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### MOUNT MILLIGAN

After the Iskut River "Golden Triangle" region north of Stewart, Mount Milligan is B.C.'s most high-profile mining site. The area southwest of Mackenzie is being touted as one of the world's largest potential gold-copper producers.



**GENERAL LOCATION** 

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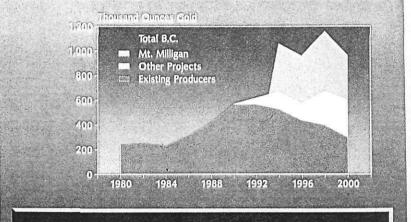
# • Mount Milligan Reaching a new high

The history of mineral exploration is littered with stories of spectacular successes, lost opportunities and miserable failures. Mt. Milligan is one of the success stories. From an unknown deposit three years ago, it is now hailed as one of the world's largest gold-copper deposits.

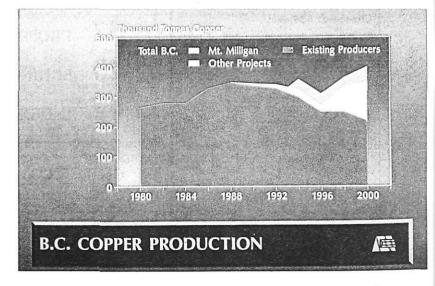
The development of Mt. Milligan is a joint venture between BP Resources Canada Limited (30 per cent) and Continental Gold (70 per cent), who is also the project operator. The actual site is located about 160 kilometres (100 miles) north of Prince George, B.C., and comprises two adjoining deposits: Mt. Milligan and Southern Star.

According to Continental Gold's 1989 annual report, current drilling indicates reserves of 440 million tons containing 6.3 million ounces of gold and 1.8 billion pounds of copper. This represents 17 per cent of Canada's undeveloped gold reserves and 20 per cent of the country's undeveloped copper reserves.

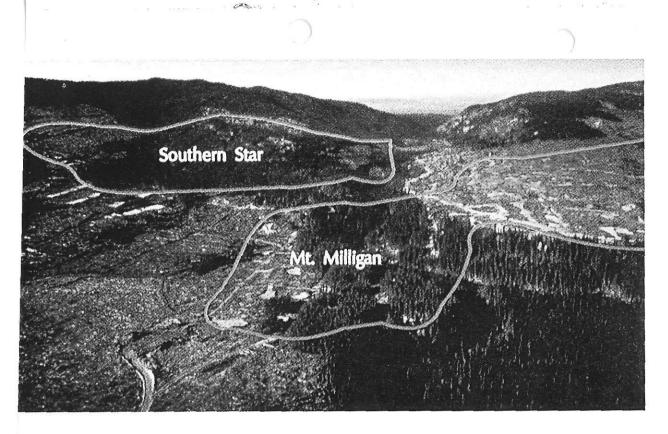
"At this stage, preliminary projections indicate conventional milling at 60,000 tons per day will yield low cost production of up to 400,000 ounces of gold and 83 million pounds of copper annually," says company chair-



**B.C. GOLD PRODUCTION** 



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man Robert Hunter in the annual report. The mine would have an expected lifespan in excess of 15 years.

By the end of 1989, the exploration program had cost \$11.6 million. Over 94 500 metres (315,000 feet) of diamond core drilling in more than 400 holes had confirmed two major bulk tonnage gold-copper deposits. Average grades for the deposits are 0.0014 ounces gold per ton and 0.20 per cent copper.

Mt. Milligan and Southern Star are located in the tectonic geological belt called the Quesnel Trough. The belt starts in the south near Princeton, B.C. and extends in a northwesterly direction across the province ending near the Alaskan panhandle.

Several major deposits are currently mined in the trough. These include Princeton Mining Corp.'s Copper Mountain and Ingerbell mines near Princeton; Teck Corp.'s Afton and Ajax mines near Kamloops; and the Gibraltar Mine near Williams Lake.

Past investigations have shown that the Quesnel Trough is favourable for the development of large deposits of gold-copper mineralization in alkaline intrusive porphyries. Exploration tended to focus on the copper content and many large discoveries were made in the 1950s and 1960s. The gold content was neglected because of low concentrations.



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by Ric Sinclair

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#### Filling the gap

The Mt. Milligan project couldn't come at a better time for the B.C. mining industry. For the past 30 years such honoured names as Copper Mountain, Gibraltar and Highland Valley have produced billions of pounds of copper and large quantities of gold as a byproduct. Some industry analysts suggest that the output from the existing mines could decline considerably over the next five years.

Depressed copper prices, especially

during the first half of the 1980s, inhibited exploration efforts in the province. It was only during the latter part of the decade that gold in the porphyry environment attracted attention and became the primary economic target with accompanying copper production.

