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# MINERAL INDUSTRY QUARTERLY REPORT

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**SPRING 1994**

GEOLOGICAL SURVEY OF CANADA  
COMMISSION GEOLOGIQUE DU CANADA

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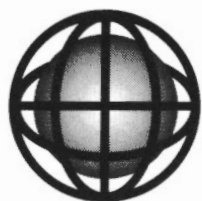
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# MINERAL INDUSTRY QUARTERLY REPORT

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SPRING 1994



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ISSN 1188-9004

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# Preface

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**T**his publication is prepared by the Mining Sector of Natural Resources Canada. Data appearing in this publication are compiled from many sources using the best information available to us. This report is intended to provide the reader with a digest of general information on the status of the mineral industry in Canada. It should not be considered an authority for exact quotation or an expression of the official views of the Government of Canada.

Your comments on the format and contents of this report are welcome. Specific comments can be directed to:

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## **MINERAL INDUSTRY INFORMATION CONTACT POINT**

In order to provide our clients with timely access to information describing the mineral industry, the Mining Sector has established a contact point through which requests for specific statistical information on the mineral industry can be channelled. Once a request has been received, it will be immediately directed to the officer most able to address that request.

This contact point is:

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# Introduction

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**E**arly in 1994, signs point to a continuing strengthening of the Canadian economy. However, this recovery, particularly with respect to the lowering of unemployment levels in the country, is likely to be a slow one.

The year 1993 was full of challenges for the mineral industry in Canada and it appears that these challenges will continue into 1994. As the "General Review" article in this publication describes, the serious concerns for the industry currently are "depressed mineral and metal prices, declining reserves, low levels of exploration and mine development, mounting environmental and land use issues, changing fiscal environments, and increasingly severe competition in the world economy."

According to preliminary forecasts, one of these concerns, the level of mineral exploration in Canada, may rebound in 1994 after a period of significant decline. Although part of the increase predicted for 1994 may reflect the current interest in diamond exploration, there are signs that the overall level of exploration in Canada has reached a low point and may again be on the rise. Information on the status of exploration in Canada is presented in two articles in this issue, "Highlights of Exploration in Canada" and "Canadian Exploration and Mine Investment in the Global Context."

Several of the issues facing the mineral industry are being jointly addressed by industry and government under the aegis of the Whitehorse Mining Initiative (WMI). Recommendations are being developed by the WMI working groups covering fiscal/taxation issues, environmental issues, workforce/workplace/community issues, and land use issues. These recommendations will be presented at the next Mines Ministers' Conference scheduled for September of this year.

An ongoing challenge for the Canadian industry is to keep apace with technological change to assure its competitive position on the world scene and, in some instances, to vend its technological skills throughout the world in areas ranging from exploration and mine-site development to smelting and refining. Industry is supported in the development of effective mining technologies through the programs of the Canada Centre for Mineral and Energy Technology, the main research and technology arm of Natural Resources Canada. A recent example of this support is the opening of the Mining Research Laboratory in Sudbury.



# Notes

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## **CANADIAN MINERALS YEARBOOK, REVIEW AND OUTLOOK, 1993**

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The 1993 edition of the *Canadian Minerals Yearbook* reports on the activities of the mineral and metal industry over the past year, identifies the predominant economic events of 1993, and indicates the major trends in the Canadian economy.

The leading chapter of the Yearbook provides a general review of the Canadian economy and the performance of the mineral industry during the year. Separate chapters address the regional and international scenes; mine reserves, developments and promising deposits; mineral exploration; and mine openings and closures.

The Yearbook's 27 commodity chapters form the major part of this publication. The subject matter spans all stages of industry activity through mining and processing to prices, trade, production and consumption. An outlook of the industry's future is also provided.

The statistical summary contains over 80 tables which provide statistical data on production; trade; consumption; prices; principal statistics; employment, salaries and wages; mining, exploration and drilling; transportation; and investment and finance.

Copies of the Yearbook can be purchased from the Canada Communication Group – Publishing, telephone: (819) 956-4802, and associated bookstores for \$45.00 plus \$5.40 for shipping and handling.

## **PUBLICATION OF CANADIAN LAW OF MINING**

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The Canadian Institute of Resources Law has published the *Canadian Law of Mining*, by Barry J. Barton. This publication contains a comprehensive study of Canadian mining law. From the broad concepts of ownership rights to the intricate details of claim-staking, it covers a variety of topics of interest to both practitioners and non-lawyers in the mining industry across Canada, as well as government personnel involved with regulating mining activity. In addition to practice and procedure, this report also addresses the policy inherent in different systems of disposition of mining interests, especially the free miner system. It covers many other issues important to mining, such as the acquisition of rights and interests from the Crown, transfers of mining interests, royalties, withdrawal of lands from mining, surface rights, and mining issues in relation to native lands.

The Canadian Institute of Resources Law believes that this publication would be a very useful tool for legal practitioners, explorationists, industry personnel, and government policy-makers. It provides a single reference source to all material directly relevant to mining law that is found in legislation, case law, and elsewhere.

The *Canadian Law of Mining*, priced at \$135 plus shipping, handling and GST, can be obtained from:

The Canadian Institute of Resources Law  
University of Calgary, 3330 PF-B  
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Please remember that we have not yet established a system to distribute information electronically. Your interest will be recorded, however, and will be used in making future publication decisions.

## **HIGHLIGHTS OF RECENT MINERAL INDUSTRY PUBLICATIONS BY STATISTICS CANADA**

Statistics Canada has recently released three publications of interest to the mineral industry:

- *Metal Mines – 1992*, catalogue no. 26-223;
- *Nonmetal Mines – 1992*, catalogue no. 26-224; and
- *Quarries and Sand Pits – 1992*, catalogue no. 26-225.

### **Metal Mines – 1992**

Catalogue no. 26-223

#### ***Establishment Statistics***

The total value of production by establishments classified in the metal mines industry group decreased to \$9767 million in 1992 from \$10 095 million in 1991.

Nickel-copper-zinc mines continued to lead in value of production by the metal mines industry, contributing 48.1% (\$4701 million). Following were gold mines, 19.9%



(\$1946 million); silver-lead-zinc mines, 13.7% (\$1338 million); iron mines, 11.1% (\$1086 million); and uranium mines, 5.9% (\$580 million). Other metal mines accounted for 1.2% (\$117 million).

Total employment in the metal mining industry was 37 774 in 1992, down by 10.3% from 42 092 in 1991. A total of 27 908 production and related workers were employed in 1992 compared to 31 168 in 1991, a drop of 10.5%.

Total wages and salaries of those employed in the metal mining industry were \$2119 million in 1992. Of this amount, mining activity employment accounted for \$1532 million.

### **Production Statistics<sup>1</sup>**

The total value of metallic minerals produced by all establishments in Canada, regardless of their industrial classification, was \$10 210 million in 1992, a decrease of 2.4% from the 1991 level of \$10 462 million.

Ontario accounted for 34.4% (\$3512 million) of the total value of metal production, followed by Quebec, 16.3% (\$1663 million); British Columbia, 14.7% (\$1502 million); and Manitoba, 8.9% (\$906 million). The other provinces and territories accounted for the remaining 25.7%.

Gold, copper, nickel, zinc, iron ore and uranium accounted for 90.2% of the total value of metal production in 1992. Their quantities and values of production are summarized below:

	Quantity	Unit	Value of Production (\$ millions)	% Share
Gold	160 351	kilograms	2 141	21.0
Copper	761 694	tonnes	2 137	20.9
Zinc	1 195 736	tonnes	1 791	17.5
Nickel	177 555	tonnes	1 502	14.7
Iron ore	31 582 000	tonnes	1 085	10.6
Uranium	9 114	tonnes	566	5.5

### **Nonmetal Mines – 1992**

Catalogue no. 26-224

#### **Establishment Statistics**

The total value of production by establishments classified in the nonmetal mines industry group increased to \$1858.8 million in 1992 from \$1806.6 million in 1991.

The potash mining industry accounted for 55.6% of the total value of production by the non-metal mines industry group. The remaining production was distributed as follows: asbestos mines, 13.2%; the peat industry, 8.0%; and other nonmetal mines, 23.2%.

Saskatchewan accounted for 47.8% (\$888.4 million) of the total value of production in 1992, followed by Quebec with 18.6% (\$345.5 million) and Ontario with 11.6% (\$215.3 million). The remaining 22.0% was shared by the other provinces.

<sup>1</sup> For definitions regarding data contained in this publication refer to Statistics Canada catalogue no. 26-202.

Total employment in the nonmetal mining industry was 10 419 in 1992, down by 3.6% from 10 812 in 1991. A total of 7938 production and related workers were employed in 1992 compared to 8055 in 1991, a drop of 1.5%.

Total wages and salaries of those employed in the nonmetal mining industry were \$435.5 million in 1992. Of this amount, mining activity employment accounted for \$313.2 million.

### ***Production of Leading Nonmetals<sup>1</sup>***

The total value of nonmetallic minerals produced by all establishments in Canada, regardless of their industrial classification, was \$2207.1 million in 1992, a decrease of 7.3% from the 1991 level of \$2381.7 million.

Potash, salt, asbestos, sulphur, peat and gypsum accounted for 85.5% of the total value of nonmetallic mineral production in 1992. Their quantities and values of production are summarized below:

	Quantity	Value of Production	% Share
	(kilotonnes)	(\$ millions)	
Potash	7 040	980.9	44.4
Salt	11 088	266.4	12.1
Asbestos	587	231.0	10.5
Sulphur, elemental	6 479	130.6	5.9
Peat	828	116.9	5.3
Sulphur, in smelter gas	783	88.1	4.0
Gypsum	7 295	71.8	3.3

### **Quarries and Sand Pits – 1992**

Catalogue no. 26-225

#### ***Establishment Statistics***

In 1992, the value of production by establishments classified as Quarries and Sand Pits decreased by 12.9% to \$609.8 million, from \$699.9 million in 1991.

Ontario accounted for 43.3% (\$264.3 million) of the total value of production followed by Quebec with 34.8% (\$212.4 million), British Columbia with 9.8% (\$59.5 million) and Alberta with 5.5% (\$33.4 million). The remaining provinces produced 6.6% of the total.

Stone quarries accounted for 60.3% (\$367.5 million) of the total value of production and sand and gravel pits constituted the remaining 39.7% (\$242.3 million).

In 1992, total employment in these establishments was 4338, down by 19.3% from the 5376 recorded in 1990 and by 13.7% from the 5026 recorded in 1991. The number of production and related workers was 3169 compared to 3644 in 1991.

Total wages of those employed in these establishments were \$164.2 million, a decrease of 8.6% from 1991. Of this amount, production and related workers earned \$114.1 million.

<sup>1</sup> For definitions regarding data contained in this publication refer to Statistics Canada catalogue no. 26-202.

***Production of Structural Materials***

The total value of structural materials produced by all establishments in Canada, regardless of industrial classification, was \$2264.9 million, a decrease of 5.7% from the \$2401.4 million registered in 1991.

Of this amount, a total value of \$115.1 million of clay products, \$682.4 million of cement, \$191.3 million of lime, \$760.4 million of sand and gravel, and \$516.5 million of stone were produced.

Total shipments of stone valued at \$571.5 million were made from Canadian quarries in 1992, a decrease from the \$589.2 million recorded in 1991.

Of this total value shipped, 70.9% was limestone, 21.9% granite, 3.4% sandstone, 3.0% marble and 0.8% shale.

A total of 103.5 million metric tonnes of stone was shipped in 1992, up by 3.1% from the 100.4 million metric tonnes shipped in 1991.

*To order a Statistics Canada publication, telephone 1-613-951-7277 or use facsimile number 1-613-951-1584. For toll-free, in Canada only, telephone 1-800-267-6677. When ordering by telephone or facsimile, a written confirmation is not required.*



## Reviews



# General Review of the Canadian Mineral Industry in 1993

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**Rob Dunn and Diana Pilsworth**

*The authors are with the Mining Sector,  
Natural Resources Canada.  
Telephone: (613) 996-6384*

## THE CANADIAN ECONOMY

**T**owards the end of 1993, evidence was building that Canada was finally pulling out of the slowest economic recovery in its history. After negative growth of nearly 2% in 1991 followed by an increase of less than 1% in 1992, preliminary estimates suggested that Canada's Gross Domestic Product (GDP) was expected to grow by about 2.5% in 1993. While falling slightly below that rate during the first half of the year, real GDP in the third quarter grew at an acceptable 0.6%. The economy was expected to record even stronger growth in the fourth quarter, largely as a result of the continued buoyancy exhibited by the U.S. economy in the latter part of the year. This trend, if sustained, would lead to Canada's best yearly performance since 1989.

Exports were a major factor fuelling growth in 1993, especially toward the end of the year. Most of the sustained export growth was provided by exports to the United States, which rose by almost 20% between October 1992 and October 1993. Over the course of 1993, total Canadian exports reached a new high, increasing by nearly 16% to \$181 billion. Improvements in Canada's cost competitiveness and a lower Canadian dollar that averaged US77.5¢ in 1993 also impacted favourably on export growth. As a result of this strong export growth, Canada's merchandise trade surplus for 1993 was expected to exceed \$11 billion, up from about \$9 billion in 1992 and \$5 billion in 1991. Merchandise trade is, however, only one component of the current account of Canada's balance of payments, the other components being service transactions, investment income and transfers. While the 1993 merchandise trade balance was positive, the current account balance for that year remained negative. In the third quarter of 1993, a \$3.0 billion merchandise trade surplus was offset by a current account deficit of \$6.3 billion.

Other factors also contributed to an improved economic climate in 1993. The first half of the year saw a turnaround in corporate profitability relative to the last quarter of 1992 when overall profits had remained well below pre-recession levels. As firms saw steady improvement in their profits and liquidity, business spending became a driving force in the economy, and investment outlays accounted for all of the growth in total spending, as measured by GDP, in the first two quarters of the year. Non-residential construction recorded back-to-back gains over the first two quarters of the year, the first such result since before the recession began. In fact, business investment in machinery and equipment showed sustained growth over the first nine months of the year, increasing by 1.6%, 1.7% and 3.9% respectively on a quarter-by-quarter basis. The strong third-quarter result was largely attributable to higher spending on industrial machinery, office equipment (including computers) and other capital goods.

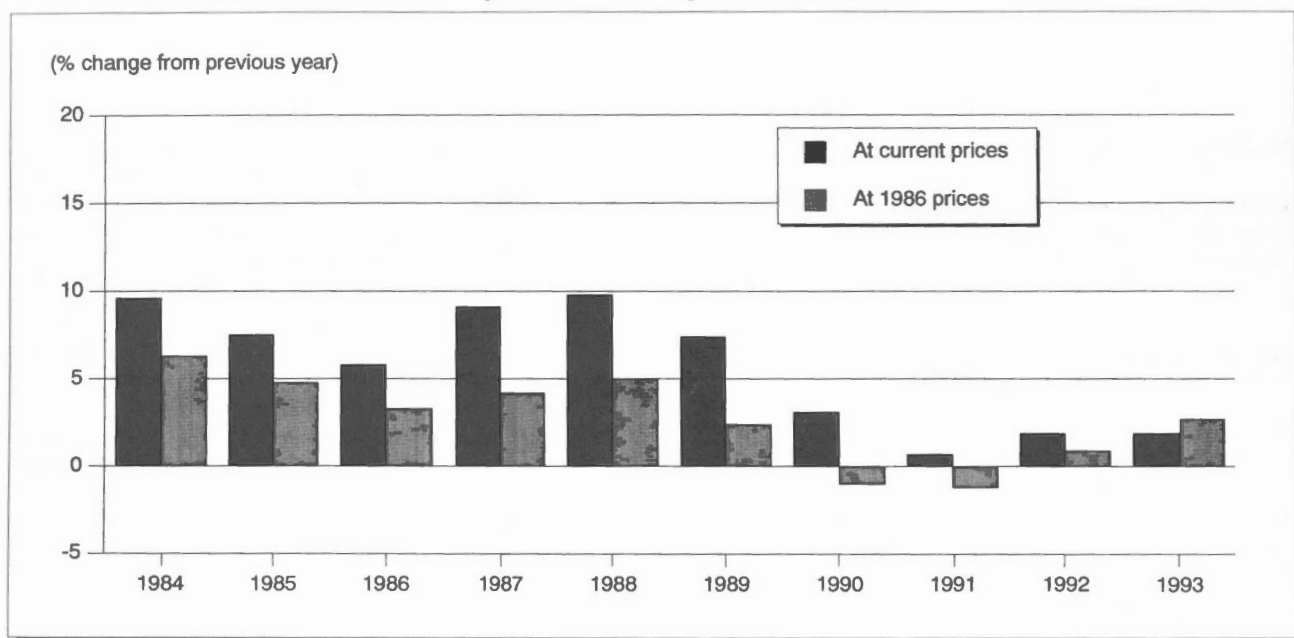
Also encouraging was a decline in the number of business and consumer bankruptcies. This decline occurred largely as a result of improved corporate profitability combined with lower interest rates. In the first nine months of 1993, combined business and individual bankruptcies fell by nearly 13% relative to the same period a year earlier.

An acceleration in economic activity in the United States in the third quarter of 1993 also proved positive for the Canadian economy. U.S. output rose at an annual rate of nearly 3% in the third quarter, considerably above the rate recorded in the first half of the year. Indicators at year-end pointed to a further fourth-quarter strengthening as demand accelerated. This buoyancy in the U.S. economy augured well for improved growth in Canada, whose economy in 1993 was weaker than that of her southern neighbour.

A subdued rate of inflation continued to be a feature of the economic environment in 1993. Domestically generated inflation was virtually non-existent in the third quarter, up by only 0.6% relative to the same quarter a year earlier, the lowest domestic inflation rate in 30 years. This result was largely attributable to ongoing under-utilization of capacity in the economy and lower production costs. Wage increases in the third quarter averaged only 0.7%, productivity grew by 1.4% and, for the first time since 1962, unit



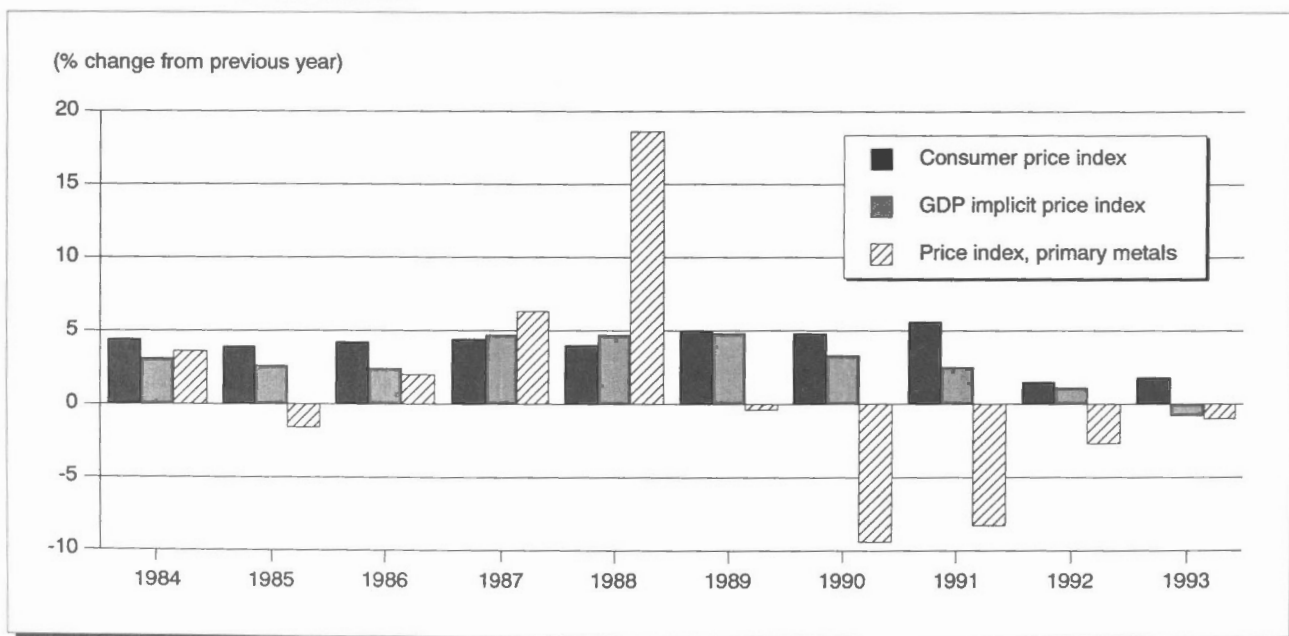
**Figure 1**  
Trends in Canadian Economic Activity, Percent Change in GDP, 1984-93



Source: Statistics Canada.

Note: Data for 1993 are estimated.

**Figure 2**  
Canadian Price Trends, 1984-93



Source: Statistics Canada (based on 1986 price indexes = 100).

Note: Data for 1993 are estimated.

labour costs were down on a year-to-year basis. In fact, the year-to-year increase in negotiated wage settlements tumbled in September to an historic low of only 0.2%, as two thirds of the negotiated agreements called for wage freezes or roll-backs. Inflation, as measured by the Consumer Price Index, grew by 1.8% on average, slightly above the 1.5% recorded in 1992. This measure of inflation reflected higher import costs associated with a falling Canadian dollar. Increased demand for credit occurred as interest rates fell to levels not seen for many years. The cost of borrowing, as measured by the prime rate established by the commercial lending establishments, fell from 6.75% in January 1993 to 5.50% in December, a 31-year low.

Several aspects of the economy in 1993 remained somewhat less than positive. In spite of low inflation and low interest rates, consumers remained cautious. Consumer spending, that had started the year with a 2.9% annualized increase over the last quarter of 1992, began to taper off as the year progressed. By the third quarter of 1993, the rate of increase had declined to 1.3%. There were signs, however, that household spending would strengthen in the fourth quarter. Motor vehicle sales were considerably above the level recorded in the third quarter and housing starts were up in October and November. On the other hand, sales of existing houses declined in the fourth quarter, failing to provide a needed impetus to sustained growth. Altogether, a somewhat inconsistent pattern of consumer spending emerged, as the stimulus of low interest rates continued to be checked by sluggish labour market conditions, and Canadians remained reluctant to borrow or to dip into savings. Low interest and inflation rates failed to lead consumers to increase discretionary spending. Instead, lack of income growth and a weak labour market continued to erode consumer confidence during the year.

While Canada's economic performance generally improved in 1993, only 43% of the employment losses incurred in 1991 and 1992 were recovered in 1993. New jobs were created and employment rose in most provinces, but the level of unemployment remained high at 11.2%, very similar to the level of 11.3% recorded in 1992. Long-term unemployment is expected to prevail for some time and, with the possible exception of the services sector, other sectors of the economy may continue to suffer.

Another negative factor was the continuing escalation of government debt at all levels. Represented as a fraction of the GDP, Canada's total public debt in 1992 was, with the exception of Italy, the worst among the G7 nations. The unavoidable cutbacks required to deal with the public debt at all levels of government clouded the economy in 1993 and will continue to do so into the foreseeable future.

## THE MINERAL INDUSTRY IN 1993

The mineral industry faced another challenging year in 1993. While prices for many of the nonmetals and industrial minerals increased or remained stable, most base-metal prices slowly declined as the year progressed. In spite of production cutbacks undertaken by the former Soviet Union (FSU), economic and political turmoil led to a reduced ability of the FSU to absorb its own domestically produced metals. Excess supplies were diverted to Western countries already mired in recession, adversely affecting base-metal prices, especially those of aluminum and nickel. It is not surprising, therefore, that production cutbacks and continuing employment declines continued throughout the year in the Canadian mining industry.

The mineral industry can be described by the following four stages of processing activity:

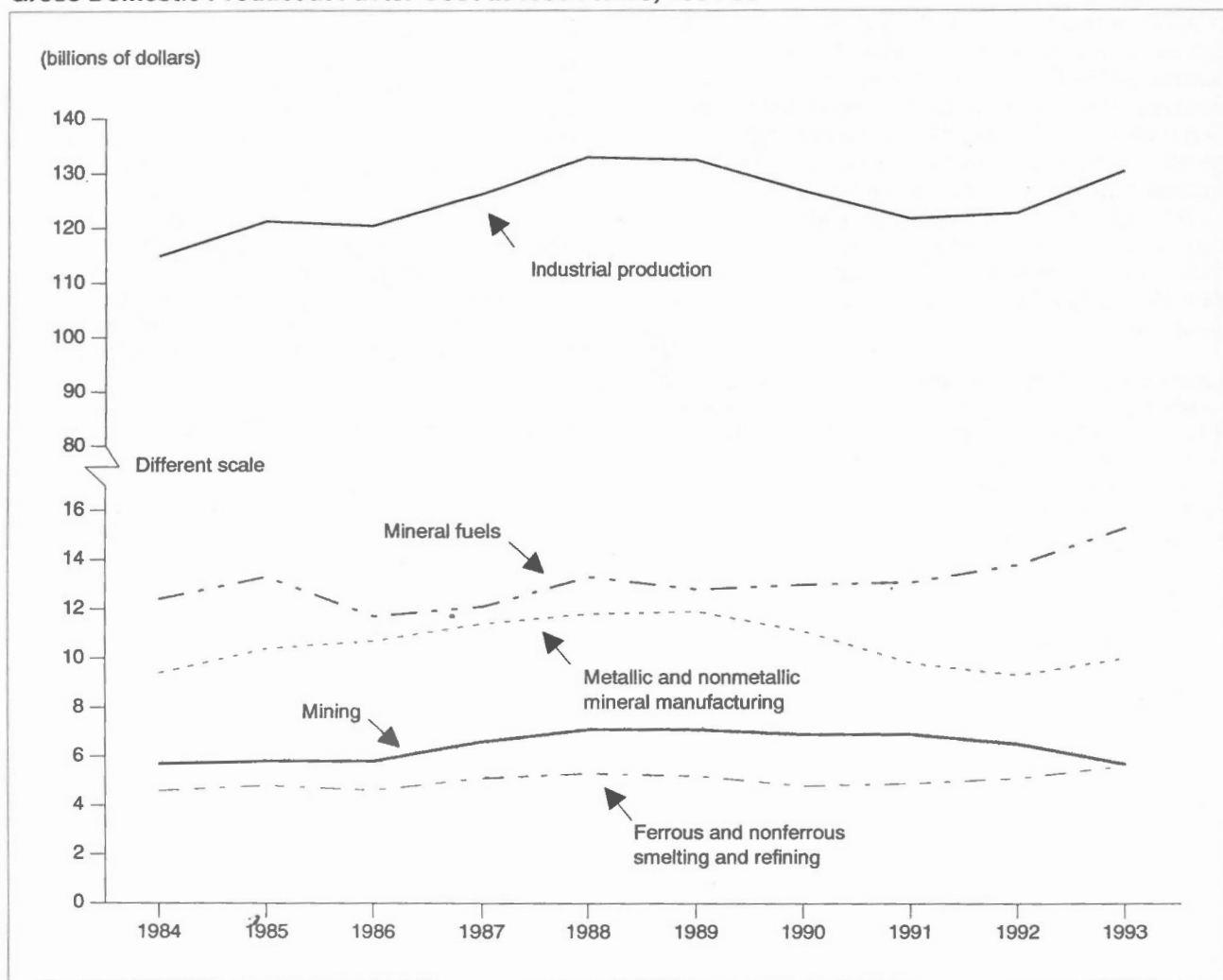
- Stage I: Primary Mineral Production (mining and concentrating);
- Stage II: Metal Production (smelting and refining);
- Stage III: Minerals and Metals-Based Semi-Fabricating Industries; and
- Stage IV: Metal Fabricating Industries.

Including all four stages of activity, and excluding oil and natural gas, the mineral industry accounted for about 4% of GDP in 1993.

