General Review

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OVERVIEW

The global economic environment improved during 1999 as the economic recovery finally got under way in Asia and Europe while Canada and the United States continued to experience strong economic growth. The expanding global economy led to an increase in most commodity prices in 1999 and an improved outlook for 2000. The price of most metals increased during 1999 and this was evident in the mining industry as operating profits rose, the decline in exploration spending moderated, and the value of non-fuel mineral production stabilized. However, there was a net decline in mining employment, and mine closures outnumbered openings as the industry continues to improve efficiency.

Canada's real Gross Domestic Product (GDP) at market prices rose by 4.5% to $880.3 billion in 1999, a significant increase from $842.0 billion in 1998 and a further increase from $815.0 billion in 1997. Both interest rates and inflation rates remained low and employment growth brought the unemployment rate down to 6.8% by the end of 1999. The Canadian dollar increased by three cents against the U.S. dollar from the beginning of the year to end the year at $0.68. Despite this appreciation, Canadian export sales increased to $360.6 billion in 1999 from $322.5 billion in 1998.

Preliminary estimates of the value of production for all sectors of the mining and fuel extraction industry showed a dramatic increase of almost 21% from $44.3 billion in 1998 to $53.5 billion in 1999. This is the highest value ever attained for Canadian mineral production. The increase is directly attributable to substantial gains in the value of crude oil and natural gas produced and to the emergence of Canada's diamond mining industry. When fuels are excluded, the value of production for the mineral industry increased by less than 1% to $17.0 billion. Of this, the value of metals production fell by 6.1% while nonmetals increased by 17.0% and structural materials increased by 4.1%.

The value of mineral and mineral product domestic exports (including fuels) increased to $71.3 billion in 1999 from $68.4 billion in 1998, a 4.3% rise. Improving commodity prices contributed significantly to the increase in the value of exports. Despite a general increase in exports, the export of primary products produced by the extraction, production or harvesting of minerals suffered the greatest decrease. The value of fabricated metal product exports increased by over 9.0% in 1999 to $13.1 billion as exports of these products to the booming U.S. economy rose significantly. In spite of an increase in mineral product imports, the trade surplus (total exports less total imports) in these products stood at a healthy $17.2 billion.

Prices for most major mineral commodities increased throughout 1999, bolstered by a recovering global economy. In some cases, such as copper, the price increased from US$0.65/lb to over US$0.80/lb during 1999 as greater demand offset higher production. The impact on nickel was also dramatic as the spot price more than doubled from US$1.81/lb to US$3.83/lb by the end of the year. Higher commodity prices are improving the outlook for Canadian mines and some expansion is expected over the next two years.

Significant developments affecting the Canadian mineral industry in 1999 included:

- increasing commodity prices;
- improving balance sheets for many companies;
- increasing activity in Canada's diamond industry;
- the continuing impasse at the Voisey's Bay nickel development;
- major capital expenditures in the iron ore industry;
- a more moderate decline in exploration activities;
- more mine closings than mine openings; and
- a fall in direct mine employment.

Outlook and Impacts on the Canadian Mining Industry

The year 2000 should see an improvement in the Canadian mining industry. The worst seems to be over as a strong global economy bolsters mineral commodity prices. Positive GDP growth is expected in most Asian countries in 2000 and for several Latin American countries as well. The gold market is showing more stability since the European central banks decided to limit gold sales over the next four years and the International Monetary Fund is looking for a means, other than gold sales, to provide debt relief for poorer countries. Despite a small increase in industrial activity, primarily in Japan, the price of high-grade metallurgical coal could decrease slightly in 2000 as purchasers hold out for a reduction in prices. Although most Canadian mining companies have reduced costs, operating profits are low and many have high debt leverage. This debt creates the possibility for mergers and acquisitions that should make the highly fragmented mining industry more attractive to investors. 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 2000.

There are, however, some positive signs. Based on company spending intentions at the end of 1999, exploration expenditures in 2000 in Canada are expected to level off at $502 million after dropping to $501 million in 1999 from $666 million in 1998. Low commodity prices have caused many companies to curtail or suspend exploration, although the recent turnaround of some metal prices may benefit exploration spending. On the Toronto Stock Exchange (TSE), the world's leading stock exchange for raising equity capital for mining companies, the nearly 300 mining companies listed had a market capitalization of $80 billion in 1999, a 21% increase over 1998. 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 1999. Inflation averaged just 1.7% for the year. Interest rates were lower during 1999 and remain low by recent historical standards. The Bank of Canada lowered its rate by 25 basis points in March and then by another 25 points in May. After that time, two successive 25-point increases brought the Bank of Canada rate to 5.25% in February 2000, returning it to the same level it started at in 1999. Consumer confidence and spending increased during 1999. Canada Mortgage and Housing Corporation announced that housing starts climbed to about 150 000 units, an increase of 9% from 1998. Housing sales were also up by about 7% to an estimated 335 735 units. Sales of new cars and trucks increased to more than 1.5 million units, an 8% increase over 1998.

CANADIAN ECONOMIC CONDITIONS

Leading Indicators	1998	1999	% Change
Real GDP ($ billion)	842.0	880.3	+4.5
Consumer prices (% annual change)	+0.9	+1.7	n.a.
Operating profits ($ millions)	132.0	158.1	+19.8
Unemployment rate (% annual average)	8.3	7.6	-8.4
Merchandise trade balance ($ billion)	19.1	33.8	n.a.
Housing starts (000)	137.4	150.7	+9.1
U.S. exchange rate (annual average)	0.6741	0.6731	-0.15
International current account deficit ($ millions)	-16 255	-3 447	n.a.
Global economic output (% change)	+2.5	+3.3	n.a.

Source: Natural Resources Canada.
n.a. Not applicable.

The unemployment rate fell to 6.8% in December from 7.9% in January. Manitoba had the lowest rate at 5.6% and Newfoundland the highest at 16.9%. Employment grew by an impressive 3.0% as an estimated 427 000 new jobs were created in 1999. In terms of real GDP growth, the Canadian economy was the best performer among the G7 countries in 1999, surpassing even the United States.

On the trade front, total merchandise exports have increased steadily over the last several years, reaching $360.6 billion in 1999. Despite an increase in imports, Canada's trade surplus climbed to $33.8 billion from $19.1 billion in 1998 and $23.8 billion in 1997. As a result of the improved trade surplus, Canada's overall international current account deficit declined in 1999 to $3.4 billion, an improvement from the 1998 deficit of $16.3 billion. Since 1982, the current account has only had a surplus in 1982 and 1996. At year-end, the dollar was trading at 67.9 cents in U.S. funds, down from a high of 68.4 cents earlier in the year. For much of the last half of 1999 and early in 2000, the dollar traded at about 68 cents.

World economic growth was a robust 3.3% in 1999 and is expected to reach 4.2% in 2000 with economic expansion continuing in the United States, Latin America and Asia, including moderate growth in Japan. Korea, India and China had strong growth in 1999 that should continue into 2000. The European Union had economic growth of 2.3% in 1999 that

could rise to 3.2% in 2000, and positive growth is improving the economies of emerging European countries such as Russia and Poland. The coincident increase in economic growth among these regions could lead to a further rise in some non-fuel commodity prices.

