

# SOQUEM



annual report 1969-1970



### **Reminder**

The Québec Mining Exploration Company is a Government-owned commercial and industrial concern. It is an incorporated company with an authorized share capital of \$15,000,000. This share capital is subscribed by the Government of Québec, its sole shareholder, at the rate of \$1,500,000 a year.

Its activities began November 1st, 1965.

# SOQUEM

## FILE COPY

annual report 1969-1970

*If a company is large enough to carry a substantial exploration programme over several years, conducted by competent engineers, if it is big enough to make the law of averages work for it, then in total, the money may prove to have been well spent, by the discovery of enough new mines to make its total exploration expenditures appear economic. But, if the company can afford only a few bets, it is almost surely doomed to failure.*

FINANCE IN THE MINING INDUSTRY — 1962, A staff study prepared by E. K. Cork, for the Royal Commission on Banking and Finance, p. 38.

*SOQUEM will have no fiscal privileges, nor specialties with the Department of Natural Resources. Confidential department information will remain such for SOQUEM as for private companies.*

*The company will enjoy the advantages of a private company, that is the privacy of its own operation, and it will submit to the Legislative Assembly information that private companies must by law submit to their shareholders.*

*SOQUEM will indeed be in competition with the rest of the industry, but in a spirit of fair play according to the rules of the game. We all know, on the other hand, that any discovery made by SOQUEM is also liable to be of benefit to other companies; and we hope that the very nature of the long-range character of its programs will profit the whole of industry. . . It should be said, however, that SOQUEM, having a private corporation personality, will also have the hard edge of business relations.*

Main address delivered on behalf of the Government of Québec by Mr. Henri Beaupré at the annual conference of the Québec Metal Mining Association, June 8, 1965.



## highlights

- Two commercial companies in which SOQUEM holds an interest have begun their operations: Louvem Mining Company Inc. and Dighem Limited.
- Marked success of airborne radiometric surveys :  
confirmation of the importance of the St-Honoré carbonatite in columbium and rare earths ;  
discovery of uraniferous sedimentary formations at St-Armand, Missisquoi county.
- Formation of a Research Department within the Company.
- The Company shares 28 of its 29 exploration projects with private companies.

## summary

	Nov. 1965 March 1966	Year 1966-67	Year 1967-68	Year 1968-69	Year 1969-70
Total expenses for the period	\$111,073	\$1,403,101	\$2,052,545	\$2,855,005	\$2,148,320
Contribution of partners to projects managed by Soquem	—	242,000	507,000	1,008,091	759,566 *
Soquem's expenses	111,073	1,161,101	1,545,545	1,846,914	1,388,754
Sales of interests : through participation	—	20,793	57,890	85,250	124,300
Soquem's net expenses	111,073	1,140,308	1,487,655	1,761,664	1,264,454
Capital stock paid in full	625,000	1,500,000	1,500,000	1,500,000	1,500,000
Excess (shortage) of capital stock over Soquem's net expenses	513,927	359,692	12,345	(261,664)	235,546
Sales of interests : through incorporation	—	—	—	—	308,776
Net excess (or shortage)	\$513,927	\$ 359,692	\$ 12,345	\$ (261,664)	\$ 544,322

\* The decrease in the contribution of partners for 1969-70 is due mainly to the fact that one partner decided to cease contributing to an important joint exploration project; consequently, SOQUEM had to support by itself the cost of this project, slow down its activities on other projects, and turn down other partnership offers in order to avoid cutting into an already low working capital.



## board of directors

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To the Honorable Gilles Massé, m.p.q.  
Minister of Natural Resources  
Parliament Buildings  
Québec

Sir:

In conformity with article 18 of the charter of the Québec Mining Exploration Company, the Board of Directors submits hereunder the Annual Report of the Company for the fiscal year ending March 31, 1970.

The field of activity of the Québec Mining Exploration Company (SOQUEM) encompasses all that is necessary in order to discover mineral deposits and subsequently to assure their full development, with a view to determining their maximum economic value.

In fact, the objects of the Company are:

- a) to carry out mining exploration by all methods;
- b) to participate in the development of discoveries, including those made by others, with power to purchase and to sell properties at various stages of development, and to associate itself with others for such purposes;
- c) to participate in bringing mineral deposits into production either by selling them outright or transferring them in return for an interest.

The end-product of the application of modern mining exploration techniques is the commercial exploitation of orebodies once their economic evaluation has shown this to be feasible. These techniques are naturally grouped into two categories:

1. The search for ore through the application of Earth Sciences, particularly mineralogy, petrography, tectonics, geochemistry and geophysics.
2. The development of such ore zones as have been discovered by the use of the above mentioned methods. The quality and quantity of the ore present must then be calculated according to

norms that are in common use throughout the mining industry for the purpose of establishing their economic value.

SOQUEM's activities are carried out generally with partners in the private sector of the industry. Its charter permits participation in the development of discoveries by associating itself with others for such purposes.

The following table indicates the extent of work carried out to date, including the principal methods which have been used by the Company since its inception.

## EXPLORATION PROJECTS

Exploration projects carried out by the Company are divided in two main categories:

1. reconnaissance projects which lead to the discovery of mineral occurrences;
2. discovery development projects, that is work on mineralized zones having an economic potential.

## Autonomous projects

An autonomous project is one which generally in its early stages is initiated and carried through solely by SOQUEM. During the fiscal year, many of these projects were completed that had been originated during the preceding years. Several were abandoned because of their very limited chance of success while others, mainly those involving the development of discoveries, resulted in the formation of partnerships with private companies.

