

Mineral Exploration, Deposit Appraisal and Mine Complex Development Activity in Canada

Ginette Bouchard

*The author is with the Minerals and Metals Sector,
Natural Resources Canada.
Telephone: (613) 992-4665
E-mail: gbouchar@nrcan.gc.ca*

INTRODUCTION

This review provides analytical highlights and describes mineral resource development activities from primary exploration to mine production in Canada for the year 2002 with emphasis being placed on mineral exploration and deposit appraisal expenditures. Also briefly discussed are the 2003 revised spending intentions, which were compiled as of August 2003. For a more detailed description of the survey results and other exploration indicators, refer to the tables and graphs presented at the end of this chapter.

Expenditures are compiled from the federal-provincial/territorial Survey of Mineral Exploration, Deposit Appraisal and Mine Complex Development Expenditures, which is described briefly in the Background section at the end of this chapter. This annual survey of exploration and mining companies provides an accurate measure of the overall mineral resource development activity in Canada. In 2002, the response rate to that survey was 96.8%. The remaining 3.2% of respondents account for only 0.5% of estimated expenditures. The results were compiled from the reports of 651 active company project operators and the reports of some prospectors or groups of prospectors. The prospectors and 537 of the companies (versus 482 of the companies in 2001) reported that they were active in mineral exploration while 66 companies were active in deposit appraisal and 105 in mine complex development. (Note: Some companies are involved in more than one work phase at the same time.)

TRENDS AND PERSPECTIVE

General Trend

Exploration and deposit appraisal expenditures by both junior and senior companies (definitions are provided in Table 16) have increased since 2001. In that year, expenditures were \$512.9 million. They climbed to \$573.4 million in 2002 and will likely top \$684.2 million in 2003, based on company revised intentions. From the year 2000 up to and including 2003, expenditures have increased by 37.8% with Ontario having the highest share (average share of 23.3%) of expenditures recorded in Canada for the period 2000-2002. In 2003, close to one third of all exploration and deposit appraisal expenditures are expected to be concentrated in Ontario. Mirroring the trend in Ontario, the total Canadian increase in expenditures is mainly attributable to more significant off-mine-site deposit appraisal activities than on-mine-site exploration activities, even though the latter also increased. In 2003, off-mine-site exploration activities are the main contributors to the anticipated sizeable increase.

At the same time as exploration and deposit appraisal spending increased over the period 2001-03, a similar trend was registered by junior and senior companies (Tables 3a, b and c). Spending by juniors increased by 7.3% in 2002 compared to 2001 (reaching \$190.8 million) and is expected to increase by a further 47.1% in 2003 (reaching an expected \$280.7 million). Senior increases were more modest at 14.2% and 5.5% for the years 2002 and 2003, respectively. In 2002, the merger of Hope Bay Gold Corp. with Miramar Mining Corp. resulted in a new company, Miramar Hope Bay Ltd., operating the Hope Bay project in Nunavut. This project takeover affected the classification of the expenses reported under the senior category, which may have partly contributed to that year's increase in senior expenditures. In 2003, four junior companies became committed to production and, as a result, their respective expenditures are now reported under the senior category. Close to 90% of all junior expenditures were dedicated to off-mine-site exploration for these years, amounting to \$172.4 million in 2002 and an expected \$246.3 million in 2003.

Factors of Influence

As outlined in Figure 2c, different factors may have an effect on the level of exploration and deposit appraisal activity in Canada and thus on the overall level of mineral resource development activity. Different factors, such as metal prices, main discoveries (see Diamond Interest below), and federal and other regional tax incentive measures, are associated with some of the survey results and will be discussed briefly. While it is clear that each of these factors is important, it is difficult to draw definite conclusions about their relative importance because of the complexity of how these and other factors are interrelated.

Metal Prices

Metal prices have a major influence on mineral resource development expenditures. As shown by the exploration trend recorded since 1969 in Figure 2a, Canada is just coming out of the fourth downturn in expenditures with a low recorded in 1999. Other depressed expenditure years were 1972, 1983 and 1992 when low metal prices were recorded. The shorter-than-normal period preceding the 1999 low in total expenditures should be noted, when metal prices seemed to fluctuate more quickly than ever before. The General Review (Chapter 1) describes in detail the trends in metal prices and the associated economic conditions.

Most metal prices improved in 2003. In 2001, the price of copper averaged US\$0.716/lb; in 2002, it averaged US\$0.707/lb. As of mid-November 2003, copper traded at almost US\$0.93/lb. Over the past two years, nickel averaged US\$2.70/lb in 2001 and US\$3.07/lb in 2002. At nearly US\$5.50/lb in mid-November 2003, nickel reached its highest level since 1989 as a result of strong demand from China, reduced inventories and limited supply. Lead and zinc prices did not fare quite as well in 2003, but are also strengthening with lead prices approaching US\$0.30/lb and zinc prices reaching US\$0.41/lb by mid-November. Zinc prices declined from an average of US\$0.51/lb in 2000 to US\$0.40/lb in 2001 and then to US\$0.35/lb in 2002. Results from the survey reveal that combined base-metal exploration and deposit appraisal expenditures for 2002 are quite stable since the last major decrease in 1999 (Table 12). However, an increase in deposit appraisal activity, mainly from the Voisey's Bay nickel-cobalt project (operated by Voisey's Bay Nickel Company Limited), conceals an overall slowdown in base-metal exploration. An improvement has been recorded in the mine complex development phase (excluding capital and repair expenditures) (Figure 1b). Again, the "go ahead" decision near the end of 2002 at the Voisey's Bay mine development project had a clear impact on this increase. The 2003 base-metal exploration plus deposit appraisal expenditures are expected to reach \$161.2 million, an important increase from the \$138.8 million recorded in 2002. Off-mine-site exploration activity at the

Nickel Rim project (operated by Falconbridge Limited) in Ontario will also be partly responsible for this increase.

Gold prices have been rising steadily since the beginning of 2001, going from about US\$265/oz at the beginning of 2001 to over US\$330/oz at the end of 2002, a trend that has continued into 2003. In mid-November, gold traded at almost US\$400/oz. At \$176.0 million, gold exploration and deposit appraisal expenditures in 2002 represent 82.7% of all precious-metal expenditures and an increase of 42.9% over the \$123.2 million recorded for gold expenditures in 2001. The increase in gold expenditures for 2002 can be explained by more major gold projects being active that year. For example, 33 gold projects each with over \$1 million in expenditures, for a total of \$109 million, accounted for 76% of all gold expenditures in 2002. Among those 33 projects, 12 were for on-mine-site activities for a total of \$55 million. The two main on-mine-site projects were the Red Lake mine in Ontario (operated by Goldcorp Inc.) and the Doyon mine in Quebec (operated by Cambior Inc.). The two main off-mine-site projects were the Hope Bay project (operated by Miramar Hope Bay Ltd.) and the Meadowbank project (operated by Cumberland Resources Inc.), both located in Nunavut. This compares to 20 major gold projects for a total of \$74 million in 2001, representing 60% of all gold expenditures, including 10 on-mine-site projects for a total of \$40 million. It is also interesting to note that 27 former gold mines (among those, 15 in Ontario and 5 in British Columbia) have been targeted for exploration and deposit appraisal activity from a total of about 44 former mines being re-examined across Canada. Thirteen are former base-metal mines, two are former silver mines, and two are former nonmetal mines. Mine complex development expenditures for precious metals have also increased by 23.8%, but a corresponding increase in capital and repair investment has not occurred. In 2003, precious-metal exploration and deposit appraisal expenditures are also expected to continue to increase and reach close to \$285 million, up from \$213 million in 2002.

Platinum prices continued to be high at over US\$700/oz in 2002 and have risen steadily through 2003 due to strong sustained demand in the motor vehicle and jewellery sectors. However, oversupply has affected the palladium market. Most palladium is produced as a by-product of platinum mining. Its price has declined from averages of US\$604/oz in 2001 to US\$337/oz in 2002 to about US\$200/oz through 2003. The current low price may, however, encourage some users of platinum to switch back to palladium. Total exploration and deposit appraisal expenditures for all platinum group metals (PGM) have declined by 13.3% from \$29.9 million in 2001 to \$25.9 million in 2002.

The price of uranium has increased over the last few years, averaging US\$8.80/lb U₃O₈ in 2001, US\$9.89/lb in 2002 and US\$11.02/lb in October 2003. The September 2003

month-end price of uranium at US\$12.20/lb was the highest since the end of 1996. Uranium off-mine-site exploration expenditures themselves increased from \$13.7 million in 2001 to \$16.8 million in 2002, and are expected to be about the same in 2003. The large supply of secondary uranium may curtail further strong activity in the search for new deposits. The Cigar Lake deposit (operated by Cameco Corporation) in Saskatchewan is still nearing the development stage waiting for permits to be issued; production is expected to start in 2006. Capital and repair expenditures for uranium and coal account for the only expenditure increases in 2002.

Diamond Interest

Another factor of influence is the impact of important discoveries of diamonds (associated with a favourable geology), reflected in the level of claim-staking activity and the resulting exploration rush. For example, the diamond discovery of 1992 in the Northwest Territories that led to the opening of the first diamond mine in Canada in October 1998 helped boost the overall amount of exploration activity in Canada. Diamond's share of the total Canadian exploration and deposit appraisal expenditures rose from 18.2% in 1993 to 28.2% in 2002. The expenditures increased from \$144.7 million in 2001 to \$161.6 million in 2002 and will possibly reach \$146.7 million in 2003. For the exploration component only, \$100.6 million was spent in 2002 compared to \$95.5 million in 2001. Capital expenditures alone accounted for \$459.7 million in 2002 compared with \$531.4 million in 2001, placing diamonds first as the leading mineral commodity for that type of spending (Figure 1b, Table 5). Those expenditures decreased when Diavik started producing in 2003. In 2002, four projects were at the deposit appraisal phase: Jericho (operated by Tahera Corporation) in Nunavut, Snap Lake and Gahcho Kue (both operated by De Beers Canada Mining) in the Northwest Territories, and Victor (also operated by De Beers Canada Mining) in Ontario. At Ekati (operated by BHP Billiton Diamonds), deposit appraisal on at least seven kimberlites in the Core and Buffer zones is still being conducted. In 2002, as in 2001, the total for deposit appraisal expenditures for diamonds surpassed that of any other mineral commodity (Figure 8b, Table 13b). Some other types of discoveries that may have triggered a subsequent exploration rush are included in Figure 2c.

If market conditions remain favourable, diamonds will continue to contribute to a strong exploration effort, leading to the discovery of more diamond deposits in many parts of the country. Canada not only has a recognized geological potential for diamonds, but is also rich in high-quality diamonds, as reflected in their average selling price. The average price per carat for a Canadian-mined diamond was the third highest in the world in 2001 and 2002, surpassed only by Namibia and Angola. (For more information, refer to Statistics Canada catalogue no. 11-621-MIE, no. 008, *Diamonds Adding Lustre to the Canadian Economy*.)

Tax Incentive Measures

In addition to periods of improved commodity prices and important discoveries, Canada has benefited from the compounded effect of different incentive measures, especially during the peak years of exploration and deposit appraisal expenditures, 1987 and 1988 (Figures 2a and 2c, Table 3a), resulting principally from the Canadian Mining Exploration Depletion Allowance (MEDA) that was put in place in 1983 and phased out in 1988. Since October 2000, the federal government has introduced a 15% Investment Tax Credit for Exploration (ITCE) aimed at assisting junior exploration companies to obtain flow-through-share (FTS) financing for their off-mine-site exploration programs. Some provincial and territorial governments have also introduced their own tax credit programs, some of which are harmonized with the federal ITCE.

The impact of government initiatives since 2000 still remains to be fully assessed. Indications for 2002 and especially 2003 are that these initiatives have contributed somewhat to increased junior off-mine-site exploration spending, as described above. A compilation of publicly available information shows that \$202 million was raised through FTS financing in 2002, compared to \$110 million in 2001. Indications for 2003 are that those amounts will easily be surpassed.

Appendix 1 summarizes the main tax incentive measures currently available in Canada. The possible impact of these measures can be observed in the junior expenditure trends described below.

Provincially (Table 15a), junior exploration and deposit appraisal expenditures increased between 2001 and 2002 in Ontario (up \$11.3 million to \$51.0 million), British Columbia (up \$9.8 million to \$28.1 million), and Newfoundland and Labrador (up \$3.8 million to \$11.0 million). Increases were less significant in the Yukon (up \$1.3 million to \$6.8 million) and Quebec (up \$2.1 million to \$32.1 million). Small increases were registered for Nova Scotia and Alberta. Expenditures in the other provinces and territories, including Manitoba and Saskatchewan with special incentives, declined from 2001 to 2002. For junior companies, the trend in off-mine-site exploration is the same with an increase of 9.2% since 2001.

A major increase of 42.9% in junior off-mine-site exploration expenditures is anticipated in 2003. Increases are expected everywhere except in New Brunswick and Alberta. In decreasing order of importance, 65.9% of the net increase originates from British Columbia, Quebec, Ontario and the Yukon. Worth mentioning are the important increases of 182.1% and 121.4% anticipated for Nova Scotia and Saskatchewan, respectively. In Nova Scotia, several closed gold mines are being explored by juniors, including the former Mooseland gold mine by Azure Resources Corp., which also operates the former Dufferin

and Miller Lake gold mines. Many other gold properties are also being revisited by True Metallic Explorations, Aurogin Resources and, more recently, Acadian Gold Corp., which has acquired six old gold properties. As for Saskatchewan, Shore Gold Inc. is sinking a shaft on the Star diamond kimberlite there in order to recover a large bulk sample. In 2003, juniors spent more than seniors in off-mine-site exploration in Newfoundland and Labrador, Nova Scotia, New Brunswick, Quebec, British Columbia, the Yukon and Nunavut.

There was an increase from the previous year in the total number of junior project operators in 2002 as 463 companies were active (including 32 companies involved in deposit appraisal activities, of which some were also active in exploration at the same time as being involved with deposit appraisal). This is compared to 400 junior operators (including 40 involved in deposit appraisal activities) that were active in 2001.

Junior companies have traditionally explored off-mine-site for precious metals. Diamonds rank as the third most-sought mineral commodity after base metals in 2000 and 2001, but in 2002 diamonds moved up to the position of second most-sought mineral (Table 14). The main exploration (off-mine-site) target for seniors is normally base metals, but in 2002 diamonds ranked first ahead of base metals.

Exploration Success

More discoveries being made (Figure 2c), more projects under deposit appraisal, and new mines being developed are some measures of the success of exploration activities that are taking place. Analysis of these factors can yield an insight into trends in the state and health of exploration in Canada.

This survey identifies how deposit appraisal (advanced) off-mine-site projects compare with mine openings. For more information on Canadian mine openings, closings, expansions, extensions and new mine development, see Chapter 5. In 2002 (Figure 9), there was an improvement in both the number of advanced projects and mine openings. The correlation between advanced off-mine-site projects and mine openings has its shortcomings and will not be discussed. However, it is known that the deposit appraisal phase can last between two and seven years before a project enters the mine complex development phase.

The total number of base-metal advanced projects declined by six in 2002 while the total number of projects for the "others" category (including uranium, coal, other metals, and iron deposits) increased by seven. Two diamond projects were also classified as deposit appraisal off-mine-site in 2002. As a result, the total number of deposit appraisal off-mine-site projects increased by three in 2002.

This short analysis shows that specific advanced projects tend to have a fairly high turnover rate. Overall, in 2002, three projects were added as the result of the introduction of 27 new deposit appraisal off-mine-site projects (including 8 reactivated projects) less 2 projects that moved into the mine complex development phase, 2 projects that were added to mine plans, and 20 projects that were put on hold or returned to the exploration phase.

Moreover, the proportion of advanced projects becoming mines is also very low. According to survey results in 2002, the number of off-mine-site deposit appraisal projects entering the mine complex development phase reached 3.0% of all off-mine-site deposit appraisal projects listed in 2001 (2 projects in 2002 out of a total of 67 off-mine-site deposit appraisal projects in 2001) compared to 3.5% in 2001 from the 2000 list of advanced projects (3 projects in 2001 out of a total of 86 projects in 2000). It must be noted that all those projects have not yet reported important production feasibility studies and that the deposit appraisal phase starts with the definition of a mineral deposit (Table 18). Further investigation of this type of expenditure may reveal higher percentages. The number of off-mine-site exploration projects entering the deposit appraisal phase in 2002 is about 1.2% compared to roughly 1.4% in 2001. The exact number of active properties at the off-mine-site exploration phase may sometimes be underestimated since some companies have difficulty in providing a breakdown of expenditures by property.

Table 17 also provides a breakdown of the number of advanced off-mine-site projects by province/territory and by junior and senior company. In 2002, 35 projects were operated by junior companies and 35 were operated by senior companies, compared to 45 by juniors and 22 by seniors in 2001. Except in Nova Scotia and the Yukon, the cost per project in 2002 is higher for seniors. There were no advanced projects operated by seniors in Manitoba that year. The most expensive ones are diamond projects in the Northwest Territories.

Total Mineral Resource Development Expenditures

Total mineral resource development expenditures (Figures 1a and 1b, Table 1), including repair and maintenance costs, decreased from \$4.6 billion in 2001 to \$4.2 billion in 2002. The major drop occurred in Quebec where three major mining construction projects were completed in 2001: the IOC pellet plant in Sept-Îles (operated by Iron Ore Company of Canada), the expansion of the Raglan mine in Ungava (operated by Société minière Raglan du Québec Limitée), and the Magnola metallurgical plant in the Eastern Townships (operated by Métallurgie Magnola Inc.), which subsequently closed in 2003. When considering all investment costs except repair and maintenance, which are not available for 2003, expenditures were expected to decrease slightly to \$2.6 billion (capital cost

contributing \$1.2 billion) compared with \$2.7 billion (capital cost contributing \$1.3 billion) in 2002. With construction at the Diavik mine (operated by Diavik Diamond Mines Inc.) completed in 2003, the Voisey's Bay project is taking over as the major contributor to capital expenditures, but not yet at the same scale.

CONCLUSION

It is encouraging that the levels of exploration and deposit appraisal in Canada for 2002 and 2003 are increasing after remaining fixed at around \$500 million in 1999, 2000 and 2001. The impact of the tax measures put in place since 2000 by different governments has not yet been fully assessed, but junior company expenditures for off-mine-site activities appear to have benefited from those measures in 2003, and will probably benefit in 2004 as the FTS financing continues to improve.

With the U.S. economy showing some signs of strength along with that of Japan, there is optimism for the world economic situation. As a consequence, industrial demand for commodities will likely improve, helping to boost prices for both base metals and precious metals. As mentioned previously, China is significantly fuelling the demand for metals. Overall, the demand is taking place at a time when there are virtually no new sources of supply. However, in Canada, the diamond project success stories based on Canada's geological potential and the quality of the gemstone mined will continue to encourage the exploration industry. Four projects are at the deposit-appraisal stage in 2002 (not to mention other pipes under deposit appraisal at the Ekati diamond mine). The second Canadian diamond mine (Diavik) started production in January 2003.

Furthermore, the annual survey of world mineral exploration by the Metals Economic Group (MEG) for 2002 indicates that, for the first time since 1992, Canada moved into first place in the world as a recipient of exploration expenditures, followed by Australia, the United States and Peru in that order. For additional information on Canadian mineral exploration and discovery analysis, refer to Chapter 4.

