General Review

Mike McMullen and Greig Birchfield

Mike McMullen is a Consulting Mineral Economist and Greig Birchfield is a Consulting Mineral Statistician with the Minerals and Metals Sector, Natural Resources Canada.
Telephone: Greig Birchfield at (613) 992-1470 or Rob Dunn at (613) 996-6384
E-mail: grbirchf@nrcan.gc.ca or rdunn@nrcan.gc.ca

OVERVIEW

Although major industrialized countries, such as Canada and the United States, continued to experience positive economic growth in 1998, the depressed state of overall global economic and industrial activity impacted negatively on Canada's natural resource sectors, which saw dramatic falls in commodity prices. This was particularly evident in the Canadian mineral industry where operating profits dropped sharply; significant cost cutting, including mine closings and employee layoffs, took place; and exploration activities declined markedly.

Canada's Real Gross Domestic Product (GDP) at market prices rose by 3.1% to $838.3 billion, an increase of $25.2 billion from 1997, but less than the 4.0% growth of 1997 (Figure 1). Interest and inflation rates remained low and employment growth brought the unemployment rate down to 8% by year-end. The Canadian dollar fell nearly 7¢ from the beginning of the year to a low of around 63¢, but hovered around 65¢ against the U.S. dollar for much of the latter part of 1998. This depreciation provided some impetus to Canadian export sales, which increased to $322.3 billion in 1998 from $301.4 billion in 1997.

Preliminary estimates of the value of production for all sectors of the mining and fuel extraction industry indicated a dramatic drop of 12.3% to $44.3 billion in 1998 from $50.4 billion in 1997. Significant declines in world prices for major minerals and metals led to this result with a significant impact on crude oil and natural gas by-products for which prices plummeted in global markets. This was the first decline for the Canadian mineral industry since 1991 when the total value of production fell by 13.7% to $35.2 billion. When fuels are excluded, the value of production for the non-fuel industry declined by 5.2% to $16.5 billion in 1998. Of this amount, the value of metals production fell by 10.7%, while nonmetals increased by 8.3% and structural materials by 2.2%.

The value of minerals and mineral product exports declined to $69.3 billion in 1998, a 5.1% drop compared to 1997. Low commodity prices brought on largely by reduced demand in Asia contributed significantly to the decline. While raw materials and primary products suffered the greatest decreases, the value of fabricated metal product exports actually increased by nearly 15% in 1998 as exports of these products to the booming economy of the United States rose significantly. In spite of the decline in the value of exports and an increase in mineral product imports, the trade surplus for these products stood at a healthy $15.6 billion.

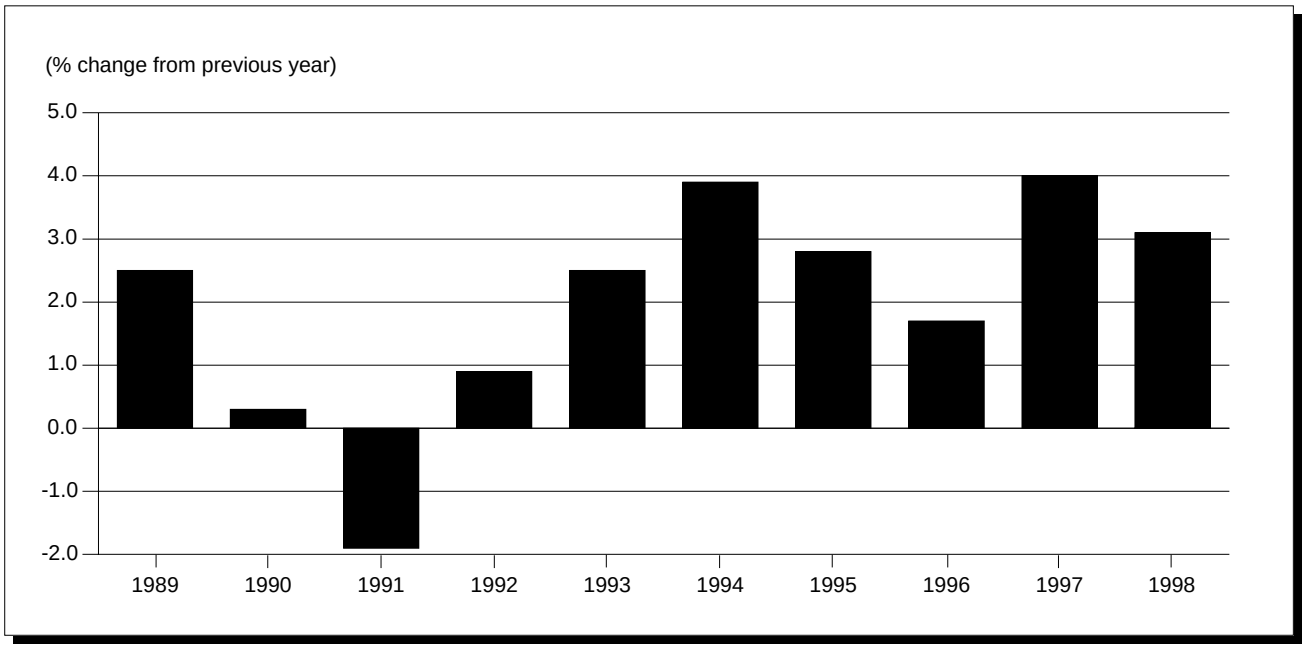
Prices for most major mineral commodities continued to fall and remained weak throughout 1998, largely in response to the Asian financial crisis that surfaced in mid-1997 and the resulting ripple effect that it caused in global markets. In some cases, such as for copper, producers have been slow to adjust and inventories shot up during the year. The impact on nickel was also dramatic as the spot price declined by over 30% during the year. To some degree, the depreciation of the Canadian dollar relative to the U.S. dollar cushioned some of the decline in revenue for Canadian producers. However, operating profits of the Canadian mining sector declined sharply.

Significant developments affecting the Canadian mineral industry in 1998 included:

- falling commodity prices;
- deteriorating balance sheets for many companies;
- the opening of Canada's first diamond mine;
- the impasse that stalled the Voisey's Bay nickel development;
- major capital expenditures in the iron ore industry;
- a continuing decline in exploration activities;
- more mine closings than openings; and
- a decrease in direct mine employment.

It appears that 1999 will see, at best, only a very minor improvement for the Canadian mineral

Figure 1
Canadian Economic Activity, Percent Change in Real GDP, 1989-98
(1992 Prices)



Source: Statistics Canada.

industry. Although the worst seems to be over, the recovery of the Asian economies will be uneven and protracted. In addition, several Latin American countries, notably Brazil, were showing signs of financial stress as 1998 came to a close. Consequently, most major mineral commodity prices, while higher than the levels experienced in 1998, are expected to remain low in 1999. The Bank of England's decision, in May 1999, to sell up to half of its gold reserves and the threat that other central banks may follow suit have had a negative impact on the price of gold, wiping out modest price gains. Reduced industrial activity, primarily in Japan, and advances in steel-making technology requiring less high-grade metallurgical coal have dealt a severe blow to the coal industry. Although most Canadian companies have reduced mining costs, operating profits are low and many have high debt leverage. As well, particularly for nickel, copper and gold, new low-cost additions to mine supply are coming on stream in other countries. These factors will intensify pressure on the ability of higher-cost, older mines to remain operational in 1999.

Based on company spending intentions at the end of 1998, exploration expenditures in 1999 in Canada are expected to decline to less than $500 million from an estimated $600 million in 1998. Low commodity prices have caused many companies to curtail or suspend exploration activity, and fallout from the Bre-X incident still makes some potential investors wary. There are, however, some positive signs. The current downturn in financing is not as deep as the previous one in 1991. In 1998, junior mining companies listed on the Vancouver Stock Exchange raised a total of $300 million, compared to roughly half that amount in 1991. There have also been a few significant mineral discoveries, in Canada and elsewhere, that have revived investor interest.

CANADIAN ECONOMY

Ongoing low and stable inflation rates, low interest rates and increasing employment led to another strong performance by the Canadian economy in 1998. Inflation averaged just 0.9% for the year and in December was at a year-over-year rate of 1%. Interest rates were higher during 1998, but still low by recent historical standards. The Bank of Canada raised its rate by 50 basis points in January and then by 100 points (1%) in August as the Canadian dollar remained under pressure. After that time, three successive 25-point declines brought the Bank of Canada rate to 5.25% in mid-November, where it remained at year-end. Two more 25-basis-point decreases in the spring of 1999 reduced the rate to 4.75%. Consumer confidence and spending remained relatively steady, but were less than the strong performance exhibited in 1997. Canada Mortgage and Housing Corporation announced that housing starts slowed to about 137 400 units, down about 7% from 1997. Housing sales were also off by about 6% at an estimated

311 500 units, even though mortgage rates remained low. Sales of cars and trucks remained flat at just under 1.4 million units, virtually the same as in 1997.

The unemployment rate fell to 8.0% in December from 8.9% in January. Alberta had the lowest rate at 5.7% and Newfoundland the highest at 18.7%. Employment growth rose by an impressive 3.2% as an estimated 449 000 new jobs were created in 1998. Again, as in 1997, the Canadian economy was one of the best performing G7 countries in 1998, trailing only the United States and France in terms of real GDP growth.

On the trade front, total merchandise exports have increased steadily over the last several years, reaching $322.3 billion in 1998. Imports, however, have increased at an even faster pace, thereby reducing Canada's trade surplus to $18.9 billion, down from $23.7 billion in 1997 and $42.0 billion in 1996. As a result of the reduced trade surplus, Canada's overall international current account deficit increased in 1998 to $16.4 billion, up from the 1997 deficit of $14.3 billion. Since 1982, the current account has only had a surplus twice: in 1982 and 1996. The dollar declined significantly against the U.S. dollar as falling prices for mineral, forestry and agricultural commodities had a major impact on Canada's trade balance. At year-end, the dollar was trading at 64.8¢ in U.S. funds, down from a high of about 71¢ earlier in the year. For much of the last half of 1998 and early in 1999, the dollar was trading at about 65¢.

MINERAL INDUSTRY

National Picture

The mineral industry, excluding the petroleum and natural gas industries, accounted for 3.7%, or $26.5 billion, of Canadian factor cost GDP, the same proportion as in 1997. These proportions can be somewhat misleading, however, in that they are based on 1992 prices. Because current price data by industry are only available up to 1995, they do not reflect commodity prices as they were in 1998. Geographically, the importance of the industry is much more significant on a regional and community basis as, in many parts of Canada, particularly in the North, it provides the major economic stimulus.

In 1998, the total value of production for metals, nonmetals and structural materials fell by 5.2% from $17.5 billion to $16.5 billion. A decline in the value of metals production, caused principally by falling prices, more than offset the gains in the value of nonmetals and structural materials. The value of metals production fell by more than $1.2 billion, or 10.7%, to $10.3 billion as the prices of major commodities, such as nickel and copper, were adversely affected by global supply/demand conditions. A bright spot for the industry was the performance of nonmetals and structural materials, which both experienced gains in 1998, reflecting strong economic conditions in North American markets. Nonmetals increased by $250 million, or 8.3%, to $3.3 billion, and structural materials increased by $63 million, or 2.2%, to more than $2.9 billion.

