Granduc Area
802446

J.C. July 9/90

Au

		75283	g
2349	oz	= 80537	g
5169	oz	= 177223	g
1360	oz	= 46629	g
		379,672	

0.156 g Au/t

Ag

1981	4850000	g
1982	5186709	g
1983	10592126	g
1984	3204823	g
	23833658	

9.79 g Ag/t

Cu

1981		7626.025 K
1982	6591.2 Tons	= 5979464 K
1983	16507.4 Tons	= 14,975,282 K
1984	4636.8 Tons	= 4,206,467 kg
~~1985~~		

1.35% Cu

HISTORY OF PRODUCTION

During November-December 1970, 105,230 tons of ore were milled; no metal content given.

During the period 1971-1974, inclusive, 9,095,398 tons of ore were milled. From this ore 34,570 ounces of gold, 2,122,957 ounces of silver, and 219,965,379 pounds of copper were recovered.

During the period 1975 to June 30, 1978 inclusive 4 809 500 tonnes of ore were milled at this property. From this ore 607.877 Kg of gold, 37 666.915 Kg of silver, and 59 835 042 Kg of copper were recovered.

Year	Tonnes Milled	AU	AG	CU
1980	about 80,000	-	-	-
1981	613 936	75 283 grams	4 850 000 grams	7 626 025 kg
1982	510 235	2 349 ozs.	151 279 ozs.	13,182,461 lbs.
1983	1 031 805	5 169 ozs.	308 937 ozs.	33,014,845 lbs.
1984	278 278	1 360 ozs.	93 474 ozs.	9,273,672 lbs.
	2434264			

MAP REFERENCES

Bacon, W.R.; Preliminary Map of the Granduc Area, (Geol.), Sc. 1":1 mile, British Columbia Dept. of Mines, 1956.

Map 104 B, Iskut River, (Topo.), Sc. 1:250,000.

Map 104 B/1 & 104 B/2, Leduc Glacier, (Topo.), Sc. 1: 50,000.

REMARKS

Comp./Rev. By	DMacR	DMacR	DMacR	DMacR	DMacR		
Date	5-76	3-79	01-81	05-85	06-87		

REFERENCES

Grove, E.W., and Dudas, B.M.; Granduc Mine; Geology, Exploration, and Mining, British Columbia Dept. of Mines, 1970, pp. 66-73. +

Norman, G.W.H., and McCue, J.; Relation of Ore to Fold Patterns at Granduc, B.C.; Tectonic History and Mineral Deposits of the Western Cordillera, The Canadian Institude of Mining and Metallurgy, Special Volume No. 8, pp. 305-314, 1966. ++

Reports of Minister of Mines, British Columbia: 1931, pp. 47, 49; 1953, pp. 82-86; 1954, pp. 80-82; 1955, pp. 14-16; 1956, pp. 15-17; 1957, p. 6; 1958, p. 6; 1960, p. 6; 1961, p. 8; 1962, p. 8; 1964, p. 18; 1965, pp. 44-48; 1966, p. 38; 1967, pp. 31-34; 1968, pp. 46-50.

Geology, Exploration and Mining, British Columbia Dept. of Mines: 1969, pp. 54-56; 1971, p. 34; 1972, p. 514; 1973, p. 497; 1974, p. 332.

Mineral Policy Sector; Corporation Files: "Granby Mining Corporation"; "Granduc Mines, Limited": "Hecla Mining Company"; "Granduc Operating Company"; "Esso Minerals Canada Limited".

Norman, G.W.H.; Faults and Folds Across Cordilleran Trends at the Headwaters of Leduc River, Northern British Columbia; Petrologic Studies, Buddington Volume, The Geological Society of America, 1962.

Granby's B.C. Copper Prospect, Western Miner & Oil Review, August 1953, p. 42.

Granduc Mines Limited; Western Miner, Vol. 38, October 1965, pp. 98-101.

