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INDUSTRY, SCIENCE AND TECHNOLOGY CANADA

REVIEW OF COMPETITIVENESS OF NORTHERN ONTARIO'S TRADITIONAL & SELECTED NON-TRADITIONAL INDUSTRIES

Report I: Part A, Part B, Gold and Appendix I

March, 1991

The Coopers & Lybrand Consulting Group

INDUSTRY, SCIENCE AND TECHNOLOGY CANADA

Review of Competitiveness of Northern Ontario's Traditional & Selected Non-Traditional Industries

Report I: Part A, Part B, Gold and Appendix I

March, 1991

Submitted to: Dr. T. Director Coordi Fednor

Dr. T. Tucker Director, Program & Coordination Fednor Secretariat

Submitted by:

Maureen Farrow Economics & Strategy Practice The Coopers & Lybrand Consulting Group

Ron Goswell, Partner Northern Research Associates Consulting, Inc.

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Management Consultants

REVIEW OF COMPETITIVENESS OF NORTHERN ONTARIO'S TRADITIONAL AND SELECTED NON-TRADITIONAL INDUSTRIES

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PART A THE ENVIRONMENT OF NORTHERN ONTARIO INDUSTRIES

I. <u>INTRODUCTION</u>

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A. OBJECTIVE

Traditionally, the economic development of Northern Ontario (defined throughout this report as those regions of the Province lying north of and including, the Districts of Parry Sound and Nipissing) are heavily dependent on primary resource extraction industries and related processing industries and sources. The principal products of the region are lumber, pulp and paper, gold, nickel, copper, zinc and uranium. With a few notable exceptions, such as Algoma Steel in Sault Ste. Marie and Hawker-Siddeley Canada in Thunder Bay, large-scale secondary manufacturing is limited.

Given the cyclical nature of the mineral and forest product markets, Northern Ontario's dependence on these industries has led to broad fluctuations in the region's level of employment and general economic prosperity during the boom/bust periods of the 1970s and 1980s. These fluctuations have been particularly pronounced for the many communities within the region which are wholly dependent on a single mining or forest products operations.

While Northern Ontario remains a dominant force in the mining and forestry industries, its market share in these world markets has been eroding due to increased global competition. Specifically, tactics undertaken by Third World countries in subsidizing production in order to bolster employment have led to periods of depressed metal prices and declines in Northern Ontario's share of the world metal market.

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In recent years, the high value of the Canadian dollar and the cost of Canadian labour relative to the cost of American labour have impeded Northern Ontario's ability to compete internationally in both the metal and pulp and paper markets.

These competitive threats have magnified the dangers inherent in being dependent on a handful of highly cyclical industries. These threats also have challenged the long held assumption that access to abundant raw material inputs is the key success factor in achieving world market dominance.

At present, many barriers exist which impede a diversification of Northern Ontario's economic base. Limited local markets, the remoteness of the region to major North American markets and the lack of infrastructure have discouraged non-traditional industries from investing in the region.

Acutely aware of the need to limit its dependence on traditional primary resource sectors and to encourage diversification into non-traditional sectors, federal, provincial and local governments have introduced programs aimed at promoting investment and entrepreneurship in the region.

One such program is the Federal Economic Development Initiative in Northern Ontario (FEDNOR) which is administered by the Industry, Science and Technology Canada (ISTC) office in Sault Ste. Marie. FEDNOR's mandate is to support private business ventures and programs that promote lasting economic growth and development within the region. ĩ,

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Under this FEDNOR program, the ISTC commissioned The Coopers & Lybrand Consulting Group (CLCG) and Northern Research Associates Consulting Inc. (ARA) to conduct a study of the principal traditional industries and selected non-traditional industries in Northern Ontario. The study's objective is to provide an understanding of the strengths and weaknesses of the region's principal economic sectors. With such an understanding ISTC will be in a stronger position to identify the technological needs and opportunities for the region and to develop support programs accordingly. The papers produced as part of this study will be used as background briefing papers at the meeting of economic development officers to be held in Sault Ste. Marie in April, 1991.

B. APPROACH AND METHODOLOGY

In undertaking this assignment, we have divided the study into two main segments. The first segment identifies the issues related to the internalization of business and the impact that changing global forces has had on Canada's and Northern Ontario's ability to compete in world markets. Brief summaries on the provincial and Northern Ontario's economies, and the role that key industries play in its development, are also documented to provide the broader context in which to assess each of the sectors.