Prices declined for virtually all mineral commodities in 1998, primarily in reaction to weak global demand conditions, particularly in the Far East where economic growth was negative in major mineral-consuming countries such as Japan and South Korea. Moreover, negative growth was experienced in most Latin American countries and in Eastern Europe, notably Russia. New mine capacity coming on stream for such commodities as nickel and copper also affected prices. Major base-metal prices exhibited a steady downward drift throughout the year, interrupted occasionally by brief, sporadic rallies. In December, copper, aluminum, nickel and zinc spot prices were at their trading lows for the year. For copper, inventories were up by two thirds in 1998 to their highest levels in nearly five years and, at US65.2¢/lb, copper was trading at nearly a 12-year low. Aluminum was down to US55.2¢/lb in December from a high of 68.9¢ in January, although warehouse inventories were down only slightly during the year. Nickel dropped to US$1.69/lb in mid-December, which was down over 35% from its high at the beginning of the year. Nickel inventories finished the year at roughly the same levels as one year earlier. Zinc and lead inventories declined during the year, but prices still fell off. Zinc finished the year at US41.5¢/lb, which was the low for the year, down from its high of US51.8¢/lb in January. Lead bottomed out at US21.7¢/lb in October, down from its high of 27.9¢/lb in April.

For precious metals, gold prices traded in a relatively narrow band, hitting a 19-year low of US$273.40/troy oz in August and closing the year at $287.45/oz, roughly the same as at the beginning of 1998. Jewellery and industrial demand were only off slightly, but uncertainty and speculation continued to prevail throughout the year concerning the intentions of central banks to sell more of their official reserves and a move to delink their currencies with gold reserve backing. The European Union's new central bank, however, indicated that it would back the new Euro currency, which came into being on January 1, 1999, with gold holdings roughly in the same proportion as the national central banks of its member countries. Silver benefited from continued investor interest early in the year, but began to drift as inventories rose and ended the year at US$5.01/oz, down from its high of $7.81/oz. Platinum was down slightly for the year, closing at US$361.50/oz, while palladium was up over 50% to US$334/oz. Both commodities were significantly affected by ongoing production and

export supply uncertainties in Russia. Russia is the world's largest palladium exporter and the second largest platinum exporter. At year-end, cobalt was down over 50% during the year to US$11.50/lb, molybdenum was down over 30% to US$2.60/lb, and uranium was down about one third to US$9.00/lb. For iron ore and coal, where prices are largely determined by benchmark international contracts, iron ore prices were up by nearly 3% whereas metallurgical coal prices were off by nearly 5% and thermal coal by about 8% in 1998. Sulphur prices reflected deteriorated market conditions, dropping about 35% by year-end. Potash prices, on the other hand, were up about 2% (in U.S. dollar terms) during 1998.

With respect to the production of Canada's leading minerals, increases in output volumes in excess of 5% were recorded for copper, nickel, the platinum group, cobalt and peat, whereas declines in excess of 5% were experienced by uranium, lead, asbestos and coal. When prices are factored in, the production values of many commodities fell in 1998, some markedly. Declines in the value of production compared to 1997 were most evident for elemental sulphur, down 35.4%; asbestos, down 22.2%; zinc, down 20.5%; nickel, down 20.1%; lead, down 20.0%; and copper, down 17.4%.

Regionally, four provinces again dominated the value of Canada's non-fuel mineral production during 1998. The value for Ontario decreased by 9.8% to $5.0 billion, Quebec increased very slightly to $3.4 billion, Saskatchewan increased by 5.6% to $2.2 billion, and British Columbia declined by 1.2% to $1.9 billion. When coal is included, Saskatchewan's value of output rises to $2.3 billion and British Columbia's to $2.9 billion. Of the 9 mine openings in 1998, 3 were in British Columbia, 2 in Saskatchewan and 1 in each of Newfoundland, Ontario, Manitoba and the Northwest Territories. Of the 15 closures recorded, 3 were in the Yukon, 3 in Ontario, 2 in each of New Brunswick, British Columbia and the Northwest Territories, and 1 in each of Quebec, Manitoba and Saskatchewan.

Profits by Canadian mining companies fell again in 1998, mainly due to falling commodity prices. For the year, operating profits for the metals sector were down by 44% to $1.4 billion from $2.5 billion for 1997. As well, many companies were forced to write off or write down the value of mining and exploration assets.

Developments in the Canadian Mining Industry

Canada's first diamond mine had its official opening on October 14, 1998. The Ekati diamond mine is operated and 51% owned by BHP Diamonds Inc., a division of The Broken Hill Proprietary Company Limited of Australia. It is owned 29% by Dia Met Minerals Ltd., with 10% owned by each of the two geologists/prospectors who made the original discovery. The mine, located some 300 km northeast of Yellowknife at Lac de Gras in the Northwest Territories, cost US$700 million to bring into production. It is currently forecast to produce between 3.5 million and 4.5 million carats per year from five kimberlite pipes over a 25-year span, with revenues averaging $400 million to $500 million per year, making it one of the 15 largest diamond mines in the world. BHP and Dia Met have agreed to sell 35% of Ekati's production to De Beers and will market the rest themselves. The first Ekati diamonds offered for sale in Antwerp, Belgium, early in 1999 brought about US$125-$130 per carat, excluding the largest stones, which were to be sold later. As well, the company opened a diamond-sorting and valuation facility at Yellowknife and has indicated that it will sell a portion of its rough diamonds to cutting and polishing operations that become established in Canada, initially to those in the Northwest Territories.

A second potential diamond mine in the Northwest Territories continued to make progress towards development in 1998. The proposed Diavik mine, located some 35 km southeast of the Ekati mine, is owned 60% by Diavik Diamond Mines Inc., a wholly owned subsidiary of Rio Tinto plc, and 40% by Aber Resources Ltd. In September 1998, Diavik Diamonds submitted an environmental assessment to the Government of Canada for the proposed mining operation. It is expected that the permitting process will take until late 1999 before a government decision is made. If approved, and if a positive production decision is made, the mine could be in production by the middle of 2003. Work to date has concentrated on the development of four kimberlite pipes for the proposed Diavik mine. The current mineable reserve is estimated at 26 Mt having an average grade of 3.9 ct/t with an estimated value of US$56/ct. Estimates put the capital costs of bringing the mine into production at US$860 million.

Continuing site development of the Voisey's Bay nickel-copper-cobalt deposit in Labrador by Voisey's Bay Nickel Company Limited, a wholly owned subsidiary of Inco Limited, came to a standstill in 1998 as negotiations between the company and the Government of Newfoundland and Labrador broke off. With falling nickel prices, coupled with other negative factors, such as the significant new lateritic nickel capacity coming on stream in Australia at forecast low production costs, Inco took the position that it was now uneconomic for the company to build a smelter refinery complex in Newfoundland to process the Voisey's Bay ore as it had previously agreed to do. The Province responded that, without this processing complex, it would not allow the company to mine and concentrate the ore. Consequently, in July, Inco announced that it had suspended engineering and procurement work on the project. In November, the

Province solidified its position by tabling amendments to its *Mineral Act* to strengthen the provisions to require the processing of ore mined in the province. Although at year-end the impasse continued, informal and confidential talks between the company and the Province were held recently to review how negotiations could be restarted on the key issues identified by the parties. In the meantime, progress has been made on other issues affecting the development of Voisey's Bay. In August 1998, an environmental assessment panel began hearings on the Voisey's Bay project. On April 1, 1999, the panel issued its report and recommendations. The panel recommended that the mine/mill project proceed subject to a number of other separate recommendations. In December 1998, a tentative Land Claims Agreement between the Government of Canada, the Province and the Labrador Inuit Association covering 72 000 km^2 in northern Labrador, which covers the Voisey's Bay area, was announced. However, in early 1999, the Labrador Inuit Association stated that the tentative Lands Claims Agreement would have to be finalized before it would support continuation of the Voisey's Bay project.

In British Columbia, Kemess Mines Inc., a subsidiary of Royal Oak Mines Inc., began production in May from its $480 million porphyry gold-copper Kemess South mine in the Toodoggone River area in the north-central part of the province. The open-pit mine has estimated mineable reserves of 220 Mt averaging 0.018 oz/t gold and 0.224% copper. At year-end, citing continuing low prices for both gold and copper, Royal Oak suspended its debt payments, announcing its intentions to refinance its debt, most of which was incurred to bring the Kemess South property into production. Unfortunately, however, in April 1999, the Ontario Court (General Division) shut down Royal Oak, putting the company into receivership when creditors could not agree on a restructuring deal. The receiver (PricewaterhouseCooper Ltd.) will manage the company's operations until they can be sold to satisfy Royal Oak's $665 million debt. The receivership order also enforces, at least for now, the continuation of operations at the company's three mines: Kemess, Pamour and Giant.

In July, Falconbridge Limited officially opened its Raglan nickel mine on the remote Ungava Peninsula in northern Quebec, although concentrate production began in December 1997. The mining operation involves both open-pit and underground operations. The $486 million project has mineable reserves of 14 Mt, grading 3.17% nickel and 0.88% copper. The nickel-copper concentrate production is trucked to and stored at Deception Bay for shipping. It is expected that a minimum of six shipments per year will be made during the eight-month shipping season.

Luscar Ltd. acquired Manalta Coal Ltd. in a $555 million hostile takeover in September through the tendering by holders of Manalta Coal Income Trust receipts to the Luscar Coal Income Fund Trust (LCFT). The merged company, to be called Luscar Ltd., will be the largest coal company in Canada, owning and operating mines in British Columbia, Alberta and Saskatchewan, and one of the largest in North America. It has a production capacity of about 41 Mt/y for both the export and domestic markets. LCFT is an open-ended trust that receives its income from Luscar Ltd.

In November, the Iron Ore Company of Canada (IOC) announced a $344 million capital expenditure program, raising its six-year total expenditure program begun in 1997 to $1.1 billion. The objective is to increase production capacity in the Labrador Trough area in order to produce higher quality iron ore pellets and to increase production from 11 Mt in 1997 to 17 Mt/y by 2003. This latest announcement features the reactivation of the Sept-Îles pellet plant, which was mothballed in 1982, and includes upgrading equipment at the Labrador City mine, purchasing additional rail equipment, and increasing hydroelectric capacity at its Sainte-Marguerite River generating facility near Sept-Îles. The reactivation of the Sept-Îles pellet plant will enable the company to process the higher-quality concentrates that will be produced at Labrador City. Following a change in the ownership structure in 1997, IOC is now owned 56.1% by North Limited, 25.0% by Mitsubishi Corporation, 12.0% by the Labrador Iron Ore Royalty Income Fund, and 6.9% by Dofasco Inc.