CANADIAN MINERAL INDUSTRY, 1999

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-Fabricating 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), a description of the mineral industry as a whole (Stages 1 to 4) provides a more comprehensive picture of the overall importance of the mining 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.

Leading Mining Indicators	1998	1999	% Change
Value of non-fuel mineral production (with coal) ($ millions)	18 742	18 528	-1.14
Exploration expenditures ($ millions)	655.9	501.1	-24
Metal Prices Index (1992=100)			
Precious metals	90.7	86.0	n.a.
Base metals	89.7	92.5	n.a.
Direct mining employment (000)	54.9	52.3	-4.7
Value of mineral and mineral product exports including coal ($ billions)	45.3	44.0	-2.9
Mining company profits – metals sector ($ billions)	1.5	1.7	+15
Mine financing ($ billions)	3.2	1.8	-44

Source: Natural Resources Canada.
n.a. Not applicable.

GDP OF THE MINERAL INDUSTRY

In 1999, the mineral industry, as defined above, contributed $27.7 billion to Canada's total GDP of $750.0 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 1998. The 1999 estimate for the mineral industry was 2.3% above the 1998 level of $27.1 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. 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 1999. 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. Some 150 communities were heavily reliant on mining in 1996 and approximately 700 000 Canadians lived in these communities.

The total GDP of all four stages of the mineral industry increased in 1999 compared to 1998. However, the GDP of the combined mining and quarry and sand pit industries declined to $7.5 billion from $7.7 billion in 1998 but still accounted for 27% of the mineral industry total. The combined GDP of Stages 2, 3 and 4 rose by 4.2% over 1998, reaching $20.2 billion.

CANADIAN MINERAL PRODUCTION

Preliminary estimates indicate that the total value of Canadian mineral production (including fuels) climbed to $53.5 billion in 1999, a 20.6% increase from the $44.3 billion recorded in 1998. The value of the fuels portion of the total increased by 33.1% due to a significant increase in the price of oil. The non-fuel portions of the total edged upward by 0.4% as an increase in the value of the nonmetallic group offset a decline in the value of metallic mineral production (see table below).

CANADIAN MINERAL INDUSTRY VALUE OF PRODUCTION 1998 AND 1999

	1998r	1999p	Change
	($ millions)		(%)
Metals	10 450.2	9 808.7	-6.1
Nonmetals	3 425.5	4 007.8	17.0
Structural materials	3 101.7	3 227.4	4.1
Total nonfuels	16 977.4	17 043.9	0.4
Fuels	27 361.5	36 422.1	33.1
Total	44 338.9	53 466.0	20.6

Sources: Natural Resources Canada; 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.

Table 1 presents commodity-specific production data for Canada's leading minerals. While there were exceptions, most of the major commodities suffered declines in production and in the value of production in 1999 relative to 1998. The value of metal production declined to $9.8 billion from $10.5 billion, a decrease of 6.1%, due mainly to sharp drops in the value of production of copper (-19.7%), iron ore (-13.8%), gold (-7.8%), and cobalt (-28.1%). The volume of nickel, platinum group metals and zinc produced declined by 10.5%, 10.1% and 3.2%, respectively, but the value increased as prices began to rise. Platinum group metals benefited from higher prices as the value of production rose by 6.3% despite the 10.1% decrease in production. The decline in the value of metals production, caused principally by falling prices, was offset by gains in the value of nonmetals and structural materials. Both experienced solid gains in 1999, reflecting strong economic conditions in North American markets and the first full year of production at Canada's first diamond mine.

Nonmetals increased by $582 million, or 17.0%, to $4.0 billion, and structural materials increased by $126 million, or 4.1%, to more than $3.2 billion. Almost all of the increase in nonmetals can be attributed to the rise in value of diamond production to $582 million from $41 million in 1998. The value of potash increased by 1.6% despite a 6.1% decrease in production from 1998. In 1999, the value of production of elemental sulphur increased 30.0% to $80.7 million despite a modest 4.6% increase in the volume produced. The value of sulphur in smelter gas also increased by 13.8%. Gypsum registered gains in both the value and volume of production.

The value of production of structural materials rose, due primarily to higher values for cement, lime and clay. The value of cement rose by 7.3%, lime by 9.6%, and clay by 22.0%.

The value of production of mineral fuels increased sharply in 1999 from $27.4 billion in 1998 to $36.4 billion in 1999, a rise of 33.1%. Of the components within the mineral fuel group, only natural gas experienced an increase in the volume of production (up 1.8%). Higher prices for crude petroleum and natural gas by-products resulted in significant increases in the value of production of these commodities (up 46.0% and 33.1%, respectively), even though the volume produced declined for both. The value of coal production declined by 4.0% and the volume by 15.9%.

Based on the value of output in 1999, the top non-fuel commodities were gold ($2.1 billion), potash ($1.8 billion), nickel ($1.6 billion), zinc ($1.5 billion), iron ore ($1.4 billion), copper ($1.4 billion) and cement ($1.2 billion). In terms of the production of some of Canada's leading minerals, increases in output volumes in excess of 5% were recorded for diamonds, peat, asbestos and gypsum, whereas declines in excess of 5% were experienced by nickel, iron ore, copper, platinum group metals, cobalt and molybdenum.

Regionally, four provinces again dominated the value of Canada's non-fuel mineral production during 1999. Ontario contributed the largest share of the non-fuel mineral output, accounting for 29.5% of the total value. Quebec contributed 20.7%, Saskatchewan 13.5%, British Columbia 9.9%, Newfoundland 5.6%, New Brunswick 4.9%, and Manitoba 4.7% to Canada's total. The remaining provinces and territories accounted for 11.3% of the total. The value for Ontario increased slightly to $5.0 billion, Quebec decreased very slightly to $3.5 billion, Saskatchewan increased minimally to $2.4 billion, and British Columbia declined by 13.1% to $1.7 billion. When coal is included, the value of British Columbia's production climbs to $2.5 billion and Saskatchewan's value remains at $2.4 billion.

Alberta remained Canada's major mineral fuels producer, accounting for 77.9% of the total value in 1999. Alberta also has 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 are Saskatchewan with 10.2% and British Columbia with 7.5% of Canada's total. Crude petroleum production from Hibernia boosted Newfoundland's contribution to the value of Canada's mineral fuel production to 2.7%. Other provinces and territories accounted for the remaining 1.7%.

Of the 10 mine openings in 1999, 3 were in Quebec, 2 each in Saskatchewan and British Columbia, and 1 in each of Newfoundland, Ontario and the Northwest Territories. Of the 23 closures recorded, 9 were in Ontario, 5 in Quebec, 4 in British Columbia, and 1 each in New Brunswick, the Northwest Territories, Nova Scotia, the Yukon and Saskatchewan.