As an example, a summary description of an autonomous project is given below:



# Statistics on the main exploration methods used at SOQUEM since April 1st, 1966

Methods	Units	Year 1966-67	Year 1967-68	Year 1968-69	Year 1969-70
<b>Geology</b>					
reconnaissance	square miles	—	18,500	4,198	—
detailed surveys	acres	—	111,948	96,000	35,250
line cutting	linear miles	881	2,096	1,280	1,105
<b>Airborne geophysics</b>					
magnetometer	" "	2,987	4,414	2,432	576
electromagnetometer	" "	2,987	4,414	2,432	576
scintillometer	" "	—	19,979	55,711	24,319
<b>Ground geophysics</b>					
magnetometer	" "	803	1,835	738	506
electromagnetometer	" "	604	1,335	654	316
TURAM	" "	278	344	178	424
induced polarization	" "	57	86	65	99
scintillometer	" "	—	228	28	388
gravity	stations	—	2,966	6,425	5,645
<b>Geochemistry</b>					
sediment	samples	4,933	17,788	23,332	3,261
heavy mineral	"	1,395	117	21	186
soil	"	5,730	8,661	15,718	15,999
rock	"	—	15	2,830	2,791
overburden drilling	holes	—	15	274	604
	feet	—	702	9,139	18,360
<b>Trenching</b>					
trenches		21	113	—	63
cubic feet		—	—	—	432,050
<b>Drilling</b>					
holes		15	137	291	136
feet		5,591	48,361	128,157	65,045
properties		4	25	25	22

# Main exploration programs under way between April 1st, 1968 and May 15, 1970

Projects	Joint Ventures								
	Autonomous			Managed by SOQUEM			Managed by partner		
	Year 1968 1969	Year 1969 1970	Current	Year 1968 1969	Year 1969 1970	Current	Year 1968 1969	Year 1969 1970	Current
Reconnaissance and search for mineral occurrences	10	8	0	15	21	19	3	3	5
Development of mineralized zones having an economic potential	5	3	1	3	3	4	0	0	0
<b>TOTAL</b>	<b>15</b>	<b>11</b>	<b>1</b>	<b>18</b>	<b>24</b>	<b>23</b>	<b>3</b>	<b>3</b>	<b>5</b>

As of March 31 1970 joint ventures had resulted in the formation of two commercial companies :

1. Louvem Mining Company Inc.
2. Dighem Limited.



## 1. Airborne radiometry project

This project was started nearly four years ago, inspired as it was by the technical objectives and priorities set forth by the Company a few months after its inception.

The exploration method consists in carrying out airborne surveys over areas of Québec, which were considered to be geologically favorable for the presence of radioactive minerals. The airborne instruments are a scintillometer and a recorder which register the total radiation of radioactive minerals in the ground. Flightlines are 3,000 feet apart.

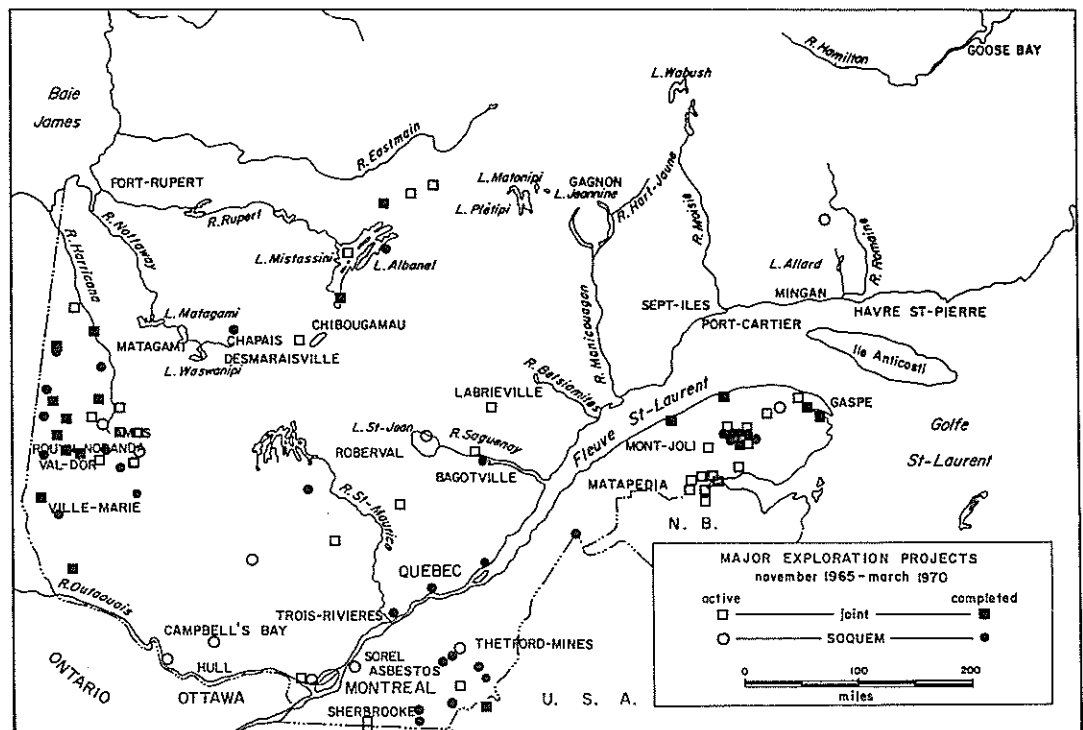
The low cost of such radiometric surveys, a maximum of \$1.50 per linear mile, has permitted the Company to fly more than

100,000 miles over an area of nearly 60,000 square miles.

