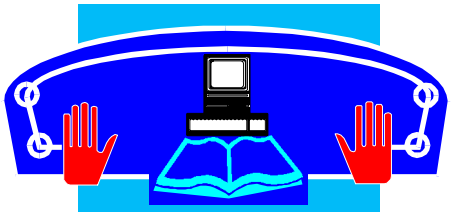


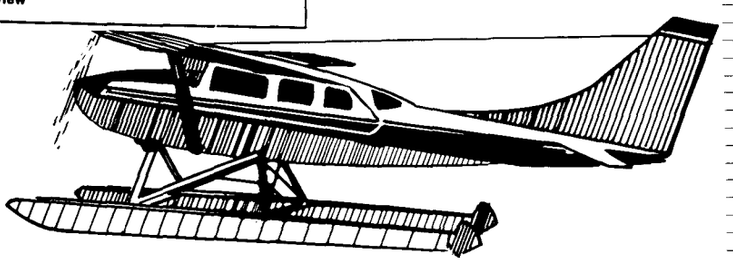
N.w.t. Mineral Sector Report - 1990
Type of Study: Analysis/review
Date of Report: 1991
Author: G.n.w.t. - Energy, Mines & Petroleum Resources
Catalogue Number: 6-3-92

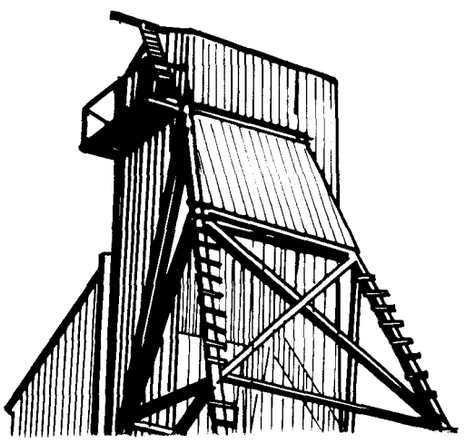
N.W.T. MINERAL SECTOR REPORT -1990

Sector: Mining/Oil/Energy

6-2-92

Analysis/Review





N.W.T. MINERAL SECTOR REPORT 1990

NWT Mineral Sector Report
1990

Contents

Overview

Mining continues to play a major role in the economy of the NWT. In 1990 the NWT ranked fifth in the value of Canada's metallic mineral production, supplying 5.9% of all metallic minerals. Metal shipments were valued at $881 million, a 9.1% increase from $805 million in 1988. The NWT, in 1990, produced 24.7% of Canada's zinc, 17% of its lead, 9.170 of its gold, 16.6% of its cadmium and 2.1% of its silver.

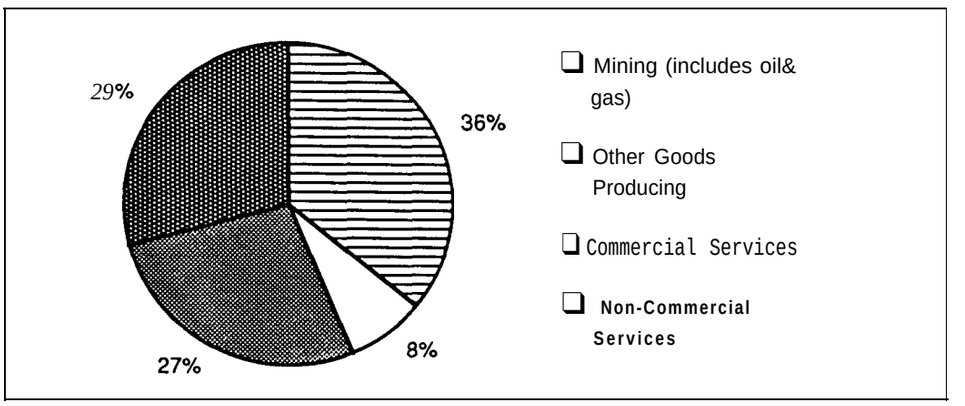


Figure 1: ***GDP AT FACTOR COST BY INDUSTRY IN 1989 (NWT)***
Source - Bureau of Statistics, GNWT

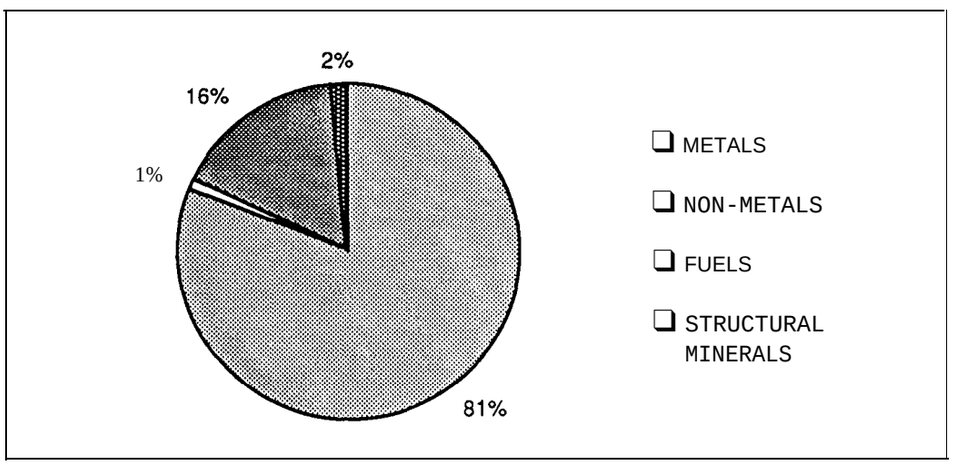


Figure 2: ***VALUE OF NWT MINERAL SHIPMENTS -1989***
Source - Statistics Canada: Canada's Mineral Production Cat. 26-202

Data for 1989 show mining accounted for 36% of the NWT Gross Domestic Product (Figure 1). The $1.15 billion gross value of NWT mineral production comprised metals 810/0, fuels 16°/0 and aggregates 3% (Figure 2).

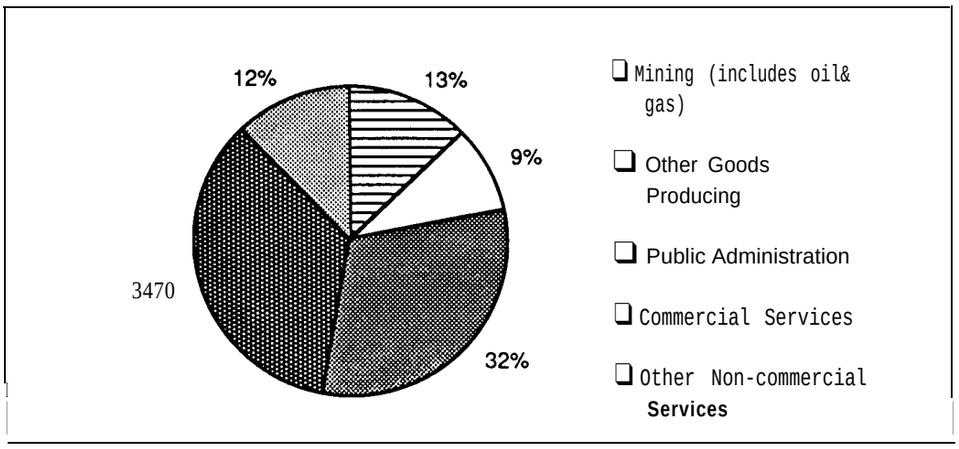


*Figure **3: SALARY AND WAGES BY SECTOR 1989***
Source - Bureau of Statistics, GNWT

