

ANACONDA BRITANNIA MINES  
DIVISION OF ANACONDA CANADA LIMITED

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804365

BRITANNIA BEACH, B.C.

(Latitude 49° 37' N, Longitude 123° 12' W, elevation sea level)

LOCATION, ACCESS AND CLIMATE

The Britannia Mine is located approximately 30 miles north of Vancouver on the east shore of Howe Sound. Access to the property is by paved highway and the British Columbia Railway. Deep sea vessels dock right at the plant site.

The following data from 1973 weather recorded at Britannia Beach for a fairly typical year: mean annual temperature 48.8° F., mean January temperature 34.4° F., mean July temperature 62.4° F; frost free days February 18th to November 6th equals 261 days. Total precipitation including snowfall of 18.8 inches was 85.83 inches. Temperature and precipitation are considerably more extreme as one moves a short distance inland where the Company has four dams for hydro-electric power.

HISTORY AND OWNERSHIP

The original mineral discovery was made in 1888 at an elevation of 3,400 feet above sea level. Underground exploratory work disclosed the presence of commercial grade copper mineralization in the early 1900's but production did not start until 1905. Except for short periods of inactivity the mine has been in continuous production. Available records show that the total production to date has been 55 million tons averaging 1.26% copper.

As early as 1901 the Jane, Bluff, Fairview and Daisy ore zones were known and ore reserves in that year were estimated to be 1.8 million tons. Reserves were at a maximum of 19 million tons in 1916 and were at a level of 12 million tons between 1930 and 1939. Production over the years has varied between 200,000 and one million tons per year, but exceeded two million tons between 1929 and 1931 and again between 1937 and 1940. Grade of ore in these years dropped from 1.7% copper to about 1.2%. For the last few years production has been in the 2,000 tons per day range with grade varying between 1.1% and 1.4% copper. Zinc production exceeded copper production during the 1950's.

The property has been operated as a subsidiary of The Anaconda Company since 1963. Previously it was operated by Howe Sound Company and its subsidiary Britannia Mining and Smelting Co. Limited.

GEOLOGY

The Britannia Mine is located in a roof pendant of Mesozoic volcanic and sedimentary rocks which have been folded, sheared, metamorphosed and invaded by several granitic intrusions. The ore zones are located in a linear belt known as the Britannia Shear Zone which varies in width from 300 to 2,000 feet, the known vertical extent is in excess of 6,000 feet.

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MINERAL INDUSTRIES IN WESTERN CANADA  
10th. Commonwealth Mining & Metallurgical Congress  
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The orebodies consist of massive sulphides with assay walls. Ore occurs in several rock types of varying competency. The mineralogy of the ore is fairly simple and consists essentially of pyrite, chalcopyrite and quartz introduced over several periods of mineralization.

A generalized plan and section showing the general relationship of mine levels and surface plant is presented in Figure 1 on a scale of approximately 1 inch equals 3,200 feet.

#### PROPERTY OPERATION

All operations are now located at Britannia Beach whereas a few years ago, mining operations were located at camps several miles inland, particularly at Mount Shear. (See Figure 1) The Beach has been the site of milling operations from the beginning in 1905. Under the direction of a manager and assistant manager, the operating crew as of December 31, 1973, numbered 286. Of these 77 were staff members and 209 hourly rated. There were also 16 contractors who did janitorial work (5), No. 11 Winze crew (9) and miscellaneous (2).

During the year 1973 the Britannia mill processed 548,801 tons of ore at an average grade of 1.45% copper yielding almost 15,000,000 pounds of copper. In addition, the copper precipitation plants processing the mine waters produced almost 500,000 pounds of copper. Silica sand, the coarse fraction of the tailings, produced for sale to cement manufacturers, amounted to 191,000 tons.

#### MINING OPERATION

All the major ore zones above the 4,100 main haulage have been mined out. The mined out zones are the Fairview, Bluff, Empress, Victoria, Jane and No. 4 and No. 5 zones. Mining methods varied from shrinkage, cut and fill, coyote blasting and square-setting to horizontal and vertical ring stoping. Two mines, No. 8 and No. 10 are operational at present. Both are serviced with internal shafts sunk from the 4,100 level. During summer months a very small tonnage of open pit ore has been high-graded from the old surface workings at the 3,300 foot elevation in the Jane Basin area.

#### No. 8 Mine

The No. 8 shaft is a vertical, 3 compartment opening, situated 11,400 feet east of the 4,100 portal. It consists of two 5'6" x 5'6" hoisting compartments and a manway. The shaft extends from 180 feet above the collar on 4,100 level to 1,640 feet below the collar for a total length of 1,820 feet. The level interval is 150 feet, the lowest level being the 5,700 horizon. The hoist is an Ingersoll-Rand double drum 96" x 60, 450 HP, AC, with a 1-1/4" 6 x 21 IWRC rope. Skips are 3-1/2 ton E. Long, top dump. Maximum rope speed is 1,500 feet per minute. The skips are loaded from a slusher trench located on 5,700 level. Muck is scraped with a 48" Eimco folding scraper and a 50 HP Rand slusher into measuring pockets. There is no primary crusher in No. 8 Mine; all the muck is grizzled to minus 12" of the ore pass dumps.