This type of survey has brought about in 1967 the discovery of carbonatites in St-André-d'Argenteuil, near Lachute, and St-Honoré, near Chicoutimi. More recently, a find has been made of uranium bearing sedimentary formations in Missisquoi county.

### a) St-Honoré carbonatite, Dubuc county

The last annual report contained information on the St-André-d'Argenteuil and St-Honoré carbonatites. Since then, some field work has been carried out while the necessary mechanics were being set up in order to acquire a development partner. Despite the limited additional diamond drilling



The location and nature of the major projects undertaken by the Company since November 1, 1965, are shown on the accompanying map.

done, this work has revealed that the St-Honoré carbonatite offers interesting economic possibilities.

This geological complex contains at least two mineralized zones, one containing columbium, and the other rare earths. We also have some information on other zones of these same metals. Columbium is a metal used in high tensile structural steel. Rare earths form a chemical group of some twenty elements for which an increased consumption by modern industry is predicted.

Six diamond drill holes cut across a well mineralized zone of columbium. Five of these holes put down at 200-foot intervals indicate a deposit at least 1,000 feet long.

The assays have shown an average grade of about 0.5%  $\text{Cb}_2\text{O}_5$  over lengths of core reaching 1,000 feet. Available data indicate a tonnage in the order of 45,000 tons per vertical foot at 0.48%  $\text{Cb}_2\text{O}_5$ , or 15,000 tons per vertical foot at an average grade of 0.66%  $\text{Cb}_2\text{O}_5$ , or 5,000 tons per vertical foot at 0.86%  $\text{Cb}_2\text{O}_5$ . The compilation of these early results suggests that the main columbium-bearing zone is of very large proportions. Moreover, the geological context suggests that other similar zones could exist within the carbonatite.

Columbium is mainly found in the form of pyrochlore which, according to geochemical assays, grades about 64%  $\text{Cb}_2\text{O}_5$ ; it seems therefore possible to produce a high grade concentrate.

The size and characteristics of the rare earths zones are not well known. Drill holes put down so far do not make it possible to compile tonnage estimates. Nevertheless it is known that total rare earths oxides intersected in four drill holes grade between 1% and 4.5%. Mineralized core lengths are generally over 150 feet and in one drill hole it reaches 300 feet for an average grade of over 3%.

Much more drilling will be necessary to evaluate these rare earths zones. Here is the list of the most significant assay results expressed in columbium pentoxide:

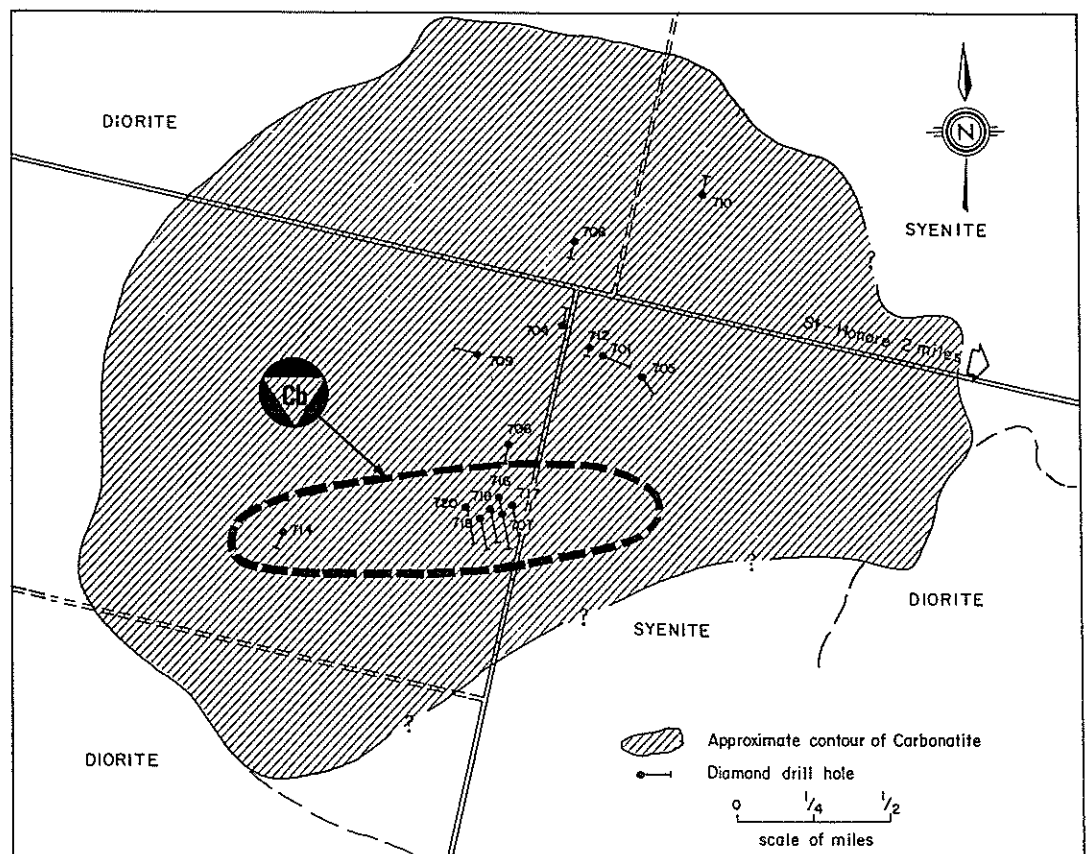
Columbium zones			
Hole No.	Footage	Core length in feet	% $\text{Cb}_2\text{O}_5$
1	378.0 - 462.0	84.0	0.32
7	360.0 - 473.0	113.0	0.85
	or 142.0 - 802.0	660.0	0.50
14	416.0 - 438.0	22.0	0.63
	438.0 - 460.0	22.0	0.32
	or 416.0 - 460.0	44.0	0.47
16	161.0 - 248.7	87.7	0.61
	248.7 - 391.0	142.3	0.43
	422.3 - 474.0	51.7	0.45
	503.0 - 527.0	24.0	0.75
	559.0 - 786.0	227.0	0.60
	822.5 - 1001.0	178.5	0.47
	1073.0 - 1118.3	45.3	0.44
	1160.0 - 1220.0	60.0	0.50
	or 161.0 - 1300.0	1139.0	0.45
17	204.5 - 300.0	95.5	0.44
	688.0 - 815.0	127.0	0.79
	or 204.5 - 900.0	695.5	0.44
18	229.0 - 281.5	52.5	1.12
	or 229.0 - 435.0	206.0	0.61
	475.0 - 530.0	55.0	0.71
	580.0 - 715.0	135.0	0.64
	or 175.0 - 900.0	725.0	0.50
19	300.5 - 393.0	92.5	1.00
	413.0 - 505.0	92.0	0.70
	or 241.3 - 505.0	263.7	0.73
	or 241.3 - 900.0	658.7	0.57
20	312.7 - 420.0	107.3	0.60
	420.0 - 490.0	70.0	1.17
	or 312.7 - 490.0	177.3	0.71
	610.0 - 671.0	61.0	0.63
	or 164.3 - 900.0	735.7	0.45