Approximately 60% of the estimated 2,200 jobs in the NWT **mining** sector are held by Territorial residents. Participation by native northerners has increased to about 12% of jobs, due to the efforts of both industry and communities. **The mining sector paid $123 million or 13% of all salaries in the NWT during 1989 (Figure 3).**

During 1989 and 1990, changes to flow-through share laws and the Canadian Exploration Incentive Program (CEIP) **reduced the attractiveness of exploration investments. These changes, combined with lower gold prices, the strong Canadian dollar and high interest rates, resulted in a decline in the amount of exploration capital available. Mineral exploration in the NWT fell from $112 million in 1988 to $55 million in 1989 and $38 million in 1990. Similar declines occurred across Canada. The NWT share of total exploration investment in 1988, 1989 and 1990 remained constant at approximately 6.2% of the total exploration investment in Canada.**

During 1990, the NorthWest Gold Corp. commenced production at the Colomac Mine, a large open pit gold mine 200 km north of Yellowknife. The Giant Mine in Yellowknife was purchased by Royal Oak Resources. The Nerco CON Mine, also in Yellowknife, refurbished one of their shafts and expanded their mill capacity. The company plans to build an autoclave circuit adjacent to the existing mill, at a cost of $19.4 million. The pressure oxidation process will recover gold from pre-existing mining waste material and allow processing of refractory ore. The Lupin Mine, 400 km northeast of Yellowknife invested in internal infrastructure and development to access deeper reserves. Development on the Kiggavik propetty, 100 km west of Baker Lake, is delayed pending the completion of the federal environmental review.

The mining industry across Canada is facing increased challenges produced by declining investments in mineral exploration, lower gold prices and the strong Canadian dollar. Activity levels and investment in the mineral industry are expected to remain lower than the record in 1988.

History of Mining in the NWT

The NWT has a wealth of gold, silver, lead, zinc, copper, nickel, uranium, tungsten, lithium, cadmium, arsenic, bismuth, antimony, beryllium, rare-earth elements, oil, gas and coal. Mineral development and exploitation began prior to the arrival of Europeans. Until the 1920s, Inuit and Yellowknife Indians recovered and traded native copper from the Bathurst Inlet and Coppermine River areas. Inuit mined soapstone to use for artistic purposes, or carve into oil lamps and other utensils.

The first European mining operation was from 1577 to 1578 when Martin Frobisher mined 1800 tonnes (t) of "blacke stone" from the southern Baffin Island region. The supposed gold ore was shipped to England where it was found to be worthless. In 1771, Matonabee, a Dene chief, guided Samuel Hearne of the Hudson's Bay Company to a copper showing at Coppermine Mountain near the Coppermine River but the showing was of little commercial interest to the Hudson's Bay Company. In the 1890s, local natives took prospectors, travelling overland to the Klondike gold rush, to lead-zinc showings in the Pine Point area. The prospectors lost interest when they realized the ore did not contain precious metals.

Small scale mineral production began in the late 1870s when 14.5 t of mica, graphite and other industrial minerals, worth $120 thousand, were mined from the Cumberland Sound area. In 1928, 2.7 kg of gold was produced at Term Point on the Whale Cove Peninsula in Hudson Bay. The first mine opened at Port Radium in 1932 and operated intermittently until 1982. Total production was 6,808 t uranium, 46,930 kg silver, 226,800 kg cobalt, 127 t nickel, 99.8 t lead, 1,292 t copper and 450 g radium.

Between 1939 and 1965, gold was the leading commodity. Since 1928, more than 364.2 t of gold was produced from a total of 25 mines. The Pine Point base metal mine opened in 1964, the Nanisivik Mine in 1976, followed by the Polaris Mine in 1982. On an annual basis, since 1965, the total value

of lead and zinc production has surpassed gold, and continues to do so, despite the closure of Pine Point. These mines established the NWT **as an important Canadian producer of base metals and proved that the high** Arctic is not a barrier to development. Mineral exploration has outlined many other mineral deposits that are waiting for the economic climate to favour a production decision.

Employment Trends

Although the NWT generally follows the employment trend for Canadian metal mines, preliminary figures for the NWT and Canada for 1989 and 1990 indicate the Territories have fared somewhat better in the latter part of the decade. Over the last ten years, even with several mines opening and closing, employment in NWT mines has averaged approximately 2,347 full time positions, with 10% of these jobs filled by contract employees (Figure 4). In 1990, the mining industry directly employed 2,188 people, 177 in contract positions and 225 native people. During this same period, approximately 60% of these positions have been filled by Northern residents. Historically, native employment at mines has been low. However, in the last two to three years, native peoples' participation in the mining industry has increased bringing it into the 10%-12% range. The increase has been effected largely through efforts by industry in taking advantage of the availability of a local workforce. Concurrent with these efforts has been the change in attitude of local people about taking advantage of business and employment opportunities offered by the mining industry.

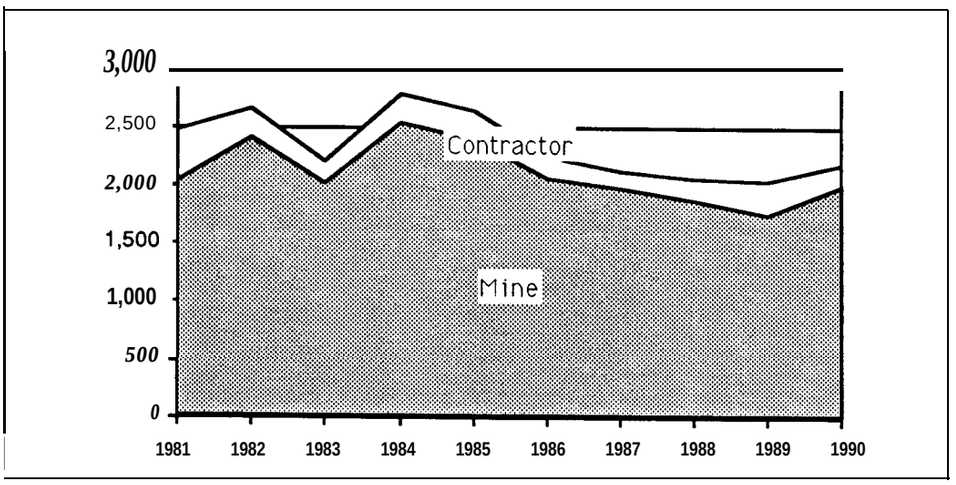


Figure 4: ***AVERAGE MINE EMPLOYMENT IN THE NWT***
Source - Bureau of Statistics, GNWT

Current Mining Operations (Figure 5)

Nerco CON Mine (Nerco CON Ltd.)

Nerco Con Mine in Yellowknife set a new production record in 1990, pouring 3,643 kg of gold, a 20% increase over 1989 when 3,001 kg were produced. The operation milled 334,560 t of ore grading 12.4 g/t at a 95% recovery rate.