Preliminary estimates for 1993 indicated that total employment in the industry was about 335 000, accounting for 2.5% of total national employment. This was down by 3.5% from the employment of 347 000 registered in 1992. All stages of the mineral industry experienced declines in employment in 1993 although the rate of decline seemed to be tapering off. Total employment in Stage I (metal mining, nonmetal mining, quarrying and coal mining) was estimated at 57 000, down from 61 000 in 1992, while employment in Stage II (nonferrous smelting and refining), estimated at 61 000, was down marginally from the level recorded the previous year. Employment in Stages III and IV (the semi-fabricating and fabricating mineral industries) dropped from 224 000 in 1992 to about 217 000 in 1993, a decline of about 3%, considerably less severe than the 7.3% drop recorded in 1992.

The capacity utilization rates in mineral-based manufacturing picked up in 1993. Capacity utilization in the primary metal industries was 91.8% in the third quarter of 1993, a significant increase over the 81.7% reported in the equivalent quarter in 1992. Capacity utilization in the fabricated metal products industry showed a smaller increase, rising from 66.6% in the

**Figure 3**  
**Gross Domestic Product at Factor Cost at 1986 Prices, 1984-93**



Source: Statistics Canada.

Note: Data for 1993 are estimated.

third quarter of 1992 to 70.5% in 1993. The increase in capacity utilization for the nonmetallic mineral products industries closely paralleled that of fabricated metals, increasing from 66.2% in the third quarter of 1992 to 71.2% in the third quarter of 1993. Good performance in the manufacturing industries was driven by rising domestic demand and increased exports of electrical and electronic products.

Operating revenues can be quite volatile in the resource-based industries as commodity prices are more sensitive to changes in the economy as a whole than are other processed or manufactured products. Revenues in the nonferrous mining and primary metals industries (Stages I, II and III) reflected the strength of metal prices in the period 1987-89. Metal

prices have, however, fallen considerably since that time, resulting in a corresponding decline in revenues. In 1993, revenues in the first three quarters dropped to \$11.4 billion, down from the \$13.1 billion recorded over the same period in 1992.

The rate of return on total assets reflects an industry's ability to earn a return on funds supplied from all sources. The return on assets for the nonferrous metals and metal products industries peaked at about 19% in the first quarter of 1989, then declined somewhat erratically to reach a new low of -3.5% in the fourth quarter of 1992. There was, however, a slight improvement in 1993 with the third quarter showing a positive return of 2.3%.

The debt-to-equity ratio is a gauge of the solvency and capital structure of an industry, measuring the relationship between loans and borrowings on the debt side, and share capital, contributed surplus and retained earnings on the equity side. For the nonferrous and primary metals industries, the debt-to-equity ratio peaked in 1985 at 0.59, then began a long and slow decline to a low of 0.28 in the third quarter of 1990. In the fourth quarter of 1990, however, this ratio began to climb again and, by the third quarter of 1993, had climbed to a high of 0.53, nearly matching the 1985 peak of 0.59.

Capital expenditure intentions reported by the non-fuel mineral industry (including coal) in 1993 totalled \$3.4 billion. This level of spending, reflecting revised investment intentions at mid-year as collected by Statistics Canada, represented a nearly 3% decrease from the \$3.5 billion spent in 1992 on construction and machinery and equipment. Most of this decrease was expected to occur in the nonferrous smelting and refining industries in which capital outlays were projected to fall from \$1.3 billion in 1992 to \$0.9 billion in 1993. When repair expenditures are included, total investment spending planned by the mineral industry was \$7.1 billion in 1993, compared with \$7.2 billion in 1992. This level of spending represented 4.4% of total capital and repair expenditures within the Canadian economy, unchanged from 1992 but down from the 5.7% recorded in 1991.

Research and Development (R&D) spending intentions of the nonfuel mineral industry (including coal) totalled \$292 million for 1993, a decrease from \$305 million in 1992. This level of R&D spending represented 5.1% of total R&D spending planned by Canadian industries. Metal mines were expected to account for 13% (\$38 million) of mineral industry R&D spending in 1993, a significant decrease from the \$59 million estimated to have been spent the year before. Spending intentions of the primary metal manufacturing industries (ferrous and nonferrous) represented 66% (\$192 million) of the mineral industry R&D total for 1993. This percentage was virtually unchanged from that of the previous year. When measured as a share of GDP, Canada is one of the lowest spenders on R&D among the G7 countries although Canadian R&D tax incentives are generally considered to be among the most favourable in the developed countries.

Total spending on exploration for the non-fuel mineral industry in 1993 was expected to increase marginally to about \$400 million, compared with \$385 million in 1992. Exploration expenditures in 1991 were considerably higher, at \$532 million. Corrected for inflation, 1992 exploration expenditures were the lowest since 1967. Diamond exploration expenditures were up in 1992 to \$19 million, a significant increase over the \$7.1 million and \$7.6 million reported in 1991 and 1990 respectively. The

economic importance of diamond discoveries, including those at Lac de Gras in the Northwest Territories, have yet to be fully assessed. Mineral reserves are in a decline and substantial new discoveries of copper, zinc and lead are needed to avoid a progressive decline in Canadian output of these metals. According to the Science Council of Canada, the mining and mineral industry spends, on average, approximately 2.6% of sales on exploration, a considerable expenditure but very necessary to the survival of the industry.

## MINERAL PRODUCTION

The Canadian mineral industry did achieve some growth in 1993. According to preliminary estimates, the total value of production of all mineral commodities, including mineral fuels, rose from \$35.4 billion in 1992 to \$36.1 billion in 1993, an increase of nearly 2%. As the accompanying table shows, this improved performance was totally attributable to an 11% gain in the value of output of natural gas and the other mineral fuels. The fuels sector includes crude petroleum, natural gas, natural gas by-products and coal. Together they accounted for nearly 64% of the total value of Canada's mineral production in 1993. The value of mineral fuels output rose from \$20.7 billion in 1992 to \$23.0 billion in 1993, an increase of about \$2.3 billion. This gain by the mineral fuels was, however, partly offset by a decline of \$1.6 billion in the total value of non-fuel mineral production, which declined by 11% from \$14.7 billion in 1992 to \$13.1 billion in 1993.

The value of production for the four mineral commodity groups (metals, nonmetals, structural materials and fuels) is summarized in the following table. Metals showed a significant drop in the value of production of nearly 14%. While gold and the platinum group metals were able to register modest increases in the value of production of 5.8% and 6.6% respectively, the leading base metals experienced declines. Natural Resources Canada's Metal Price Index provides a partial explanation for the declines in production values of the metals group. This index, which tracks the monthly prices of copper, nickel, lead, zinc, gold and silver, generally followed a downward trend through to October when it hit a low not recorded since 1987. However, the index began to turn up again in November and finished the year with the December level equalling the level recorded at the start of the year.

Based on value of production, the top ten commodities in 1993 were crude petroleum (\$11.16 billion), natural gas (\$7.25 billion), natural gas by-products (\$2.79 billion), gold (\$2.26 billion), coal (\$1.78 billion), copper (\$1.76 billion), zinc (\$1.23 billion), nickel (\$1.22 billion), iron ore (\$1.04 billion), and potash (\$0.90 billion).

**CANADIAN MINERAL INDUSTRY VALUE OF PRODUCTION, 1992 AND 1993**

	1992	1993P	Change
	(\$ millions)		(%)
Metals	10 201.6	8 808.4	-13.7
Nonmetals	2 207.1	1 994.9	-9.6
Structurals	2 264.9	2 279.4	0.6
Total Nonfuels	14 673.6	13 082.6	-10.8
Fuels	20 730.6	22 979.6	10.8
Total	35 404.3	36 062.2	1.9

Sources: Natural Resources Canada; Statistics Canada.  
P Preliminary.

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

On a provincial basis, Alberta's contribution to total Canadian mineral output represented the largest share on a value basis, amounting to \$18.6 billion, or 51.7% of the total. Ontario was second with a value of \$4.4 billion or 12.4% of the total. British Columbia accounted for \$3.5 billion (9.8%), Saskatchewan for \$3.2 billion (8.8%), Quebec for \$2.6 billion (7.1%), and Manitoba for \$0.90 billion (2.5%). The remaining provinces and territories accounted for the other 7.7%. Non-fuel minerals plus coal accounted for slightly more than 40% of the total value of Canada's mineral production in 1993.

**MINERAL TRADE**

The mineral industry continued to make a significant contribution to Canada's merchandise trade balance. Mineral and mineral product exports, including fuels, totalled \$32.3 billion for the first three quarters of 1993, an increase of nearly 11% over the corresponding period in 1992. Over the first nine months of the year, 78.4% of total mineral exports went to the United States, 6.6% to the European Community, and 5.1% to Japan. Mineral and mineral product exports represented 25% of total domestic exports.

Imports of minerals and mineral products, including fuels, for the first three quarters of the year totalled \$16.5 billion, or 13% of total Canadian imports. In terms of net trade, a surplus of approximately \$15.8 billion was recorded for minerals and mineral products, including fuels, for the first three quarters of 1993.

The value of exports of non-fuel minerals with coal included was estimated at \$19.4 billion for the first nine months of 1993, an increase of about 5% over the corresponding period in 1992. These exports included crude minerals, smelted and refined products, and semi-fabricated and fabricated products. The United

States was the destination for 66% of Canada's exports of non-fuel minerals and coal, while the European Community and Japan received 11.1% and 8.4% respectively.

Imports of non-fuel minerals and coal for the first nine months of the year were estimated at nearly \$12 billion, or 9.5% of total Canadian imports, resulting in a trade surplus for non-fuel minerals and coal of about \$7.5 billion for the first three quarters of the year. The surplus for the full year was expected to be approximately \$10 billion.

**LEADING MINERALS****Gold**

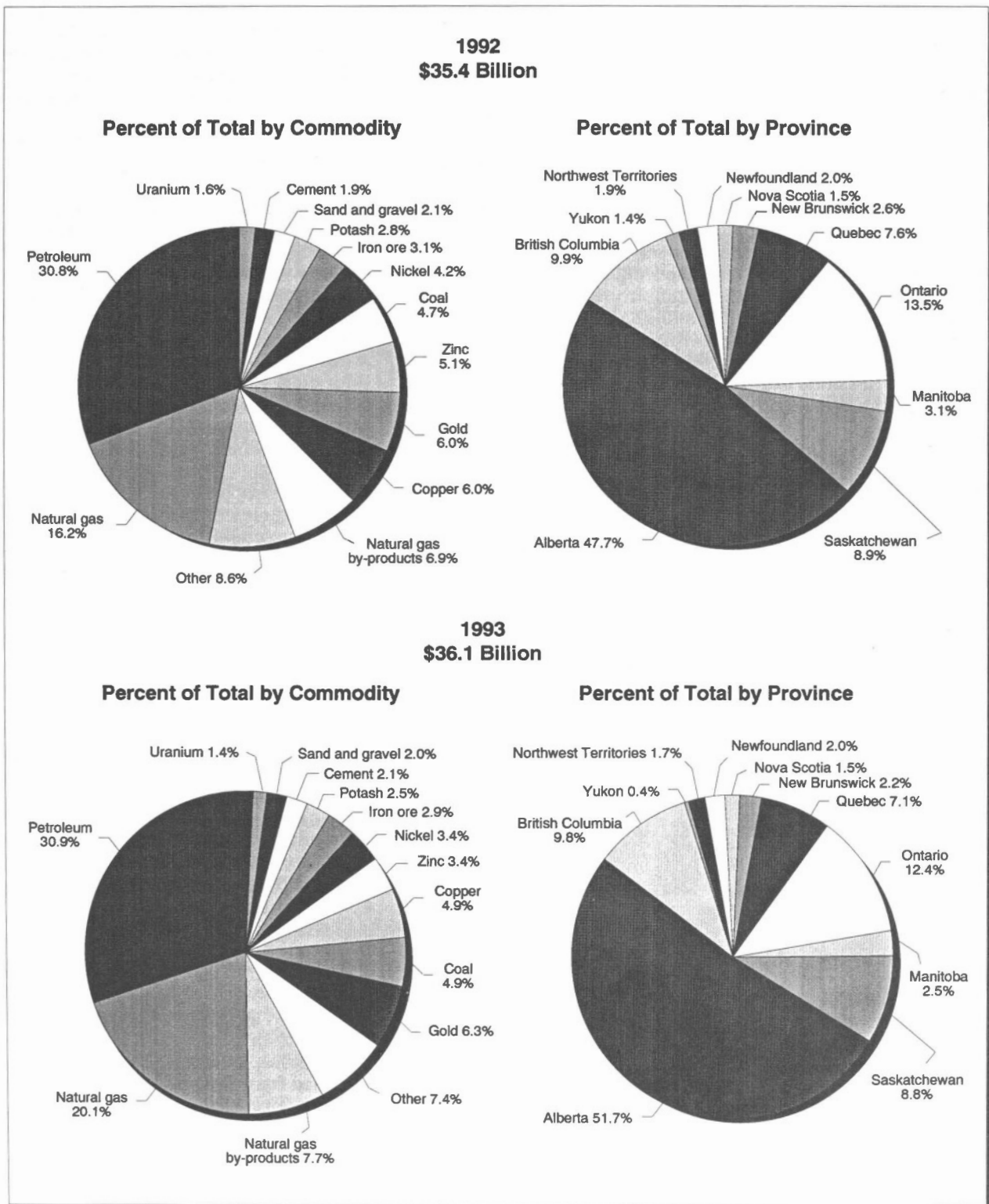
The volume of gold production fell to 153 t in 1993 from 160 t in 1992 and the record level of 176 t produced in 1991. The decrease of over 4% between 1992 and 1993 was largely a result of cutbacks in production levels at several large operations. However, by year-end, rising gold prices and new mine openings resulted in monthly production rebounding to 1992 levels. These rising prices precipitated a climb in the value of 1993 production to \$2258 million, significantly higher than the \$2135 million recorded in 1992 which permitted gold to retain its status as the leading metal produced in Canada. After starting 1993 at approximately US\$330/oz, prices rose dramatically later in the year to boost the annual average to about US\$360/oz. Gold prices fluctuated, reaching a peak of over \$406/oz in August and a low of \$326/oz in March. These price increases were triggered by heavy investor and fabrication demands, particularly from Far East countries. In 1993, Canada became the fourth-ranked world producer of gold trailing only South Africa, the United States and Australia. While two mines closed and six opened during the year, total employment in gold mines continued to decrease, dropping from 9400 in 1992 to an estimated 8700 in 1993. It is forecast that gold production will range between 160 and 170 t/y for the remainder of the decade.

**Copper**

In 1993, the value of production of copper declined dramatically from \$2137 million in 1992 to \$1760 million. Correspondingly, production volumes of copper dropped by over 8% to 699 000 t from the 762 000 t recorded in 1992. While the opening of the Louvicourt mine in Quebec will temporarily offset declining production levels, it is estimated that Canadian production levels will generally continue to decline for the remainder of the decade. Copper prices, reacting to lacklustre demand and continuing high levels of production, dropped from US\$1.04/lb in 1992 to average US\$0.87/lb in 1993. In the absence of any major increases in consumption or significant



**Figure 4**  
**Value of Mineral Production, Percent Shares by Commodity and by Province, 1992 and 1993**



Sources: Statistics Canada; Natural Resources Canada.

Notes: The provincial shares may not add to 100% due to rounding. Prince Edward Island's share is excluded as it is too small to be expressed.

cutbacks in production, it is foreseen that prices may decline even further until rising consumption and slowdowns in production result in significant price increases later in the decade. Canada remains the fourth largest producer of copper behind Chile, the United States and the FSU.

## Nickel

Canada and the FSU are the two largest producers of nickel in the world, producing between them almost 50% of world production. Weak demand and an over-supply of nickel in world markets signalled a continued decline in nickel prices during 1993 and cutbacks in production late in the year. Despite the fact that Canadian nickel production increased slightly in 1993, rapidly declining prices resulted in a drop in the value of production from about \$1.5 billion in 1992 to \$1.2 billion in 1993. Prices declined from US\$2.70/lb to about US\$2.00/lb later in the year, and averaged about US\$2.40/lb over the full year. It is expected that stainless steel production, which accounts for over 60% of Western World primary nickel consumption, will increase by roughly 3% per year. Despite the cutbacks that affected production levels at the end of 1993, Canadian nickel production is expected to increase to the year 2000. It is anticipated that worldwide stocks of nickel will decline in 1994, giving rise to higher nickel prices in 1995.

## Zinc

Canada is the world's largest producer of zinc concentrates. Production levels in 1993 dropped to 0.998 Mt in 1993 from 1.196 Mt in 1992, a decline of about 16.5%. As with other base metals, falling prices severely affected the total value of Canadian zinc production which fell from \$1.79 billion in 1992 to about \$1.23 billion in 1993, a drop of 31.4%. Zinc prices on the London Metal Exchange (LME), which averaged about US\$56/lb in 1992, plunged to about 44¢/lb in 1993. In 1994, the outlook for zinc is one of improving demand due to shortages of concentrates, declining stocks and corresponding increases in zinc prices. Canadian mine production is likely to rise slightly in 1994. This increased level is expected to be maintained through to the year 2000, as mine closures in Ontario and the Northwest Territories are offset by openings in Quebec, the Yukon and the Northwest Territories.

## Lead

Canada has become the third largest producer of lead in the world after Australia and the United States. Large decreases in mine production, however, occurred as a result of cutbacks and closures in response to accumulated surpluses and low lead prices. Shipments of recoverable lead in ores and concentrates dropped from 337 000 t in 1992 to 187 000 t in 1993, a decrease of 44.3%. The value of

those shipments declined by 61.1% from \$247 million in 1992 to \$96 million in 1993. The price for lead averaged just over US\$18¢/lb in 1993, a major decline from the 1992 average of 24.6¢/lb. This price drop reflects the large inventories available on the LME. Lead prices are expected to increase over the next few years, provided that regulatory restrictions on the use of lead are not widely adopted in industrialized and newly industrialized countries.

## Silver

Silver is normally produced as a by-product or co-product of base-metal mining or gold mining in Canada. Canada ranks in the top five world producers of silver. Shipments of silver fell to 869 t in 1993 from 1169 t in 1992, a decrease of 26%. This decline was the result of a continuing pattern of mine closures and reductions in production levels. Correspondingly, the value of shipments fell by 14.5% to \$153 million from the \$179 million recorded in 1992. Silver prices that had been on a downward trend during much of the previous decade rebounded in 1993 to post an average annual value of US\$4.30/oz for the year, well above the 1992 average price of US\$3.95/oz. During the course of the year, prices approached US\$5.00/oz. It is anticipated that silver production will remain at 1993 levels during 1994, but is forecast to increase to 1300 t by the year 2000.

## Iron Ore

Production of iron ore in Canada remained relatively stable in 1993 when compared to 1992. The value of shipments decreased from \$1.085 billion in 1992 to \$1.036 billion in 1993. However, iron ore shipments increased in volume from 31.58 Mt in 1992 to 31.72 Mt in 1993. These levels are significantly below the 1991 shipments of 35 Mt valued at \$1.228 billion. The outlook for 1994 was one of maintenance of production levels similar to 1993, with the possibility of a slight increase in response to higher steel production levels in North America. In terms of exports, it is expected that increased sales to Europe will be offset by a reduction in sales to Japan, where steel production is expected to decrease substantially.

## Asbestos

Total Canadian asbestos shipments were estimated at 509 341 t in 1993, down from a 1992 production level of 586 994 t. Correspondingly, the total value of production declined from \$231 million in 1992 to \$213 million in 1993. These decreases can be attributed to a softening in some markets due to the worldwide recession. There have been, however, no major shut-downs or closures in the Canadian asbestos industry in 1993. Canada is the second largest producer of asbestos in the world, after the FSU. The publication of a clarification notice by the U.S. Environmental Protection Agency is expected to have



a positive impact on Canadian markets in developing countries. Asbestos-cement products are still favoured by many users despite increasing competition from substitute fibres and steel. Canadian production is expected to remain relatively stable in 1994.

## Potash

World production of potash declined by 11% in 1993 to about 21.3 Mt, with most of this decrease occurring in the FSU, Canada and Germany, the world's three top producers. Canadian potash shipments fell, largely due to reduced shipments to offshore markets. World consumption dropped in 1993 with about three quarters of the decline occurring in the FSU. Aside from the FSU, markets remained relatively static as reduced consumption in China was offset by higher levels of demand in both North and South America. Potash is produced in two Canadian provinces, Saskatchewan and New Brunswick, with Saskatchewan accounting for the majority of the production. Canadian potash production fell marginally from 7.040 Mt in 1992 to 6.970 Mt in 1993. Canadian potash mines operated at about 57% of capacity in 1993, down slightly from the 60% recorded in 1992, while the capacity of other major world producers reached between 75% and 95%.

## Coal

Coal production rebounded to a level of 68.6 Mt in 1993, almost 5% higher than the 65.5 Mt recorded in 1992, but still substantially lower than the 1991 level of 71.1 Mt. This increase followed the resolution of financial restructuring and labour problems at three mines in southeastern British Columbia, which raised the production volume in that province by 16% from 17.7 Mt to 20.6 Mt. The value of coal produced grew to \$1.78 billion, higher by over 7% than the \$1.66 billion registered in 1992. Canada is a major coal exporter, ranking fourth in the world. Much of Canada's coal exports are directed to Pacific Rim countries, particularly Japan, South Korea and Taiwan for both steam and coking coal. In addition, there are expectations of strong growing demand by China for imported coal before the end of the century, despite the fact that China will remain a significant exporter of coal itself. It is expected that exports to the European Community will continue to decline. Overall coal production and trade in both Canada and the world will increase substantially throughout the current decade.

## Structural Materials

The value of production of structural materials, which are defined to include sand, gravel, cement, clay products, lime and stone, reached \$2.2 billion in 1993, a marginal increase over the levels achieved in the previous year. Shipments of cement increased by about

12% over 1992 to reach a level of \$765 million, largely as a result of higher exports to the United States and a moderate increase in demand from western Canada. Housing starts in Canada declined by 7.5% in 1993 and both non-residential housing and engineering construction remained weak, adversely affecting shipments of structural materials. A national infrastructure renewal program, initiated in late 1993, offered some promise for the structural materials industry in the upcoming period.

## CHALLENGES FOR THE INDUSTRY

Canada's mineral industry is confronted with the most daunting challenges that it has ever faced. Among the more serious concerns are depressed mineral and metal prices, declining ore reserves, low levels of exploration and mine development, mounting environmental and land use issues, changing fiscal environments, and increasingly severe competition in the world mineral economy.

There is strong and growing competition from other parts of the world that enjoy their own particular advantages such as richer orebodies, lower supply and wage costs, and cooperative governments anxious to obtain private investment for the development of their own countries. Mexico, Chile, Venezuela, Argentina and Bolivia, as well as a number of smaller South American and Central American countries, are attracting the interests of foreign mineral investors. These countries appear to be offering highly competitive investment climates that include free mineral rights, tax rate concessions, and generous depreciation and loss carry-over provisions.

Canadian mineral reserves are declining and projected mine closures over the next few years could place the industry in a critical position. This decline in the inventory of mineable base-metal ores has sharply diminished the time available for finding and developing new orebodies and, unless new reserves are discovered, will impact seriously on the sustainability of Canadian mine production in the future.

Underlying any discussion of the future of the mining industry in Canada is the question of metal prices. After peaking in 1989, metal prices have, in general, continued to decline. These lower prices are largely a reflection of reduced demand because of poor economic conditions throughout the world. If the average cost of producing metals exceeds the price for a prolonged period, production will inevitably fall and the least competitive suppliers may be permanently squeezed out. The challenge for the Canadian mining industry is to ensure that production costs are kept at a level lower than world metal prices. Accomplishing this with our natural disadvantages, such as climate and transportation distances, will not be an easy task.

The mining industry, like many other industrial sectors, has been the focus of a number of regulatory initiatives to reduce pollution-generating activities. There is, however, concern among industry officials that some of the regulations are poorly designed and inefficient, and are causing uncertainty, delay and unnecessary increases to costs, thereby inhibiting domestic mineral investment.

Also of concern to the Canadian mineral industry is the fact that some Canadian provinces, when compared with competing jurisdictions, have become less competitive from a tax perspective.

The need to develop both a vision and a process to renew Canada's minerals and metals sector was identified by The Mining Association of Canada at the Mines Ministers' Conference held in Whitehorse, Yukon Territory, in September 1992. As a result, the Whitehorse Mining Initiative (WMI) came into existence and was officially launched at the Prospectors and Developers Association of Canada conference in Toronto on March 30, 1993. The WMI established the long-term objective of moving towards a socially, economically and environmentally sustainable and prosperous mining industry, underpinned by political and community consensus. The four issue groups established under the WMI umbrella deal with Environment, Land Use, Workplace, and Finance/Taxation. The WMI is charged with identifying and developing suitable measures to resolve current issues and pave the way for a renewed minerals and metals sector.

## ECONOMIC OUTLOOK FOR 1994

Leading economists are predicting moderate but steady growth in the Canadian economy in 1994 with forecasts ranging from a conservative 2.7% to a more optimistic 4%. Exports are expected to remain the main source of economic growth, largely as the result of a lower Canadian dollar, and improving productivity and strong growth in the United States, anticipated to be about 3% in 1994.

Business investment spending in machinery and equipment is expected to show robust growth in 1994, as corporations emerging from the recession replace outdated technology. Much of Canada's machinery and equipment is imported, however, and the impact of this growth on job creation is likely to be minimal. The residential sector is also expected to revive in 1994, as housing construction is forecast to rise by 6% as a result of low mortgage rates and a strengthening economy.

Because the Canadian economy is still performing well below capacity, inflationary pressures are not expected to build for several years. As a result, the Consumer Price Index should remain stable at around 1.8%. Interest rates, on the other hand, may

edge up, mainly as a result of the impact of a weaker Canadian dollar that some economists believe will fall to between US72¢ and US74¢ at year-end. The possible increase in interest rates expected in the United States, where the economy is operating at close to capacity, could have an unfavourable impact on Canadian rates. There were signs at the end of 1993 that consumer spending was finally picking up but, because of higher taxes, low wage settlements and continuing high unemployment, Canadians generally believed that their financial positions are likely to remain fragile in 1994.

Unemployment is expected to remain high for several years to come and is forecast to remain at about 11% in 1994. This represents very little change from 1993, partly because production gains have not translated into employment gains. Also of concern is the ongoing impact of a large public debt that is certain to restrain the pace of economic recovery.

## MINERAL INDUSTRY OUTLOOK

Factors related to the strength and timing of an economic recovery, both domestically and internationally, will continue to be of concern to Canada's mineral producers. Although the North American economy appeared to be recovering, other major economies of the world continued to exhibit weakness. Internationally, world mineral supply and demand will continue to be affected by political and economic developments in markets such as Japan, continental Europe, the former Soviet Union, China and South Africa. Canada's positioning within the global industry will depend on how well the domestic industry draws on its strengths to respond to the challenges. Canada is still one of the leading mineral producers of the world and one of the world's top exploration targets. An attractive investment climate is, however, critical to sustaining a viable mineral industry. Public policy initiatives and regulatory structures will be needed to maintain the industry as a world-class producer of mineral and metal products, and to stimulate investment in mineral exploration and development in Canada.

The WMI is viewed as an important step in uncovering ways of dealing with the challenges facing the mineral industry in the months and years ahead. The federal government has voiced its support for the mining industry as a vital part of the Canadian economy and intends to articulate a national strategy for sustainable development based on consultation and the recommendations of the WMI.

A critical period lies ahead but, with a sustained effort on the part of all stakeholders, tough challenges can be met. As a result, Canada's mineral industry should continue to make a significant contribution to Canada's economy.

