

Canadian Global Mining Presence

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DOMESTIC BASE

In late 1995, companies listed on Canadian stock exchanges held interests in more than 7300 mineral properties worldwide, about the same number as in 1994 (Figure 1). Canadian companies continued to maintain a strong domestic base of operations, with over 60% of their worldwide mineral property portfolio in this country. As a result, in January 1996, at least 20 base-metal or precious-metal projects in Canada had reached the production feasibility stage or were awaiting the environmental permits required to begin mine construction (Table 1).¹

FOREIGN PRESENCE

Canadian companies held interests in a portfolio of almost 2750 foreign mineral properties at the end of 1995. This represents an increase of more than 300 properties, or up by over 10%, since December 1994. These foreign properties are located in 99 countries around the world.

The Americas have remained the focus of Canadian companies abroad. On a regional basis, the United States and the large area that comprises Latin America and the Caribbean each account for about an equal share of almost 80% of all Canadian mining projects abroad. On a country basis, two dozen nations, spread across the globe, account for 80% of the more than 1700 Canadian mining projects abroad that are located outside the United States (Figure 2). There has been no growth in the number of Canadian projects in the United States over the past four years,

¹ A more detailed account of base-metal and precious-metal deposits undergoing appraisal in Canada can be found in an article by André Lemieux, "Canadian Reserves of Selected Major Metals, Recent Production Decisions, and Deposits Promising for Future Production," *Canadian Minerals Yearbook*, 1995 edition, Natural Resources Canada, Ottawa, 1996.

but there are now more Canadian projects in Latin America and the Caribbean than there are immediately south of the Canadian border.

Latin America and the Caribbean

A considerable increase in the rate of growth in Canadian mining activity in Latin America occurred during 1994, and this continued into 1995 in most countries of that region, although at a slower pace than during the previous year. At the end of 1995 there were at least 200 Canadian mining companies active in South America, 100 in Mexico, and 75 in Central America and the Caribbean. These companies had 700 projects in South America, 240 in Mexico, 110 in Central America and the Caribbean, more than 100 in each of Venezuela and Chile, and more than 50 in each of Argentina, Bolivia, Brazil, Ecuador, Guyana and Peru (Figure 3).

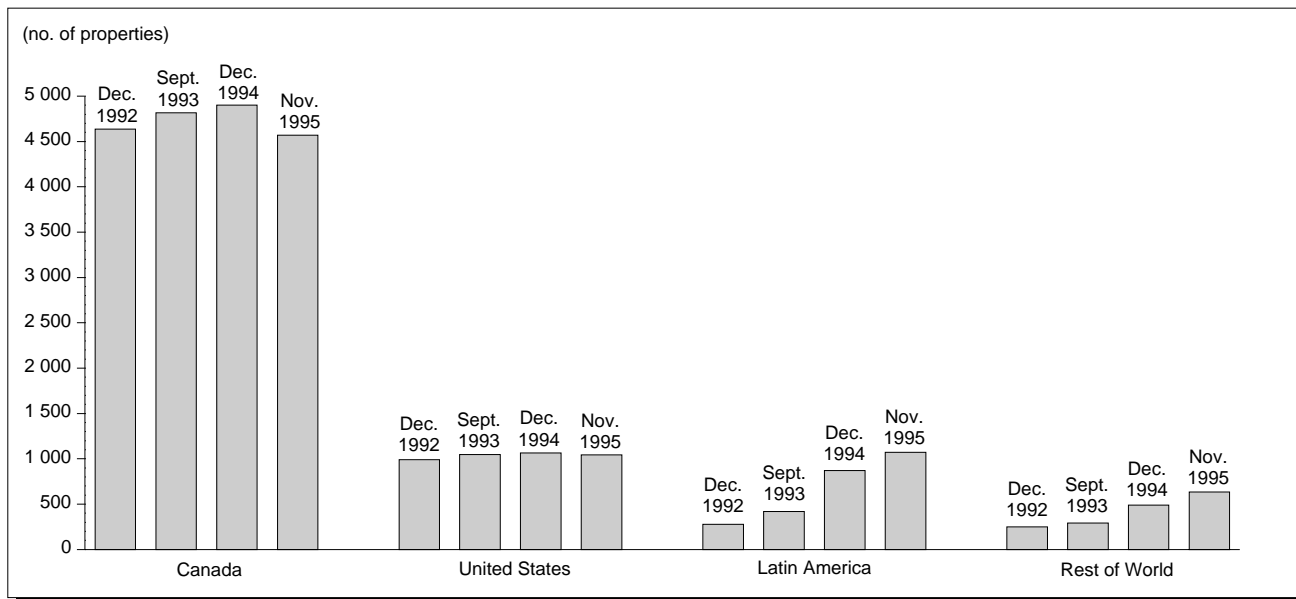
Two thirds of Canadian mining companies active in Mexico in December 1994 were listed on junior stock exchanges in Canada, predominantly the Vancouver Stock Exchange. Compared with 1993, there was a significant increase during 1994 in the average size of company project portfolios in Mexico. Already, at the end of 1994, Canadian companies had projects in at least half of Mexico's 32 states.² A number of these projects have come to fruition, including Calgary-based Fording Coal Limited's Pilares project in the state of Sonora. Fording Coal announced, in January 1996, that it had finalized plans to build, at Pilares, the world's largest wollastonite (CaSiO₃) mine.