BACKGROUND INFORMATION ON MINERAL RESOURCE DEVELOPMENT STATISTICS

Natural Resources Canada (NRCan) coordinates the collection of all statistics for off-mine-site and on-mine-site expenditures for the exploration and deposit appraisal phases and the mine complex development phase. Statistics Canada coordinates the collection of detailed on-mine-site statistics on capital, repair and maintenance

expenditures reported by producers at the mine complex development phase. NRCan and Statistics Canada cooperate with the provinces and territories to collect, assemble and publish the comprehensive national mineral resource development statistics presented in this review. These are compiled from the annual federal-provincial/territorial Survey of Mineral Exploration, Deposit Appraisal and Mine Complex Development Expenditures. For the 2002 survey year, the questionnaire has been modified to integrate the revised spending intentions for 2003. To protect the confidential data provided by respondents, only aggregate statistics are released.

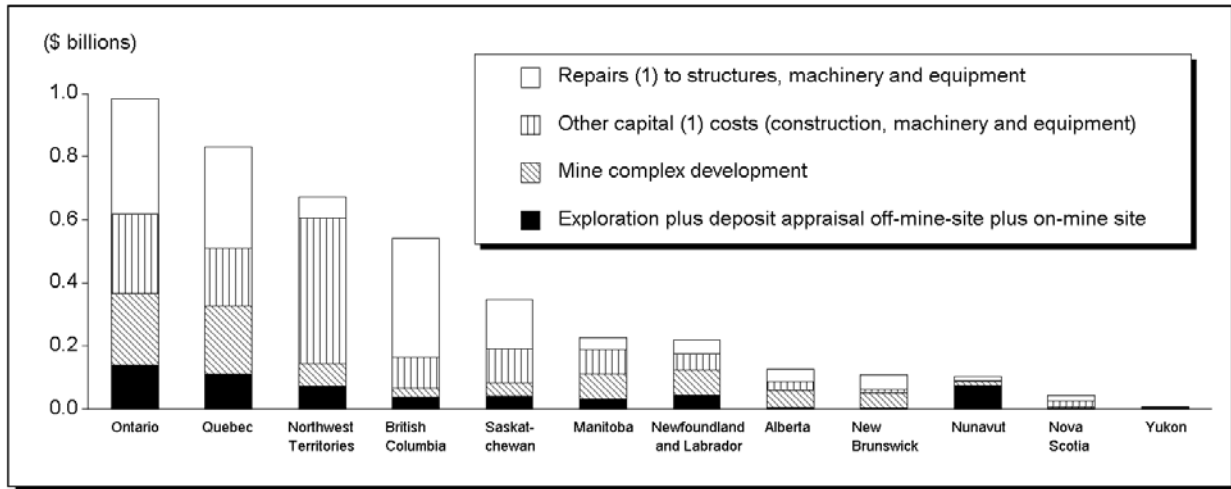
New definitions of work phases for mineral resource development were introduced in the 1997 survey. They provide a more complete and accurate coverage of project evolution from exploration to mine production. Table 18 describes the mineral resource development and mining process model upon which the new definitions are based. Specific definitions by category of expenditures are available on NRCan's exploration web site at http://mmsd1.mms.nrcan.gc.ca/mmsd/exploration/default_e.asp.

Notes: (1) Information in this review was current as of August 2003. (2) This and other reviews, including previous editions, are available on the Internet at www.nrcan.gc.ca/mms/cmy/2002CMY_e.htm.

NOTE TO READERS

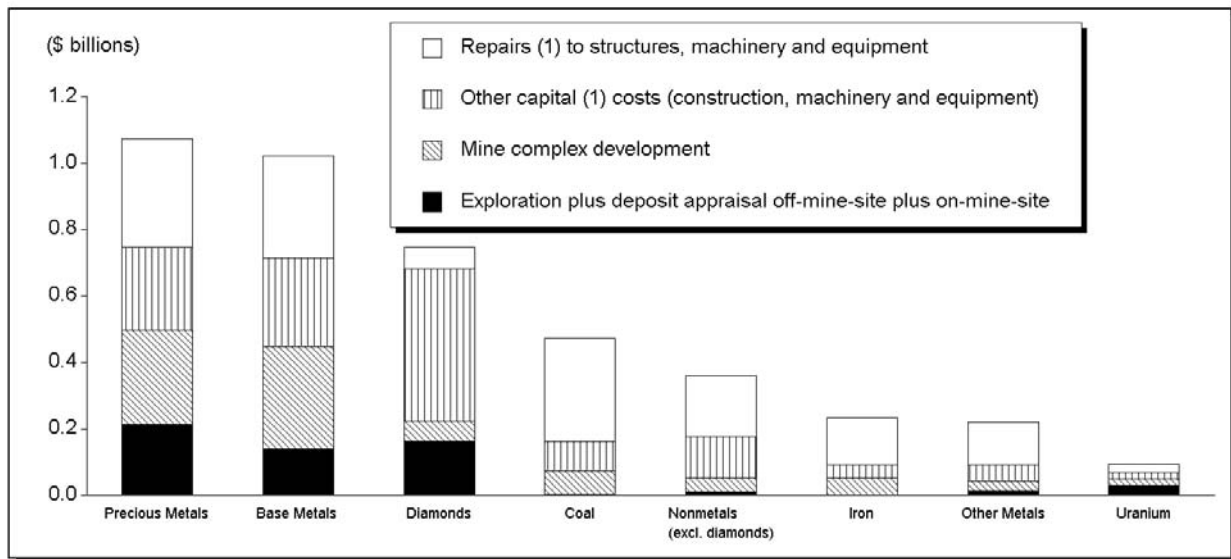
The intent of this document is to provide general information and to elicit discussion. It is not intended as a reference, guide or suggestion to be used in trading, investment, or other commercial activities. The author and Natural Resources Canada make no warranty of any kind with respect to the content and accept no liability, either incidental, consequential, financial or otherwise, arising from the use of this document.

Figure 1a
Total Mineral Resource Development Expenditures in Canada, by Province and Territory, 2002
\$4.2 Billion



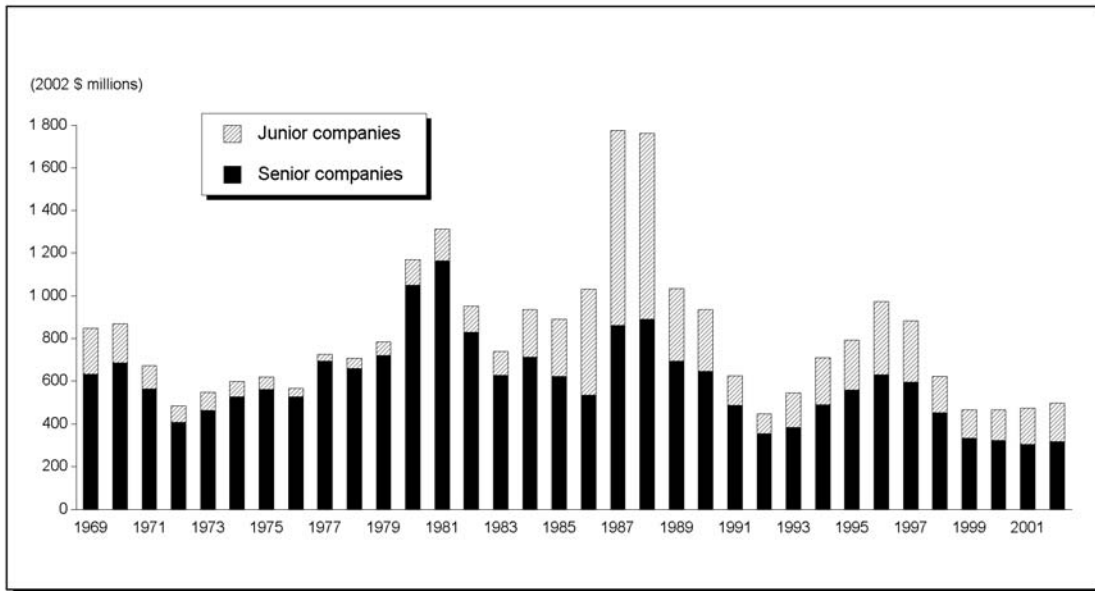
Source: Natural Resources Canada, from a federal-provincial territorial survey of mining and exploration companies.
 (1) Includes expenditures related to exploration (0.7%), deposit appraisal (0.9%) and mine complex development (98.4%).

Figure 1b
Total Mineral Resource Development Expenditures in Canada, by Commodity Sought, 2002
\$4.2 Billion



Source: Natural Resources Canada, from a federal-provincial territorial survey of mining and exploration companies.
 (1) Includes expenditures related to exploration (0.7%), deposit appraisal (0.9%) and mine complex development (98.4%).

Figure 2a
Exploration Plus Deposit Appraisal Expenditures, (1) Field and Overhead (2) Costs, by Junior and Senior Companies, 1969-2002

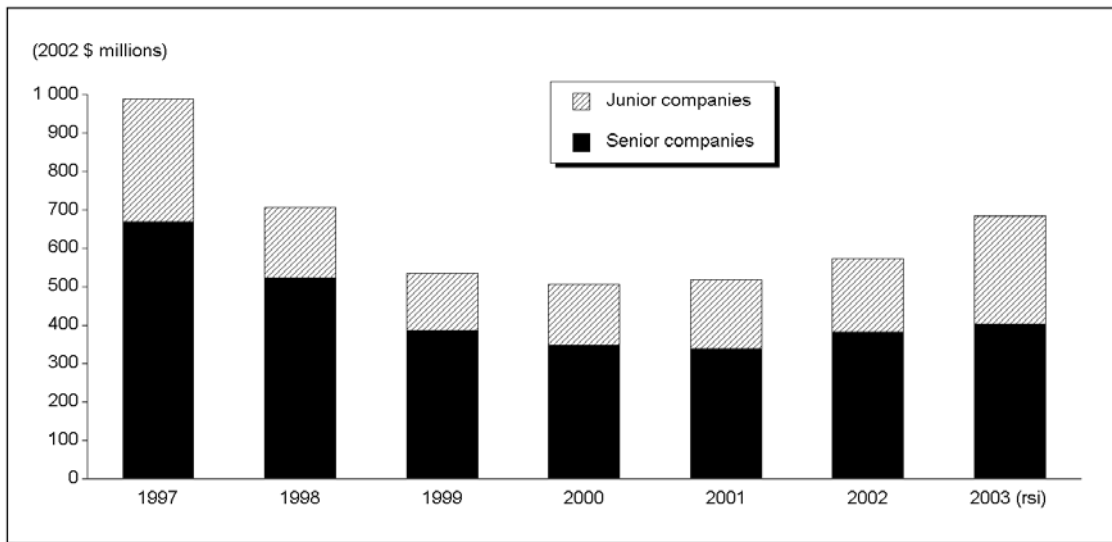


Sources: Natural Resources Canada and Statistics Canada, from a federal/provincial-territorial survey of mining and exploration companies.

(1) Includes on-mine-site plus off-mine-site activities. (2) Overhead costs include mineral leases, claims and property taxes, and project-related head office expenditures.

Notes: Total exploration expenditures for 1975-81 are overstated by an average of about 17% relative to earlier and later years because of changes to the methodology used by Statistics Canada over the years. Up to and including 1996, most of the expenditures now included in the deposit appraisal work phase were reported under exploration (broadly speaking).

Figure 2b
Exploration Plus Deposit Appraisal Expenditures, (1) by Junior and Senior Companies, 1997-2003

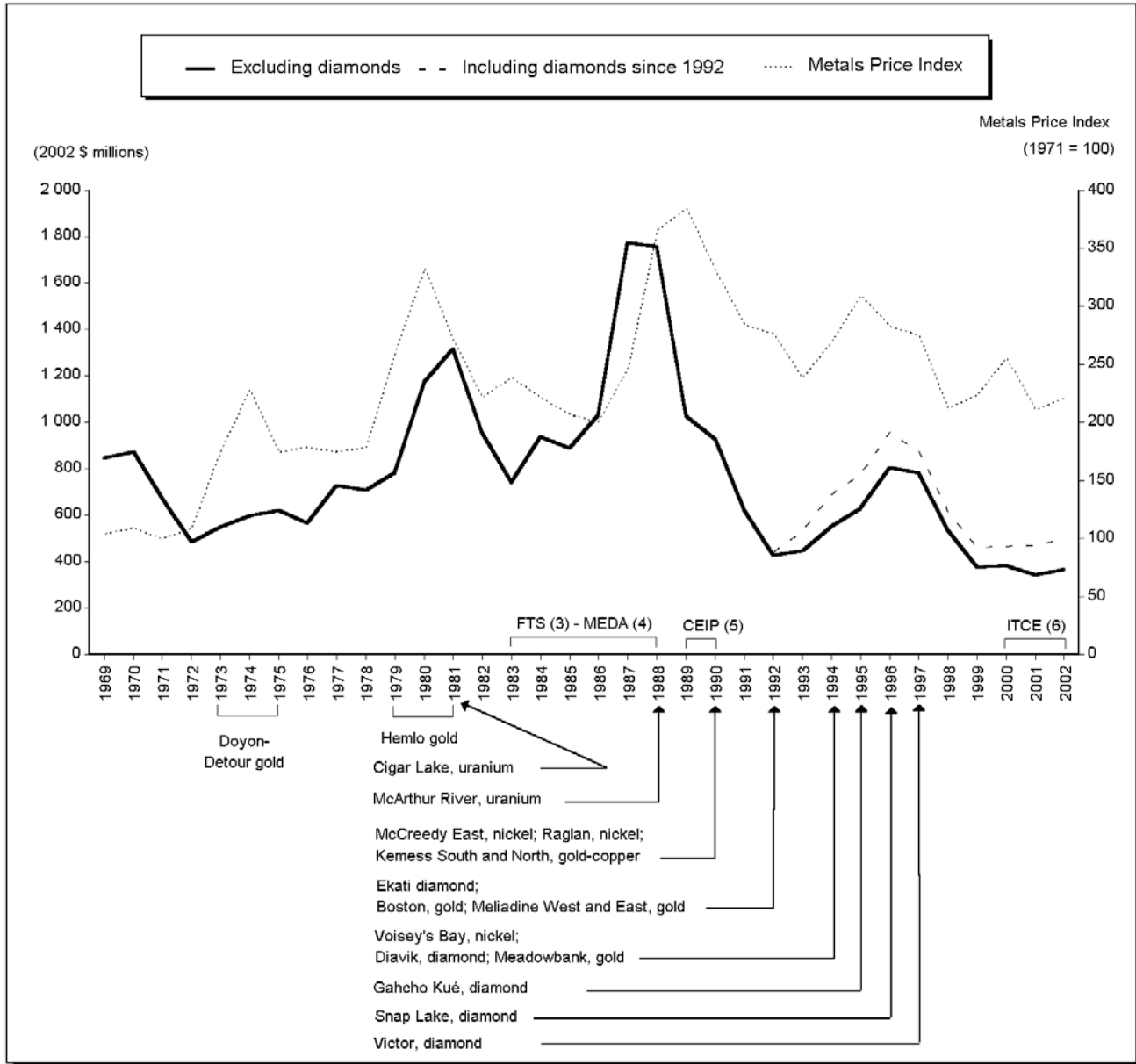


Source: Natural Resources Canada, from a federal-provincial territorial survey of mining and exploration companies.

(rsi) Revised spending intentions.

(1) Includes on-mine-site plus off-mine-site activities. Includes field work, overhead, engineering, economic and pre- or production feasibility studies, environment and land access costs.

Figure 2c
Exploration Plus Deposit Appraisal Expenditures, (1) Field and Overhead (2) Costs, Comparing Metals Price Index, Some Major Discoveries, and Federal Incentive Measures, 1969-2002



Sources: Natural Resources Canada and Statistics Canada, from a federal-provincial/territorial survey of mining and exploration companies.

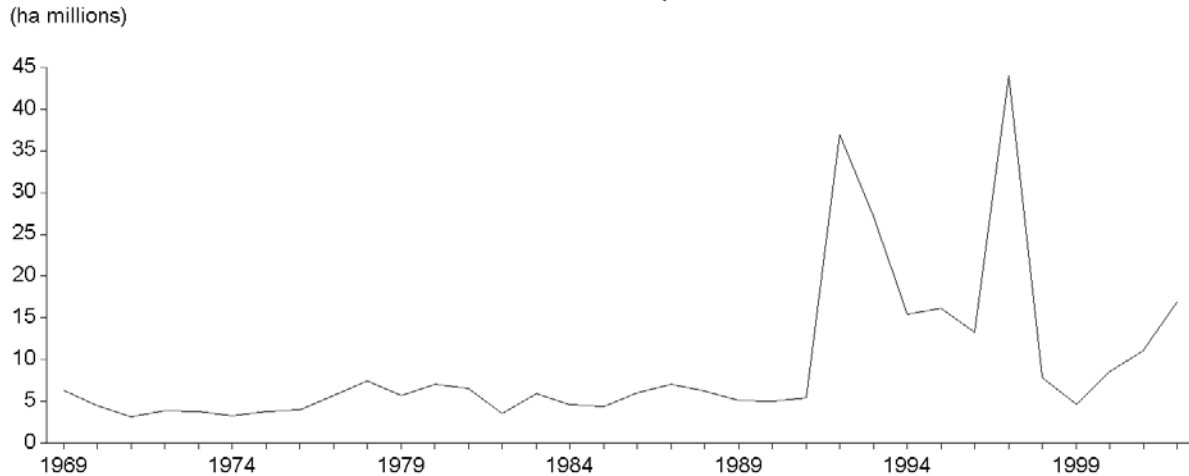
(1) Includes on-mine-site plus off-mine-site activities. (2) Overhead costs include mineral leases, claims and property taxes, and project-related head office expenditures. (3) FTS: Flow-through shares. (4) MEDA: Mining Exploration Depletion Allowance. (5) CEIP: Canadian Exploration Incentive Program. (6) ITCE: Investment Tax Credit for Exploration.

Notes: FTS program is continuous since 1983. Total exploration expenditures for 1975-81 are overstated by an average of about 17% relative to earlier and later years because of changes to the methodology used by Statistics Canada over the years.

Expenditures for 1997 to 2002 include both exploration plus deposit appraisal as per new definitions; up to and including 1996, most of the expenditures now included in the deposit appraisal work phase were reported under exploration (broadly speaking).

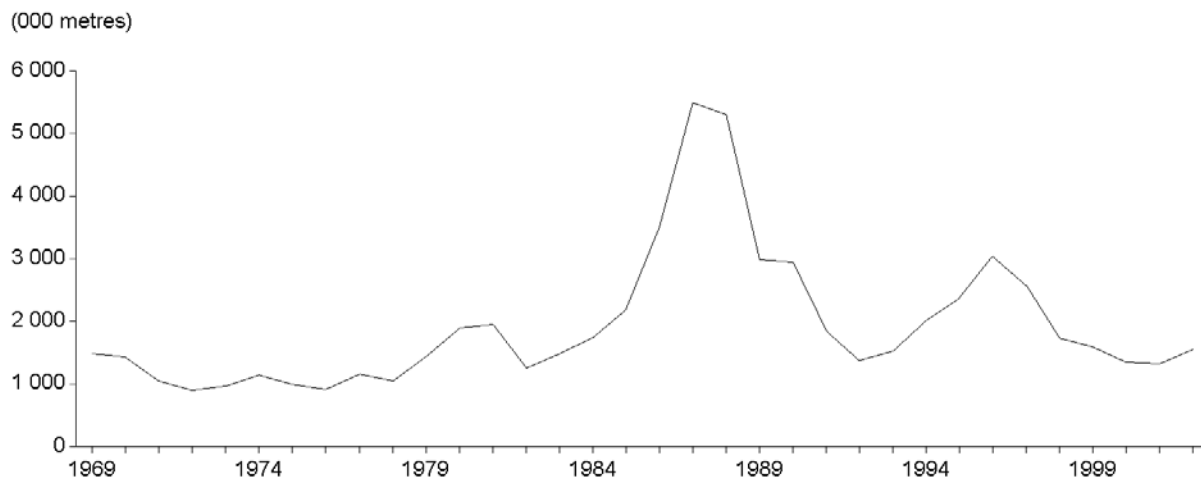
Figures 3a and 3b
Selected Measures of Exploration Activity

Figure 3a. Area of New Mineral Claims Staked or Recorded, 1969-2002



Source: Information obtained and compiled annually by Natural Resources Canada from provincial and territorial mining recorders.