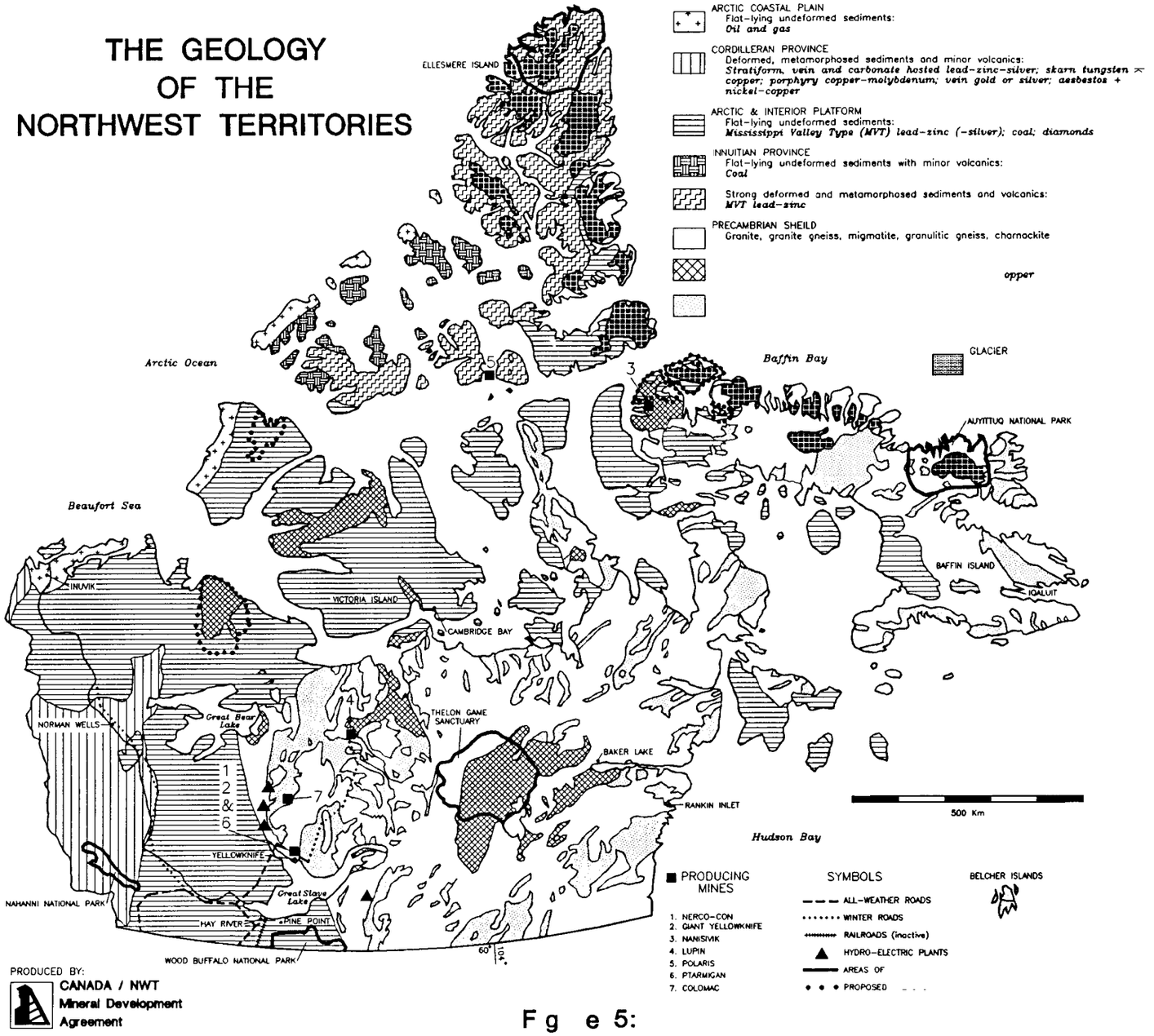
Mill capacity is being expanded from 1000 t/day to 1,200 t/day. In June, 1990, the mine began using the refurbished Cl shaft to increase production capacity.

Giant Mine (Giant Yellowknife Mines Ltd.)

On November 2, 1990 Royal Oak Resources purchased the interest of Giant Resources Ltd. of Australia, in Giant Yellowknife Mines Ltd. and Pamour Inc. Royal Oak controls Giant Mine in Yellowknife through combined direct and indirect holdings.

In 1990 the Giant Mine milled 376,469 t of ore at an average grade of 9.9 g/t with an 87.5% recovery rate yielding 3,010 kg of gold. The tailings retreatment plant processed 752,937 t of tailing grading at 2.6 g/t and a recovery rate of 28.2% producing 637 kg of gold. Total gold production from Yellowknife operation was 3,647 kg compared to 3,270 kg in 1989.

Open pit mining ceased in June of 1990. This loss of production was offset by increasing tonnage from underground mining, extraction of higher grade ore and improvements in mineral processing. An access ramp from surface to the 1500 Level workings, was started in 1989, became serviceable early in 1990 and provides increased equipment mobility and operational flexibility.


THE GEOLOGY
OF THE
NORTHWEST TERRITORIES
ARCTIC COASTAL PLAIN
Flat-lying undeformed sediments:
Oil and gas
CORDILLERAN PROVINCE
Deformed, metamorphosed sediments and minor volcanics:
Stratiform, vein and carbonate hosted lead-zinc-silver; skarn tungsten ≻ copper; porphyry copper-molybdenum; vein gold or silver; asbestos + nickel-copper
ARCTIC & INTERIOR PLATFORM
Flat-lying undeformed sediments:
Mississippi Valley Type (MVT) lead-zinc (-silver); coal; diamonds
INNUITIAN PROVINCE
Flat-lying undeformed sediments with minor volcanics:
Coal
Strong deformed and metamorphosed sediments and volcanics:
MVT lead-zinc
PRECAMBRIAN SHEILD
Granite, granite gneiss, migmatite, granulitic gneiss, charnockite
opper
GLACIER
ELLESMERE ISLAND
Arctic Ocean
Baffin Bay
Beaufort Sea
AUYITTUQ NATIONAL PARK
BAFFIN ISLAND
IQALUIT
INUVIK
VICTORIA ISLAND
CAMBRIDGE BAY
NORMAN WELLS
Great Bear Lake
THELON GAME SANCTUARY
BAKER LAKE
RANKIN INLET
1 2 & 6
7
YELLOWKNIFE
Great Slave Lake
NAHANNI NATIONAL PARK
HAY RIVER
MINE POINT
WOOD BUFFALO NATIONAL PARK
60°
104°
500 Km
Hudson Bay
BELCHER ISLANDS
PRODUCING MINES
1. NERCO-CON
2. GIANT YELLOWKNIFE
3. NANISIVIK
4. LUPIN
5. POLARIS
6. PTARMIGAN
7. COLOMAC
SYMBOLS
ALL-WEATHER ROADS
WINTER ROADS
RAILROADS (inactive)
HYDRO-ELECTRIC PLANTS
AREAS OF
PROPOSED
PRODUCED BY:
CANADA / NWT
Mineral Development
Agreement

Fg e 5:

Lupin Mine (Echo Bay Mines Ltd.)

The Lupin Mine is 400 km northeast of Yellowknife, just 90 km south of the Arctic circle. The operation is supported by three Boeing 727 flights per week from Edmonton and a 600 km winter road from Yellowknife. The winter road is usually open for tractor-trailer haulage of supplies from late January to early April. Between 700 and 900 round trips, each taking 48 hours, bring more than 18.4 million litres of diesel fuel and 5.9 million kg of bulk supplies to the mine.

Since start-up in 1982, the mine has produced more than 46,654 kg of gold; current reserves are 43,544 kg. Production statistics for 1990 are: 681,912 t of ore mined and milled at an average grade of 10.26 g/t with a 94.2% recovery rate yielding 6,072 kg of gold. The stated cash production cost/oz is US$229.