The second segment of the study involves an analysis of the following major industries in Northern Ontario:



- 1. Precious metals (gold)
- 2. Non-precious metals (nickel, copper, zinc, and uranium)
- 3. Wood products
- 4. Pulp and paper
- 5. Steel
- 6. Transportation
- 7. Secondary industries

Each industry profile includes an examination of key trends in the industry during the last decade, the key competitive forces shaping the industry and the relative competitiveness of the sector as it faces the mid 1990s. An analysis of the present and future role of technology within each industry is also discussed.

In preparing this report, we drew upon a synthesis of Coopers & Lybrand's extensive databases, relevant industry experience and working knowledge, major published studies as well as field interviews where appropriate. A summary of key sources used in this report is included as Appendix I.

II.NORTHERN ONTARIO IN THE GLOBAL SETTINGA.THE INTERNATIONALIZATION OF BUSINESS

Today's business world has become increasingly more dependent on international markets as a means of ensuring survival and growth. Approximately 30% of Canada's economic activities are trade driven, with the resource sector playing an important role. As a result, Canada and, in particular, Northern Ontario, have been significantly affected by the new -

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global forces which are reshaping the way in which business competes. These new global forces include the emergence of global consumer and industrial markets, the realities of a global capital market and advances in information and communications technology all of which have diminished the importance of national boundaries. As a result, Canada's once sheltered markets are now open to intense, foreign competition. In order to effectively access these strategic global markets and to provide some protection against these new competitive threats, new economic and politically associated trading blocs are being created. Now, smaller countries like Canada, which have limited global trading power of their own, can benefit from belonging to one of the five key regional trading blocs: North America, Europe, "Japan Inc.", Asia and Latin America.

Achieving competitive advantage in this new world reality requires a new set of skills and resources. Now more than ever, a company's or a country's ability to compete is determined by a combination of many factors including scale of production, competitive cost structures, cost of capital considerations, technology, marketing strengths and exchange rates. For Canada, this means it can no longer rely solely on its abundance of raw material inputs as its source for competitive advantage.

In fact, Canada's competitiveness in international markets has declined in recent years because of an inattention to these other factors which create competitive advantage. A strong Canadian dollar, small scale production, high labour costs, heavy government regulation and taxation and limited investment in technology mean that Canada now finds itself playing catch up in the global competitiveness game.



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This situation has particularly serious implications for Northern Ontario because of the high exposure of its core industries to global markets. Northern Ontario's economic prospects are no longer tied solely to industry cycles, but also now to its ability to achieve a more sustainable competitive advantage in a global arena. This will require Northern Ontario's core sectors to overcome the competitiveness deficiencies that are currently plaguing Canadian industry as a whole.

B. THE ONTARIO ECONOMY

Accounting for approximately 40% of Canada's Gross Domestic Product (GDP) and labour force, Ontario is Canada's most highly industrialized province. Thus, the state of Ontario's economy and its competitiveness is crucial in determining the country's overall economic and competitive strength.

As detailed in Exhibits 1 and 2, which provide a breakdown of Ontario's GDP and employment by industry, Ontario has a diversified industrial base with manufacturing, trade and service being the most dominant industries.

Manufacturing is most heavily concentrated in the "Golden Horseshoe" region which surrounds the western end of Lake Ontario and the urban centres of the Province's southwest. The automotive sector accounts for the largest portion of manufacturing output. There is little large scale manufacturing in Northern Ontario where the economy is based principally on primary resource extraction industries and related processing industries and services.

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Exhibit 1

| Industry | <u>1985</u> | <u>1989</u> | <u>1990</u> Percent of | <u>1992</u> Total |
|--|---------------------------|-------------|---------------------------|----------------------|
| Agriculture | 1.5 | 1.1 | 1.2 | 1.2 |
| Other Primary | 1.4 | 1.5 | 1.4 | 1.6 |
| Manufacturing | 26.8 | 24.8 | 23.8 | 24.4 |
| Construction | 5.1 | 6.1 | 5.9 | 5.5 |
| Utilities Transportation and Communication | 2.9 | 2.9 | 2.6 | 2.6 |
| Wholesale and Retail Trade | 11.3 | 11.9 | 11.5 | 11.1 |
| Finance, Insurance and Real Estate | 14.9 | 16.2 | 16.6 | 17.1 |
| Community, Busines and Personal Servic | ss e 23.0 ⁻ | 22.8 | 23.9 | 23.6 |
| Public Administratic and Defence | on 6.4 | 5.8 | 6.1 | 6.0 |
| All Industries | 100.0 | 100.0 | 100.0 | 100.0 |

Ontario Gross Domestic Product Share By Industry

Note:

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Source:

Details may not add to totals due to rounding Conference Board of Canada estimates of constant (1986) dollar levels based on Statistics Canada data for 1985 and 1989, with estimates for 1990 and 1992.