Figure 3b. Surface Diamond Drilling, 1969-2002
 (all minerals except oil and gas)

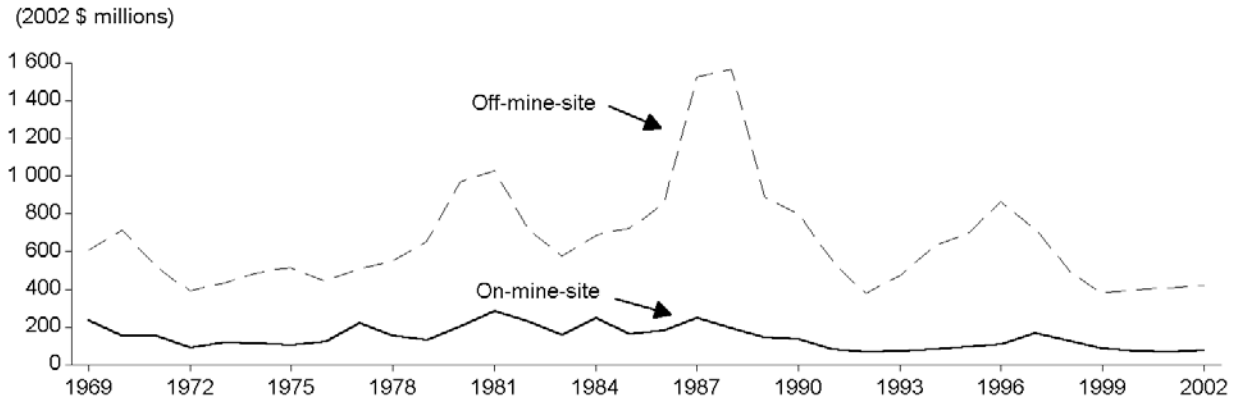


Source: 1969-84, Statistics Canada (cat no. 26-201); 1985-2002, from a federal-provincial territorial survey of mining and exploration companies.

Note: Data for 1969-84 include surface diamond drilling for the entire mineral development cycle. Data for 1985-2002 include surface diamond drilling in the exploration and deposit appraisal work phases only.

Figures 3c and 3d
Selected Measures of Exploration Activity

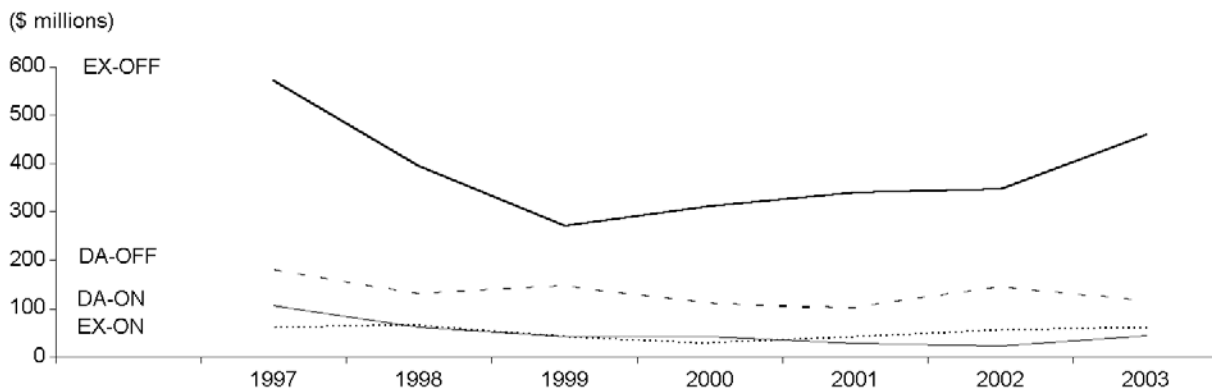
**Figure 3c. Exploration Plus Deposit Appraisal,
 Field Work Plus Overhead Expenditures, 1969-2002**
 (all minerals except oil and gas)



Sources: 1969-84, Statistics Canada, Exploration, Development and Capital Expenditures for Petroleum and Natural Gas Wells, Intentions (cat. no. 61-216); 1985-2002, from a federal-provincial/territorial survey of mining and exploration companies.

Notes: Adjusted to 2002 dollars using Gross Domestic Product deflator series. These expenditures do not include expenditures for oil and gas exploration. Expenditures for 1997-2002 include exploration plus deposit appraisal as per new definitions; up to and including 1996, most of the expenditures now included in the deposit appraisal work phase were under exploration (broadly speaking). Off-mine-site and on-mine-site overhead expenditures for 1969-88 were estimated based on an average from the years 1989-96.

Figure 3d. Exploration and Deposit Appraisal Expenditures, (1) On- and Off-Mine-Site, 1997-2003



Source: Natural Resources Canada, from a federal-provincial/territorial survey of mining and exploration companies.

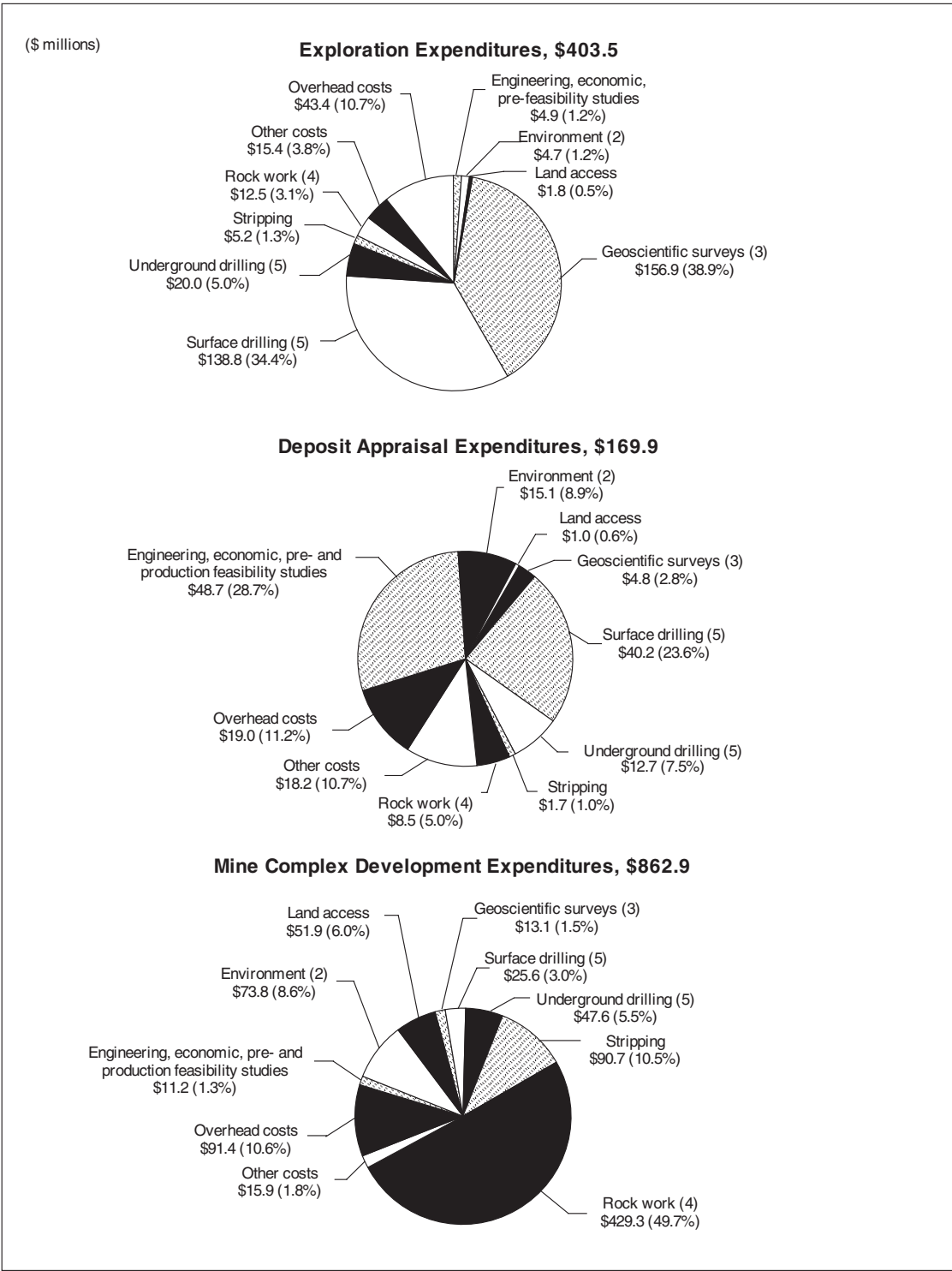
EX-OFF: Exploration off-mine-site. DA-OFF: Deposit appraisal off-mine-site.

EX-ON: Exploration on-mine-site. DA-ON: Deposit appraisal on-mine-site.

(1) Includes field work, overhead, engineering, economic, pre- or production feasibility studies, environment and land access costs.

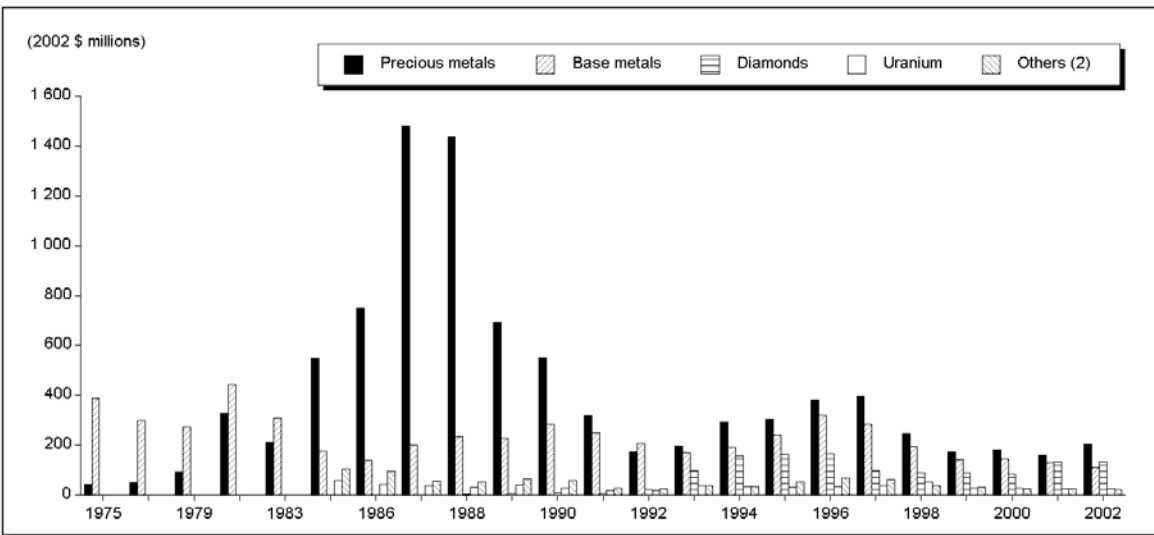
Note: Data for 2003 are revised spending intentions.

Figure 4
Exploration, Deposit Appraisal and Mine Complex Development Expenditures, (1)
by Type of Activity, 2002



Source: Natural Resources Canada, from a federal-provincial/territorial survey of mining and exploration companies.
 (1) Includes on-mine-site plus off-mine-site activities. (2) Environment includes characterization, permitting, protection, monitoring and restoration.
 (3) Geoscientific surveys include geology, geochemistry, ground geophysics and airborne geophysics. (4) Rock work activity includes shaft work, drifts, cross-cuts, raises, declines, rock sampling and dewatering costs. (5) Drilling includes diamond and other types of drilling.

Figure 5a
Exploration Plus Deposit Appraisal Expenditures, (1) Field and Overhead Costs, by Mineral Commodity, 1975-2002

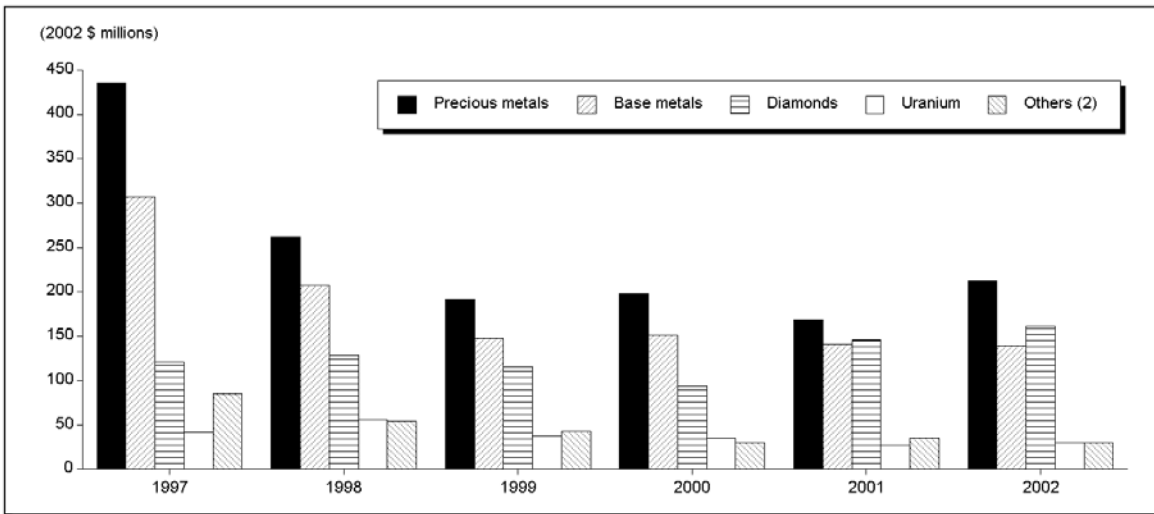


Sources: Natural Resources Canada and Statistics Canada, from a federal-provincial/territorial survey of mining and exploration companies.

(1) Includes on-mine-site plus off-mine-site activities; up to and including 1996, most of the expenditures now included in the deposit appraisal work phase were under exploration (broadly speaking). (2) Others include coal, iron, other metals, nonmetals and unspecified mineral commodities where applicable.

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

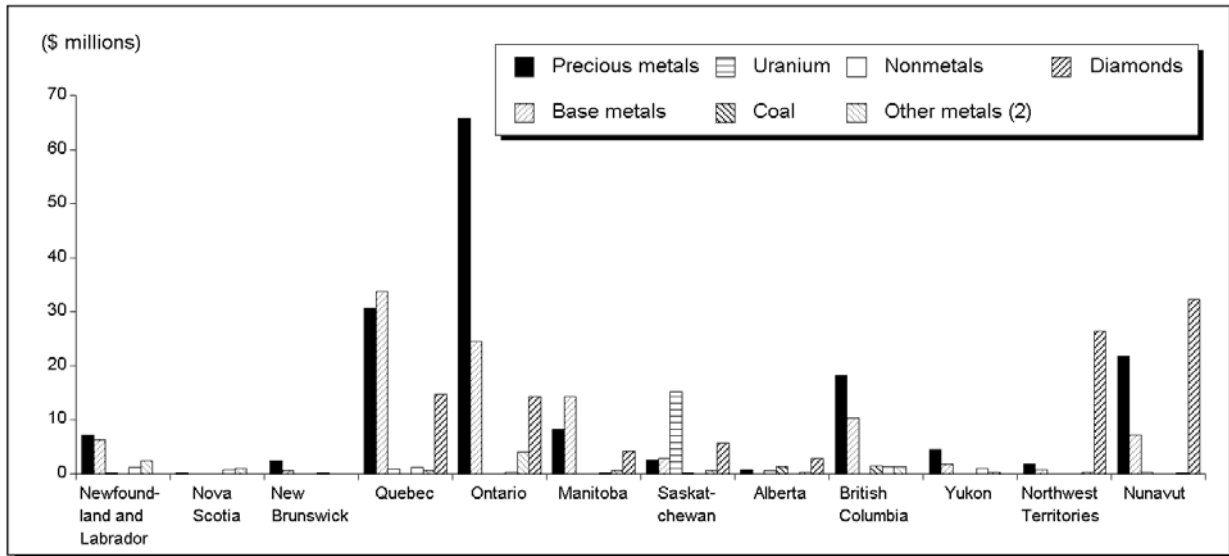
Figure 5b
Exploration Plus Deposit Appraisal Expenditures, (1) by Mineral Commodity, 1997-2002



Source: Natural Resources Canada, from a federal-provincial/territorial survey of mining and exploration companies.

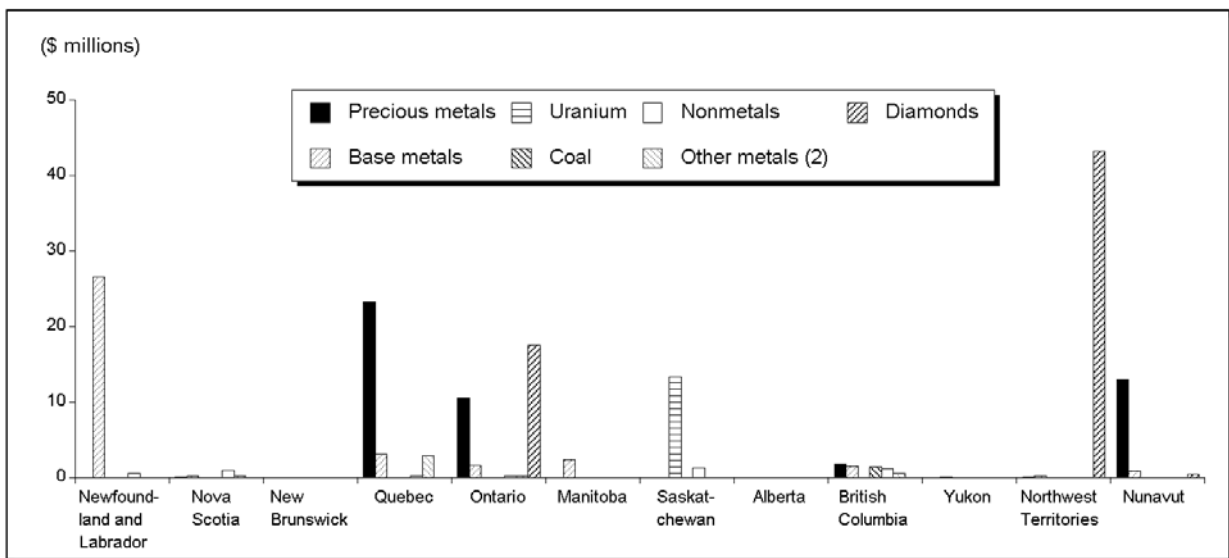
(1) Includes on-mine-site plus off-mine-site activities for field work, overhead, engineering, economic pre- or production feasibility studies, environment and land access costs. (2) Others include coal, iron, other metals, nonmetals and unspecified mineral commodities where applicable.