METAL PRICES

Prices increased for most mineral commodities in 1999 in reaction to strengthening global demand conditions, particularly in the Far East where economic growth improved in major mineral-consuming countries. Moreover, some growth was experienced in Latin American countries and more is expected in 2000. Overall, the Eastern European countries' GDP grew by over 1% during 1999 and the Russian economy grew by a surprisingly strong 3.2%. Major base-metal prices exhibited a steady increase throughout the year with the exception of lead. In December, copper, aluminum, nickel and zinc spot prices were at their trading highs for the year. For copper, inventories were up to their highest levels in nearly six years in early 1999, but the price increased to US$0.78/lb

by year-end as stocks were reduced due to increased consumption. Aluminum climbed from US$0.54/lb in the first quarter to US$0.68/lb in the fourth quarter, although total stocks were down only slightly. Nickel prices rose significantly throughout the year from US$1.69/lb in mid-December 1998 to US$3.83/lb at the end of 1999, an increase of over 100%. Similar to aluminum, nickel inventories finished the year down moderately from last year. Zinc inventories declined during the year, helping to raise the annual average price to US$0.49/lb from US$0.46/lb in 1998. An 85% increase in the inventories of lead lowered the annual average price of lead to US$0.23/lb, down 1 cent from 1998.

For precious metals, the price of gold finished 1999 at an average of US$279/oz, down 5% from the previous year. However, during the year, the price of gold plunged to US$253/oz with the threat of central bank sales and soared later in the year to US$325/oz on the news that European central banks had agreed to limit the sales of gold from official reserves. Jewellery and industrial demand were up slightly from 1998 as demand increased over 15% in the Middle East. Silver had an annual average price of US$5.25/oz, down from the 1998 average of US$5.53/oz as above-ground stocks were used to make up the demand not met by mine production and recycled scrap. The rising demand for platinum was driven by jewellery fabrication, especially from China. The price increase for platinum through 1999 led to a small increase in its average price from US$372 per troy ounce in 1998 to US$377/oz in 1999. Palladium finished the year with an average price of US$361/oz, up 47% from last year as demand continues to escalate while it is being substituted for platinum in autocatalysts. Both metals were significantly affected by ongoing production and export supply uncertainties in Russia, which is the world's largest palladium exporter and the second largest platinum exporter. The price of cobalt increased by over 50% during the year to US$17.02/lb, molybdenum increased slightly to US$2.59/lb, and uranium declined 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 over 5% whereas metallurgical coal prices were off by more than 20% to US$41/t in 1999. Sulphur prices increased about 40% in 1999 to US$37/t after dropping 35% in 1998. Potash prices were up about 2% during 1999.

RESERVES

Canadian reserves of copper, molybdenum, lead, zinc, silver and gold decreased significantly during 1998 and only nickel reserves increased. Ore reserves were reduced at many operations because reserve calculations were done using lower metal prices at the end of 1998. Lower metal prices reduce the level of reserves because lower-grade ores become uneconomical to mine and are removed from reserves. Production is normally the main factor reducing the reserves at individual mines, but in 1998 declining metal prices were a significant factor. Canadian reserves of copper, nickel, lead, zinc, molybdenum and silver have declined steadily since the early 1980s, and gold began a gradual decline in 1988. The closure of mines during 1999 will likely reduce reserves, but higher prices for some metals should help offset the decline.

EMPLOYMENT IN THE MINERAL INDUSTRY

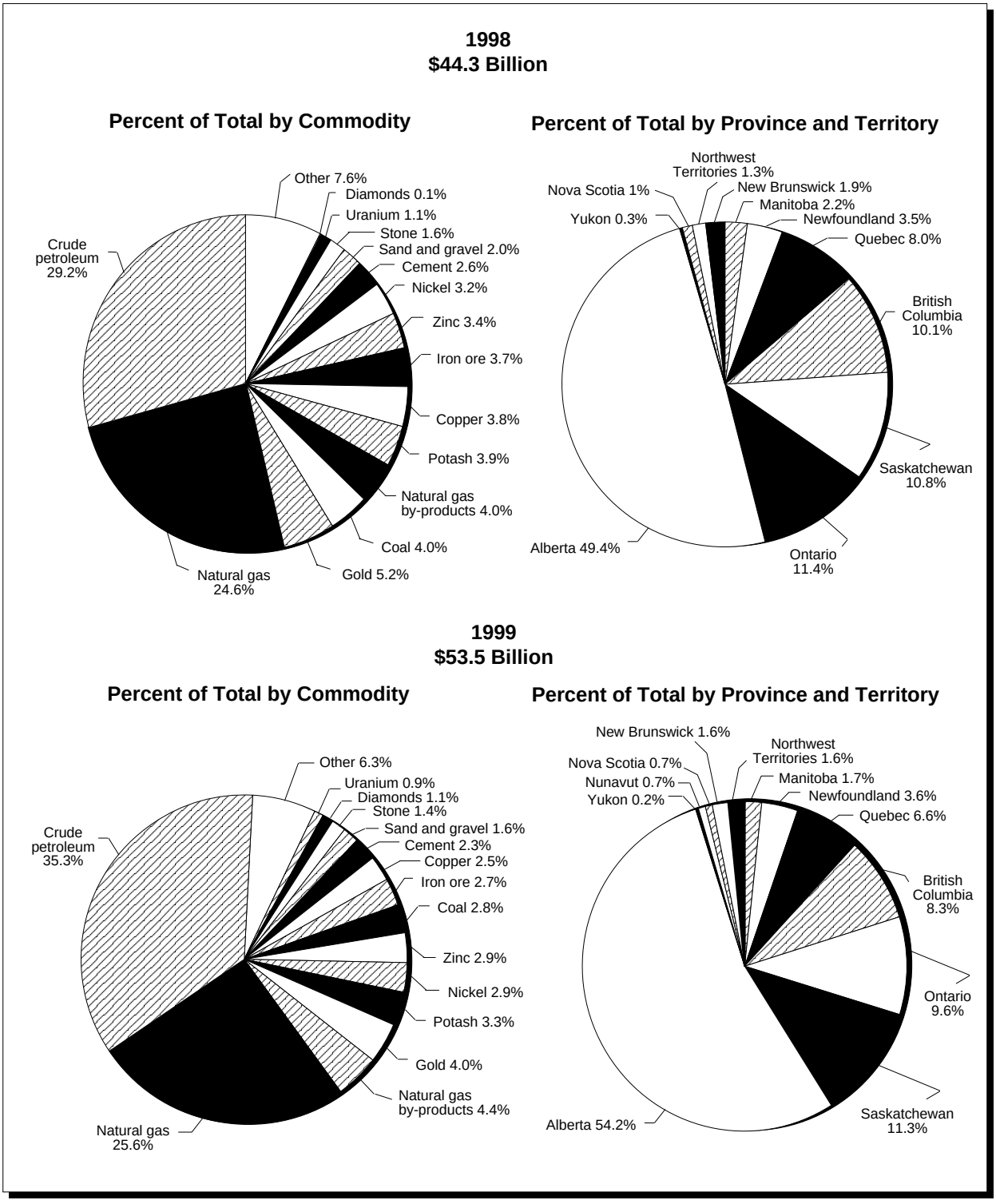
Combined employment in the four stages of the mineral industry (including coal mining) is estimated to have reached 386 000 in 1999, 1.8% above the revised 1998 level of 379 300. The mineral industry thus accounted for 2.7% of the national employment level of 14.5 million in 1999.

While total mineral industry employment grew, employment in Stage 1 (metal, nonmetal and coal mining, and quarries and sand pits) declined for the fourth straight year in 1999. Stage 1 employment was estimated at 52 300 in 1999, a 4.7% decline compared to 1998. Both metal mining and coal mining experienced declines in employment in 1999 while nonmetal mines saw a modest increase. 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, the structural materials sector experienced an increase in its level of employment in 1999 (up 5.1% to 7845).