During 1990, Echo Bay began deepening the mine shaft by 268 m and extending an internal underground spiral ramp 189 m. For the first time, large mined-out stopes were back-filled with waste rock to provide additional structural stability. This will allow access to an otherwise unmineable block of ore containing up to 1,555 kg of gold.

Ptarmigan Mine (Treminco Resources Ltd.)

The Ptarmigan Mine, 15 km east of Yellowknife, operated at a capacity of 197 t/day, milling 59,040 t and producing 585 kg of gold during 1990. An access ramp was developed to a newly discovered gold-bearing zone.

Colomac Mine (NorthWest Gold Corp.)

The Colomac Mine began operations in May 1990. The site, 220 km north of Yellowknife, was built at a cost of $166 million. The operation was planned to process 9,840 t per day at an average grade of 1.9 g/t gold yielding about 6,220 kg of gold per year over an eight year mine-life. At the start of production, reserves stood at 26.2 million tonnes (Mt) grading 1.9 g/t gold with production initially from a higher grade core of 17.2 Mt grading 2.1 g/t gold.

The operation employs approximately 300 people. Under an agreement with the local Dogrib Tribal Council, 25°/0 of employees are from native communities and contracts are tendered in a manner that encourages local native business participation in the operation.

At year-end, Colomac had milled 1,494,204 t to produce 2,163 kg of gold. At the time of writing, Colomac is experiencing financial difficulties and is expected to close at some time in 1991.

Polaris Mine (Cominco Ltd.)

The Polaris Mine, the most northerly mine in the western hemisphere, is on the north end of Little Cornwallis Island. Preliminary data indicate that production at Polaris is down slightly. In 1990, 1,007,400 t of ore was milled to produce 138,670 t of zinc and 34,130 t of lead concentrates compared to the 1989 production of 1,023,300 t of ore producing 139,207 t of zinc and 32,066 t of lead concentrates.

Nanisivik Mine (Conwest Exploration Co. Ltd.)

Nanisivik Mine, near Arctic Bay on the northern part of Baffin Island, increased production to 780,312 t of ore milled resulting in 61,992 t of zinc and 2,317 t of lead concentrates as well as 18,350 kg of silver. [n 1989, 706,000 t of ore were processed to produce 57,000 t zinc concentrate, **2,200 t** lead concentrate and 16,300 kg silver. Native employees comprise 25% of the average workforce of 190 to 200 people.

Production Trends

Gold continues to be a major focus of mining companies. The high value/weight ratio of gold ensures gold's position as a preferred exploration target in the NWT where high transportation costs are an important consideration. NWT gold production has increased 3.5 fold from 4,200 kg in 1980 to 15,000 kg in 1990 (Figure 6), while its dollar value has increased just 2.2 times (Figure 7).

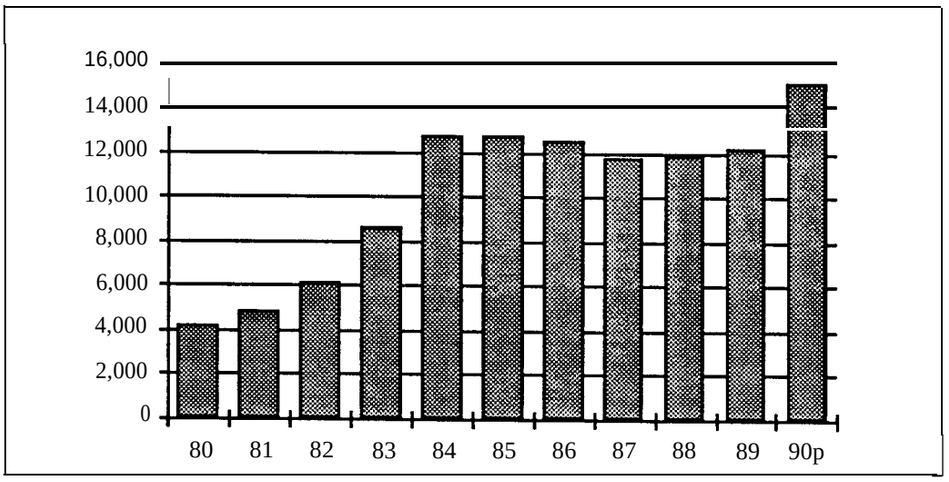


*Figure **6: NWT GOLD SHIPMENTS (kg)***
Source - Statistics Canada: Canada's Mineral Production Cat. 26-202

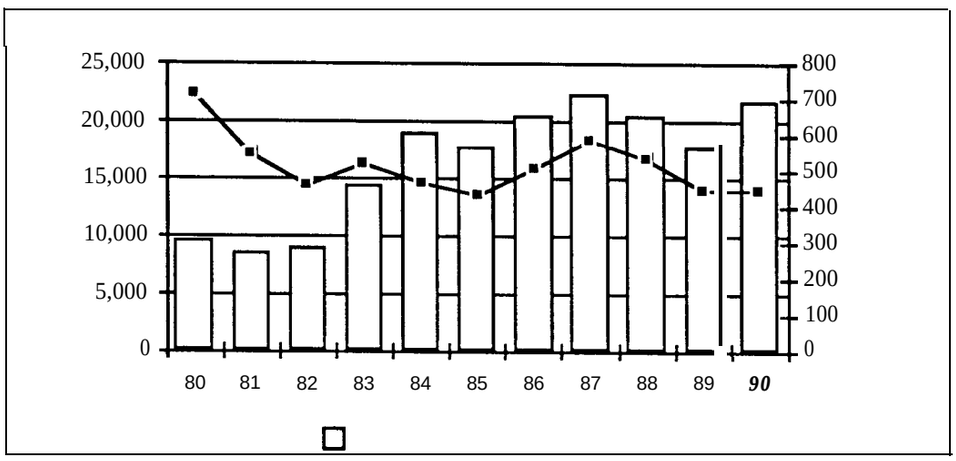


*Figure 7: **GOLD PRODUCTION VALUE AND PRICE***
Source - Statistics Canada : Canada's Mineral Production Cat. 26-202; Handy& Harman and Bank of Canada exchange rates

Despite the attraction of gold, the value of zinc production exceeds that of gold by almost 3 to 1. Zinc shipments have increased 1.8 fold between 1980 and 1990 while the value of these shipments has increased 3.5 fold.