Figure 6a
Exploration Expenditures (1) by Province and Territory, by Mineral Commodity, 2002



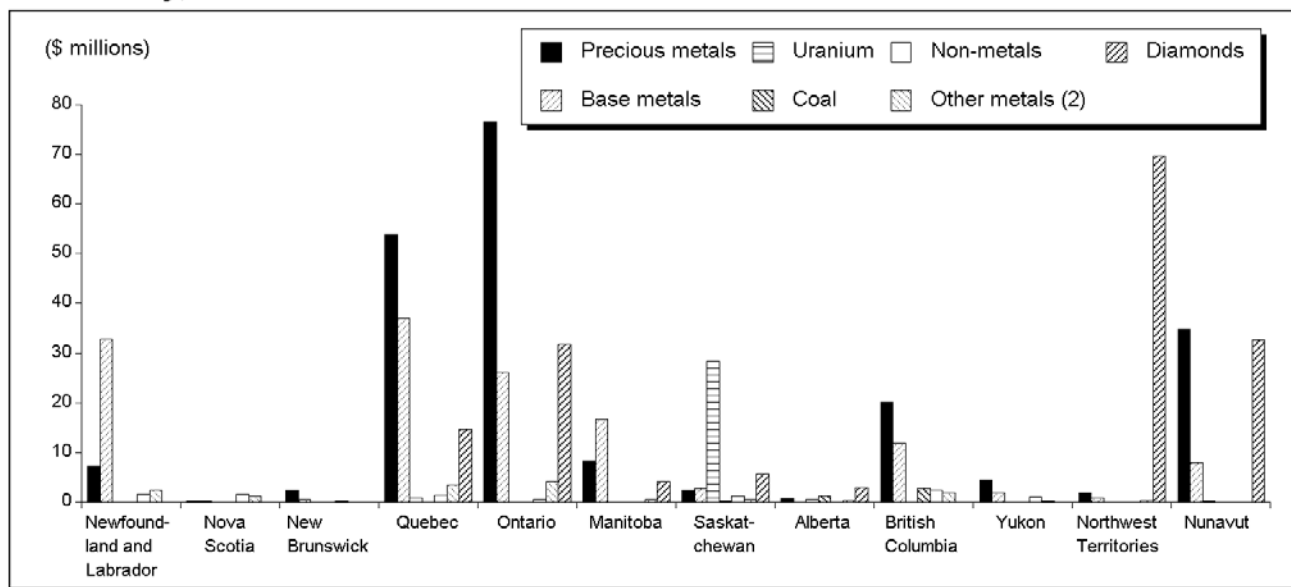
Source: Natural Resources Canada, from a federal-provincial/territorial survey of mining and exploration companies.
 (1) Includes on-mine-site plus off-mine-site activities. Includes field work, overhead, engineering, economic and pre-feasibility studies, environment and land access costs. (2) Includes ferrous metals.

Figure 6b
Deposit Appraisal Expenditures (1) by Province and Territory, by Mineral Commodity, 2002



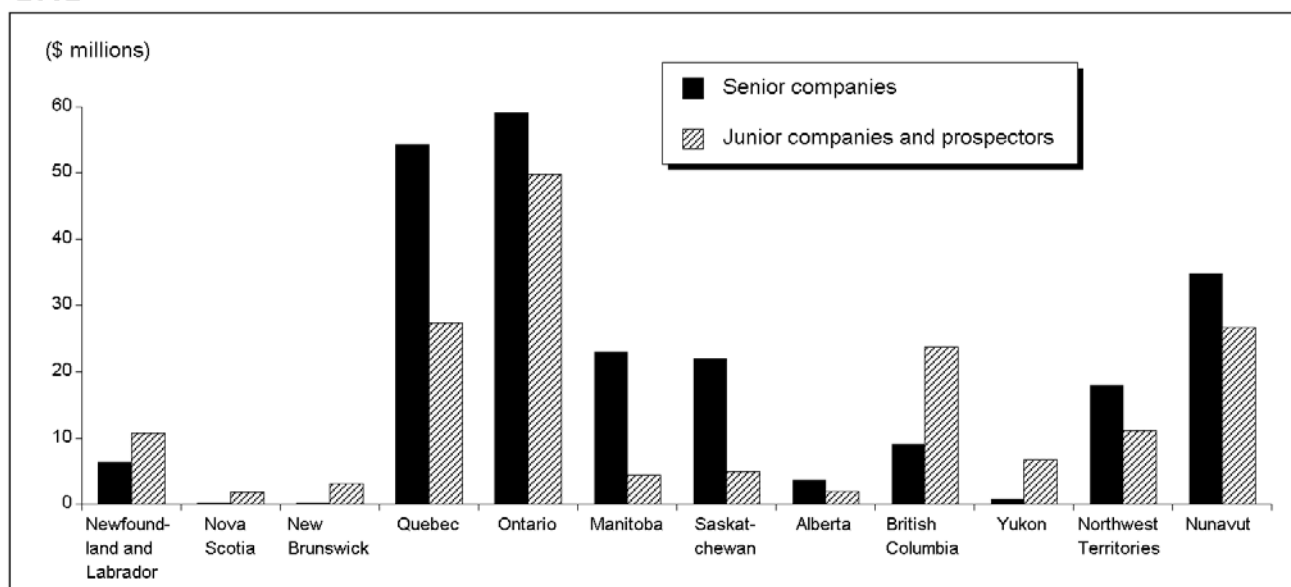
Source: Natural Resources Canada, from a federal-provincial/territorial survey of mining and exploration companies.
 (1) Includes on-mine-site plus off-mine-site activities. Includes field work, overhead, engineering, economic and pre- or production feasibility studies, environment and land access costs. (2) Includes ferrous metals.

Figure 6c
Exploration Plus Deposit Appraisal Expenditures (1) by Province and Territory, by Mineral Commodity, 2002



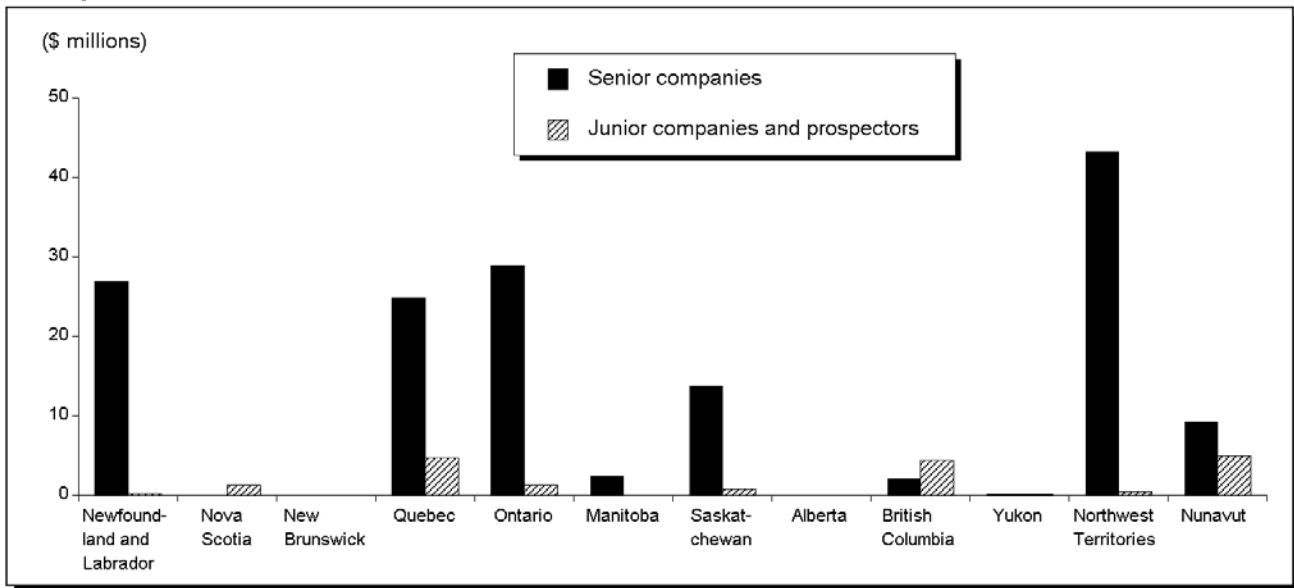
Source: Natural Resources Canada, from a federal-provincial/territorial survey of mining and exploration companies.
 (1) Includes on-mine-site plus off-mine-site activities. Includes field work, overhead, engineering, economic and pre- or production feasibility studies, environment and land access costs. (2) Includes ferrous metals.

Figure 7a
Exploration Expenditures (1) by Province and Territory, by Junior and Senior Companies, 2002



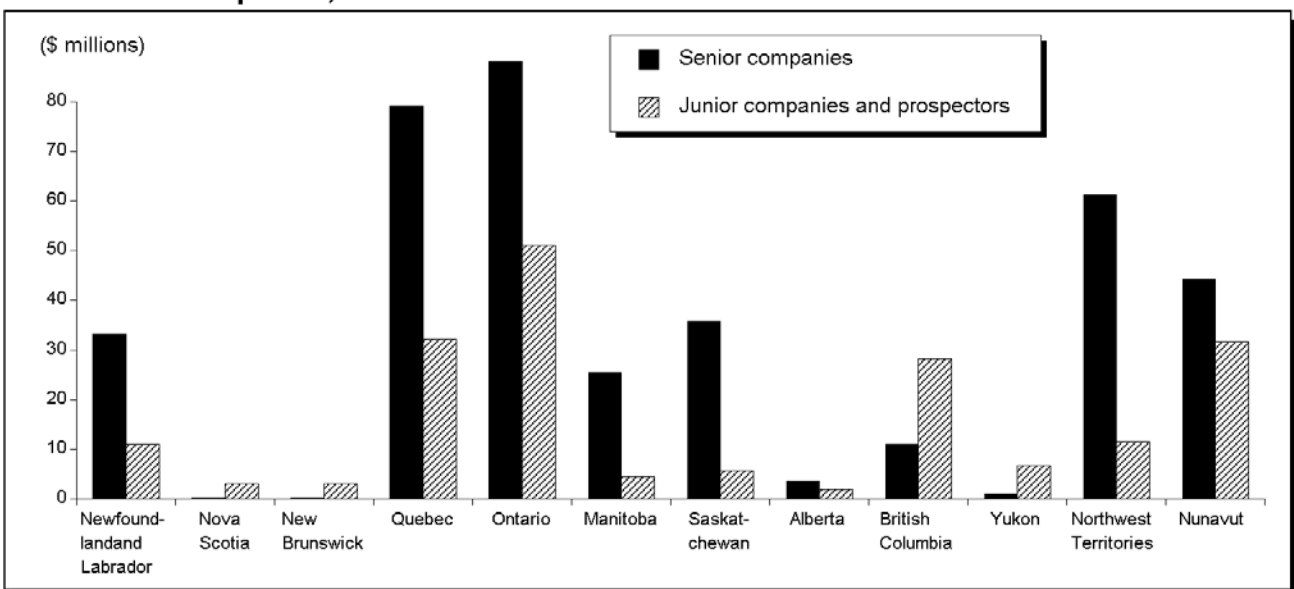
Source: Natural Resources Canada, from a federal-provincial/territorial survey of mining and exploration companies.
 (1) Includes on-mine-site plus off-mine-site activities. Includes field work, overhead, engineering, economic and pre-feasibility studies, environment and land access costs.

Figure 7b
Deposit Appraisal Expenditures (1) by Province and Territory, by Junior and Senior Companies, 2002



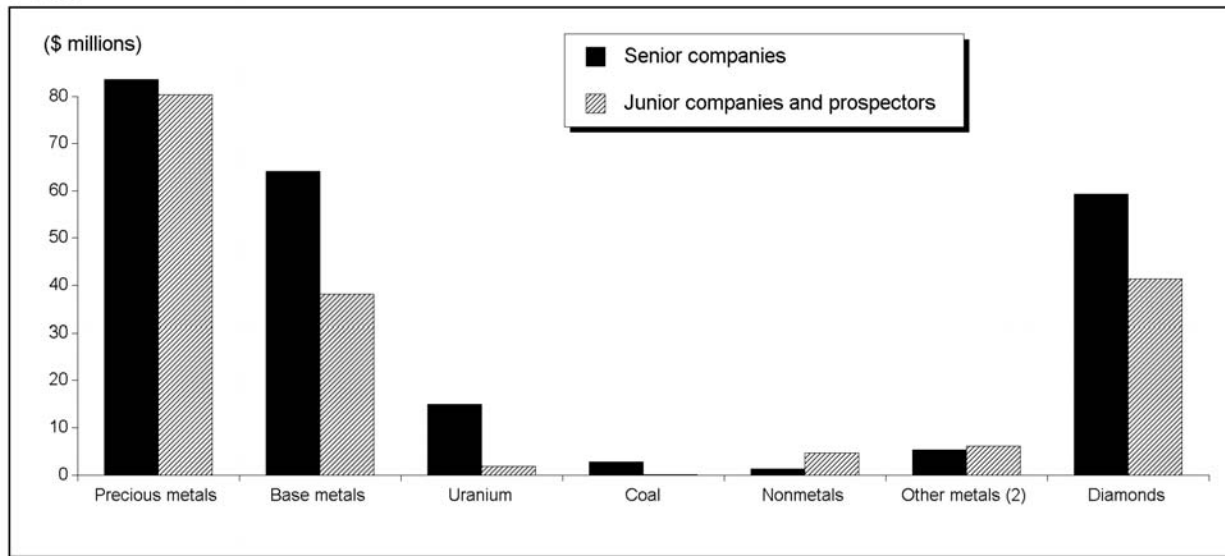
Source: Natural Resources Canada, from a federal-provincial/territorial survey of mining and exploration companies.
 (1) Includes on-mine-site plus off-mine-site activities. Includes field work, overhead, engineering, economic and pre- or production feasibility studies, environment and land access costs.

Figure 7c
Exploration and Deposit Appraisal Expenditures (1) by Province and Territory, by Junior and Senior Companies, 2002



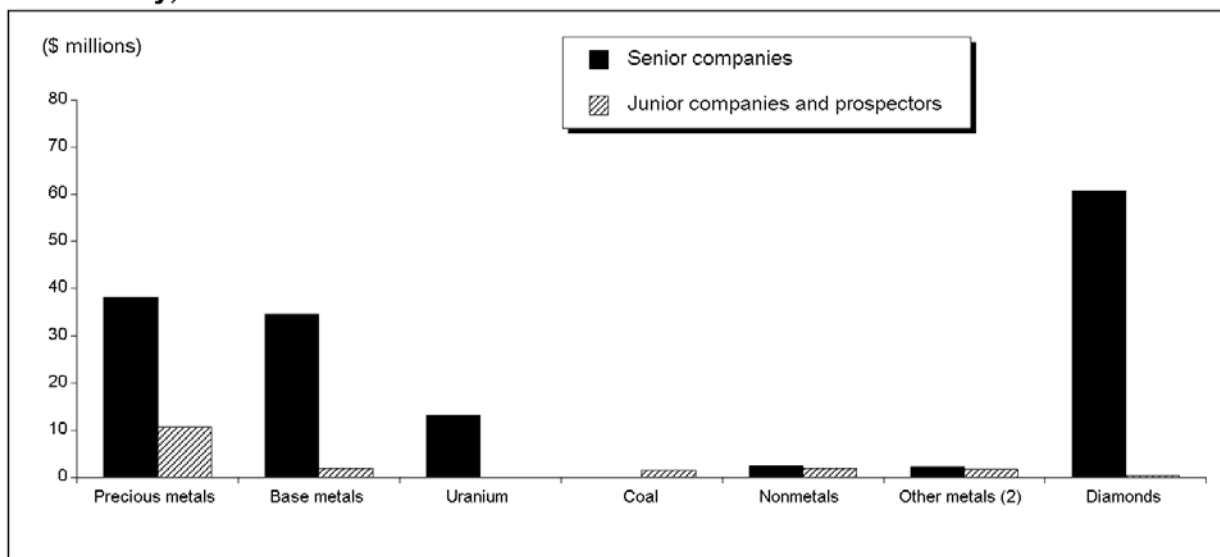
Source: Natural Resources Canada, from a federal-provincial/territorial survey of mining and exploration companies.
 (1) Includes on-mine-site plus off-mine-site activities. Includes field work, overhead, engineering, economic and pre- or production feasibility studies, environment and land access costs.

Figure 8a
Exploration Expenditures, (1) by Junior and Senior Companies and by Mineral Commodity, 2002



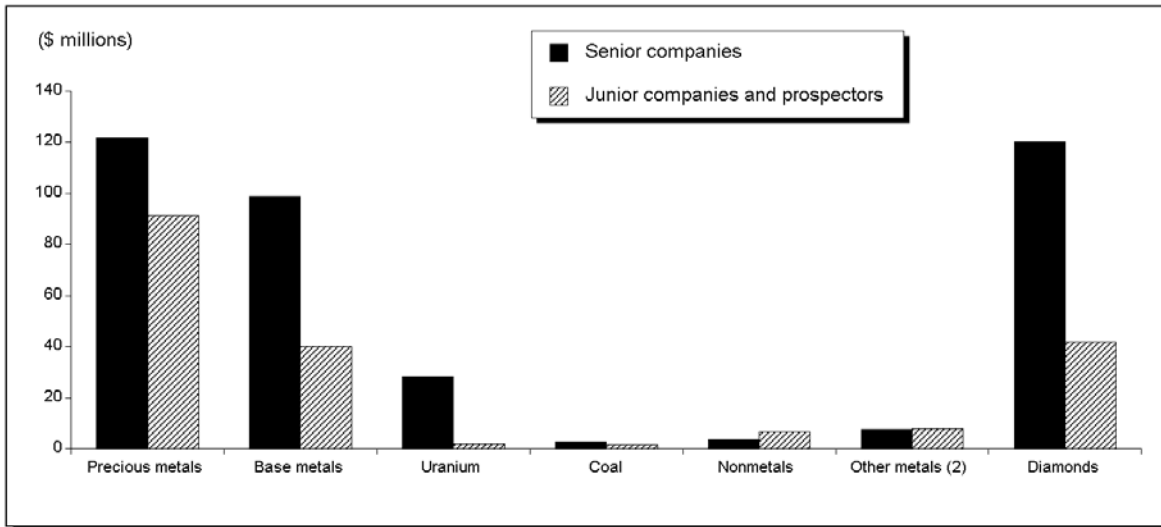
Source: Natural Resources Canada, from a federal-provincial/territorial survey of mining and exploration companies.
 (1) Includes on-mine-site plus off-mine-site activities. Includes field work, overhead, engineering, economic and pre-feasibility studies, environment and land access costs. (2) Includes ferrous metals.

