

Apr. 9/91

Seminar Notes

Bright Ideas

BEAVERDELL (Pluton) > 37.5 m 22 Ag : TOTAL

Need \$8-\$10/22 Ag / when closed casting ~ \$7/22

~ 90 yrs. of operation / Av. 10 opt Ag heads in '80's -

Dumps provided up to 30% of mill feed.

55-62 Ma batholith host - tonalite = Host
pre + post-ore dykes @ 61 + 51 Ma

Shear Hosted
(Intrusive)

Acanthite + Pyrrhotite/Praustite
→ 'higher' up in system ⇒

EPITHEMAL

+ native Ag, wire Ag

chloritic alt'n halos symmetric to veins

MESOTHERMAL

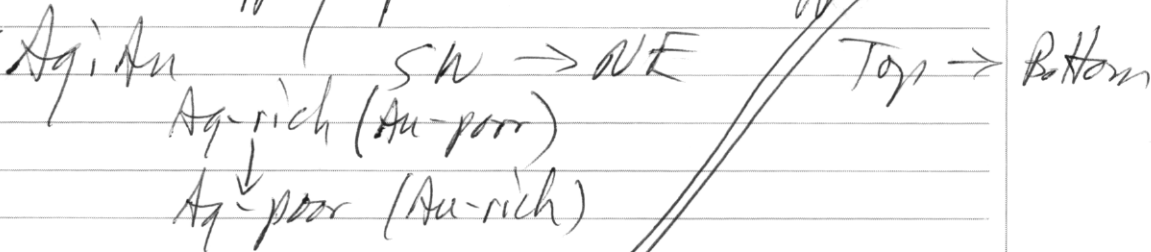
NE dextral zone pre-date mid-Eocene fault (extensional)

> 3000 ft strike of veins

Largest vertical displacement (fault) = 700 ft. to east (dipping)

Also west-dipping post-min. faults offset vein.

ZONING



OPERATIONS



Wolf P. Nickel, Mine Manager,
Afton copper mine, B.C.

serves remain unchanged, at 9.5 million tonnes of 1.5% copper and 0.033 ounces of gold per tonne. The underground reserves are not included in the present mine production program.

Much of the land in the vicinity of the Afton operation is used for cattle ranching and Afton itself operates two ranches acquired in connection with the mine properties. As soon as mining activities have been completed in a particular area, land reclamation activities commence. For example, the waste dumps associated with the Afton, Pothook and Crescent pits have been re-sloped and seeded with a mixture of grasses which will be suitable for cattle grazing.

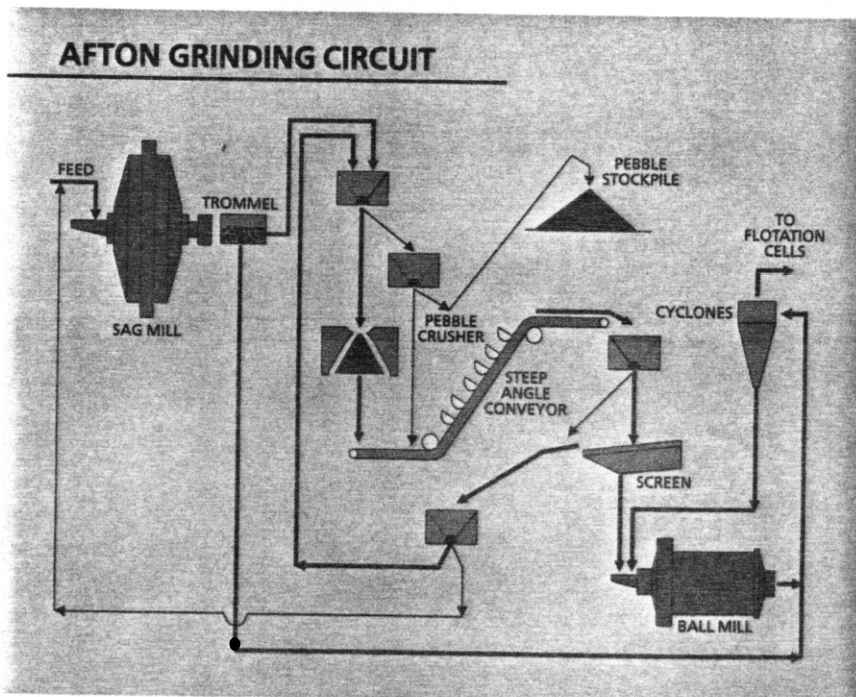
BEAVERDELL (silver)

The Beaverdell silver mine is one of the oldest operating mines in Canada, having a history of continuous production since the turn of the century. It is wholly owned by Teck and is located on the West Kettle River, south of Kelowna, British Columbia.