Exhibit 2

Ontario Labour Force Share by Industry

| Industry | <u>1985</u> Percent | <u>1990</u> of Total |
|---|------------------------|-------------------------|
| Agriculture | 2.8 | 2.2 |
| Other Primary | 1.2 | 1.0 |
| Manufacturing | 22.7 | 19.7 |
| Construction | 5.6 | 7.0 |
| Transportation, Communication and Other Utilities | 6.8 | 6.9 |
| Trade | 17.1 | 17.2 |
| Finance, Insurance and Real Estate | 5.7 | 6.7 |
| Service | 31.0 | 32.9 |
| Public Administration | 6.5 | 6.0 |
| Unclassified | 0.6 | 0.3 |
| All Industries | 100.0 | 100.0 |

Note: Details may not add to totals due to rounding.

Source: Statistics Canada, Household Surveys Division, Labour Force Survey Section.

With manufacturing accounting for the largest portion of Ontario's GDP, the business cycle is closely tied to the health of the manufacturing sector. Ontario, along with the rest of Canada suffered through a severe recession in 1981-82 and then enjoyed a strong expansion in the mid to late 1980s. With its strong export orientation, Ontario recorded one of the fastest rates of economic growth in the industrialized world as it responded to increased trade opportunities in the manufacturing sector. Much of this growth was fed by the construction or expansion of new auto assembly plants in southern Ontario. However, high interest rates and an erosion of competitiveness resulting from a strong Canadian dollar and other 2

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structural factors have led to a serious downturn in the Ontario economy since early 1990. This slowdown was exacerbated by companies adjusting to the Canada-U.S. Free Trade Agreement which became effective January 1, 1990.

As Ontario faces greater foreign competition both at home and abroad, its challenge is to achieve efficient scales of production and to undertake investment in technology and training to ensure that it remains the economic core of Canada.

C. NORTHERN ONTARIO ECONOMY

The economy of Northern Ontario is heavily dependent on primary resource extraction industries and related processing industries and services. Exhibit 3, which is based on the latest statistics (1981 census data), shows that 55.4% of total Ontario employment in the other primary group is based in the North. Within this other primary group, 1.0% is in fishing, 23.9% is in forestry and the remaining 74.3% is in mining. In addition, a substantial portion of the manufacturing activity in Northern Ontario is resource related.

Since many communities have developed solely on the basis of a single mining or forest products operation, a depletion of the raw material or the demand for it can have a devastating impact on entire communities.



Exhibit 3

Distribution of Employment by Sector in Per Cent

| | Northern <u>Ontario</u> | Rest of <u>Ontario</u> | Northern Ontario Share of Ontario |
|--|----------------------------|---------------------------|--------------------------------------|
| Agriculture | 1.4 | 3.6 | 3.0 |
| Other Primary | 11.3 | 0.7 | 55.4 |
| Manufacturing | 16.5 | 25.5 | 4.8 |
| Construction | 5.9 | 5.1 | 8.3 |
| Transportation/Communication and Other Utilities | 9.3 | 7.0 | 9.4 |
| Trade | 15.8 | 16.2 | 7.1 |
| Finance, Insurance and Real Es | tate 3.1 | 6.1 | 3.8 |
| Services | 28.2 | 29.4 | 7.0 |
| Public Administration | 8.5 | <u> 6.4</u> | _9.5 |
| Total | 100.0 | 100.0 | 7.3 |

Source: 1981 Census and Statistics Canada The Labour Force, Cat. No. 71-001.

This dependence means that Northern Ontario's business cycle is more closely tied to the world minerals and forest products markets than to general economic conditions in Ontario or Canada. For example, Northern Ontario did not experience the boom of the mid-to-late 80's as did Southern Ontario because it was suffering from a decline in metal prices ٠.

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caused in part by subsidized production in Third World countries. Similarly, despite anticipated higher metal prices and improvements in the Canadian economy, a depressed forest products market which is expected to continue well into the 1990s will limit the recovery of the Northern Ontario economy in the early to mid 1990s.

This profile will have changed during the 1980s to some extent as the Ontario and Canadian governments relocated ministries to Northern Ontario as the Hemlo mines experienced significant expansion.

III. <u>CONCLUSION</u>

The trend towards the internationalization of business has particularly affected Northern Ontario's core resource industries of precious and base metals, steel, pulp and paper, forestry products and transportation as well as the related secondary industries. Thus, the future economic development of Northern Ontario will be contingent on the region's ability to adapt to and compete in global markets. This presents a major challenge for Northern Ontario because the changes that are occurring are so significant that the means in which Northern Ontario has traditionally achieved competitive advantage will continue to be challenged in the 1990s. Given the importance of the resource sectors to the region's economic development and viability, the current and potential competitiveness of each of Northern Ontario's core sectors is examined in greater detail in Part B of this report.