Figure 8b
Deposit Appraisal Expenditures, (1) by Junior and Senior Companies and by Mineral Commodity, 2002



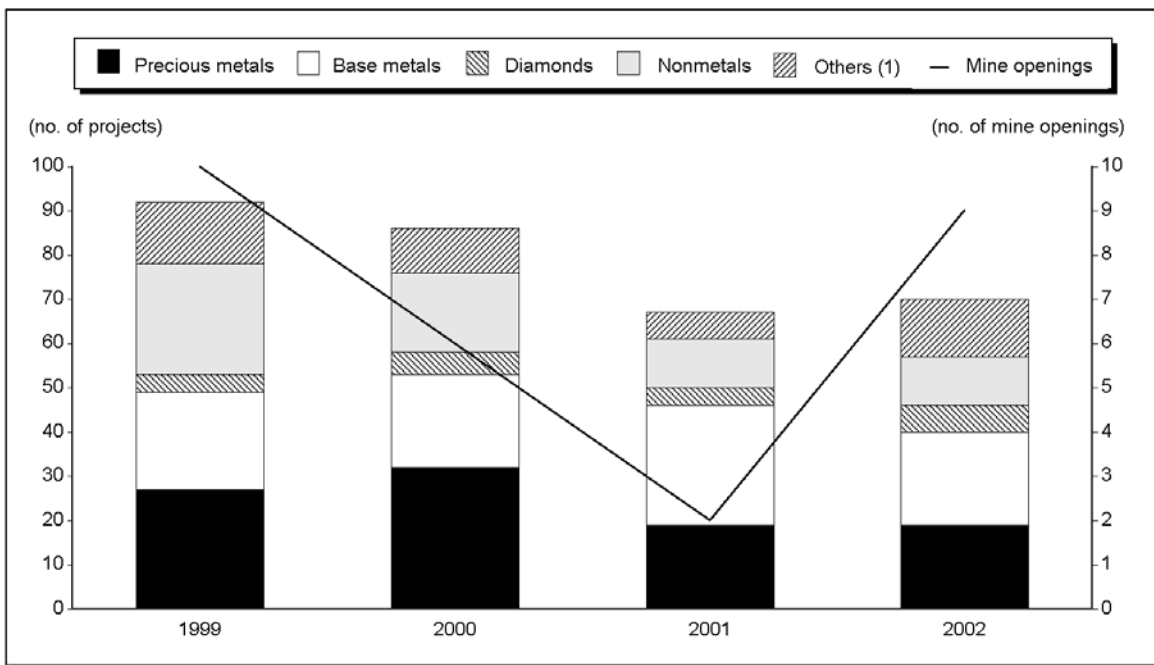
Source: Natural Resources Canada, from a federal-provincial/territorial survey of mining and exploration companies.
 (1) Includes on-mine-site plus off-mine-site activities. Includes field work, overhead, engineering, economic and pre- or production feasibility studies, environment and land access costs. (2) Includes ferrous metals.

Figure 8c
Exploration Plus Deposit Appraisal Expenditures, (1) by Junior and Senior Companies and by Mineral Commodity, 2002



Source: Natural Resources Canada, from a federal-provincial/territorial survey of mining and exploration companies.
 (1) Includes on-mine-site plus off-mine-site activities. Includes field work, overhead, engineering, economic and pre- or production feasibility studies, environment and land access costs. (2) Includes ferrous metals.

Figure 9
Deposit Appraisal Off-Mine-Site, Number of Projects by Commodity, and Mine Openings, 1999-2002



Source: Natural Resources Canada, from a federal-provincial/territorial survey of mining and exploration companies.
 (1) Includes iron, uranium, other metals, coal, nonmetals and unspecified mineral commodities where applicable.
 Note: In 2002, the number of diamond projects includes two separate projects at Ekati.

TABLE 1. EXPLORATION, DEPOSIT APPRAISAL AND MINE COMPLEX DEVELOPMENT ACTIVITY, ON- AND OFF-MINE-SITE, 2001-03

Expenditure Category by Work Phase	2001			2002			2003(rsi)							
	Off-Mine-Site	On-Mine-Site	Total	Off-Mine-Site	On-Mine-Site	Total	Off-Mine-Site	On-Mine-Site	Total					
	(\$ millions)	(%)	(\$ millions)	(%)	(\$ millions)	(%)	(\$ millions)	(%)	(\$ millions)					
EXPLORATION														
Field work and overhead	332.2	88.9	41.6	11.1	373.9	339.0	86.5	53.1	13.5	392.1	..	..	..	..
Engineering studies	0.9	98.2	...	1.8	1.0	4.1	89.4	0.5	10.6	4.6	..	..	..	..
Economic studies	0.2	100.0	..	..	0.2	0.2	99.5	...	0.5	0.2	..	..	..	..
Pre-feasibility studies	0.3	59.7	0.2	40.3	0.5	0.1	100.0	..	..	0.1	..	..	..	..
Environment	2.7	86.5	0.4	13.5	3.1	1.9	39.7	2.9	60.3	4.7	..	..	..	..
Land access	2.6	98.9	...	1.1	2.6	1.8	100.0	..	..	1.8	..	..	..	..
Subtotal	338.9	88.9	42.3	11.1	381.2	347.1	86.0	56.4	14.0	403.5	459.3	88.1	62.2	11.9
Capital (1)	7.6	100.0	..	..	7.6	0.6	6.3	9.6	93.7	10.3	2.8	20.9	10.5	79.1
Repair and maintenance (1)	1.2	71.5	0.5	28.5	1.7	0.5	5.3	8.9	94.7	9.4	..	..	..	..
Total	347.6	89.0	42.8	11.0	390.4	348.3	82.3	74.9	17.7	423.2	462.1	86.4	72.7	13.6
DEPOSIT APPRAISAL														
Field work and overhead	69.6	72.4	26.6	27.6	96.2	81.9	77.9	23.2	22.1	105.1	..	..	..	..
Engineering studies	15.9	89.7	1.8	10.3	17.7	24.0	97.9	0.5	2.1	24.5	..	..	..	..
Economic studies	4.7	96.6	0.2	3.4	4.8	1.0	100.0	..	..	1.0	..	..	..	..
Pre- or production feasibility studies	4.3	94.2	0.3	5.8	4.6	23.0	99.4	0.1	0.6	23.2	..	..	..	..
Environment	4.9	93.5	0.3	6.5	5.2	15.0	99.9	...	0.1	15.1	..	..	..	..
Land access	3.2	100.0	..	..	3.2	1.0	100.0	..	..	1.0	..	..	..	..
Subtotal	102.5	77.8	29.2	22.2	131.7	146.0	86.0	23.9	14.0	169.9	117.6	72.2	45.2	27.8
Capital (1)	1.6	85.2	0.3	14.8	1.9	20.9	99.1	0.2	0.9	21.1	4.8	76.7	1.5	23.3
Repair and maintenance (1)	2.1	100.0	..	..	2.1	2.7	62.6	1.6	37.4	4.3	..	..	..	..
Total	106.2	78.3	29.5	21.7	135.7	169.6	86.9	25.7	13.1	195.3	122.4	72.9	46.6	27.6
EXPLORATION PLUS DEPOSIT APPRAISAL														
Field work and overhead	401.8	85.5	68.2	14.5	470.1	421.0	84.7	76.3	15.3	497.2	..	..	..	..
Engineering studies	16.8	90.1	1.8	9.9	18.7	28.1	96.6	1.0	3.4	29.1	..	..	..	..
Economic studies	4.8	96.7	0.2	3.3	5.0	1.2	99.9	...	0.1	1.2	..	..	..	..
Pre- or production feasibility studies	4.6	91.0	0.5	9.0	5.0	23.1	99.4	0.1	0.6	23.3	..	..	..	..
Environment	7.6	90.9	0.8	9.1	8.3	16.9	85.5	2.9	14.5	19.8	..	..	..	..
Land access	5.8	99.5	...	0.5	5.8	2.8	100.0	..	..	2.8	..	..	..	..
Subtotal	441.4	86.1	71.5	13.9	512.9	493.1	86.0	80.3	14.0	573.4	576.9	84.3	107.3	15.7
Capital (1)	9.2	97.0	0.3	3.0	9.5	21.6	68.7	9.8	31.3	31.4	7.6	38.8	12.0	61.2
Repair and maintenance (1)	3.3	87.4	0.5	12.6	3.7	3.2	23.5	10.5	76.5	13.7	..	..	..	..
Total	453.9	86.3	72.2	13.7	526.1	517.9	83.7	100.6	16.3	618.5	584.5	123.1	119.3	17.0
MINE COMPLEX DEVELOPMENT														
Field work and overhead	n.a.	n.a.	742.4	100.0	742.4	n.a.	n.a.	726.0	100.0	726.0	n.a.	n.a.	..	..
Engineering studies	n.a.	n.a.	23.4	100.0	23.4	n.a.	n.a.	10.2	100.0	10.2	n.a.	n.a.	..	..
Economic studies	n.a.	n.a.	0.1	100.0	0.1	n.a.	n.a.	0.3	100.0	0.3	n.a.	n.a.	..	..
Pre- or production feasibility studies	n.a.	n.a.	0.9	100.0	0.9	n.a.	n.a.	0.7	100.0	0.7	n.a.	n.a.	..	..
Environment	n.a.	n.a.	57.9	100.0	57.9	n.a.	n.a.	73.8	100.0	73.8	n.a.	n.a.	..	..
Land access	n.a.	n.a.	4.8	100.0	4.8	n.a.	n.a.	51.9	100.0	51.9	n.a.	n.a.	..	..
Subtotal	n.a.	n.a.	829.5	100.0	829.5	n.a.	n.a.	862.9	100.0	862.9	n.a.	n.a.	751.2	100.0
Capital (1)	n.a.	n.a.	1 766.1	100.0	1 766.1	n.a.	n.a.	1 260.1	100.0	1 260.1	n.a.	n.a.	1 189.5	100.0
Repair and maintenance (1)	n.a.	n.a.	1 524.0	100.0	1 524.0	n.a.	n.a.	1 474.6	100.0	1 474.6	n.a.	n.a.	..	..
Total	n.a.	n.a.	4 119.5	100.0	4 119.5	n.a.	n.a.	3 597.6	100.0	3 597.6	n.a.	n.a.	1 940.7	100.0
Grand total	453.9	9.8	4 191.7	90.2	4 645.6	517.9	12.3	3 698.2	87.7	4 216.1	584.5	22.1	2 060.1	77.9

Sources: Natural Resources Canada and Statistics Canada, from a federal-provincial/territorial survey of mining and exploration companies.

- Nil; n.a. Not applicable; .. Not available; ... Amount too small to be expressed; (rsi) Data for 2003 are revised spending intentions.

(1) Includes construction, and machinery and equipment expenditures, as well as related environmental protection and restoration expenditures.

Notes: Totals for 2003 revised spending intentions are incomplete; they do not include any repair and maintenance expenditures. Numbers may not add to totals due to rounding.

TABLE 2. SUMMARY OF ENVIRONMENT EXPENDITURES FOR EXPLORATION, DEPOSIT APPRAISAL AND MINE COMPLEX DEVELOPMENT, 2001 AND 2002

Expenditure Category	Exploration				Deposit Appraisal				Exploration Plus Deposit Appraisal				Mine Complex Development				Total				
	2001		2002		2001		2002		2001		2002		2001		2002		2001		2002		
	(\$000)	(%)	(\$000)	(%)	(\$000)	(%)	(\$000)	(%)	(\$000)	(%)	(\$000)	(%)	(\$000)	(%)	(\$000)	(%)	(\$000)	(%)	(\$000)	(%)	
Environment																					
Characterization	491	15.7	539	11.2	1 990	38.2	4 064	27.0	2 481	29.8	4 603	23.1	4 372	3.7	1 885	1.2	6 853	5.4	6 488	3.6	
Permits	337	10.8	321	6.6	2 080	40.0	3 941	26.2	2 417	29.0	4 262	21.4	2 374	2.0	1 394	0.9	4 791	3.8	5 657	3.2	
Protection	251	8.0	553	11.4	1 104	21.2	7 011	46.6	1 356	16.3	7 564	38.0	25 311	21.6	21 517	13.5	26 667	21.2	29 081	16.3	
Restoration	2 055	65.6	3 319	68.7	30	0.6	35	0.2	2 085	25.0	3 354	16.9	25 814	22.0	48 999	30.8	27 899	22.2	52 353	29.3	
Subtotal	3 134		4 731		5 204		15 052		8 338		19 783		57 872		73 796		66 210		93 579		
Capital, share of environment	-	-	-	-	-	-	-	-	-	-	-	-	26 324	22.4	56 124	35.3	26 324	20.9	56 124	31.4	
Repair and maintenance, share of environment	-	-	100	2.1	-	-	3	...	-	-	103	0.5	33 239	28.3	29 012	18.3	33 239	26.4	29 115	16.3	
Total environment	3 134	100.0	4 831	100.0	5 204	100.0	15 055	100.0	8 338	100.0	19 886	100.0	117 434	100.0	158 931	100.0	125 773	100.0	178 817	100.0	
Total environment as a percentage of work phase total (1)		0.8		1.1		3.8		7.7		1.6		3.2		2.9		4.5		2.7		4.3	

Source: Natural Resources Canada, from a federal-provincial/territorial survey of mining and exploration companies.

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

(1) Work phase total refers to Table 1.

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

**TABLE 3a. EXPLORATION PLUS DEPOSIT APPRAISAL EXPENDITURES,⁽¹⁾
FIELD WORK PLUS OVERHEAD, BY JUNIOR AND SENIOR COMPANIES,
1969-2002**

Year	Current Dollars				Constant 2002 Dollars			
	Share of Total		Total	% of Total	Share of Total		Total	% of Total
	Junior	Senior			Junior	Senior		
	(\$ millions)		(%)		(\$ millions)		(%)	
1969	44.4	130.5	174.9	25.4	215.0	631.9	846.9	25.4
1970	39.9	147.2	187.1	21.3	185.7	685.0	870.7	21.3
1971	24.5	127.5	152.0	16.1	108.4	564.0	672.4	16.1
1972	18.3	97.4	115.7	15.8	76.5	407.4	484.0	15.8
1973	22.5	121.6	144.1	15.6	85.8	463.5	549.3	15.6
1974	21.8	158.5	180.3	12.1	72.3	525.9	598.2	12.1
1975	19.5	187.8	207.3	9.4	58.4	562.4	620.7	9.4
1976	13.9	192.9	206.8	6.7	38.0	527.7	565.7	6.7
1977	12.5	271.0	283.5	4.4	32.0	693.6	725.6	4.4
1978	19.8	275.0	294.8	6.7	47.5	659.9	707.4	6.7
1979	29.4	329.5	358.9	8.2	64.2	719.9	784.2	8.2
1980	60.2	530.0	590.2	10.2	119.4	1 051.2	1 170.6	10.2
1981	83.0	651.2	734.2	11.3	148.5	1 164.8	1 313.3	11.3
1982	73.8	502.5	576.3	12.8	121.9	829.8	951.6	12.8
1983	71.2	400.6	471.8	15.1	111.4	626.8	738.3	15.1
1984	146.9	470.4	617.3	23.8	222.7	713.2	936.0	23.8
1985	181.1	424.7	605.8	29.9	266.0	623.7	889.7	29.9
1986	348.6	374.7	723.3	48.2	497.1	534.2	1 031.2	48.2
1987	668.2	631.8	1 300.0	51.4	911.6	861.9	1 773.5	51.4
1988	668.3	681.8	1 350.1	49.5	871.9	889.5	1 761.4	49.5
1989	272.6	555.3	827.9	32.9	340.4	693.3	1 033.7	32.9
1990	241.0	533.7	774.7	31.1	291.4	645.4	936.8	31.1
1991	116.1	415.6	531.8	21.8	136.4	488.3	624.8	21.8
1992	79.9	305.4	385.3	20.7	92.7	354.2	446.8	20.7
1993	142.7	334.5	477.3	29.9	163.2	382.6	545.8	29.9
1994	195.8	432.3	628.1	31.2	221.3	488.7	710.0	31.2
1995	213.4	504.2	717.6	29.7	236.0	557.6	793.6	29.7
1996	314.7	580.0	894.8	35.2	342.4	631.1	973.5	35.2
1997	266.7	553.4	820.2	32.5	286.7	595.0	881.7	32.5
1998	155.9	420.0	575.9	27.1	168.3	453.3	621.6	27.1
1999	123.3	314.6	437.9	28.2	130.8	333.8	464.7	28.2
2000	142.3	315.8	458.1	31.1	145.1	322.1	467.2	31.1
2001	167.7	302.4	470.1	35.7	169.3	305.2	474.5	35.7
2002	179.0	318.2	497.2	36.0	179.0	318.2	497.2	36.0

Sources: Natural Resources Canada and Statistics Canada, from a federal-provincial/territorial survey of mining and exploration companies.

(1) Includes on-mine-site plus off-mine-site activities.

Note: Up to and including 1996, most of the expenditures now included in the deposit appraisal work phase were reported under exploration (broadly speaking).

**TABLE 3b. EXPLORATION PLUS DEPOSIT APPRAISAL EXPENDITURES,⁽¹⁾ BY
JUNIOR AND SENIOR COMPANIES, 1997-2003**

Year	Current Dollars				Constant 2002 Dollars			
	Share of Total		Total	% of Total	Share of Total		Total	% of Total
	Junior	Senior			Junior	Senior		
	(\$ millions)		(%)		(\$ millions)		(%)	
1997	298.0	623.0	921.0	32.4	320.3	669.7	990.0	32.4
1998	170.5	485.4	655.9	26.0	184.1	523.9	708.0	26.0
1999	141.4	362.9	504.3	28.0	150.1	385.1	535.2	28.0
2000	156.0	340.7	496.7	31.4	159.1	347.5	506.5	31.4
2001	177.7	335.1	512.9	34.7	179.4	338.3	517.7	34.7
2002	190.8	382.6	573.4	33.3	190.8	382.6	573.4	33.3
2003 (rsi)	280.7	403.5	684.2	41.0	280.7	403.5	684.2	41.0

Source: Natural Resources Canada, from a federal-provincial/territorial survey of mining and exploration companies.

(rsi) Revised spending intentions.

(1) Includes on-mine-site plus off-mine-site activities. Includes field work, overhead, engineering, economic and pre- or production feasibility studies, environment and land access costs.

TABLE 3c. EXPLORATION AND DEPOSIT APPRAISAL EXPENDITURES,⁽¹⁾ ON- AND OFF-MINE-SITE, BY JUNIOR AND SENIOR COMPANIES, 1997-2003

	Exploration		Deposit Appraisal		Exploration Plus Deposit Appraisal		Exploration Plus Deposit Appraisal
	On-Mine-Site	Off-Mine-Site	On-Mine-Site	Off-Mine-Site	On-Mine-Site	Off-Mine-Site	On- and Off-Mine-Site
	(\$000)						
1997							
Junior	n.a.	233 231	n.a.	64 730	n.a.	297 961	297 961
Senior	62 383	338 796	105 608	116 222	167 991	455 018	623 009
Total	62 383	572 027	105 608	180 951	167 991	752 979	920 970
1998							
Junior	n.a.	144 970	n.a.	25 573	n.a.	170 544	170 544
Senior	67 875	249 959	61 535	106 018	129 411	355 977	485 387
Total	67 875	394 929	61 535	131 591	129 411	526 520	655 931
1999							
Junior	n.a.	92 923	n.a.	48 498	n.a.	141 421	141 421
Senior	44 471	177 265	42 302	98 889	86 773	276 154	362 927
Total	44 471	270 188	42 302	147 386	86 773	417 575	504 348
2000							
Junior	n.a.	127 853	n.a.	28 109	n.a.	155 962	155 962
Senior	30 743	183 929	42 273	83 744	73 016	267 672	340 689
Total	30 743	311 782	42 273	111 853	73 016	423 635	496 651
2001							
Junior	n.a.	157 913	n.a.	19 820	n.a.	177 733	177 733
Senior	42 297	180 963	29 173	82 704	71 469	263 667	335 136
Total	42 297	338 876	29 173	102 524	71 469	441 400	512 869
2002							
Junior	n.a.	172 402	n.a.	18 391	n.a.	190 793	190 793
Senior	56 408	174 735	23 863	127 621	80 272	302 356	382 628
Total	56 408	347 137	23 863	146 012	80 272	493 149	573 421
2003 (rsi)							
Junior	n.a.	246 288	n.a.	34 406	n.a.	280 694	280 694
Senior	62 165	213 010	45 184	83 173	107 349	296 183	403 532
Total	62 165	459 298	45 184	117 580	107 349	576 877	684 227

Source: Natural Resources Canada, from a federal-provincial/territorial survey of mining and exploration companies.
n.a. Not applicable; (rsi) Revised spending intentions.

(1) Includes field work, overhead, engineering, economic and pre- or production feasibility studies, environment and land access costs.