Africa

Canadian mining activity in Africa increased substantially during the past two years and, as a result, 140 Canadian companies had interests in over 300 mining projects located in 26 of the more than 50 countries of Africa. They had 60 projects or more in

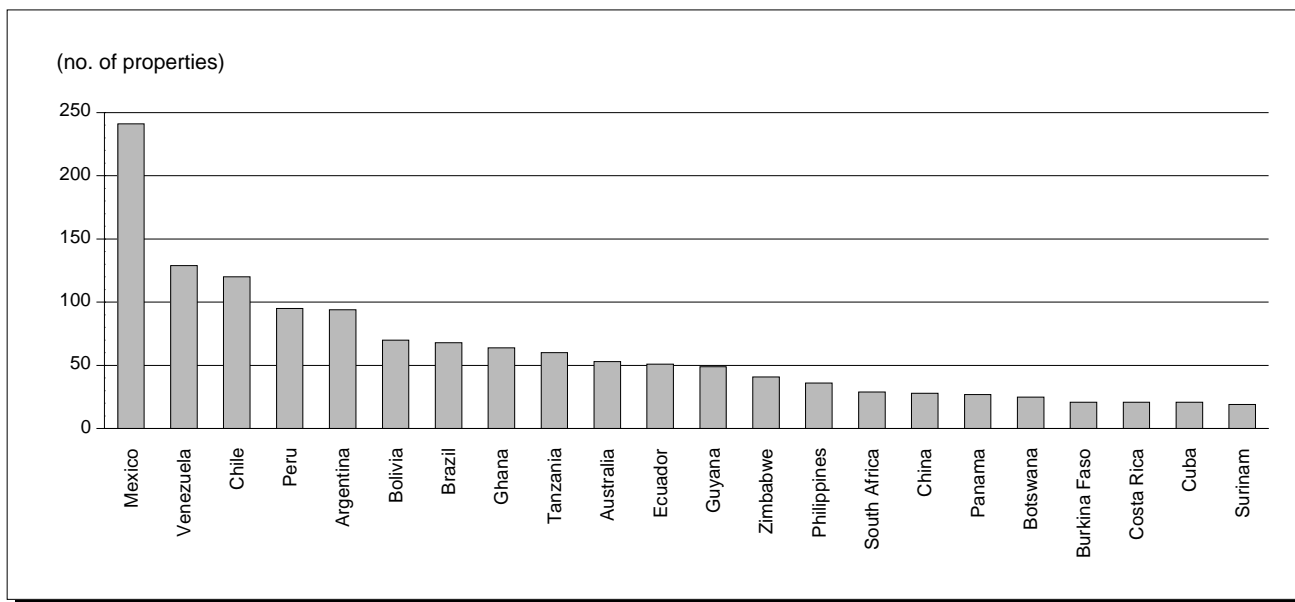
² Penetration of the Mexican mineral exploration market by Canadian mining companies, including a table of companies and their projects, state by state, is documented in an article by André Lemieux, "Canadian Mining Activity in Mexico," *World Mineral Notes*, Vol. 11, No. 1, March 1995, Mining Sector, Natural Resources Canada, Ottawa, pp. 23-34.