TABLE 1. CANADA, PRODUCTION OF LEADING MINERALS, 1992 AND 1993

		Volume		Percent Change	Value		Percent Change
		1992	1993P	1993/1992	1992	1993P	1993/1992
		(000 tonnes except where noted)			(\$ millions)		
<b>METALS</b>							
Gold	kg	159 858.2	152 578.3	-4.6	2 134.6	2 258.0	5.8
Copper		761.7	698.8	-8.3	2 137.0	1 759.7	-17.7
Zinc		1 195.7	998.2	-16.5	1 791.2	1 228.8	-31.4
Nickel		177.6	180.8	1.8	1 502.1	1 216.0	-19.0
Iron ore		31 582.0	31 720.5	0.4	1 084.8	1 036.6	-4.4
Uranium	tU	9 114.1	9 015.4	-1.1	566.4	509.0	-10.1
Silver	t	1 169.0	868.7	-25.7	178.7	152.9	-14.5
Platinum group	kg	11 311.3	13 116.4	16.0	130.2	138.8	6.6
Lead		336.9	187.6	-44.3	247.3	96.2	-61.1
Cobalt		2.2	2.4	6.6	131.4	89.8	-31.6
<b>NONMETALS</b>							
Potash (K <sub>2</sub> O)		7 039.6	6 969.8	-1.0	980.9	901.5	-8.1
Salt		11 088.0	11 371.4	2.6	266.4	279.8	5.0
Asbestos		587.0	509.3	-13.2	231.0	215.1	-6.9
Peat		827.9	820.0	-1.0	116.9	119.2	2.0
Sulphur, in smelter gas		783.4	797.0	1.7	88.1	95.0	7.9
Gypsum		7 294.7	7 835.9	7.4	71.8	83.1	15.7
<b>STRUCTURALS</b>							
Cement		8 598.2	9 841.6	14.5	682.4	764.6	12.0
Sand and gravel		240 616.0	229 940.5	-4.4	760.4	736.5	-3.1
Stone		89 337.7	79 208.6	-11.3	516.5	469.6	-9.1
Lime		2 384.3	2 446.6	2.6	191.3	200.7	4.9
Clay products		..	..	..	114.3	108.1	-5.4
<b>FUELS</b>							
Petroleum, crude	000 m <sup>3</sup>	93 255.8	97 249.3	4.3	10 907.8	11 155.0	2.3
Natural gas	million m <sup>3</sup>	116 663.5	129 245.1	10.8	5 718.6	7 248.6	26.8
Natural gas by-products	000 m <sup>3</sup>	26 734.5	28 462.6	6.5	2 434.9	2 793.0	14.7
Coal		65 612.0	68 600.0	4.6	1 669.3	1 783.0	6.8

Sources: Natural Resources Canada; Statistics Canada.

.. Not available; P Preliminary.

Note: Numbers have been rounded.

TABLE 2. CANADA, EXPORTS OF MINERAL COMMODITIES BY COUNTRY AND BY COMMODITY AS DEFINED BY THE HARMONIZED SYSTEM (HS), 1993 (9 MONTHS)

HS Chapter1	Description	United States		EC2		Japan		Mexico		Other		Total	
		(\$000)	(%)	(\$000)	(%)	(\$000)	(%)	(\$000)	(%)	(\$000)	(%)	(\$000)	(%)
25	Salts; sulphur; earths or stone, plastering materials, lime and cement	388 951	53.8	50 397	7.0	44 472	6.2	13 699	1.9	225 522	31.2	723 041	100
26	Ores, slag and ash	283 308	19.1	634 194	42.8	362 841	24.5	19 683	1.3	182 704	12.3	1 482 730	100
27	Mineral fuels, oils and products of their distillation; bituminous substances; mineral waxes3	12 855 047	89.4	72 688	0.5	891 221	6.2	12 117	0.1	540 227	3.8	14 371 300	100
28	Inorganic chemicals; compounds of precious metals, radioactive elements, etc.	1 114 828	86.0	79 101	6.1	37 137	2.9	846	0.1	64 980	5.0	1 296 892	100
31	Fertilizers	849 168	69.2	10 660	0.9	47 628	3.9	5 747	0.5	314 723	25.6	1 227 926	100
68	Articles of stone, plaster, cement, asbestos, mica or similar materials	312 172	91.5	11 155	3.3	2 811	0.8	73	—	14 804	4.3	341 015	100
69	Ceramic products	32 254	81.1	1 957	4.9	617	1.6	7	—	4 957	12.5	39 792	100
70	Glass and glassware	341 846	84.0	43 464	10.7	1 473	0.4	218	0.1	19 999	4.9	407 000	100
71	Natural/cultured pearls, precious stones and metals, coins, etc.	1 851 009	70.8	144 678	5.5	6 504	0.2	52	—	611 048	23.4	2 613 291	100
72	Iron and steel	1 955 338	91.3	11 436	0.5	4 609	0.2	30 723	1.4	138 728	6.5	2 140 834	100
73	Articles of iron or steel	1 448 772	90.9	21 120	1.3	1 691	0.1	7 014	0.4	115 383	7.2	1 593 980	100
74	Copper and articles thereof	767 056	64.8	248 579	21.0	4 460	0.4	45	—	163 899	13.8	1 184 039	100
75	Nickel and articles thereof	356 732	32.5	330 731	30.2	38 229	3.5	5 419	0.5	365 292	33.3	1 096 403	100
76	Aluminum and articles thereof	2 241 806	73.7	451 209	14.8	194 152	6.4	688	—	155 327	5.1	3 043 182	100
78	Lead and articles thereof	60 872	81.2	1 324	1.8	511	0.7	—	—	12 266	16.4	74 973	100
79	Zinc and articles thereof	449 466	84.3	6 231	1.2	8 816	1.7	—	—	68 431	12.8	532 944	100
80	Tin and articles thereof	7 838	82.8	620	6.5	174	1.8	—	—	835	8.8	9 467	100
81	Other base metals; cermets; and articles thereof	60 142	35.6	30 501	18.1	17 192	10.2	401	0.2	60 500	35.9	168 736	100
Total mineral exports		25 376 605	78.4	2 150 045	6.6	1 664 538	5.1	96 732	0.3	3 059 625	9.6	32 347 545	100
Total domestic exports		104 275 804	80.5	7 467 155	5.8	6 298 346	4.9	545 467	0.4	11 019 328	8.5	129 606 100	100
Percentage, mineral to domestic		24.3		28.8		26.4		17.7		27.8		25.0	

Source: Statistics Canada, catalogue no. 65-003 (Quarterly).

— Nil.

1 Chapter refers to a group of commodities covered in a specified chapter of the "Harmonized Commodity Description and Coding System," as of January 1, 1988. Canadian external trade statistics are classified according to the Harmonized System. 2 EC: European Community. 3 Total value of coal exports included in Chapter 27 is \$1440 million.

# Highlights of Exploration in Canada

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Total exploration expenditures for 1992 were \$385 million, down from the 1991 total of \$532 million. The amount expended for exploration on off-property sites was \$326 million, a 30% decrease from 1991. The total amount spent on mine-site (on-property) exploration (that is, the search for additional deposits in the vicinity of a property in production or committed to production) was \$59 million, a decrease of 12% from the 1991 total. Expenditures by senior companies were \$305 million in 1992, compared to \$415 million in 1991, while expenditures by junior companies were \$80 million, compared to \$117 million in 1991.

About 600 companies were operators of Canadian non-petroleum exploration projects in 1992, down from 732 companies in 1991.

Exploration activities decreased in all regions except Manitoba and the Northwest Territories. In the Territories, expenditures increased by 35% over the 1991 total, largely because of the diamond exploration rush; a total of \$43 million was expended in 1992, well above the \$32 million expended in 1991. The most significant decreases occurred in British Columbia and the Yukon, down by 47% and 41% respectively when compared to the previous year.

For base metals, exploration expenditures decreased by 16% to \$180 million in 1992, compared to \$214 million in 1991. Exploration for precious metals decreased by 45% to \$151 million in 1992, compared to \$274 million in 1991. The decrease in precious metals exploration was much more severe than for base-metal exploration; consequently, total expenditures in base-metal exploration exceeded that for precious metals for the first time since 1983.

For nonmetals, exploration expenditures totalled \$28 million (67%, or \$18.6 million, of which was incurred for diamond exploration). Diamond exploration expenditures in 1992 more than doubled the \$7 million spent during 1991. Diamond exploration was dominant in the Northwest Territories (\$13 million) followed by Ontario and Alberta (\$4 million in total). The contribution of foreign companies to dia-

mond exploration was \$13 million in 1992 compared to \$4 million in 1991. During 1992, junior companies also increased their interest in diamond exploration by spending \$4 million.

The decreases in exploration expenditures were very significant during 1991 and 1992. Corrected for inflation, 1992 exploration expenditures were the lowest since 1967. Exploration expenditures are not expected to decrease any further during 1993. Preliminary data for 1993 show an increase in the level of exploration expenditures to about \$480 million, indicating that the decline in exploration may have bottomed out. The total of exploration expenditures forecasted in early 1993 had been \$435 million. Forecasts for 1994 hint at a further increase to about \$550 million. If this 1994 forecast is accurate, it will represent a 43% increase over the \$385 million spent during 1992. The quest for diamonds is expected to be the highlight of this welcome improvement in exploration spending.

Interest in diamond exploration accelerated in 1993, especially in the Northwest Territories (mainly in the Lac de Gras area) and in Saskatchewan (mainly in the Fort à la Corne area) where diamond exploration activities increased. Preliminary data for 1993 and forecast data for 1994 show expenditures of about \$58 million in the Northwest Territories for each year for diamond exploration. Saskatchewan should rank second with \$9 million and \$17 million, respectively, for those years. Overall, some \$80 million should be spent annually on diamond exploration in 1993 and 1994. This amount represents about 15% of total Canadian exploration expenditures compared to 5% in 1992.

Recent discoveries of diamonds also led to a staking rush in 1993 with 27 million hectares (ha) staked, the second largest area ever staked in Canada after the unprecedented 33 million ha staked in 1992. In 1993, the area staked increased significantly in the Northwest Territories (by 64%), in Saskatchewan (by 152%), and in Manitoba (by 246%).

Some results of the Federal-Provincial Survey of Mining and Exploration Companies follow. Totals for commodities given in the text may differ from those listed in the following tables because "unspecified" commodities were pro-rated between the different commodity categories.

Further details can be obtained by contacting the author.



TABLE 1. GENERAL EXPLORATION PLUS MINE-SITE EXPLORATION<sup>1</sup> ACTIVITIES BY PROVINCE AND TERRITORY, BY TYPE OF WORK, 1992

Province/Territory	Drilling (Surface and Underground)				Surveys - Other Exploration Work						Total Field Expenditures	Total, Including Overhead <sup>2</sup>
	Diamond		Other		Geochemical	Geology	Geophysical		Rock Work	Other Field Costs		
	Metres	Cost	Metres	Cost			Ground	Airborne				
	(000)	(\$000)	(000)	(\$000)								
	(000)	(\$000)	(000)	(\$000)						(\$000)		
Newfoundland	22	1 447	—	—	586	3 327	1 153	488	387	995	8 384	11 141
Nova Scotia	12	688	1	30	162	393	469	6	290	335	2 373	3 258
New Brunswick	65	4 900	—	—	535	2 107	931	71	313	1 238	10 095	12 207
Quebec	647	40 326	—	—	2 108	14 893	5 249	956	2 281	18 396	84 209	94 095
Ontario	424	32 882	4	722	1 564	12 213	4 748	1 357	6 345	3 925	63 758	77 445
Manitoba	204	17 035	—	—	797	2 581	3 225	159	2 827	1 651	28 274	31 959
Saskatchewan	122	9 812	10	864	1 004	2 953	1 440	615	1 011	3 131	20 829	25 875
Alberta	—	32	73	2 117	105	88	69	—	403	1 183	3 997	5 377
British Columbia	260	20 413	34	1 337	4 091	12 196	3 344	749	5 132	8 545	55 808	71 585
Northwest Territories	110	11 437	8	545	3 530	6 171	3 453	3 600	609	8 477	37 821	42 718
Yukon Territory	23	1 792	10	929	593	1 706	318	45	1 253	1 271	7 908	9 671
Total Canada	1 889	140 765	139	6 544	15 075	58 627	24 400	8 046	20 851	49 149	323 456	385 330

Source: Natural Resources Canada, from the Federal-Provincial Survey of Mining and Exploration Companies.

— Nil.

<sup>1</sup> Exploration activity includes only the search for new mines; it does not include exploration for extensions to deposits already being mined or committed to production. <sup>2</sup> Overhead expenditures include land costs, field administration costs and exploration-related head office expenses.

Note: May not balance due to rounding.

TABLE 2. GENERAL EXPLORATION PLUS MINE-SITE EXPLORATION<sup>1</sup> ACTIVITIES BY TYPE OF COMPANY, 1992

Type of Company	Drilling (Surface and Underground)				Surveys - Other Exploration Work						Total Field Expenditures	Total, Including Overhead <sup>a</sup>
	Diamond		Other		Geochemical	Geology	Geophysical		Rock Work	Other Field Costs		
	Metres	Cost	Metres	Cost			Ground	Airborne				
	(000)	(\$000)	(000)	(\$000)			(\$000)					
1. Companies with a producing mine in Canada	1 172	78 642	105	3 808	6 488	26 016	12 021	2 022	10 033	22 836	161 867	188 776
2. Affiliates of group 1	250	26 414	4	727	1 848	12 741	4 104	918	799	8 410	55 961	66 883
3. Oil companies	30	3 164	—	—	281	515	156	130	45	1 021	5 311	6 728
4. Foreign companies (excluding group 3)	70	5 740	6	193	1 239	6 382	1 218	3 014	95	7 542	25 424	34 565
5. Junior companies and prospectors	333	24 760	23	1 565	5 113	11 066	6 130	1 683	9 507	7 673	67 497	79 912
6. Other companies	35	2 046	—	250	106	1 907	771	278	371	1 667	7 396	8 466

Source: Natural Resources Canada, from the Federal-Provincial Survey of Mining and Exploration Companies.

— Nil.

<sup>1</sup> Exploration activity includes only the search for new mines; it does not include exploration for extensions to deposits already being mined or committed to production. <sup>2</sup> Overhead expenditures include land costs, field administration costs and exploration-related head office expenses.

Note: May not balance due to rounding.

**TABLE 3a. GENERAL EXPLORATION PLUS MINE-SITE EXPLORATION<sup>1</sup> EXPENDITURES, NOT INCLUDING OVERHEAD,<sup>2</sup> BY PROVINCE AND TERRITORY, BY COMMODITY SOUGHT, 1992**

PROVINCE AND TERRITORY, BY COMMODITY GROUP, 1992

Province/Territory	Metals					Nonmetals	Coal	Commodity Not Specified	Total Field Expenditures
	Base	Precious	Iron	Uranium	Other				
	(\$'000)								
Newfoundland	5 949	1 286	—	339	144	643	—	23	8 384
Nova Scotia	1 379	148	—	—	—	310	536	—	2 373
New Brunswick	7 423	2 609	—	—	—	22	41	—	10 095
Quebec	38 504	41 725	1 108	—	348	2 523	—	—	84 209
Ontario	31 501	28 332	—	—	21	3 771	133	—	63 758
Manitoba	25 962	1 605	—	—	204	352	—	151	28 274
Saskatchewan	4 633	3 928	—	11 125	—	1 126	17	—	20 829
Alberta	—	3	—	—	—	1 154	2 841	—	3 997
British Columbia	19 618	29 854	127	—	783	1 905	1 357	2 164	55 808
Northwest Territories	11 541	12 967	—	2 832	—	10 480	—	—	37 821
Yukon Territory	4 537	3 319	—	—	—	—	—	52	7 908
Total Canada	151 046	125 777	1 235	14 296	1 500	22 286	4 925	2 391	323 456

Source: Natural Resources Canada, from the Federal-Provincial Survey of Mining and Exploration Companies.

— Nil.

<sup>1</sup> Exploration activity includes only the search for new mines; it does not include exploration for extensions to deposits already being mined or committed to production. <sup>2</sup> Overhead expenditures include land costs, field administration costs and exploration-related head office expenses.

Note: May not balance due to rounding.

**TABLE 3b. GENERAL EXPLORATION PLUS MINE-SITE EXPLORATION<sup>1</sup> EXPENDITURES, INCLUDING OVERHEAD,<sup>2</sup> BY PROVINCE AND TERRITORY, BY COMMODITY SOUGHT, 1992**

BY PROVINCE AND TERRITORY, BY COMMODITY SOURCE, 1992

Province/Territory	Metals					Nonmetals	Coal	Commodity Not Specified	Total, Including Overhead
	Base	Precious	Iron	Uranium	Other				
	(\$'000)								
Newfoundland	6 692	2 777	22	339	178	1 095	—	38	11 141
Nova Scotia	2 108	175	4	1	—	340	626	4	3 258
New Brunswick	9 096	3 026	—	—	4	40	41	—	12 207
Quebec	43 068	46 262	1 108	—	401	3 256	—	—	94 095
Ontario	39 639	33 392	65	—	25	4 045	279	—	77 445
Manitoba	28 942	2 124	—	—	220	489	—	184	31 959
Saskatchewan	6 254	5 295	—	12 504	—	1 354	269	199	25 875
Alberta	4	3	—	4	—	1 442	3 924	—	5 377
British Columbia	25 126	38 473	151	—	917	2 170	2 163	2 584	71 585
Northwest Territories	12 141	14 115	5	3 240	—	13 216	—	1	42 718
Yukon Territory	5 365	3 918	—	—	—	25	—	363	9 671
Total Canada	178 435	149 561	1 354	16 088	1 745	27 471	7 302	3 373	385 330

Source: Natural Resources Canada, from the Federal-Provincial Survey of Mining and Exploration Companies.

— Nil.

<sup>1</sup> Exploration activity includes only the search for new mines; it does not include exploration for extensions to deposits already being mined or committed to production. <sup>2</sup> Overhead expenditures include land costs, field administration costs and exploration-related head office expenses.

Note: May not balance due to rounding.



**TABLE 4a. GENERAL EXPLORATION PLUS MINE-SITE EXPLORATION<sup>1</sup> EXPENDITURES, NOT INCLUDING OVERHEAD,<sup>2</sup> BY TYPE OF COMPANY AND BY COMMODITY SOUGHT, 1992**

COMPANY AND BY COMMODITY, 1962									
Type of Company	Base	Precious	Metals		Other	Nonmetals	Coal	Commodity Not Specified	Total Field Expenditures
			Iron	Uranium					
	(\$000)								
1. Companies with a producing mine in Canada	78 167	66 558	1 088	5 890	382	2 800	4 791	2 190	161 867
2. Affiliates of group 1	45 124	9 401	—	1 304	37	44	—	52	55 961
3. Oil companies	546	2 452	—	2 314	—	—	—	—	5 311
4. Foreign companies (excluding group 3)	4 657	5 580	—	4 449	—	10 586	133	18	25 424
5. Junior companies and prospectors	18 918	38 601	146	339	1 081	8 283	—	129	67 497
6. Other companies	3 635	3 186	—	—	—	573	—	3	7 396

Source: Natural Resources Canada, from the Federal-Provincial Survey of Mining and Exploration Companies.

— Nil.

<sup>1</sup> Exploration activity includes only the search for new mines; it does not include exploration for extensions to deposits already being mined or committed to production.<sup>2</sup> Overhead expenditures include land costs, field administration costs and exploration-related head office expenses.

Note: May not balance due to rounding.

**TABLE 4b. GENERAL EXPLORATION PLUS MINE-SITE EXPLORATION<sup>1</sup> EXPENDITURES, INCLUDING OVERHEAD,<sup>2</sup> BY TYPE OF COMPANY AND BY COMMODITY SOUGHT, 1992**

Type of Company	Base	Precious	Metals			Nonmetals	Coal	Commodity Not Specified	Total, Including Overhead
			Iron	Uranium	Other				
(\$000)									
1. Companies with a producing mine in Canada	90 896	76 728	1 184	6 641	426	3 741	6 354	2 806	188 776
2. Affiliates of group 1	53 923	11 054	—	1 368	63	85	28	363	66 883
3. Oil companies	692	2 613	—	2 701	—	106	616	—	6 728
4. Foreign companies (excluding group 3)	7 375	8 801	—	5 038	—	13 067	266	18	34 565
5. Junior companies and prospectors	21 554	46 597	171	339	1 257	9 772	38	183	79 912
6. Other companies	3 994	3 768	—	—	—	700	—	4	8 466

Source: Natural Resources Canada, from the Federal-Provincial Survey of Mining and Exploration Companies.

— Nil.

<sup>1</sup> Exploration activity includes only the search for new mines; it does not include exploration for extensions to deposits already being mined or committed to production.<sup>2</sup> Overhead expenditures include land costs, field administration costs and exploration-related head office expenses.

Note: May not balance due to rounding.

**TABLE 5. GENERAL EXPLORATION PLUS MINE-SITE EXPLORATION,<sup>1</sup> SURFACE AND UNDERGROUND DRILLING, BY PROVINCE AND TERRITORY, BY COMMODITY SOUGHT, 1992**

Province/Territory	Metals					Nonmetals	Coal	Total
	Base	Precious	Iron	Uranium	Other			
(000 metres)								
Newfoundland	11	4	—	—	1	5	—	22
Nova Scotia	7	1	—	—	—	4	2	13
New Brunswick	48	17	—	—	—	—	—	65
Quebec	176	409	33	—	3	25	—	647
Ontario	220	197	—	—	—	11	—	428
Manitoba	191	10	—	—	2	1	—	204
Saskatchewan	20	27	—	84	—	1	—	133
Alberta	—	—	—	—	—	3	70	73
British Columbia	135	122	2	—	2	4	29	294
Northwest Territories	63	38	—	15	—	3	—	118
Yukon Territory	21	12	—	—	—	—	—	33
Total Canada	891	837	35	100	9	56	100	2 029

Source: Natural Resources Canada, from the Federal-Provincial Survey of Mining and Exploration Companies.

— Nil.

<sup>1</sup> Exploration activity includes only the search for new mines; it does not include exploration for extensions to deposits already being mined or committed to production.

Note: May not balance due to rounding.

**TABLE 6. GENERAL EXPLORATION PLUS MINE-SITE EXPLORATION,<sup>1</sup> SURFACE AND UNDERGROUND DRILLING, BY TYPE OF COMPANY AND BY COMMODITY SOUGHT, 1992**

Type of Company	Metals					Nonmetals	Coal	Total
	Base	Precious	Iron	Uranium	Other			
(000 metres)								
1. Companies with a producing mine in Canada	545	520	33	50	4	25	101	1 277
2. Affiliates of group 1	201	47	—	6	—	—	—	255
3. Oil companies	2	11	—	17	—	—	—	30
4. Foreign companies (excluding group 3)	16	29	—	26	—	6	—	76
5. Junior companies and prospectors	113	212	2	—	4	25	—	357
6. Other companies	15	19	—	—	—	1	—	35

Source: Natural Resources Canada, from the Federal-Provincial Survey of Mining and Exploration Companies.

— Nil.

<sup>1</sup> Exploration activity includes only the search for new mines; it does not include exploration for extensions to deposits already being mined or committed to production.

Note: May not balance due to rounding.

**TABLE 7a. GENERAL EXPLORATION PLUS MINE-SITE EXPLORATION<sup>1</sup> EXPENDITURES, NOT INCLUDING OVERHEAD,<sup>2</sup> BY PROVINCE AND TERRITORY, BY TYPE OF COMPANY, 1992**

Province/Territory	(1) Companies With a Producing Mine in Canada	(2) Affiliates of (1)	(3) Oil Companies	(4) Foreign Companies Excluding (3)	(5) Junior Companies and Prospectors	(6) Other Companies	Total Field Expenditures
(\$000)							
Newfoundland	2 192	3 768	—	456	1 879	88	8 384
Nova Scotia	1 463	137	—	—	729	44	2 373
New Brunswick	5 764	3 501	—	587	237	6	10 095
Quebec	37 774	20 059	190	1 246	18 710	6 230	84 209
Ontario	38 108	9 797	—	3 963	11 571	319	63 758
Manitoba	26 045	1 139	—	5	1 085	—	28 274
Saskatchewan	13 904	2 115	2 314	1 669	813	15	20 829
Alberta	3 070	—	—	920	8	—	3 997
British Columbia	20 264	5 343	15	2 476	27 127	583	55 808
Northwest Territories	10 028	8 968	2 066	13 374	3 275	110	37 821
Yukon Territory	3 254	1 134	727	729	2 063	—	7 908
Total Canada	161 867	55 961	5 311	25 424	67 497	7 396	323 456

Source: Natural Resources Canada, from the Federal-Provincial Survey of Mining and Exploration Companies.

— Nil.

<sup>1</sup> Exploration activity includes only the search for new mines; it does not include exploration for extensions to deposits already being mined or committed to production. <sup>2</sup> Overhead expenditures include land costs, field administration costs and exploration-related head office expenses.

Note: May not balance due to rounding.

**TABLE 7b. GENERAL EXPLORATION PLUS MINE-SITE EXPLORATION<sup>1</sup> EXPENDITURES, INCLUDING OVERHEAD,<sup>2</sup> BY PROVINCE AND TERRITORY, BY TYPE OF COMPANY, 1992**

Province/Territory	(1) Companies With a Producing Mine in Canada	(2) Affiliates of (1)	(3) Oil Companies	(4) Foreign Companies Excluding (3)	(5) Junior Companies and Prospectors	(6) Other Companies	Total, Including Overhead
(\$000)							
Newfoundland	3 789	4 215	—	512	2 528	96	11 141
Nova Scotia	1 935	170	—	296	806	51	3 258
New Brunswick	6 357	4 419	—	1 052	370	8	12 207
Quebec	41 347	22 823	190	2 654	20 781	6 301	94 095
Ontario	44 437	13 572	6	6 052	13 028	349	77 445
Manitoba	28 779	1 800	—	22	1 228	130	31 959
Saskatchewan	17 873	2 361	2 701	1 969	956	15	25 875
Alberta	4 231	28	26	1 041	51	—	5 377
British Columbia	24 996	6 535	610	4 120	33 939	1 385	71 585
Northwest Territories	11 048	9 494	2 264	16 104	3 679	130	42 718
Yukon Territory	3 984	1 468	932	743	2 545	—	9 671
Total Canada	188 776	66 883	6 728	34 565	79 912	8 466	385 330

Source: Natural Resources Canada, from the Federal-Provincial Survey of Mining and Exploration Companies.

— Nil.

<sup>1</sup> Exploration activity includes only the search for new mines; it does not include exploration for extensions to deposits already being mined or committed to production. <sup>2</sup> Overhead expenditures include land costs, field administration costs and exploration-related head office expenses.

Note: May not balance due to rounding.

# Canadian Exploration and Mine Investment in the Global Context

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## THE CANADIAN SCENE

In 1992, Canadian mineral exploration expenditures<sup>1</sup> totalled \$385 million, down from \$532 million in 1991 and \$775 million in 1990. Corrected for inflation (Figure 1), exploration expenditures during 1992 were at their lowest level since 1967.

Expenditures were lower in all provinces and territories, except in Manitoba, where they were up by some \$2 million, and in the Northwest Territories, where they were up by \$11 million because of increasing diamond exploration activity following a significant diamond discovery announced by Dia Met Minerals and BHP Minerals Canada in November 1991.

In early 1992, companies reported that they planned to spend \$498 million on exploration in Canada during that year. Near year-end 1992, preliminary indications from companies were that they had spent only \$420 million. However, actual expenditures for 1992 were \$385 million, considerably below the two earlier estimates for that year.

The shift, which began in 1988, in Canadian exploration emphasis from precious metals (95% or more of this for gold) to base metals continued through 1992 (Figure 2). Compared with 1991, exploration expenditures for precious metals declined by 45% in 1992, whereas those for base metals declined by only 16%.

