in the establishment of these new railroad and port facilities.

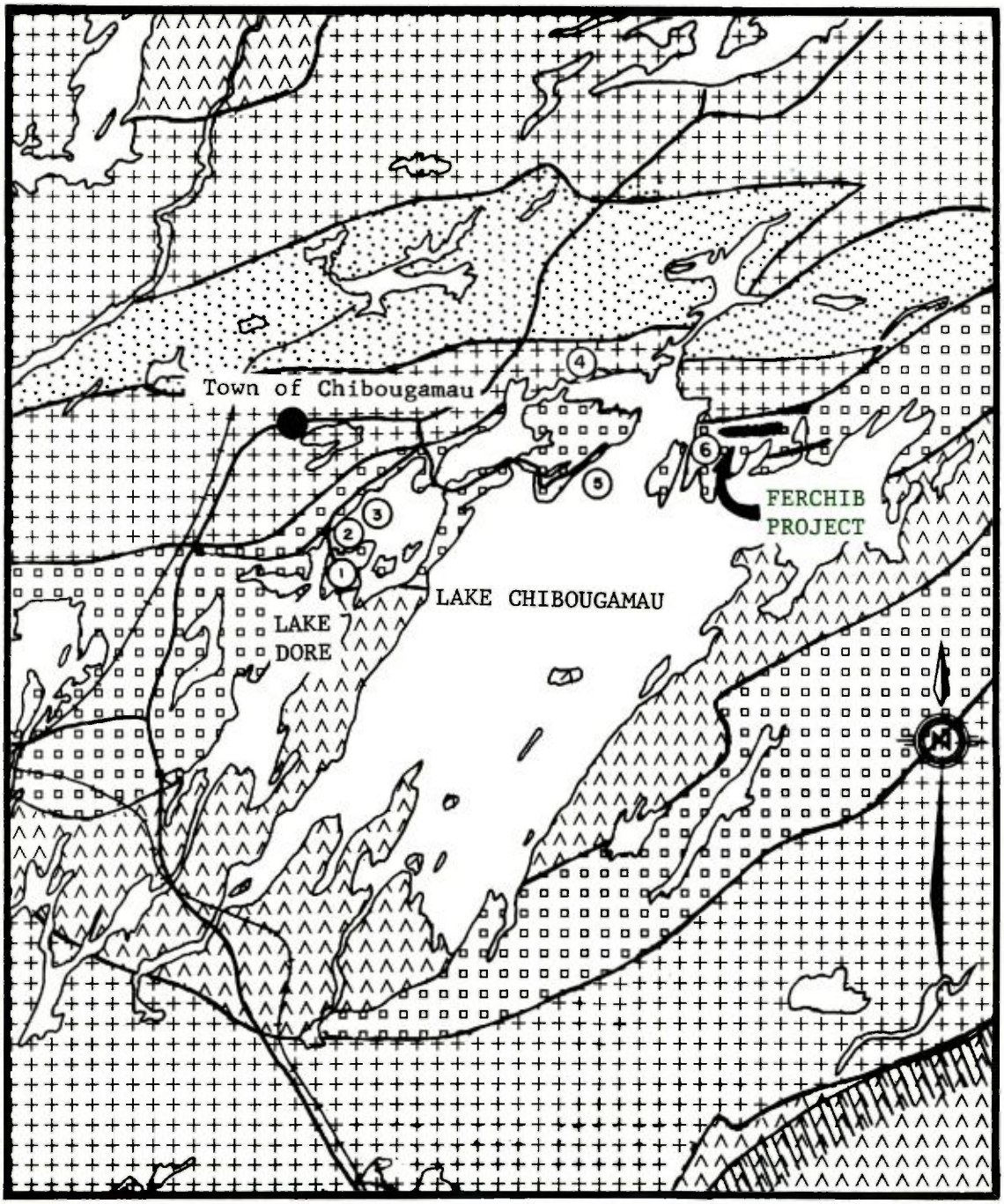
This was confirmed by the Quebec Minister of Transport, Mr. Raymond Mailloux, who has announced that the Government will retain in the next few weeks a specialized firm to make a study on the possibilities of building a railroad between the Port Alfred area on the Saguenay and the iron deposits in Chibougamau and Albanel. The cost of the study is estimated at more than half a million dollars.

6. MARKETING AND CURRENT PLANS

The above work, i.e., diamond drilling, planning, testing, and feasibility study is estimated to cost between $600,000 and $700,000.