The Granduc Project; Western Miner, July 1971, Vol. 44, No. 7, pp. 49-67.

PRODUCT COPPER	PROVINCE OR TERRITORY British Columbia	N.T.S. AREA 104 B/1	Card 2 - REF. CU 1

NAME OF PROPERTY GRANDUC (LEDUC) (EDNA MAY)

DESCRIPTION OF DEPOSIT (continued)

The junction of the North and South Leduc Glaciers crudely marks the local boundary between the mixed gneiss zone on the west and the complex, deformed tactite (gneiss) cataclasite zone which essentially comprises the west half of Granduc Mountain. The east half of the mountain consists largely of epiclastic and pillowed volcanic rocks with minor intercalated sedimentary rocks, which are all variably indurated and altered, but relatively undeformed compared to the cataclasite section.

The cataclasite zone, including the mine series, comprises an assemblage of mylonites, phyllonites, and irregular lenses of less-deformed limestone, hornblende gneiss, tacite, as well as recognizable sedimentary units. Deformational structures, although complex in detail, essentially parallel the steep northerly trending gneisses to the west of the glacier. In detail the various country rock units have been subjected to extensive refolding, stretching, and boudinage. Mylonized tacite occurs as irregular banded units throughout the cataclasite zone. These rocks consist of alternating bands dominated by clastic diopside, epidote, quartz, feldspar with variable apatite and magnetite, and commonly have a recrystallized calcite matrix.

A number of extensive steep northerly trending faults have been identified cutting orebodies as well as crosscutting Tertiary and older dykes. The Western and Granduc graphitic fault zones are west of the ore zone and are expressed on the surface by lineaments which transgress the lower west slope of Granduc Mountain. Several of the orebodies have been offset by apparent right-hand strike-slip movement, and in the north mine sector different orebodies have been faulted into juxtaposition.

The ore, consisting mainly of simple sulphides and oxides, is apparently confined to a lenticular 400 to 800-foot-wide zone within the tactite-gneiss sequence that has a steep dip and northerly trend. This narrow section is marked by an apparent relative abundance of deformed marble. The ore lenses appear from diamond drilling and underground development to be pancake-like overlapping bodies which are knewn to extend vertically from about 1,500 feet elevation to 4,000 feet elevation and laterally at least 4,000 feet. As designated, the "A" orebody lies along the west limit of the zone and extends from depth at the south to

see reverse Card 2 ....

HISTORY OF EXPLORATION AND DEVELOPMENT (continued)

of diamond drilling. Reserves were estimated at 32,510,000 tons averaging 1.93 per cent copper before dilution.

Granby Consolidated in 1959 changed its name to The Granby Mining Company Limited. Granby sold all of its share interest in Granduc Mines in 1961. Hecla Mining Company acquired a controlling interest in Granduc Mines by the purchase, during the period 1964-1967, of 35.4% of the common stock and all of the preferred stock. Newmont Mining Corporation surrendered all its shares of Granduc Mines in 1965.

Due to the high capital cost of the project the property was jointly leased in October 1965 to Granduc Operating Company, a newly formed wholly owned subsidiary of Newmont Mining Corporation, and to American Smelting and Refining Company. Early in 1965 the driving of a 11.6 mile access tunnel from Tide Lake to the orebody was begun. The tunnel was completed in December 1968. Mine development and mill construction were in progress during 1969 and 1970. The 7,000 ton per day mill commenced operating on November 1, 1970. American Smelting and Refining changed its name in 1975 to Asarco Incorporated. Ore reserves at the end of 1975 were estimated at 19,606,000 tons averaging 1.69% copper before dilution, and include the ore below the 2,600 level. Production cutbacks early in 1975 and 1976 reduced the milling rate to about 3,400 tons per day. Reserves at Dec. 31, 1977 were 15,900,483 tons at 1.65% copper (Granduc Mines, Limited, 1977 AR).