TABLE 4. EXPLORATION PLUS DEPOSIT APPRAISAL EXPENDITURES,⁽¹⁾ BY RANGE OF EXPENDITURES AND BY JUNIOR AND SENIOR COMPANIES, 2000-2003

Range of Expenditures	Junior			Senior			Total		
	Companies	Expenditures	Percentage of Total Expenditures	Companies	Expenditures	Percentage of Total Expenditures	Companies	Expenditures	Percentage of Total Expenditures
(\$)	(number)	(\$000)	(%)	(number)	(\$000)	(%)	(number)	(\$000)	(%)
2000									
>10 million	1	16 697	10.7	8	160 666	47.2	9	177 363	35.7
5 million-10 million	1	5 678	3.6	16	112 933	33.1	17	118 611	23.9
1 million-5 million	34	67 998	43.6	26	53 380	15.7	60	121 378	24.4
500 000-1 million	35	24 328	15.6	12	8 254	2.4	47	32 582	6.6
200 000-500 000	69	22 736	14.6	7	2 184	0.6	76	24 920	5.0
100 000-200 000	58	8 121	5.2	14	2 080	0.6	72	10 201	2.1
50 000-100 000	48	3 368	2.2	12	887	0.3	60	4 255	0.9
1-50 000	141	2 522	1.6	22	304	0.1	163	2 826	0.6
Subtotal	387	151 448	97.1	117	340 689	100.0	504	492 137	99.1
Prospectors (2)	37	4 514	2.9	–	–	–	37	4 514	0.9
Total 2000	424	155 962	100.0	117	340 689	100.0	541	496 651	100.0
2001									
>10 million	1	14 336	8.1	11	222 869	66.5	12	237 205	46.3
5 million-10 million	4	28 571	16.1	9	60 863	18.2	13	89 434	17.4
1 million-5 million	34	62 821	35.3	19	37 525	11.2	53	100 346	19.6
500 000-1 million	42	28 921	16.3	9	6 494	1.9	51	35 416	6.9
200 000-500 000	69	22 237	12.5	9	3 046	0.9	78	25 284	4.9
100 000-200 000	71	10 144	5.7	24	3 629	1.1	95	13 773	2.7
50 000-100 000	57	4 027	2.3	4	304	0.1	61	4 331	0.8
1-50 000	122	2 052	1.2	25	405	0.1	147	2 458	0.5
Subtotal	400	173 110	97.4	110	335 136	100.0	510	508 246	99.1
Prospectors (2)	43	4 623	2.6	–	–	–	43	4 623	0.9
Total 2001	443	177 733	100.0	110	335 136	100.0	553	512 869	100.0
2002									
>10 million	–	–	–	12	256 148	66.9	12	256 148	44.7
5 million-10 million	6	37 258	19.5	8	56 659	14.8	14	93 917	16.4
1 million-5 million	40	69 855	36.6	23	61 252	16.0	63	131 107	22.9
500 000-1 million	48	32 201	16.9	4	2 918	0.8	52	35 118	6.1
200 000-500 000	89	28 979	15.2	10	3 448	0.9	99	32 427	5.7
100 000-200 000	76	10 886	5.7	9	1 426	0.4	85	12 312	2.1
50 000-100 000	60	3 939	2.1	6	448	0.1	66	4 387	0.8
1-50 000	144	2 828	1.5	21	329	0.1	165	3 157	0.6
Subtotal	463	185 946	97.5	93	382 628	100.0	556	568 573	99.2
Prospectors (2)	30	4 847	2.5	–	–	–	30	4 847	0.8
Total 2002	493	190 793	100.0	93	382 628	100.0	586	573 421	100.0
2003 (rsi)									
>10 million	1	10 500	3.7	14	282 369	70.0	15	292 869	42.8
5 million-10 million	5	29 360	10.5	8	54 007	13.4	13	83 367	12.2
1 million-5 million	71	140 794	50.2	24	56 800	14.1	95	197 594	28.9
500 000-1 million	74	49 063	17.5	7	4 824	1.2	81	53 887	7.9
200 000-500 000	112	32 849	11.7	12	3 481	0.9	124	36 330	5.3
100 000-200 000	64	8 701	3.1	7	909	0.2	71	9 611	1.4
50 000-100 000	42	2 556	0.9	9	609	0.2	51	3 165	0.5
1-50 000	111	1 884	0.7	24	533	0.1	135	2 417	0.4
Subtotal	480	275 708	98.2	105	403 532	100.0	585	679 240	99.3
Prospectors (2)	39	4 986	1.8	–	–	–	39	4 986	0.7
Total 2003 (rsi)	519	280 694	100.0	105	403 532	100.0	624	684 227	100.0

Source: Natural Resources Canada, from a federal-provincial/territorial survey of mining and exploration companies.

– Nil; (rsi) Revised spending intentions.

(1) Includes on-mine-site plus off-mine-site activities. Includes field work, overhead, engineering, economic and pre- or production feasibility studies, environment and land access costs. (2) The number of prospectors is underestimated because it contains groups of prospectors.

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

TABLE 5. SUMMARY OF TOTAL DIAMOND EXPLORATION, DEPOSIT APPRAISAL AND MINE COMPLEX DEVELOPMENT EXPENDITURES,⁽¹⁾ 1998-2002

Expenditure Category	1998	1999	2000	2001	2002
(\$ millions)					
Field work and overhead	148.9	83.9	95.0	240.2	188.3
Engineering, economic and pre- or production feasibility studies, environment and land access	36.7	25.0	55.2	27.5	34.4
Capital (2)	155.9	13.3	226.3	531.4	459.7
Repair (2)	5.4	62.7	55.5	88.4	63.3
Total	347.1	185.0	432.1	887.4	745.7

Source: Natural Resources Canada, from a federal-provincial/territorial survey of mining and exploration companies.

(1) Includes on-mine-site plus off-mine-site activities. (2) Includes construction, and machinery and equipment expenditures.

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

TABLE 6a. AREA⁽¹⁾ OF NEW MINERAL CLAIMS STAKED OR RECORDED IN CANADA AS A PERCENTAGE OF PREVIOUS YEAR, 1996-2002

Province/Territory	1996		1997		1998		1999		2000		2001		2002	
	(hectares)	(%)	(hectares)	(%)	(hectares)	(%)	(hectares)	(%)	(hectares)	(%)	(hectares)	(%)	(hectares)	(%)
Newfoundland and Labrador	417 575	6.8	334 075	80.0	361 900	108.3	241 075	66.6	324 225	134.5	391 625	120.8	828 150	211.5
Nova Scotia	424 815	231.0	208 191	49.0	74 180	35.6	157 394	212.2	96 819	61.5	87 722	90.6	147 713	168.4
New Brunswick	93 760	155.1	53 760	57.3	40 000	74.4	28 336	70.8	49 344	174.1	35 712	72.4	33 888	94.9
Quebec	954 967	64.8	1 050 629	110.0	728 142	69.3	754 102	103.6	2 187 551	290.1	2 115 424	96.7	3 290 446	155.5
Ontario	903 488	135.1	855 584	94.7	577 632	67.5	604 096	104.6	874 896	144.8	981 904	112.2	813 424	82.8
Manitoba	325 452	48.6	386 243	118.7	475 634	123.1	801 550	168.5	1 759 381	219.5	1 054 106	59.9	1 287 997	122.2
Saskatchewan	469 040	137.6	950 253	202.6	680 048	71.6	(a) 161 083	23.7	523 440	325.0	558 131	106.6	339 490	60.8
Alberta	5 328 000	320.0	37 200 000	698.2	3 490 000	9.4	1 026 000	29.4	2 349 600	229.0	4 192 055	178.4	4 670 028	111.4
British Columbia	997 740	118.0	765 257	76.7	474 296	62.0	478 740	100.9	699 050	146.0	636 800	91.1	688 500	108.1
Yukon	(r) 415 256	(r) 147.0	(r) 196 457	(r) 47.3	(r) 113 057	(r) 57.5	(r) 146 419	(r) 129.5	(r) 53 413	(r) 36.5	(r) 40 644	(r) 76.1	81 872	201.4
Northwest Territories	2 956 017	77.0	1 953 191	66.1	827 615	42.4	563 378	(b) 68.1	891 419	158.2	626 177	70.2	1 099 888	175.7
Nunavut	..	..	..	..	..	..	710 092	..	498 230	70.2	441 270	88.6	3 623 559	821.2
Total	13 286 110	83.3	43 953 640	330.8	7 842 504	17.8	4 709 632	60.1	10 307 368	218.9	11 161 570	108.3	16 904 955	151.5

Source: Provincial and territorial mining recorders.

.. Not available (r) Revised.

(a) Prior to 1999, Saskatchewan data do not include exploration permits. (b) Percentage based on new claims staked in 1999 in the Northwest Territories and Nunavut combined.

(1) Excludes coal.

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

TABLE 6b. AREA⁽¹⁾ OF NEW MINERAL CLAIMS STAKED OR RECORDED BY PROVINCE AND TERRITORY AS A PERCENTAGE OF TOTAL CANADA, 2000-2002

Province/Territory	2000		2001		2002	
	(hectares)	(%)	(hectares)	(%)	(hectares)	(%)
Newfoundland and Labrador	324 225	3.1	391 625	3.5	828 150	4.9
Nova Scotia	96 819	0.9	87 722	0.8	147 713	0.9
New Brunswick	49 344	0.5	35 712	0.3	33 888	0.2
Quebec	2 187 551	21.2	2 115 424	19.0	3 290 446	19.5
Ontario	874 896	8.5	981 904	8.8	813 424	4.8
Manitoba	1 759 381	17.1	1 054 106	9.4	1 287 997	7.6
Saskatchewan	523 440	5.1	558 131	5.0	339 490	2.0
Alberta	2 349 600	22.8	4 192 055	37.6	4 670 028	27.6
British Columbia	699 050	6.8	636 800	5.7	688 500	4.1
Yukon	(r) 53 413	0.5	(r) 40 644	0.4	81 872	0.5
Northwest Territories	891 419	8.6	626 177	5.6	1 099 888	6.5
Nunavut	498 230	4.8	441 270	4.0	3 623 559	21.4
Total	10 307 368	100.0	11 161 570	100.0	16 904 955	100.0

Source: Provincial and territorial mining recorders.

(r) Revised.

(1) Excludes coal.

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

TABLE 7a. EXPLORATION AND DEPOSIT APPRAISAL, OFF-MINE-SITE AND ON-MINE-SITE EXPENDITURES,⁽¹⁾ BY PROVINCE AND TERRITORY, 2002

Province/Territory	Exploration		Deposit Appraisal		Exploration Plus Deposit Appraisal	
	Off-Mine-Site	On-Mine-Site	Off-Mine-Site	On-Mine-Site	Off-Mine-Site	On-Mine-Site
	(\$000)					
Newfoundland and Labrador	15 945	1 077	26 909	254	42 854	1 330
Nova Scotia	1 964	–	1 361	61	3 325	61
New Brunswick	3 206	–	–	–	3 206	–
Quebec	63 662	18 024	16 502	13 020	80 163	31 044
Ontario	81 513	27 278	24 161	6 018	105 673	33 296
Manitoba	21 743	5 634	40	2 414	21 783	8 048
Saskatchewan	26 650	226	14 035	515	40 685	741
Alberta	5 186	418	–	–	5 186	418
British Columbia	31 354	1 370	5 562	940	36 916	2 310
Yukon	7 561	–	233	–	7 794	–
Northwest Territories	29 127	–	42 966	641	72 094	641
Nunavut	59 227	2 382	14 243	–	73 471	2 382
Total	347 137	56 408	146 012	23 863	493 149	80 272
Total (on- plus off-mine-site)	403 545		169 876		573 421	

Source: Natural Resources Canada, from a federal-provincial/territorial survey of mining and exploration companies.

– Nil.

(1) Includes field work, overhead, engineering, economic and pre- or production feasibility studies, environment and land access costs.

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

TABLE 7b. EXPLORATION AND DEPOSIT APPRAISAL, OFF-MINE-SITE AND ON-MINE-SITE EXPENDITURES,⁽¹⁾ BY PROVINCE AND TERRITORY, 2003

Province/Territory	Exploration		Deposit Appraisal		Exploration Plus Deposit Appraisal	
	Off-Mine-Site	On-Mine-Site	Off-Mine-Site	On-Mine-Site	Off-Mine-Site	On-Mine-Site
	(\$000)					
Newfoundland and Labrador	16 790	735	865	4 640	17 654	5 375
Nova Scotia	5 508	–	1 337	63	6 845	63
New Brunswick	1 987	–	–	–	1 987	–
Quebec	80 648	15 638	12 343	14 959	92 991	30 597
Ontario	139 247	33 483	32 882	6 994	172 129	40 477
Manitoba	20 509	7 906	–	1 579	20 509	9 485
Saskatchewan	31 960	55	19 093	1 819	51 053	1 874
Alberta	4 242	213	–	–	4 242	213
British Columbia	42 918	2 528	12 015	14 375	54 933	16 903
Yukon	18 123	–	225	–	18 348	–
Northwest Territories	29 576	670	25 146	755	54 721	1 425
Nunavut	67 791	938	13 674	–	81 466	938
Total	459 298	62 165	117 580	45 184	576 877	107 349
Total (on- plus off-mine-site)	521 463		162 764		684 227	

Source: Natural Resources Canada, from a federal-provincial/territorial survey of mining and exploration companies.

– Nil.

(1) Includes field work, overhead, engineering, economic and pre- or production feasibility studies, environment and land access costs.

Notes: Data for 2003 are revised spending intentions. Numbers may not add to totals due to rounding.

TABLE 8. EXPLORATION PLUS DEPOSIT APPRAISAL EXPENDITURES,⁽¹⁾ BY PROVINCE AND TERRITORY, 2000-2003

Province / Territory	2000			2001			2002			2003 (rsi)		
	(\$ millions)	2000 as a % of 1999 Expenditures	(%)	(\$ millions)	2001 as a % of 2000 Expenditures	(%)	(\$ millions)	2002 as a % of 2001 Expenditures	(%)	(\$ millions)	2003 as a % of 2002 Expenditures	(%)
Newfoundland and Labrador	27.3	5.5	87.3	28.4	5.5	104.1	44.2	7.7	155.3	23.0	3.4	52.1
Nova Scotia	3.6	0.7	68.2	2.8	0.5	78.6	3.4	0.6	120.1	6.9	1.0	204.0
New Brunswick	12.1	2.4	119.9	9.5	1.8	78.0	3.2	0.6	33.9	2.0	0.3	62.0
Quebec	94.1	19.0	82.9	102.9	20.1	109.4	111.2	19.4	108.0	123.6	18.1	111.1
Ontario	117.9	23.7	135.0	113.6	22.2	96.4	139.0	24.2	122.3	212.6	31.1	153.0
Manitoba	28.1	5.7	123.1	28.7	5.6	101.9	29.8	5.2	104.1	30.0	4.4	100.5
Saskatchewan	45.6	9.2	104.6	37.5	7.3	82.3	41.4	7.2	110.4	52.9	7.7	127.8
Alberta	7.2	1.5	49.1	4.5	0.9	61.5	5.6	1.0	125.8	4.5	0.7	79.5
British Columbia	35.9	7.2	87.0	29.1	5.7	81.1	39.2	6.8	134.6	71.8	10.5	183.1
Yukon Territory	11.2	2.3	88.1	7.8	1.5	69.5	7.8	1.4	99.8	18.3	2.7	235.4
Northwest Territories	51.4	10.3	61.1	86.6	16.9	168.7	72.7	12.7	83.9	56.1	8.2	77.2
Nunavut	62.1	12.5	166.0	61.3	12.0	98.7	75.9	13.2	123.7	82.4	12.0	108.6
Total	496.7	100.0	98.5	512.9	100.0	103.3	573.4	100.0	111.8	684.2	100.0	119.3
Exploration	342.5	69.0	108.9	381.2	74.3	111.3	403.5	70.4	105.9	521.5	76.2	129.2
Deposit appraisal	154.1	31.0	81.3	131.7	25.7	85.4	169.9	29.6	129.0	162.8	23.8	95.8

Source: Natural Resources Canada, from a federal-provincial/territorial survey of mining and exploration companies.

(rsi) Revised spending intentions.

(1) Includes on-mine-site plus off-mine-site activities. Includes field work, overhead, engineering, economic and pre- or production feasibility studies, environment and land access costs.

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

TABLE 9a. EXPLORATION ACTIVITIES,⁽¹⁾ BY PROVINCE AND TERRITORY, 2002

Province/Territory	Drilling (Surface and Underground)				Geochemical	Geology	Geophysical		Rock Work (2)	Other Field Costs	Engineering Studies	Economic Studies	Pre-Feasibility Studies	Mineral Lease and Head Office	Environment	Land Access	Grand Total
	Diamond		Other				Ground	Airborne									
	Metres	Cost	Metres	Cost													
(000)	(\$000)	(000)	(\$000)	(\$000)													
Newfoundland and Labrador	56	4 569	—	—	1 225	6 023	1 510	655	185	270	146	4	21	2 268	72	72	17 021
Nova Scotia	5	373	1	63	64	316	271	—	141	3	513	—	23	101	76	20	1 964
New Brunswick	21	1 570	—	—	309	801	307	41	42	18	—	—	—	92	12	15	3 206
Quebec	487	24 639	—	—	3 473	15 704	7 214	8 976	5 308	4 259	406	24	34	8 921	2 668	62	81 686
Ontario	746	53 559	2	997	7 262	18 245	6 333	3 290	4 974	3 260	1 465	55	9	8 098	570	673	108 790
Manitoba	130	11 610	...	76	2 499	1 708	2 276	2 843	1 356	2 032	15	—	—	2 797	74	90	27 377
Saskatchewan	116	13 284	2	1 965	723	1 633	2 696	556	—	1 841	1 304	85	—	2 729	58	3	26 876
Alberta	6	1 030	80	451	303	859	426	500	197	224	41	—	—	1 567	4	2	5 603
British Columbia	169	13 860	2	164	3 465	7 588	1 149	356	1 469	916	451	17	2	2 529	614	143	32 724
Yukon	10	2 485	1	321	1 076	1 728	361	20	880	119	150	—	—	357	60	5	7 581
Northwest Territories	20	5 143	3	2 510	6 948	1 437	2 981	3 684	—	301	56	11	—	5 365	293	398	29 127
Nunavut	64	17 517	7	2 566	14 424	4 056	3 104	5 511	3 095	2 175	42	—	—	8 536	230	352	61 609
Total	1 830	149 640	99	9 113	41 771	60 097	28 628	26 432	17 647	15 417	4 590	195	88	43 361	4 731	1 836	403 545
Percentage of grand total	n.a.	37.1	n.a.	2.3	10.4	14.9	7.1	6.5	4.4	3.8	1.1	...	...	10.7	1.2	0.5	100.0

Source: Natural Resources Canada, from a federal-provincial/territorial survey of mining and exploration companies.

— Nil; ... Amount too small to be expressed; n.a. Not applicable.

(1) Includes on-mine-site plus off-mine-site activities. (2) Includes stripping, trenching, shaft work, drifts, cross-cuts, raises, declines, rock sampling and de-watering costs.