The core angle varies between 40° and 65°.

# SOQUEM

These sections are comparable or superior in grade to the columbium ore mined at Oka, northwest of Montréal. Obviously, there is a large number of technical and marketing problems to be solved before this discovery can be considered a commercial proposition. Nevertheless, it is encouraging to see that the market for columbium concentrates seems to have improved greatly during the last year. In its last annual report, the only North-American producer of concentrates, which mines columbium ore at Oka, states that consumption of columbium pentoxide ( $\text{Cb}_2\text{O}_5$ ) increased from 12 million pounds in 1968 to 19 million in 1969 and that it could be over 25 million pounds in 1970.

The development of the St-Honoré carbonatite is just beginning but data compiled so far indicate a property having a potentially high value. Moreover, the geographical location of the complex in a well organized industrial region, close to a seaport, offers definite advantages in comparison to similar complexes found in different parts of the world during the last twenty years. Carbonatites are interesting geological features as they are the source, in many geographical areas, of a variety of metals and industrial minerals such as barite, copper, fluorite, iron, nepheline (alumina), columbium phosphate, rare earths, thorium, titanium, vermiculite and zirconium.



## Rare earths zones

Hole No.	Footage	Core length in feet	% total rare earths oxides
1	152.0 - 186.5	34.5	1.08
	186.5 - 200.0	13.5	0.77
	216.5 - 262.0	45.5	1.08
	262.0 - 317.0	55.0	0.99
	or 152.0 - 317.0	165.0	0.92
4	81.3 - 122.8	41.5	1.97
	122.8 - 170.6	47.8	2.84
	170.6 - 204.8	34.2	4.50
	206.0 - 248.6	42.6	3.13
	248.6 - 290.0	41.4	4.10
	290.0 - 345.0	55.0	3.37
	345.0 - 378.0	33.0	2.91
	378.0 - 407.0	29.0	2.23
or	81.3 - 407.0	325.7	3.13
9	253.0 - 310.0	57.0	3.30
	310.0 - 367.0	57.0	1.83
	367.0 - 410.0	43.0	1.31
	410.0 - 460.0	50.0	2.44
	460.0 - 504.0	44.0	2.15
or	253.0 - 504.0	251.0	2.25
12	12.2 - 79.0	66.8	2.23
	79.0 - 150.0	71.0	2.28
or	12.2 - 150.0	137.8	2.26

The core angle varies between 45° and 50°.

In order to assure the development of the St-André-d'Argenteuil and St-Honoré mining properties, the management of SOQUEM had active discussions during the last two years with several companies concerning the sale, under different terms, of a part of its own interest.

At the end of the fiscal year, Keevil Mining Group Limited and SOQUEM agreed to form a joint venture which was approved by the board of directors of both companies. The resulting contract provides for the sale of an interest of 50% by SOQUEM for development expenses of up to

\$1,400,000 to be made by the Keevil Mining Group. The group has an option to cease its participation after completing the first phase of work after an expenditure of \$150,000 and a second of \$250,000, at which time it will have gained a 25% position in a limited area of the property.

Upon completion of the \$400,000 program by the Keevil Group, SOQUEM will contribute one dollar for each two dollars invested by the partner, for the total sum of \$1,900,000 in development work, hopefully within three years, assuming the continuation of the joint venture over the period of its stated term.

## b) Uraniferous sedimentary formations of St-Armand, Missisquoi county

During May 1969, an airborne radiometric survey conducted by SOQUEM detected a half-mile long anomaly near St-Armand, in Missisquoi county, some 40 miles southeast of Montréal.