Figure 1
Canadian Mining Presence Worldwide
 Distribution of Mineral Properties by Region



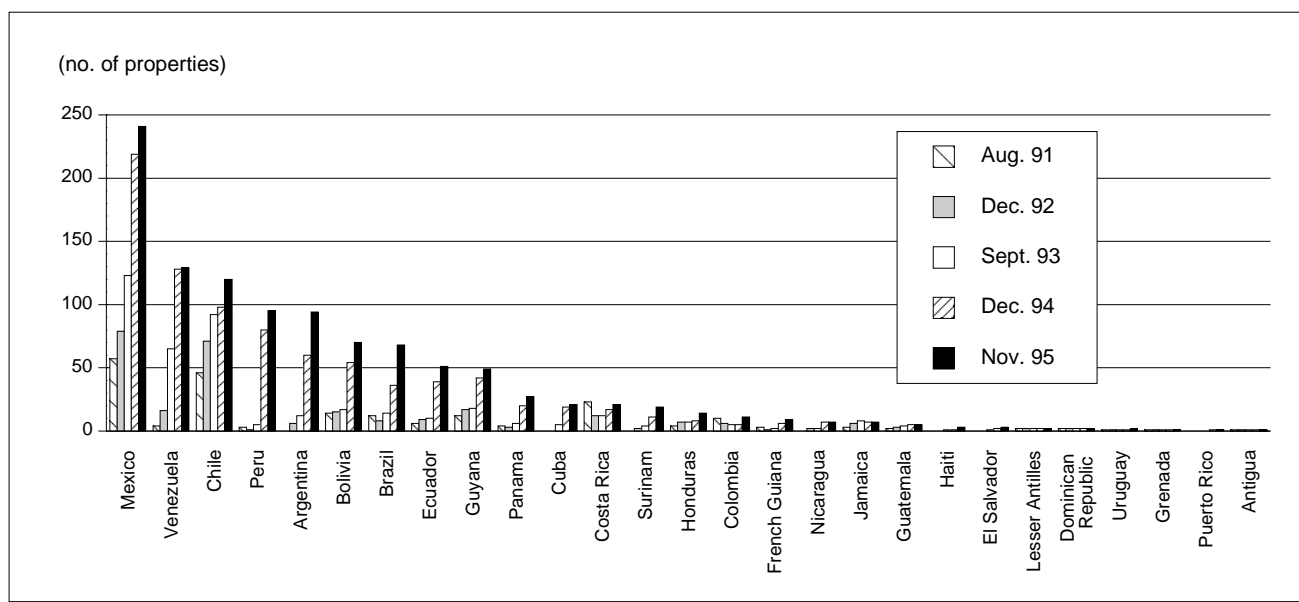
Source: Natural Resources Canada, based on MIN-MET CANADA database and used under licence.

Figure 2
Canadian Mining Presence Worldwide
 Countries Accounting for 80% of Foreign Holdings Located Outside the United States



Source: Natural Resources Canada, based on MIN-MET CANADA database and used under licence.

Figure 3
Canadian Mining Presence in Latin America and the Caribbean
 Distribution of Mineral Properties by Country



Source: Natural Resources Canada, based on MIN-MET CANADA database and used under licence.

each of Ghana and Tanzania, and 20 or more in each of Botswana, Burkina Faso, South Africa, and Zimbabwe (Figure 4).

In Ghana, Sierra Leone, Tanzania and Zimbabwe, Canadians are involved mainly in gold and diamond projects. In Botswana, the Central African Republic, Namibia, South Africa and Zaïre, they are focussing mainly on diamonds. In Burkina Faso, Ethiopia, Gabon, Côte d'Ivoire, Kenya, Mali, Mozambique, Niger, Swaziland and Uganda, their projects are mainly gold.

Canadians also have interests in several base-metal projects in Africa, notably in Burkina Faso, Eritrea, Côte d'Ivoire, the Sudan, Tanzania, Tunisia, Uganda, Zambia and Zimbabwe.