<u>PART B</u>

PROFILE OF NORTHERN ONTARIO'S KEY RESOURCE SECTORS

I. <u>INTRODUCTION</u>

A. OBJECTIVE

Part B of this report comprises seven reports which examine the structural, competitive and technological aspects of each of Northern Ontario's key resource sectors. These sectors are precious metals (gold), base metals (nickel, copper, zinc, and uranium), steel, pulp and paper, forestry, transportation and related secondary industries. The objective in preparing these sector profiles is to facilitate the identification of the potential opportunities and threats that may affect the longer term economic development and competitiveness of each sector and the Northern Ontario region.

B. APPROACH AND METHODOLOGY

Each profile comprises two major sections. The first section provides an understanding of the particular sector, detailing its structure, size and the key trends that have occurred in the sector during the last decade. The second section identifies the competitive forces within the sector as well as the competitiveness of Northern Ontario vis-à-vis these forces. It is within this section that the current and projected state of technology in the industry is also examined. • •

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The work plan undertaken to develop the aforementioned analysis involved extensive use of Coopers & Lybrand's mining and economic databases, its working knowledge and experience in each of the sectors as well as major internal and external published studies. Key sources of information are detailed in Appendix I of this report.

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II. INDUSTRY PROFILES

A. GOLD

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II. INDUSTRY PROFILES

A. GOLD

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A. PROFILE OF GOLD SECTOR

- 1. <u>Executive Highlights</u>
 - Canada is ranked fourth in total world gold production behind South Africa, the U.S.A. and Australia.
 - Due to significant discoveries and developments in the Hemlo region of Northern Ontario in the early 1980s, Ontario's gold reserves have risen to over 1,000 kilograms. As a result, Ontario is Canada's leading gold producer with five of the world's top ten gold reserves located in Northern Ontario.
 - While gold prices have fluctuated dramatically during the past 15 years, demand and production levels have experienced steady incline since 1980.
 - Rising gold prices and new investment schemes have resulted in a significant increase in mine exploration and development in Ontario in the last ten years.
 - The high grade level of the Hemlo region enables Ontario to have one of the lowest direct cost of production of gold in the world. While its main competitor, South Africa enjoys abundance of reserves, its gold is of relatively low grade and expensive to extract. South Africa is also suffering from rising labour costs, high inflation rates and a depreciating currency, putting the South African gold industry at a distinct cost competitive disadvantage.
 - It is due to these cost disadvantages that South Africa has invested heavily in technology research and development.



• On the other hand, Ontario's investment in technology has been moderate, relying on its high grade and high quantity deposits and low direct costs as its means to achieve competitive advantage within the world gold industry.

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2. <u>Introduction</u>

For the purpose of this report, the precious metals industry is defined as only those activities related to the extraction, production and refining of gold. Silver and platinum have been excluded from this report due to the very limited role these two minerals play in the economic development of the Northern Ontario mining region.

3. Industry Structure and Trends

(a) Industry Size

Due to significant gold discoveries and developments in the Hemlo region of Northern Ontario in the late 1970s and early 1980s, Ontario's and Canada's share of the free world's gold production has virtually doubled since 1971. As of 1988, Canada ranked fourth in total gold production behind South Africa, U.S.A. and Australia, with Ontario's share of world gold production equal to 4%.

Exhibit 1

Ontario's Share of Gold Production



Source: Ontario Ministry of Northern Development and Mines Ontario Mineral Score and Energy, Mines and Resources, Canadian Minerals Yearbook



3.

Ontario is Canada's largest gold producer ahead of British Columbia and the Northwest Territories.

As Exhibit 2 details, Ontario's gold production rose 128.8% between 1971-1989, with its share of Canadian gold production increasing slightly from 50.2% to 50.9%.

Exhibit 2

Ontario's Share of Gold Production

| | <u>1971</u> | <u>1989(P)</u> | <u>% a 1971-1980</u> |
|-------------------|-------------|----------------|----------------------|
| Canada (Kgs.) | 70,318 | 158,440 | 125.3 |
| % of Total Canada | 50.2 | 50.9 | 120.0 |

(P) Preliminary

Source: Ontario Ministry of Northern Development and Mines, Mineral Score; 1988. Energy Mines and Resources Canada, Canadian Minerals Yearbook, 1989.