The anomalous readings are explained by appreciable amounts of uraninite disseminated in thin layers of brecciated dolomite of Cambrian age. The uranium-bearing stratigraphic horizon dips easterly at an angle of 30°. This horizon was tested over a strike length of 3,500 feet by 9 holes drilled along cross-sections located at right angles to it and spaced at 800-foot intervals. The available data suggest that the uranium-bearing beds are continuous along the strike, and have a thickness ranging from 5 to 10 feet, at a grade ranging from 0.1 to slightly above 1.0 pound  $U_3O_8$  per ton. The last hole (No. 11) completed cut across a section 106 feet thick, assaying an average of 0.25 pound  $U_3O_8$  per ton.

The following table lists the mineralized sections assaying 0.4 pound  $U_3O_8$  per ton or more:





Hole No.	Footage	Thickness in feet	Pounds of $U_3O_8$ per ton
1	24½ - 25½	1	.60
	27½ - 34½	7	.54
	91 - 93½	2½	.56
	165 - 166	1	.73
	186 - 187	1	1.06
2	99 - 100	1	.41
	105 - 107	2	.46
	117 - 119	2	.44
	129½ - 130½	1	.41
	189½ - 190½	1	.59
3	241 - 243½	2½	.41
	229 - 230	1	.42
	253½ - 254½	1	.54
4A	80 - 81	1	.49
5	481 - 482	1	.46
8	288 - 293	5	.59
	293 - 295	2	1.16
	306 - 307	1	.40
	472 - 473	1	.40
9	124 - 125	1	.40
	138 - 139	1	.42
	140 - 141	1	.40
	142 - 143	1	.85
	148 - 150	2	.41
	202 - 203	1	.47
	209 - 210	1	.49
10	217 - 219	2	.47
	116 - 117	1	.62
	123 - 124	1	.40
	124 - 127	3	.84
11	134 - 135	1	.47
	357 - 358	1	.48
	379 - 380	1	.56
	383 - 391	8	.48
	424 - 426	2	.56
	426 - 428	2	1.66
	435 - 443	8	.79
	445 - 446	1	.68

It is the experts' opinion that a content of about 2 pounds  $U_3O_8$  per ton is commercial ore. It is felt that a large scale mining operation in a sedimentary environment would not require such a high grade in order to be economic. Accordingly, values found in hole No. 11 indicate that the occurrence offers a long-term potential, thus inducing us to pursue the search.

## Joint ventures

According to a practice that is becoming general in the mining exploration industry, while also respecting the wishes expressed by the Legislature in article 3b) of its charter, SOQUEM now shares with other companies nearly all of its projects. As can be seen in the following tables, not only are the more advanced development projects being carried out in partnership but also those programs dealing mainly with geological reconnaissance and field verification of anomalies. In all joint projects, whatever the stage at which the partner joins, the principle of a fair distribution of benefits according to the risks and expenses incurred is part of the contracts with partners. In the case of a discovery and, hopefully, a subsequent mining operation, the obligations and benefits of each party are on equal footing, provided that both have upheld their association to the end and that they have maintained their respective interests. In all cases, either of the two parties has a right to opt out of the partnership, but if one does so he loses the privileges related to the abandoned interests in the joint venture.

This is the stage at which might be tested the social-economic innovation that SOQUEM is, operating jointly with partners in a context of free enterprise.

The last annual report contains a certain number of examples of joint projects. Among these, the Louvicourt project which was brought to an end through the foundation of a new mining operation company, Louvem Mining Company Inc., deserves particular attention.

### 1. Louvicourt Township

In accordance with the agreement signed with Nemrod Mining Co. Ltd., Naganta Mining & Development Co. Ltd., and

# SOQUEM

Timrod Mining Co. Ltd., SOQUEM continued until October 31, 1969 to explore mining claims located 13 miles east of Val d'Or.

It is on this property that the Company discovered, in 1968, two copper deposits as well as two zones containing mineralized bodies that could be considered eventually as possible sources of zinc, silver, and gold.

The sinking of an exploration shaft announced in last year's annual report was suspended during the summer of 1969 for two reasons. Firstly, around June 9, 1969, our partners ceased their contribution to the development work under way, imposing on SOQUEM the sole financial responsibility of the commitments already undertaken in accordance with the joint venture agreement; secondly, SOQUEM received, only in October following, a firm offer from Manitou-Barvue Mines Limited to custom mill at its nearby plant, the ore to be mined from the property. The offer contained all the necessary guarantees to assure the proper development of the operation. The building of a mill on the Louvicourt property could then be put aside, thus permitting to proceed with the open-pit exploitation of the known reserves before undertaking the exploration of the orebody at depth from underground levels.



These guarantees being assured, SOQUEM then applied for the incorporation of a mining exploitation company as stipulated in the original agreement with the Nemrod Group.

The exploration program cost a total of \$999,100, of which Nemrod Group paid \$292,591 and SOQUEM, \$706,509. In accordance with the agreement, four out of seven members of the board of directors of the Louvem Mining Company Inc. were named by SOQUEM; they were chosen among its own staff. In consideration for the disbursements made up to the date of the incorporation of Louvem, SOQUEM was awarded 3,065,779 shares of the total of 5,000,000 making up the capital stock of the exploitation company, which means an interest of 61.3%.

Lastly, SOQUEM was put in a position to guarantee unconditionally the repayment of a loan of \$1,300,000 contracted by Louvem to finance the pre-production work on the property. In connection with the loan, 300,000 shares of Louvem already issued to SOQUEM were optioned by the Company to the main lender, Québec Deposit and Investment Fund, as an incentive to finance the project.