The company name (Granduc Operating Company) was changed in 1977 to Newmont Mines Limited. The milling rate was raised during 1977 from 3,400 to 4,000 tons per day. Underground development work was terminated in September 1977. Exploration for the possible northward extension of the present orebody began in mid July 1977 with the drilling of a surface hole inclined easterly from the 5,400-foot elevation. The hole encountered promising mineralized zones about 2,700 feet north of, and 1,500 feet above, the northern extremity of the 2,600 level. To evaluate this area a drift was begun from the main haulage (2,600) level in December 1977. The drift

see reverse Card 2 ....

PRODUCT	COPPER	PROVINCE OR TERRITORY	British Columbia	N.T.S. AREA	104 B/1	REF. CU 1

NAME OF PROPERTY GRANDUC (LEDUC) (EDNA MAY)

OBJECT LOCATED - mineralized zone.

UNCERTAINTY IN METRES 300. Lat. 56°12'45" Long. 130°20'30"

Mining Division Skeena District Cassiar

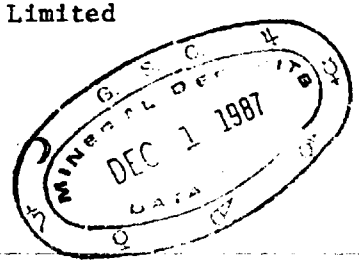
County Township or Parish

Lot Concession or Range

Sec Tp. R.

OWNER OR OPERATOR AND ADDRESS

Granduc Mines, Limited



DESCRIPTION OF DEPOSIT

The Granduc ore deposit lies about 3 miles east of a conspicuous re-entrant in the main easterly contact of the Coast Plutonic Complex. The country rocks west of the mine and North Leduc Glacier include mainly mixed biotite-hornblende and hornblende gneisses. The country rocks east of the North Leduc Glacier on Granduc Mountain, including the mine series, appear to be part of the mixed gneiss succession which is overlain on the east by easterly dipping volcanic conglomerates, thick pillow volcanic units, and minor intercalated sediments. On Granduc Mountain, a number of deformed, recrystallized limestone lenses which form distinctive units along the east side of the North Leduc Glacier and in the mine series have been identified as Lower Jurassic.

Small plutons and dykes are abundant in the Granduc Mountain section, as well as in the Unuk River area in general. These various intrusive rocks have been dated by field relationships as Upper Triassic, Lower and Middle Jurassic, and Tertiary. The main Coast Plutonic Complex, which cuts northwesterly across the general area, has been dated as Tertiary. see Card 2 ....

Associated minerals or products of value - Gold, silver.

HISTORY OF EXPLORATION AND DEVELOPMENT

The Granduc orebody outcrops between elevations of 2,500 and 4,000 feet on the east side of the south fork of Leduc Glacier, 4 miles east of the Alaska-British Columbia border and 23 miles northwest of Stewart.

Wendall Dawson and W. Fromholz, of Ketchikan, Alaska, prospected the Granduc Mountain area in 1931 and staked 3 claims, the Edna May, Mineral Lode, and New Alaska on minor mineralization about 3 miles from the minesite. The claims were allowed to lapse.

In 1948 Einar Kvale prospectad the area and visited most of the known mineral showings. The rapid melting of the South Leduc Glacier and of the snowfield and hanging glacier on Granduc Mountain subsequently exposed the Granduc showings. Mr. Kvale and T.J. McQuillan returned to the area in 1951 as employees of the Karl Springer and associated interests and staked claims covering the main Granduc surface showing and adjacent areas in the name of Helicopter Exploration Co. Ltd. They returned to the area in 1952 and carried out further staking, consolidating a group of 36 claims for the company. A group of 72 claims was staked on adjacent ground by Wendall Dawson and associates in February 1953.