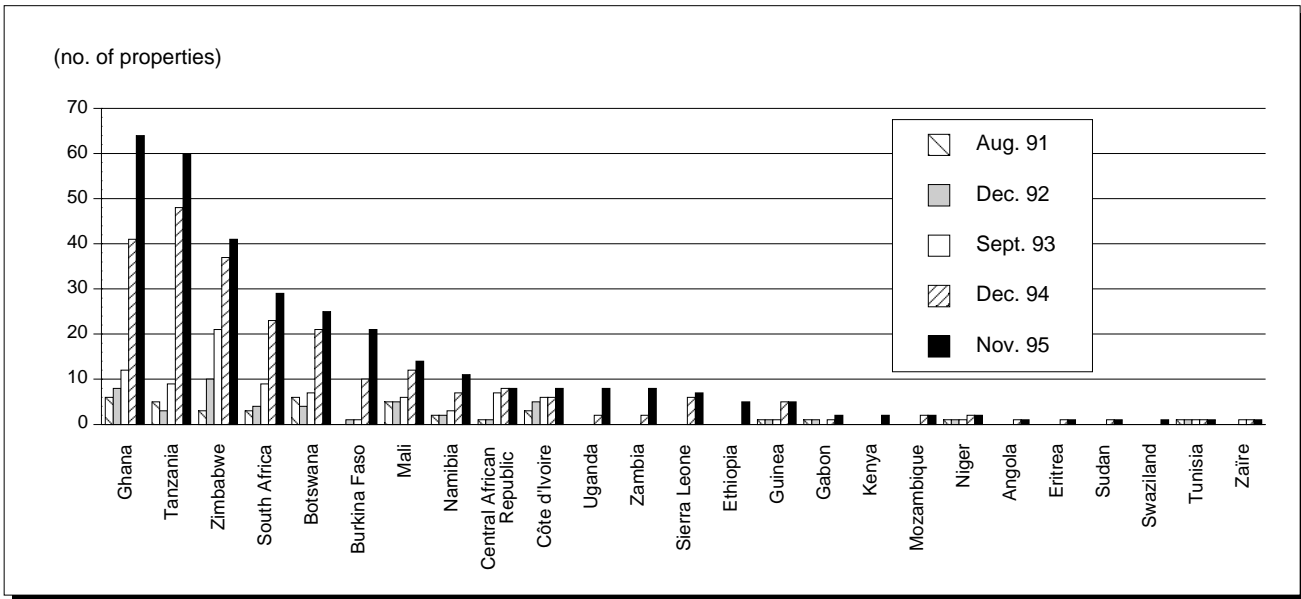
In addition, there is a considerable variety of other mineral commodities of interest to Canadian companies in Africa. Some of these commodities are not produced or widely explored for in Canada. Canadians are looking for gemstones such as amethyst, emerald, ruby or sapphire in Guinea, Tanzania and Zambia. They are looking for platinum group metals in South Africa, and for the heavy minerals hematite, ilmenite, magnetite, monazite, rutile or zircon in Namibia and Tanzania. They also have manganese projects in Burkina Faso and Namibia, and bauxite interests in Ghana and Guinea.

Southeast Asia

About 40 Canadian companies were active in seven of the countries of Southeast Asia at the end of 1995. They had interests in almost 70 projects in that region (Figure 5). Canadians are most active in the Philippines where they have over 35 projects, and in Indonesia where they have more than 15.