Government and Industry Initiatives

Over the 18-month period ending in early 1999, the Canadian government, through Natural Resources Canada (NRCan), in conjunction with provincial governments and the mineral industry, undertook a wide variety of activities to promote and support Canada's minerals and metals industry and the mining-related equipment and service sector. These activities included: a ministerial-led mission to Latin America (Argentina, Chile and Peru); ministerial participation in the annual Mines Ministers of the Americas Conference (Argentina); a ministerial visit to Russia, the Ukraine and Kazakstan; and deputy ministerial involvement in two investment missions and the Canada: A Window on Global Mining - World-Class Technology and Investment Prospects Conference held in Tokyo, Japan. In addition, NRCan officials, at seminars and conferences around the world and in Canada, have promoted Canada's geological potential and Canadian mineral properties, highlighted the competitiveness of Canada's minerals and metals industry, showcased new Canadian advances in mining, mineral processing and related technologies, and demonstrated to investors that Canada can supply a full range of equipment and services to the world's mining community. Also, the Canadian government is helping small gold mining companies work more efficiently. On May 12, 1999, the Minister of NRCan

officially announced increased funding of $2.5 million over three years for its Canada Centre for Mineral and Energy Technology (CANMET). The funding will be used at the experimental mine facility in Val-d'Or to research innovative methods to automate the extraction of gold from narrow veins.

In December 1997, Canada signed The Kyoto Protocol, or the United Nations Framework Convention on Climate Change, to reduce greenhouse gas emissions. Under this international agreement, Canada will reduce its emissions of carbon dioxide, nitrous oxide, and methane by 6% below 1990 levels by 2012. Levels of hydrofluorocarbons, perfluorocarbons and sulphur hexafluoride will be reduced by 6% below 1995 levels by 2012. In order to develop a national implementation strategy, 14 sector groupings or tables were established by the federal government to bring stakeholders together to make recommendations on how to achieve Canada's commitment by 2012. The Canadian minerals and metals sector, which is part of the Industry Table, began deliberations in 1998. A final report of this Table, with its recommendations, is expected by the end of 1999.

New policy initiatives affecting the mineral industry were announced by several provinces and territories in 1998. In Newfoundland, *The Mineral Act* and *The Quarry Materials Act* were amended to define dimensional stone as a mineral with land tenure administrated under *The Mineral Act*. In Quebec, new tax measures under the *Taxation Act* were introduced to further stimulate exploration in the Near North and Far North areas of the province by adding another 25% to the existing tax deduction for exploration work carried out in these two regions. In British Columbia, four new initiatives were introduced: the *Mining Rights Amendment Act*, which recognizes the right to mine and assures access to mineral tenures, the right to compensation when tenures are expropriated for parks, and timely permitting; the *Mineral Exploration Code*, which creates a one-agency window for permit approvals and applies environmental protection standards designed specifically for exploration; the creation of the position of Mining Advocate; and the introduction of a refundable Mineral Exploration Tax Credit worth up to $9 million annually. As well, the mine allowance that provides a one-third gross-up of capital costs for new mines in British Columbia for mineral tax purposes was extended to all new mines that begin production before January 1, 2010, rather than 2000.

The Mining Innovation, Rehabilitation, and Applied Research Corporation (MIRARCo) was established in April to promote mining innovation and to provide a bridge between knowledge providers and knowledge users. The non-profit corporation is a collaboration between Laurentian University and the private and public sectors. Start-up funding was provided by the Northern Ontario Heritage Fund Corporation, the Federal Economic Development Initiative in Northern Ontario, the Sudbury Regional Development Corporation, the Ontario Research and Development Challenge Fund, Human Resources Development Canada, and Laurentian University. MIRARCo, which consists of several mining research centres and a mining innovation and development group, will attempt to facilitate the transfer of mining-related research to commercial applications by fostering partnerships between technology providers, research and development organizations, service providers, and industrial users.

Established principally in response to the 1997 Bre-X incident, and the resulting loss in investor confidence in the mineral industry, the Mining Standards Task Force of the Toronto Stock Exchange (TSE) and the Ontario Securities Commission (OSC) issued its interim report in June 1998. After gathering comments, the Task Force, which also included members from the mining industry and the financial services sector, released the final report in early 1999. A major recommendation is that companies should be required to have a "Qualified Person" who would be responsible for scientific and technical matters, including the release of all mineral exploration information. Also, it is recommended that companies follow "best practice" operational guidelines. Other important recommendations relate to brokerage houses' behaviour and the need to improve market disclosure and transparency. Similar recommendations were also announced in early 1999 by the Study Committee on the Financing of the Quebec Mining Industry, which was established in 1997 to investigate exploration disclosure standards.

An overview report, prepared by a government-industry task force on federal-provincial/territorial regulatory reform was presented to Canadian mines ministers at their 55th annual meeting held in Calgary, Alberta, in July. This report focused on federal environmental regulations and provincial and territorial mining and environmental regulations that affect exploration, development, mining, and mine closure, as well as the relationship between relevant provincial/territorial and federal environmental regulations and related decision-making processes. The results of this review indicated a need for: increased efficiency and effectiveness of regulations, the administration of regulations and decision-making processes; better coordination and cooperation within and between governments and interested stakeholders; better coordination within and between jurisdictions; clarification of responsibilities and requirements; relevant, easily accessible information; and greater transparency in decision-making processes. Work in these areas by the respective jurisdictions and stakeholder organizations will continue with progress to be reported at the 56th Mines Ministers' Conference, held in Charlottetown, Prince Edward Island, in September 1999.

The Report of the Ontario Lands for Life Round Tables was presented to the Government of Ontario in October. The purpose of the Lands for Life program was to investigate and address the best uses of 39 million ha of the province's Crown Land resources. Three Round Tables consulted with individuals and groups during much of 1998. The Report contains 242 recommendations with a principal recommendation being that the Crown Land in question should be assigned to one of seven land-use designations ranging from new provincial parks to general use areas. Following a period for comments and reaction to the Report, the Government of Ontario announced its decision to accept 98% of the Round Table's recommendations on March 29, 1999, under the banner *Ontario's Living Legacy*. The province's Living Legacy fulfills a key goal of the Lands for Life process through the completion of a representative system of parks and protected areas totaling 12% of the planning area. Of particular interest to the mining and exploration industries, Ontario's Minister of Northern Development and Mines stated that access for environmentally sensitive mineral exploration is being protected in areas of significant mineral potential in the province, and that it is business as usual for existing claim holders and mining activity already under way.

In October, 17 major mining companies, including 7 Canadian companies, established the International Network on Acid Prevention (INAP). The Canadian member companies are Inco Limited, Placer Dome Inc., Teck Corporation, Noranda Inc., Falconbridge Limited, Barrick Gold Corporation and Rio Algom Limited. INAP plans to promote the sharing of information and technology for the purpose of reducing hazards caused by acids produced at mining operations. Two specific issues that INAP plans to study are improved water and air-flow in waste dumps, and coating acid-generating minerals to prevent oxidation of pyrite.

In December, the Government of Canada passed legislation enacting the international Comprehensive Nuclear Test Ban Treaty, which Canada signed in 1996. This treaty, which bans all nuclear weapons testing in the atmosphere, in the oceans and underground, will affect the mining industry. The legislation requires mandatory reporting of all explosions that involve the detonation of more than the equivalent of 300 t of TNT. The reporting of large mine rockbursts and falls are also covered by the legislation. Following consultations with the provinces, territories and the mining industry, it is expected that Canadian regulations will be put in place in 1999 to ensure the collection and reporting of the necessary information to satisfy the commitments of the Treaty.

Planning continued during 1998 for the establishment of the new territory of Nunavut in Canada's eastern arctic and, on April 1, 1999, the new territory became a reality. Canada's third territory covers approximately 2 million km^2, or about one fifth of Canada's landmass. The Nunavut territorial government has the same status and powers as the current Government of the Northwest Territories, including the administration of mineral activities with the federal Department of Indian Affairs and Northern Development. The Nunavut Lands Claims Agreement, settled in 1993, gave the Inuit title to about 18% of the new territory. Eleven percent of the Inuit land includes land with mineral rights. Nunavut Tunngavik Incorporated has regulatory authority over mining on those Inuit-owned lands on which the Inuit hold the mining rights.

A Statistical Portrait of the Canadian Mineral Industry

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

- Stage 1: primary mineral production (mining, including quarries and sand pits, and concentrating)
- Stage 2: metal production (smelting and refining);
- Stage 3: minerals and metals-based semi-fabricated industries; and
- Stage 4: metals fabricating industries.

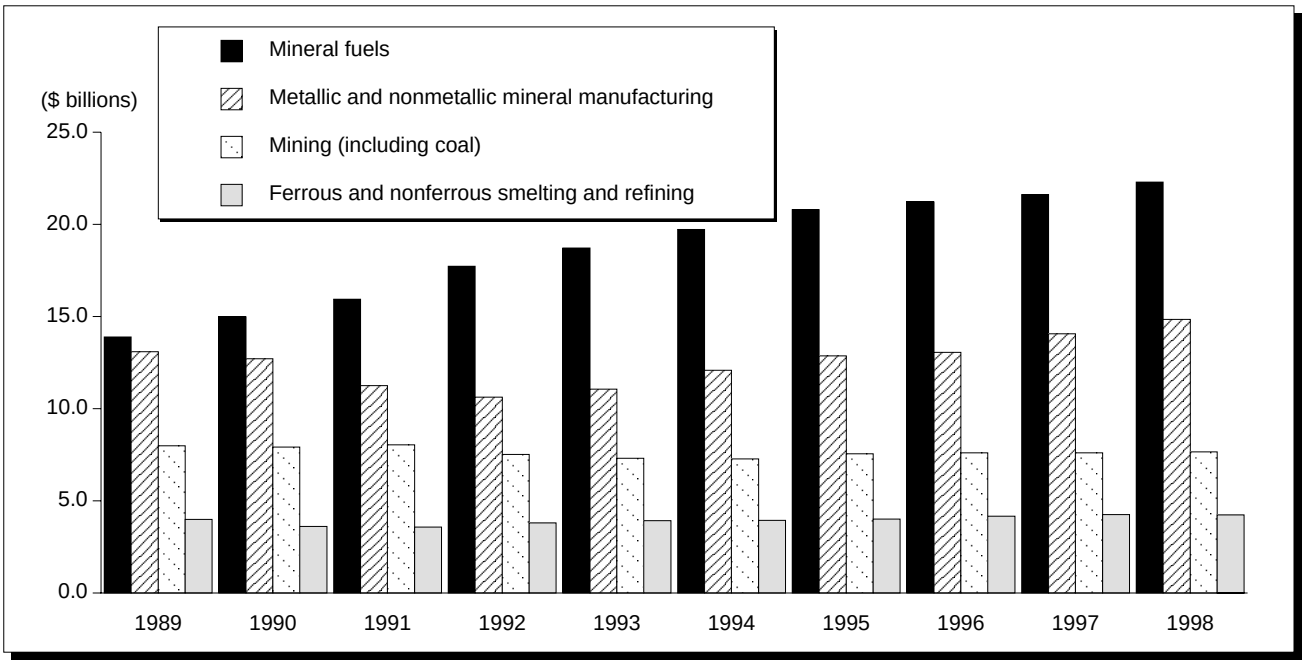
While much of the emphasis of this article focuses on Stage 1 activities (the activities of the mining industry), much of the portrait that follows describes the mineral industry as a whole, providing a more comprehensive picture of the overall importance of the mineral industry to Canada. In the context of this article, the mineral industry should be taken to exclude the extraction and processing of crude petroleum and natural gas, but to include both the coal and uranium mining industries.