Employment levels for Stages 2, 3 and 4 were all higher in 1999 compared to the previous year. Employment increased in Stage 2 by 0.5% to 60 000, in Stage 3 by 1.4% to 97 000, and in Stage 4 by 4.5% to 176 700. The strong North American economies are boosting 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 1999 the number employed in the sector declined by almost 8% to 8633. This figure includes 1569 in the mining diamond drilling sector. Because there is no establishment-based survey undertaken at this time either by Natural Resources Canada or by Statistics Canada for Services Incidental to Mining, these numbers should be viewed with caution.

Figure 1
Value of Mineral Production, Percent Shares by Commodity and by Province and Territory, 1998 and 1999



Sources: Natural Resources Canada; Statistics 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.

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 was by far the primary recipient of Canada's mineral and mineral (non-fuel) product exports in 1999, receiving 78.8% of domestic exports. The European Union (7.6%) and Japan (4.4%) followed. The relative strength of the U.S. economy resulted in an even higher proportion of Canada's mineral industry exports being directed to the United States. In 1998, the proportion received by the United States was 74.9% (refer to the chapter entitled "Statistical Report").

In 1999, the value of domestic exports of minerals and mineral products, including fuels, increased by 4.3% to $71.3 billion from $68.4 billion in 1998 (Table 2). An increase in the export value of mineral fuels more than offset a decline in the value of metals and metal products. Commodities produced in Stages 3 and 4 accounted for the gains. Metals and metal products contributed 47.0% to total mineral product exports; mineral fuels, 41.1%; nonmetals, 10.3%; and structural materials, 1.6%. Together these products accounted for 21.6% of the value of Canada's total domestic merchandise exports of $330.4 billion.

The total value of metallic minerals and mineral product domestic exports decreased to $33.5 billion in 1999, a drop of 3.6% from 1998. The value of domestic exports of Stage 1 metallic commodities declined by 18.2% to $3.2 billion. For individual commodities within the total metallic minerals sector, exports rose for zinc (2.3%), iron and steel (2.0%) and aluminum (1.3%); exports declined for gold (-16.9%), copper (-18.1%), iron ore (-18.4%), nickel (-12.0%), uranium (-10.9%) and cobalt (-37.5%). Two commodities, iron and steel and aluminum, accounted for over half of the total value of exports in the metallic mineral 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 1999, up 4.2% to $7.4 billion. Gains in the value of exports of gypsum (35.1%), glass and glassware (13.6%), nitrogen (10.2%), and potash and potassium compounds (6.6%) offset declines in chlorine (-25.7%), sulphur and sulphur compounds (-14.4%), and salt and sodium compounds (-9.3%). Sulphur exports would have decreased further except that shipments to China increased by 144%. Potash (including potassium products) is the major component in the nonmetals sector, accounting in 1999 for 28.7% of the value of total nonmetallic exports.

The value of structural material domestic exports increased significantly in 1999, rising 15.6% to $1.1 billion, led by the largest component of this group, cement (17.0%). Other commodities experiencing gains were clay and clay products, granite, slate, sand and gravel, marble, dolomite and other structural materials. The value of exports of limestone flux and other limestone, lime and sandstone declined in 1999.

An increase in the value of domestic exports of petroleum (due to sharply higher crude oil prices in 1999) and the value of natural gas exports offset a decline in the value of coal and coke exports (-19.4%). This resulted in an increase in the value of mineral fuel exports to $29.3 billion, a 14.6% increase from the 1998 level of $25.6 billion. More than half of the value of mineral fuel exports is accounted for by petroleum. In 1999, the value of petroleum exports increased by 16.1% to $15.0 billion. The value of natural gas exports also increased by more than $2.1 billion to $11.0 billion.

The value of imports of mineral products, including fuels, increased by 2.9% from $53.7 billion in 1998 to $55.3 billion in 1999 (Table 2). The value of imports of all the non-fuel sectors rose, offsetting decreases in the value of imported coal and coke products and natural gas. The value of imports of the metals and metal products sector rose slightly to $36.2 billion from $36.0 billion in 1998. As with exports, iron and steel and aluminum are the two largest components of metal product imports comprising 55.0% of the total. Metallic minerals and products accounted for two thirds of the value of total mineral product imports in 1999, nonmetallic mineral products for 11.2%, structural materials for 2.5%, and mineral fuels for 20.9%. When fuels are excluded, mineral industry imports (including coal) totaled $44.9 billion, 14.0% of total merchandise imports in 1999.

As a result of the slight decrease in the level of non-fuel minerals and mineral product exports (including coal) and higher levels of imports, the balance of trade surplus for these commodities declined to $0.2 billion in 1999 from $2.2 billion in 1998. For the total economy, Canada's merchandise trade surplus increased to a substantial $34.2 billion in 1999 from $20.0 billion in 1998 as the increased value of exports offset the smaller rise in the value of imports.

INVESTMENT BY THE MINERAL INDUSTRY

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

capacity. In 1999, almost 300 mining companies were listed on the TSE with a market capitalization of $80 billion compared to approximately $65 billion in 1998.

Exploration Expenditures

Final exploration figures for 1998 show that exploration and deposit appraisal expenditures totaled $655.9 million compared to $921.0 million in 1997. Preliminary estimates for 1999 indicate that the level of non-fuel exploration and deposit appraisal field expenditures show an additional decline to $501.1 million. Company spending intentions for 2000 of $502.1 million indicate that the decline in activity may be leveling off. An expected increase in expenditures on the search for diamonds should offset the expected decline in the search for metals. Lower prices for some metals and lower investor interest in mineral exploration activities are the primary causes for this decreased exploration spending.

All provinces and territories experienced declines in exploration expenditures in 1999. Particularly hard-hit regions were Saskatchewan, Ontario and Alberta.

Mine complex development expenditures, which went from $866 million in 1997 to $966 million in 1998, are expected to decrease to $763 million in 1999 and to $735 million in 2000.

The level of mineral exploration activity is closely linked to mineral commodity prices, so it is not unexpected that exploration expenditures declined in 1999. When commodity prices show signs of strength, the mineral exploration industry can be expected to respond.

Capital Investment

Capital expenditures for construction and materials and equipment in the mining and mineral processing industries are expected to reach $6.3 billion in 2000, up from an estimated $5.8 billion in 1999 and the $6.2 billion recorded in 1998. While the overall numbers for the mineral industry are relatively strong (levels for 1996 and 1997 were $5.3 billion and $6.7 billion, respectively), the performance of the different sectors within the mineral industry vary markedly. Capital expenditures for the mining and quarrying industry (Stage 1) were estimated to be $1.9 billion in 1999, down 28.0% from $2.6 billion in 1998. A slight increase of 3.7% to $2.0 billion is anticipated for 2000. Capital investments in the primary metal and nonmetallic mineral semi-fabricating industries (Stages 2 and 3) are expected to increase between 1998 and 2000, buoyed by the strong North American economy. In 2000, investment is expected to reach $3.6 billion, up from the $3.3 billion recorded in 1999 and the $2.7 billion estimated for 1998. Investments in Stage 4 industries are expected to fluctuate from $872.1 million in 1998 to $669.4 million in 1999 and to $727.3 million in 2000.

