

PRODUCT COPPER
PRODUIT

PROVINCE OR TERRITORY PROVINCE OU TERRITOIRE British Columbia

N.T.S. AREA 92 H/16
RÉGION DU S.N.R.C.

REF. CU 1
RÉF.

NAME OF PROPERTY
NOM DE LA PROPRIÉTÉ

BRENDA

OBJECT LOCATED - Open pit.
OBJET LOCALISÉ

UNCERTAINTY 300 m
FACTEUR D'INCERTITUDE

Lat. 49°52'40" Long. 120°00'20"
Lat. Long.

Mining Division Osoyoos
Division minière

District
District

Kamloops

County
Comté

Township or Parish
Canton ou paroisse

Lot
Lot

Concession or Range
Concession ou rang

Sec
Sect.

Tp.
Ct.

R.
R.

OWNER OR OPERATOR/PROPRIÉTAIRE OU EXPLOITANT

Brenda Mines Ltd.

DESCRIPTION OF DEPOSIT/DESCRIPTION DU GISEMENT

The Brenda copper-molybdenum deposit is within the Brenda stock which is considered to be part of the much larger Pennask batholith of Jurassic age. The batholith was emplaced into rocks of the eugeosynclinal Upper Paleozoic Cache Creek and Chapperon groups on the north and east and into Upper Triassic Nicola Group sedimentary and volcanic rocks on the west.

The Brenda deposit is within the Brenda stock, approximately 390 meters from its contact with the Nicola Group. The stock is a composite, zoned quartz diorite to granodiorite body which is divided into two units, based on the composition and nature of the rock forming minerals. One unit is of quartz diorite composition; the other consists of porphyritic granodiorite with a chilled, finer grained phase.

Pre- and post-ore dykes of several ages and compositions cut the Brenda stock. At least four types, aplite-pegmatite, andesite, trachyte porphyry and basalt, have been identified in the Brenda orebody. Faults in the Brenda pit are expressed as fractured zones in which the rock is intensely altered to clay minerals, sericite, epidote and chlorite. Most strike N70°E and dip steeply southward. see Card 2

Associated minerals or products - Molybdenum, gold, silver.
Minéraux ou produits associés

HISTORY OF EXPLORATION AND DEVELOPMENT
HISTORIQUE DE L'EXPLORATION ET DE LA MISE EN VALEUR

The property is located at the head of Peachland Creek, 14 miles northwest of Peachland. The mineralized zone outcrops between elevations of 5,100 and 5,600 feet on a southeasterly spur between MacDonald and Peachland Creeks. The open pit is primarily on Mineral Lease M-58.

M.S. Hedley, in the 1936 Report of the Minister of Mines, described the property under the name "Iron Horse". This group of 7 claims was owned by Otto and Pete Sandberg and associates, of Kelowna. The workings consisted of open cuts and stripping which exposed a quartz vein over a length of about 200 feet.

Rice in 1944 described the property as the "Copper King". The workings at that time included a 130 foot long adit comprising 70 feet of crosscut and 60 feet of drift on a mineralized quartz vein. The claims were subsequently allowed to lapse.

In 1954, Robert Bechtal, a spare time prospector from Penticton, noticed the increasing rustiness of the granitic rocks while travelling up Peachland Creek and subsequently located the old workings. He restaked the claims a few days later in association with E.S. Hill. In 1955 Bechtal asked B.O. Brynelsen, branch exploration manager for Noranda Mines, Limited, to examine the property. Noranda optioned the claims and in 1956 staked additional claims and put down 3 short diamond drill holes, with discouraging results. Brynelsen then approached Kennecott Copper Corporation and proposed a joint program with Noranda. In June 1957 Northwestern Explorations, Limited, Kennecott's exploration company, began exploration work. An induced potential survey was carried out and about 70 shallow x-ray diamond drill holes totalling 1,585 feet were put down, entirely within the leached zone. The winter of 1957-58 saw Noranda and Kennecott withdraw and the property was returned to Bechtal. Brynelsen and his assistant branch manager, M.M. Menzies, were allowed to advise Bechtal and to provide personal financing for additional testing. Prospecting continued and two deep holes were drilled, the first in 1959 and the second in 1962, mainly for assessment purposes.

In 1964 Nippon Mining Company, Limited, agreed to participate in financing further exploration work, but Canadian participation was not forthcoming. In 1965 M.E.

see Card 2

HISTORY OF PRODUCTION/HISTORIQUE DE LA PRODUCTION

From 1970 to 1974 inclusive 44,234,354 tons of ore were milled. From this ore 20,129 ozs gold, 1,372,994 ozs silver, 169,614,386 lbs copper, and 42,793,509 lbs molybdenum were recovered.

Production for the period 1975-78 inclusive totalled 38 793 561 tonnes. From this ore 463.124 Kg gold, 30 921.638 Kg silver, 59 870 224 Kg copper, and 14 957 192 Kg molybdenum were recovered.

REFERENCES/BIBLIOGRAPHIE

Reports of Minister of Mines, British Columbia:
 1936, p. D 26; 1957, p. 34; 1965, p. 164;
 1966, p. 181; 1967, pp. 183-210+; 1968, p. 215.

Rice, H.M.A.; Geology and Mineral Deposits of the Princeton Map-Area, British Columbia; Memoir 243, p. 110, Geol. Surv. of Canada, 1947.

Geology, Exploration and Mining; British Columbia Dept. of Mines: 1969, p. 292; 1970, p. 381; 1971, p. 288; 1972, p. 142; 1973, p. 163; 1974, p. 126.