GDP of the Mineral Industry

In 1998, the mineral industry, as defined above, contributed $26.5 billion to Canada's total GDP of $717.5 billion. (In this section, all figures are based on GDP at factor cost and at 1992 prices.) The mineral industry, therefore, accounted for 3.7% of the total, the same proportion as in 1997. The 1998 figure for the mineral industry was 3.1% above the 1997 level of $25.7 billion. Because these figures are based on 1992 prices, an increase in the value of production indicates an increase in the volume of goods produced.

The GDP of all four stages of the mineral industry increased in 1998 compared to 1997. In spite of the low commodity prices, the GDP of the combined

Figure 2
Gross Domestic Product at Factor Cost at 1992 Prices, 1989-98



Source: Statistics Canada.

mining and quarry and sand pit industries increased to $7.7 billion, almost 29% of the mineral industry total and slightly higher than 1997's $7.6 billion. The combined GDP of Stages 2, 3 and 4 rose at a greater rate, reaching $18.9 billion, a 4.2% increase over 1997 (Figure 2).

Canadian Mineral Production

Preliminary estimates indicate that the total value of Canadian mineral production (including fuels) declined to $44.3.billion in 1998, a 12.3% decrease from the $50.5 billion recorded in 1997. Both the fuel and non-fuel portions of the total declined – fuels by 16.0%, non-fuels by 5.2% (refer to the table on the following page).

The decline in the value of production in 1998 resulted from a steep drop in the value of mineral fuel production and a significant drop in the value of metal production. These decreases more than offset the increases observed in the value of nonmetals and structural materials.

Table 1 presents commodity-specific production data for Canada's leading minerals. While there were exceptions, most of the major commodities suffered declines in the value of production in 1998 relative to 1997. The value of metal production declined to $10.3 billion from $11.5 billion, a decrease of 10.7%, due mainly to sharp drops in the value of production of zinc (-20.5%), nickel (-20.1%), lead (-20.0%), copper (-17.4%) and gold (-8.1%). Lower prices were the major causes of the declines; the volume of gold produced decreased only 3.1% and the volume of zinc decreased only 3.8%. The volumes of nickel and copper produced actually increased by 11.2% and 6.3%, respectively. The platinum group bucked the trend as both its volume of production (up 22.7%) and value of production (up 66.0%) rose. Short-term concerns about supplies from Russia pushed the price of palladium from US$198/troy oz at the beginning of 1998 to $417/oz in May. The price surge was driven by the lack of imports from Russia, the world's largest producer, during the first four months of 1998. The sharp price increase was only temporary, falling to US$285/oz at the end of May 1998 as Russian shipments began to reach the market. Even so, palladium prices averaged US$290/oz in 1998, significantly higher than the 1997 average of $184/oz.

The value of nonmetal output increased in 1998 by 8.3% to $3.3 billion, almost all of the increase attributable to potash. Potash, the leading mineral in the nonmetals group, accounted for more than half of the total. In 1998, the value of production of potash increased 9.1% to $1.7 billion despite a 2.9% decline in the volume produced. The value of production of chrysotile, the only form of asbestos produced in Canada, declined by 22.2% in 1998, reflecting a 23.8% drop in the volume of chrysotile output. Of the other major nonmetal commodities produced in Canada in 1998, only diamonds and peat registered gains in both the value and volume of production.

CANADIAN MINERAL INDUSTRY VALUE OF PRODUCTION, 1997 AND 1998

	1997r	1998p	Change
	($ millions)		(%)
Metals	11 549.2	10 318.9	-10.7
Nonmetals	3 027.0	3 277.2	8.3
Structural materials	2 885.4	2 948.8	2.2
Total nonfuels	17 461.6	16 544.9	-5.2
Fuels	33 076.7	27 770.2	-16.0
Total	50 538.3	44 315.1	-12.3

Sources: Natural Resources Canada and Statistics Canada, *Canada's Mineral Production, Preliminary Estimates*, cat. no. 26-202-XIB.
p Preliminary; r Revised.
Note: Numbers may not add to totals due to rounding.

The value of production of structural materials rose 2.2% in 1998 to $2.9 billion, due primarily to cement, which increased its volume of output by 2.3% and its value of output by 6.0%.

Based on the value of output in 1998, the top non-fuel commodities in 1998 were gold ($2.3 billion), copper ($1.7 billion), potash ($1.7 billion), iron ore ($1.6 billion), zinc ($1.5 billion), nickel ($1.4 billion) and cement ($1.1 billion).

Regionally, the picture in 1998 remained much the same as in 1997. Ontario again contributed the largest share of the non-fuel mineral output, accounting for 30.2% of the total value. Quebec contributed 20.8% to Canada's total; Saskatchewan, 13.4%; British Columbia, 11.6%; Newfoundland, 6.1%; Manitoba, 5.5%; and New Brunswick, 5.0%. The remaining provinces and territories accounted for 7.5% of the total.

The value of production of mineral fuels declined sharply in 1998 from $33.1 billion in 1997 to $27.8 billion in 1998, a drop of 16.0%. Of the components within the mineral fuel group, only natural gas experienced an increase in volume of production (up 3.1%) and value (up 4.4%). Lower prices for crude petroleum and natural gas by-products resulted in significant declines in the value of production of these commodities (down 27.2% and 31.1%, respectively), even though the volume produced rose for both. The value of coal production declined by 6.6% and the volume by 5.5%.

Alberta remained Canada's major mineral fuels producer, accounting for 78.1% of the total value in 1998. Alberta also had significant volumes of all the components of the mineral fuels – crude petroleum, coal, natural gas, and natural gas by-products. Other provinces with significant mineral fuel components were British Columbia with 9.3% of Canada's total and Saskatchewan with 8.8%. Crude petroleum production from Hibernia boosted Newfoundland's contribution to Canada's mineral fuel production to 1.6%. The other provinces and territories accounted for the remaining 2.3%.

Employment in the Mineral Industry

Combined employment in the four stages of the mineral industry (including coal mining) is estimated to have reached 367 200 in 1998, 4.1% above the 1997 level of 352 900. The mineral industry thus accounted for 2.6% of the national employment level of 14.3 million.

While total mineral industry employment grew, employment in Stage 1 (metal, nonmetal and coal mining, and quarries and sand pits) declined in 1998 for the third straight year. Stage 1 employment was estimated to be 55 700, a 4.6% decline compared to 1997. Metal mining, nonmetal mining and coal mining all experienced declines in employment in 1998, and the decreases were evident throughout the commodity-specific industries. Mine closures and suspensions due to weak commodity prices, coupled with the necessity to reduce costs and improve efficiencies, led to the declines. Buoyed by the robust North American construction industry, only the structural materials sector experienced an increase in its employment level in 1998 (up 17% to 7800).

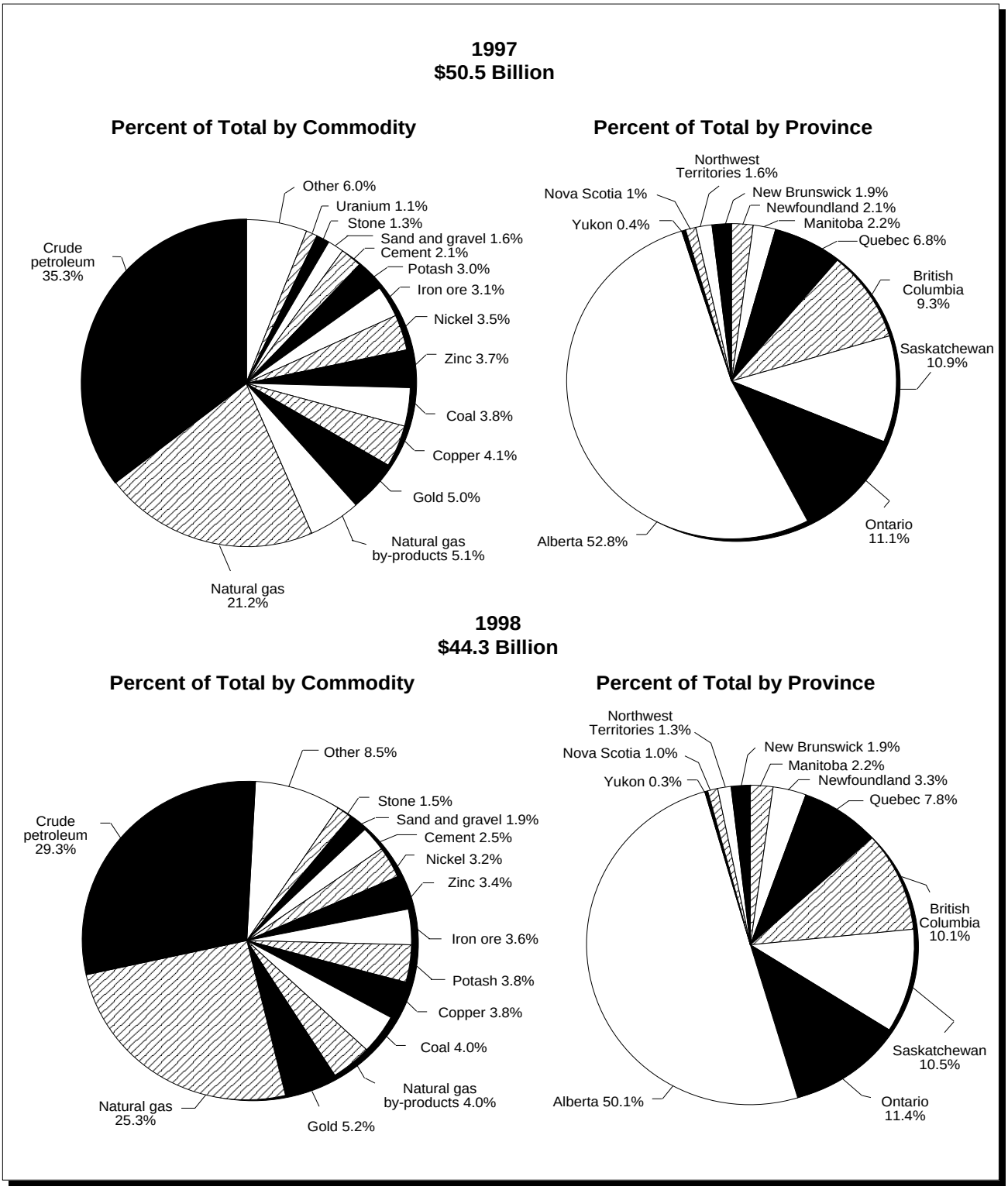
Employment levels for Stages 2, 3 and 4 were all higher in 1998 compared to the previous year. Employment increased in Stage 2 by 1.6% to 59 600, in Stage 3 by 7.9% to 94 100, and in Stage 4 by 6.1% to 157 800. The strong North American economies boosted these sectors.