In 1998, capital investment in the total economy stood at $167.4 billion. Estimates indicate an increase to $174.3 billion in 1999 and $176.6 billion in 2000. In 1998, investments in the mineral industry (Stages 1 to 4) accounted for 3.7% of the total capital expenditures in the Canadian economy. This proportion declined in 1999 to 3.4% but should rebound to 3.6% in 2000. When repair expenditures to structures, machinery and equipment are included, expenditures in the mining and mineral processing industries totaled $10.8 billion in 1998, the latest year for which repair data are available. The 1998 level represented 5.2% of the total capital and repair expenditures within the Canadian economy. This indicates that in 1998 the mineral industry spent relatively more adding to existing plants, machinery and equipment than the economy as a whole.

HIGHLIGHTS IN THE CANADIAN MINING INDUSTRY

Profits by Canadian mining companies rebounded in 1999 chiefly due to a recovery in some commodity prices. For the year, operating profits for the metals sector were up by 15% to $1.7 billion from $1.5 billion in 1998.

Canada's first diamond mine had its first full year of production in 1999. The Ekati diamond mine produced 2.4 million carats (Mct) with an estimated value of $582 million. It is currently forecast to produce between 3.5 and 4.5 Mct/y from five kimberlite pipes over a 25-year span, with revenues averaging $500 million per year, making it one of the 15 largest diamond mines in the world. The first Ekati diamonds offered for sale in Antwerp, Belgium, early in 1999 brought about US$125-US$130/ct, excluding the largest stones, which were to be sold later. As well, BHP Diamonds Inc. 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 potential second diamond mine in the Northwest Territories continued to make progress towards development in 1999. 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 November, Diavik Diamonds received approval for permitting and licensing from the Government of Canada for the proposed mining operation. The mine could be in production by the first half of 2003. Work to date has concentrated on the development of four kimberlite pipes for the pro-

posed Diavik mine. The current mineable reserve is estimated at 26 Mt grading an average of 3.9 ct/t with an estimated value of US$56/ct. Preliminary estimates put the capital costs of putting the mine into production at $1.3 billion. Year 2000 construction is an infrastructure establishment program to ready the site for major dike and plant construction in the following two years.

Noranda Inc. began production at the Bell Allard zinc mine near Matagami, Quebec, in August 1999 and reached commercial production of 65% of its designed operating capacity of 2000 t/d in January 2000. It was brought on stream at an estimated capital cost of $133 million. At the start of production, ore reserves stood at 3.2 Mt grading 13.8% zinc, 1.5% copper, 48 g/t silver and 0.68 g/t gold. Ore is processed at the company's concentrator in Matagami. The mine life is estimated at five years and planned zinc production is about 100 000 t/y. The mine was developed to replace the Isle Dieu and Norita East mines, both of which closed in 1997.

Canada's first phosphate mine began production in August 1999 at the Kapuskasing open-pit mine in Ontario. Agrium Inc. began developing the high-quality phosphate deposit in September 1997 at a cost of US$70 million. At the start of production, ore reserves were estimated at 22 Mt grading 38% P_2O_5. The phosphate rock mined is processed at the company's Redwater, Alberta plant, which was modified to process it into phosphate fertilizer. The high-grade, low-cost mine is expected to supply 100% of the phosphate rock required by the Redwater plant for approximately 20 years. The Redwater plant has an annual production capacity of 650 000 t of mono-ammonium phosphate (MAP). Procuring phosphate rock constitutes about 70% of the plant's production cost. The original Kapuskasing deposit was drilled in 1954 by Continental Copper as a base-metal project. The property was acquired by Agrium when it merged with Viridian Inc. in December 1996. Prior to the start of mining at Kapuskasing, Agrium relied on imported rock from Togo, Africa, since 1986.

The McArthur River uranium mine came into production in early December 1999 at McArthur River, Saskatchewan. Cameco Corporation owns a 69.8% controlling interest and is the mine's operator. COGEMA Resources Inc. owns the remaining 30.2%. Mine production is planned at 18 million lb U_3O_8 (6924 tU) annually. The mine was developed at a capital cost of $400 million. It is the world's largest and highest-grade uranium deposit. As of December 31, 1999, the overall reserves and resources outlined stood at 186 000 tU, with 98 000 tU currently in the mineable category. While the ore grade of ore reserves averages 14.7% U (17% U_3O_8), the resource grade averages 10.2% U (12.03% U_3O_8). There is significant potential to delineate additional reserves. Ore is processed at the Key Lake mill (located some 80 km southwest of the mine), which was revamped in June 1999 to handle blended ore grading 4% U_3O_8.

Production began at the McClean Lake uranium mine near McMahon Lake, Saskatchewan, on June 22, 1999, when stockpiled uranium ore from the JEB pit was fed into the McClean Lake mill and the first barrel of yellow cake was produced on July 12. It is the first Canadian, French and Japanese mining joint venture in Canada. COGEMA Resources Inc., the majority owner of the project, holds a 70% interest, Denison Mines Ltd. holds 22.5%, and OURD (Canada) Co., Ltd. holds 7.5%. The McClean Lake uranium deposit has overall mineable reserves of 17 300 tU. The designed open pit runs from 20-145 m in depth. Currently, the overall ore grade averages 2.7% with underground ore increasing to 4% at a depth of 170 m. The mine was developed at a capital cost of $200 million. The overall operation involves open pit at the Sue, A, B and C orebodies and underground at McClean. Production is planned at 6 million lb of U_3O_8 annually. Mill capacity may be expanded to mill ore from the Cigar Lake mine, which is scheduled to come on stream in 2002.

Since the discovery of extensive gold-silver-copper-zinc mineralization at depth, Agnico-Eagle Mines Limited has embarked on a shaft-sinking (Shaft No. 3) capacity expansion program to increase production at the LaRonde mine. In the Phase I expansion program, which started in 1997, the mine's ore capacity was increased from the original 1800 t/d to 3265 t/d in 1999, with production reaching capacity level in the first quarter of 2000. However, higher-than-expected ore thicknesses in zones accessible from Shaft No. 3 enabled the company to plan further expansion. A revised Phase II capital program was designed in 1999 to increase the ore capacity to 4535 t/d. Although the revised plan will require an extra US$34 million, increasing the total capital cost of the two-phase expansion program to US$218 million, the expansion is expected to result in a greater rate of return and a shorter payback period. About US$120 million of the US$218 million remains to be spent over the next 3.5 years. An expansion of the mill capacity to 4535 t/d is expected to be completed by the fourth quarter of 2000. At this rate, LaRonde's annual gold production is expected to triple to 337 000 oz in 2004 at a cash operating cost of US$104/oz, making the mine one of the lowest-cost gold mines in the world. Current mine reserves stand at 3 million oz with an additional 3.1 million oz in the mineral resource category. As major ore zones are opened at depth, there is good potential to further increase ore reserves.

In 1999, Goldcorp Inc. continued its drilling program at the Red Lake mine in Ontario for further definition of the High Grade Zone reserves. The development work being done will make the Red Lake mine one of the lowest-cost-per-ounce gold producers in the world.