## 2. Major joint exploration projects under way during 1969-70, by regions

### Search for mineral occurrences managed by SOQUEM

Type and objective of project	Partners	Contribution of partners and sharing of interest — %	Location of search
Verification of mineral showings. Cu, Zn, Ag	Kerr Addison Mines Limited	60	Eastern Townships
Verification of geophysical anomalies. Cu, Pb, Zn, Ag	Sullico Mines Limited	60	Eastern Townships
Verification of radiometric anomalies. $U_3O_8$	Rio Tinto Canadian Exploration Limited	10	Eastern Townships
Verification of geochemical anomalies. Cu, Pb, Zn, Ag, Sb	Penarroya Canada Limitée	45	Gaspé
Verification of geochemical anomalies. Cu, Pb, Zn, Ni	Bemok Ltée (subs. of Mokta (Canada) Ltée, PECHINEY and Serem Ltée)	50	Gaspé
Geological reconnaissance. Asbestos, Cu, Ni	Bell Asbestos Mines Ltd.	65	Gaspé
Verification of showings and drilling. Asbestos	Bell Asbestos Mines Ltd.	65	Gaspé
Geochemical reconnaissance and verification of anomalies. Cu, Pb, Zn, Ag	Union Minière Explorations and Mining Corporation Limited (UMEX)	60	Gaspé and Northern New Brunswick
Verification by drilling of geophysical anomalies. Cu	Keewil Mining Group Limited Consolidated Nicholson Mines Limited	None during the year owing to prior expenses incurred. Contemplated interest: 51	Gaspé
Verification of anomalies and mineral showings. Cu, Pb, Zn	Sullico Mines Limited	53	Gaspé
Geological reconnaissance and verification of geophysical anomalies. Cu, Pb, Zn	Cerro Mining Company of Canada Limited	Total contribution owing to past expenses incurred by SOQUEM. Contemplated interest: 75	Abitibi
Geophysical reconnaissance and test drilling of showings. Cu, Pb, Zn, Ag, Au	Noranda Exploration Company Limited	60	Abitibi

Type and objective of project	Partners	Contribution of partners and sharing of interest — %	Location of search
Verification of geophysical anomalies and mineral showings. Cu, Pb, Zn	Union Minière Explorations and Mining Corporation Limited (UMEX)	60	Abitibi
Verification of geophysical anomalies.	Union Minière Explorations and Mining Corporation Limited (UMEX)	60	Abitibi
Verification of geophysical anomalies. Cu, Pb, Zn, Ag, Au	New Jersey Zinc Exploration Company (Canada) Ltd.	50	Abitibi
Airborne radiometric surveys. U <sub>3</sub> O <sub>8</sub>	Rio Tinto Canadian Exploration Limited	60	Abitibi
Verification of geophysical anomalies. Detailed geological survey.	Consolidated Monpas Mines Limited	None owing to prior expenses incurred. Contemplated interest: 53.3	Abitibi
Verification of geophysical anomalies. Detailed geological survey. Cu, Ag, Au	Long Lac Mineral Exploration	Contribution to total expenses: 90	Abitibi
Geophysical airborne surveys and drilling of anomalies. Cu, Zn, Ag	East Malartic Mines Limited	Contribution to total expenses: 90	Abitibi
Verification of radiometric anomalies and mineral showings. U <sub>3</sub> O <sub>8</sub>	Rio Tinto Canadian Exploration Limited	60	New Québec
Airborne geophysical surveys. Radioactive and associated minerals.	Quebec Cartier Mining Company	55	Laurentians and North Shore

#### Development of discoveries managed by SOQUEM

Development of discoveries and verification of anomalies. Cu, Pb, Zn, Ag, Au	Nemrod Mining Co. Ltd. Naganta Mining & Development Co. Ltd. Timrod Mining Co. Ltd.	Interrupted contribution. Retained interest: 38.7	Abitibi
Development of discoveries and ore dressing research. Fe, TiO <sub>2</sub> , P <sub>2</sub> O <sub>5</sub>	Terra Nova Explorations Ltd.	50	Saguenay Lake St. John
Development of discoveries. Cu, Ni	Zenmac Metal Mines Limited	Contribution to total expenses. Contemplated interest: 45	La Tuque region





### Search for mineral occurrences managed by partners

Type and objective of project	Partners	Contribution of partners and sharing of interest — %	Location of search
Test drilling of geophysical anomalies. Cu, Pb, Zn, Ag, Au	Penarroya Canada Limitée	75	Abitibi
Geophysical survey and verification of anomalies. Cu, Pb, Zn	Serem Ltée	Contemplated interest : 50 approximately	Abitibi
Geochemical reconnaissance and verification of anomalies. U <sub>3</sub> O <sub>8</sub> , Cu, Pb, Zn	Serem Ltée	55	Mistassini

### New projects

Since March 31, 1970, three joint projects were abandoned, at least temporarily, due to disappointing results. The following projects were initiated between the end of the 1969-1970 fiscal year and May 15, 1970.