Virtually all of Ontario's gold production is based in Northern Ontario, with some refining activities distributed throughout other parts of Ontario, as well as elsewhere in Canada.

The main gold producing communities in Northern Ontario include Timmins, Kirkland Lake/Larder Lake and Marathon.

(b) Key Trends: 1980-1990

i) Demand

During the 1970s, the demand for gold rose steadily as investors were attracted to it as a hedge against the high inflation in the industrialized world, the oil price shocks of 1973 and 1979 and the political uncertainty in the Middle East. Demand for gold continued to grow in the 1980s as a result of Asian bar hoarding and greater jewellery demand. Exhibit 3 details the main gold end-uses in 1980 and 1988.

Exhibit 3

Gold End-Uses

| | 1980 | 1988 |
|-----------------------|-------------------|-------------------|
| End-Uses | <u>% of Total</u> | <u>% of Total</u> |
| | | |
| Carat jewellery | 53 | 64 |
| Electronics | 10 | 6 |
| Dentistry | 7 | 2 |
| Other industrial | 6 | 3 |
| Official coins | 2 | 1 |
| Medals and Medallions | 20 | 4 |
| Bar-hoarding | <u>·2</u> | _20 |
| | | |
| Total | 100 | 100 |
| | | |

Source: Gold 1989, Consolidated Goldfields PLC.



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ii) Prices

Determined twice daily in London, gold price quotes reflect current market sentiments and have little connection to other base metal price trends. Gold prices are linked to a degree to the value of the U.S. dollar, due to the demand for gold as an investment medium and hedge against the U.S. dollar.

As illustrated in Exhibit 4, gold prices rose sharply in the 1970s, reaching a record high of over U.S.\$800 in 1980. Prices dropped dramatically in the early 1980s and have since continued to hover around the U.S.\$350-\$400 level.



Exhibit 4 GOLD PRICES

Source: International Monetary Fund International Financial Statistics and U.S. Department of Commerce, Bureau of Economic Analysis

current dollars are deflated by U.S. GNP Implicit Price Index.

iii) Production

In response to much lower prices in the early 1980s, Ontario production declined to below 20 metric tonnes during this period, as illustrated in Exhibit 5. However, the return to stable gold prices and the discovery of large and high grade deposits in the Hemlo area led to 1989 Ontario production reaching its highest level since before 1972. However, while gold production has quadrupled between 1982-1989, the volume is still less than one third of 1940 production levels.

Exhibit 5



Source: Ontario Ministry of Northern Development and Mines; Ontario Mineral Score, 1988. Energy Mines and Resources Canada, 1989, Canadian Minerals Yearbook.



7.

Three companies, Hemlo Gold Mines, Placer Dome and Lac Minerals account for 61% of Ontario's gold output. Exhibit 6 provides 1988 output figures of the major Ontario gold producers.

Exhibit 6

Major Ontario Gold Producers

| Company (000 | <u>)'s Kg.)</u> |
|--------------------------------|-----------------|
| Placer Dome 13,3 | 50 |
| Hemlo Gold Mines 11,3 | 69 |
| Lac Minerals 8,28 | 35 |
| Teck Corona 4,64 | 3 |
| Giant Yellowknife 3,85 | 59 |
| Inco 2,49 | 91 |
| Falconbridge (Kidd Creek) 2,16 | 68 |
| Dickenson Mines 1,98 | 32 |
| % of provincial output 89 | |

Source: Energy, Mines and Resources Canada, Canadian Minerals Yearbook, 1988.

Although Ontario has three of Canada's four primary gold refineries, a good proportion of Ontario's gold output is smelted and refined elsewhere in Canada and principally in Quebec. ٠,

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Exhibit 7

Production Flow of Gold in Ontario



Source: Ontario Mineral Score, 1988; Statistics Canada, International Trade Division, Province of origin, HS-6 Exports Date, 1988.

iv) Exploration Activity

The general level of basic exploration activity is best indicated by the level of total mining claims. These claims rose significantly from 1980-1988 and is again the result of increased gold prices since 1980 and key discoveries such as the Hemlo deposits.

As illustrated in Exhibit 8, this increased activity is reflected in the dramatic increase in gold reserves in Ontario over the past 15 years.



Exhibit 8

ONTARIO GOLD RESERVES



Source: Energy Mines and Resources Canada, Canadian Minerals Yearbook, various years.

In addition to the level of world gold prices and the availability of gold deposits, tax and investment incentives can have a significant impact on the levels of exploration and mine development. A new flow-through tax scheme introduced in Canada in 1988 has attributed to the surge in new exploration and development activities.

v) Mine Development

As detailed in Exhibit 9, the number of gold mine openings during the 1979-1988 period has been partially offset by the number of closures during this same period.