Its cash production cost will drop from US$360/oz when it was last operating in 1996 to $88/oz when production begins in November 2000. In addition, its annual gold production will increase from 53 000 oz to 240 000 oz. The company also resolved its long-running labour dispute in April 2000 with the union recommending and approving its own de-certification.

In November 1998, the Iron Ore Company of Canada (IOC) announced a $344 million capital expenditure program, raising its six-year total expenditure program, which began 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, mothballed in 1982, and includes upgrades of equipment at the Labrador City mine, the purchase of additional rail equipment, and an increase in 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 much higher-quality concentrates that will be produced at Labrador City.

A positive feasibility study, completed in the third quarter of 1999, supported the expansion of the Niobec mine near Chicoutimi, Quebec, to capture the rising market for niobium. In 1998, Teck Corporation and Cambior inc. launched a $15.7 million capital program to deepen the mine shaft at the Niobec mine and to develop ore reserves in the lower or third block, which contains 7 Mt grading 0.73% Nb_2O_5, by developing a ramp and installing a new crusher. With the addition of these new reserves, total mine reserves now stand at 10.6 Mt grading 0.52% Nb_2O_5, sufficient to sustain the current production rate until the mid-2010s. Initial production from the first-phase expansion is expected to begin in the fourth quarter of 2000. The project will slowly ramp up, increasing capacity by 20% as the market warrants. A second-phase expansion, to begin at an unspecified date, will increase output by another 20%. Capital costs for the first-phase expansion will be $4.7 million and, for the second phase, less than $2 million. Production in 2000 is expected to total 2400 t of contained niobium, up from 2300 t in 1999 and 2177 t in 1998.

Construction will not be proceeding at Voisey's Bay in 2000 as talks between Inco Limited and the Government of Newfoundland and Labrador broke off in January 2000. It is uncertain when talks will resume. After six months of negotiations, the two parties could not agree on what facilities would be constructed for processing the ore. Inco has stated that the original plan is uneconomic and they cannot guarantee the construction of a commercial processing facility. They did, however, propose building a process research and development pilot facility. Inco outlined a project for developing the property that includes a 6000-t/d mine/mill operation at a cost of $750 million and a $95 million underground exploration program. Premier Brian Tobin stated that his position remains that the project will include the processing of nickel concentrate to a final nickel product in the province. The Voisey's Bay deposit could be among the lowest-cost nickel deposits in the world when production begins. In August 1999, Inco received approval of its Environmental Impact Statement for developing the deposit from the Canadian Environmental Assessment Agency.

Northgate Exploration Limited acquired the Kemess gold mine in British Columbia from the interim receiver for Royal Oak Mines Inc., which filed for bankruptcy in December 1999. Northgate will take over management of the mine and terminate the interim receiver. The Kemess mine is expected to produce 280 000 oz of gold and 55 million lb of copper annually at an expected operating cost of US$160/oz. It is the largest gold mine built in Canada during the last decade.

Government and Industry Initiatives

The Canadian government, through Natural Resources Canada, in conjunction with provincial governments and the mineral industry, has undertaken a wide variety of activities to promote and support Canada's minerals and metals industry and the mining-related equipment and services sector. These activities include a Minister-led mission to Asia (China, South Korea and Japan), cohosting the World Mines Ministries Forum as part of the Mining Millennium 2000 event in Toronto, and ministerial participation in GeoCanada 2000 in Calgary in May 2000. In addition, Natural Resources Canada 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.

The Government of Canada announced in August 1999 that it will invest $60 million over the next five years in GeoConnections, an initiative that will make geospatial data and innovation accessible to all Canadians through the Internet. GeoConnections will bring all of Canada's geographical data together on the Internet, which will permit the creation of composite pictures of an area's geographic, environmental and socio-economic characteristics. It will encourage private industry to develop new kinds of data and applications, improve emergency response measures such as 911, and ensure that Canadians in remote communities have access to the latest information.

In December 1997, Canada signed the Kyoto Protocol to the United Nations Framework Convention on Climate Change to reduce greenhouse gas emissions. Under this international agreement, Canada will reduce 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 to develop a national implementation strategy to find ways to effectively reduce Canada's greenhouse gas emissions.

New initiatives affecting the mineral industry were announced by provinces and territories in 1999. In Ontario, Operation Treasure Hunt was launched to encourage prospecting and development across Ontario. This is a new two-year, $19 million program that will include conducting state-of-the-art geophysical and geochemical surveys to provide mineral exploration data to the public. In Quebec, the government and the mining industry agreed to create a mineral research consortium (COREM) to conduct research and development in the processing and conversion of mineral substances. COREM will replace the Centre de recherche minérale du Québec, a similar organization. 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 British Columbia, certainty of tenure was established when the B.C. government announced that it had established a clear process for determining fair compensation when mineral tenures are expropriated for parks under a new mineral compensation regulation. The Government of Manitoba announced that a mining accord had been developed that outlines a code of practice for the Manitoba mining industry. The code is endorsed by both the mining industry and the Aboriginal community.

PROFILES OF THE LEADING MINERALS PRODUCED IN CANADA

Gold

Canada has long been one of the world's leading producers of gold. For the fifth consecutive year, Canada trails only South Africa, the United States and Australia in the production of this precious metal. In 1999, Canada's gold output decreased from 164.8 t to 157.8 t, a decline of 4.2%. The value of gold shipments decreased by 7.8% to $2.1 billion. The average price of gold declined to US$279 per troy oz in 1999, the lowest annual price since 1978. Price volatility was higher than in 1998 with gold trading in a range of US$256-$310/oz. The main factors affecting the price were the threat of central bank sales, the announcement by European central banks to limit gold sales over the next four years and to not increase gold lending, and the decision by the International Monetary Fund to revalue part of its reserves through an off-market transaction. Although gold was trading up slightly at about US$285/oz early in 2000, gold production is likely to continue to decline in Canada throughout the year as mines close or suspend operations and companies merge or delay expansions.

In 1999, one new mine opened and two re-opened while nine mines suspended operations and five closed. About 33 primary gold mines operated in Canada at the end of 1999, accounting for over 88% of all the gold produced in Canada. Employment in these mines totaled an estimated 7417 in 1999, down from 8188 in 1998 and continuing a general downward trend that started in 1989 when employment was 12 631. In an effort to attract investors, major global producers are merging and consolidating, and this process is expected to continue and accelerate.

Copper

The volume of copper produced in Canada fell 16.0% in 1999 to 580 000 t due to the suspension of two mines in British Columbia and the closure of the Gaspé mine in Quebec. The decline in production led to a 19.7% drop in the value of copper produced in Canada to $1.4 billion. Lower copper prices also contributed to the decline in value as the average price fell to US$0.71/lb in 1999 from 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 use in electrical transmission, water tubing, castings and heat exchangers. Global consumption increased sharply in 1999 and is expected to increase again in 2000 as demand rises from the recovering economies in Southeast Asia. Copper prices are expected to recover in 2000 as the effects of closing down some operations, the deferring of some new projects, and the extension of mine and smelter shut-downs reduce supply. For the first half of 2000, copper prices have averaged about US$0.80/lb, which is close to the estimated average cost of production. However, the upside potential for the price of copper is limited by mine re-openings and producer forward hedge selling.