## Effectiveness of Recent Canadian Mineral Exploration Efforts

Canada has been a producer of base metals and precious metals for almost 150 years. Measured by current standards of large-scale production, Canada has been a major producer of most metals for only 30 to 60 years, depending on the metal.

For most metals, the period of major Canadian mineral discovery started in the early 1950s. The value

of metal discovered in Canada, calculated by multiplying tonnages of metals discovered in three-year periods by an appropriate set of corresponding metal prices, is one measure of exploration success.

The preliminary results of a study in progress in the Mining Sector, Natural Resources Canada, of Canadian mineral exploration and mineral discovery over the period 1946-90 indicate that the gross value of metals discovered in Canada in the three-year period 1988-90 (although not the best of the three-year discovery periods since 1946), is significantly higher than the long-term average of all such periods since 1946. The combined gross value of metals discovered in the period 1988-90 is not far below that of the most successful three-year periods since the end of World War II. Much more metal was discovered between 1988 and 1990 than in the two immediately previous three-year periods, 1985-87 and 1982-84. There was also a notable improvement in 1988-90 in the value of metal discovered per dollar spent on exploration relative to the periods 1985-87 and 1982-84, although this ratio for the period 1988-90 is still low relative to those of all three-year periods between 1946 and 1975.

A count of the total number of metal deposits discovered in Canada since the first nonferrous metal deposit was discovered in 1846 shows that the number of deposits discovered per three-year period during the second half of the 1980s was at a record high. However, the average size of the deposits discovered, measured by the value (corrected for inflation) of contained metals, was much smaller in the period 1982-87 than it had been in previous three-year periods. One explanation for the small average size of discoveries made during the period 1982-87 is that most Canadian mineral exploration efforts during that portion of the 1980s were directed at gold, and Canadian vein-type gold deposits have an inherently lower average value than Canadian base-metal deposits. The much smaller average size of discoveries in the period 1982-87 may also be related to the nature of the exploration targets selected by companies. It was important that junior companies identify targets on which they could spend all of their flow-through share funds by the end of February of the following year. If juniors were to continue to be able to raise funds by selling flow-through shares, it was also important that they obtain, in short order, exploration results that were newsworthy to current or prospective investors. As a result, these companies may well have tended to concentrate their

exploration programs on known available showings with relatively lower tonnage potential. This may explain why such showings had not been more thoroughly explored previously. Most exploration programs in Canada during the flow-through share period, 1983-90, were not concentrated on longer-term grassroots exploration programs of the type that tend to yield major new discoveries. Nonetheless, a number of large gold deposits and base-metal deposits were discovered during this period.

## Gold Discovery Analysis

A more detailed analysis undertaken by Natural Resources Canada concerning discovery rates and discovery costs for gold deposits in Canada over the period 1946-90 shows that, between 1983 and 1990, the combination of flow-through shares, improved Mining Exploration Depletion Allowance (MEDA), the Canadian Exploration Incentive Program (CEIP) and favourable gold prices (Figure 3) led to an increase in exploration activity in Canada, a major increase in gold exploration expenditures (Figure 4), and to the discovery of substantial quantities of gold relative to the amounts discovered in the period 1946-79 (Figure 5). Over the period 1983-90, exploration expenditures for gold totalled some \$5 billion (1992 dollars), almost two-thirds of all exploration expenditures in Canada for non-petroleum minerals. Because of the discovery, in 1981, of the very large Hemlo gold deposit in Ontario, the period 1980-82 is atypical. However, most of the gold deposits discovered in Canada in the period 1983-90 were small. This may reflect a concentration of exploration efforts on already known, but less promising, mineral occurrences and deposits to meet the short-term objective of flow-through share investors (i.e., of claiming income tax deductions for the taxation year in which investments were made).

Exploration activity in Canada decreased after 1988, especially for gold. This relates not only to the above reasons, but also to the market losses suffered by the majority of flow-through share investors after 1987, to the declining price of gold after 1987, and to the changes in the taxation rules on income and capital gains that took place in 1987.

As a result of the sharp decrease in exploration activity that started after 1988, many of the follow-up programs that, under more favourable conditions, would have been expected to take place on some of the promising deposits and showings discovered between 1983 and 1990 have yet to be initiated. This distorts evaluation of the results of this period, because this period is shorter than the usual full cycle of mineral exploration that encompasses initial exploration, deposit discovery, deposit appraisal and mine development. Typically, successful exploration programs take about 10 years from the start of exploration to mine production; it takes an average of

about 6 years to bring a mine to production following the discovery of a deposit. More gold mines and additional gold production will result in the future from discoveries made during the period 1983-90. Additional discoveries of gold deposits and prospective gold mines are likely to ensue from a number of the showings and anomalies also found during that period, and the same is also true for deposits, showings and anomalies of base metals found during the period.

As of early 1994, about 13% of the total number of gold or gold-rich base-metal discoveries made during the period 1983-90 had been brought to production. A significant number of these new mines have closed, some of them because the price of gold has failed to regain the levels that prevailed at the time that production decisions were made. More gold was discovered during the three-year period 1988-90 (Figure 5) than in any other period of the interval 1946-90, except for the exceptional period 1979-81, that saw the major discovery at Hemlo. The improved results of the period 1988-90 may stem partly from earlier gold exploration programs that came to fruition then. Also, as the amount of exploration funding was more limited in 1989 and 1990, companies became much more selective in choosing projects for funding so that, in general, the quality of exploration targets was higher in these years.

Substantial quantities of gold were discovered in Canada in the periods 1973-75, 1979-81, 1982-84, 1985-87 and 1988-90 (Figure 5). As a result, the **value** of the gold discovered in gold deposits and in gold-rich base-metal deposits is exceptional in each of these three-year periods (Figure 6).

In this study, as in other studies of this type conducted by Natural Resources Canada, the size of most deposits has been scaled up by means of "metal multipliers." These factors are based on the historical relationship between the amounts of metals reported at individual Canadian mines when production began and the amounts of metals ultimately known (extracted plus remaining in place).

Despite the exceptional amount of gold discovered between 1985 and 1990, the unit cost of discovering gold (Figure 7) in gold deposits and in gold-rich base-metal deposits combined was more than double that of the two most-recent typical periods (1976-78 and 1982-84) of gold exploration in Canada. The value of gold discovered in gold and gold-rich base-metal deposits per dollar spent on gold exploration is another measure of exploration success. This ratio was evaluated (Figure 8) using the three sets of constant-dollar gold prices used to evaluate discovery values (Figure 6). The periods 1973-75 and 1979-81 (Figures 5, 6 and 8) are anomalous. The first one saw the discovery of the large Doyon and Bousquet gold deposits in Quebec and the Detour Lake gold deposit

in Ontario, all found at a time when expenditures for gold exploration in Canada were very low. The period 1979-81 saw the highest quantity of gold discovered over the entire period 1946-90, because of the discovery of the very large Hemlo gold zone (three mines). Hemlo is probably the second largest gold concentration ever discovered in Canada; the largest was the Hollinger-McIntyre ore zone (two mines) discovered in Timmins, Ontario, in 1909. The so-called "Golden Mile," discovered in 1911 at Kirkland Lake, Ontario, and mined from several separate operations, probably does not equal in total the gold contained in the Hemlo gold zone.

## Mine Investment

In 1992, mine-site investment in Canada (including uncatalyzed repairs) amounted to some \$3.1 billion. Ontario, British Columbia and Quebec, Canada's three largest non-fuel mineral-producing provinces, accounted for over 60% of the total.

Coal producers invested \$550 million (Figure 9), the leading investors on a commodity basis. They made almost 18% of total Canadian investment at mine sites. Producers of gold invested almost \$450 million. Producers of all metallic mineral commodities invested almost \$2 billion, and \$1.1 billion of that was invested by base-metal producers. Producers of nonmetallic minerals invested over \$1.1 billion.

In 1992, repairs amounted to \$1.7 billion. Repairs were almost 60% of total mine-site investment made in Canada, the highest proportion in more than 20 years. Ore development expenditures fell to less than \$770 million from more than \$1 billion in 1991; the last time that annual development expenditures were less than \$1 billion was in 1979. Investment in machinery and equipment was almost \$460 million; investment in structures was less than \$130 million.

Annual mine-site investment in Canada (corrected for inflation) was generally on a cyclical rise from at least 1969 to 1981, when it reached over \$6.7 billion. Since then, it has generally been on a cyclical downward trend. In 1992, it was only about half of the peak level reached in 1981. This has occurred largely because annual investment in new structures as well as in machinery and equipment, which is characteristic of the construction of new mines and expansion to existing capacity, has generally been decreasing. It is unlikely that the amount of mine-site investment made in Canada in 1993 was any larger than what was made in 1992 (Figure 10).

Annual investment in structures fell from \$1.7 billion in 1981 to less than \$1 billion after 1983. Annual investment in machinery and equipment, which generally stood at over \$1 billion between 1980 and 1984, has generally been falling as well, except for the period 1988-89 when it rose temporarily to over \$900 million.

Investment in repairs and development, which is more characteristic of ongoing mining operations, has been relatively constant since 1980. Together, annual expenditures on repairs and development hovered at about \$3 billion from 1979 to 1991. In 1992, they fell to \$2.5 billion.

## CANADIAN EXPLORATION FROM A GLOBAL PERSPECTIVE

For more than two decades, Canada, Australia, the United States and, to a lesser extent, South Africa were the main targets of world mineral exploration. Exploration expenditures in Canada have been declining following the unprecedented levels of 1987 and 1988, but there has also been a general decline in most other countries over the same period. The Metals Economics Group (MEG) of Halifax, Nova Scotia, has conducted three surveys of the exploration budgets of companies (excluding any companies based in present or former communist countries) that had annual expenditure plans of US\$1 million or more (US\$500 000 in 1992). Results published in September 1991<sup>2</sup> indicate that some 23% of world-wide exploration expenditures in 1991 was expected to be made in Canada (Figure 11), making Canada the world's principal exploration target for metals that year. MEG results for 1992<sup>3</sup> and 1993<sup>4</sup> indicate that Canada has likely fallen to third place in both years. In 1992, Canada was expected to account for 19% of worldwide expenditure intentions, behind the United States (23%) and Australia (20%). Exploration in Latin America was expected to constitute 16% of 1992 world exploration expenditures. In 1993, Canada was again in third place. Worldwide intentions of US\$1.9 billion were expected to be allocated as follows: the United States, 20%; Australia, 19%; Canada, 17%; and Latin America, 19%. Of the 1993 Latin American budgets, about one-half were intended for Chile, one-fifth for Mexico, significantly smaller portions for Brazil and Peru, and still smaller portions for other countries.

## CANADIAN EXPLORATION ABROAD

In September 1993, Canadian mining companies had a worldwide portfolio of at least 6600 mining properties.<sup>5</sup> Almost 70% of this portfolio was in Canada; the rest was distributed among 86 countries around the world. Some 60% of the foreign property portfolio of Canadian companies was in the United States and almost one quarter was in Latin America. Canadian mining interests in Latin America have grown over the past three years (Figure 12), especially in Mexico and Chile.

During 1993, Canadian-based companies (with exploration budgets exceeding \$1 million) planned to spend



over \$530 million (Canadian) both on exploration in Canada and exploration abroad.<sup>6</sup> This budget cutoff excludes many of Canada's numerous junior companies. Nonetheless, depending on the criteria used to allocate corporate affiliations to specific countries, Canada had, for 1993, either the largest or the second largest worldwide exploration budget of any country in the world. Canada continues to be a driving force in mineral exploration, both at home and abroad.

Seven corporate groups based in Canada were among the 25 corporate entities with the largest worldwide exploration budgets for 1993: Placer Dome, with planned expenditures of \$78 million, held 7th place; Noranda Minerals (\$67 million, 8th); Inco (\$44 million, 15th); Cambior (\$41 million, 16th); Cameco (\$40 million, 19th); Metal Mining (\$37 million, 24th); and Falconbridge (\$33 million, 25th). The budgets of these Canadian groups accounted for almost \$340 million, or about 15% of planned worldwide mineral exploration expenditures for 1993.

Canadian companies with budgets exceeding \$1 million planned to spend close to \$260 million on exploration outside Canada during 1993, almost half of their total budgets, roughly the same proportion as companies of the same size based in the United States. In 1992, these Canadian companies may have spent only about 40% of their global exploration budgets abroad, and those based in the United States may have spent about one third.

The main foreign exploration targets of Canadian companies in 1993 were the United States (\$110 million) and Latin America (\$97 million). Canadian companies planned to spend almost as much, if not more, on mineral exploration in Latin America as the local companies. In addition to exploration, Canadian companies have substantial stakes in some of the major mine development projects in Latin America.

Chile and Mexico were the world's principal mineral exploration targets in Latin America for 1993. In 1993, Canadians planned to spend at least \$40 million in Chile and at least \$12 million in Mexico. This does not include an undisclosed amount that Placer Dome planned to spend in these two countries. Canadian companies could account for 40% of the amount expected to be spent by all exploration companies in both Chile and Mexico in 1993. Canadians also intended to explore in Bolivia, Brazil, Cuba, Ecuador, Guatemala, Guyana, Panama, Peru, Surinam, Uruguay, Venezuela, and elsewhere, but to spend smaller amounts there.

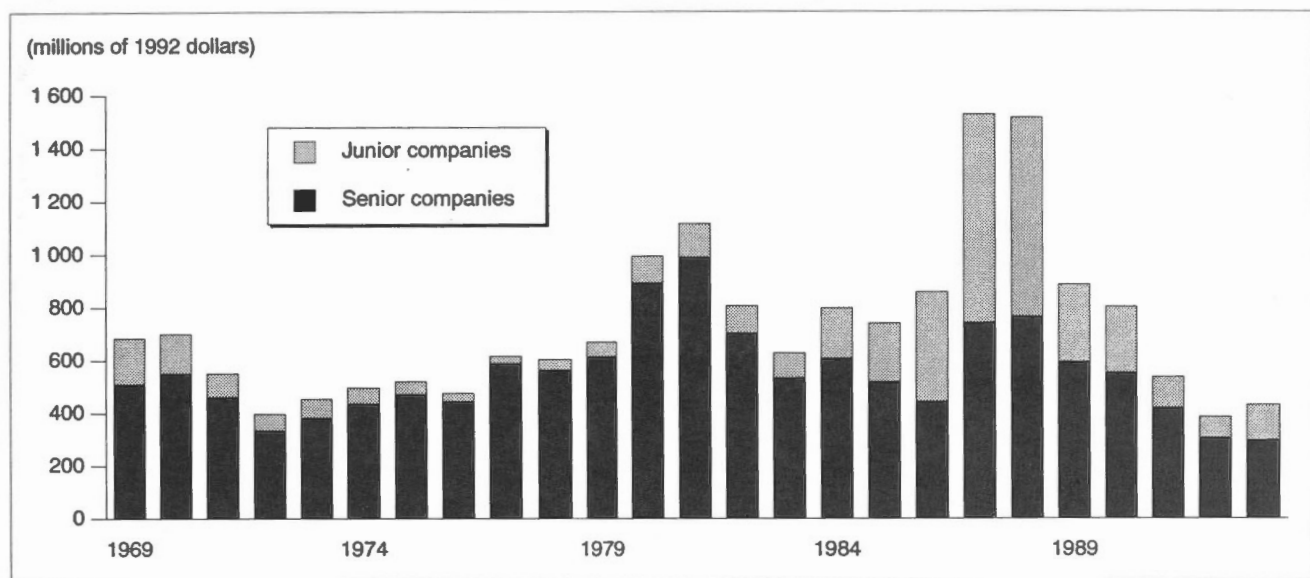
In Canada, almost 60% of domestic and foreign company budgets for 1993 were in search of base metals. In contrast, in Latin America, almost half of total foreign and domestic exploration budgets for 1993 were for gold; however, Canadian companies in Latin America planned to spend almost 60% of their

budgets on exploration for base metals, much as in Canada. This strategy appears to differ somewhat from that of their competitors in Latin America.

## REFERENCES

- <sup>1</sup> The results of the 1992 federal-provincial survey of exploration activity in Canada are presented in the preceding article "Highlights of Exploration in Canada." Further details are available from Ginette Bouchard, Mining Sector, Natural Resources Canada, Ottawa, Ontario K1A 0E4, Telephone: (613) 992-4665, Facsimile: (613) 943-8453.
- <sup>2</sup> Metals Economics Group, Halifax, Nova Scotia, September 1991, *Corporate Exploration Strategies: Current Trends and the Costs of Finding Gold*, 244 pp. Used with permission.
- <sup>3</sup> Metals Economics Group, Halifax, Nova Scotia, September 1992, *Corporate Exploration Strategies: A Worldwide Analysis*, 313 pp. Used with permission.
- <sup>4</sup> Metals Economics Group, Halifax, Nova Scotia, September 1993, *Corporate Exploration Strategies: A Worldwide Analysis*, 433 pp. Used with permission.
- <sup>5</sup> MIN-MET CANADA database, September 1993, A. MacG. ROBERTSON INFO-DATA Inc., Vancouver, British Columbia. Used under License.
- <sup>6</sup> Metals Economics Group, September 1993, op. cit.

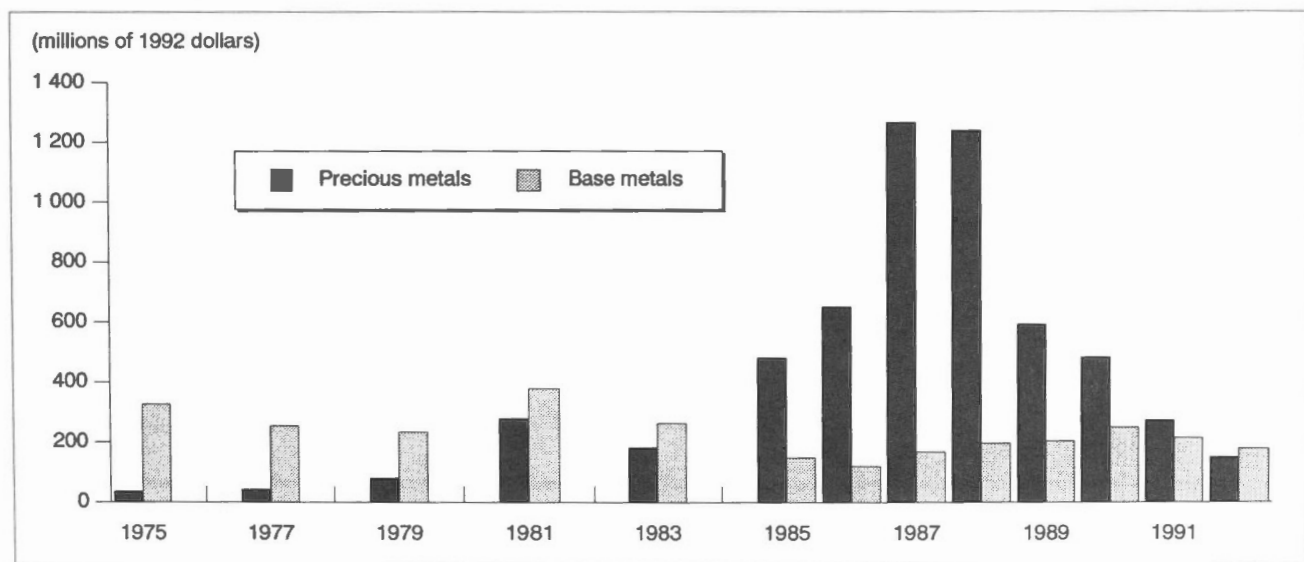
**Figure 1**  
**Exploration Expenditures in Canada, by Junior and Senior Companies, 1969-93**



Sources: Natural Resources Canada; Federal-Provincial Survey of Mining and Exploration Companies.

Notes: Total exploration expenditures for 1975 to 1981 are overstated by an average of about 17% relative to earlier and later years because of changes to the methodology used by Statistics Canada over the years. The 1993 data are intentions. Overhead expenditures are included.

**Figure 2**  
**Exploration Expenditures in Canada for Base Metals and Precious Metals, 1975-92**

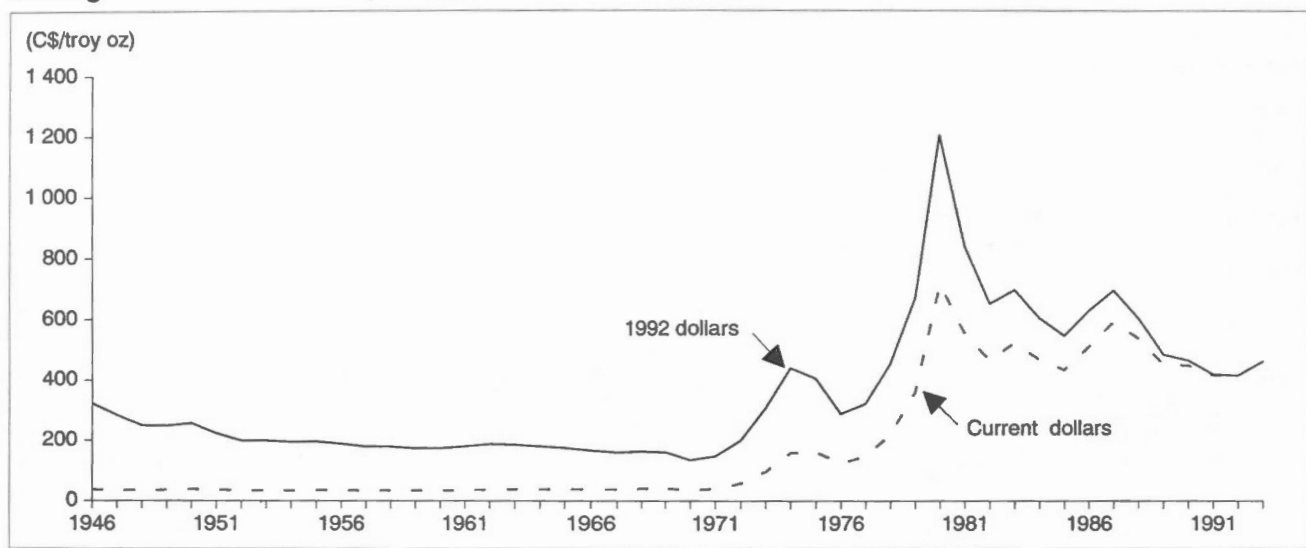


Source: Natural Resources Canada, based on Federal-Provincial Survey of Mining and Exploration Companies.

Note: Data have not been compiled by commodity for the years 1976, 1978, 1980, 1982 and 1984.

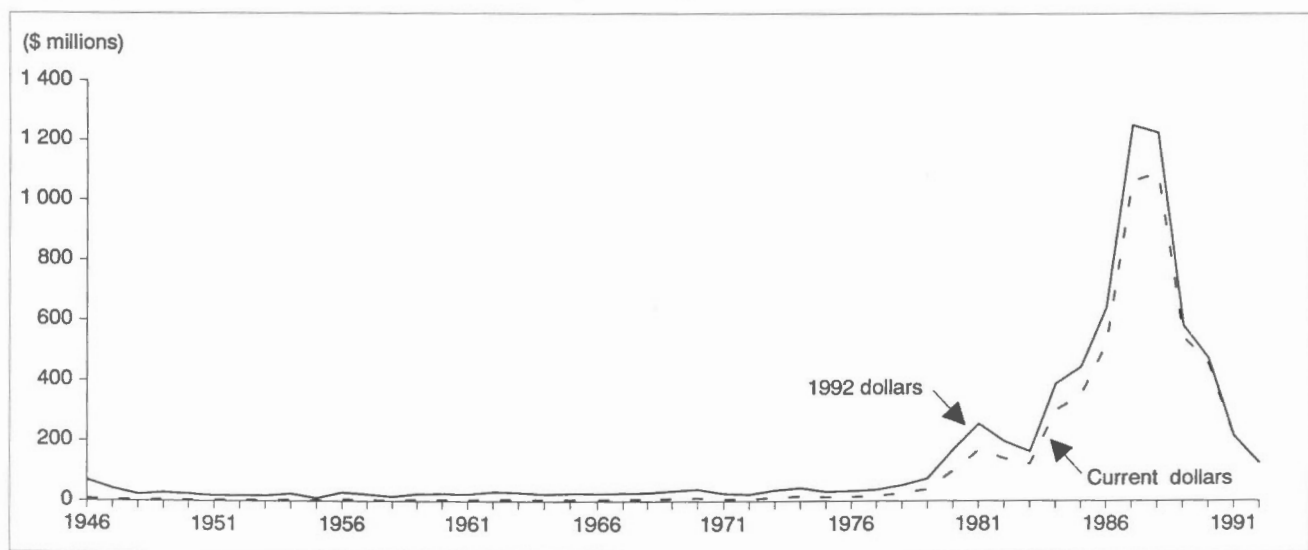


**Figure 3**  
**Average Annual Gold Prices, 1946-93**



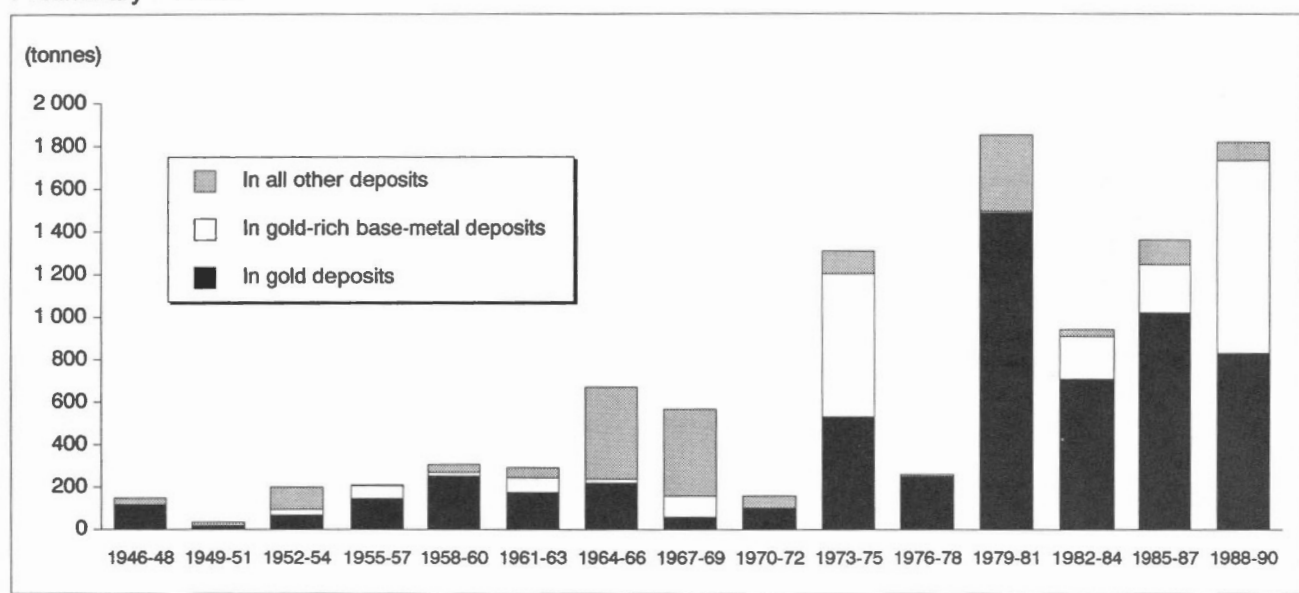
Source: Natural Resources Canada, based on average annual London Gold Market prices.

