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Open File 82G-3E

By L. P. STARCK, P. Eng.

General Manager
Giant Mascot Mines Limited
and Giant Soo Mines Limited

NEWEST BASE-METAL PRODUCER IN BRITISH COLUMBIA

003454



Location and Access

The Estella property of Giant Soo Mines Ltd. is located at the head of Tracey Creek on the West flank of the Rocky Mountains, some four miles east of Wasa.

Wasa, which is 11 miles north of Fort Steele, is connected by paved road to Cranbrook, 23 miles to the south and to Kimberley, 21 miles to the west. The Kootenay Central Branch of the Canadian Pacific Railway passes through Wasa.

The mine workings are between elevations 6100 and 6600 feet, and are accessible from Wasa by 18 miles of gravel road.

History

The discovery claims were staked in 1895 by Tracey and Bedford, who the following year took Scott, Mutch and the American store in as partners. In 1897 the property was optioned to Polson for \$36,000, but the option was not exercised. In 1898 Polson and the American Store bought Scott, Mutch, Tracey and Bedford's interests.

By 1902 the new group did over 3,000 feet of development work on the main showings, plus driving several small adits on quartz veins that outcrop in Tracey Creek.

In 1910, the property was bonded for



The Hon. D. L. Brothers, Minister of Mines and Petroleum Resources, officially opened the Giant Soo mining and milling operation September 14, 1966.

\$175,000, but due to poor treatment facilities and low metal prices, it was not brought into production.

At the time Polson acquired full ownership of the property in 1927, the Rover adit (6250 level) had been advanced southeasterly for 900 feet in mineralization, and the Estella crosscut (6100 level) had been advanced to within a few feet of the vein.

In 1927, Cominco optioned the property, but after drilling 11 holes, they relinquished their option in 1929. In 1944 they renewed their interest in the property and made a complete geologic survey of it, but they could not arrive at a satisfactory agreement with the owners, so they withdrew.

In April, 1950, the property was acquired by Estella Mines Ltd. and immediate plans were made to place it into production. The old mine camp was re-established and a new road was built to replace the former strip road up Tracey Creek. Simultaneously, with the construction of a 150-ton mill at Wasa, the Estella crosscut was advanced and the mine prepared for production.

The ore reserves in 1951 were 47,800 tons (before dilution) grading 1.9 oz. silver, 5.8% lead and 19.0% zinc, across an average width of 5.7 feet. The plant was operated until February, 1953, at which time it was closed down due to lack of ore. During the 16-month operating period, 67,000 tons of ore were treated.

Prior to the closure, an intensive exploration and development program was carried on in the search for additional reserves, but it was not successful. In addition to diamond drilling, this work included sinking a 100-foot winze from the 6100 level to establish the 6000 level and the start of a raise from 6250 level to the bottom of the No. 2 shaft on the A Zone.

Between August and November, 1954, 1020 feet of diamond drilling was done near the southeast face of the 6100 level, but no commercial ore intersections were made.

In 1955, the company was re-organized as "United Estella Mines Limited," and an underground program undertaken. A 35-foot crosscut was

driven from the southeast end of the 6100 level, the 6000 drift was extended 109 feet, and 3 raises aggregating 100 feet, were driven from the 6000 level and the raise to the No. 2 shaft was extended 135 feet, a total distance of 287 feet from the 6250 level. No commercial ore was intersected by this work.

In 1957, the No. 2 shaft was sampled and three surface diamond drill holes were driven to intersect the shaft on at depth. The mineralization encountered was not commercial and no further work was done. The United Estella Mines Limited was placed in liquidation.

Copper Soo Mining Company Limited acquired the property in 1962 by purchase from W. L. Rand who had obtained the property by foreclosure on the United Estella mortgage. Copper Soo re-established the old mine camp at the portal of 6100 level and undertook the development of the A Zone. The raise to the No. 2 shaft was completed and sublevels were established at elevations 6464 and 6380.

In 1963, the 6464 sublevel was extended to the northwest and south east, but the ore faulted off in both directions. Diamond drilling was then undertaken to pick up the fault block below the 6464 level and on 6250 level to locate the downward extension of the known 6464 ore. During the period August 22nd to September 30th, some 1300 tons of ore, grading 7.0 oz. silver, 13.2% lead and 23.1% zinc, was shipped from the area above 6464 sublevel.

During the period 1964 to 1965, the 6100 and 6250 levels were extended to the southeast and raises driven between the 6100 and 6250 levels and between the 6250 and 6464 levels. An exploratory raise was also driven from the southeast end of the 6250 level, up to elevation 6350.

On August 1, 1965, the property was



The new Giant Soo 150-ton concentrator.

optioned to Giant Mascot Mines Ltd. on the basis that Mascot would earn a 60% interest in the property by placing it into production at the rate of 100 tons per day. After a complete resampling of the mine, which involved cutting well over 650 samples and a guarantee from Cominco that they would purchase the concentrate production from the first 70,000 tons of ore, Mascot committed to place the property into production.

Mill design and the acquisition of machinery was started in late January, 1966, and construction was started in mid-May.

Construction was completed in mid-August, 1966, and the plant was run in.

Geology

The rocks at the Estella are in the transitional zone between the Aldridge and Fort Steele formations. They are argillites and quartzites, striking northwesterly and dipping to the northeast. These formations have been intruded by a sill-like intrusive of diorite which crosscut the formations. Throughout the area there are numerous arrow dikes of feldspar-bearing porphyritic rocks. These dikes are not extensive, but in the area of the mine there are two large, irregular, plug-like masses of porphyry.