Exhibit 9

Annual Number of Gold Mine Openings and Closings in Ontario

| | <u>1979</u> | <u>1980</u> | <u>1981</u> | <u>1982</u> | <u>1983</u> | <u>1984</u> | <u>1985</u> | <u>1986</u> | <u>1987</u> | <u>1988</u> | <u>Total</u> |
|----------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|--------------|
| Openings Closures | 3 | 2 | | 7 3 | 2 | 4 2 | 4 3 | 2 1 | 4 3 | 2 1 | 30 13 |

Source: Ministry of Northern Development and Mines.

The large number of openings reflect the development of three large gold mines near Hemlo which came onstream in 1985 after a short lead time of three years. The Hemlo mines are considered to be one of the most major mining discoveries in Ontario in the last 20 years. It is expected that the Hemlo mines will remain operational well beyond the year 2000. The Hemlo mines account for 55% of current Ontario gold reserves with the Campbell Lake mine accounting for another 15% of the total.

Many of the closures that have occurred over the last decade were small marginal operations. Further closures of this nature are expected in the short to medium term, particularly

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if the price of gold drops below \$U.S. 350 for any length of time.

vi) Employment

Employment in the gold mining industry has risen by 44% since 1980 despite a 21% decline in total direct mining employment in Ontario. As a result, the share of gold mining employment of total direct mining employment also increased from 10% in 1980 to 18% in 1987.

Exhibit 10

Direct Mining Employment in Ontario

| | Total Province | Gold Quartz Mines |
|-----------|----------------|-------------------|
| 1980 | 31,129 | 3,150 |
| 1981 | 31,549 | 3,438 |
| 1982 | 29,034 | 3,272 |
| 1983 | 26,590 | 3,578 |
| 1984 | 26,923 | 3,823 |
| 1985 | 25,565 | 3,599 |
| 1986 | 24,148 | 3,969 |
| 1987 | 24,682 | 4,526 |
| % change | • | |
| 1980/1987 | -20.7 | 43.7 |
| | | |

Source: Ontario Mineral Score.

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Canadian gold exports have risen 114% between 1976-1988 with the U.S., Japan and Hong Kong accounting for 37%, 26% and 19% of these exports, respectively.

Exhibit 11

Canadian Gold Exports

| Destinations | <u>1976*</u> | <u>1980</u> | <u>1985</u> Kilogram | <u>1988</u> Is | <u>1989</u> |
|--------------|---------------|--------------|-------------------------|-------------------|---------------|
| U.S.A. | 46,080 | 54,084 | 99,260 | 45,416 | 62,875 |
| Japan | - | 113 | 5,313 | 31,550 | 21,458 |
| Hong Kong | - | 305 | 1,037 | 23,827 | 39,738 |
| Others | <u>11,360</u> | <u>6,134</u> | <u>2,903</u> | <u>22,212</u> | <u>32,564</u> |
| Total | 57,440 | 60,636 | 108,513 | 123,005 | 156,635 |

First year of reporting

Source: Statistics Canada, Exports, Merchandise Trade, Cat. No. 65-202.

Ontario accounted for over 90% (\$2.1 billion) of Canadian refined gold (unwrought, non-monetary form) exports. In 1989, exports of gold from Ontario in this form far exceeded mine output which indicates that a significant proportion of gold that is refined in Ontario is for other producers. Only 7% of Canada's total gold exports is exported in the form of concentrates.



(c) Conclusion

In summary, the period 1980-1990 has been a very positive period for the Northern Ontario gold industry.

The discoveries and subsequent development of large bodies of high grade gold in the Hemlo region in the early 1980s as well as the return of stable gold prices have led to significant increases in gold production, reserves and employment in Northern Ontario.

As a result both Canada and Northern Ontario's competitive position in world markets has been strengthened during the last decade.

4. <u>Competitiveness Position of Sector</u>

Given that gold is Ontario's second major mineral commodity (by total value), the long term competitiveness of the Northern Ontario gold mining region, is a key strategic concern for the industry and the Ontario government. With 1988 Ontario gold exports valued at over \$2.1 billion, it is essential that the competitiveness of both Canada's and Ontario's gold mining industries be assessed within a global context. The first step in such an assessment is to identify the key competitive forces within the industry that affect the demand and supply of gold throughout the world.

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(a) Future Demand

Demand prospects for the gold industry will have a direct impact on the magnitude of supply side adjustments. The ability to make accurate long term demand forecast allows competitors enough lead time to respond appropriately to possible changes in demand. In the mining industry, this is important due to the significant lead time required for exploration and development before a mine becomes operational.