Reduced activity in Stage 1 affected the level of employment in the sector that provides services incidental to mining and quarrying. This sector provides drilling services, conducts exploration, and provides other services. In 1998, the number employed in this sector declined by more than 10% to about 9700. This figure includes about 2100 in the mining diamond drilling sector. Because there is no establishment-based survey undertaken at this time by either NRCan or Statistics Canada for Services Incidental to Mining, these numbers should be viewed with caution.

Mineral Industry Trade

Canada is one of the world's largest exporters of minerals and metals, and the export of these commodities and more refined mineral products has a significant impact on Canada's overall merchandise balance of trade surplus and, hence, on the national standard of living. The United States is by far the primary recipient of Canada's minerals and mineral product exports, receiving 82.9% of domestic exports in 1998, followed by the European Union (5.8%) and Japan (3.6%). The relative strength of the U.S. economy resulted in an even higher proportion of Canada's

Figure 3
Value of Mineral Production, Percent Shares by Commodity and by Province, 1997 and 1998



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.
1998 data for uranium are confidential and included in "other."

mineral industry exports being directed to the United States. In 1997, the proportion received by the United States was 80.9% (Table 2).

In 1998, for the first time in several years, the value of exports of minerals and mineral products, including fuels, declined, falling 4.7% to $68.1 billion from $71.5 billion in 1997. A decline in the export value of mineral fuels offset gains in the value of metals and metal products, nonmetals and nonmetal products, and structural materials. Metals and metal products contributed more than half (50.8%) to total mineral products exports; mineral fuels, 37.4%; nonmetals, 10.3%; and structural materials, 1.4%. Together these products accounted for 23% of the value of Canada's total domestic merchandise exports.

The total value of metallic minerals and mineral products domestic exports increased to $34.7 billion in 1998, a rise of almost 2% from 1997. Commodities produced in Stages 2 through 4 accounted for the gains. The value of domestic exports of Stage 1 commodities declined by nearly 12% to $3.7 billion. For individual commodities within the total metallic minerals sector, exports rose for iron and steel (13.1%), silver (44.7%) and cobalt (7.5%); they declined for gold (-2.9%), copper (-18.6%), nickel (-10.2%), zinc (-14.7%), uranium (-19.1%) and lead (-15.0%). The value of exports of aluminum and iron ore remained about the same in 1998 as in 1997. Two commodities, iron and steel and aluminum, accounted for almost half of the total value of exports in the metallic minerals and mineral products sector. Other major contributors were gold, copper, nickel, zinc and iron ore.

The value of domestic exports of nonmetallic minerals and mineral products increased in 1998, up 2.6% to $7.0 billion. Gains in the value of exports of potash and potassium compounds (12.9%), glass and glassware (3.6%), salt and sodium compounds (7.8%), peat (11.1%) and abrasives (8.6%) offset declines in nitrogen (-7.1%), sulphur and sulphur compounds (-24.0%), and asbestos (-14.4%). A combination of reduced exports of sulphur to Brazil and Morocco and lower sulphur prices resulted in the significant decrease in the value of sulphur exports. Potash (including potassium products) is the major component in the nonmetals sector, accounting for 28.1% of the value of total nonmetallic exports in 1998.

The value of structural materials domestic exports increased significantly in 1998, rising 13.1% to $959 million, led by the largest component of this group, cement, which was up almost 10%, and miscellaneous structural materials, up 13.1%. Other commodities experiencing gains were granite, limestone flux and other limestone, marble, sand and gravel, and dolomite. The value of exports of clay and clay products, lime and slate declined in 1998.

A significant decline in the value of domestic exports of petroleum (due to sharply lower crude oil prices in 1998) and coal and coke offset an increase in the value of natural gas exports, resulting in a decrease in the value of mineral fuel exports to $25.5 billion, a 14.5% decline from the 1997 level of $29.8 billion. More than half the value of mineral fuel exports is accounted for by petroleum. In 1998, the value of petroleum exports declined by nearly 25% to $13.0 billion. The value of natural gas exports, on the other hand, increased by more than $200 million to $8.9 billion.

The value of imports of mineral products, including fuels, increased by 6.9% from $50.1 billion in 1997 to $53.6 billion in 1998 (Table 3). The value of imports of all the non-fuel sectors rose, which offset decreases in the value of coal and coke products and petroleum. Led by substantial increases in the value of imports of iron and steel and aluminum (up 19.1% and 13.9%, respectively), the value of imports of the metals and metal products sector rose to nearly $39 billion from about $31 billion in 1997. As with exports, iron and steel and aluminum are the two largest components of metal products imports, which comprise 55% of the total. Metallic minerals and products accounted for two thirds of the value of total mineral product imports in 1998, nonmetallic mineral products for 10.4%, structural materials for 2.4%, and mineral fuels for 20.3%. When petroleum and natural gas are excluded, mineral industry imports totaled $43.9 billion, or 14.7% of total merchandise imports in 1998.

As a result of the only slightly increased level of non-fuel mineral exports (but including coal) and significantly higher levels of imports, the balance of trade surplus for these commodities declined to $2.3 billion in 1998 from $7.1 billion in 1997 (Table 4). For the total economy, Canada's merchandise trade surplus declined to a still substantial $19.6 billion in 1998 from $26.2 billion in 1997 as the increased value of imports offset the smaller rise in the value of exports.

Investment by the Mineral Industry

Information on capital spending and exploration expenditures provides a useful indication of market conditions and gives an indication of the views management and investors in the Canadian mining industry hold on future market conditions in relation to present productive capacity.

Exploration Expenditures

Final exploration figures for 1997 show that exploration and deposit appraisal field expenditures totaled $820.2 million compared to $894.8 million in 1996. Preliminary estimates for 1998 indicate that the level of non-fuel exploration and deposit appraisal field expenditures declined sharply to $601.1 million and company spending intentions for 1999 indicate a further decline to $488.6 million. Low gold and base-metal prices, brought on largely by the sharp

downturn in many Asian economies and lower investor interest in mineral exploration activities, are the primary causes for this decreased exploration spending. With the exception of Alberta, all provinces and territories experienced declines in exploration expenditures in 1998. Particularly hard-hit regions were British Columbia, where low gold and copper prices sharply curtailed exploration expenditures, and the Yukon. Diamonds continued to be the driving force behind Alberta's non-fuel mining industry in 1998.

The level of mineral exploration activity is closely linked to mineral commodity prices, so it is not unexpected that estimated exploration expenditures in 1998 and company spending intentions in 1999 have declined. When commodity prices show signs of strength, the mineral exploration industry can be expected to respond. While financing on the Vancouver Stock Exchange (VSE) was down in 1998, the decrease was not as drastic as in previous downturns. According to statistics compiled by Gammah International, a company that tracks mine financing trends, junior companies listed on the VSE raised $300 million in 1998, about double the amount raised in 1991.

A new expenditures survey, launched for 1997 survey data, allows a more extensive analysis of expenditures. When costs for engineering, economic and feasibility studies, environmental protection, and land access are added to the $820.2 million expended for exploration and deposit appraisal, total expenditures rise to $921.0 million.

Capital Investment

Capital expenditures for construction and materials and equipment in the mining and mineral processing industries are expected to reach $6.1 billion in 1999, up from an estimated $5.8 billion in 1998, but down from the $6.7 billion recorded in 1997. While the overall numbers for the mineral industry are relatively strong (1995 and 1996 levels were $4.7 billion and $5.3 billion, respectively), the performance of the component industries (stages) vary markedly. Capital expenditures for the mining and quarrying industry (Stage 1) were estimated to be $2.5 billion in 1998, down 23.4% from the $3.3 billion level in 1997. A further 16.2% decline to $2.2 billion is anticipated for 1999. Reduced demand for mineral commodities and the resultant low prices have, to a significant extent, halted or curtailed mine expansion or new mine development. In contrast, capital investments in the primary metal and nonmetallic mineral semi-fabricating industries (Stages 2 and 3) are expected to increase significantly in 1999 rising 26.9% to $3.2 billion, up from the $2.6 billion recorded in 1997 and the $2.5 billion estimated for 1998, with this sector being buoyed by the strong North American economy. Investments in Stage 4 industries are expected to decline moderately from $796.3 million in 1997 to $758.1 million in 1998 and to $693.2 million in 1999.

In 1997, capital investment in the total economy stood at $157.4 billion. Estimates indicate an increase to slightly above $161 billion for each of 1998 and 1999. In 1997, investments in the mineral industry (Stages 1 to 4) accounted for 4.2% of total capital expenditures in the Canadian economy. The proportion is estimated to decline to 3.6% in 1998 but to rebound slightly to 3.8% in 1999. When repair expenditures to structures, machinery and equipment are included, expenditures in the mining and mineral processing industries totaled $10.9 billion in 1997, the latest year for which repair data are available. The 1997 level represented 5.6% of total capital and repair expenditures within the Canadian economy. This indicates that in 1997 the mineral industry spent relatively more in repairing (rather than adding to) existing plants, machinery and equipment than the economy as a whole.

PROFILES OF THE LEADING MINERALS PRODUCED IN CANADA

Gold

Canada has long been one of the world's leading producers of gold. For the fourth consecutive year, Canada trails only South Africa, the United States and Australia in the production of this precious metal. In 1998, Canada's gold output decreased from 171.5 t to 166.1 t, a decline of 3.1%. The value of gold production decreased by 8.1% to $2.3 billion. The average price of gold declined to US$294.11/troy oz in 1998, the lowest annual price since 1978. Price volatility was moderate with gold trading in a range of US$315-$273/oz. The main factors adversely affecting the price of gold are the world's central banks, which have been selling off or threatening to sell off significant quantities of their gold reserves. A strong U.S. dollar and a 3% decline in gold consumption for fabrication in 1998 were other factors contributing to the weakened price of gold. If current low prices continue (gold is averaging about US$282/oz early in 1999 and in mid-June 1999 was trading at under US$260/oz), gold production is likely to decline in Canada in 1999 and 2000 as mines close or suspend operations and companies merge or delay expansions.

About 40 primary gold mines operated in Canada at the end of 1998, accounting for over 90% of all the gold produced in Canada. Employment in these mines totaled an estimated 8964, down from 9656 in 1997 and continuing a general downward trend that started in 1989 when employment was 12 631.

Copper

The volume of copper produced in Canada rose 6.3% in 1998 to 688 600 t due to the start-up of several

mines, primarily in British Columbia. In spite of this increased volume, the value of the copper produced fell by more than 17% to $1.7 billion as copper prices declined from an average of US$1.03/lb in 1997 to an average of US$0.75/lb in 1998.