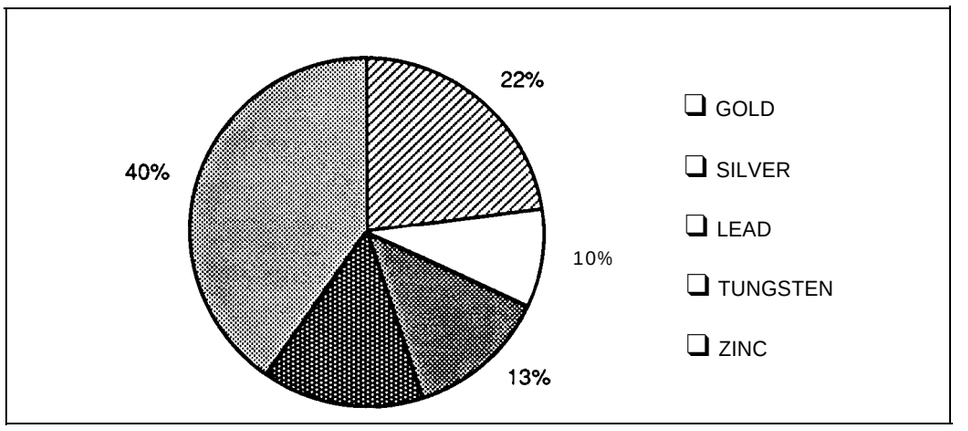


Figure 8: ***VALUE OF NWT METAL SHIPMENTS 1980***
Source - Statistics Canada: Canada's Mineral Production, Cat. 26-202

Figures 8 and 9 illustrate the 1980-90 change in NWT metal production and shipments. Closure of the Pine Point Mine (1989) and cessation of the mine's zinc concentrate shipments (1990), combined with depressed commodity prices,

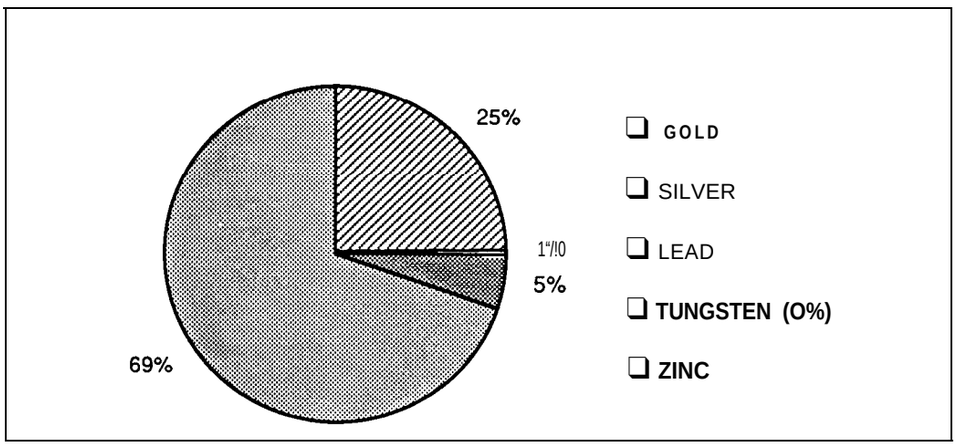


Figure 9: ***VALUE OF NWT METAL SHIPMENTS 1990***
Source - Mineral Policy EMR, Canada

have significantly reduced the value of lead and silver shipments over the ten year period by 60% and 94% respectively.

In 1990, 70% of the value of NWT metal shipments was from two zinc mines while five gold mines produced 25%.

Zinc and Lead

Present NWT zinc and lead production comes from two high Arctic mines: Cominco's Polaris Mine (75°/0) and Conwest's Nanisivik Mine (25%). At both mines, zinc is the primary and lead the secondary product; silver and cadmium are by-products.

Figure 10 shows the very strong correlation between annual zinc prices and production rates over the last ten years. By-product lead production does not necessarily correlate with lead metal prices (Figure 11).

Figure 10 also shows the very significant dollar value of zinc and lead production. NWT zinc constituted 25.0% of Canada's 1990 zinc production. The NWT shipped 317,298 t of zinc having a value of $611.4 million in 1990.

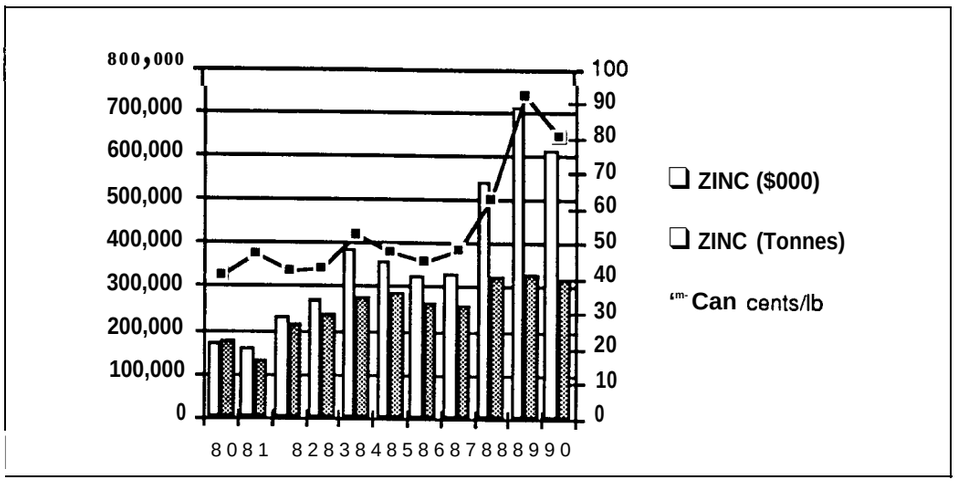


Figure 10: ***ZINC PRODUCTION AND VALUE IN NWT IN COMPARISON TO ZINC PRICES***

Source - Statistics Canada: Canada's Mineral Production, Cat. 26-202; London Metals Exchange cash lead price & Bank of Canada exchange rates

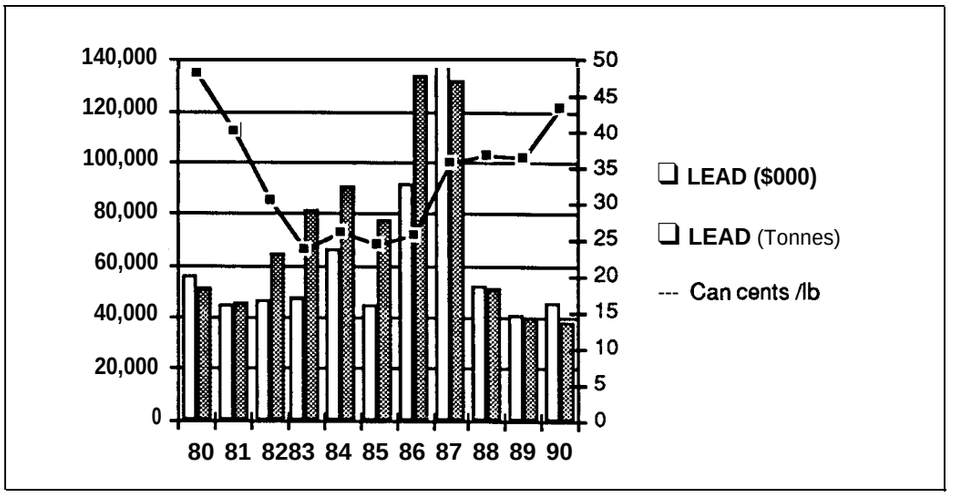


Figure 11: ***LEAD PRODUCTION AND ITS VALUE IN NWT IN COMPARISON TO LEAD PRICES***

Source - Statistics Canada: Canada's Mineral Production Cat. 26-202; LME cash price & Bank of Canada exchange rate

Gold

For seven years, 1983 to 1989, NWT gold **output was dominated by three large** gold mines. Production remained relatively constant between 11,740 and 12,732 kg of gold/annum (Figure 6). Gold production reached a record 15,400 kg in 1990, from five mines; up from 12,051 kg in 1989 and 11,880 kg in 1988.

Preliminary data for 1990 indicates gold accounted for 24.6% of the value of NWT metal shipments and 9.10/0 of Canada's gold production.

Gold remained the favourite exploration target for prospectors and mining companies alike. Favorable geology, low land acquisition costs, high expected success rates, the high unit value of gold production and the lowest royalty rates in Canada encourage explorationists to work in the NWT.