The Granby Consolidated Mining, Smelting and Power Company, Limited optioned the claims late in 1952 and Granduc Mines, Limited was incorporated in March 1953 to acquire title to the property. One million Granduc shares were issued for the claims held by Helicopter Exploration and others. Granby purchased 200,000 shares and held options on an additional 2 million shares. Late in 1953 Granby reached an agreement with Newmont Mining Corporation whereby the latter would participate equally in the stock option. Funds for exploration and development in subsequent years were obtained through the sale of these treasury shares to Granby and Newmont.

Additional staking expanded the property to 207 claims and fractions. Underground work began in June 1953 and the initial program of exploration and diamond drilling was completed in the spring of 1958. Geological and geophysical surveys were carried out in 1959 and 1960. Underground work resumed in 1961. Development work on the deposit to the end of 1964 was done on 4 main levels and included 18,553 feet of drifts and crosscuts, 676 feet of shaft, and 130,810 feet see Card 2 ....

DESCRIPTION OF DEPOSIT (continued)

the central mine section. The "B" orebody lies on the eastern limits in the main central mine section. "C" zone lies between "A" and "B" and joins "F" zone, which extends to the northern known limit. "Ch" zone is an upper part of the main "C" orebody. In detail the individual orebodies consist of streaks, blebs, blobs, and irregular massive lenses of sulphide of rapidly changing outline within phyllonite-mylonite. Breccia-like textures in the massive sulphides, rotated blocks of mylonite in the ore, as well as abundant evidence of sulphide remobilization as veins indicate extensive and porvasive ore deformation at several periods. The widespread cataclasis that has deformed the ore, tactite, and gneiss leaves the timing of metasomatism and ore formation open to question and the genesis of the ore to hypothesis. The use of the term "stringer-lode" to describe the orebodies indicates the irregular, feathery nature of the ore boundaries probably produced during the main period of cataclastic deformation.

The ore minerals include pyrite, chalcopyrite, pyrrhotite, and sphalerite in order of relative abundance. Arsenopyrite has been noted in several shoots, cobaltite described in the upper part of the "A" zone, galena in the "A", "Ch", and "C" zones, and magnetite appears to be common but apparently concentrated along the western ore limit. Gangue consists essentially of quartz with country rock.

HISTORY OF EXPLORATION AND DEVELOPMENT (continued)

was driven 2,000 feet and from it 5,000 feet of diamond drilling was completed by May 1978, with inconclusive results; work to that date indicated the mineralized zones are below mining width and grade.

The mine continued to operate until June 30, 1978 when mining and milling operations ceased and the mine closed. The lease agreement whereby Granduc Mines, Limited, leased the property to Newmont Mines Limited and Asarco Incorporated was terminated December 1, 1978.

Esso Resources Canada Limited on May 31,1979 acquired the property from Granduc Mines Limited subject to a 15% retained interest after payout. Subsequent activities were directed towards the resumption of production in mid 1980 with Esso Minerals Canada as operator. Reserves were reported as 8,000,000 tons at 2% copper (NM 1/03/79).

Major work by Canada Wide Mines Limited, a wholly owned subsidiary of Esso Minerals Canada, included rehabilitation of the mill for a planned mill rate of about 4,000 tons per day, and a changeover of the mine from sublevel caving to open-stoping. Milling began in October 1980. Esso estimated in-place reserves of approximately 12 million tons grading 1.79% Cu (Western Miner, May 1980, p. 24).

The 1982 mill rate of about 1,800 tons per day was increased to about 3,600 in 1983. To explore the North Zone of the mine some 20,000' of surface diamond drilling was done in 1982; this zone was explored underground in 1983. A potential for additional tonnage exists in the North Zone and in the down plunge continuation of the mine zone. Due to depressed copper prices and operating losses the mine closed in April 1984. All surface facilities were removed. Esso Resources transferred title to the claims to Granduc Mines, Limited. Reserves are reported as 9 890 000 tonnes at 1.79% Cu with minor Au-Ag (Preliminary Map 65, BCDM, 1986).