**Figure 4**  
**Exploration Expenditures in Canada for Gold, 1946-92**



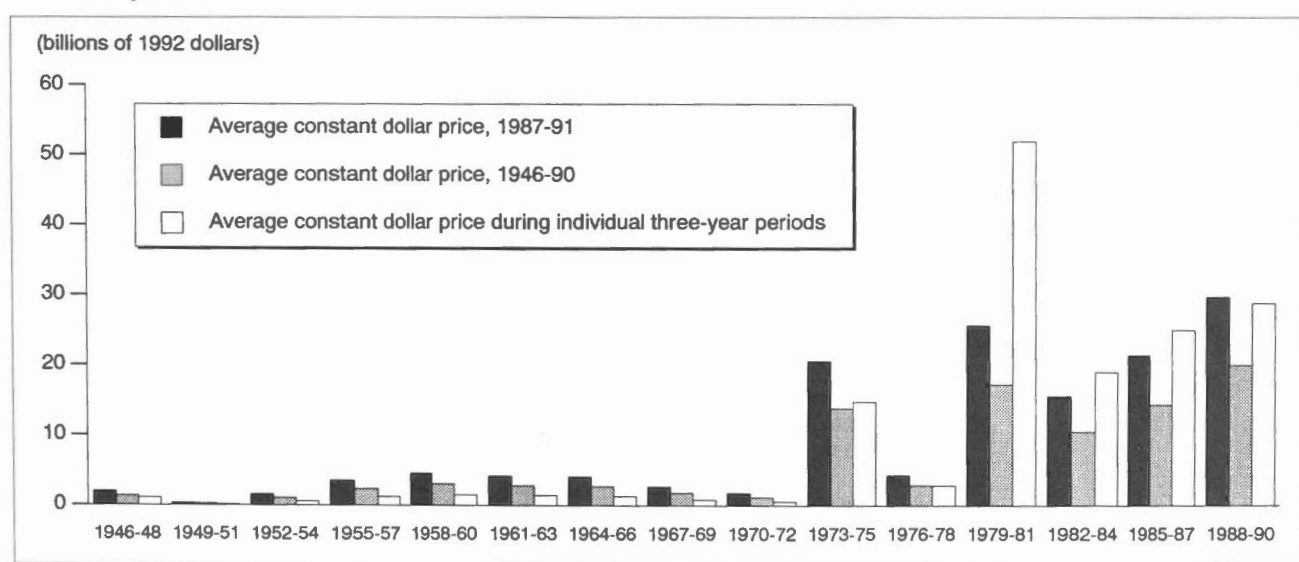
Source: Natural Resources Canada.

**Figure 5**  
**Amount of Gold Discovered in Canada, 1946-90**  
 Preliminary Results



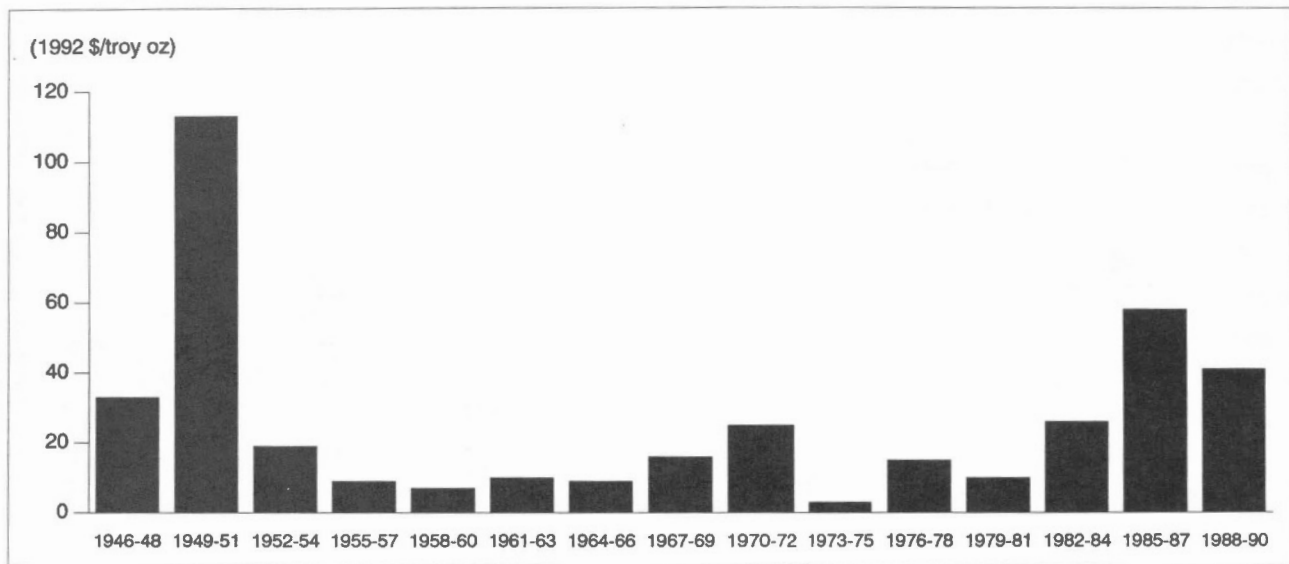
Source: Natural Resources Canada.

**Figure 6**  
**Value of Gold Discovered in Canada in Gold and Gold-Rich Deposits, 1946-90**  
 Preliminary Results



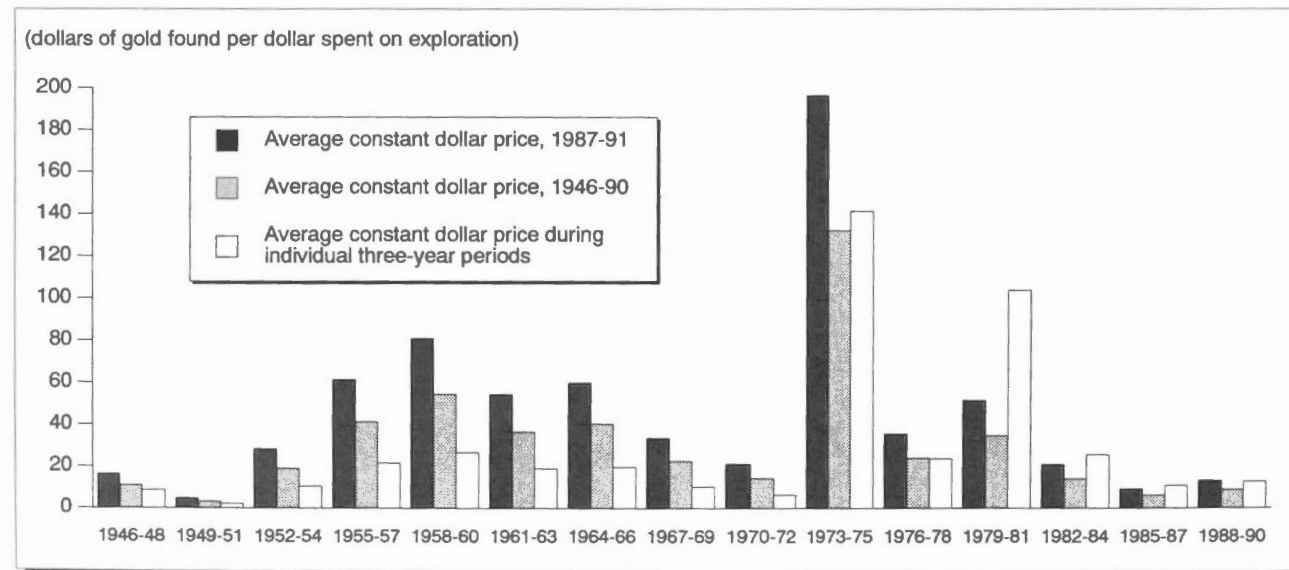
Source: Natural Resources Canada.

**Figure 7**  
**Unit Cost of Gold Discovered in Canada in Gold and Gold-Rich Deposits, 1946-90**  
 Preliminary Results



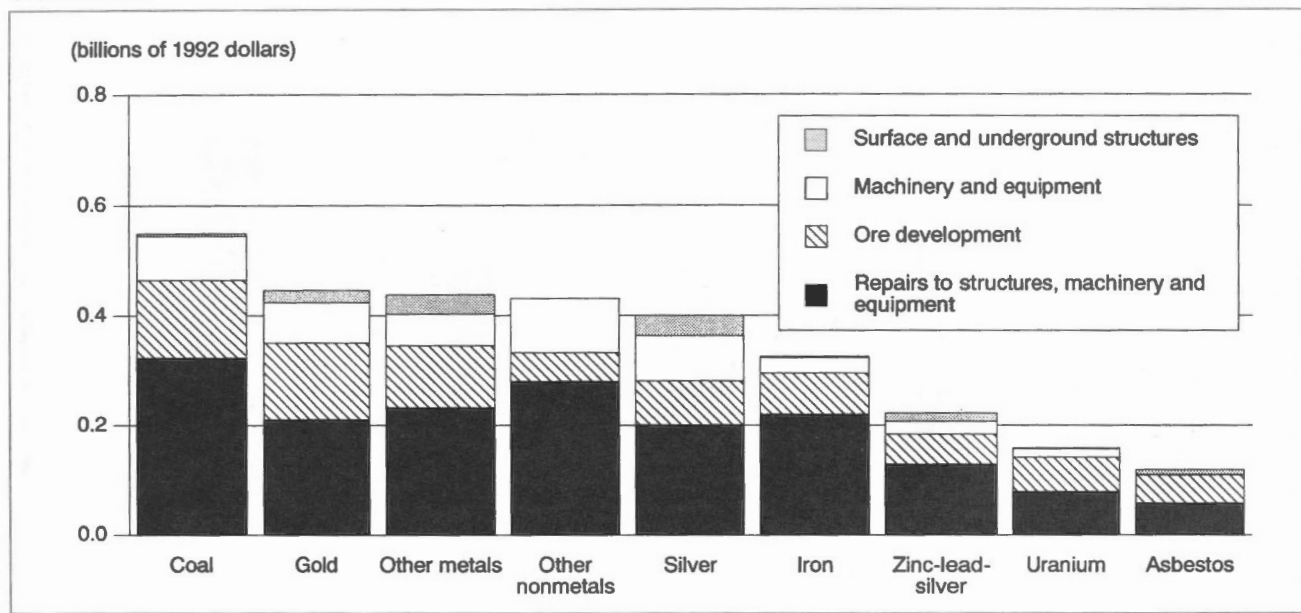
Source: Natural Resources Canada.

**Figure 8**  
**Value of Gold Discovered in Canada in Gold and Gold-Rich Deposits**  
**Per Dollar Spent on Exploration, 1946-90**  
 Preliminary Results



Source: Natural Resources Canada.

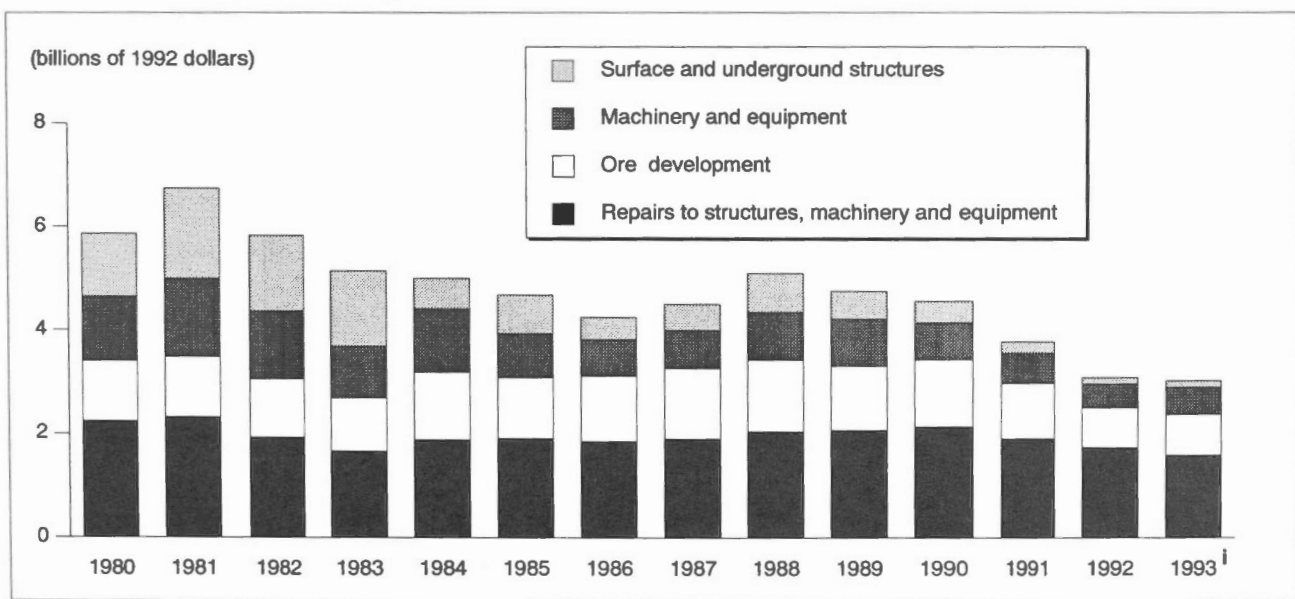
**Figure 9**  
**Mine Investment in Canada, 1992, by Industry Groups**  
**\$3.1 Billion**



Source: Natural Resources Canada, based on Statistics Canada, "Exploration, Development and Capital Expenditures for Mining," catalogue no. 61-216.

Notes: Other nonmetals include potash, gypsum, salt, stone, sand and gravel. Other metals include nickel-copper.

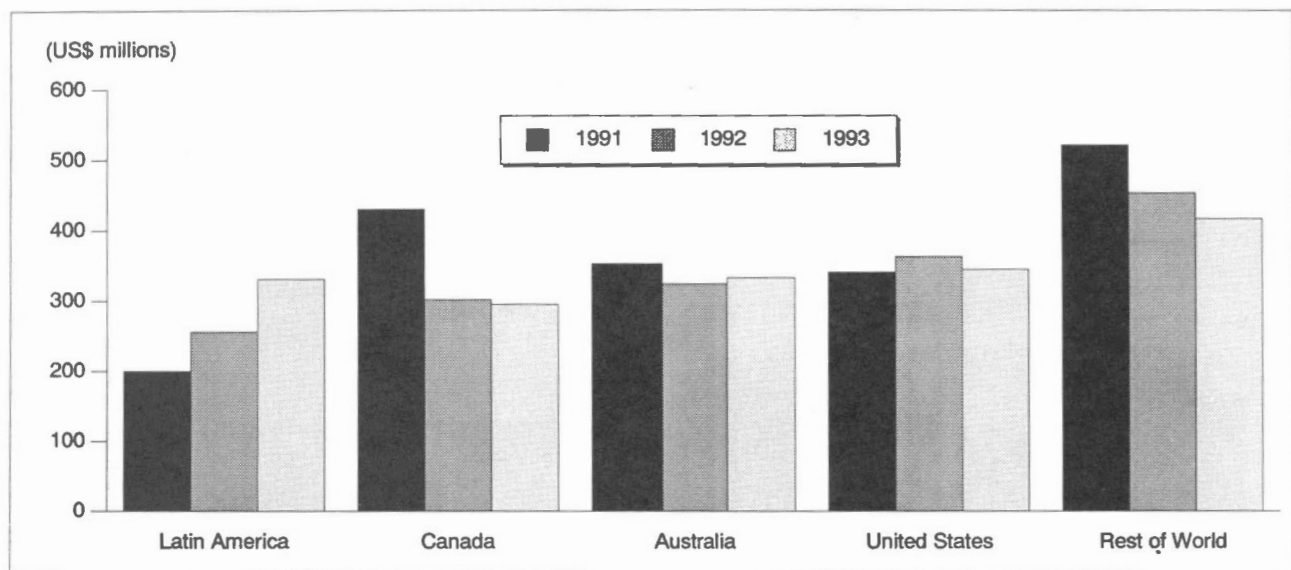
**Figure 10**  
**Mine Investment in Canada, by Investment Category, 1980-93**



Source: Natural Resources Canada, based on Statistics Canada, "Exploration, Development and Capital Expenditures for Mining," catalogue no. 61-216.

<sup>1</sup> Intentions.

**Figure 11**  
**Worldwide Exploration Expenditures, 1991-93**

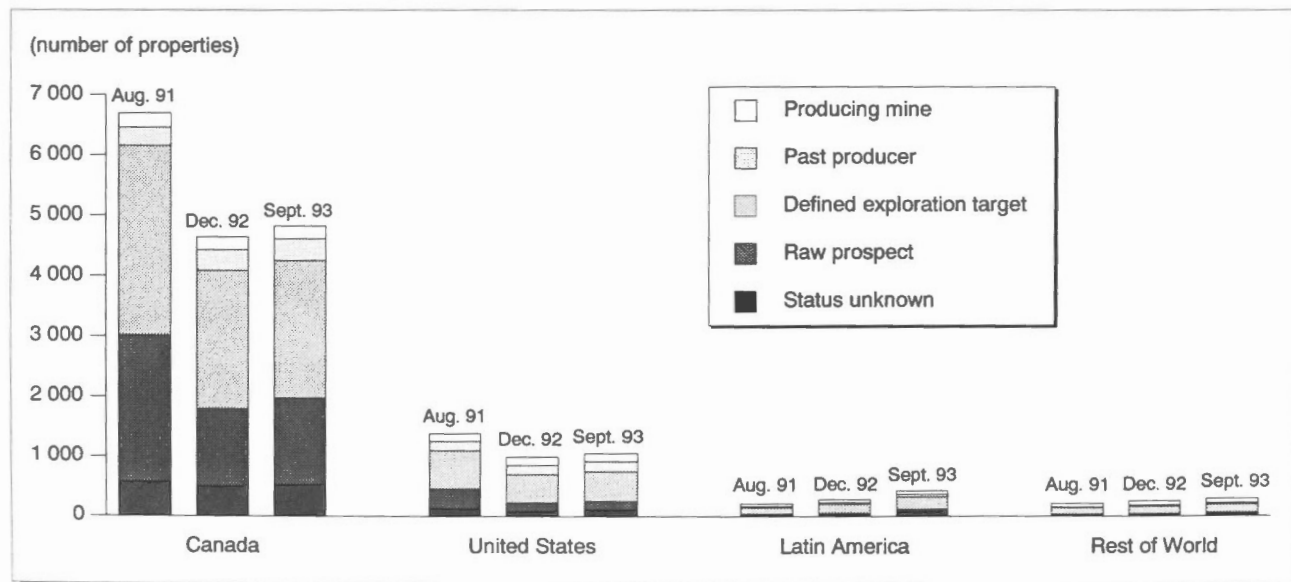


Source: Natural Resources Canada, based on data from Metals Economics Group (MEG), and used with permission.

Notes: 1991 survey, 159 companies; 1992 survey, 154 companies; 1993 survey, 141 companies.

Excludes exploration for iron ore, aluminum, coal, oil and gas, most exploration for industrial minerals, and exploration by most companies with exploration budgets less than US\$1 million. Surveys are said to cover at least 80% of all worldwide spending on exploration for nonferrous metals.

**Figure 12**  
**Mining Properties of Companies Listed on Canadian Stock Exchanges**  
**Geographical Distribution of Properties by Property Status**



Source: Natural Resources Canada, based on MIN-MET CANADA database.

## Statistical Tables



TABLE 1. CANADA, PRODUCTION OF LEADING MINERALS (SEPTEMBER, OCTOBER 1993)

		1992			1993			Percentage Changes		
		September	October	Total 10 Months	September	October	Total 10 Months	October 1993 October 1992	October 1993 September 1993	10 Months 1993 1992
(000 tonnes except where noted)										
<b>METALS</b>										
Copper		62.5 <sup>r</sup>	64.2 <sup>r</sup>	626.8 <sup>r</sup>	63.5 <sup>r</sup>	61.2	593.6	-4.6	-3.6	-5.3
Gold	kg	13 969.3 <sup>r</sup>	13 074.1 <sup>r</sup>	134 636.1 <sup>r</sup>	13 468.7 <sup>r</sup>	12 875.6	126 481.5	-1.5	-4.4	-6.1
Iron ore		2 971.8	3 437.4	26 398.7	3 483.1	3 158.4	26 160.2	-8.1	-9.3	-0.9
Lead		34.0 <sup>r</sup>	38.4 <sup>r</sup>	273.7 <sup>r</sup>	24.6 <sup>r</sup>	19.6	150.9	-49.1	-20.6	-44.9
Molybdenum	t	841.8 <sup>r</sup>	726.6	7 200.6	715.7	1 179.8	8 440.3	62.4	64.8	17.2
Nickel		17.6 <sup>r</sup>	17.4 <sup>r</sup>	155.1 <sup>r</sup>	16.6	16.2	147.3	-7.4	-2.7	-5.0
Silver	t	90.8 <sup>r</sup>	88.4	947.8	80.3 <sup>r</sup>	81.7	729.0	-7.5	1.8	-23.1
Uranium <sup>1</sup>	t	1 110.4	1 101.8	8 199.8	1 099.7 <sup>r</sup>	740.8	7 290.1	-32.8	-32.6	-11.1
Zinc		122.5 <sup>r</sup>	118.9 <sup>r</sup>	1 023.7 <sup>r</sup>	114.8 <sup>r</sup>	92.3	845.8	-22.3	-19.6	-17.4
<b>NONMETALS</b>										
Asbestos		46.7	56.8	500.2 <sup>r</sup>	41.9	52.6	434.9	-7.5	25.4	-13.1
Clay products	\$000	12 884.2	14 967.9	105 761.7	9 303.4	12 192.6	90 931.0	-18.5	31.1	-14.0
Gypsum		684.3	718.3	6 551.3	611.9	750.8	6 104.9	4.5	22.7	-6.8
Potash K <sub>2</sub> O		586.5	553.2	6 079.0 <sup>r</sup>	497.1 <sup>r</sup>	578.3	5 845.9	4.5	16.3	-3.8
Cement		995.5 <sup>r</sup>	933.8 <sup>r</sup>	7 437.3 <sup>r</sup>	1 192.2	1 066.5	8 006.3	14.2	-10.5	7.7
Lime		208.5	192.7	1 973.9	206.6	201.0	2 023.9	4.3	-2.7	2.5
Salt		1 053.6	1 141.6	8 847.7	1 022.1	1 021.1	8 791.7	-10.6	-0.1	-0.6
<b>FUELS</b>										
Coal		4 887.6 <sup>r</sup>	5 000.7	55 246.9	..	..	..	..	..	..
Natural gas	million m <sup>3</sup>	11 291.0	11 594.0	115 270.0	..	..	..	..	..	..
Crude oil and equivalent	000 m <sup>3</sup>	8 241.0 <sup>r</sup>	8 890.0	83 978.0	..	..	..	..	..	..

Sources: Natural Resources Canada; Statistics Canada.

.. Not available; <sup>r</sup> Revised.<sup>1</sup> Tonnes uranium (1 tonne U = 1.2999 short tons U<sub>3</sub>O<sub>8</sub>).

Note: Percentage changes are calculated on the basis of actual production figures as opposed to the rounded figures as shown.



TABLE 1A. CANADA, PRODUCTION OF LEADING MINERALS (NOVEMBER, DECEMBER 1993)

		1992			1993			Percentage Changes		
		November	December	Total 12 Months	November	December	Total 12 Months	December 1993 December 1992	December 1993 November 1993	12 Months 1993 1992
(000 tonnes except where noted)										
<b>METALS</b>										
Copper		60.3 <sup>r</sup>	59.4 <sup>r</sup>	761.7 <sup>r</sup>	62.4 <sup>r</sup>	58.3	711.1	-2.0	-6.6	-6.6
Gold	kg	12 242.7 <sup>r</sup>	13 098.3 <sup>r</sup>	160 350.5 <sup>r</sup>	13 040.3 <sup>r</sup>	12 075.9	150 936.7	-7.8	-7.4	-5.9
Iron ore		2 839.5 <sup>r</sup>	2 932.0 <sup>r</sup>	32 137.2 <sup>r</sup>	3 604.0	3 902.7	33 666.9	33.1	8.3	4.8
Lead		27.3 <sup>r</sup>	22.3 <sup>r</sup>	339.6 <sup>r</sup>	9.5 <sup>r</sup>	11.4	182.4	-49.0	19.4	-46.3
Molybdenum	t	827.6 <sup>r</sup>	618.1 <sup>r</sup>	8 870.3 <sup>r</sup>	738.9 <sup>r</sup>	963.3	9 836.2	55.8	30.4	10.9
Nickel		15.2 <sup>r</sup>	11.5 <sup>r</sup>	177.6 <sup>r</sup>	17.8 <sup>r</sup>	13.7	178.5	19.5	-23.2	0.5
Silver	t	89.0 <sup>r</sup>	91.1 <sup>r</sup>	1 169.0 <sup>r</sup>	70.4 <sup>r</sup>	61.3	879.0	-32.7	-12.9	-24.8
Uranium <sup>1</sup>	t	599.8 <sup>r</sup>	237.8 <sup>r</sup>	9 114.1 <sup>r</sup>	953.0	626.8	8 919.4	163.5	-34.2	-2.1
Zinc		82.9 <sup>r</sup>	87.0 <sup>r</sup>	1 195.7 <sup>r</sup>	70.1 <sup>r</sup>	62.6	994.9	-28.1	-10.7	-16.8
<b>NONMETALS</b>										
Asbestos		46.4 <sup>r</sup>	47.6 <sup>r</sup>	587.0 <sup>r</sup>	43.1	43.0	520.9	-9.7	-0.2	-11.3
Clay products	\$000	8 112.8 <sup>r</sup>	7 067.9 <sup>r</sup>	115 137.3 <sup>r</sup>	8 390.8	6 074.1	105 395.8	-14.1	-27.6	-8.5
Gypsum		554.5 <sup>r</sup>	494.3 <sup>r</sup>	7 294.7 <sup>r</sup>	695.4 <sup>r</sup>	647.2	7 887.0	30.9	-6.9	8.1
Potash K <sub>2</sub> O		409.3 <sup>r</sup>	503.0 <sup>r</sup>	7 039.6 <sup>r</sup>	508.9	478.8	6 833.6	-4.8	-5.9	-2.9
Cement		699.4	456.8 <sup>r</sup>	8 593.4 <sup>r</sup>	854.6	543.5	9 393.6	19.0	-36.4	9.3
Lime		202.5	208.1 <sup>r</sup>	2 384.3 <sup>r</sup>	190.0	165.0	2 379.0	-20.7	-13.2	-0.2
Salt		1 046.9 <sup>r</sup>	1 084.5 <sup>r</sup>	11 088.0 <sup>r</sup>	1 036.2	1 088.5	10 922.9	0.4	5.0	-1.5
<b>FUELS</b>										
Coal		5 052.5 <sup>r</sup>	5 062.2	65 361.6	6 140.8	..	..	..	..	..
Natural gas	million m <sup>3</sup>	12 701.0	13 394.0	141 365.0	..	..	..	..	..	..
Crude oil and equivalent	000 m <sup>3</sup>	8 541.0	8 444.0	100 963.0	..	..	..	..	..	..

Sources: Natural Resources Canada; Statistics Canada.

.. Not available; <sup>r</sup> Revised.<sup>1</sup> Tonnes uranium (1 tonne U = 1.2999 short tons U<sub>3</sub>O<sub>8</sub>).

Note: Percentage changes are calculated on the basis of actual production figures as opposed to the rounded figures as shown.