Jeff Franzen, director of Continental Gold, says the project has been put on a fast-track schedule. The environment impact statement and the feasibility study are proceeding concurrently at an estimated cost of \$7.1

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The deposits are relatively shallow, underlying an overburden averaging 22 metres (75 feet) thick. The Mt. Milligan deposit measures up to 1 200 metres (4,000 feet) by 780 metres (2,600 feet) and is up to 390 metres (1,300 feet) deep. The Southern Star deposit has slightly smaller dimensions. The deposits are ideally suifed for open pit mine development, and preliminary engineering estimate stripping ratios in the range of 1.2 to 1.

Franzen says that no significant environment values will be adversely affected by the proposed mine. Most of the Mt. Milligan site has been clearcut logged, salmon do not occur in the region's streams and no heritage sites have been recorded. The porphyry deposits, which are naturally alkaline, will eliminate any acid leaching from the waste dump and tailings pounds.

The project is well situated to take advantage of existing regional infrastructure. Located close to existing mines and the communities of Mackenzie and Fort St. James, the project has easy access to electricity and rail transport. In addition, several major mines will be depleted within the next few years, making available a ready pool of trained personnel.

A conventional crushing, grinding and flotation process is expected to recover a premium copper concentrate containing 1.5 to 5.5 ounces gold per ton. An 80 to 90 per cent recovery rate is expected for each mineral. The concentrate will be shipped for processing, probably to Japan. The lack of an on-site smelter or the use of a cyanide gold recovery process will help speed up the environmental permitting process.

Detailed engineering of the mine and auxiliary facilities is planned to begin in 1991. If the estimated financing of \$300 million can be put in place, the mine will be in full-scale production by 1993.

### Spurred further activity

Continental Gold has translated the discovery into a stock market success. It has enjoyed strong share prices and some investment firms suggest that the company is undervalued at current prices. The recent buy-out by Placer Dome Inc. has helped remove the only dark cloud hanging over the project, which was BP's lawsuit against its joint-venture partner. (See accompanying story, "Mount Milligan: A look back.")

The project has also spurred exploration companies to seek their own "Mt. Milligan look-alikes." There are currently 35 senior and junior companies with interests in the area, some reviewing existing deposits and others seeking blind targets.

The fact that the Mt. Milligan and Southern Star deposits were blind with no surface expression gives other exploration companies some encouragement. The Mt. Milligan area had been investigated by several companies for more than a decade before the deposits were discovered. As far back as 1937 a gold float was discovered in the area, but the source of the float was not found.

The Cat Mountain property, owned by BP Resources Canada (53 per cent) and Lysander Gold Corporation (47 per cent), has many characteristics in common with the Mt. Milligan deposits. It is located 150 km north, on Quesnel Trough, and contains alkaline gold and copper porphyry deposits. The project is the subject of a \$1.2 million 1989 joint venture exploration program on claims encompassing approximately 31 aquare kilometres.

The Cat property was first examined for lode gold in the 1950s and for copper in the 1970s. However, the first discovery of widespread gold was made in 1984 and Lysander started exploration during that year.

The Chuchi Lake project is located 32 km (20 miles) northwest of Mt. Milligan. The project is a 50-50 joint venture between BP Resources Canada and Digger Resources Inc. Drilling in 1989 confirmed a mineralized porphyry system. An airborne magnetometer survey was flown over the property and additional anomalies have been defined. The joint venture partners plan additional drilling for this year.

Kookaburra Gold Corp. has recently completed an induced polarization survey on the Col property, 45 km west of Mt. Milligan. The survey successfully extended the anomalies previously found. Earlier studies of the property had confirmed the ex-

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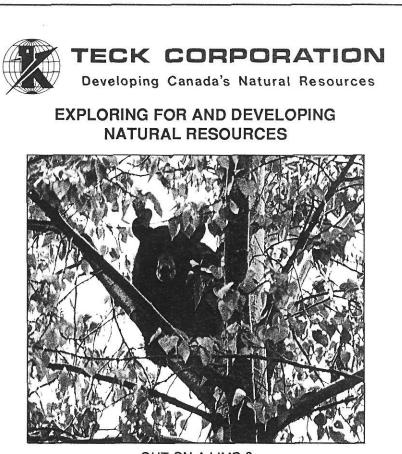
istence of at least 2 million tons at a copper grade of 0.6 per cent.

According to a compilation of the Omineca Porphyry Copper-Gold District by Yorkton Continental Securities Inc., another six properties in the Mt. Milligan vicinity have known gold-copper porphyry deposits. These include the Tas property, Indata property, Swan property, Takla-Rainbow property, Tam property and the Lorraine deposit.

The known deposits will be subject to intensive exploration over the next

few years. Companies will be looking for the indicators that point the way to another Mt. Milligan type of deposit hidden deep within their properties.

The inherent strength of the Mt. Milligan project is not simply in the large size of mineral deposits and its low production costs. The existence of two metals provides the mine flexibility and some protection from fluctuating prices. As one commentator phrased it, "It's gold for the price of copper."