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

TABLE 9b. DEPOSIT APPRAISAL ACTIVITIES,⁽¹⁾ BY PROVINCE AND TERRITORY, 2002

Province/Territory	Drilling (Surface and Underground)				Geochemical	Geology	Geophysical		Rock Work (2)	Other Field Costs	Engineering Studies	Economic Studies	Pre- or Production Feasibility Studies	Mineral Lease and Head Office	Environment	Land Access	Grand Total
	Diamond		Other				Ground	Airborne									
	Metres	Cost	Metres	Cost													
(000)	(\$000)	(000)	(\$000)	(\$000)													
Newfoundland and Labrador	10	3 959	—	—	43	61	160	—	160	10	12 479	6	7 379	2 859	47	—	27 162
Nova Scotia	—	—	—	—	—	9	—	—	—	—	365	130	80	452	386	—	1 422
New Brunswick	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Quebec	255	12 989	—	—	111	270	144	—	8 403	2 111	2 253	685	387	1 434	735	—	29 522
Ontario	100	6 244	...	418	199	940	345	86	1 579	391	4 120	27	8 781	4 817	1 374	859	30 179
Manitoba	42	2 414	—	—	—	—	—	—	—	16	—	—	—	4	20	—	2 454
Saskatchewan	—	—	—	—	—	—	515	—	—	7 304	3 357	—	750	1 958	666	—	14 550
Alberta	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
British Columbia	22	1 814	2	240	—	136	—	—	18	166	364	148	1 950	604	1 002	59	6 502
Yukon	—	—	—	—	14	2	—	—	—	4	—	36	—	27	105	45	233
Northwest Territories	12	4 617	10	11 942	78	641	—	—	—	8 225	968	—	2 698	5 939	8 500	—	43 607
Nunavut	35	8 157	...	114	179	870	—	—	—	—	611	—	1 148	946	2 217	1	14 243
Total	476	40 193	13	12 714	623	2 928	1 164	86	10 161	18 210	24 532	1 033	23 174	19 041	15 052	964	169 876
Percentage of grand total	n.a.	23.7	n.a.	7.5	0.4	1.7	0.7	0.1	6.0	10.7	14.4	0.6	13.6	11.2	8.9	0.6	100.0

Source: Natural Resources Canada, from a federal-provincial/territorial survey of mining and exploration companies.

— Nil; ... Amount too small to be expressed; n.a. Not applicable.

(1) Includes on-mine-site plus off-mine-site activities. (2) Includes stripping, trenching, shaft work, drifts, cross-cuts, raises, declines, rock sampling and de-watering costs.

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

TABLE 9c. EXPLORATION PLUS DEPOSIT APPRAISAL ACTIVITIES,⁽¹⁾ BY PROVINCE AND TERRITORY, 2002

Province/Territory	Drilling (Surface and Underground)				Geochemical	Geology	Geophysical		Rock Work (2)	Other Field Costs	Engineering Studies	Economic Studies	Pre- or Production Feasibility Studies	Mineral Lease and Head Office	Environment	Land Access	Grand Total
	Diamond		Other				Ground	Airborne									
	Metres	Cost	Metres	Cost													
	(000)	(\$000)	(000)	(\$000)	(\$000)												
Newfoundland and Labrador	66	8 528	-	-	1 268	6 084	1 670	655	345	280	12 625	10	7 400	5 127	120	72	44 184
Nova Scotia	5	373	1	63	64	325	271	-	141	3	878	130	103	553	462	20	3 386
New Brunswick	21	1 570	-	-	309	801	307	41	42	18	-	-	92	12	15	3 206	
Quebec	741	37 628	-	-	3 583	15 975	7 357	8 976	13 711	6 370	2 659	709	421	10 355	3 403	62	111 208
Ontario	846	59 802	3	1 415	7 461	19 185	6 678	3 376	6 554	3 651	5 585	82	8 790	12 916	1 944	1 532	138 970
Manitoba	172	14 024	...	76	2 499	1 708	2 276	2 843	1 356	2 032	31	-	2 801	94	90	29 831	
Saskatchewan	116	13 284	2	1 965	723	1 633	3 211	556	-	9 145	4 661	85	750	4 687	724	3	41 426
Alberta	6	1 030	80	451	303	859	426	500	197	224	41	-	1 567	4	2	5 603	
British Columbia	191	15 674	5	404	3 465	7 724	1 149	356	1 487	1 082	815	165	1 952	3 134	1 617	203	39 225
Yukon	10	2 485	1	321	1 090	1 730	361	20	880	123	150	36	-	384	165	50	7 794
Northwest Territories	32	9 760	13	14 452	7 027	2 078	2 981	3 684	-	8 525	1 024	11	2 698	11 304	8 793	398	72 735
Nunavut	99	25 674	7	2 680	14 603	4 926	3 104	5 511	3 095	2 175	653	-	1 148	9 482	2 447	353	75 853
Total	2 306	189 832	112	21 828	42 394	63 026	29 792	26 518	27 807	33 627	29 123	1 228	23 262	62 402	19 783	2 800	573 421
Percentage of grand total	n.a.	33.1	n.a.	3.8	7.4	11.0	5.2	4.6	4.8	5.9	5.1	0.2	4.1	10.9	3.4	0.5	100.0

Source: Natural Resources Canada, from a federal-provincial/territorial survey of mining and exploration companies.

- Nil; ... Amount too small to be expressed; n.a. Not applicable.

(1) Includes on-mine-site plus off-mine-site activities. (2) Includes stripping, trenching, shaft work, drifts, cross-cuts, raises, declines, rock sampling and de-watering costs.

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

TABLE 9d. MINE COMPLEX DEVELOPMENT ACTIVITIES,⁽¹⁾ BY PROVINCE AND TERRITORY, 2002

Province/Territory	Drilling (Surface and Underground)				Geochemical	Geology	Geophysical		Rock Work (2)	Other Field Costs	Engineering Studies	Economic Studies	Pre- or Production Feasibility Studies	Mineral Lease and Head Office	Environment	Land Access	Grand Total
	Diamond		Other				Ground	Airborne									
	Metres	Cost	Metres	Cost													
	(000)	(\$000)	(000)	(\$000)	(\$000)												
Newfoundland and Labrador	2	110	121	2 082	5	4	-	-	14 049	150	506	-	100	12 467	170	49 969	79 612
Nova Scotia	1	53	149	225	-	19	-	-	4 180	115	120	-	246	558	111	5 627	
New Brunswick	29	8 142	-	-	35	50	-	481	25 694	9 700	-	-	1 024	2 708	10	47 844	
Quebec	148	5 310	56	3 294	397	2 174	53	-	171 137	3 725	4 020	89	-	13 348	12 397	49	215 995
Ontario	481	24 645	146	1 936	134	5 819	196	-	152 452	619	1 374	-	26	8 925	29 658	10	225 796
Manitoba	180	8 267	-	-	365	491	-	-	68 871	108	731	-	-	1 032	205	-	80 070
Saskatchewan	53	2 060	45	7 609	-	-	80	-	14 059	-	310	-	-	14 000	3 497	104	41 719
Alberta	3	4 071	4	262	2	97	-	-	29 078	157	1 458	102	205	2 017	16 643	46	54 137
British Columbia	47	2 318	42	2 493	754	1 082	237	-	8 870	721	386	86	401	7 859	4 100	1	29 309
Yukon	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Northwest Territories	-	-	27	133	-	443	-	-	32 507	641	970	-	-	30 477	3 859	1 584	70 615
Nunavut	2	186	-	-	18	205	-	-	11 458	-	286	-	-	-	7	-	12 160
Total	945	55 163	592	18 034	1 709	10 384	566	481	532 357	15 937	10 162	277	732	91 395	73 796	51 891	862 885
Percentage of grand total	n.a.	6.4	n.a.	2.1	0.2	1.2	0.1	0.1	61.7	1.8	1.2	...	0.1	10.6	8.6	6.0	100.0

Source: Natural Resources Canada, from a federal-provincial/territorial survey of mining and exploration companies.

- Nil; ... Amount too small to be expressed; n.a. Not applicable.

(1) Includes on-mine-site plus off-mine-site activities. (2) Includes stripping, trenching, shaft work, drifts, cross-cuts, raises, declines, rock sampling and de-watering costs.

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

TABLE 10. SUMMARY OF DRILLING ACTIVITY IN CANADA, 2002

Drilling Activity	Exploration				Deposit Appraisal				Exploration Plus Deposit Appraisal
	Off-Mine-Site		On-Mine-Site		Off-Mine-Site		On-Mine-Site		On- Plus Off-Mine-Site
	(metres)	(% of subtotal)	(metres)	(% of subtotal)	(metres)	(% of subtotal)	(metres)	(% of subtotal)	(metres)
Diamond drilling									
Surface	1 171 529	98.7	184 619	28.7	168 092	84.0	33 910	12.3	1 558 150
Underground	15 874	1.3	458 057	71.3	32 051	16.0	241 583	87.7	747 565
Subtotal	1 187 403	100.0	642 676	100.0	200 143	100.0	275 493	100.0	2 305 715
Percentage of work phase total diamond drilling	64.9		35.1		42.1		57.9		
Other drilling									
Surface	20 471	100.0	78 515	100.0	12 802	100.0	–	–	111 788
Underground	–	–	–	–	–	–	–	–	–
Subtotal	20 471	100.0	78 515	100.0	12 802	100.0	–	–	111 788
Percentage of work phase total other drilling	20.7		79.3		100.0		–		n.a.
Total surface drilling	1 192 000		263 134		180 894		33 910		1 669 938
Total underground drilling	15 874		458 057		32 051		241 583		747 565
Grand total	1 207 874		721 191		212 945		275 493		2 417 503

Source: Natural Resources Canada, from a federal-provincial/territorial survey of mining and exploration companies.

– Nil; n.a. Not applicable.

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

TABLE 11a. EXPLORATION PLUS DEPOSIT APPRAISAL (SURFACE DRILLING),⁽¹⁾ BY PROVINCE AND TERRITORY, BY MINERAL COMMODITY, 2002

Province/Territory	Metals					Nonmetals	Diamonds	Coal	Total
	Base	Precious	Iron	Uranium	Other				
	(000 metres)								
Newfoundland and Labrador	27	25	8	–	4	3	–	–	66
Nova Scotia	–	1	...	–	4	1	–	–	5
New Brunswick	2	17	–	–	–	2	–	–	21
Quebec	118	236	–	–	7	3	6	–	370
Ontario	145	404	–	–	18	1	17	–	586
Manitoba	38	26	–	–	2	...	3	–	69
Saskatchewan	10	17	–	76	–	–	11	–	114
Alberta	–	–	–	3	–	–	4	80	86
British Columbia	60	107	–	–	7	9	–	11	195
Yukon	3	5	...	–	...	...	–	–	9
Northwest Territories	...	6	–	–	...	–	38	–	45
Nunavut	16	76	–	–	...	–	12	–	104
Total	419	920	8	78	42	19	91	92	1 670

Source: Natural Resources Canada, from a federal-provincial/territorial survey of mining and exploration companies.

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

(1) Includes on-mine-site plus off-mine-site drilling activity for diamond and other types of drilling.

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

TABLE 11b. EXPLORATION PLUS DEPOSIT APPRAISAL (UNDERGROUND DRILLING),⁽¹⁾ BY PROVINCE AND TERRITORY, BY MINERAL COMMODITY, 2002

Province/Territory	Metals					Nonmetals	Diamonds	Coal	Total
	Base	Precious	Iron	Uranium	Other				
(000 metres)									
Newfoundland and Labrador	–	...	–	–	–	–	–	–	...
Nova Scotia	–	–	–	–	–	–	–	–	–
New Brunswick	–	–	–	–	–	–	–	–	–
Quebec	7	365	–	–	–	–	–	–	372
Ontario	21	233	–	–	10	–	–	–	263
Manitoba	58	45	–	–	–	–	–	–	103
Saskatchewan	5	–	–	–	–	–	–	–	5
Alberta	–	–	–	–	–	–	–	–	–
British Columbia	–	–	–	–	–	...	–	–	...
Yukon	–	3	–	–	–	–	–	–	3
Northwest Territories	–	–	–	–	–	–	–	–	–
Nunavut	–	1	–	–	–	–	–	–	1
Total	90	647	–	–	10	...	–	–	748

Source: Natural Resources Canada, from a federal-provincial/territorial survey of mining and exploration companies.

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

(1) Includes on-mine-site plus off-mine-site drilling activity for diamond and other types of drilling.

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

TABLE 12. COMPARISON OF 2001 AND 2002 EXPLORATION PLUS DEPOSIT APPRAISAL EXPENDITURES,⁽¹⁾ BY MINERAL COMMODITY

Mineral Commodity	2001 Expenditures (\$ millions)	2002 as % of 2001 Expenditures (%)	2002 Total Expenditures			Percentage of Total (%)
			On-Mine-Site	Off-Mine-Site	On-Mine-Site Plus Off-Mine-Site	
Base metals (2)	139.4	99.6	15.9	123.0	138.8	24.2
Precious metals (3)	166.9	127.5	59.4	153.4	212.8	37.1
Gold	123.2	142.9	58.3	117.7	176.0	30.7
Platinum group elements	29.9	86.7	0.7	25.2	25.9	4.5
Iron ore	2.2	73.6	0.5	1.2	1.6	0.3
Uranium	27.1	111.0	–	30.1	30.1	5.2
Other metals	18.5	74.7	0.9	12.8	13.8	2.4
Nonmetals	8.6	120.5	1.6	8.7	10.3	1.8
Diamonds	144.7	111.7	0.6	161.0	161.6	28.2
Coal	5.5	79.0	1.2	3.1	4.3	0.8
Total	512.9	111.8	80.3	493.1	573.4	100.0

Source: Natural Resources Canada, from a federal-provincial/territorial survey of mining and exploration companies.

– Nil.

(1) Includes field work, overhead, engineering, economic and pre- or production feasibility studies, environmental and land access costs.

(2) Includes copper, nickel, lead and zinc. (3) Includes silver, gold and platinum group metals.

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

TABLE 13a. EXPLORATION EXPENDITURES,⁽¹⁾ BY PROVINCE AND TERRITORY, BY MINERAL COMMODITY, 2002

Province/Territory	Metals					Nonmetals	Diamonds	Coal	Total
	Base	Precious	Iron	Uranium	Other				
(\$000)									
Newfoundland and Labrador	6 248	7 163	1 249	47	1 168	1 110	37	–	17 021
Nova Scotia	4	167	30	–	1 059	703	–	...	1 964
New Brunswick	586	2 447	–	–	43	130	–	–	3 206
Quebec	33 758	30 637	95	845	476	1 188	14 687	–	81 686
Ontario	24 452	65 835	–	–	4 002	235	14 266	–	108 790
Manitoba	14 263	8 214	–	–	596	105	4 198	–	27 377
Saskatchewan	2 865	2 521	–	15 114	525	–	5 703	149	26 876
Alberta	9	652	–	501	299	–	2 894	1 248	5 603
British Columbia	10 385	18 215	–	–	1 332	1 342	33	1 417	32 724
Yukon	1 766	4 455	87	–	152	1 074	12	16	7 561
Northwest Territories	698	1 765	79	1	144	–	26 439	–	29 127
Nunavut	7 170	21 813	–	278	65	–	32 282	–	61 609
Total	102 203	163 884	1 541	16 786	9 863	5 887	100 551	2 830	403 545

Source: Natural Resources Canada, from a federal-provincial/territorial survey of mining and exploration companies.

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

(1) Includes on-mine-site plus off-mine-site activities. Includes field work, overhead, engineering, economic and pre-feasibility studies, environmental and land access costs.

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

TABLE 13b. DEPOSIT APPRAISAL EXPENDITURES,⁽¹⁾ BY PROVINCE AND TERRITORY, BY MINERAL COMMODITY, 2002

Province/Territory	Metals					Nonmetals	Diamonds	Coal	Total
	Base	Precious	Iron	Uranium	Other				
	(\$000)								
Newfoundland and Labrador	26 574	24	19	—	—	546	—	—	27 162
Nova Scotia	195	97	—	—	195	936	—	—	1 422
New Brunswick	—	—	—	—	—	—	—	—	—
Quebec	3 166	23 167	70	—	2 887	232	—	—	29 522
Ontario	1 631	10 579	—	—	189	280	17 500	—	30 179
Manitoba	2 430	16	—	—	8	—	—	—	2 454
Saskatchewan	—	—	—	13 285	—	1 265	—	—	14 550
Alberta	—	—	—	—	—	—	—	—	—
British Columbia	1 489	1 841	—	—	570	1 164	—	1 437	6 502
Yukon	92	75	—	—	—	—	—	66	233
Northwest Territories	240	105	—	—	75	—	43 187	—	43 607
Nunavut	829	13 009	—	—	—	—	406	—	14 243
Total	36 645	48 913	89	13 285	3 923	4 424	61 094	1 503	169 876

Source: Natural Resources Canada, from a federal-provincial/territorial survey of mining and exploration companies.

— Nil.

(1) Includes on-mine-site plus off-mine-site activities. Includes field work, overhead, engineering, economic and pre- or production feasibility studies, environmental and land access costs.

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

TABLE 13c. EXPLORATION PLUS DEPOSIT APPRAISAL EXPENDITURES,⁽¹⁾ BY PROVINCE AND TERRITORY, BY MINERAL COMMODITY, 2002

Province/Territory	Metals					Nonmetals	Diamonds	Coal	Total
	Base	Precious	Iron	Uranium	Other				
	(\$000)								
Newfoundland and Labrador	32 821	7 188	1 268	47	1 168	1 655	37	—	44 184
Nova Scotia	198	265	30	—	1 254	1 639	—	...	3 386
New Brunswick	586	2 447	—	—	43	130	—	—	3 206
Quebec	36 924	53 804	165	845	3 362	1 420	14 687	—	111 208
Ontario	26 083	76 414	—	—	4 191	515	31 766	—	138 970
Manitoba	16 693	8 230	—	—	604	105	4 198	—	29 831
Saskatchewan	2 865	2 521	—	28 399	525	1 265	5 703	149	41 426
Alberta	9	652	—	501	299	—	2 894	1 248	5 603
British Columbia	11 874	20 056	—	—	1 902	2 507	33	2 854	39 225
Yukon	1 858	4 530	87	—	152	1 074	12	82	7 794
Northwest Territories	938	1 870	79	1	219	—	69 627	—	72 735
Nunavut	7 999	34 822	—	278	65	—	32 688	—	75 853
Total	138 848	212 797	1 630	30 071	13 786	10 310	161 645	4 333	573 421

Source: Natural Resources Canada, from a federal-provincial/territorial survey of mining and exploration companies.

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

(1) Includes on-mine-site plus off-mine-site activities. Includes field work, overhead, engineering, economic and pre- or production feasibility studies, environmental and land access costs.

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

TABLE 13d. MINE COMPLEX DEVELOPMENT EXPENDITURES,⁽¹⁾ BY PROVINCE AND TERRITORY, BY MINERAL COMMODITY, 2002

Province/Territory	Metals					Nonmetals	Diamonds	Coal	Total
	Base	Precious	Iron	Uranium	Other				
	(\$000)								
Newfoundland and Labrador	60 780	6 565	11 374	—	—	893	—	—	79 612
Nova Scotia	—	7	—	—	—	4 819	—	801	5 627
New Brunswick	24 420	16 280	—	—	—	7 144	—	—	47 844
Quebec	53 539	95 988	38 608	—	15 082	12 777	—	—	215 995
Ontario	96 055	121 952	—	—	5 067	2 723	—	—	225 796
Manitoba	64 673	15 379	—	—	—	18	—	—	80 070
Saskatchewan	3 455	4 470	—	18 881	—	8 761	—	6 153	41 719
Alberta	—	—	—	—	—	4 908	—	49 229	54 137
British Columbia	6 582	2 846	—	—	5 249	948	—	13 685	29 309
Yukon	—	—	—	—	—	—	—	—	—
Northwest Territories	—	7 165	—	—	2 385	—	61 064	—	70 615
Nunavut	—	12 160	—	—	—	—	—	—	12 160
Total	309 504	282 812	49 983	18 881	27 783	42 990	61 064	69 868	862 885

Source: Natural Resources Canada, from a federal-provincial/territorial survey of mining and exploration companies.