Copper's properties, especially its high electrical and thermal conductivity, good tensile strength, relatively high melting point and resistance to corrosion, make it and its alloys attractive for electrical transmission, water tubing, castings and heat exchangers. Despite reduced consumption in Southeast Asia, global copper consumption increased strongly in 1998 and should increase again in 1999, although at a slower rate. Copper prices, however, are expected to remain depressed in 1999, as world copper output continues to outpace demand, driving copper stockpiles to record levels. For the first half of 1999, copper prices have averaged less than US$0.65/lb, which is at or below the estimated average cost of production. Globally, this has resulted in the closing down of some production, the deferral of some new projects, and the extension of mine and smelter shut-downs. These are actions that analysts think are necessary to begin to rebalance the supply of copper and the amount consumed.

Zinc

Canada is the world's second largest producer of zinc, a metal used in the automotive and construction industries for the galvanization of steel and manufacture of die-cast alloys, in the production of brass, in semi-manufactures such as rolled zinc, and in chemical applications. In 1998, production of zinc (recoverable zinc in concentrates shipped) declined by 3.8% compared to 987 400 t in 1997. Zinc prices averaged US$0.464/lb in 1998, a 22.4% decrease over 1997 as a result of uncertainties related to the turmoil in Southeast Asian currency markets and the overall economic downturn in Asian, particularly Japanese, economies. These factors offset the generally positive fundamentals for zinc. World zinc consumption reached 7.8 Mt in 1998, a total that was slightly less than world refined zinc metal production. World consumption is expected to increase by about 3% in 1999 primarily due to increased demand in North America and Europe. Zinc stocks on the London Metal Exchange declined steadily throughout 1998 to finish at 317 000 t, or 175 000 t less than at the end of 1997.

For 1999, the zinc market is expected to remain fairly balanced. The continued market weakness in Japan and other Southeast Asian nations will probably continue to exert downward pressure on prices, which should average about US$0.45/lb. (Throughout the first half of 1999, the price has averaged slightly above US$0.45/lb.)

Nickel

Canada is the world's second largest nickel producer, trailing Russia and ahead of New Caledonia and Australia. Nickel's resistance to corrosion, high strength, pleasing appearance and suitability as an alloying agent are characteristics that make it useful in many applications. Major markets include stainless steel, nickel- and copper-based alloys, electroplating, alloy steels, and foundry products.

In 1998, nickel production in Canada increased by 11.2% over 1997 to 200 900 t. Quebec once again became a nickel producer in 1998 as Falconbridge Limited's Raglan mine began commercial production. As with other metals, the price of nickel declined sharply in 1998 compared to 1997. The effects of Asian financial problems translated into decreased demand by that region, especially by Japan. The stainless steel industry is the largest consumer of primary nickel, accounting for about two thirds of consumption. Consequently, the demand for nickel is largely a function of the demand for stainless steel and high-nickel alloy steels. After a 0.8% drop in world primary nickel consumption in 1998 to 1.0 Mt, consumption is expected to rise in 1999 to about 1.05 Mt. Nickel production in Canada will be dependent on the direction of prices. With nickel prices expected to remain low in 1999, Canadian nickel production should decline in that year. Production is expected to increase from the Raglan mine in 1999, the first full year of operation, but this should be more than offset by other nickel mine closures. For the first half of 1999, nickel prices have averaged a little above US$2.20/lb, compared to yearly averages of US$2.09/lb in 1998 and US$3.14/lb in 1997.

Iron Ore

Iron ore production levels in Canada remained virtually unchanged in 1998 at 38.9 Mt, while the value of production increased 0.8% to $1.58 billion. Over 80% of the volume and value of iron ore shipments are exported. The United States is the largest single customer, receiving 33% of the shipments in 1998. The European Union was the recipient of 53% of shipments of Canadian iron ore in 1998. Both of these percentages were similar to 1997 levels (35% to the United States and 53% to the European Union).

For 1999, prices were negotiated to lower levels on both the European (reduction of 11-14%) and Japanese (reduction of 11%) markets. Shipments for the first half of 1999 to all markets (the United States, Europe and Asia) are expected to be substantially lower than the levels reached in 1998 during the same period. The same situation may prevail for the second half of 1999 unless Asian economies recover.

The price for iron ore in 1999 dropped about US$2/t from the 1998/99 base of US$19/t, due mainly to weak

demand from the Asian steel industry. Australia and Brazil, which together supply over half the world iron ore market, set the price internationally in direct negotiations with Japanese and European steelmakers. To combat the lower prices in 1999, the three Quebec-Labrador iron ore companies, which mine virtually all of the iron ore produced in Canada, will seek new markets and further reduce their production costs. Also, some Canadian iron ore producers may be forced to temporarily lay off some of their employees for extended periods to adjust to the new market conditions.

Uranium

Canada is the world's largest producer and supplier of uranium, exporting about 80% of its production. The United States is the largest market for Canadian uranium. The world's two largest uranium-producing companies have operations in Canada. Uranium production in Canada declined by more than 10% in 1998 to 9980 t. ("Production" is defined as the metal content (U) reported by producers of uranium precipitates or concentrates.) Despite this decline, uranium still ranks solidly among Canada's top 10 metal commodities in terms of value of production. As for prices, the increase in spot market prices during the second half of 1997 was unsustainable, giving way to almost continuous decline throughout 1998. Reflecting the downward trend in spot prices, the average price of Canadian export deliveries also decreased from $51.30/kgU (US$14.20/lb U_3O_8) in 1997 to $51.10/kgU (US$13.30/lb U_3O_8) in 1998. Canadian producers were, to a large extent, sheltered from the price decline during 1998 by the weakness of the Canadian dollar relative to the U.S. currency.

The commercial fate of the uranium derived from dismantled Russian nuclear weapons remained unresolved in 1998 but, by year-end, there were encouraging signs that an agreement between the Russian Ministry of Atomic Energy and a consortium of Western companies might finally be concluded in 1999. An agreement would significantly reduce the uncertainty hanging over the international uranium market, providing a more stable environment for long-term investment decisions.

Silver

In Canada, silver is normally produced as a co-product of gold mining or base-metal mining. British Columbia is the leading silver-producing province, followed by New Brunswick, Ontario and Quebec. In 1998, Canada produced 1115 t of silver valued at $293.5 million, compared to 1194 t valued at $260.0 million in 1997. Silver was the only metal to buck the trend to lower prices in 1998 when prices averaged US$5.54/oz compared to US$4.90/oz in 1997. Even though the Silver Institute reported that demand for silver dropped 2.2% in 1998 to 840.6 million oz (the first decline in four years), consumption outstripped production for the tenth consecutive year. Ample inventories and sales of scrap metal are making up for the shortfall.

Potash

The term "potash" refers to a group of potassium-bearing minerals and chemicals. The dominant potash product is potassium chloride, a naturally occurring pink, salty mineral for which Canada is the world's leading producer and exporter. The main use of potash is in the agricultural sector where it is used to enhance the efficiency of plants in the uptake of nutrients. Other uses include detergents, ceramics, chemicals and pharmaceuticals. In 1998, potash was the third most valuable non-fuel mineral produced in Canada, trailing only gold and copper. In 1998, the value of potash produced in Canada totaled $1.67 billion, a 9.1% increase over 1997. At the end of 1998, the potash industry in Canada employed more than 3400 workers in eight underground mines and two solution mining operations in Saskatchewan and one underground mine in New Brunswick.

The world's potash supply/demand situation in 1998 was relatively balanced despite the prevalent financial crisis in Asia and the emergence of currency fluctuations in Latin America. Market conditions in 1998 were driven by a relatively stable demand, and suppliers reacted by adjusting production and sales, which led to an increase in inventories during the second half of 1998. Offshore potash price quotations were firm in 1998, registering a slight increase at the end of 1998 and in early 1999. For 1998, price quotations rose by 2% to average US$118.50/t standard KCl f.o.b. Vancouver.

Chrysotile

Chrysotile is regarded as the form of asbestos "least hazardous" to human health. It is the only form produced or extracted in Canada. Quebec is the only province currently producing chrysotile. In 1998, Canadian chrysotile shipments decreased by 23.9% from 1997 levels. Total shipments for 1998 were estimated to be 320 000 t valued at $167.2 million, compared to 420 278 t valued at $214.9 million in 1997. Canadian exports of chrysotile in 1998 were an estimated 319 430 t, a 25.7% decrease in volume from the previous year. The value of these exports decreased by 23.0% to $198.7 million. Because of depressed markets, due mainly to the continued Asian financial crisis and the European ban movement, employment in the Canadian chrysotile industry declined to about 1500 workers in 1998.

Salt

Canadians are the highest per capita consumers of salt in the world, due primarily to the extensive use

of salt as a de-icing agent to improve driving in wintry conditions. In 1998, Canadian salt (halite in geological terms) shipments were estimated at 13.2 Mt, a 2.3% decrease over 1997. The average unit value of salt shipments was estimated at $30.29/t, a 1% increase over that of 1997. In 1999, domestic production and consumption of salt are expected to remain stable.

Salt is a widespread, low value bulk commodity. It is relatively easy to extract and transportation represents a significant proportion of the total delivered price. As a consequence, international trade in salt is small relative to world production – about 20% of world production.

Gypsum

Canadian shipments of natural gypsum totaled 8.1 Mt valued at $88.0 million in 1998, compared to 8.6 Mt valued at $95.3 million in 1997. The decrease in shipments of natural gypsum (about 6%) resulted from weaker levels of construction activity in Canada and from a decrease in exports to the United States.

Most gypsum producers in Canada are closely integrated in both mining and wallboard manufacturing. Six companies operate 12 mines and 13 wallboard plants, in total employing about 1900 workers. Canadian housing starts are expected to be at least as high as 1998's 137 000 units and, with real economic growth in both Canada and the United States expected to continue, the outlook continues to be positive in the office and industrial building sectors, including renovation and repair work. Therefore, Canadian shipments of gypsum are expected to increase moderately in 1999.

Sulphur

In 1998, total sulphur production increased by 1.9% to 9.2 Mt. Elemental sulphur (recovered from natural gas and crude oil processing) accounted for 8.4 Mt, or 91% of the total. The additional 0.8 Mt was recovered from the smelting of metallic sulphides and the roasting of zinc-sulphide concentrates.

According to industry sources, at an estimated 5.2 Mt, Canadian sulphur offshore exports in 1998 were about 7% lower than in 1997, due mostly to much reduced exports to Morocco and Brazil, which are the largest offshore destinations for Canadian sulphur. Some of this reduction was offset by significantly higher exports to China. In addition, Canada exported 1.8 Mt of sulphuric acid, nearly all to the United States. Canadian imports were minimal and were mostly from the United States.

Entering 1998, sulphur price quotations on a free on board (f.o.b.) Vancouver basis were between US$38 and $30/t. Quotations decreased steadily, reaching a low of US$21-$23/t in June. Quotations remained at that level for the remainder of the year.