Metal Prices

Gold

Gold has been trading at or below $US430/oz since September, 1988. It began a steady decline from $US419/02 in January 1990 to $US347/oz in June. Rising tensions in the Middle East, and Iraq's invasion of Kuwait, added short-term upward volatility to world gold trading markets. Gold prices rose to $US370/oz to $US400/oz in the latter part of 1990.

Production in the Western World has been rising due to successful exploration across North America utilizing new theories for the formation of gold deposits, and extensive exploration actively stimulated by favorable Canadian tax incentives. The successful application of new, low cost heap leach technology for recovering gold has been primarily carried out in the US. Concurrently, high interest rates and relatively low inflation reduced the attractiveness of gold as an investment.

Zinc

Zinc began and ended 1990 in market commodity troughs, trading at or below $USI 300/t in both January and December (Figure 12). For seven of the ten intervening months, zinc

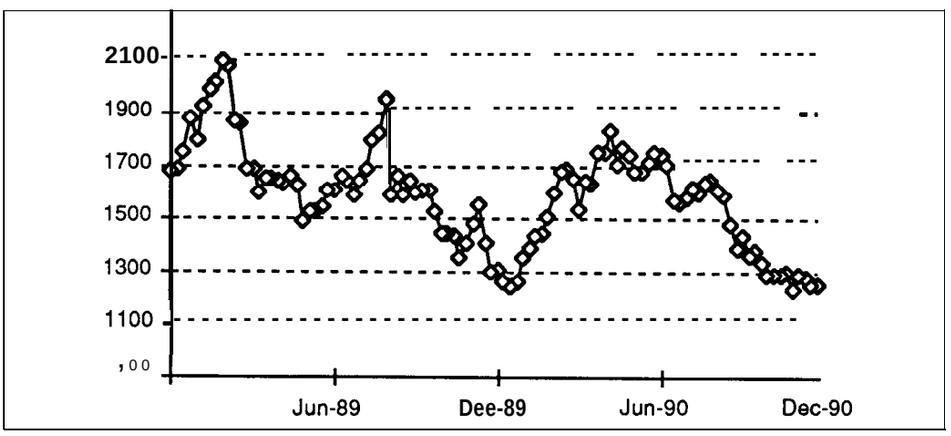


*Figure **12: ZINC WEEKLY CLOSING PRICES ($US/t)***
Source - London Metals; Market fax Infoservices Ltd.

traded above $US1 500/t rising to a high of $US1835/t in May. In late July, the price of zinc fell $US150/t.

Despite increasing evidence of recession in North America and Europe, zinc markets through June and much of July exceeded the predictions of many analysts as both demand and prices remained firm. A combination of factors, including uncertainty due to Iraq's invasion of Kuwait, resulted in the zinc price decline resuming in mid-September.

Lead

Lead traded above £400/t for the first three quarters of 1990 (Figure 13). A jump to £800/t in March is attributed to traders competing in an attempt to cover their 'short' positions when surprisingly strong demand exceeded lower than usual supplies resulting from labour and technical problems at smelters in Canada, Italy and Peru. As the recession in North America and Europe took hold, demand declined and the price of lead slid from £500/t in April to £330/t in December 1990.

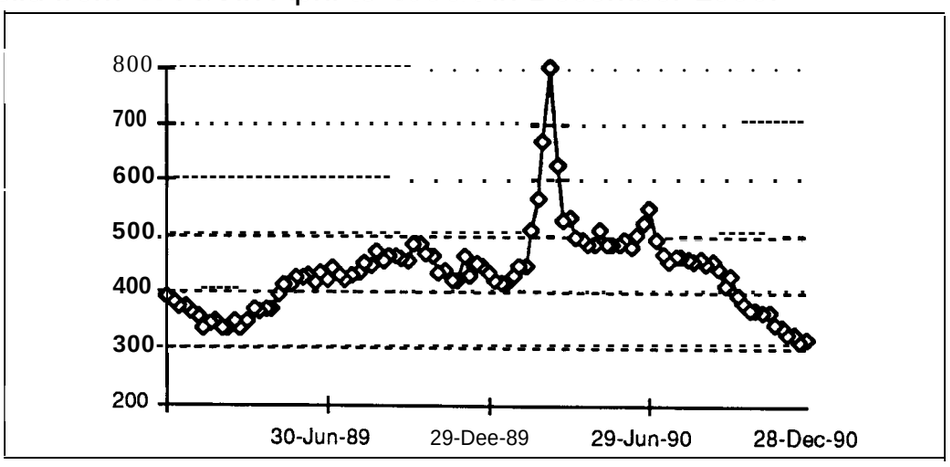


*Figure **13: LEAD WEEKLY CLOSING PRICES (Pound Sterling/t)***
Source - London Metals; Marketfax In foservices Ltd.

Approximately 60% of recent lead production is used for lead - acid batteries in motor vehicles. A high percentage of lead is supplied as a by-product of zinc, copper or silver mines. Hence the supply and pricing of lead is heavily influenced by the economics of other metals. The Western World con-

sumes about 5.5 Mt of lead annually. Scrap metal recycling recovers approximately 2 Mt.

Silver

Silver decreased by 20% in value from $US5.20/oz in January to $US4.1 O/oz in December 1990. The downward trend, similar to those for zinc, platinum and palladium, may reflect decreasing demand as industry enters a period of economic recession (Figure 14).

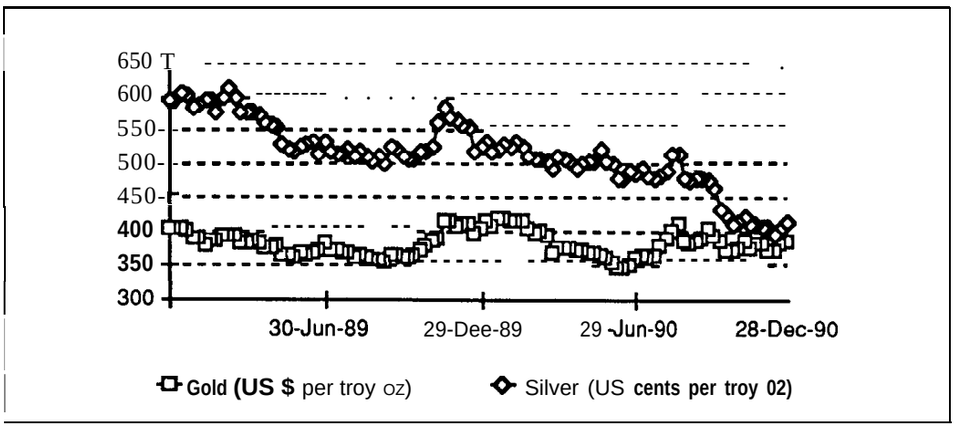


Figure 14: ***GOLD AND SILVER WEEKLY CLOSING PRICES***
Gold: London P.M. fixing
Silver: Handy & Harman
Source - Market fax Infoservices Ltd.

Principal end-uses for silver are photography, electrical/electronic components and investment demands. New technologies and substitutions threaten the industrial use of silver. Silver investment demand has been erratic, variable, and sometimes considerably speculative.

Demand for silver exceeds mine production with deficits being made up by secondary sources such as salvage or recycling, sales from private stocks, central banks or centrally planned (communist) economies and demonetarized (old) coinage. Large US stockpiles of processed silver mitigate upward price mobility in the market.