— Nil.

(1) Includes on-mine-site plus off-mine-site activities. Includes field work, overhead, engineering, economic and pre- or production feasibility studies, environmental and land access costs.

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

TABLE 14. EXPLORATION AND DEPOSIT APPRAISAL EXPENDITURES,⁽¹⁾ BY JUNIOR AND SENIOR COMPANIES AND BY MINERAL COMMODITY, 2002

Work Phase/ Type of Company	Base Metals	Precious Metals	Uranium	Diamonds	Others	Total
(\$000)						
Exploration, off-mine-site Junior companies and prospectors	38 086	80 379	1 837	41 320	10 780	172 402
Senior companies	51 961	42 530	14 949	59 231	6 063	174 735
Total	90 048	122 910	16 786	100 551	16 843	347 137
Exploration, on-mine-site Junior companies and prospectors	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Senior companies	12 155	40 975	–	–	3 278	56 408
Total	12 155	40 975	–	–	3 278	56 408
Exploration, off- plus on-mine-site Junior companies and prospectors	38 086	80 379	1 837	41 320	10 780	172 402
Senior companies	64 116	83 505	14 949	59 231	9 342	231 143
Total	102 203	163 884	16 786	100 551	20 121	403 545
Deposit appraisal, off-mine-site Junior companies and prospectors	2 001	10 747	–	406	5 237	18 391
Senior companies	30 902	19 694	13 285	60 047	3 694	127 621
Total	32 903	30 441	13 285	60 453	8 931	146 012
Deposit appraisal, on-mine-site Junior companies and prospectors	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Senior companies	3 742	18 472	–	641	1 008	23 863
Total	3 742	18 472	–	641	1 008	23 863
Deposit appraisal, off- plus on-mine-site Junior companies and prospectors	2 001	10 747	–	406	5 237	18 391
Senior companies	34 644	38 166	13 285	60 688	4 702	151 485
Total	36 645	48 913	13 285	61 094	9 939	169 876
Exploration plus deposit appraisal, off- plus on-mine-site Junior companies and prospectors	40 087	91 126	1 837	41 726	16 017	190 793
Senior companies	98 761	121 671	28 234	119 918	14 044	382 628
Total	138 848	212 797	30 071	161 645	30 060	573 421

Source: Natural Resources Canada, from a federal-provincial/territorial survey of mining and exploration companies.

– Nil; n.a. Not applicable.

(1) Includes field work, overhead, engineering, economic and pre- or production feasibility studies, environmental and land access costs.

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

TABLE 15a. EXPLORATION AND DEPOSIT APPRAISAL EXPENDITURES,⁽¹⁾ BY PROVINCE AND TERRITORY, BY JUNIOR AND SENIOR COMPANIES, 2002

Province/Territory	Exploration			Deposit Appraisal			Exploration Plus Deposit Appraisal		
	Junior Companies and Prospectors	Senior Companies	Total	Junior Companies and Prospectors	Senior Companies	Total	Junior Companies and Prospectors	Senior Companies	Total
	(\$000)								
Newfoundland and Labrador	10 722	6 299	17 021	287	26 875	27 162	11 009	33 175	44 184
Nova Scotia	1 849	115	1 964	1 360	63	1 422	3 209	177	3 386
New Brunswick	3 082	125	3 206	—	—	—	3 082	125	3 206
Quebec	27 395	54 290	81 686	4 734	24 788	29 522	32 129	79 078	111 208
Ontario	49 717	59 074	108 790	1 302	28 877	30 179	51 019	87 951	138 970
Manitoba	4 415	22 962	27 377	40	2 414	2 454	4 455	25 377	29 831
Saskatchewan	4 966	21 911	26 876	750	13 800	14 550	5 716	35 711	41 426
Alberta	1 963	3 641	5 603	—	—	—	1 963	3 641	5 603
British Columbia	23 684	9 040	32 724	4 457	2 045	6 502	28 141	11 085	39 225
Yukon	6 700	861	7 561	84	149	233	6 784	1 010	7 794
Northwest Territories	11 171	17 956	29 127	420	43 187	43 607	11 591	61 144	72 735
Nunavut	26 738	34 871	61 609	4 958	9 286	14 243	31 696	44 156	75 853
Total	172 402	231 143	403 545	18 391	151 485	169 876	190 793	382 628	573 421

Source: Natural Resources Canada, from a federal-provincial/territorial survey of mining and exploration companies.

— Nil.

(1) Includes on-mine-site plus off-mine-site activities. Includes field work, overhead, engineering, economic and pre- or production feasibility studies, environmental and land access costs.

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

TABLE 15b. EXPLORATION AND DEPOSIT APPRAISAL EXPENDITURES,⁽¹⁾ BY PROVINCE AND TERRITORY, BY JUNIOR AND SENIOR COMPANIES, 2003

Province/Territory	Exploration			Deposit Appraisal			Exploration Plus Deposit Appraisal		
	Junior Companies and Prospectors	Senior Companies	Total	Junior Companies and Prospectors	Senior Companies	Total	Junior Companies and Prospectors	Senior Companies	Total
	(\$000)								
Newfoundland and Labrador	12 962	4 563	17 525	855	4 650	5 505	13 817	9 213	23 029
Nova Scotia	5 217	291	5 508	1 337	63	1 400	6 554	354	6 908
New Brunswick	1 965	22	1 987	—	—	—	1 965	22	1 987
Quebec	40 540	55 746	96 286	6 340	20 962	27 302	46 880	76 708	123 588
Ontario	60 214	112 516	172 730	4 278	35 598	39 876	64 491	148 115	212 606
Manitoba	7 567	20 848	28 415	—	1 579	1 579	7 567	22 427	29 994
Saskatchewan	10 995	21 020	32 014	70	20 842	20 912	11 065	41 862	52 926
Alberta	1 612	2 843	4 455	—	—	—	1 612	2 843	4 455
British Columbia	39 606	5 839	45 446	6 990	19 400	26 390	46 596	25 239	71 835
Yukon	16 795	1 328	18 123	225	0	225	17 020	1 328	18 348
Northwest Territories	12 364	17 882	30 246	2 600	23 301	25 901	14 964	41 182	56 146
Nunavut	36 450	32 279	68 729	11 712	1 962	13 674	48 163	34 241	82 404
Total	246 288	275 175	521 463	34 406	128 357	162 764	280 694	403 532	684 227

Source: Natural Resources Canada, from a federal-provincial/territorial survey of mining and exploration companies.

— Nil.

(1) Includes on-mine-site plus off-mine-site activities. Includes field work, overhead, engineering, economic and pre- or production feasibility studies, environmental and land access costs.

Notes: Numbers may not add to totals due to rounding. Data for 2003 are revised spending intentions.

TABLE 16. EXPLORATION PLUS DEPOSIT APPRAISAL EXPENDITURES,^(a) BY PROVINCE AND TERRITORY, BY TYPE OF COMPANY, 2002

Province/Territory	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Companies With a Producing Mine in Canada	Affiliates of (1)	Oil Companies	Foreign Companies Excluding (1-3)	Junior Companies and Prospectors	Other Companies	Total
	(\$ 000)						
Newfoundland and Labrador	32 159	797	–	130	11 009	89	44 184
Nova Scotia	70	–	107	–	3 209	–	3 386
New Brunswick	80	–	–	–	3 082	45	3 206
Quebec	63 514	5 391	–	2 697	32 129	7 477	111 208
Ontario	61 946	1 278	–	23 308	51 019	1 418	138 970
Manitoba	16 829	3 520	–	2 249	4 455	2 779	29 831
Saskatchewan	29 055	2 119	–	4 537	5 716	–	41 426
Alberta	1 834	1 806	–	–	1 963	–	5 603
British Columbia	10 867	10	198	–	28 141	11	39 225
Yukon	975	3	–	14	6 784	18	7 794
Northwest Territories	21 796	1 189	–	36 898	11 591	1 260	72 735
Nunavut	11 664	19 824	163	12 506	31 696	–	75 853
Total	250 789	35 936	468	82 339	190 793	13 096	573 421

Source: Natural Resources Canada, from a federal-provincial/territorial survey of mining and exploration companies.

– Nil.

(a) Includes on-mine-site plus off-mine-site activities. Includes field work, overhead, engineering, economic and pre- or production feasibility studies, environmental and land access costs.

Notes: Senior companies include categories 1, 2, 3, 4 and 6. Numbers may not add to totals due to rounding.

TABLE 17. DEPOSIT APPRAISAL, OFF-MINE-SITE, PROJECTS BY PROVINCE AND TERRITORY, BY JUNIOR AND SENIOR COMPANIES, 2001-2002

	2001			2002		
	Projects	Costs (a)	Cost Per Project	Projects	Costs (a)	Cost Per Project
	(no.)	(\$000)	(\$000)	(no.)	(\$000)	(\$000)
Newfoundland and Labrador						
Junior	2	1 333	666	3	287	96
Senior	2	8 846	4 423	2	26 622	13 311
Nova Scotia						
Junior	5	1 796	359	2	1 360	680
Senior	1	x	x	2	42	21
New Brunswick						
Junior	–	–	–	–	–	–
Senior	–	–	–	–	–	–
Quebec						
Junior	7	3 500	500	7	4 734	676
Senior	8	13 666	1 708	11	13 478	1 225
Ontario						
Junior	9	1 910	212	7	1 309	187
Senior	4	3 387	847	7	38 714	5 531
Manitoba						
Junior	3	760	253	1	x	x
Senior	–	–	–	–	–	–
Saskatchewan						
Junior	–	–	–	1	x	x
Senior	1	x	x	2	x	x
Alberta						
Junior	–	–	–	–	–	–
Senior	–	–	–	–	–	–
British Columbia						
Junior	7	2 181	312	7	4 465	638
Senior	1	x	x	1	x	x
Yukon						
Junior	6	406	68	3	539	180
Senior	–	–	–	3	216	72
Northwest Territories						
Junior	2	990	495	2	430	215
Senior	3	45 748	15 249	4	42 616	10 654
Nunavut						
Junior	4	7 673	1 918	2	5 459	2 729
Senior	2	753	377	3	9 286	3 095
Subtotal, junior	45	20 549	457	35	19 372	553
Subtotal, senior	22	85 678	3 894	35	150 278	4 294
Total	67	106 227	1 585	70	169 650	2 424

Source: Natural Resources Canada, from a federal-provincial/territorial survey of mining and exploration companies.

– Nil; x Confidential.

(a) Deposit appraisal expenditures include field work, overhead, engineering, economic and pre- or production feasibility studies, environmental, land access, non-residential construction (capital and repair), and machinery and equipment costs.

TABLE 18. GENERALIZED MODEL OF THE MINERAL RESOURCE DEVELOPMENT AND MINING PROCESS

PHASE	MINERAL RESOURCE ASSESSMENT	MINERAL EXPLORATION					MINERAL DEPOSIT APPRAISAL				MINE COMPLEX DEVELOPMENT	MINE PRODUCTION	ENVIRONMENTAL RESTORATION
		GRASS-ROOTS EXPLORATION					DA-1	DA-2	DA-3	DA-4			
	MRA	EX-1	EX-2	EX-3	EX-4	EX-5							
STAGE	Various surveys, research and synthesis.	Exploration planning.	Regional reconnaissance and surveys.	Prospecting and ground surveys of anomalies.	Verification of anomalies and showings.	Discovery and delimitation of a mineral deposit.	Mineral deposit definition.	Project engineering.	Project economics.	Feasibility study, production decision.	Mine development, construction of processing plant and infrastructure.	Production, marketing and renewal of reserves.	Mine complex closure and decommissioning, site restoration.
OBJECTIVES	Supply information and tools required to develop the mineral potential of the nation for economic benefit, in the perspective of sustainable development.	Select target commodities. Establish exploration objectives and strategies. Select target areas and sites. Acquire claims or permits if appropriate.	Seek anomalies of interest over wide areas by various survey methods. Select the more promising targets. Acquire claims or permits.	Confirm the presence, exact location and characteristics of anomalies. Acquire claims, leases and properties.	Investigate the cause of anomalies. Find mineral showings. Acquire additional claims, leases and properties.	Discover, delimit and interpret grade, quality and tonnage of a new mineral deposit. Determine if it constitutes a mineral resource of "potential economic interest" to justify more intensive and detailed work.	Define the limits, controls and internal distribution of grades, mineralogy and mineral processing characteristics of the deposit. Acquire all data required for project engineering and cost estimation.	Determine, in an iterative fashion, the design, plans, schedules, capital cost and operating cost estimates for all aspects of the project. Establish technical feasibility and costs thoroughly and realistically.	Obtain all the information required and determine, based on corporate objectives, parameters for the economic, financial and social-political evaluation of the project.	Diligently validate and integrate project data, interpretations, estimations, plans and evaluations to achieve MCD and production objectives. Decide on whether to undertake the mining project. Obtain permits and financing.	Complete mine development and construction on schedule and within budgets and specifications. Ensure efficient and timely mine complex start-up according to schedule, specifications and cash flow forecasts.	Achieve commercial production on schedule and meet cash flow forecasts and quantity and quality specifications. Achieve mine profitability and company survival in the perspective of sustainable development.	Restore mine site, outside plant and infrastructure to environmentally acceptable condition. Ensure the future quality of the environment.
EVALUATION METHODS	Geoscientific, mineral and economic surveys, research, compilations and synthesis by governments, research institutes, universities and industry.	Metal and mineral market research. Review of geological and ore deposit information and of the legal, fiscal and socio-political context in various areas.	Remote sensing, aerial photography and airborne geophysics. Prospecting, geology and geochemistry. Appraisal, rating and selection of anomalies.	Ground, geological, geochemical and geophysical prospecting and surveys. Compilation, appraisal and selection of significant anomalies.	Geological mapping and other surveys. Trenching, drilling and sampling. Appraisal of results, recommendations for further work, and selection of new targets.	Stripping, trenching, mapping, sampling, drilling and down-hole geophysics. Initial mineral processing tests. Environmental and site surveys. Mineral resource estimation and inventory.	Detailed mapping, sampling and drilling on surface or from underground. Systematic mineralogy and mineral processing tests. Detailed environmental and site surveys. Pre-feasibility studies.	Pilot tests, engineering design and planning. Capital and operating costs for mining, mineral processing, infrastructure, environmental protection and restoration. Technical risk analysis. Pre-feasibility studies.	Market, prices, product development and financial studies. Environmental, economic, financial, and socio-political risk analysis. Pre-feasibility studies.	Exhaustive due diligence review of all data, interpretations, plans and estimates. Evaluation of profitability, financial and qualitative risks, and the up-side factors.	Project management methods in a quality assurance perspective. Training program for personnel and detailed start-up plan to meet the requirements of this demanding period.	Production management methods to ensure continuous quality and efficiency improvements. Exploration, deposit appraisal and development of new zones or deposits on-mine-site and off-mine-site.	Mine closure and decommissioning. Environmental restoration and monitoring.
RESULTS	Maps, data bases, tools and models.	Exploration projects.	Regional anomalies.	Local anomalies.	Mineral showings.	Mineral deposit.	Deposit appraisal project.			Mining project.	Mining complex.	Mineral production.	Restored site.
MINERAL INVENTORY	UNDISCOVERED MINERAL POTENTIAL					INFERRED RESOURCE	DELIMITED MINERAL RESOURCE				MINERAL RESERVE		
	SPECULATIVE		HYPOTHETICAL				INDICATED	INDICATED AND MEASURED			PROVEN AND PROBABLE		
ESTIMATION ERROR (targeted margin of error of tonnage/grade estimates at the 90% confidence level)						± 100%	± 50%	Indicated: ± 50 to ± 30% Measured: ± 20 to ± 10% (often several sample grid dimensions are used in each category)			Proven (feasibility: ± 10%; mining: ± 5%)		
INVESTMENTS	Moderate	Low, but increasing multiple investments.				Larger and increasing multiple investments.				Very large industrial investment.		Full compliance	
RISK LEVEL	Low	Very high, but decreasing risk of failure and financial loss.				High, but decreasing risk of failure.				Moderate to low industrial risk.			

Sources: Modified by D.A. Cranstone, A. Lemieux and M. Vallée, February 25, 1994, from M. Vallée, 1992, *Guide to the Evaluation of Gold Deposits*, CIM Special Volume 45, p. 4, and *SOQUEM Annual Report*, 1976-77, pp. 4 and 5. Revised by M. Vallée and G. Bouchard, January 2001.

APPENDIX 1. FEDERAL, PROVINCIAL AND TERRITORIAL TAX INCENTIVES FOR MINERAL EXPLORATION

Jurisdiction	Incentive	Description	Date		Notes
			Introduced	End	
Federal	Mining exploration flow-through shares	Mechanism allowing the transfer of deductions related to Canadian Exploration Expenses (CEE) and Canadian Development Expenses (CDE) to investors.	1983(1)	No sunset date	(1) In fact, flow-through shares were introduced in 1954. However they only became popular in 1983 when the depletion allowance associated with CEE became transferable to investors.
	Investment Tax Credit for Exploration (ITCE)	15% non-refundable investment tax credit for individual investors in flow-through shares (FTS) of qualifying companies. Eligible expenses relate to grass-roots exploration from or above surface.	Oct. 2000	Dec. 2004	End date is December 2004 for raising funds and December 2005 for completing grass-roots exploration work.
Quebec	Additional deduction program for flow-through shares	Maximum 75% deduction for surface exploration spending revised to a maximum 31.25% deduction in June 2003. Applies to flow-through-share investors paying taxes to the province.	1983	Dec. 2004	Will be fully replaced by refundable tax credit.
	Refundable tax credit for resources	Maximum 45% tax credit paid directly to corporations (refundable and non-refundable components).	2001	2008	Refundable and non-refundable tax credit rates vary according to type of company and location of exploration project.
Ontario	Ontario Focused Flow-Through Share Tax Credit	5% refundable tax credit for investors in eligible shares of qualifying companies. Applies to investors paying taxes to the province.	Dec. 2000	No sunset date	Harmonized with federal ITCE, but refundable and no sunset date.
Manitoba	Manitoba Mineral Exploration Tax Credit (MMETC)	Non-refundable 10% personal income tax credit for investors in eligible flow-through shares of qualifying companies. Applies to investors paying taxes to the province.	Apr. 2002	Dec. 2004	Harmonized with federal ITCE.
Saskatchewan	Mineral Exploration Tax Credit	Income tax credit of 10% for investors in eligible flow-through shares of qualifying companies. Applies to investors paying taxes to the province.	Mar. 2001	Dec. 2004	Harmonized with federal ITCE.
British Columbia	Mining Flow-Through Shares Tax Credit (BC MFTS)	Non-refundable 20% tax credit for investors in eligible flow-through shares of qualifying companies. Applies to investors paying taxes to the province.	July 2001	Dec. 2004	Harmonized with federal ITCE.
	Mining Exploration Tax Credit (METC)	20% refundable tax credit on eligible mineral exploration. Paid directly to companies or individuals incurring the expenses.	Aug. 1998	July 2006	Cannot be used concurrently with BC MFTS. Partly harmonized with federal CEE rules.
Yukon	Yukon Mineral Exploration Tax Credit (YMETC)	Refundable corporate and personal income tax credit of 22%, revised to 25% in March 2001, of eligible off-mine-site mineral exploration expenditures.	Apr. 1999	Mar. 2004	Subject to annual review. Individuals claiming the credit must be residents of the Yukon. Corporations must have a permanent establishment in the Yukon.

Note: For more information on tax-related exploration incentives, please contact Robert Clark, Tax and Mineral Resources Division, Minerals and Metals Sector, Natural Resources Canada, by telephone at (613) 996-3286 or by e-mail at rclark@nrcan.gc.ca.