In 1999, the world sulphur market is expected to perform at a level equal to or slightly better than that of 1998. The consumption of phosphate fertilizers (the principal use of sulphur) is forecast to grow in most Asian regions. In 1999, Canadian production is expected to remain at, or slightly above, 1998 levels, and prices are expected to improve throughout the year.

Coal

Total Canadian coal production in 1998 was 74.4 Mt, 5.5% below the 1997 level. The value of coal production in 1998 totaled $1.8 billion, a 6.6% decrease compared to 1997. Metallurgical coal (used in the production of steel) accounted for about 37% of total coal production, the remaining 63% was thermal (used for the generation of electricity). Metallurgical coal production decreased by about 7% and thermal coal by 2%. Thermal coal exports were down some 10% at about 5.8 Mt, while metallurgical exports were down some 5% at about 29.0 Mt.

In 1999, metallurgical coal producers are facing an 18% price cut on coal exported to Japan from about US$50/t in 1998 to US$41.40/t. Weak demand from the Japanese steel industry and changing technology in the steel-making process are two factors causing this significant decline.

Coal is an organically derived material that is formed from the remains of decayed plant material compacted into a solid through millions of years of pressure and heat. It is the world's most abundant and widely distributed fossil fuel. In Canada, most of the coal is produced in the western provinces of Alberta (34.9 Mt in 1998), British Columbia (25.0 Mt) and Saskatchewan (12.0 Mt), with smaller amounts being produced in Nova Scotia and New Brunswick.

Structural Materials

The value of all structural materials produced in Canada (clay products, cement, lime, sand and gravel, and stone) was $2.9 billion in 1998, a 2.2% increase over 1997. The highest valued product of the structural materials group is cement. In 1998, the value of cement produced was $1.1 billion, 6% above the 1997 figure. Demand for cement in Ontario remained relatively strong, although in British Columbia there was a substantial decrease in demand. Overall construction activity was weaker than in 1997, affected by an 8% drop in residential construction. Cross-border trade of cement with the United States varies considerably from year to year depending on demand. Canadian cement production efficiencies and a lower-valued Canadian dollar (relative to the U.S. currency) continue to make Canadian cement competitive in

U.S. markets. Annual exports of cement to the United States amount to 3-4 Mt and account for about one third of total Canadian shipments.

Cement shipments in 1999 are expected to increase mainly based on relatively low interest rates, continued recent strength in both residential and non-residential building construction, and a stable demand for exports.

The value of sand and gravel produced in Canada in 1998 declined by 1.1% to $819.9 million, the value of stone increased slightly to $646.2 million, and the value of lime increased to $220.5 million. The value of clay products declined by 0.7% to $135.3 million.

Diamonds

On October 14, 1998, BHP Diamonds Inc. opened the Ekati mine in the Northwest Territories, Canada's first major diamond mine. By the end of the year, the mine had produced nearly 200 000 carats (ct). Once full capacity is reached, annual production is expected to be about 3.5-4.5 Mct. At that level, the Ekati mine will account for about 4% of global diamond production by weight and 6% by value.

In 1998, exploration for diamonds continued in several regions of Canada. Preliminary data indicate that diamond exploration expenditures declined from $92.2 million in 1997 to $73.9 million in 1998. Exploration was focused principally in the Northwest Territories.

In comparison to other countries with cutting and polishing industries, the Canadian industry is quite small. However, the start of Canada's mine production of rough diamonds has created interest in establishing new facilities in this country.

Worldwide, the demand for polished diamonds of a size between 0.75 ct and 2-3 ct with good colour and clarity is expected to continue to be strong. The surplus of small inexpensive polished diamonds should continue for a few years. Prices for natural industrial diamonds should continue to decline if world production remains at its present level, or increases, due to strong competition from synthetic diamonds.

LOOKING AHEAD FOR THE MINERAL INDUSTRY

The outlook for the Canadian mineral industry in 1999 was not promising as the year 1998 came to a close. Mineral commodity prices, which fell to depressed levels during 1998, are expected to remain near their lows and not to rebound significantly until weak global demand and surplus supply conditions for many minerals and metals are brought more in balance. Unfortunately, there is added negative pressure on the supply side with large low-cost mines, particularly for nickel, copper and gold, coming on stream around the world. Furthermore, global steelmaking, which is a major consumer of mineral-based commodities, looks particularly weak. In early 1999, benchmark international contracts for metallurgical coals, which are directly related to steelmaking, were being renegotiated with prices for 1999 being, on average, about 18% lower than the 1998 international price of about US$50/t f.o.b. port. In some cases, shipments were also being reduced. Similarly, iron ore contract benchmark prices were down about 11% for 1999.

Even though natural resource sectors such as forestry, agriculture and minerals remain depressed, the Canadian economy is expected to expand in 1999, but at a slower pace. GDP growth is estimated to be in the 2.5% range, down from 3.0% in 1998 and 3.8% in 1997. Even with a 2.5% growth rate, Canada would still be near the top of the G7 countries for 1999. A capital spending survey by Statistics Canada indicates that capital spending is expected to be flat in 1999 after five years of growth, although energy projects in Quebec, New Brunswick and Newfoundland will increase activity in these provinces. Inflation is expected to continue at an annual rate of about 1-1.5%, while the Bank of Canada interest rate is expected to remain around the 5.25% that prevailed at the end of 1998. Unemployment, which was at 8.0% at the end of 1998, dropped to 7.8% in early 1999. However, with a slowing economy and a likely fall-off in the strong consumer spending, which was a driving force in both 1997 and 1998, the rate can be expected to be under pressure to rise above this level as the year progresses.

On a global basis, most forecasters are looking at GDP growth of about 1.5% for the world's economy in 1999 and about 2.5% in 2000. The Latin American and Japanese economies are expected to decline in 1999, but by 2000 are expected to improve. Economies in North America and Western Europe are expected to remain steady, with the U.S. economy still leading the way with a continuing strong performance, but these economies could be adversely affected by countries trying to export their way out of economic difficulties.

For Canadian mineral producers, an excess of production and the economic weakness in global markets will maintain ongoing downward pressure on most mineral commodity prices and, consequently, on the financial health and outlook of these companies. There will therefore be continued efforts by producers to cut operating costs. Mining operations currently at the higher end of the cost curve will be under added pressure to close, to consider merger opportunities, or to be the target of takeover bids. All of these actions reinforce the long-term global trend of declining mineral commodity prices. New mine investment, exploration activity and mining employment can be expected to be down again in Canada in 1999 due to continuing weakness in the mining sector.

As shown in this article, while still going through difficult times, the mining industry continues to make a major contribution to the Canadian economy. Mining has been viewed as a relatively low-tech industry when compared with manufacturing, where automated on-line production processes have helped firms compete and restore profit margins. However, the mining industry is now heading in the same direction as it automates more of its operations. For example, companies such as Inco Limited are now in the early stages of controlling different aspects of underground activity with operators working on the surface, a new method referred to as "telemining." Canada's mining industry is a world leader in these kinds of innovations, which also include geo-sensing, laser-guidance systems and 3-D animation and simulation applications.

The mining industry has been under severe profit margin pressures. Applying technical advances in automation, robotics and telecommunications will result in better safety, more accurate drilling and blasting, faster ore extraction, higher output, productivity gains, and lower costs. Earlier automation moves have already achieved significant productivity gains, improved drill-bit lifetimes and lowered maintenance costs. These changes will likely result in fewer underground mine employees, but will also create well-paid, skilled surface jobs and will make mining safer. If increased automation allows Canada's mining companies to compete more successfully, it will create wealth for mining communities and benefit the whole economy. Technological innovation in the mining industry is a very positive development for the industry's future.

Note: Information in this review was current as of June 18, 1999.

TABLE 1. CANADA, PRODUCTION OF LEADING MINERALS, 1997 AND 1998p

		Volume		Percent Change	Value		Percent Change
		1997	1998p	1998/1997	1997	1998p	1998/1997
		(000 tonnes except where noted)			($ millions)		
METALS							
Gold	kg	171 479	166 089	–3.1	2 527.4	2 322.4	–8.1
Copper		648	689	6.3	2 050.9	1 693.2	–17.4
Iron ore		38 928	38 908	–0.1	1 571.7	1 584.1	0.8
Zinc		1 027	987	–3.8	1 870.9	1 487.0	–20.5
Nickel		181	201	11.2	1 775.9	1 419.4	–20.1
Uranium	tU	11 127	9 984	–10.3	553.9	x	x
Silver	t	1 194	1 115	–6.6	260.0	293.5	12.9
Platinum group	kg	11 836	14 522	22.7	134.2	222.9	66.0
Cobalt	t	2 168	2 324	7.2	154.4	167.7	8.6
Lead		171	152	–11.2	147.6	118.0	–20.0
Molybdenum	t	7 594	7 563	–0.4	87.6	82.4	–5.9
NONMETALS							
Potash (K_2O)		9 235	8 969	–2.9	1 528.3	1 667.0	9.1
Salt		13 497	13 192	–2.3	405.5	399.5	–1.5
Peat		1 054	1 127	6.9	146.4	169.7	15.9
Asbestos		420	320	–23.8	214.9	167.2	–22.2
Gypsum		9 628	8 095	–6.2	95.3	88.0	–7.7
Sulphur in smelter gas		800	838	4.8	59.5	58.3	–1.9
Sulphur, elemental		8 272	8 410	1.7	84.1	54.3	–35.4
Diamonds	000 carats	–	278	n.a.	–	53.4	n.a.
Nepheline syenite		648	617	–4.8	51.3	50.2	–2.2
STRUCTURAL MATERIALS							
Cement		11 736	12 064	2.8	1 062.7	1 126.9	6.0
Sand and gravel		225 495	217 650	–3.5	829.2	819.9	–1.1
Stone		99 265	95 998	–3.3	644.2	646.2	0.3
Lime		2 477	2 514	1.5	213.0	220.5	3.5
Clay products		. .	. .	. .	136.3	135.3	–0.7
MINERAL FUELS							
Crude oil and equivalent	000 m^3	123 827	128 769	4.0	17 837.8	12 990.3	–27.2
Natural gas	million m^3	156 171	161 015	3.1	10 719.2	11 196.0	4.4
Coal		78 670	74 370	–5.5	1 920.2	1 793.2	–6.6
Natural gas by-products	000 m^3	26 527	26 612	0.7	2 599.2	1 790.6	–31.1

Sources: Natural Resources Canada; Statistics Canada, *Canada's Mineral Production, Preliminary Estimates,* cat. no. 26-202-XIB.
– Nil; . . Not available; n.a. Not applicable; p Preliminary; x Confidential.
Note: Numbers have been rounded.