We are currently contacting potential buyers and, or, partners, with the intention of forming a joint venture to undertake this study. If justified; we hope that by the end of 1975, a market will be found for the pellets, that financing will be arranged, that a production decision could be taken, and that the next phase of the project, i.e., detailed engineering, could start immediately.

The first delivery of pellets is tentatively set for the end of 1978, or beginning of 1979.



SCALE - 1" = 4 Miles

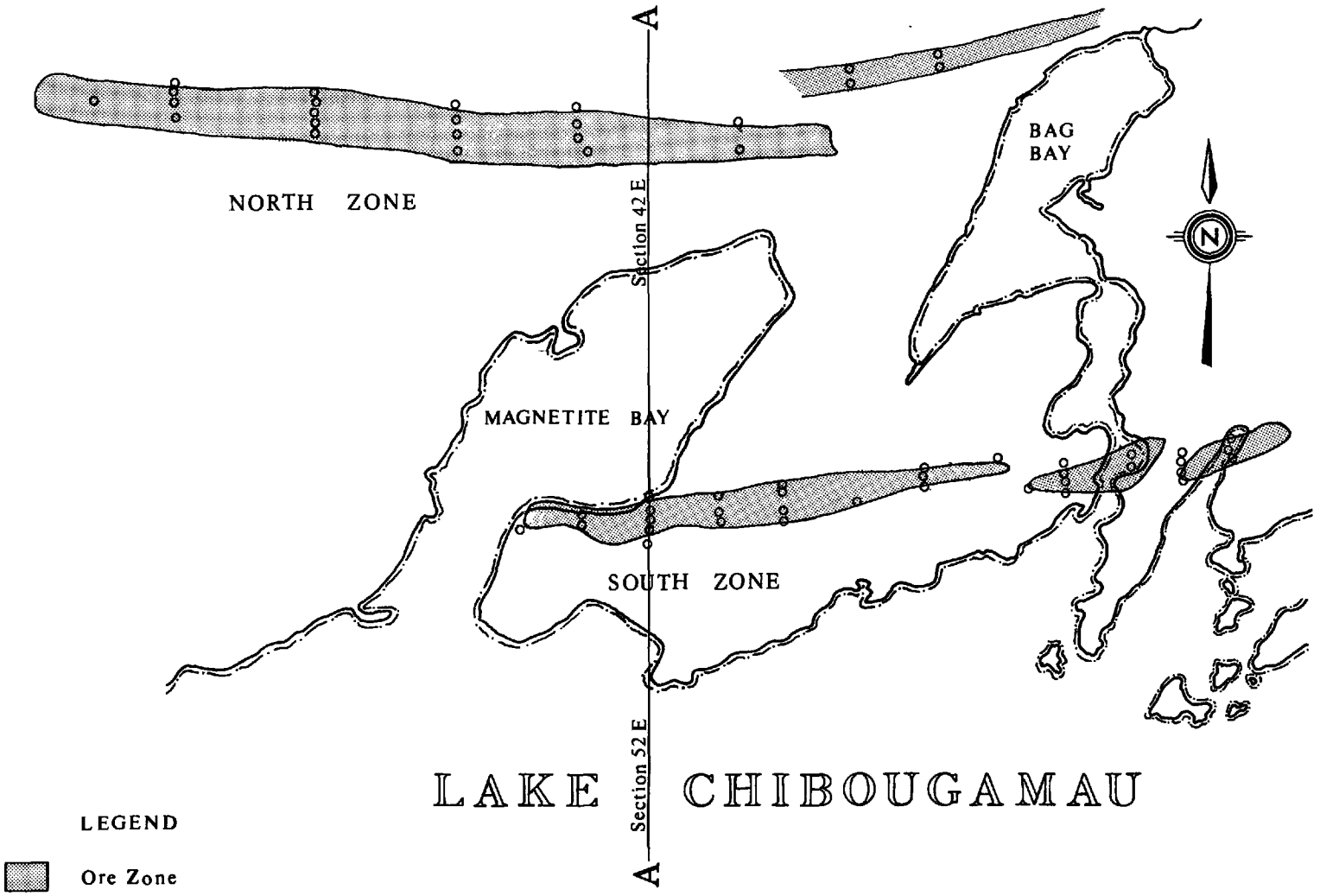
LEGEND

- GILMAN FORMATION (Volcanics)
- GRANITE
- ANORTHOSITE
- ULTRA-BASIC
- GRENVILLE FRONT
- FAULTS
- IRON FORMATION

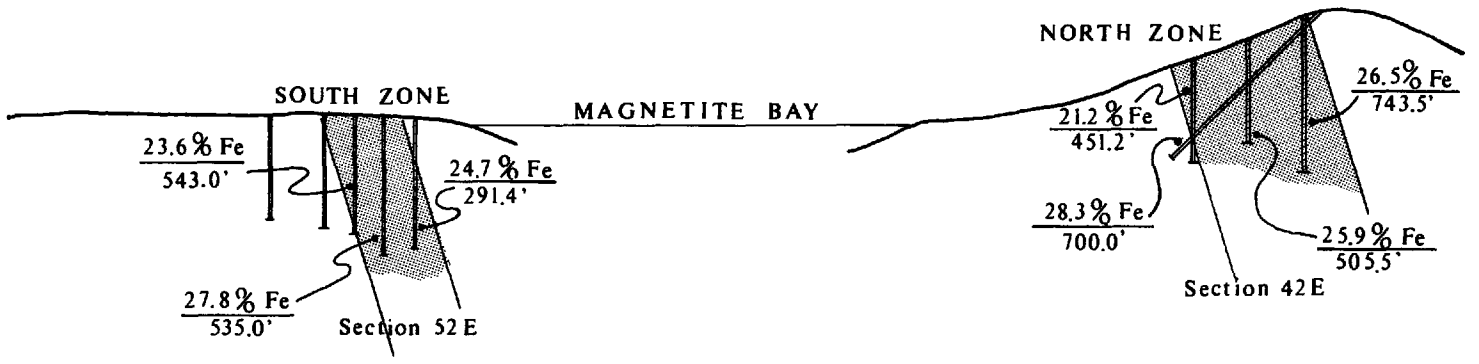
MINES OPERATED
CAMPBELL CHIBOUGAMAU MINES LTD.

1. ORIGINAL MINE, MERRIL & CHIB-KAYRAND
2. KOKKO CREEK
3. CEDAR BAY & QUEBEC CHIBOUGAMAU
4. GRANDROY
5. HENDERSON 1 & 2
6. **FERCHIB PROJECT**