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### MOUNT MILLIGAN

# A look back

t is ironic that a gold-bearing float was discovered on the western flank of Mt. Milligan in 1937 by prospector George Snell. Float samples returned assays up to 148 grams per tonne gold, but the source of the float was not found and no other gold-bearing mineralization was discovered at the time.

During the 1970s and early 1980s, Mt. Milligan was staked by several different companies and tested for mineralization deposits. In 1972 Pechiney Development Ltd. used induced polarization to test for porphyry copper mineralization. The claims were allowed to lapse.

In 1984-85, BP Resources Canada Inc. undertook extensive geological surveys that identified some porphyry gold-copper, but the exploration program was abandoned in early 1986. The property was optioned from BP

by a junior company, later to become United Lincoln Resources Inc., which resumed work on the site.

The first discovery hole was drilled into the gold-copper deposit in September 1987. Drilling in the following years substantiated the discovery of a major deposit at Mt. Milligan and the adjoining Southern Star deposit. By the beginning of 1990, after coring more than 96 kilometres in over 400 diamond-drill holes, drilling had delineated in excess of 400 million tonnes of gold-copper mineralization.

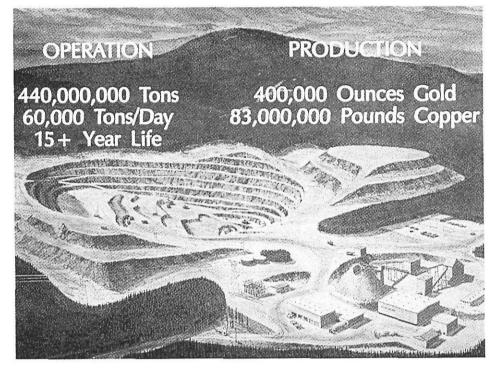
Ownership of the deposits has changed substantially since its discovery. In August 1988, Continental Gold Corp. acquired 64 per cent of the outstanding shares of United Lincoln Resources Inc. and the two companies merged in 1989.

BP Resource's interest in the property had diluted to 30.16 per cent by 1988, but maintained this level by funding on-going exploration.

In October 1989, BP Resources issued a writ alleging that Continental Gold had breached the property agreement by amalgamating with its subsidiary. BP claimed that its right of first refusal to buy the joint venture claims was breached.

Continental Gold contended the case was without merit and issued a counter claim for damages resulting from the writ.

Breaking through this gridlock of intrigue, claim and



counter claim is the recent take-over bid by Placer Dome Inc.

"On August 31st, we announced that we had signed an agreement with BP to purchase their claims to the Mt. Milligan property, subject to approval under the Canadian Competition Act," says John Eckersley, a spokesman for Placer Dome.

On September 14, a press release from Placer Dome confirmed the company had completed its purchase of BP's 30.16 per cent interest in the Mt. Milligan property for \$78.8 million; the deal included BP's interest in the joint-venture agreement with Continental and in the outstanding litigation between BP and Continental.

With the BP situation settled, Placer Dome also confirmed its offer to Continental Gold shareholders of \$20 (Canadian) a share. At press time, the offer was mailed on or about September 21, 1990 to all shareholders and was to expire October 23, 1990 unless withdrawn or extended.

"Placer Dome already has an agreement with some of Continental Gold's directors, who hold 30 per cent of the company's stock, to tender their shares to us if we make an offer before October 22," explains Eckersley.

While the current round of negotiations and buy-outs is apparently nearing its end, the mining industry's interest in Mt. Milligan should continue to run high for many years to come.  $\hfill \Box$ 

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A geological cross-section

he Quesnel Trough is associated with a number of important mineral deposits in B.C. The trough traverses the province from the south close to the U.S. border to the northwest corner near the Alaska-B.C. border. Along its length are located established copper mines like Copper Mountain, Ingerbell, Afton and Bell Copper. In the northwest the trough is related to the polymetallicgold discoveries of the Stikine Arch, Eskay, Iskut and Stewart. In Central B.C. lies the deposits of Mt. Milligan.

The alkaline porphyry copper deposits along the trough are characterized by their relatively high gold content. The deposits are associated with highly fractured volcanic units or their equivalents. Gold veins also occur in the same geological environment, and are not necessarily restricted to the porphyry copper mineralization.

According to Continental Gold's annual report, the Mt. Milligan project encompasses a ten-squarekilometre area in which the goldcopper rich sulfide system exists around alkali monzonite stocks that intrude volcanic strata.

The deposits do not outcrop or have any surface expression. They were discovered by drill-testing anomalies identified from aerial and ground electromagnetic and magnetic surveys, induced polarization surveys and soil sampling. The Mt. Milligan porphyry deposit is larger and has a higher gold content compared to other known alkaline porphyries.  $\Box$ 

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