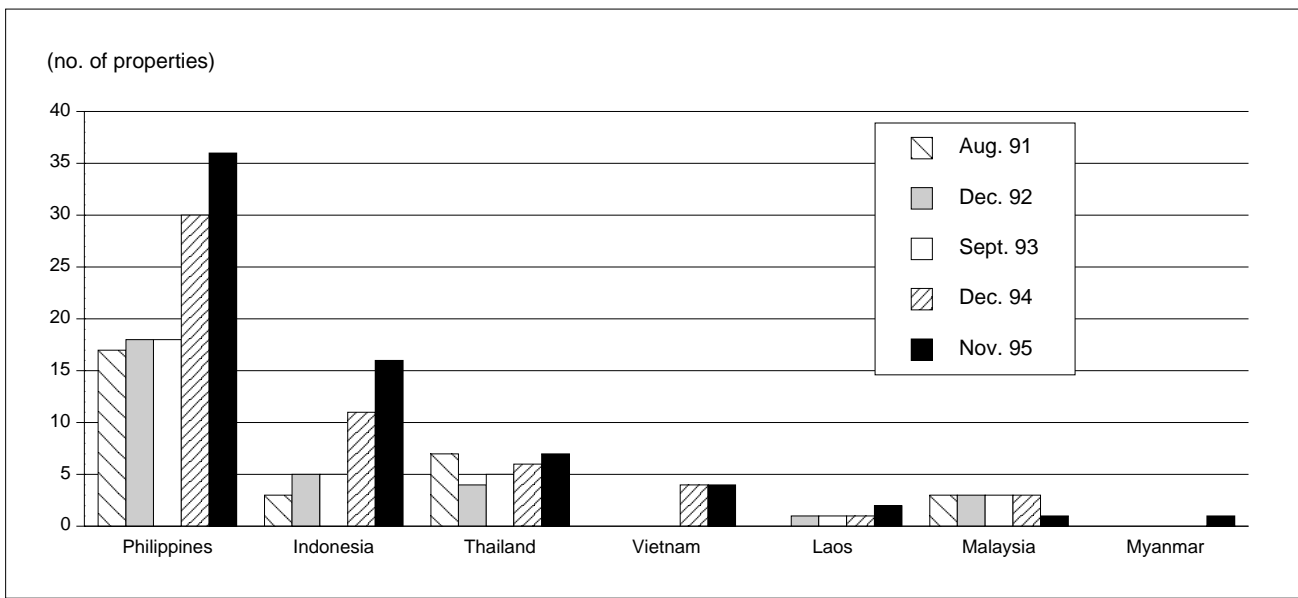
Most of the Canadian projects in the Philippines involve gold or copper-gold, but there is a significant number of chromite and nickel projects as well. Until recently, the best-known Canadian project in Indonesia was P.T. Inco's Soroako open-pit lateritic nickel mine, which has been in production since 1978. However, attention has now shifted to Calgary-based Bre-X Minerals Ltd. which announced, in late February 1995, an initial resource calculation for its Busang gold deposit in Kalimantan on the eastern portion of the island of Borneo. Almost 2.75 million oz of gold, contained in over 35 Mt grading 2.44 g/t gold, had been reported in the Central zone of this deposit as at January 1996. Considerably more gold is expected to be outlined at Busang. Although the majority of Canadian mining projects in Indonesia involve gold, Canadians have a variety of other projects there including some dealing with heavy minerals (cassiterite and chromite), zeolites, copper-sulphuric acid, lead-zinc-silver and copper-gold.

Figure 4
Canadian Mining Presence in Africa
 Distribution of Mineral Properties by Country



Source: Natural Resources Canada, based on MIN-MET CANADA database and used under licence.

Figure 5
Canadian Mining Presence in Southeast Asia
 Distribution of Mineral Properties by Country



Source: Natural Resources Canada, based on MIN-MET CANADA database and used under licence.

In Thailand, Canadian projects involve gold, zinc-lead-silver, tungsten-tin and potash. Canadians have also recently initiated projects in Vietnam and Myanmar (Burma). Canadians are focussing almost exclusively on gold in Vietnam and Myanmar, as well as in Laos and Malaysia.

OUTLOOK

In Canada, mineral exploration, deposit appraisal and mine development activities are currently at a high level. This will result in many new discoveries and additional new mines in this country.

The mining industry is becoming evermore globalized, and growth in mining activity is expected to continue in many countries of Latin America, Africa, Southeast Asia and the former Soviet Union. Many countries in these regions have enormous geological potential, but modern exploration techniques have not yet been widely used. The loci of growth in mineral exploration and development will be influenced significantly by company perceptions of country risk.

Because of their knowledge and expertise, Canadian companies are well positioned to continue to respond to opportunities arising from the globalization of the mining industry. The activities of Canadian exploration and mining companies abroad are providing other Canadian firms that specialize in mining-related goods and services with opportunities to expand their markets.

Through their presence abroad, Canadian companies are helping many countries to develop their mineral resources and, as a result, a more open economy. For the foreseeable future, Canadian companies will continue to be a driving force for exploration and mining, both in Canada and abroad.

Note: Information in this review was current as of early February 1996.