Fig. III — Regional Geology — Chibougamau area



PLAN SCALE : 1" = 2000 Feet



SECTION A - A SCALE : 1" = 1000 Feet

Fig. IV — Plan and Section of Magnetite Bay Deposit

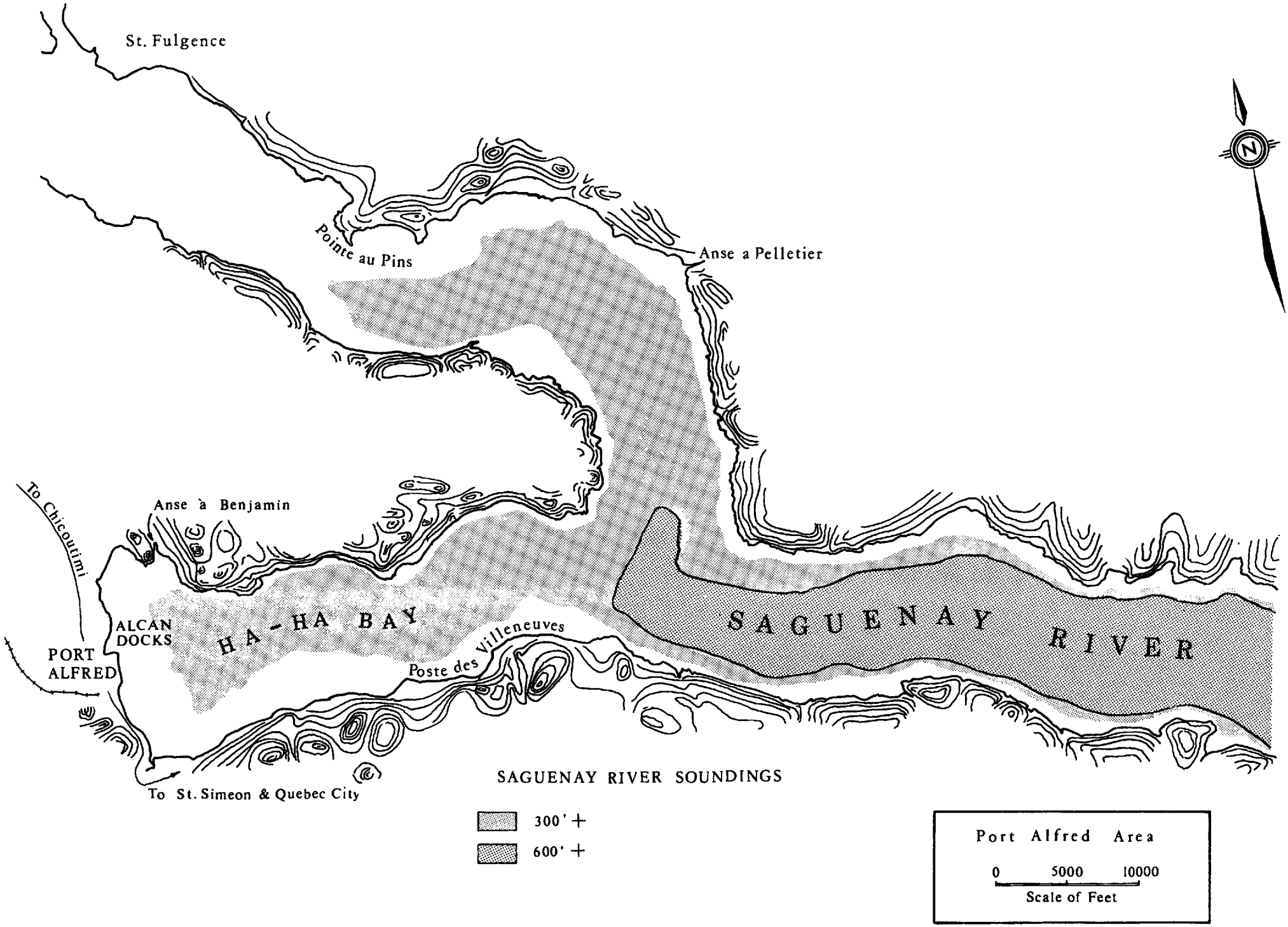


Fig. V — Port Alfred area

LIST OF REPORTS AVAILABLE

1959	E. Gaucher, Quebec Dept. of Mines	R.P.-379 — Geologie du Quart Sud-Est du Canton Roy.
1960	E. Gaucher	Ph.D. Thesis — Harvard University — The Magnetite Anomaly, etc.
Oct. 1965	Quebec Dept. of Natural Resources	Mineralography of crushed sample.
Dec. 1965	Quebec Dept. of Natural Resources — Pilot Plant, G. Castonguay, Eng.	Project #506, Magnetic Concentration tests.
Jan. 1966	H. E. Neal, P.Eng.	Summary of Metallurgical Results.
Feb. 1966	H. E. Neal & W. J. Riddell	Preliminary Open Pit tonnage and grade estimate.
June 1966	G. G. Hatch	Blast Furnace Smelting of iron ore pellets containing 1% TiO_2.
July 1966	Hughes Tool Co.	Drillability estimate.
July 1966	Allis-Chalmers	Pelletizing Tests.
Aug. 1966	Kaiser Canada	Review of Magnetite Bay Iron Property.
Aug. 1966	Neal & Riddell	Magnetite Bay Project Review of Mining & Milling Costs, and Current Status of Work.
Sept. 1966	Kaiser Canada	Preliminary Capital and Operating cost estimate to produce sponge iron.
Oct. 1966	H. E. Neal, P.Eng.	Highlights of Magnetite Bay pilot plant test work at Quebec City.