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 1999, the production of zinc (recoverable zinc in concentrates shipped) in Canada declined by 3.2% to 960 000 t compared to 1998, but is expected to increase by 5% in 2000. Zinc prices averaged US$0.49/lb in 1999, a 4.9% increase over 1998, reflecting strong demand and a continued decline in stock levels. World zinc consumption increased to 8.1 Mt in 1999, a total that was slightly less than world refined zinc metal production of 8.2 Mt. World consumption is expected to increase by about 2.6% in 2000, primarily due to increasing demand in Japan and Europe. Zinc stocks on the London Metal Exchange declined steadily throughout 1999 to finish the year at 279 050 t, or 38 000 t less than at the end of 1998.

For 2000, the zinc market is expected to remain fairly balanced. The market recovery in Japan and other Southeast Asian nations, as well as continued growth in North America and Europe, will probably continue to strengthen demand, pushing prices above US$0.50/lb. (Through the first half of 2000, the price has averaged about US$0.51/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. 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.

In 1999, nickel production in Canada decreased by 10.5% over 1998 to 177 200 t. A labour dispute at one of Canada's major nickel mines contributed to this decline. Despite this, the value of nickel produced increased by almost 11% as a result of sharply higher prices. Nickel prices averaged US$2.73/lb in 1999, but rose steadily through the year to end at US$3.66/lb. The price rise was supported by production cuts, sharply reduced nickel inventories and, in the second half of 1999, strong demand for stainless steel. After a 5.3% rise in world primary nickel consumption in 1999 to 1.06 Mt, consumption is expected to rise in 2000 to about 1.12 Mt. Nickel production in Canada could reach 204 000 t in 2000. World inventory levels are expected to continue to decline, but major production increases are on the horizon from Western Australian laterite nickel producers. For the first half of 2000, the price of nickel has averaged US$4/lb, compared to yearly averages of US$2.72/lb in 1999 and US$2.10/lb in 1998.

Iron Ore

Iron ore production levels in Canada declined by almost 10% in 1999 to 33.0 Mt, while the value of production fell 13.8% to $1.42 billion. Over 80% of the volume and value of iron ore shipments is exported. The United States was the largest single customer in 1999, receiving 29% of the shipments. The European Union was the recipient of 60% of the shipments of Canadian iron ore in 1999, up from 53% in 1998.

For 1999, prices were negotiated lower on both the European (reduction of 11-14%) and Japanese (reduction of 11%) markets. The Japanese steel market experienced a moderate recovery that, coupled with strong markets elsewhere, resulted in increased demand for iron ore.

The price for 1999 dropped by 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 of the world's iron ore market, set the international price in direct negotiations with Japanese and European steelmakers.

Better prices, coupled with increased sales, should allow Canadian producers to return to profitability. The Iron Ore Company of Canada recently announced that it is going ahead with the recommissioning of the Sept-Îles pellet plant at a cost of more than $360 million.

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 this uranium. The world's two largest uranium-producing companies have operations in Canada. Uranium production in Canada declined by 1% in 1999 to 9892 t. (Production is defined as 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. An increase in uranium spot market prices to US$10.85/lb U_3O_8 during the first quarter of 1999 was unsustainable and the price slowly declined to US$9.60/lb U_3O_8 by year-end. Reflecting the downward trend in spot market prices, the average price of Canadian export deliveries also decreased from $51.10/kgU (US$13.30/lb U_3O_8) in 1998 to $49.10/kgU (US$12.70/lb U_3O_8) in 1999.

The conclusion of the commercial transaction to allow natural uranium derived from the dismantling of Russian nuclear weapons to move smoothly into Western commercial markets resolved one major con-

cern in the uranium market, reducing some of the uncertainties overhanging the market. This, in turn, will enable Canada to remain a stable and competitive supplier of uranium to world markets for the foreseeable future.

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 1999, potash was the second most valuable non-fuel mineral produced in Canada, trailing gold. The value of potash produced in Canada totaled $1.78 billion, a 1.6% increase over 1998. At the end of 1999, more than 3400 workers were employed at the eight underground mines and two solution mining operations in Saskatchewan and the underground mine in New Brunswick.

Canada is the world's largest potash exporter with a 40% share of international trade. Canadian exports, with the exception of those to Asia, decreased marginally in 1999.

The world's potash market was relatively balanced in 1999 as world production of 25.8 Mt K_2O remained close to 1998 levels and sales rose only 2% to 24.7 Mt K_2O. The production of potash remained stable as producers maintained inventories by using temporary shut-downs. Higher demand from Asian countries offset weaker demand from other countries such as France, the United States and Brazil. Offshore potash price quotations rose by an overall 2% for the first three quarters of 1999 but remained flat in the fourth quarter, ending the year at US$121/t. Price quotations averaged US$118.50/t standard KCl f.o.b. Vancouver during 1999.

Diamonds

In its first full year of operation, BHP Diamonds Inc.'s Ekati diamond mine in the Northwest Territories produced about 2.4 Mct of diamonds with an estimated value of $582 million. The mine accounts for about 4% of global diamond production by weight and 6% by value. New processing equipment at the mine is expected to boost production by about 50% by the latter part of 2001. Two other projects, the Snap Lake mine and the Diavik mine, are scheduled to open late in 2002 or in 2003. When these three mines are in full production they will account for about 12% of the world's supply of diamonds.

Exploration for diamonds continues in several regions in Canada and preliminary data indicate that expenditures on the search for diamonds are expected to increase from $126 million in 1999 to $161 million in 2000. Exploration is focused principally in the Northwest Territories, but Alberta, Nunavut, Ontario and Quebec have also attracted significant diamond exploration activity.

OUTLOOK

The outlook for the Canadian mineral industry in 2000 is promising as mineral prices rebound from 1998 and 1999 levels. Synchronized global economic growth is improving demand for most minerals and continued growth in the United States should benefit Canadian producers. However, increasing supplies from large low-cost mines coming on stream around the world will offset increasing demand.

The Canadian economy is expected to increase by 4.5% in 2000 and by a more sustainable 3% in 2001 after climbing by 4.5% in 1999. In the natural resource sectors, oil and gas are expected to remain bouyant and minerals and metals should see modest improvement, while agriculture and forestry are not likely to benefit. Surveys by Statistics Canada indicate that capital spending is expected to increase in 2000, a continuation of the last five years of growth. Energy-related projects in most provinces will increase economic activity across Canada. Inflation is expected to continue within the Bank of Canada's 1-3% target range while the Bank of Canada interest rate is expected to rise to 6.5% in 2000 and to decline to 6.0% by the end of 2001. Unemployment, which averaged 7.6% in 1999, should continue to decline to an average of 6.6% in 2000.

On a global basis, most forecasters are looking at GDP growth of about 4.2% for the world's economy in 2000 and 4.0% in 2001 and 2002. Continued growth in the United States will lead to strong global growth with support from an improving Japanese economy, steady growth in Europe, and growth in Latin American and Asian economies.