Mineral Policy Sector; Corporation Files: "Brenda Mines Ltd."; "Noranda Mines, Limited".

++Soregaroli, A.E.; Geology of the Brenda Copper-Molybdenum Deposit in British Columbia; The Canadian Mining and Metallurgical Bulletin, Vol. 67, No. 750, October 1974, pp. 76-83.

+++Soregaroli, A.E., Whitford, D.F.; Brenda; Porphyry Deposits of the Canadian Cordillera, The Canadian Institute of Mining and Metallurgy, Special Volume 15, pp. 186-194, 1976.

White, Wm. H., Harakal, J.E., Carter, N.C.; Potassium-Argon Ages of Some Ore Deposits in British Columbia; Canadian Institute of Mining & Metallurgy, Bulletin, Vol. 61, No. 679, November 1968, p. 1330.

Johnson, A.E.; Mineralogical and Textural Study of the Copper-Molybdenum Deposit of Brenda Mines Limited; Information Circular 302, Mines Branch, Ottawa, 1973.

Brenda Mines Ltd.; Western Miner, Vol. 43, No. 6, June 1970, pp. 39-60.

Menzies, M.M.; The Brenda Project; Canadian Mining Journal, April 1969, pp. 120-123.

Lang, A.H.; Historical Sidelights of Brenda Mine and Region; Canadian Mining Journal, March 1970, pp. 41-43.

MAP REFERENCES/RÉFÉRENCES CARTOGRAPHIQUES

Map 888 A, Princeton, (Geol.), Sc. 1":4 miles - accomp. Memoir 243.

#Geology of the Brenda Lake Area, Sc. 1": $\frac{3}{4}$ mile, Fig. 22, Report of Minister of Mines, British Columbia, 1967.

Geology of the Brenda deposit, Sc. 1":600', Fig. 3, Special Volume 15, p. 189.

Map 8528 G, Paradise Lake, (Aeromag.), Sc. 1":1 mile.

*Map 92 H/16, Paradise Lake, (Topo.), Sc. 1:50,000.

Map 82 E/13, Peachland, (Topo.), Sc. 1:50,000.

REMARKS/REMARQUES

Comp./Rev. By Comp./rév. par	DMacR						
Date Date	06-81						

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PROVINCE OR PROVINCE OU British Columbia
 TERRITORY TERRITOIRE

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 NOM DE LA PROPRIÉTÉ

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HISTORY OF EXPLORATION AND DEVELOPMENT (continued)
 HISTORIQUE DE L'EXPLORATION ET DE LA MISE EN VALEUR

DESCRIPTION OF DEPOSIT/DESCRIPTION DU GISEMENT (continued)

The Brenda orebody is part of a belt of copper-molybdenum mineralization that extends north-northeasterly from the Nicola Group-Brenda stock contact at least to Long Lake. Mineralization of economic grade (0.300% copper equivalent) is confined to a somewhat irregular zone about 720 meters long and 360 meters wide. Ore-grade mineralization extends more than 300 meters below the original surface and, although not explored in detail, all diamond drill holes in the ore zone bottomed in ore-grade mineralization. Lateral boundaries of ore-grade mineralization are gradational and appear to be nearly vertical.

Primary mineralization is confined almost entirely to veins, except in altered dyke-rocks and in local areas of intense hydrothermal alteration which may contain minor disseminations. The grade of the orebody is a function of fracture (vein) density and of the thickness and mineralogy of the filling material.

The average total sulphide content within the orebody is 1 per cent or less. Chalcopyrite and molybdenite, the principal sulphides, generally are accompanied by minor, but variable, quantities of pyrite and magnetite. Bornite, specular hematite, sphalerite and galena are rare constituents of the ore.

Davies & Associates, of Penticton, agreed to participate and a seven unit financing syndicate (Brenda Mining Syndicate) was organized to include Nippon Mining, M.E. Davis & associates, Brynelsen-Menzies, Hedlin-Menzies, and Fisher in trust. An option was taken from Bechtal and Associates and the property later transferred to Northlands Explorations Limited, a private company acquired for use as the eventual successor to the Brenda Mining Syndicate. Work during 1965 included an induced potential survey, trenching, and 950 feet of diamond drilling in 3 holes. Results indicated that the copper and molybdenum content was higher than in original estimates.

The company name (Northlands) was changed in November 1965 to Brenda Mines Ltd. Noranda Mines, Limited, in exchange for Brenda shares provided financing for an exploration program and feasibility study which was carried out between January 1966 and March 1968. The program included diamond drilling totalling 42,573 feet in 74 wire line drill holes, percussion drilling totalling 7,323 feet in 19 holes, and underground openings totalling 2,835 feet of drifts, cross-cuts, and raises. By 1967 Noranda had acquired a major interest and assumed management control of the project. With subsequent financing Noranda acquired a total of 2,177,900 Brenda shares for a 50.9% interest.

Mill construction began in March 1968. The 24,000 tons per day mill began tune up operations in November 1969 and commercial production began on April 1, 1970. When production began, the Brenda orebody had proven reserves of 177,000,000 tons at 0.183% copper and 0.049% molybdenum (Brenda Mines Ltd., 1969 Annual Report). A computer control system installed in early 1976 aided in boosting the mill capacity to the 30,000 ton per day range. Diamond drilling during 1979 in certain fringe areas of the open pit indicated that additional tonnages could be classified as ore under the existing economic conditions. Reserves at December 31, 1979 were reported as 152,869,450 tons at 0.145% copper and 0.032% molybdenum (Brenda Mines Ltd., 1979 Annual Report).