Type and objective of project	Partners	Contribution of partners and sharing of interest — %	Location of search
Verification of radiometric anomalies. U <sub>3</sub> O <sub>8</sub>	Atlas Alloys Inc.	90 Financial contribution SOQUEM : none	Vermont USA
Geophysical reconnaissance and verification of anomalies. Cu, Ag, Au	Chibougamau Mining and Smelting Co. Inc.	None owing to prior expenses incurred. Contemplated interest : 60	Chibougamau
Geological reconnaissance and verification of anomalies.	Falconbridge Nickel Mines Ltd.	Total contribution owing to past expenses incurred by SOQUEM. Contemplated interest : 60	Eastern Townships
Development of two carbonatite complexes, bearing columbium and rare earths.	Keevil Mining Group Limited	Contribution Keevil : \$1,400,000. Contribution SOQUEM : \$500,000. Contemplated interest : 50	Saguenay Lake St. John St-André-d'Argenteuil
Geological reconnaissance. Verification of geochemical anomalies. Cu, Mo, Ag	Noranda Exploration Company Ltd.	60	Gaspé



At the moment, SOQUEM shares with private companies 28 of its 29 exploration projects. The only exception is the development of huge titaniferous magnetite deposits named Magpie and located 80 miles north of Havre-St-Pierre on the north shore of the St. Lawrence River.

Since its inception four years ago, the Company has undertaken 43 joint exploration ventures with several partners. It is proud to have maintained excellent relations with so many national as well as international mining companies. Their important financial and technological contribution efficiently helped SOQUEM the better to play its role and influence the economic growth of Québec. SOQUEM is highly grateful for their confidence and cooperation.

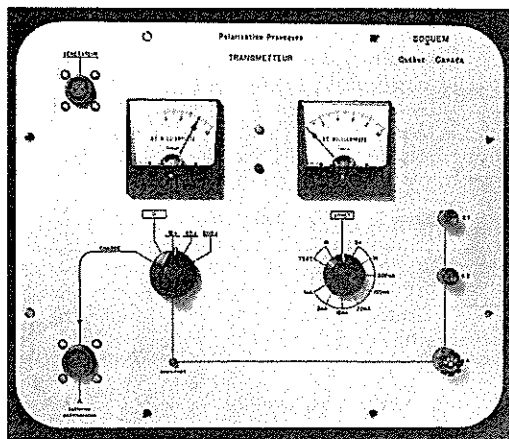
## RESEARCH PROJECTS

During 1969, an applied research department, independent from the current operations, was created. This department groups within the Company all functions dealing with research in exploration, methodology and instrumentation; its main objective is to

assist the management in technological planning, on a short as well as a long term basis. During its first year of existence, it dealt with twelve different research projects.

An example of SOQUEM's research department's achievements is the design and development of a sophisticated induced polarization instrument. The new equipment is currently undergoing a first series of field tests; so far the instrument has proved satisfactory. Induced polarization is based on the electro-chemical phenomenon created by the transmission of an electric current in a rock formation when it contains iron, copper, nickel or other sulphides. These act as the plates of a car battery and produce an electric current that is picked up by the instrument. In the search for metal sulphide orebodies anywhere in the world, more than 50% of all land geophysical surveys are based on the principle of induced polarization.

By year's end negotiations for the establishment of joint research projects began to show results. One of these projects, dealing with exploration strategy for massive sulphides, has such high possibilities that it will probably be 50% financed by partners.



# SOQUEM

As in previous years, members of the scientific staff of the Company presented several well received papers at annual conventions of professional associations.

## NEW COMMERCIAL COMPANIES

### Louvem Mining Company Inc.

Development work done on the orebodies of this company is ahead of schedule. On March 31, 1970, the management of this new company informed SOQUEM that the removal of the overburden to prepare for open-pit mining was completed. Sinking of the shaft was resumed at the beginning of April and it had reached a depth of 350 feet by the middle of May. The extraction of the ore which will be shipped to the mill of Manitou-Barvue Mines Limited, should start on August 1, 1970.

### Dighem Limited

An electromagnetic survey system, known under the name of Dighem (Digital Recording Helicopter-borne Electromagnetic Laboratory), was developed by Barringer Research in conjunction with Geophysical Engineering and Surveys Limited, New Jersey Zinc, and SOQUEM, under the management of Geophysical Engineering and Surveys Limited. The system is designed to perform electromagnetic, magnetic, and radiometric surveys simultaneously as do several other systems, but many experts consider it the most advanced helicopter-borne electromagnetic equipment, developed to date.

SOQUEM may acquire a 15% interest in Dighem Limited, with the right to appoint one member on its board of directors; it also has, along with the other partners, priority rights in the use of the system for its own survey work. The contribution of SOQUEM in the project has been in the form of a \$75,000 loan which will be reimbursed through the operating profits of the new company.

## PERSONNEL

During the summer of 1969, the number of persons employed reached a total of 126. There are three main groups of employees: a seasonal staff made up of university professors and students in earth sciences; a group of temporary employees comprising prospectors and labourers; and a permanent roster of 48.

On March 31 last, the permanent personnel of the Company, engaged in administrative and in joint-venture management duties, both at its headquarters and at its commercial office in Montréal, numbered 22 persons; 26 geologists, engineers and technologists man the exploration departments.

The seasonal staff required for summer field work tends to decrease, due to a gradual evolution in the overall nature of the work performed. Diamond drilling operations are gaining greater importance as more of the zones that were found in the course of general reconnaissance surveys during previous years have to be investigated. Drilling and related activities are let out to firms specializing in this type of service on a contract basis. We wish to mention here, that the opening up of the Louvem Mining Company Inc. mine near Val d'Or is creating an important new source of employment in a region that has seen a number of mine closures in recent years. In conclusion, a greater number of functions are being taken care of by a better organized and more experienced permanent personnel. The excellent cooperation of this energetic staff was largely responsible for the remarkable achievements of the year. We are thankful to its members.