As commodity prices and demand are strongly influenced by the health of global economies, the strong and widespread improvements noted above bode well for the Canadian mineral industry. Along with the improving performance of Canadian mining companies, recent major merger proposal announcements (for example, Newmont Mining Corporation agreed to buy Battle Mountain Gold Company, Franco-Nevada Mining Corporation Limited announced a merger with Gold Fields Limited, and Barrick Gold Corporation offered to purchase all the outstanding common shares of Pangea Goldfields Inc.) should make the highly fragmented mining industry more attractive to investors.

Mining is often portrayed as a relatively low-tech industry. This portrayal is fast becoming obsolete.

The mining industry is adapting new technologies in an effort to improve productivity and safety and is developing technologies that can be adapted to other industries. Some examples follow:

- Inco Limited and its partners have sold one of their high-tech telemining systems to Cameco Corporation and will soon announce sales to other mining companies. Inco's tele-remote operator control of underground machinery is being further developed and will ultimately automate many more tasks.

- Falconbridge Limited has placed an order (its second) for Modular Mining Systems Intellimine™ software. The software provides key information on mobile production units involved in production mucking, backfilling and waste rock handling. The system is designed to optimize resources and to control variability of production activities and reduce production costs and downtime.

- Fourteen of the world's largest mining companies, including four from Canada, have created a joint Internet marketplace where they will have access to hundreds of suppliers. The site will allow companies to buy supplies and raw materials online, a strategy designed to decrease the US$200 billion the industry spends on those purchases each year.

- The Northern Centre for Advanced Technology Inc. (NORCAT), a non-profit company based in Sudbury, Ontario, is looking at ways to employ technologies used by Canadian mining firms in the exploration of space. Conversely, mining firms and educational institutions study ways to apply space technology to Canada's mining and other resource industries. For Canada's mining industries, the lure is the need for robotics and computers to improve safety and lower costs. Space agencies are looking at the possibility of mining hydroxide rocks in space to extract oxygen and hydrogen instead of shipping these elements into space.

In general, applying technical advances in automation, robotics and telecommunications will result in better worker safety, more accurate drilling and blasting, faster ore extraction, higher output, productivity gains and lower costs. Early investments in automation 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 Canadian mining industry is a very positive development for the industry's future.

Notes: (1) Information in this review was current as of June 2000. (2) This and other reviews, including previous editions, are available on the Internet at http://www.nrcan.gc.ca/mms/cmy/index_e.html.

NOTE TO READERS

TABLE 1. CANADA, PRODUCTION OF LEADING MINERALS, 1998 AND 1999p

		Volume		Percent Change	Value		Percent Change
		1998	1999p	1999/1998	1998	1999p	1999/1998
		(000 tonnes except where noted)			($ millions)		
METALS							
Gold	kg	164 773	157 790	–4.2	2 312.6	2 132.5	–7.8
Nickel		198	177	–10.5	1 411.2	1 563.0	10.8
Zinc		992	960	–3.2	1 507.2	1 533.3	1.7
Iron ore		36 586	33 004	–9.8	1 646.4	1 419.7	–13.8
Copper		691	580	–16.0	1 695.8	1 361.3	–19.7
Uranium	tU	9 992	9 892	–1.0	508.0	502.5	–1.1
Silver	t	1 140	1 173	2.9	301.1	296.5	–1.5
Platinum group	kg	15 588	14 012	–10.1	236.0	250.9	6.3
Lead		150	156	4.1	117.6	117.4	–0.2
Cobalt	t	2 262	2 015	–10.9	158.6	114.0	–28.1
Molybdenum	t	8 099	6 293	–22.3	98.8	75.7	–23.3
NONMETALS							
Potash (K_2O)		8 884	8 345	–6.1	1 748.0	1 775.8	1.6
Diamonds	000 carats	203	2 400	1 082.3	40.8	581.7	1 326.7
Salt		13 034	12 643	–3.0	390.7	391.5	0.2
Peat		1 125	1 216	8.1	166.5	168.8	1.3
Asbestos		321	345	7.5	167.4	162.5	–2.9
Gypsum		8 307	8 935	7.6	94.3	101.2	7.3
Sulphur, elemental		8 404	8 792	4.6	62.1	80.7	30.0
Sulphur in smelter gas		836	846	1.2	55.5	63.1	13.8
Nepheline syenite		636	693	9.0	53.4	58.0	8.6
STRUCTURAL MATERIALS							
Cement		12 124	12 604	4.0	1 147.8	1 232.1	7.3
Sand and gravel		225 338	218 458	–3.1	875.2	861.7	–1.6
Stone		108 924	104 026	–4.5	727.9	732.4	0.6
Lime		2 461	2 538	3.1	215.0	235.6	9.6
Clay products		. .	. .	. .	135.8	165.7	22.0
MINERAL FUELS							
Petroleum, crude	000 m^3	128 401	122 448	–4.6	12 940.1	18 894.0	46.0
Natural gas	million m^3	160 515	163 384	1.8	10 893.5	13 696.4	25.7
Natural gas by-products	000 m^3	26 666	26 075	–2.2	1 763.1	2 347.3	33.1
Coal		75 360	72 310	–4.0	1 764.8	1 484.4	–15.9

Sources: Natural Resources Canada; Statistics Canada, *Canada's Mineral Production, Preliminary Estimates,* cat. no. 26-202-XIB.
. . Not available; p Preliminary.
Note: Numbers have been rounded. Percent changes are based on unrounded data.

TABLE 2. CANADA, VALUE OF DOMESTIC EXPORTS, TOTAL EXPORTS (INCLUDING RE-EXPORTS), IMPORTS, AND BALANCE OF TRADE OF MINERALS AND MINERAL PRODUCTS, STAGES I TO IV, 1995-99

	1995	1996	1997	1998	1999
			($000)		
TOTAL MINING, INCLUDING FUELS					
Domestic exports	61 648 825	67 867 539	71 497 523	68 352 704	71 283 564
Total exports	63 105 723	69 082 166	72 967 312	69 489 214	72 447 956
Imports	39 903 358	42 333 336	50 205 741	53 731 462	55 280 764
Balance of trade	23 202 365	26 748 830	22 761 571	15 757 752	17 167 192
NON-FUEL MINING					
Domestic exports	38 272 045	39 368 644	41 714 562	42 780 403	41 969 529
Total exports	38 938 207	40 078 789	42 544 306	43 767 037	42 992 400
Imports	30 899 727	31 494 439	37 356 917	42 932 502	43 743 418
Balance of trade	8 038 480	8 584 350	5 187 389	834 535	-751 018
TOTAL NON-FUEL MINING, INCLUDING COAL					
Domestic exports	40 639 065	41 989 018	44 449 132	45 302 944	44 002 176
Total exports	41 309 253	42 700 794	45 279 932	46 290 575	45 028 534
Imports	31 589 695	32 251 995	38 236 081	44 074 028	44 860 445
Balance of trade	9 719 558	10 448 799	7 043 851	2 216 547	168 089
TOTAL ECONOMY					
Domestic exports	248 440 788	259 265 000	281 255 740	297 451 300	330 409 547
Total exports	264 207 000	275 773 600	299 089 922	318 383 900	354 107 556
Imports	225 629 195	232 648 033	272 855 758	298 381 900	319 909 560
Balance of trade	38 577 805	43 125 567	26 234 164	20 002 000	34 197 996

Sources: Natural Resources Canada; Statistics Canada.