Nov. 1966	H. E. Neal, P.Eng.	Magnetite Bay operating costs.
Nov. 1966	H. E. Neal, P.Eng.	Capital costs for 3,000,000 TPY pellets.
Jan. 1968	Lurgie Gesellsehaft Fur Chemie and Huttenwesen M.B.H.	Reduction tests in an Electrically heated rotary kiln with pellets of Campbell Chibougamau Mines Ltd.
1969	André Dorr	Ms Thesis — McGill University — Magnetite Deposit in the Northern part of the Doré Lake complex — Chibougamau District.
May 1970	H. E. Neal, P.Eng.	Summary of Test Results.
Nov. 1970	H. E. Neal, P.Eng.	Magnetite Bay Property — Summary of Test Results
Jan. 1971	Hatch Associates Ltd.	Review of Campbell's iron ore properties with relation to markets and profitability
March 1971	Hatch Associates Ltd.	Magnetite Iron Bay Deposit — Review of costs and Profitability.
Nov. 22, 1972 & June 26, 1973	Min. des Richesses Naturelles, Quebec	Project 701 Récupération du Vanadium dans le concentré magnétique. 1ère et 2ième parties.
Dec. 1972	Caron & Dufour, Séguin & Associés	Production of V_2O_5 from the Magnetite Bay Deposit.
March 1973	Caron & Dufour	Revisions of various aspects of the Magnetite Bay Iron Project, Progress Reports, I, II, III and IR #2.

OFFICERS — THE FERCHIB PROJECT

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