Equity Markets

Canada's five equity markets, and in particular the Toronto (TSE) and Vancouver (VSE) stock exchanges, have provided much of the venture capital required to conduct mineral exploration and development in the NWT and Canada.

Examination of TSE and VSE indices of activity (composite, gold & silver, metal mines) along with such statistics as historical record of equities trading (volume, value, transactions, financings, new listings) provide insight into the ability of Canadian companies to raise venture capital.

The TSE 300 composite index started 1990 on a high of 3,704, fluctuated down to a low of 3,047 by mid-October and recovered to 3,250 by year-end, a 20% decline. The TSE gold and silver index mirrored the composite index (Figure 15), dropping 25% from 8,000 to 6,000 over the year; the metal mines sub-index decline was more moderate (Figure 15).

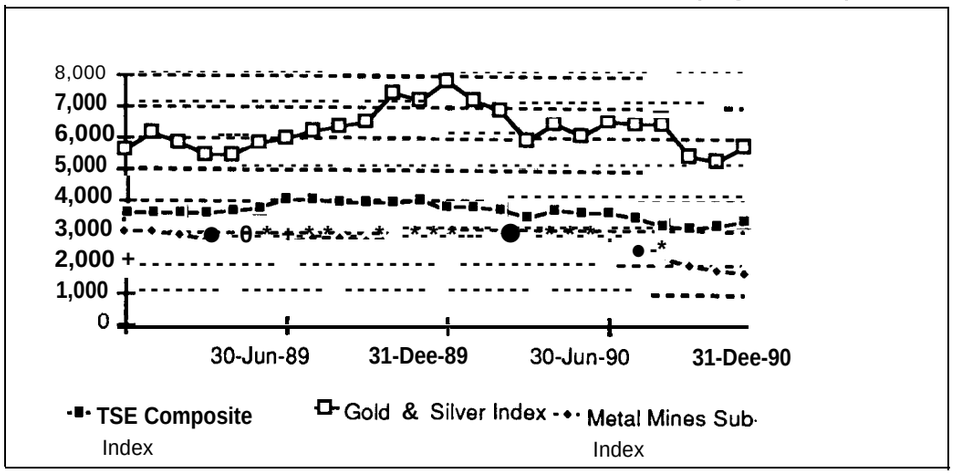


*Figure 15: **TORONTO STOCK EXCHANGE INDICES***
Source - Marketfax In foservices Ltd.

The VSE composite index closed out the year at 527, down 32% from its first quarter close of 777. By comparison, the first quarter close of the previous three years were: 810 in 1989, 1101 in 1988 and 1757 in 1987.

At the end of 1990, 2104 companies were listed on the VSE. Of 1866 companies responding to an annual questionnaire, 1113 were involved in mineral activities: exploration and development of mining properties (1070), producing mining companies (39) and mining services (4).

Venture capital companies require cash investments to carry out their high risk business. However, total VSE financing for 1990 were only $455.7 million compared to $642.3 million in 1989 and $1037.8 million in 1988, decreases of 29% and 56% respectively. This inability of the market to attract new investment dollars to be used in search of new mineral deposits directly impacts on field expenditures.

Taxation Changes

Canadian Exploration Incentive Program (CEIP)

The February, 1990 federal budget eliminated CEIP which had provided a grant of 30% of the cost of prescribed exploration expenses incurred under flow-through share agreements. In 1988 CEIP had replaced mining exploration and earned depletion allowances in the mining industry.

This tax change combined with a declining gold price, recessionary concerns and high interest rates had a strong negative impact on equity markets.

During the last two years it has been difficult to raise venture capital via flow-through share financing on the VSE as Figure 16 illustrates:

Year	Total ($ million)	% of Financings	Number of Projects
1990	92.0	20.2	224
1989	94.5	15.2	294
1988	332.5	32.0	800
1987	309.5	23.0	605

Figure 16: FLOW-THROUGH SHARE FINANCING
Source - VSE Statistics; 1990

Federal Goods and Services Tax (GST)

January 1, 1991 saw the introduction of the GST as a replacement for the previously existing Federal Sales Tax (FST). Mining companies should benefit from the change; however, the net effect on the entire industry is uncertain at this time.

Royalties

Royalty rates in the NWT are the lowest in Canada.

1987-91 Canada-NVVT Mineral Development Agreement (MDA)

The MDA, delivered in part by Energy, Mines and Petroleum Resources (EMPR), was one of the six sub-agreements of the second Canada-NWT Economic Development Agreement (EDA). Commencing in **1987,** and ending on March 31, 1991, $7 million were contributed by the federal and territorial governments to further mineral resource development in the NWT under three programs: Geoscience, Technology Assistance and Mining Information. The programs were designed after consultation with federal agencies and the mining industry.

Geoscience Program

Objectives were to assist and encourage mineral exploration, by improving and increasing the geological data base through mapping high mineral potential areas, detailed studies of significant mineral deposits and the compilation and publication of index maps, bibliographies and data files.

Over thirty multi-year projects across the NWT were supported from a budget of $5.9 million: $3.05 million from EMPR and $2.85 million from the Geological Survey of Canada (GSC). The Geology Division of the federal Department of Indian Affairs and Northern Development (DIAND) provided scientific and logistical support to the projects. To date, over 175 maps of various scales and more than 40 publications have been produced.

Northern Technology Assistance Program (NTAP)

NTAP assisted the private sector in the development and adaptation of innovative technologies to improve mining, mineral processing, and exploration technology in northern conditions. The scientific authority for the projects was supplied by the Canada Centre for Mineral and Energy Technology (CANMET) of Energy, Mines and Resources Canada (EMR Canada) .

Seven projects were funded under NTAP. The projects ranged from developing a method of mining the pillars at Nanisivik Mine to improving gold recovery rates at Giant Yellowknife Mines. The Nanisivik project has been credited with extending the mine life for a minimum of one year.

Northern Mining Information Program (NMIP)

NMIP promoted greater awareness and understanding of the economic importance of the mining industry to NWT residents and encouraged the participation of northern residents in the mining industry.

NMIP has supported the production of posters, maps, brochures, slides shows, videos and 1600 rock kits for the NWT school system; a monthly newsletter, produced by the NWT Chamber of Mines; and trips by EMPR geologists and representatives of the NWT Chamber of Mines to schools in selected Kitikmeot communities and Yellowknife.

1991-96 Mineral Development Agreement

The new Economic Development Agreement was signed in February, 1991. The territorial government, DIAND and EMR Canada are jointly designing a number of Mineral Initiatives including Geosciences, Technology Assistance, Mining Information and Prospectors' Assistance. The new Mineral Initiatives will be in place during the summer of 1991.

Exploration

General Summary

Exploration levels, indicated by the number of claims staked, expenditures, number of active projects, and to a lesser extent the number of prospecting permits issued, declined during 1990. The NWT Chamber of Mines' annual survey of exploration companies active in the NWT **indicates that in 1990,** $38.03 million **was** spenton exploration: $28.47 million in the Mackenzie region, $8.10 million in the Keewatin and $1.455 million in the Arctic Islands. Fifteen percent of the expenditures were financed through CEIP.

Exploration expenditures in 1990 declined 45% from $55.05 million spent in 1989, although the NWT retained 6.1 to 6.3°/0 of total Canadian exploration dollars. The decline was due in part to the drop in the price of gold, poor metal markets, and tight money markets. One program, the $35 million underground exploration program at the Tundra Deposit (**Noranda Inc., Hemlo Gold Mines,** and **Total Energold**) accounted for a significant portion of the decline. The program terminated as the gold grades encountered did not support a production decision at that time, although the deposit represents a substantial gold inventory.