TABLE 2. CANADA, STAGE I TO STAGE IV, DOMESTIC EXPORTS OF MINERALS AND MINERAL PRODUCTS BY COMMODITY, 1996-98

	Unit of Measure	1996		1997		1998p	
	(000)	(Quantity)	($000)	(Quantity)	($000)	(Quantity)	($000)
METALS							
Aluminum	..	..	6 328 775	..	7 127 264	..	7 137 180
Antimony	kg	1 434	2 332	244	875	769	1 403
Bismuth	kg	141	1 517	135	1 415	175	2 015
Cadmium	kg	1 722	8 198	2 622	5 612	2 097	3 205
Calcium metal	kg	4 570	3 655	5 685	4 281	5 616	3 661
Chromium	kg	8 749	29 370	7 902	33 642	7 085	31 948
Cobalt	kg	5 120	385 335	6 356	431 471	6 911	463 890
Copper	..	..	3 028 916	..	2 929 108	..	2 385 148
Gold	..	..	3 547 590	..	3 485 710	..	3 384 271
Iron and steel	..	..	8 238 652	..	8 495 816	..	9 606 446
Iron ore	t	27 920	1 032 860	32 340	1 262 406	30 180	1 286 304
Lead	..	..	430 810	..	334 083	..	284 009
Magnesium and magnesium compounds	kg	101 974	221 788	106 592	252 921	111 542	273 808
Molybdenum	kg	8 771	71 562	11 303	91 702	10 759	67 691
Nickel	..	..	2 339 044	..	2 119 890	..	1 903 017
Platinum group	..	..	158 116	..	182 857	..	207 789
Silver	..	..	433 218	..	350 772	..	507 443
Tin	..	..	20 261	..	17 343	..	13 793
Uranium and thorium	..	..	960 516	..	970 889	..	785 718
Zinc	kg	1 331 509	1 486 297	1 121 286	1 789 170	1 054 247	1 526 058
Other metals	..	..	3 510 826	..	4 112 100	..	4 780 624
Total metals		..	32 239 638	..	33 999 327	..	34 655 421
NONMETALS							
Asbestos	..	..	353 188	..	308 350	..	264 060
Barite and witherite	t	15	5 285	21	5 907	25	9 158
Diamonds	kg	..	16 794	..	13 660	110	6 869
Graphite	..	..	132 208	..	132 581	..	126 945
Gypsum	..	..	230 768	..	288 927	..	341 734
Mica	t	17	9 516	16	9 240	18	11 308
Nepheline syenite	t	269	43 919	372	50 498	338	52 205
Peat	..	..	289 132	..	288 094	..	320 061
Potash and potassium compounds	kg	12 961 046	1 546 155	14 647 353	1 752 693	14 278 275	1 978 593
Salt and sodium compounds	t	4 959	543 287	4 727	503 537	5 227	542 661
Sulphur and sulphur compounds	kg	7 697	495 545	8 185	468 190	6 803	356 041
Talc, soapstone and pyrophyllite	kg	26	7 607	26	8 010	30	10 227
Titanium oxides	kg	69 781	152 332	79 185	172 758	83 861	211 129
Other nonmetals	..	..	2 549 744	..	2 842 054	..	2 798 073
Total nonmetals		..	6 375 480	..	6 844 499	..	7 029 064
STRUCTURAL MATERIALS							
Cement	..	..	506 880	..	573 844	..	628 957
Clay and clay products	..	..	41 809	..	44 475	..	39 427
Lime	kg	216 849	24 701	224 233	27 203	171 447	21 304
Sand and gravel	t	1 428	11 844	1 809	15 680	1 999	19 737
Silica and silica compounds	..	..	13 995	..	18 370	..	16 426
Stone	..	..	104 479	..	128 992	..	153 370
Other structural materials	..	..	49 807	..	57 682	..	96 407
Total structural materials		..	753 515	..	866 246	..	975 628
FUELS							
Coal and coke	t	34 979	2 620 374	36 158	2 734 570	33 258	2 504 909
Natural gas	000 m^3	80 117	7 432 768	81 795	8 625 631	87 326	8 858 923
Natural gas by-products	000 m^3	8	1 154 199	8	1 161 236	9	860 303
Petroleum	..	..	17 040 149	..	17 003 934	..	12 978 294
Other fuels	kg	193 888	251 406	163 634	257 592	163 696	269 320
Total fuels		..	28 498 896	..	29 782 963	..	25 471 749
Total mineral domestic exports (including fuels)		..	67 867 529	..	71 493 035	..	68 131 862
Total economy domestic exports		..	259 265 000	..	281 255 740	..	296 699 975

Sources: Natural Resources Canada; Statistics Canada.
.. Not available or not applicable; p Preliminary.
Note: Numbers may not add to totals due to rounding.

TABLE 3. CANADA, STAGE I TO STAGE IV, IMPORTS OF MINERALS AND MINERAL PRODUCTS BY COMMODITY, 1996-98

	Unit of Measure	1996		1997		1998p	
	(000)	(Quantity)	($000)	(Quantity)	($000)	(Quantity)	($000)
METALS							
Aluminum	. .	. .	3 373 306	. .	3 827 343	. .	4 359 671
Antimony	kg	2 515	11 917	2 514	11 017	2 670	9 747
Bismuth	kg	98	2 102	237	3 043	220	2 426
Cadmium	kg	736	1 502	487	1 341	35	607
Calcium metal	kg	44 889	35 803	53 902	40 576	74 768	47 542
Chromium	kg	112 877	94 366	104 999	97 948	96 008	93 994
Cobalt	kg	1 123	70 232	1 213	63 955	1 522	62 975
Copper	. .	. .	1 648 903	. .	1 810 201	. .	1 624 140
Gold	. .	. .	1 077 642	. .	1 438 458	. .	1 577 937
Iron and steel	. .	. .	10 245 590	. .	12 912 369	. .	15 379 922
Iron ore	t	6 911	334 255	7 148	357 847	7 255	387 944
Lead	. .	. .	498 422	. .	551 199	. .	589 792
Magnesium and magnesium compounds	kg	390 826	157 023	326 106	203 457	277 286	186 701
Molybdenum	kg	3 686	38 652	3 677	40 489	4 216	41 009
Nickel	. .	. .	757 023	. .	599 185	. .	639 258
Platinum group	g	243 738	207 343	266 556	228 667	195 251	182 448
Silver	. .	. .	125 790	. .	142 383	. .	136 801
Tin	. .	. .	56 634	. .	59 240	. .	61 700
Uranium and thorium	. .	. .	248 005	. .	219 999	. .	223 827
Zinc	. .	. .	153 816	. .	275 855	. .	234 856
Other metals	. .	. .	6 887 494	. .	8 348 454	. .	10 003 004
Total metals			26 025 820		31 233 026		35 846 301
NONMETALS							
Asbestos	. .	. .	75 281	. .	85 281	. .	81 023
Barite and witherite	t	16	1 868	22	2 994	14	2 479
Diamonds	. .	. .	191 132	. .	223 942	. .	251 119
Graphite	. .	. .	335 829	. .	369 379	. .	447 787
Gypsum	. .	. .	24 787	. .	30 779	. .	36 164
Mica	t	4	10 460	4	12 369	5	11 469
Nepheline syenite	. .	. . .	52	. . .	12	. . .	3
Peat	. .	. .	750	. .	1 289	. .	2 743
Potash and potassium compounds	kg	. .	35 430	. .	39 055	118 389	41 588
Salt and sodium compounds	t	2 155	325 159	2 306	318 140	1 930	308 783
Sulphur and sulphur compounds	kg	110	15 975	152	19 096	189	21 688
Talc, soapstone and pyrophyllite	kg	58	15 283	56	13 072	47	12 173
Titanium oxides	kg	84 713	180 046	111 291	231 247	117 814	272 653
Other nonmetals	. .	. .	3 122 830	. .	3 480 783	. .	3 959 731
Total nonmetals			4 334 882		4 827 438		5 449 403
STRUCTURAL MATERIALS							
Cement	. .	. .	157 885	. .	188 201	. .	210 343
Clay and clay products	. .	. .	671 334	. .	762 951	. .	862 270
Lime	kg	36 640	5 054	47 382	6 380	33 988	5 752
Sand and gravel	t	3 241	16 300	3 207	17 619	3 068	18 955
Silica and silica compounds	. .	. .	109 098	. .	125 737	. .	143 146
Stone	. .	. .	93 950	. .	105 411	. .	134 142
Other structural materials	. .	4	57 623	4	67 242	. .	78 031
Total structural materials			1 111 244		1 273 541		1 452 639
FUELS							
Coal and coke	t	12 860	757 557	15 939	879 158	20 880	1 141 455
Natural gas	000 m^3	1 923	111 361	953	137 292	734	103 999
Natural gas by-products	000 m^3	. . .	70 227	. . .	56 091	. . .	56 626
Petroleum	. .	. .	9 592 959	. .	11 428 616	. .	9 143 758
Other fuels	. .	. .	306 498	. .	347 478	. .	449 774
Total fuels			10 838 602		12 848 635		10 895 612
Total mineral imports (including fuels)			42 310 548		50 182 640		53 643 955
Total economy imports			232 648 033		272 855 758		298 316 804

Sources: Natural Resources Canada; Statistics Canada.
. . Not available or not applicable; . . . Amount too small to be expressed; p Preliminary.
Note: Numbers may not add to totals due to rounding.

TABLE 4. CANADA, VALUE OF DOMESTIC EXPORTS, TOTAL EXPORTS (INCLUDING RE-EXPORTS), IMPORTS, AND BALANCE OF TRADE OF MINERALS AND MINERAL PRODUCTS, STAGES I TO IV, 1994-98

	1994	1995	1996	1997	1998
			($000)		
TOTAL MINING, INCLUDING FUELS					
Domestic exports	53 514 519	61 638 947	67 867 537	71 493 041	68 131 860
Total exports	54 315 676	63 094 715	69 082 164	72 962 766	69 264 551
Imports	35 621 152	39 877 705	42 310 542	50 182 644	53 643 958
Balance of trade	18 694 524	23 217 010	26 771 622	22 780 122	15 620 593
NON-FUEL MINING					
Domestic exports	32 673 188	38 262 167	39 368 642	41 710 077	42 660 112
Total exports	33 164 779	38 927 197	40 078 786	42 539 760	43 643 003
Imports	27 700 890	30 874 074	31 471 941	37 334 009	42 748 347
Balance of trade	5 463 889	8 053 123	8 606 845	5 205 751	894 656
TOTAL NON-FUEL MINING, INCLUDING COAL					
Domestic exports	34 834 414	40 629 187	41 989 016	44 444 647	45 165 020
Total exports	35 326 376	41 298 243	42 700 792	45 275 387	46 148 907
Imports	28 277 764	31 564 042	32 229 497	38 213 167	43 889 802
Balance of trade	7 048 612	9 734 201	10 471 295	7 062 220	2 259 105
TOTAL ECONOMY					
Domestic exports	213 290 163	248 440 788	259 265 000	281 255 740	296 699 975
Total exports	226 475 000	264 207 000	275 773 600	299 089 922	317 902 296
Imports	202 737 000	225 629 195	232 648 033	272 855 758	298 316 804
Balance of trade	23 738 000	38 577 805	43 125 567	26 234 164	19 585 492

Sources: Natural Resources Canada; Statistics Canada.