TABLE 1
CANADIAN DEPOSITS OF SELECTED MAJOR METALS
UNDERGOING ACTIVE APPRAISAL AS AT JANUARY 1996

PROJECTS THAT HAVE REACHED OR PASSED THE ECONOMIC FEASIBILITY STUDY STAGE
(The metal in these deposits is not counted in Canadian reserves.)

- DEPOSITS: Individual deposits have been selected on the basis of public information. Deposits committed for production prior to January 1, 1996, are not included.
- TONNAGES and GRADE: As reported by companies or, where necessary, from the secondary source that appeared to be the most reliable. Data reported in imperial units were converted to metric units and rounded to the corresponding number of significant digits. Tonnages and grade descriptions such as "probable and possible" are those reported by companies.
- COMPANIES: Where two or more companies are identified with a deposit, the first is usually the operator.

Deposits and Companies	Tonnage and Grade Description	Tonnage ¹	Grade ²							Comments
			Cu	Ni	Pb	Zn	Mo	Ag	Au	
		(tonnes)	(%)	(%)	(%)	(%)	(%)	(g/t)	(g/t)	
NEWFOUNDLAND										
Nugget Pond Novéder Inc., Richmont Mines Inc.	-	416 168	-	-	-	-	-	-	14.3	Richmont acquired 60% interest in May 1995. Planned, in July 1995, to complete a feasibility study before year-end for production in late 1996.
Voisey's Bay Diamond Fields Resources Inc., Inco Limited, Teck Corporation	Mineable Ovoid zone Potential Eastern Deepes zone	31 700 000 45 000 000	1.68 ..	2.83 ..	- -	- -	- -	- -	- -	Discovered in late 1994. Teck was appointed, in August 1995, primary contractor for the project. Feasibility study of producing at a minimum annual rate of 130 million lb of nickel, 90 million lb of copper and 3 million lb of cobalt from an open pit is expected to be completed in 1996. Production could begin before the end of the decade. The tonnage also grades 0.12% cobalt .
QUEBEC										
Copper Mountain mine (oxide) Noranda Mining and Exploration Inc.	Probable mineable	19 496 000	0.44	-	-	-	-	..	-	Planned, in August 1995, to construct a \$4 million SX/EW pilot plant to recover copper from oxide ore and assess the feasibility of a commercial-scale plant. A decision on the commercial-scale plant is expected in 1997.
Magnola Noranda Mining and Exploration Inc.	-	..	-	-	-	-	-	-	-	Company and three partners announced, in the first quarter of 1995, the construction of a \$33 million pilot plant to test a process to recover magnesium from asbestos tailings. Commercial production could start in 1997.
Natashquan (mineral sands) Tiomin Resources Inc., Shairco (Saudi Arabia)	Drill indicated	2 100 000 000	-	-	-	-	-	-	-	The deposit grades 6% heavy minerals (ilmenite , magnetite , zircon and garnet). Pre-feasibility study prepared in June 1994 by Met-Chem Engineers estimated the capital cost of a dredge mine and mineral processing facility at US\$260 million. Feasibility study under way, in August 1995, to determine capital and operating costs to ±10%. The deposit could be in production by 1998.
ONTARIO										
Duport (Shoal Lake) Conwest Exploration Company Limited, Consolidated Professor Mines Limited	Geological	1 800 000	-	-	-	-	-	-	12.	Capital cost of 450-t/d operation estimated at \$50 million. Planned, in March 1995, to update the project feasibility study.
Fenn-Gib Pangea Goldfields Inc.	Drill-indicated probable	40 600 000	-	-	-	-	-	-	1.33	Resource estimate increased in September 1995. Planned, as at November 1995, to complete a feasibility study in the summer of 1996.