TABLE 2. METAL PRICES, 1994

	January	February	March	April
<b>COPPER</b>				
Electrolytic, U.S. producer f.o.b. refinery, cents (US)	103.998	102.250	99.098	92.018
Electrolytic, COMEX, 1st pos. plus 5 cents (US)	100.565	98.263	95.800	87.031
Electrolytic, LME Grade A settlement, cents (US)	102.369	100.362	97.640	88.445
<b>LEAD</b>				
U.S. producer, cents (US)	31.500	30.000	30.000	30.000
Montréal, cents (C)	44.000	44.000	44.000	44.000
LME cash, cents (US)	19.784	18.766	18.392	19.065
<b>SILVER</b>				
Handy & Harmon, cents per troy oz (US)	367.925	364.395	364.804	396.357
Handy & Harmon, cents per troy oz (C)	470.061	459.028	454.874	500.203
<b>ZINC</b>				
LME SHG cash, cents (US)	48.131	48.631	45.181	45.567
North American SHG, cents (US)	50.519	50.896	47.261	48.106
<b>TIN</b>				
New York, dealers, cents (US)	272.438	266.875	261.500	258.500
Metals Week, composite, cents (US)	389.914	384.470	378.364	374.124
<b>GOLD</b>				
London, p.m., US\$ per troy oz	329.010	329.310	330.078	342.150
<b>NICKEL</b>				
New York, dealers, cathode, US\$	2.680	2.760	2.755	2.739
LME cash, US\$	2.690	2.739	2.709	2.709
<b>ANTIMONY</b>				
New York, dealers, cents (US)	78.000	78.000	78.000	78.000
<b>PLATINUM</b>				
London PM fix, US\$ per troy oz	359.330	358.962	350.459	368.938
<b>CADMIUM</b>				
New York, dealers, US\$	0.600	0.600	0.544	0.466
<b>ALUMINUM</b>				
LME cash, cents (C)	69.933	68.261	65.118	63.456
LME cash, cents (US)	54.738	54.188	52.223	50.282
<b>COBALT</b>				
Shot/cathode/250 kg, US\$	18.000	18.000	18.000	18.000
U.S. spot cathode, US\$	15.213	15.625	15.800	15.025
<b>TUNGSTEN</b>				
U.S. spot ore, US\$/metric tonne unit	46.297	46.297	43.652	41.888
<b>MOLYBDENUM</b>				
Metals Week dealer oxide, US\$	1.842	1.917	2.098	2.188
<b>URANIUM</b>				
Nuexco, US\$, U <sub>3</sub> O <sub>8</sub>	7.900	7.850	7.650	7.613

Sources: Metals Week; The Northern Miner.

Average U.S. Exchange Rate for January = 1.2776, February = 1.2597, March = 1.2469, April = 1.262.

Notes: Prices are per pound unless otherwise stated.

TABLE 3. CANADA, REAL GROSS DOMESTIC PRODUCT AT FACTOR COST BY INDUSTRY, IN 1986 PRICES, QUARTERLY (SEASONALLY ADJUSTED AT ANNUAL RATES)

Industry Sector	1992 4th Quarter	1993 1st Quarter	1993 2nd Quarter	1993 3rd Quarter	1993 4th Quarter	% Change 4th Quarter 1993 3rd Quarter 1993	% Change 4th Quarter 1993 4th Quarter 1992
(\$ millions)							
<b>TOTAL ECONOMY</b>	506 827.0	511 456.3	515 413.8	518 399.0	524 306.5	1.1	3.4
<b>Business Sector</b>							
Agriculture	10 797.5	11 396.6	11 669.1	11 834.5	11 960.6	1.1	10.8
Fishing and trapping	732.1	777.7	832.1	747.4	724.4	-3.1	-1.1
Forestry	3 137.3	3 304.4	3 371.8	3 183.9	3 225.0	1.3	2.8
<b>Mines, quarries and oil wells</b>	<b>19 828.8</b>	<b>20 468.6</b>	<b>21 731.1</b>	<b>22 007.9</b>	<b>21 801.3</b>	<b>-0.9</b>	<b>9.9</b>
Mining industries	5 545.3	5 673.0	5 721.8	5 537.6	5 730.6	3.5	3.3
Gold mines	1 557.1	1 621.7	1 543.3	1 509.5	1 547.5	2.5	-0.6
Iron mines	447.5	440.5	429.1	438.8	469.2	6.9	4.8
Other metal mines	2 048.2	1 979.2	1 986.7	1 872.5	1 814.8	-3.1	-11.4
Asbestos mines	91.8	88.3	85.7	78.5	78.4	-0.1	-14.6
Other nonmetal mines	485.2	472.4	513.3	437.6	498.7	14.0	2.8
Salt mines	139.6	139.8	144.9	141.7	141.2	-0.4	1.1
Coal mines	775.8	931.2	1 018.8	1 059.2	1 180.8	11.5	52.2
Crude petroleum and natural gas	12 328.1	12 632.4	13 193.3	13 630.6	13 210.8	-3.1	7.2
Quarry and sand pit industries	513.0	510.9	538.2	534.7	525.7	-1.7	2.5
Services related to mineral extraction	1 442.4	1 652.2	2 277.8	2 304.9	2 334.2	1.3	61.8
Manufacturing	89 859.1	91 428.2	91 622.3	92 185.6	94 246.9	2.2	4.9
Construction industry	27 893.5	27 654.4	27 841.7	27 340.0	27 659.7	1.2	-0.8
Transportation and storage	21 856.7	22 158.7	22 313.1	22 674.0	22 986.1	1.4	5.2
Communications	19 098.5	19 294.5	19 310.6	19 530.7	19 829.4	1.5	3.8
Other utilities	15 560.8	15 710.9	15 252.3	15 684.3	15 396.8	-1.8	-1.1
Wholesale trade	30 829.9	30 918.1	31 049.7	31 903.6	33 186.8	4.0	7.6
Retail trade	30 204.8	30 651.9	30 933.0	31 128.3	31 167.3	0.1	3.2
Finance, insurance and real estate	83 413.3	83 834.6	85 455.0	86 450.0	88 316.4	2.2	5.9
Community, business and personal services	60 412.0	60 619.9	61 085.3	61 158.7	61 375.4	0.4	1.6
<b>Non-Business Sector</b>							
Government service industries	34 191.5	34 113.9	33 890.4	33 581.0	33 554.3	-0.1	-1.9
Community and personal services	54 485.8	54 539.0	54 497.4	54 427.2	54 271.8	-0.3	-0.4
Other non-business industries and services	4 525.4	4 584.9	4 558.9	4 561.9	4 604.3	0.9	1.7

Source: Statistics Canada.

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

**TABLE 4. CANADA, REAL GROSS DOMESTIC PRODUCT AT FACTOR COST BY INDUSTRIES INVOLVED IN MINERAL MANUFACTURING, IN 1986 PRICES, QUARTERLY (SEASONALLY ADJUSTED AT ANNUAL RATES)**

Industry	1992 4th Quarter	1993 1st Quarter	1993 2nd Quarter	1993 3rd Quarter	1993 4th Quarter	% Change 4th Quarter 1993 3rd Quarter 1993	% Change 4th Quarter 1993 4th Quarter 1992
(\$ millions)							
<b>PRIMARY METAL INDUSTRIES</b>	<b>7 265.4</b>	<b>7 583.0</b>	<b>7 428.7</b>	<b>7 605.6</b>	<b>7 793.7</b>	<b>2.5</b>	<b>7.3</b>
Primary steel industries	2 846.0	2 967.8	2 753.5	2 846.9	2 907.0	2.1	2.1
Steel, pipe and tube industries	494.0	539.0	551.2	547.6	586.2	7.0	18.7
Iron foundries	448.3	463.8	435.3	439.9	493.3	12.1	10.0
Nonferrous smelting and refining industries	2 583.2	2 691.8	2 742.3	2 780.3	2 732.4	-1.7	5.8
<b>FABRICATED METAL PRODUCTS INDUSTRIES</b>	<b>5 392.7</b>	<b>5 491.2</b>	<b>5 567.2</b>	<b>5 664.4</b>	<b>5 852.6</b>	<b>3.3</b>	<b>8.5</b>
Power boiler and heat exchanger industry	830.4	836.2	872.8	916.2	930.1	1.5	12.0
Ornamental and architectural metal products industry	610.4	611.8	652.2	660.7	675.4	2.2	10.6
Stamped, pressed and coated metals	1 268.5	1 304.0	1 210.1	1 203.1	1 258.4	4.6	-0.8
Wire and wire products industries	447.1	462.0	493.6	509.7	513.6	0.8	14.9
Hardware, tool and cutlery industries	787.1	834.7	844.4	873.5	899.3	3.0	14.3
Heating equipment industry	221.4	208.9	238.7	246.1	277.1	12.6	25.2
Machine shops industry	634.3	629.4	648.4	641.7	663.0	3.3	4.5
Other metal-fabricating industries	593.4	604.3	607.1	613.5	635.9	3.7	7.2
<b>NONMETALLIC MINERAL PRODUCTS INDUSTRIES</b>	<b>2 272.9</b>	<b>2 254.2</b>	<b>2 354.7</b>	<b>2 388.5</b>	<b>2 398.6</b>	<b>0.4</b>	<b>5.5</b>
Cement industry	353.2	345.3	380.9	399.8	411.2	2.9	16.4
Concrete products industries	274.0	253.7	282.1	288.1	272.1	-5.6	-0.7
Ready-mix concrete industry	362.8	331.2	356.0	368.4	353.2	-4.1	-2.6
Glass and glass products industries	529.8	552.0	557.9	576.6	590.7	2.4	11.5
Miscellaneous nonmetallic mineral products	661.7	679.9	696.8	682.7	694.5	1.7	5.0

Source: Statistics Canada.

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

TABLE 5. MINERAL PRODUCTION OF CANADA, 1991, 1992 AND 1993, AND AVERAGE, 1989-93

		Unit of Measure	1991		1992		1993p		Average 1989-93		
			(000)	(Quantity)	(\$000)	(Quantity)	(\$000)	(Quantity)	(\$000)	(Quantity)	(\$000)
<b>METALS</b>											
Antimony	kg		429	897	796	1 678	622	1 358	1 046	2 415	
Bismuth	kg		60	446	204	1 360	157	1 047	130	1 166	
Cadmium	kg		1 549	7 724	1 393	3 366	1 242	1 592	1 446	10 459	
Calcium	kg		x	x	x	x	x	x	137	1 385	
Cesium, pollucite	kg		x	x	x	x	x	x	192	528	
Cobalt	kg		2 171	77 549	2 223	131 353	2 370	89 819	2 258	78 813	
Columbium (niobium) (Cb <sub>2</sub> O <sub>5</sub> )	kg		x	x	x	x	x	x	3 340	21 384	
Copper	kg		780 362	2 112 152	761 694	2 137 039	698 799	1 759 675	743 344	2 165 310	
Germanium	kg		—	—	—	—	—	—	2	528	
Gold	g		175 282 <sup>r</sup>	2 338 614 <sup>r</sup>	159 858	2 134 586	152 578	2 258 007	162 917	2 290 944	
Ilmenite	t		x	x	x	x	x	x	414	21 687	
Indium	g		x	x	x	x	x	x	18 830	3 987	
Iron ore	t		35 421	1 228 188	31 582	1 084 773	31 720	1 036 587	34 768	1 195 507	
Iron remelt	t		x	x	x	x	x	x	675	186 124	
Lead	kg		248 102	210 886	336 878	247 268	187 554	96 215	254 959	222 672	
Lithium	kg		x	x	x	x	x	x	1 048	4 674	
Magnesium	kg		x	x	x	x	x	x	4 816	17 325	
Molybdenum	kg		11 437	65 928	8 870	52 253	10 006	66 731	11 209	76 272	
Nickel	kg		188 098	1 807 619	177 555	1 502 112	180 763	1 215 994	187 395	1 919 184	
Platinum group	g		11 123	150 155	11 311	130 204	13 116	138 799	11 309	150 062	
Rare earths	t		—	—	—	—	—	—	—	—	
Rhenium	kg		x	x	x	x	x	x	1	1 250	
Rubidium	kg		x	x	x	x	—	—	2	23	
Selenium	kg		227	3 937	345	5 013	482	6 517	327	5 294	
Silver	kg		1 261	187 676	1 169	178 738	869	152 891	1 199	208 758	
Tantalum (Ta <sub>2</sub> O <sub>5</sub> )	kg		114	10 254	54	3 977	7	603	75	6 827	
Tellurium	kg		16	1 128	25	1 891	31	2 345	18	1 390	
Tin	kg		4 392	25 241	58	432	—	—	2 354	18 040	
Tungsten (WO <sub>3</sub> )	kg		—	—	—	—	—	—	—	—	
Uranium (U)	kg		8 162	595 467	9 114	566 352	9 015	509 025	9 401	694 301	
Vanadium	kg		x	x	—	—	—	—	8	36	
Yttrium (Y <sub>2</sub> O <sub>3</sub> )	kg		—	—	—	—	—	—	31	1 090	
Zinc	kg		1 083 008	1 385 167	1 195 736	1 791 212	998 234	1 228 826	1 145 840	1 883 407	
Total metals				10 461 797 <sup>r</sup>		10 201 641		8 808 352		11 190 841	
<b>NONMETALS</b>											
Arsenious trioxide	t		—	—	—	—	—	—	2	305	
Asbestos	t		686	271 030	587	231 020	509	215 076	636	255 676	
Barite	t		47	3 013	35	2 852	37	3 114	40	3 036	
Fluorspar	t		—	—	—	—	—	—	14	1 744	
Gemstones	kg		542	663	1 283	842	1 215	757	879	1 284	
Graphite	t		x	x	x	x	x	x	13	10 552	
Gypsum	t		6 727	71 654	7 295	71 820	7 836	83 107	7 603	78 475	
Magnesite	t		x	x	x	x	x	x	176	24 036	
Marl	t		x	x	x	x	x	x	1	18	
Mica	t		x	x	x	x	x	x	17	7 014	
Nepheline syenite	t		486	25 105	557	28 109	557	32 924	537	26 573	
Peat	t		833	100 133	828	116 869	820	119 174	815	105 116	
Potash (K <sub>2</sub> O)	t		7 087	931 932	7 040	980 855	6 970	901 539	7 091	959 354	
Potassium sulphate	t		x	x	x	x	x	x	3	865	
Salt	t		11 871	259 166	11 088	266 441	11 371	279 796	11 336	264 382	
Serpentine	t		x	x	x	x	x	x	3	524	
Soapstone, talc and pyrophyllite	t		115	13 278	113	13 132	108	14 176	122	13 918	
Sodium sulphate	t		335	25 457	281	21 193	316	22 289	321	24 474	
Sulphur in smelter gas	t		749	89 187	783	88 055	797	94 984	786	88 073	
Sulphur, elemental	t		6 180	335 381	6 479	130 634	7 313	2 444	6 309	251 373	
Titanium dioxide	t		x	x	x	x	x	x	620	230 998	
Tremolite	t		x	x	x	x	x	x	...	56	
Total nonmetals				2 381 705		2 207 090		1 994 862		2 347 846	
<b>FUELS</b>											
Coal	t		71 133	1 916 780	65 612	1 669 300	68 600	1 783 000	68 841	1 819 972	
Natural gas	000m <sup>3</sup>		105 244	5 394 073	116 664	5 718 636	129 245	7 248 635	109 208	5 889 529	
Natural gas by-products	m <sup>3</sup>		24 919	2 178 094	26 735	2 434 914	28 463	2 792 960	25 407	2 279 403	
Petroleum, crude	m <sup>3</sup>		89 788	10 456 364	93 256	10 907 793	97 249	11 154 997	92 243	11 297 089	
Total fuels				19 945 311		20 730 643		22 979 592		21 285 993	
<b>STRUCTURAL MATERIALS</b>											
Clay products	\$		..	119 838	..	114 262	..	108 127	..	135 679	
Cement	t		9 372	810 769	8 598	682 422	9 842	764 589	10 430	841 844	
Lime	t		2 375	193 541	2 384	191 313	2 447	200 663	1 910	195 074	
Sand and gravel	t		215 576 <sup>r</sup>	737 728 <sup>r</sup>	240 616	760 367	229 940	736 479	186 138	785 194	
Stone	t		87 807 <sup>r</sup>	539 569 <sup>r</sup>	89 338	516 518	79 209	469 550	97 409	571 234	
Total structural materials				2 401 445 <sup>r</sup>		2 264 882		2 279 407		2 529 025	
Total all minerals				35 190 259 <sup>r</sup>		35 404 256		36 062 213		37 353 706	

Sources: Natural Resources Canada; Statistics Canada.

— Nil; .. Not available; ... Amount too small to be expressed; p Preliminary; r Revised; x Confidential.

Notes: Numbers may not add to totals due to rounding. Confidential values are included in totals.

**TABLE 6. CANADA, VALUE OF MINERAL PRODUCTION, PER CAPITA VALUE OF MINERAL PRODUCTION, AND POPULATION, 1964-93**

	Metallics	Industrial Minerals	Fuels	Other Minerals <sup>1</sup>	Total	Per Capita Value of Mineral Production	Population of Canada
	(\$ millions)					(\$)	(000)
1964	1 702	691	973		3 365	174.44	19 291
1965	1 908	761	1 046		3 715	189.11	19 644
1966	1 985	844	1 152		3 981	198.88	20 015
1967	2 285	861	1 235		4 381	214.98	20 378
1968	2 493	886	1 343		4 722	228.12	20 701
1969	2 378	893	1 465		4 736	225.51	21 001
1970	3 073	931	1 718		5 722	268.68	21 297
1971	2 940	1 008	2 014		5 963	276.46	21 568
1972	2 956	1 085	2 368		6 408	293.92	21 802
1973	3 850	1 292	3 227		8 370	379.69	22 043
1974	4 821	1 731	5 202		11 753	525.55	22 364
1975	4 795	1 898	6 653		13 347	588.05	22 697
1976	5 315	2 269	8 109		15 693	682.51	22 993
1977	5 988	2 612	9 873		18 473	793.74 <sup>r</sup>	23 273 <sup>r</sup>
1978	5 698	2 986	11 578		20 261	861.55 <sup>r</sup>	23 517 <sup>r</sup>
1979	7 951	3 514	14 617		26 081	1 098.29 <sup>r</sup>	23 747 <sup>r</sup>
1980	9 697	4 201	17 944		31 842	1 324.39 <sup>r</sup>	24 043 <sup>r</sup>
1981	8 753	4 485	19 046	136	32 420	1 331.88 <sup>r</sup>	24 342 <sup>r</sup>
1982	6 874	3 703	23 038	216	33 831	1 376.21 <sup>r</sup>	24 583 <sup>r</sup>
1983	7 399	3 741	27 154	245	38 539	1 554.79 <sup>r</sup>	24 787 <sup>r</sup>
1984	8 670	4 318	30 399	401	43 789	1 753.09 <sup>r</sup>	24 978 <sup>r</sup>
1985	8 709	4 859	31 120	41	44 730	1 777.43 <sup>r</sup>	25 165 <sup>r</sup>
1986	8 798	4 863	18 763	22	32 446	1 279.77	25 353
1987	10 962	5 125	20 274	—	36 361	1 419.39	25 617
1988	13 608	5 574	17 773	—	36 955	1 426.32 <sup>r</sup>	25 909
1989	13 982	5 566	19 785	—	39 333	1 498.97	26 240
1990	12 500	5 289	22 990	—	40 778	1 532.42 <sup>r</sup>	26 610 <sup>r</sup>
1991	10 462 <sup>r</sup>	4 783	19 945	—	35 190 <sup>r</sup>	1 303.13 <sup>r</sup>	27 004 <sup>r</sup>
1992	10 202	4 472	20 731	—	35 404	1 245.05	27 436
1993 <sup>p</sup>	8 808	4 274	22 980	—	36 062	1 254.21	28 753

Sources: Natural Resources Canada; Statistics Canada.

— Nil; <sup>p</sup> Preliminary; <sup>r</sup> Revised.

<sup>1</sup> 1981-86: Other minerals may include arsenious trioxide, bentonite, calcium, cesium, cobalt, diatomite, ilmenite, indium, iron remelt, lithium, marl, magnesium, niobium, perlite, rhenium, serpentine, sodium antimonate, strontium, tin, tungsten or yttrium, for which the value of production may be confidential in that year. Beginning in 1987, this category was discontinued.

Notes: Beginning in 1986, bentonite, diatomite and sodium antimonate are reported in industrial minerals. Numbers may not add to totals due to rounding.

TABLE 9. PRODUCTION OF LEADING MINERALS, BY PROVINCE AND TERRITORY IN CANADA, 1993<sup>p</sup>

	Unit of Measure	Nfld.	P.E.I.	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Yukon	N.W.T.	Total Canada
	(000)													
Petroleum, crude	m <sup>3</sup>	—	—	1 077	—	—	245	633	14 749	76 710	1 966	—	1 889	97 249
	\$	—	—	131 649	—	—	36 795	78 950	1 459 053	9 016 060	241 757	—	190 733	11 154 997
Natural gas	000 m <sup>3</sup>	—	—	—	—	—	410	—	6 362	105 351	16 512	399	212	129 245
	\$	—	—	—	—	—	39 331	—	339 370	6 045 160	795 543	18 463	10 768	7 248 635
Natural gas by-products	m <sup>3</sup>	—	—	—	—	—	—	6	129	27 482	816	—	29	28 463
	\$	—	—	—	—	—	—	620	13 273	2 698 797	77 290	—	2 980	2 792 960
Gold	g	x	—	—	492	41 891	71 957	3 045	x	19	14 357	3 407	13 016	152 578
	\$	x	—	—	7 288	619 945	1 064 891	45 062	x	281	212 477	50 426	192 630	2 258 007
Coal	t	—	—	3 500	390	—	—	—	9 950	34 210	20 550	—	—	68 600
	\$	—	—	222 200	33 800	—	—	—	104 000	573 000	850 000	—	—	1 783 000
Copper	kg	350	—	—	10 517	77 963	268 944	61 618	—	—	279 407	—	—	698 799
	\$	881	—	—	26 484	196 322	677 239	155 163	—	—	703 585	—	—	1 759 675
Zinc	kg	—	—	—	308 579	128 065	182 873	95 476	—	—	103 307	33 906	146 027	998 234
	\$	—	—	—	379 861	157 648	225 117	117 531	—	—	127 171	41 738	179 760	1 228 826
Nickel	kg	—	—	—	—	—	124 299	56 464	—	—	—	—	—	180 763
	\$	—	—	—	—	—	836 163	379 832	—	—	—	—	—	1 215 994
Iron ore	t	17 547	—	—	—	13 626	490	—	—	—	57	—	—	31 720
	\$	636 989	—	—	—	x	x	—	—	—	1 327	—	—	1 036 587
Potash (K <sub>2</sub> O)	t	—	—	—	x	—	—	—	x	—	—	—	—	6 970
	\$	—	—	—	x	—	—	—	x	—	—	—	—	901 539
Cement	t	x	—	x	—	2 530	4 142	x	x	x	1 461	—	—	9 842
	\$	x	—	x	—	146 482	301 764	x	x	x	133 418	—	—	764 589
Sand and gravel	t	3 551	448	5 629	6 684	30 445	90 000	8 766	6 147	34 003	39 431	2 236	2 601	229 940
	\$	17 477	1 700	19 906	14 041	104 961	265 305	31 871	17 835	118 402	127 134	6 261	11 585	736 479
Uranium (U)	kg	—	—	—	—	—	x	—	x	—	—	—	—	9 015
	\$	—	—	—	—	—	x	—	x	—	—	—	—	509 025
Stone	t	2 367	—	4 671	2 694	29 044	33 451	1 967	—	300	4 247	—	467	79 209
	\$	9 508	—	26 499	14 556	176 822	193 811	9 878	—	4 137	32 134	—	2 205	469 550
Salt	t	—	—	x	x	x	6 916	—	533	1 359	—	—	—	11 371
	\$	—	—	x	x	x	168 049	—	25 654	13 672	—	—	—	279 796
Asbestos	t	15	—	—	—	494	—	—	—	—	—	—	—	509
	\$	5 216	—	—	—	209 860	—	—	—	—	—	—	—	215 076
Lime	t	—	—	—	x	x	1 495	x	—	207	x	—	—	2 447
	\$	—	—	—	x	x	114 468	x	—	20 362	x	—	—	200 663
Silver	kg	x	—	—	223	134	239	41	x	—	192	29	11	869
	\$	x	—	—	39 273	23 653	42 039	7 182	x	—	33 845	5 027	1 855	152 891
Platinum group	g	—	—	—	—	—	x	x	—	—	—	—	—	13 116
	\$	—	—	—	—	—	x	x	—	—	—	—	—	138 799
Peat	t	2	—	x	274	292	x	x	x	94	—	—	—	820
	\$	259	—	x	33 224	41 250	x	x	x	21 034	—	—	—	119 174
Clay products	\$	x	—	x	x	x	68 228	—	x	x	x	—	—	108 127
Lead	kg	—	—	—	73 076	—	—	2 099	—	—	56 353	27 112	28 914	187 554
	\$	—	—	—	37 488	—	—	1 077	—	—	28 909	13 908	14 833	96 215
Sulphur, in smelter gas	t	—	—	—	102	109	463	...	—	—	123	—	—	797
	\$	—	—	—	14 920	16 093	29 152	30	—	—	34 789	—	—	94 984
Cobalt	kg	—	—	—	—	—	1 994	375	—	—	—	—	—	2 370
	\$	—	—	—	—	—	75 600	14 219	—	—	—	—	—	89 819
Gypsum	t	x	—	6 130	—	—	866	x	—	—	414	—	—	7 836
	\$	x	—	57 707	—	—	14 350	x	—	—	x	—	—	83 107
Total leading minerals	\$	726 651	1 700	528 543	779 969	2 139 384	4 392 627	903 819	3 148 185	18 641 215	3 433 248	135 824	607 349	35 438 514
Total all minerals	\$	728 034	1 700	529 518	781 663	2 553 738	4 467 894	912 499	3 173 335	18 642 273	3 528 387	135 824	607 349	36 062 213
Leading minerals as % of all minerals		99.8	100.0	99.8	99.8	83.8	98.3	99.0	99.2	100.0	97.3	100.0	100.0	98.3

Sources: Natural Resources Canada; Statistics Canada.

— Nil; . . . Amount too small to be expressed; p Preliminary; x Confidential.

Notes: Certain minerals are not included in the leading minerals due to confidentiality constraints. Confidential values are included in "Total all minerals." Numbers may not add to totals due to rounding.

**TABLE 7. CANADA, VALUE OF MINERAL PRODUCTION BY PROVINCE, TERRITORY AND MINERAL CLASS, 1993P**

	Metals		Industrial Minerals		Fuels		Total	
	(\$000)	(% of total)	(\$000)	(% of total)	(\$000)	(% of total)	(\$000)	(% of total)
Alberta	281	...	308 975	7.2	18 333 017	79.8	18 642 273	51.7
Ontario	3 187 469	36.2	1 204 299	28.2	76 126	0.3	4 467 894	12.4
British Columbia	1 178 103	13.4	385 694	9.0	1 964 590	8.5	3 528 387	9.8
Saskatchewan	436 288	5.0	821 351	19.2	1 915 696	8.3	3 173 335	8.8
Quebec	1 593 597	18.1	960 140	22.5	—	—	2 553 738	7.1
Manitoba	740 492	8.4	92 437	2.2	79 570	0.3	912 499	2.5
New Brunswick	492 072	5.6	255 791	6.0	33 800	0.1	781 663	2.2
Newfoundland	679 871	7.7	48 163	1.1	—	—	728 034	2.0
Northwest Territories	389 079	4.4	13 790	0.3	204 481	0.9	607 349	1.7
Nova Scotia	—	—	175 669	4.1	353 849	1.5	529 518	1.5
Yukon	111 100	1.3	6 261	0.1	18 463	0.1	135 824	0.4
Prince Edward Island	—	—	1 700	...	—	—	1 700	...
<b>Total</b>	<b>8 808 352</b>	<b>100.0</b>	<b>4 274 269</b>	<b>100.0</b>	<b>22 979 592</b>	<b>100.0</b>	<b>36 062 213</b>	<b>100.0</b>

Sources: Natural Resources Canada; Statistics Canada.

— Nil; ... Amount too small to be expressed; P Preliminary.