Unfortunately, in the gold industry, it is difficult to forecast annual world demand because of the strong speculative and psychological factors involved in determining demand for gold. However, there are some major long term forces shaping the world's business climate in the 1990s, which have particular relevance to the gold sector:

The rapid growth of the Newly Industrializing Countries (NICs) into a global consumer/industrial market. This growth has particularly affected the demand for gold over the last decade as developing countries have increased their production in electronics and jewellery, both of which are key uses of gold. There is also the economic transition of the centrally planned economies to more market driven societies which must be considered. The U.S.S.R. is one of the world's leading producers of gold. Given their need to generate essential foreign exchange, there could well be incentives for the U.S.S.R. to increase gold exports to the West.

The Coopers & Lybrand Consulting Group Global capital markets. Advances in information and communication technologies have allowed the world's financial markets to become fully integrated. Given that gold can be used as an investment medium and a hedge in times of political and economic certainty, the advances may affect the way in which gold is traded.

The emergence of regional trading blocs. The evaporation of national boundaries in trading terms has led to the creation of new economic and politically associated trading regions, comprising North America, Europe, Japan, Asian and South America. Trade relationships will be less between individual countries, but between trading regions whereby trade agreements will set the terms under which trade will be conducted. As a result of one such agreement, Canadian gold enters the United States tariff-free and indicates why the U.S. accounts for 37% of Canada's total gold exports.

(b) Reserves

The existence of large, easily accessible deposits of high grade gold is essential for competitiveness within the gold industry. The larger the deposits, the longer the mine life over which the costs of the exploration and the mine's development can be distributed. Furthermore, a long mine life allows for greater lead time for exploration and development of replacement mines before the current mine's reserves are depleted. Given the nature of gold deposits, the gold industry tends to have many small operations with the mine life of these smaller operations are less than 10 years.

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Thus, exploration for new mines must be ongoing to ensure sustained operations.

Exploration is a high risk, high cost undertaking and the level of exploration activity is driven by gold price expectations and investment and tax incentives offered by governments to encourage exploration and development.

Accessibility to the deposits, in both geographical and geological terms, is a key factor in cost competitiveness. The geographical remoteness may require the construction of roads and other essential services and higher wages to attract labour, all of which adds to the cost of extraction. If the gold is difficult to access in geological terms, special equipment or a more complex extraction process may be required which again contributes to higher costs.

Northern Ontario has three of the largest gold reserves in the world, outside of South Africa. In addition, five of the world's ten highest grade gold deposits in the Western world are located in Northern Ontario.

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Exhibit 12

Position of Major Ontario Gold Mines

| | <u>Campbell</u> | Golden <u>Patricia</u> | David <u>Bell</u> | <u>Macassa</u> | Hoyle <u>Pond</u> | South African Average |
|---|------------------------|---------------------------|------------------------|----------------|----------------------|--------------------------|
| Recovered grade (grams per tonne) | 20.6 | 18.9 | 17.5 | 16.5 | 16.5 | 5.0 |
| Rank among 10 highest grade outside South Africa | 4 | 6 | 8 | 9 | 10 | |
| Proven and probable reserves (tonnes gold) | <u>Williams</u> 211 | Golden Giant 199 | <u>Campbell</u> 140 | | | |
| Rank among 10 largest reserves outside South Africa | 5 | 6 | 8 | | | |

Source: Metal Market Consultants Inc.

The three Hemlo area mines brought onstream in 1985 after a very short lead time of three years has contributed to the tripling of Ontario gold reserves between 1981-1988. These three mines account for 55% of Ontario's current gold reserves, with the Campbell Lake Mine accounting for an additional 15%.

Based on a proven and probable reserves, these mines are expected to remain operational well beyond the year 2000 and Ontario is expected to retain its competitive position.

(c) Production

The level of world production is contingent on the level of world gold prices. Higher prices can justify the extraction and production of lower grade, and therefore of higher cost gold. Since, gold prices have remained at moderate and stable prices over the last five years, low production costs are essential in achieving world ;

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competitiveness. The principal factor which determines the direct production cost is the grade of the gold mined. Generally speaking, the higher the grade, the lower cost in extraction and refining. While indirect costs count to a lesser extent, these can have an impact on margins and a mine's overall competitiveness. Indirect costs include exchange rate adjustments and interest charges. The cost of labour is also a factor in direct production costs, which is driven in part by regional employment levels and domestic inflation rates.

As illustrated in Exhibit 13, Canada is ranked fourth in gold production in the world behind South Africa, the United States and Australia. In terms of production growth, Canada had the third largest growth rate (10%) from 1987 to 1988, with Australia and the United States recording 37% and 33% increases, respectively.