On behalf of the Board of Directors,

*Côme Carboneau*

Côme Carboneau,  
President

May 29, 1970



## BALANCE SHEET AS AT MARCH 31, 1970

		<b>Assets</b>	
		1970	1969
<b>Current assets</b>			
Cash	\$ 25,500		
Accounts receivable and advances	319,556		
Prepaid expenses and deposits	4,962		
		\$ 350,018	\$ 437,417
<b>Inventory of supplies</b>		50,375	64,515
<b>Advance to affiliate (Louvem Inc.)</b>		252,893	
<b>Investments and advances (at cost)</b>			
Common shares (Louvem Inc.)	462,628		
Shares, others	60		
Advances, others	75,000		
		537,688	75,060
<b>Fixed assets (at cost)</b>			
Lands and buildings	74,041		
Vehicles and equipment	216,056		
Furniture and fixtures	77,276		
Leasehold improvements	35,421		
	402,794		
Less: Accumulated depreciation	191,601		
		211,193	260,800
<b>Deferred expenditures</b>			
Cost of mining rights	279,275		
Exploration expenditures	4,332,289		
	4,611,564		
Less: Recovery of expenditures through participation	288,233		
	4,323,331		
Administrative expenses	1,133,047		
		5,456,378	4,500,700
		<u>\$6,858,545</u>	<u>\$5,338,492</u>





## Liabilities

		1970	1969
<b>Current liabilities</b>			
Accounts payable	\$ 212,327		
Salaries and employer's contributions payable	20,618		
Director's fees payable	600		
		\$ 233,545	\$ 213,492
<b>Capital stock</b>			
Authorized : 1,500,000 shares of \$10 par value	15,000,000		
Issued and paid : 600,000 shares	6,000,000		
Subscribed and paid : 62,500 shares	625,000		
		6,625,000	5,125,000
		<u>\$6,858,545</u>	<u>\$5,338,492</u>

N.B. : By a resolution of its Board of Directors, Soquem has warranted repayment of loans of its affiliate amounting to a maximum of \$1,300,000. As at March 31st, 1970, the latter company had borrowed \$500,000 out of the \$1,300,000.

### Signed on behalf of the Board of Directors

Mousseau Tremblay

Georges Gauvreau

### Auditor's Report

In accordance with Section 17 of Statutes of 1965, c. 36, I have verified the balance sheet of the Quebec Mining Exploration Company as at March 31, 1970, and the statement of the deferred expenditures and I have submitted my report to the Board of Directors. My examination included a general review of the accounting procedures and such tests of accounting records and other supporting evidence as I considered necessary.

In my opinion, the accompanying balance sheet and the statement of deferred expenditures present fairly the financial position of the Company as at March 31, 1970, and the expenses incurred during the year, in accordance with generally accepted accounting principles.

October 1st, 1970

Gustave-E. Tremblay, c.a.,  
Provincial Auditor.



## Comparative statement of deferred expenditures as at March 31, 1970

	April 1969 to March 1970	April 1968 to March 1969
<b>Cost of mining rights</b>		
Options	\$ 13,610	\$ 51,370
Claim staking	12,791	28,841
	<u>26,401</u>	<u>80,211</u>
<b>Exploration expenditures</b>		
Lines	50,610	45,984
Geology	62,523	31,225
Geophysics	175,315	162,127
Geochemistry	131,098	129,083
Drilling	284,611	637,162
Mineral dressing	21,834	11,744
Aircraft	56,485	112,938
Vehicles	58,260	43,955
Development licenses and renewals	36,871	47,707
Field parties supplies, camp and travel	138,007	198,988
Research fellowships	22,387	19,450
Miscellaneous research expenditures on exploration methods	20,235	33,485
	<u>1,058,236</u>	<u>1,473,848</u>
	1,084,637	1,554,059
Less: Recovery of expenditures through participation	<u>124,300</u>	<u>85,250</u>
	960,337	1,468,809
<b>Administrative expenses</b>		
Salaries	196,365	162,035
Directors' fees	4,200	3,900
Social security and fringe benefits	11,305	8,759
Travelling and entertaining expenses	13,921	17,495
Conventions and staff development	3,303	6,173
Rent and maintenance	10,914	21,750
Insurance and taxes	3,562	3,073
Supplies and printing	10,899	13,723
Telephone and telegraph	6,641	7,366
Depreciation and write-offs	17,088	14,871
Legal expenses	4,829	5,800
Maps and documentation	3,366	3,141
Personnel transfer	2,291	1,519
Consultants' fees	3,128	7,014
Advertising	10,890	14,572
Data processing	9,343	10,862
Sundry and annual report	10,339	14,046
	<u>322,384</u>	<u>316,099</u>
Less: Interest on deposits and sundry revenue	<u>18,267</u>	<u>23,244</u>
	304,117	292,855
<b>Total</b>	<u>\$1,264,454</u>	<u>\$1,761,664</u>

N.B. The above total exploration expenditures of \$1,058,236 do not include an amount of \$406,744 spent during 1969/70, and including the cost of sinking an exploration shaft, on the Louvicourt Project. In 1968/69, a sum of \$308,777 had been spent on exploration, and these two amounts totalling \$715,521 are shown in the Balance Sheet under "Advance to affiliate (Louvem Inc.)" and "Common shares (Louvem Inc.)."