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

**TABLE 8. CANADA, VALUE OF MINERAL PRODUCTION BY PROVINCE, TERRITORY AND MINERAL CLASS, 1992**

	Metals		Industrial Minerals		Fuels		Total	
	(\$000)	(% of total)	(\$000)	(% of total)	(\$000)	(% of total)	(\$000)	(% of total)
Alberta	452	...	414 203	9.3	16 470 719	79.5	16 885 374	47.7
Ontario	3 505 366	34.4	1 188 958	26.6	75 254	0.4	4 769 578	13.5
British Columbia	1 501 697	14.7	367 885	8.2	1 629 622	7.9	3 499 204	9.9
Saskatchewan	424 379	4.2	875 882	19.6	1 857 490	9.0	3 157 751	8.9
Quebec	1 663 010	16.3	1 031 398	23.1	—	—	2 694 407	7.6
Manitoba	905 808	8.9	89 386	2.0	86 850	0.4	1 082 044	3.1
New Brunswick	594 174	5.8	281 747	6.3	32 200	0.2	908 121	2.6
Newfoundland	664 767	6.5	40 906	0.9	—	—	705 673	2.0
Northwest Territories	468 506	4.6	13 352	0.3	199 286	1.0	681 144	1.9
Nova Scotia	1 925	...	160 111	3.6	360 997	1.7	523 033	1.5
Yukon	471 558	4.6	6 446	0.1	18 225	0.1	496 230	1.4
Prince Edward Island	—	—	1 699	...	—	—	1 699	...
<b>Total</b>	<b>10 201 641</b>	<b>100.0</b>	<b>4 471 972</b>	<b>100.0</b>	<b>20 730 643</b>	<b>100.0</b>	<b>35 404 256</b>	<b>100.0</b>

Sources: Natural Resources Canada; Statistics Canada.

— Nil; ... Amount too small to be expressed.

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



TABLE 10. PRODUCTION OF LEADING MINERALS, BY PROVINCE AND TERRITORY IN CANADA, 1992

	Unit of Measure	Nfld.	P.E.I.	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Yukon	N.W.T.	Total Canada
(000)														
Petroleum, crude	m <sup>3</sup>	—	—	577	—	—	224	656	13 355	74 505	2 060	—	1 878	93 256
	\$	—	—	96 097	—	—	35 175	86 289	1 415 908	8 823 901	262 772	—	187 651	10 907 793
Natural gas	000 m <sup>3</sup>	—	—	—	—	—	427	—	6 182	95 180	14 293	393	188	116 664
	\$	—	—	—	—	—	40 079	—	327 466	4 736 172	588 006	18 225	8 688	5 718 636
Natural gas by-products	m <sup>3</sup>	—	—	—	—	—	—	6	129	25 798	772	—	30	26 735
	\$	—	—	—	—	—	—	561	12 416	2 346 446	72 544	—	2 947	2 434 914
Copper	kg	—	—	—	13 697	91 950	272 242	60 024	—	—	323 781	—	—	761 694
	\$	—	—	—	38 428	257 979	763 814	168 405	—	—	908 412	—	—	2 137 039
Gold	g	x	—	—	490	44 589	74 343	3 106	x	34	16 773	3 737	13 518	159 858
	\$	x	—	—	6 541	595 400	992 705	41 471	x	452	223 966	49 898	180 501	2 134 586
Zinc	kg	—	—	582	301 020	107 466	190 523	89 211	—	—	133 149	202 304	171 481	1 195 736
	\$	—	—	871	450 928	160 984	285 403	133 638	—	—	199 458	303 051	256 878	1 791 212
Coal	t	—	—	4 486	399	—	—	—	10 027	33 526	17 174	—	—	65 612
	\$	—	—	264 900	32 200	—	—	—	101 700	564 200	706 300	—	—	1 669 300
Nickel	kg	—	—	—	—	—	118 860	58 695	—	—	—	—	—	177 555
	\$	—	—	—	—	—	1 005 556	496 556	—	—	—	—	—	1 502 112
Iron ore	t	17 692	—	—	—	13 350	482	—	—	—	59	—	—	31 582
	\$	645 333	—	—	—	x	x	—	—	—	1 353	—	—	1 084 773
Potash (K <sub>2</sub> O)	t	—	—	—	x	—	—	—	x	—	—	—	—	7 040
	\$	—	—	—	x	—	—	—	x	—	—	—	—	980 855
Sand and gravel	t	3 537	444	5 976	6 552	37 307	87 647	9 591	6 236	38 094	39 923	2 318	2 991	240 616
	\$	17 610	1 699	20 462	13 161	116 968	266 368	35 239	17 841	125 277	128 624	6 446	10 673	760 367
Cement	t	x	—	x	—	1 909	3 789	x	x	x	1 336	—	—	8 598
	\$	x	—	x	—	129 662	269 861	x	x	x	119 313	—	—	682 422
Uranium (U)	kg	—	—	—	—	—	989	—	8 125	—	—	—	—	9 114
	\$	—	—	—	—	—	166 204	—	400 148	—	—	—	—	566 352
Stone	t	1 000	—	4 705	2 784	36 524	37 666	1 549	—	316	3 910	—	884	89 338
	\$	4 758	—	24 910	15 799	207 500	219 388	7 770	—	3 600	30 113	—	2 679	516 518
Salt	t	—	—	x	x	x	6 638	—	565	1 271	—	—	—	11 088
	\$	—	—	x	x	x	155 390	—	24 475	13 617	—	—	—	266 441
Lead	kg	—	—	834	78 137	—	—	1 487	—	—	81 591	135 688	39 141	336 878
	\$	—	—	612	57 352	—	—	1 091	—	—	59 888	99 595	28 729	247 268
Asbestos	t	14	—	—	—	567	—	—	—	—	6	—	—	587
	\$	3 531	—	—	—	224 549	—	—	—	—	2 939	—	—	231 020
Lime	t	—	—	—	x	x	1 456	x	—	191	x	—	—	2 384
	\$	—	—	—	x	x	108 470	x	—	18 463	x	—	—	191 313
Silver	kg	x	—	...	254	143	247	41	x	—	345	124	16	1 169
	\$	x	—	4	38 500	21 798	37 725	6 246	x	—	52 741	19 014	2 397	178 738
Cobalt	kg	—	—	—	—	—	1 706	517	—	—	—	—	—	2 223
	\$	—	—	—	—	—	100 797	30 556	—	—	—	—	—	131 353
Sulphur, elemental	t	—	—	—	—	—	x	—	75	5 868	x	—	—	6 479
	\$	—	—	—	—	—	x	—	2 082	115 297	x	—	—	130 634
Platinum group	g	—	—	—	—	—	x	x	—	—	—	—	—	11 311
	\$	—	—	—	—	—	x	x	—	—	—	—	—	130 204
Peat	t	5	—	x	323	271	—	x	x	94	—	—	—	828
	\$	725	—	x	38 053	36 944	—	x	x	20 500	—	—	—	116 869
Clay products	\$	x	—	x	x	x	74 871	—	x	x	x	—	—	114 262
Sulphur, in smelter gas	t	—	—	...	95	109	511	2	—	—	66	—	—	783
	\$	—	—	46	15 349	17 893	37 909	400	—	—	16 458	—	—	88 055
Total leading minerals	\$	701 674	1 699	474 394	905 977	2 257 407	4 690 322	1 069 756	3 135 802	16 885 374	3 413 259	496 229	681 144	34 713 037
Total all minerals	\$	705 673	1 699	523 033	908 121	2 694 407	4 769 578	1 082 044	3 157 751	16 885 374	3 499 204	496 230	681 144	35 404 256
Leading minerals as % of all minerals		99.4	100.0	90.7	99.8	83.8	98.3	98.9	99.3	100.0	97.5	100.0	100.0	98.0

Sources: Natural Resources Canada; Statistics Canada.

— Nil; ... Amount too small to be expressed; x Confidential.

Notes: Certain minerals are not included in the leading minerals due to confidentiality constraints. Confidential values are included in "Total all minerals." Numbers may not add to totals due to rounding.

TABLE 11. CANADA'S WORLD ROLE AS A PRODUCER OF CERTAIN IMPORTANT MINERALS, 1992P

			Rank of Five Leading Countries					
			World	1	2	3	4	5
Potash (K <sub>2</sub> O equivalent)	000 t	24 036	Canada	FSU	Germany	United States	Israel	
(mine production)	% of world total		7 270	6 948	3 525	1 658	1 296	
			30.2	28.9	14.7	6.9	5.4	
Uranium (U concentrates)	t	34 921	Canada	FSU	Niger	Australia	France	
(mine production)	% of world total		9 298*	8 300*	2 965	2 333	2 119	
			26.6	23.8	8.5	6.7	6.1	
Nickel (mine production)	000 t	853	Canada	FSU	New Caledonia	Indonesia	Australia	
	% of world total		186	180*	101	78	58	
			21.8	21.1	11.8	9.1	6.8	
Zinc (mine production)	000 t	7 231	Canada	Australia	China	Peru	United States	
	% of world total		1 325	1 013	706	603	552	
			18.3	14.0	9.8	8.3	7.6	
Sulphur, elemental	000 t	36 368	United States	Canada	FSU	Poland	Saudi Arabia	
(mine production)	% of world total		9 369	6 556	5 181	2 925	2 370	
			25.8	18.0	14.2	8.0	6.5	
Asbestos (mine production)	000 t	3 685	FSU	Canada	Brazil	China	Zimbabwe	
	% of world total		2 200*	591	250*	220*	160*	
			59.7	16.0	6.8	6.0	4.3	
Cadmium (refined production)	t	19 463	Japan	Canada	United States	Belgium	FSU	
	% of world total		2 987	1 963	1 620	1 550	1 320*	
			15.3	10.1	8.3	8.0	6.8	
Titanium concentrates (ilmenite)	000 t	5 660	Australia	South Africa	Canada	Norway	FSU	
	% of world total		1 718	959	753*,b	718	358	
			30.4	16.9	13.3	12.7	6.3	
Lead (mine production)	000 t	2 980	Australia	United States	Canada	China	FSU	
	% of world total		572	408	344	287	225	
			19.2	13.7	11.5	9.6	7.6	
Aluminum (primary metal)	000 t	19 453	United States	FSU	Canada	Australia	Brazil	
	% of world total		4 042	3 200*	1 972	1 236	1 193	
			20.8	16.6	10.1	6.4	6.1	
Platinum group metals	kg	193 402	South Africa	Russia	Canada	United States	Colombia	
(mine production)	% of world total		145 000	112 500	11 907	8 310	1 600	
			75.0	58.2	6.2	4.3	0.8	
Cobalt (shipments)	t	21 786	Zaire	Zambia	FSU	Canada	Australia	
	% of world total		6 625	4 610	4 400*	2 223	1 670	
			30.4	21.2	20.2	10.2	7.7	
Copper (mine production)	000 t	9 259	Chile	United States	FSU	Canada	Zambia	
	% of world total		1 933	1 761	800	769	433	
			20.9	19.0	8.6	8.3	4.7	
Gypsum (mine production)	000 t	98 303	United States	China	Iran	Canada	Thailand	
	% of world total		14 759	10 977	7 983	7 566	6 985	
			15.0	11.2	8.1	7.7	7.1	
Silver (mine production)	t	13 825	Mexico	United States	Peru	Australia	Canada	
	% of world total		2 316	1 804	1 570	1 248	1 214	
			16.8	13.0	11.4	9.0	8.8	
Molybdenum (Mo content)	t	111 532	United States	China	FSU	Chile	Canada	
(mine production)	% of world total		49 725	16 000*	15 000*	14 500	9 405	
			44.6	14.3	13.4	13.0	8.4	
Gold (mine production)	t	2 165	South Africa	United States	FSU	Australia	Canada	
	% of world total		613	296	253*	243	161	
			28.3	13.7	11.7	11.2	7.4	

<sup>a</sup> Estimated; <sup>p</sup> Preliminary.

FSU: former Soviet Union.

<sup>a</sup> Includes uranium (tU) recovered by Elliot Lake producers from refinery/conversion facility wastes. <sup>b</sup> Titaniferous slag with 80% TiO<sub>2</sub> content.

TABLE 12. CANADA, REPORTED CONSUMPTION OF MINERALS AND RELATION TO PRODUCTION, 1990-92

TABLE 12. CANADA, REPORTED CONSUMPTION OF MINERALS AND RELATION TO PRODUCTION, 1990-92										
	Unit of Measure	1990			1991			1992P		
		Consumption	Production	Consumption as % of Production	Consumption	Production	Consumption as % of Production	Consumption	Production	Consumption as % of Production
METALS										
Aluminum <sup>1</sup>	t	465 144 <sup>r</sup>	1 567 395	29.7 <sup>r</sup>	465 302 <sup>r</sup>	1 821 642	25.5 <sup>r</sup>	501 680	1 971 843	25.4
Antimony	kg	294 321	564 527	52.1	406 221	428 559	94.8	355 423	796 373	44.6
Bismuth	kg	12 032	74 300	16.2	32 036	59 526	53.8	56 231	203 789	27.6
Cadmium	kg	35 194	1 333 664	2.6	27 667	1 549 087	1.8	29 873	1 393 099	2.1
Chromium (chromite)	t	19 921	—	..	14 722 <sup>r</sup>	—	..	10 752	—	..
Cobalt	kg	194 205	2 183 620	8.9	165 908	2 171 483	7.6	204 724	2 222 862	9.2
Copper <sup>2</sup>	t	184 497	771 433	23.9	185 055	780 362	23.7	175 737	761 694	23.1
Lead <sup>3</sup>	t	71 468	233 372	30.6	79 556 <sup>r</sup>	248 102	32.1 <sup>r</sup>	91 719	336 878	27.2
Magnesium	t	15 125	x	x	15 745 <sup>r</sup>	x	x	17 707	x	x
Manganese ore	t	253 002	—	..	109 028	—	..	8 860	—	..
Mercury	kg	33 907	—	..	9 299	—	..	4 515	—	..
Molybdenum (Mo content)	t	1 179	12 188	9.7	1 644	11 437	14.4	1 535	8 870	17.3
Nickel	t	7 910 <sup>r</sup>	195 004	4.1 <sup>r</sup>	9 978 <sup>r</sup>	188 098	5.3	12 118	177 555	6.8
Selenium	kg	13 798	369 193	3.7	18 479	226 636	8.2	16 347	344 988	4.7
Silver	kg	579 407	1 381 257	41.9	399 295	1 261 359	31.7	364 471	1 168 950	31.2
Tellurium	kg	x	12 212	x	x	16 108	x	x	25 228	x
Tin	t	3 600	3 844	93.7	3 178 <sup>r</sup>	4 392	72.4 <sup>r</sup>	3 042	58	5 244.8
Tungsten (W content)	kg	326 216	—	..	256 597 <sup>r</sup>	—	..	340 040	—	..
Zinc <sup>3</sup>	t	121 502	1 179 372	10.3	104 902 <sup>r</sup>	1 083 008	9.7	114 725	1 195 736	9.6
NONMETALS										
Barite	t	17 153 <sup>r</sup>	43 906	39.1 <sup>r</sup>	11 629 <sup>r</sup>	46 614	24.9	9 187	34 870	26.3
Feldspar	t	2 177	—	..	1 806 <sup>r</sup>	—	..	1 476	—	..
Fluorspar	t	142 240 <sup>r</sup>	x	x	110 495 <sup>r</sup>	—	..	93 785	—	..
Mica	kg	4 213 <sup>r</sup>	x	x	3 555 <sup>r</sup>	x	x	3 379	x	x
Nepheline syenite	t	72 258	532 911	13.6	60 223 <sup>r</sup>	485 520	12.4	63 438	556 926	11.4
Phosphate rock	t	1 392 043	—	..	1 181 971	—	..	1 209 712	—	..
Potash (K <sub>2</sub> O)	t	262 934	7 344 620	3.6	263 133 <sup>r</sup>	7 087 027	3.7 <sup>r</sup>	259 122	7 039 590	3.7
Sodium sulphate	t	184 035 <sup>r</sup>	346 607	53.1 <sup>r</sup>	144 287	334 959	43.1	132 411	281 246	47.1
Sulphur	t	1 017 273	6 611 933	15.4	917 869 <sup>r</sup>	6 929 014	13.2 <sup>r</sup>	924 906	7 262 241	12.7
Talc, etc.	t	70 004	130 861	53.5	65 682 <sup>r</sup>	114 898	57.2 <sup>r</sup>	72 421	113 270	63.9
FUELS										
Coal	000 t	49 039	68 332	71.8	50 280	71 133	70.7	51 012	65 612	77.7
Crude oil <sup>4</sup>	000 m <sup>3</sup>	90 207	90 279	99.9	84 359	89 788	94.0	81 364	93 256	87.2
Natural gas <sup>5</sup>	million m <sup>3</sup>	50 565	98 771	51.2	49 983	105 244	47.5	50 685	116 664	43.4

Sources: Natural Resources Canada; Statistics Canada.

— Nil; .. Not available; P Preliminary; r Revised; x Confidential.

<sup>1</sup> Consumption of primary aluminum ingot and alloys, secondary ingot and scrap, reported by consumers. <sup>2</sup> Consumption defined as domestic shipments of refined copper plus imports of refined copper. <sup>3</sup> Consumption of primary and secondary refined metal. <sup>4</sup> Consumption defined as refinery receipts. <sup>5</sup> Consumption defined as domestic sales.

Notes: Unless otherwise stated, consumption refers to reported consumption of refined metals or nonmetallic minerals by consumers. Production of metals, in most cases, refers to production in all forms, and includes the recoverable content of ores, concentrates, matte, etc., and metal content of primary products recoverable at domestic smelters and refineries. Production of nonmetals refers to producers' shipments. For fuels, production is equivalent to actual output less waste.

**TABLE 13. CANADA, PRINCIPAL STATISTICS OF THE MINERAL INDUSTRY, 1 1991**

	Establish- ments	Mining Activity							Total Activity <sup>2</sup>		
		Production and Related Workers			Costs		Value of Production	Value Added	Employees	Salaries and Wages	Value Added
		Employees	Person- Hours Paid	Wages	Fuel and Electricity	Materials and Supplies					
	(number)	(number)	(000)	(\$000)	(\$000)	(\$000)	(\$000)	(\$000)	(number)	(\$000)	(\$000)
<b>METALS</b>											
Nickel-copper-zinc	27	13 454	30 194	690 877	246 507	1 912 099	4 898 042	2 739 436	18 634	980 522	2 772 333
Gold	60	8 563	18 555	463 010	139 954	546 017	2 228 023	1 542 051	10 869	594 521	1 543 209
Iron	5	4 230	9 257	239 064	162 588	397 999	1 226 507	665 920	5 683	327 029	674 318
Uranium	5	1 924	3 828	93 853	43 372	69 375	609 045	496 298	2 391	130 846	495 795
Silver-lead-zinc	12	2 167	4 994	106 737	57 670	475 175	978 570	445 726	3 459	176 256	446 009
Miscellaneous metal mines <sup>3</sup>	5	830	1 839	33 712	17 607	51 990	154 812	85 215	1 056	44 382	87 220
<b>Total</b>	<b>114</b>	<b>31 168</b>	<b>68 666</b>	<b>1 627 254</b>	<b>667 698</b>	<b>3 452 655</b>	<b>10 094 999</b>	<b>5 974 646</b>	<b>42 092</b>	<b>2 253 556</b>	<b>6 018 884</b>
<b>INDUSTRIALS</b>											
Potash	11	2 854	6 292	120 649	106 277	134 869	988 361	747 215	3 825	172 675	745 379
Stone	118	2 080	4 756	73 171	31 679	90 474	386 445	264 292	2 774	101 872	268 870
Miscellaneous nonmetals <sup>4</sup>	34	1 686	3 643	63 692	30 446	57 674	345 556	257 435	2 409	96 105	256 748
Sand and gravel	122	1 564	3 647	52 859	25 254	74 841	313 472	213 376	2 252	77 813	218 755
Asbestos	5	1 769	3 790	72 591	32 269	57 080	273 954	184 604	2 423	107 260	190 147
Peat	51	1 229	2 747	27 723	6 280	30 713	131 783	94 790	1 519	36 823	97 044
Gypsum	10	517	1 205	16 826	6 975	15 511	66 981	44 496	636	21 873	44 145
<b>Total</b>	<b>351</b>	<b>11 699</b>	<b>26 080</b>	<b>427 512</b>	<b>239 180</b>	<b>461 163</b>	<b>2 506 551</b>	<b>1 806 208</b>	<b>15 838</b>	<b>614 421</b>	<b>1 821 088</b>
<b>FUELS</b>											
Oil, crude and natural gas	674	8 724	17 670	480 966	383 096	1 504 989	16 092 573	14 204 488	31 450	1 940 737	14 423 165
Coal	30	9 253	18 711	444 628	136 675	438 531	1 767 063	1 191 857	11 237	554 597	1 211 927
<b>Total</b>	<b>704</b>	<b>17 977</b>	<b>36 381</b>	<b>925 594</b>	<b>519 771</b>	<b>1 943 520</b>	<b>17 859 636</b>	<b>15 396 345</b>	<b>42 687</b>	<b>2 495 334</b>	<b>15 635 092</b>
<b>Total mineral industry</b>	<b>1 169</b>	<b>60 844</b>	<b>131 127</b>	<b>2 980 360</b>	<b>1 426 650</b>	<b>5 857 338</b>	<b>30 461 187</b>	<b>23 177 199</b>	<b>100 617</b>	<b>5 363 311</b>	<b>23 475 063</b>

Sources: Natural Resources Canada; Statistics Canada.

<sup>1</sup> Cement manufacturing, lime manufacturing, clay and clay products (domestic clays) are included in the mineral manufacturing industry. <sup>2</sup> Total activity includes sales and head offices.

<sup>3</sup> Includes molybdenum. <sup>4</sup> Includes salt.

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

TABLE 14. CANADA, PRINCIPAL STATISTICS OF THE MINERAL MANUFACTURING INDUSTRIES, 1991

	Establish- ments	Mineral Manufacturing Activity							Total Activity <sup>1</sup>		
		Production and Related Workers			Costs		Value of Shipments	Value Added	Employees	Salaries and Wages	Value Added
		Employees	Person- Hours Paid	Wages	Fuel and Electricity	Materials and Supplies					
	(number)	(number)	(000)	(\$000)	(\$000)	(\$000)	(\$000)	(\$000)	(number)	(\$000)	(\$000)
<b>PRIMARY METAL INDUSTRIES</b>											
Smelting and refining	36	20 006	43 798	954 933	594 819	2 767 593	5 873 880	2 515 718	28 817	1 424 983	2 544 680
Primary steel	63	29 282	61 677	1 277 185	522 127	3 794 421	6 826 510	2 472 013	38 126	1 735 019	2 466 248
Wire and wire products industries <sup>2</sup>	274	9 552	19 841	281 946	40 141	875 134	1 550 156	620 143	12 369	397 305	656 795
Steel pipe and tube	48	4 458	9 325	169 698	20 085	1 026 188	1 590 376	537 988	5 618	224 167	537 451
Iron foundries	84	6 537	13 802	253 240	65 467	342 781	897 381	484 206	7 680	311 277	489 632
Aluminum rolling, casting and extruding	64	4 007	8 843	148 799	32 053	1 034 703	1 473 404	393 939	5 169	210 410	392 016
Metal rolling, casting and extruding n.e.s.	100	4 008	8 409	128 132	25 450	446 666	775 754	299 456	4 710	161 598	297 277
Copper and alloy rolling, casting and extruding	43	1 840	3 788	58 503	12 920	261 678	413 888	140 803	2 211	76 566	140 619
Total	712	79 690	169 483	3 272 436	1 313 062	10 549 164	19 401 349	7 464 266	104 700	4 541 325	7 524 718
<b>NONMETALLIC MINERAL PRODUCTS INDUSTRIES</b>											
Ready-mix concrete	658	9 526	20 146	297 317	65 838	964 443	1 672 825	646 957	11 633	379 778	660 234
Cement	21	1 964	4 247	85 405	138 030	152 132	746 276	465 054	3 111	140 662	476 565
Glass products	155	4 747	9 917	142 099	18 727	260 224	586 880	307 642	5 660	178 557	357 377
Primary glass and glass containers	19	4 129	8 631	137 082	50 495	159 064	498 267	280 526	5 195	187 587	300 937
Mineral insulating products	42	1 989	4 244	64 048	33 160	146 058	401 845	220 404	2 956	111 300	287 532
Other concrete products	267	4 227	8 874	107 295	20 113	224 446	486 709	239 719	4 993	138 116	253 240
Structural concrete products	58	2 505	5 284	81 332	5 361	96 118	291 904	185 706	3 101	105 011	184 016
Other nonmetallic mineral products	158	2 710	5 700	72 795	12 709	116 320	296 505	174 310	3 206	91 413	180 598
Refractory products	29	1 154	2 369	34 953	6 677	73 837	197 608	111 912	1 668	56 885	127 254
Gypsum products	29	1 137	2 392	39 624	22 791	163 983	295 661	108 831	1 711	64 357	117 435
Concrete pipe	41	1 049	2 329	33 975	5 499	61 858	172 788	100 373	1 348	46 691	105 177
Lime	13	647	1 368	26 301	39 218	28 229	168 954	102 124	861	37 824	103 324
Abrasives	30	1 046	2 205	31 193	33 442	84 230	205 922	86 895	1 408	46 402	100 196
Clay products (domestic)	28	730	1 533	21 512	14 983	14 808	106 749	69 693	1 036	33 546	71 139
Clay products (imported)	39	1 032	2 089	26 348	5 827	32 871	105 473	67 237	1 218	33 681	69 290
Asbestos products industry	6	164	377	4 442	380	8 191	17 220	8 099	229	7 031	9 702
Total	1 593	38 756	81 707	1 205 721	473 250	2 586 812	6 251 586	3 175 482	49 334	1 658 841	3 404 016

# **FABRICATED METAL PRODUCTS INDUSTRIES**

Stamped and pressed metal products industries	963	24 932	52 724	713 004	84 394	2 158 718	3 950 549	1 682 420	30 348	927 153	1 750 726
Fabricated structural metal products industries	469	15 099	31 248	490 799	31 392	1 079 018	2 235 906	1 117 521	18 667	637 978	1 136 528
Hardware, tool and cutlery industry	815	19 559	40 873	591 512	31 303	584 874	1 660 346	1 035 594	21 912	688 310	1 064 639
Other metal fabricating industries	596	13 087	27 357	372 422	38 821	995 685	2 001 972	962 543	16 770	516 627	1 007 093
Machine shop industry	1 564	21 198	44 121	593 473	40 440	553 048	1 493 641	901 720	23 092	656 780	923 203
Ornamental and architectural metal products industries	784	15 966	32 888	415 224	27 419	1 026 021	1 961 590	895 119	19 885	566 788	915 900
Power boiler and heat exchanger industry	42	3 211	6 908	120 381	6 559	235 636	568 003	286 955	5 081	199 180	297 021
Heating equipment industry	142	4 265	8 861	101 613	6 657	251 630	502 269	243 906	5 246	136 042	248 245
<b>Total</b>	<b>5 375</b>	<b>117 317</b>	<b>244 980</b>	<b>3 398 428</b>	<b>266 985</b>	<b>6 884 630</b>	<b>14 374 276</b>	<b>7 125 778</b>	<b>141 001</b>	<b>4 328 858</b>	<b>7 343 355</b>

# **PETROLEUM AND COAL PRODUCTS INDUSTRIES**

Petroleum refining products	33	5 582	11 713	301 828	382 237	14 248 136	17 512 636	2 234 534	12 459	680 969	2 227 092
Lubricating oils and greases	28	649	1 426	23 076	6 558	181 595	275 000	85 990	1 046	40 154	99 683
Other petroleum and coal products	79	789	1 677	24 992	14 052	178 412	278 799	83 375	1 138	38 705	99 586
<b>Total</b>	<b>140</b>	<b>7 020</b>	<b>14 815</b>	<b>349 896</b>	<b>402 847</b>	<b>14 608 143</b>	<b>18 066 435</b>	<b>2 403 899</b>	<b>14 643</b>	<b>759 828</b>	<b>2 426 361</b>
<b>Total mineral manufacturing industries</b>	<b>7 820</b>	<b>242 783</b>	<b>510 984</b>	<b>8 226 481</b>	<b>2 456 144</b>	<b>34 628 749</b>	<b>58 093 646</b>	<b>20 169 425</b>	<b>309 678</b>	<b>11 288 852</b>	<b>20 698 450</b>

Source: Statistics Canada, Catalogue no. 31-203.

n.e.s. Not elsewhere specified.