Ontario produced 58 tonnes in 1988 with a gross value of Cdn.\$1 billion, making it Canada's largest gold producer.







Exhibit 13

Source: Consolidated Gold Field PLC, Canadian Mines Handbook 1989-90

Due to its abundance of high grade gold, Ontario has the world's lowest direct cost of production. While the average direct cash cost of production in 1988 in Ontario ranged between U.S.\$195 to U.S.\$230 per troy ounce, two thirds of Ontario's gold production comes from the high premium Hemlo and Red Lake mines where the direct cost of gold is about U.S.\$131 per troy ounce. 5

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Exhibit 14

Comparison of Direct Gold Cost and Production (1988)

| | Approximate Cost* (U.S.\$/oz. troy) | Approximate Production (tonnes) |
|---------------|--|---------------------------------|
| South Africa | 275 | 621 |
| Australia | 238 | 152 |
| United States | 223 | 205 |
| Canada | 214 | 128 |
| Ontario | 211** | 58 |
| Untario | 211 | 20 |

Estimated by Consolidated Goldfields PLC.

* Assuming mid-range cost at an exchange rate in 1988 of Cdn.\$1.23=U.S.\$1.00.

Source: Consolidated Goldfields "Gold 1989".

Exhibit 14 compares the cost of production among the major producers. South Africa has a high cost base for several reasons. Firstly, the grade is relatively low at 5 grams gold per tonne versus 15 grams per tonne for Ontario mines. Secondly, South Africa is suffering from a high inflation rate, rising labour costs and a depreciating currency.

With its long term reserves and low cost base, Ontario production prospects are positive in the short to medium term. Assuming the price of gold remains within the U.S.\$350 to \$400 per ounce band, Ontario production should not fall below 55 to 60 tonnes per year. However, if the price falls below the band, output could drop as some of the high cost, smaller operations shut down.



There is little threat that Ontario will lose its position as Canada's leading gold producer in the short to medium term. However, if by or co-product gold output from copper-gold porphyry deposits located elsewhere is economically feasible Ontario's position could be challenged. For instance, there are known copper-gold porphyry deposits in British Columbia but copper prices must be at the U.S.\$1 per pound level in order to justify extracting the copper.

(d) Technology, Research and Development

Technology research and development are essential in identifying new methods for extraction, production and refinement and for lowering costs. Unlike many other industries, technological information is freely exchanged within the gold industry. As a result, the level of technology does not vary much amongst gold producers. Once a certain piece of technology is established as economically feasible, most producers will adapt it, if it is applicable to their own operations.

Very often, the level of technology required by any one producer is dependent on the nature of the reserves. For instance, in many parts of the U.S. heap leaching technology is used to access shallow, low grade deposits. In South Africa, technology and research and development are important due to the labour intensive, narrow-vein hard rock high cost nature of its mining. :

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In Ontario, the level of technology used is moderate. Given Ontario's high grade deposits and low cost advantage, there is less need for technology to be utilized to overcome such problems such as inaccessible or low grade deposits.

(e) Macro-Economics

The competitiveness within a sector can also be affected by a number of macroeconomic forces, such as inflation, interest and exchange rates.

Like most other mining sectors, gold mining is a capital intensive activity and is characterized by relatively high debt-to-equity ratios. Thus, a company's cost structure and ability to compete internationally is dependent in part on its debt structure and domestic interest rates.

Since gold prices are determined on an international basis, a high domestic inflation rate affects its cost structure through higher labour costs, plant and equipment. Furthermore, inflation rates can lead to high interest rates (higher interest charges) as the government attempts to dampen spending.

Given the international nature of gold, a country's exchange rate relative to other competing countries' exchange rates can affect competitiveness. Exchange rates are linked, in part, to interest rates. Higher interest rates attract more investors to the country



causing the currency to appreciate as currency demand increases. The higher the value of the currency relative to other currencies, the more foreign currency is required to purchase goods from that country. Thus, foreign customers will buy its gold from countries with lower valued currencies.

(f) Conclusion

Due to the existence of large quantities of high grade, low cost gold in Northern Ontario as well as ongoing and substantial investment in exploration and mine development, the region is expected to maintain it strong competitive position vis-a-vis other Canadian and international competitors. In fact, given the increasing political and economic instability and declining quality in reserves of its main competitor, South Africa, the Northern Ontario gold industry is well placed to further increase its share of the world gold market in the decade ahead.

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APPENDIX I

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PRINCIPAL DATA SOURCES

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PRINCIPAL DATA SOURCES

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