The Beaverdell mine is a small underground operation which produced 368,669 ounces of silver in 1990, compared with 311,868 ounces the prior year.

Employees at Beaverdell did their utmost to improve productivity during the year and succeeded in improving the ore recovery rate and reducing operating costs. Unfortunately, due to declining silver prices and a high Canadian dollar exchange rate, the Beaverdell mine suffered a small operating loss for the third consecutive year.

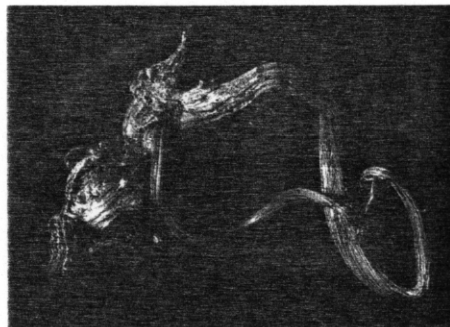
The price of silver has declined from an average of US\$7.01 per ounce in 1987, the last year in which Beaverdell was profitable, to an average of US\$4.82 per ounce in 1990. The price of silver is not expected to increase in the immediate future since current stocks are sufficient to meet consumption for many years and high levels of by-product silver are expected to continue.



1990 Ann. Rpt.

Late in the year, Teck announced that it will be suspending operations at Beaverdell early in 1991, pending an improvement in silver prices or the discovery of higher grade reserves.

It is sad to report that Bruno Goetting passed away on October 22, 1990 after a lengthy illness. Bruno retired in 1988 after 36 years of diligent and faithful service, the last 22 years as Manager of the Beaverdell mine. Bruno was also an avid collector of mineral specimens and his unique collection has been acquired by Teck for future display in Teck's offices.



Rare wire silver specimen from the Beaverdell mine, B.C.

BULLMOOSE (coal)

The Bullmoose mine is an open-pit coal operation located in northeastern British Columbia, approximately 30 kilometres northwest of Tumbler Ridge. It is a joint venture between Teck (60.9%), Rio Algom Ltd. (29.1%) and Nissho Iwai Canada Limited (10%).

Mine development and the wash plant were completed in late 1983 at a cost of \$275 million, which was \$37 million under the original construction budget. Construction was part of a major northern development program which included a 136-kilometre railroad built by B.C. Rail, a new townsite at Tumb-

ler Ridge and a new coal port facility at Prince Rupert.

Metallurgical coal is sold to nine Japanese steel companies under long-term contracts which provide for an annual volume of 1.7 million tonnes. This volume is subject to adjustment up or down by 5% at the option of the purchasers. Sales volume in 1990 was 1.6 million tonnes, roughly the same as in 1989 and the same as forecasted for 1991. Subsequent to the year end, an agreement was signed with the Japanese customers which will result in a price reduction for Bulmoose coal delivered after December 31, 1990 (see "Markets").

During the year the mine supplied 2.0 million tonnes of raw coal to the wash plant and produced 1.5 million tonnes of clean metallurgical coal for a yield of 74%. This production plus coal from inventory satisfied the 1990 contractual sales obligations.

Extremely cold winter temperatures for sustained periods affected pit production. Despite this, the mine achieved 97% of its waste stripping objectives. A 25-day strike by B.C. Rail employees forced the mine to stockpile clean coal at the rail loadout during this period. Accelerated coal shipments during the last few months of the year have essentially eliminated this stockpile.

Total reserves of saleable coal at year end were 38.8 million tonnes, compared with 40.3 million tonnes at the end of 1989. At present levels of output, this is sufficient for 24 years of operations.

Bullmoose operating and management staff are to be congratulated for operating the safest open-pit coal mine in British Columbia in 1990.