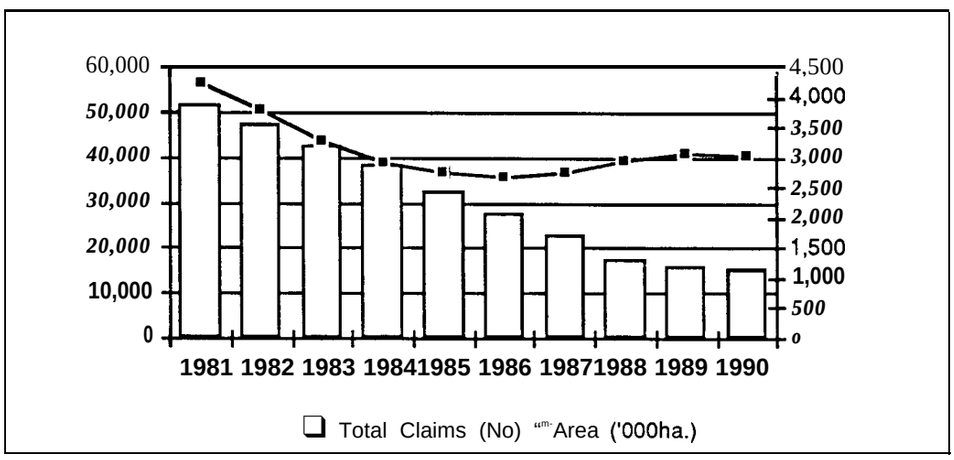


Figure 17: ***MINERAL CLAIMS IN GOOD STANDING***
Source - Statistics Quarterly, Bureau of Statistics, GNWT

The total number of claims in good standing has decreased since the early 1980s. However, 66 prospecting permits were issued in 1990, the most since 1983. During 1990, an area covering 281,902 hectares (ha) was staked, while over the same period, 437,228 ha lapsed. Claims in good standing at the end of 1990 totalled 15,477 and covered 3,029,271 ha (Figure 17).

Exploration

In the Interior Platform, west of Great Slave Lake, 27,000 ha were staked, an increase from 19,200 ha in 1989. Exploration targets included lead-zinc deposits and diamonds.

Exploration of the Arctic Islands has increased as indicated by the staking of 38,000 ha in 1990 compared to 15,400 ha in 1989. Base metals were explored for around the area of the Nanisivik Mine, and on Truro, Little Cornwallis and Victoria islands.

In the Keewatin District 117,000 ha were staked compared to 139,300 ha in 1989. Thirteen properties were actively explored for gold, base metals and uranium. **Asamera Minerals Inc.** in joint venture with **Comaplex Resources International Ltd.** obtained promising results from gold exploration on their Meliadine River property northeast of Rankin Inlet, and their Meadowbank River project, 300 km northwest of Rankin Inlet.

In the southeastern Mackenzie District, south of the East Arm of Great Slave Lake, only 1000 ha were staked in 1990, a decline from a high of 22,000 ha staked in 1988. Two companies were active evaluating copper-zinc-silver-gold and copper-nickel-gold-platinum group element showings.

Activity in the Slave Structural Province, which underlies the area between Yellowknife and the Coronation Gulf, decreased significantly. Only 87,000 ha were staked in 1990, a decline from the five year peak of 423,500 ha staked in 1988. Exploration was for a number of commodities, but predominantly gold. **Cameron Mining Ltd.** and New **Era Development Ltd.** milled 1700 t of handpicked material from 1989 and 1990 bulk

samples taken from the Burnt Island property in Gordon Lake, approximately 120 km northeast of Yellowknife. Results are pending. **Can-Mac Exploration Ltd.** milled 1015 t of a 2300 t bulk sample taken from the Mon Property, 50 km north of Yellowknife. The sample graded 5.5 g/t gold.

The Bear Province, north of Great Bear Lake, has been sporadically explored over the past five years. Although the trend has been an overall decline in staking over that period, 12,000 ha were staked in **1990,** up from 6,500 ha in 1989.

In 1990 no new areas were staked in the Cordilleran District. One company explored for polymetallic base metals deposits in the area.

Advanced Exploration

The George Lake Joint Venture **(Homestake Mining Company Ltd. and Kerr-McGee Corporation)** continued exploration of five iron formation hosted gold deposits in the George Lake Belt, 525 km northeast of Yellowknife. In January 1990, estimated reserves were announced of between 0.2 and 1.0 Mt grading at least 10 g/t for each of the five zones. The company plans 24,000 m of additional diamond drilling.

BHP-Utah Mines Ltd. continued gold exploration on the ULU claims in the High Lake Belt, approximately 550 km north of Yellowknife. The extensive $3.5 million exploration program included drilling of approximately 18,000 m. The Ulu deposit, a siliceous shear zone in mafic volcanics, has been drill tested for a strike length of 250 m to a depth of 500 m. The company plans to mobilize a 50 person crew during the 1991 field season for further exploration and 15,000 m of diamond drilling.

Athabaska Gold Resources and **Chevron Minerals Ltd.** completed a $400,000 exploration program at the Nicholas Lake deposit approximately 75 km north of Yellowknife. Indicated reserves of 557,000 t grading 12.3 g/t gold suggest the deposit could support a 400 t/day mining operation. Chevron Minerals is attempting to sell the 40% interest they hold in the project. Athabaska Gold Resources Ltd. plans to conduct a

$3 million underground bulk sample test of the deposit when financing is available.

Noranda Exploration Ltd. optioned claims of the Sunrise base metals deposit (**Aber** Resources Ltd. and Hemisphere Development **Corp)** and conducted a $1.2 million diamond-drill test of the deposit. Estimated reserves for the deposit are 1.8 Mt grading 8.9% zinc, 4.2°/0 lead, 405 g/t silver and 1 g/t gold. The option agreement was terminated in the autumn of 1990. Aber and Hemisphere anticipate further exploration of the deposit in 1991.

Cominco Ltd. and **Westview Resources Inc.** completed $750,000 of diamond drilling, mapping and geophysics on the REN claims 330 km north of Yellowknife. Estimated reserves were published in 1990 of 2 to 3 Mt grading 10 g/t gold.

In 1989 **Urangesellschaft** submitted their Environmental Impact Statement for the proposed Kiggavik (Lone Gull) Mine. A number of organizations outlined deficiencies in the statement, and in 1990, Urangesellschaft requested that the Federal Environmental Assessment and Review Office panel to delay indefinitely the environmental assessment hearings for the project. The project cannot be continued without approval through the public review process.

Operating mines continued surface exploration of their mine leases. **Nerco Inc.** completed an **$800,000** program of geophysical and geochemical surveys, diamond drilling, mapping and trenching on their mine leases. **Treminco Resources** conducted surface drilling on the Tom and Ptarmigan properties. **Echo Bay Gold Mines Ltd.** explored the Lupin Mine property during a $1 million program of diamond drilling, geophysical and geological surveys and have budgeted **$700,000** for further exploration in 1991. **Giant Yellowknife Mines** drilled four deep surface exploration holes from the mine property. **Conwest** completed diamond drilling and geophysical surveys in the Nanisivik Mine area. **Cominco** explored deposits on northeastern Little Cornwallis Island.

Sources

The following agencies can be contacted for more information about the mineral industry in the NWT:

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