1 Total activity includes sales and head offices. 2 Wire and wire products have been included in the primary metal industries group.

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

**TABLE 15. CANADA, EMPLOYMENT IN THE MINERAL INDUSTRY, STAGE I – MINERAL EXTRACTION AND CONCENTRATING (TOTAL ACTIVITY),<sup>1</sup> 1961-93**

	Metal Mines	Nonmetal Mines	Structural Materials	Nonfuel Mining	Coal	Crude Oil and Natural Gas	Total Nonfuel and Fuel
SIC no.	061	062	081, 082	061, 062 081, 082	063	071	
				(number)			
1961	58 591	11 003	5 235	74 829	10 302	11 184	96 315
1962	58 243	11 408	5 514	75 165	9 897	11 232	96 294
1963	57 119	11 661	5 686	74 466	9 828	11 237	95 531
1964	57 648	11 727	6 044	75 419	9 796	11 242	96 457
1965	60 942	12 116	6 248	79 306	9 697	11 817	100 820
1966	61 670	12 422	6 312	80 404	9 281	12 378	102 063
1967	61 728	13 077	5 779	80 584	8 981	13 113	102 678
1968	63 369	13 673	5 836	82 878	8 427	13 611	104 916
1969	60 550	14 322	5 692	80 564	7 371	14 153	102 088
1970	66 590	15 150	5 510	87 250	7 874	14 970	110 094
1971	66 012	15 105	5 328	86 445	8 069	15 896	110 410
1972	61 994	14 866	5 154	82 014	8 704	16 604	107 322
1973	66 134	15 391	5 276	86 801	7 856	16 786	111 443
1974	70 038	16 198	6 197	92 433	8 142	18 155	118 730
1975	69 161	13 703	6 382	89 246	8 416	18 053	115 715
1976	68 269	15 649	5 685	89 603	8 995	19 096	117 694
1977	67 242	16 608	5 190	89 040	9 781	20 240	119 061
1978	56 447	16 035	4 847	77 329	10 574	22 045	109 948
1979	58 960	16 770	4 692	80 422	10 269	24 554	115 245
1980	66 118	16 979	4 461	87 558	11 416	27 448	126 422
1981	68 712	16 391	4 183	89 286	11 182	28 783	129 251
1982	61 503	13 680	3 491	78 674	13 113	31 699	123 486
1983	52 194	13 170	3 403	68 767	11 646	33 418	113 831
1984	52 683	13 698	3 560	69 941	11 905	33 944	115 790
1985	48 672	12 974	3 941	65 587	12 076	38 720	116 383
1986	46 487	12 376	4 887	63 750	10 747	34 936	109 433
1987	45 496	12 181	5 738	63 415	10 406	33 855	107 676
1988	48 277	11 679	5 917	65 873	11 122	33 762	110 757
1989	49 405	11 714	5 881	67 000	11 279	32 696	110 975
1990	45 248	11 515	5 376	62 139	11 406 <sup>r</sup>	31 926	105 471
1991	42 092	10 812	5 026	57 930	11 237	31 450	100 617
1992 <sup>p</sup>	37 774	10 306	4 305	52 385	8 964 <sup>f</sup>	28 433	89 782
1993 <sup>f</sup>	34 968	10 279	4 260	49 507	7 800	23 137	80 444

Sources: Natural Resources Canada; Statistics Canada.

SIC: Standard Industrial Classification, 1980.

<sup>f</sup> Forecast; <sup>p</sup> Preliminary; <sup>r</sup> Revised.<sup>1</sup> Total activity includes sales and head offices.

**TABLE 16. CANADA, EMPLOYMENT IN THE NON-FUEL MINERAL INDUSTRY, STAGE I - MINERAL EXTRACTION AND CONCENTRATING (TOTAL ACTIVITY),<sup>1</sup> 1961-93**

	Gold	Uranium	Iron	Nickel, Copper, Zinc	Silver, Lead, Zinc	Other Nonferrous	Asbestos	Peat	Gypsum	Potash	Other Nonmetal	Stone Quarries	Sand and Gravel	Total Nonfuel Mining
SIC no.	0611	0616	0617	0612, 0613	0614	0615, 0619	0621	0622	0623	0624	0625, 0629	081	082	
						(number)								
1961	15 994	(2)	8 446	23 351	4 524	6 276	6 773	1 207	599	(3)	2 424	3 173	2 062	74 829
1962	15 425	(2)	9 181	23 383	4 669	5 585	6 936	1 220	594	(3)	2 658	3 221	2 293	75 165
1963	14 639	(2)	9 608	22 703	5 163	5 006	6 828	1 303	677	(3)	2 853	3 477	2 209	74 466
1964	14 012	(2)	9 544	23 848	5 898	4 346	6 544	1 290	710	(3)	3 183	3 718	2 326	75 419
1965	13 155	(2)	11 739	25 892	6 121	4 035	6 536	1 201	646	1 050	2 683	3 511	2 737	79 306
1966	11 656	(2)	11 464	27 651	6 356	4 543	6 736	1 254	585	1 195	2 652	3 701	2 611	80 404
1967	10 355	(2)	10 899	29 288	6 030	5 156	6 931	1 261	505	1 724	2 656	3 381	2 398	80 584
1968	9 001	(2)	11 342	30 557	6 320	6 149	7 213	1 306	489	2 086	2 579	3 340	2 496	82 878
1969	8 221	(2)	10 490	28 679	6 467	6 693	7 242	1 156	657	2 713	2 554	3 252	2 440	80 564
1970	7 185	(2)	11 336	36 253	7 103	4 713	7 664	1 195	671	2 837	2 783	3 023	2 487	87 250
1971	6 148	(2)	11 524	37 713	6 506	4 121	8 101	1 269	603	2 519	2 613	2 832	2 496	86 445
1972	5 579	(2)	10 842	36 012	6 057	3 504	7 843	1 114	670	2 440	2 799	2 803	2 351	82 014
1973	5 603	(2)	13 395	37 602	6 112	3 422	8 027	1 236	676	2 684	2 768	3 097	2 179	86 801
1974	5 665	(2)	15 019	38 876	6 722	3 756	8 131	1 288	671	3 224	2 884	3 458	2 739	92 433
1975	5 798	(2)	16 155	35 538	7 362	4 308	6 042	1 303	576	3 351	2 431	3 544	2 838	89 246
1976	5 051	3 430	16 765	34 049	7 351	1 623	7 900	1 168	591	3 270	2 720	3 217	2 468	89 603
1977	4 643	4 140	15 550	33 703	7 512	1 694	8 302	1 244	652	3 628	2 782	3 004	2 186	89 040
1978	4 943	4 965	12 103	25 610	7 073	1 753	7 752	1 295	683	3 708	2 597	2 876	1 971	77 329
1979	5 013	5 858	14 563	25 116	7 081	1 329	8 067	1 372	738	3 905	2 688	2 860	1 832	80 422
1980	5 839	6 304	13 753	31 063	7 349	1 810	8 055	1 308	715	4 160	2 741	2 660	1 801	87 558
1981	6 809	6 869	12 397	33 246	7 740	1 651	6 829	1 441	711	4 661	2 749	2 418	1 765	89 286
1982	7 350	6 035	10 676	28 851	6 837	1 754	4 973	1 323	614	4 076	2 694	2 028	1 463	78 674
1983	7 956	5 390	8 236	24 953	5 073	586	4 617	1 301	682	3 696	2 874	1 980	1 423	68 767
1984	8 450	6 249	7 843	24 000	5 165	976	4 177	1 369	770	4 508	2 874	2 256	1 304	69 941
1985	7 862	5 989	7 077	22 073	4 724	947	3 569	1 363	753	4 488	2 801	2 340	1 601	65 587
1986	8 562	5 608	6 379	20 616	4 162	1 160	2 766	1 468	990	4 315	2 837	2 627	2 260	63 750
1987	9 757	5 289	6 039	18 979	4 372	1 060	2 858	1 510	929	4 094	2 790	2 911	2 827	63 415
1988	12 594	5 103	6 095	18 881	4 443	1 161	2 720	1 581	956	3 970	2 452	2 981	2 936	65 873
1989	12 631	4 839	6 303	19 837	4 487	1 308	2 800	1 713	965	3 893	2 343	3 145	2 736	67 000
1990	11 807	3 702	5 820	19 104	3 727	1 088	2 699	1 740	786	3 822	2 468	2 951	2 425	62 139
1991	10 869	2 391	5 683	18 634	3 459	1 056	2 423	1 519	636	3 825	2 409	2 774	2 252	57 930
1992 <sup>p</sup>	9 403	1 702	5 090	17 128	3 664	787	2 289	1 335	672	3 779	2 231	2 463	1 842	52 385
1993 <sup>f</sup>	8 705 <sup>pr</sup>	1 576 <sup>pr</sup>	4 860(4)	15 707 <sup>pr</sup>	3 392 <sup>pr</sup>	729 <sup>pr</sup>	2 283 <sup>pr</sup>	1 332 <sup>pr</sup>	670 <sup>pr</sup>	3 769 <sup>pr</sup>	2 225 <sup>pr</sup>	2 435(4)	1 825(4)	49 507

Sources: Natural Resources Canada; Statistics Canada.

SIC: Standard Industrial Classification, 1980.

<sup>f</sup> Forecast; <sup>p</sup> Preliminary; <sup>pr</sup> Pro-rated.

<sup>1</sup> Total activity includes sales and head offices. (2) Included in "Other Nonferrous." (3) Included in "Other Nonmetal." (4) Estimated by Natural Resources Canada.

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



**TABLE 17. CANADA, EMPLOYMENT IN THE MINERAL INDUSTRY, STAGE II – SMELTING AND REFINING (TOTAL ACTIVITY),<sup>1</sup> 1961-93**

	Smelting/ Refining	Iron and Steel Mills	Total Primary Metals	Petroleum Refineries	Total Smelting and Refining
SIC no.	295	291	291, 295 (number)	3611	
1961	29 938	34 749	64 687	10 660	75 347
1962	29 693	36 593	66 286	10 184	76 470
1963	28 516	38 196	66 712	9 734	76 446
1964	30 153	41 505	71 658	9 547	81 205
1965	31 835	44 274	76 109	8 976	85 085
1966	34 237	45 999	80 236	8 996	89 232
1967	34 764	44 203	78 967	9 147	88 114
1968	34 710	44 634	79 344	9 091	88 435
1969	33 376	42 954	76 330	8 765	85 095
1970	37 298	49 169	86 467	14 725	101 192
1971	36 445	49 601	86 046	14 506	100 552
1972	33 829	49 758	83 587	14 376	97 963
1973	32 396	53 008	85 404	14 843	100 247
1974	35 249	54 253	89 502	15 967	105 469
1975	35 577	54 003	89 580	15 624	105 204
1976	34 246	51 978	86 224	15 105	101 329
1977	35 647	52 709	88 356	16 464	104 820
1978	32 652	56 669	89 321	18 958	108 279
1979	32 869	59 167	92 036	18 037	110 073
1980	36 137	61 238	97 375	18 743	116 118
1981	38 011	56 543	94 554	21 325	115 879
1982	33 215	52 330	85 545	20 155	105 700
1983	31 788	47 693	79 481	17 557	97 038
1984	31 752	48 899	80 651	15 847	96 498
1985	30 567	47 685	78 252	15 326	93 578
1986	29 058	46 461	75 519	13 287	88 806
1987	29 397	46 493	75 890	13 252	89 142
1988	30 099	48 259	78 358	13 358	91 716
1989	30 651	46 738	77 389	13 881	91 270
1990	30 573	39 120	69 693	13 842	83 535
1991	28 817 <sup>a</sup>	38 126	66 943 <sup>a</sup>	12 573	79 516
1992 <sup>e</sup>	25 999 <sup>a</sup>	35 430	61 430 <sup>a</sup>	12 223	73 653
1993 <sup>f</sup>	27 232 <sup>a</sup>	33 325	60 557 <sup>a</sup>	9 703	70 260

Sources: Natural Resources Canada; Statistics Canada.

SIC: Standard Industrial Classification, 1980.

<sup>e</sup> Estimated; <sup>f</sup> Forecast.<sup>a</sup> Change is partially due to the reclassification of a unit from SIC 295 to SIC 296 effective May 1991.<sup>1</sup> Total activity includes sales and head offices.

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

**TABLE 18. CANADA, EMPLOYMENT IN THE MINERAL INDUSTRY, STAGE III – SEMI-FABRICATION (TOTAL ACTIVITY),<sup>1</sup> 1961-93**

	Total Nonfuel Semi-Fabrication	Miscellaneous Petroleum and Coal Products	Lubricating Oil and Greases	Total Semi-Fabrication
SIC no. <sup>2</sup>		369	3612	
	(number)			
1961	77 063	581	331	77 975
1962	80 606	608	352	81 566
1963	82 420	635	354	83 409
1964	87 843	726	373	88 942
1965	93 912	531	408	94 851
1966	98 602	585	424	99 611
1967	96 033	546	407	96 986
1968	96 375	518	397	97 290
1969	99 438	532	438	100 408
1970	96 144	499	423	97 066
1971	95 831	561	450	96 842
1972	101 109	555	478	102 142
1973	105 884	757	487	107 128
1974	109 818	954	514	111 286
1975	104 296	984	656	105 936
1976	103 411	982	602	104 995
1977	101 257	716	669	102 642
1978	107 234	683	712	108 629
1979	111 231	461	695	112 387
1980	105 902	532	798	107 232
1981	103 192	584	729	104 505
1982	90 194	571	792	91 557
1983	86 814	503	857	88 174
1984	91 405	521	896	92 822
1985	94 515	513	900	95 928
1986	96 744	778	1 001	98 523
1987	99 963	894	1 002	101 859
1988	103 307	1 161	1 091	105 559
1989	101 419	1 135	1 029	103 583
1990	94 544	1 000	1 026pr	96 570
1991	87 091	1 138	932pr	89 161
1992 <sup>e</sup>	85 079	1 222	906pr	87 208
1993 <sup>f</sup>	82 806	1 342	727pr	84 875

Sources: Natural Resources Canada; Statistics Canada.

<sup>e</sup> Estimated; <sup>f</sup> Forecast; pr Prorated.<sup>1</sup> Includes sales and head offices. <sup>2</sup> 1970 Standard Industrial Classification for years 1961-82.

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

TABLE 19. CANADA, EMPLOYMENT IN THE MINERAL INDUSTRY, STAGE III – NON-FUEL SEMI-FABRICATION (TOTAL ACTIVITY),<sup>1</sup> 1961-93

SIC no.	Steel Pipe and Tube	Iron Foundries	Aluminum Rolling, Casting, Extruding	Copper Rolling, Casting, Extruding	Other Rolling, Casting, Extruding	Wire and Wire Products	Clay and Clay Products	Cement	Concrete Products	Ready-Mix Concrete	Glass and Glass Products <sup>2</sup>	Abrasives	Lime	Other Non- metallic Products	Total Nonfuel Semi- Fabrication
	292	294	296	297	299	305	351	352	354	355	356	357	358	359	
	(number)														
1961	3 407	8 178	5 095	3 482	2 731	12 227	5 327	3 590	8 503	4 232	9 802	2 481	847	7 161	77 063
1962	3 676	8 546	5 118	3 492	2 770	13 045	5 468	3 679	9 156	4 886	10 042	2 577	949	7 202	80 606
1963	3 840	8 216	5 164	3 651	3 038	13 743	5 376	3 566	9 317	5 411	10 346	2 464	886	7 402	82 420
1964	4 437	9 620	4 834	3 849	3 382	14 850	5 582	3 592	10 225	6 171	10 362	2 580	815	7 544	87 843
1965	4 799	11 714	4 654	3 620	3 736	16 099	5 675	3 837	10 988	6 559	10 873	2 821	800	7 737	93 912
1966	4 795	13 027	4 943	4 199	4 103	16 391	5 876	4 053	11 090	7 349	11 248	3 044	785	7 699	98 602
1967	5 012	11 970	5 468	4 027	4 287	16 060	5 559	3 972	10 321	7 137	11 388	2 734	724	7 374	96 033
1968	5 441	11 131	5 491	3 947	4 585	16 082	5 515	3 747	10 166	7 440	11 992	2 617	662	7 559	96 375
1969	5 146	11 582	6 028	3 922	4 856	17 014	5 383	3 778	11 011	7 509	12 031	2 697	707	7 774	99 438
1970	5 314	10 663	6 297	3 744	4 060	16 598	4 938	3 887	9 562	7 340	11 654	2 559	660	8 868	96 144
1971	5 306	9 897	5 612	3 608	3 845	16 272	4 682	3 954	10 719	7 997	11 672	2 310	670	9 287	95 831
1972	6 268	9 948	6 200	3 740	4 215	17 651	4 695	4 732	10 817	8 240	12 045	2 367	651	9 540	101 109
1973	5 288	10 965	6 206	3 736	4 863	18 877	5 001	4 871	10 790	9 233	12 840	2 555	724	9 935	105 884
1974	5 845	12 054	6 162	3 779	4 877	19 535	5 289	4 666	11 602	9 219	12 915	2 676	840	10 359	109 818
1975	5 785	11 480	5 672	3 240	4 573	17 614	5 042	4 577	11 201	9 541	11 779	2 318	790	10 684	104 296
1976	5 546	10 365	6 255	3 297	5 354	17 573	4 791	4 517	10 773	9 128	11 836	2 535	804	10 637	103 411
1977	5 634	10 459	6 884	3 183	4 703	17 886	4 553	4 265	10 001	8 521	11 204	2 557	828	10 579	101 257
1978	6 289	10 472	7 060	3 586	5 268	18 823	4 366	4 520	10 486	9 520	11 595	2 678	784	11 787	107 234
1979	6 480	10 520	7 698	3 728	6 292	19 765	4 947	4 828	9 766	9 332	11 835	2 660	925	12 455	111 231
1980	6 514	9 245	6 627	3 230	5 749	18 529	4 875	4 791	9 280	9 348	11 967	2 628	1 003	12 116	105 902
1981	7 531	8 358	6 512	3 031	5 182	17 309	4 145	4 726	9 121	10 053	12 003	2 571	968	11 682	103 192
1982	6 017	8 163	6 255	2 541	4 694	14 575	3 004	4 317	8 245	8 034	11 016	2 170	895	10 268	90 194
1983	4 521	7 364	6 415	2 744	4 827	13 493	3 008	4 057	7 286	8 390	11 896	1 852	862	10 099	86 814
1984	5 482	7 911	6 661	2 971	5 274	14 212	3 070	3 771	7 657	8 802	12 754	1 949	876	10 015	91 405
1985	5 978	7 750	6 196	3 012	5 620	15 354	2 727	3 533	8 336	9 210	12 872	1 895	783	11 249	94 515
1986	4 829	7 547	6 200	3 059	6 357	15 262	3 770	3 514	9 174	10 422	13 448	1 827	778	10 557	96 744
1987	4 964	7 860	6 143	2 828	6 403	14 943	3 930	3 646	10 309	11 910	13 605	1 693	784	10 945	99 963
1988	6 008	8 095	6 124	3 040	7 049	15 154	3 261	3 388	11 386	12 461	13 336	1 917	873	11 215	103 307
1989	5 438	7 538	6 285	3 119	6 645	15 077	3 044	3 350	11 505	12 377	12 664	2 039	871	11 467	101 419
1990	5 319	8 397	5 463	2 316	5 479	12 965	2 563	3 259	10 627	12 798	11 733	1 837	836	10 952	94 544
1991	5 618	7 680	5 169 <sup>a</sup>	2 211	4 710	12 369	2 254	3 111	9 442	11 633	10 855	1 408	861	9 770	87 091
1992 <sup>a</sup>	5 325	7 090	5 766 <sup>a</sup>	2 026	5 014	12 908	2 110	2 969	8 458	12 097	8 991	1 149	944	10 232	85 079
1993 <sup>f</sup>	5 265	7 667	5 578 <sup>a</sup>	2 042	6 029	12 547	1 961	2 258	7 130	11 285	9 480	926	1 022	9 615	82 806

Sources: Natural Resources Canada; Statistics Canada.

SIC: 1980 Standard Industrial Classification.

• Estimated; † Forecast.

<sup>a</sup> Increase is primarily due to the reclassification of an establishment from SIC 295 to SIC 296 effective May 1991.<sup>1</sup> Includes sales and head offices. <sup>2</sup> Includes sealed window manufacturers until 1969; thereafter, these are included in Stage IV – Ornamental Metal Products.

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

**TABLE 20. CANADA, EMPLOYMENT IN THE MINERAL INDUSTRY, STAGE IV – METALLIC MINERAL MANUFACTURING (TOTAL ACTIVITY),<sup>1</sup> 1961-93**

	Boilers	Structural Metal Products	Ornamental Metal Products	Stamped, Pressed and Coated Products	Hardware Tool and Cutlery	Heating Equipment	Machine Parts	Other Metal Fabricating	Total Mineral Manufacturing
SIC no.	301	302	303	304	306	307	308	309	
					(number)				
1961	4 709	14 231	10 641	21 156	9 135	5 137	7 756	15 249	88 014
1962	4 886	14 802	11 640	23 606	10 223	5 349	8 603	16 283	95 392
1963	5 350	14 212	12 459	24 024	11 112	5 586	9 179	16 627	98 549
1964	5 429	14 602	12 808	25 192	13 110	5 673	10 137	18 088	105 039
1965	6 496	18 072	13 439	27 925	13 570	5 711	11 618	20 017	116 848
1966	7 239	21 038	13 488	29 577	14 326	5 464	13 235	21 431	125 798
1967	6 622	18 547	12 994	29 830	14 056	5 461	13 810	21 007	122 327
1968	7 962	17 150	12 664	29 560	14 166	4 930	13 501	20 825	120 758
1969	7 494	18 203	12 784	30 463	14 401	5 059	14 517	20 895	123 816
1970	7 661	19 104	12 417	29 709	15 241	4 670	14 221	20 543	123 566
1971	7 847	17 556	12 614	28 710	14 920	4 749	13 097	20 755	120 248
1972	8 136	17 113	13 611	27 939	16 386	4 238	11 731	21 504	120 658
1973	8 013	18 164	13 937	30 026	18 819	4 453	10 138	22 494	126 044
1974	8 681	20 020	14 470	31 276	20 234	4 930	10 936	23 663	134 210
1975	10 211	19 101	15 241	30 273	18 990	4 717	10 922	23 810	133 265
1976	10 704	18 056	15 541	31 487	19 316	4 977	10 764	23 704	134 549
1977	9 660	17 209	14 800	30 888	17 867	4 538	10 762	23 298	129 022
1978	9 124	16 759	16 753	34 181	18 856	5 086	12 029	24 904	137 692
1979	9 477	18 676	18 018	33 548	21 090	5 818	13 081	23 705	143 413
1980	10 374	17 700	17 890	32 266	20 830	5 993	13 449	24 217	142 719
1981	11 215	18 445	17 603	32 459	19 575	5 806	14 297	22 123	141 523
1982	10 965	17 021	15 228	29 865	17 342	5 317	13 083	18 167	126 988
1983	5 413	18 437	13 537	27 947	16 609	5 032	12 881	16 044	115 900
1984	4 548	17 162	13 538	27 758	17 308	4 220	14 200	16 256	114 990
1985	4 455	18 083	15 598	31 021	19 297	5 607	15 356	14 927	124 344
1986	4 990	19 213	17 462	31 584	21 164	5 779	17 259	15 170	132 621
1987	4 816	18 615	19 770	35 329	22 129	6 252	18 398	16 358	141 667
1988	6 182	19 689	20 795	36 976	23 042	6 390	22 681	17 887	153 642
1989	5 407	23 006	22 591	36 707	25 626	7 076	24 639	20 099	165 151
1990	5 234	21 277	21 075	33 665	22 475	6 112	24 271	19 298	153 407
1991	5 081	18 667	19 885	30 348	21 912	5 246	23 092	16 770	141 001
1992 <sup>e</sup>	4 907	18 174	18 654	24 329	26 202	5 300	23 997	17 505	139 067
1993 <sup>f</sup>	5 213	17 195	17 760	22 397	21 977	5 466	24 397	19 869	134 274

Sources: Natural Resources Canada; Statistics Canada.

SIC: Standard Industrial Classification, 1980.

<sup>e</sup> Estimated; <sup>f</sup> Forecast.

<sup>1</sup> Total activity includes sales and head offices.

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

**TABLE 21. CANADA, EMPLOYMENT FOR SERVICES INCIDENTAL TO MINES, QUARRIES AND OIL WELLS, 1961-93<sup>1</sup>**

	Petroleum and Natural Gas Contract Drilling	Mining Diamond Drilling	Other Services Incidental to Mines, Quarries and Oil Wells	Total
	(number)			
1961	4 144	2 025	1 409	7 578
1962	3 800	1 926	1 720	7 446
1963	4 179	2 201	1 491	7 871
1964	4 158	2 401	2 077	8 636
1965	4 648	2 776	3 137	10 561
1966	4 428	2 887	4 317	11 632
1967	4 249	2 669	5 425	12 343
1968	4 434	2 985	6 350	13 769
1969	4 821	3 109	6 967	14 897
1970	4 267	3 207	7 894	15 368
1971	4 093	2 514	7 710	14 317
1972	4 817	2 083	6 139	13 039
1973	5 680	2 123	5 193	12 996
1974	5 054	2 317	5 017	12 388
1975	5 096	1 899	4 139	11 134
1976	5 486	1 548	5 043	12 077
1977	6 054	1 682	5 723	13 459
1978	7 419	1 681	7 492	16 592
1979	9 076	2 420	8 436	19 932
1980	11 097	2 959	9 327	23 383
1981	8 448	2 721	9 856	21 025
1982	6 882	1 880	7 752	16 514
1983	12 032	1 575	12 254	25 861
1984	27 059	1 684	10 602	39 345
1985	30 146	1 625	12 191	43 962
1986	25 290	2 198	11 582	39 069
1987	24 527	3 353	11 174	39 054
1988	26 216	3 201	12 384	41 801
1989	23 513	2 072	11 052	36 637
1990	22 779	1 848	9 540	34 166
1991	24 058	1 395	8 606	34 059
1992 <sup>p</sup>	18 527	1 115	6 995	26 636
1993 <sup>f</sup>	19 450	1 115	6 785	27 350

Sources: Natural Resources Canada; Statistics Canada.

SIC: Standard Industrial Classification, 1980.

<sup>f</sup> Forecast; <sup>p</sup> Preliminary.

<sup>1</sup> From 1961 to 1983, Petroleum and Natural Gas Contract Drilling included SIC Code 0911, Mining Diamond Drilling included SIC Code 0921, and Other Services Incidental to Mines, Quarries and Oil Wells included both SIC Codes 0919 and 0929. For data beginning in the year 1984, these series changed. Petroleum and Natural Gas Contract Drilling includes both SIC Codes 0911 and 0919, Mining Diamond Drilling includes SIC Code 0921, and Other Services Incidental to Mines and Quarries (excluding Oil Wells) includes SIC Code 0929 only.

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