Musselwhite³ - T. Antiform Placer Dome Canada Limited, TVX Gold Inc.	Measured and drill-indicated resource	11 025 000	-	-	-	-	-	-	9.	Building a 45-km all-weather access road to the property. Results of feasibility study expected by end of November 1995. A production decision could be made by year-end 1995.
SASKATCHEWAN										
Goldfields - Athona and Box Greater Lenora Resources Corp.	Mineable	16 600 000	-	-	-	-	-	-	1.7	Feasibility study prepared by H.A Simons Ltd. estimated the capital cost of a 6000-t/d operation at \$66.1 million. Construction could start in early 1996 for production in the summer of 1997.
Komis⁴ Waddy Lake Resources Inc., Golden Rule Resources Ltd.	Proven and probable mineable	687 320	-	-	-	-	-	-	10.	Submitted environmental impact statement in August 1995. Results of a feasibility study announced in August 1995 estimated the capital cost of a 400-t/d underground operation using the Jolu concentrator at \$9.8 million. Production could begin in early 1996.
BRITISH COLUMBIA										
Cirque (Stronsay) Teck Corporation, Cominco Ltd., Korea Zinc Co. Ltd.	Mineable North Cirque South Cirque	25 000 000 12 000 000	-	-	2.3 . .	8.5 . .	-	51. . .	-	Mine development certificate issued in 1992. Planned to review and update feasibility study during 1995.
Huckleberry - Main and East Zones Princeton Mining Corporation, Mitsubishi Materials Corporation, Dowa Mining Co., Ltd., Furakawa Co. Ltd.	Mineable	90 900 000	0.512	-	-	-	0.014	2.81	0.062	Feasibility study completed in October 1995 by H.A. Simons Ltd. estimated the capital cost of 15 500-t/d open-pit operation at US\$100 million. Provincial approval to develop mine received in December 1995. Production could start in late 1997.
Kemess-South Royal Oak Mines Inc.	Mineable	200 440 000	0.224	-	-	-	-	-	0.629	Pre-feasibility study prepared in 1993 by Kilborn Engineering Pacific Ltd. estimated the capital cost of a 40 000-t/d open-pit operation at \$374 million. Planned, in October 1995, to extract and test a bulk sample by January 1996. Contractors for engineering, procurement and construction have been appointed. Production could start in late 1997.
Mt. Polley Imperial Metals Corporation, Sumitomo Corp.	Mineable (S-19 Pit)	49 000 000	0.383	-	-	-	-	-	0.556	Mine development certificate issued in 1992. Feasibility study completed in February 1995 estimated the capital cost of a 14 000-t/d operation at \$102 million. Production could start in 1997.
Tulsequah Chief mine Redfern Resources Ltd.	Mineable	7 150 000	1.24	-	1.18	6.32	-	99.33	2.41	Last produced during the 1950s. Results released in July 1995 of a feasibility study prepared by Rescan Engineering Ltd. estimated the capital cost of a 900 000-t/y underground operation at \$160 million. Studies required to apply for a mine development certificate were in progress as at July 1995. The adjacent Big Bull mine contains a resource of 700 000 t.
YUKON TERRITORY										
ABM (Kudz Ze Kayah) Cominco Ltd.	Possible resource	13 000 000	1.	-	1.3	5.5	-	125.	1.2	Discovered in 1994. Possible production decision by end of 1995 for a 2700-t/d operation with capital costs of some \$100 million to be in operation by fall of 1997.

TABLE 1 (cont'd)

Deposits and Companies	Tonnage and Grade Description	Tonnage ¹	Grade ²							Comments
			Cu	Ni	Pb	Zn	Mo	Ag	Au	
		(tonnes)	(%)	(%)	(%)	(%)	(%)	(g/t)	(g/t)	
Dy (underground) Anvil Range Mining Corporation	Probable	9 390 000	-	-	5.50	6.62	-	80.3	0.82	Production expected in 2001 at a capital cost of \$40 million.
Williams Creek Thermal Exploration Company, Western Copper Holdings Limited	Diluted oxide reserve	14 110 000	1.01	-	-	-	-	-	0.51	Feasibility study, prepared in 1994, by Kilborn Engineering Pacific Ltd. estimated the capital cost of a 5800-t/d heap leach SX/EW operation at \$62 million. Permitting and financing in progress as at August 1995. Production could start in 1997. Partners agreed, in May 1995, to merge.

Source: Natural Resources Canada.

- Nil or unknown; . . Not available; * Author's estimate; k Combined lead and zinc grade.

¹ One tonne = 1.1023113 short tons. ² One gram per tonne (g/t) = 0.02916668 troy ounces per short ton. ³ Musselwhite was committed to production in mid-February 1996. ⁴ Construction of the Komis mine began in mid-February 1996.