The lode is a zone of fracturing and light shearing, semi-bedded in the sedimentary rocks and penetrating diorite in the workings. The ore is a replacement by sphalerite, galena, and pyrite, accompanied by silica. Vein quartz is not abundant except in diagonal veins which generally contain little sulphides.

The reason for the localization of the ore within the lode is not fully understood. Ore is found to occur in diorite, in grey argillite, and in quartzite, but in some parts the intensity of silicification and of mineralization makes it difficult to determine the character of the rock being replaced.

Generally, the lode is bedded, but



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locally, it crosses the bed at a shallow angle where it passes into apparently less favourable rocks. Locally, relatively flat sections of the lode occur and have some bearing on the ore.

The sphalerite grains are generally less than a quarter of an inch in size and occur as granular masses of various colours, ranging from light buff and yellow, to reddish brown, or brown, to almost black. The galena varies in size from one quarter inch grains to steel-grey coloured layers of fine grained material. Silver occurs with galena in a ratio of approximately one ounce silver to two per cent

lead. Small amounts of pyrite, quartz and calcite occur in the lode. The ore contains cobalt and germanium in the order of 0.01% to 0.02%, and it is these two elements which have made the zinc concentrate unacceptable to certain smelters.

Description of Workings

For ready reference, the mine is divided into two sections. The "A" section is the portion with which we are presently concerned and the "B" section is the portion which was mined out by previous operators.

Both sections have been developed by two adit levels; the 6100 and 6250

levels. The 6100 adit was driven as a crosscut to the ore structure for 1,000 feet. The mineralized structure was then drifted on to the northwest for 750 feet and to the southeast for 1,200 feet. The 6250 adit is some 1,200 feet long on the course of the vein. Details of the "B" zone development will not be given except to note that two shafts were sunk to the 6,000-foot horizon and the 6000 level was driven for 750 feet.

The "A" zone has been developed by the No. 2 shaft raise which extends from the 6250 level through to the surface at elevation 6550. Extending out from this raise is the 6464 sub-level which is approximately 400 feet long and the 6400 sublevel which is of the same length as the 6464 sub-level. No. 3 raise connects the southeast end of the 6400 level to the 6250 level. The 6250 and 6100 levels are connected by the No. 1 raise. On the southeast end of the 6250 level, the ore zone has been further explored by the No. 2 raise which extends up to elevation 6350. In addition to the workings as described, there are numerous short crosscuts, raises and surface open cuts.

The ore is mined by open stoping and shrinkage methods with Atlas Copco jacklegs and Gardner Denver stopers. The broken muck is slushed by Ingersoll Rand 18-h.p. slushers, equipped with Pacific slusher hoes to the main transfer ore passes from whence they are loaded into cars by air operated chutes and Eimco 12B mucking machines. Nine two-ton side dump mine cars drawn by a 3-ton Atlas battery locie are used to train the ore to the coarse-ore bin on the 6100 level. A Mancha mule is used for servicing on the 6250 level.

Air is supplied to the mine by a 600-c.f.m. Ingersoll-Rand, and a 600-c.f.m. Gardner-Denver compressor driven by General Motors diesel engines.

Ore Reserves

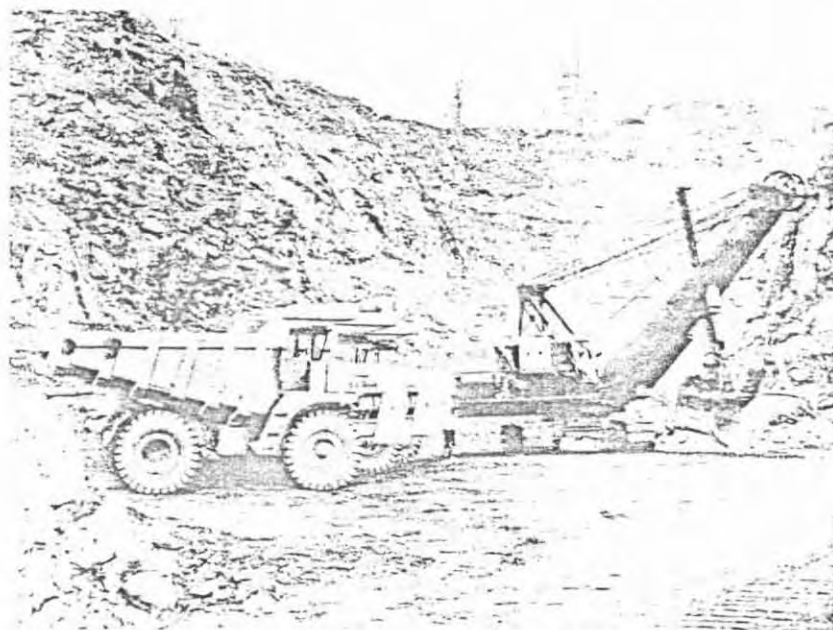
The proven and probable ore reserves are estimated at 49,103 tons, grading 2.93 oz. silver, 7.01% lead and 14.19% zinc. These reserves included 17% planned dilution for mining to a minimum width of four feet, plus 10% stope wall dilution. In addition, there are some 20,000 to 25,000 tons of possible ore in the old stopes to the southeast of the "A" zone and below the 6100 level.

Stoping is currently in progress above the 6464 and 6250 levels.

Mill Flow Sheet

The 120-ton mill which is presently treating 150 tons, was designed by the Giant Mascot staff. Ore is drawn

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from the coarse-ore bin by a Jeffrey vibrator feeder to a Sawyer Massey 10x20 inch jaw crusher discharging to a 36-inch by 30-foot conveyor which carries the ore to a 3x6-foot Magia screen. This screen has a 1½-inch scalping deck and a ¾-inch lower deck. Oversize goes to a 3-foot Tel-smith gyrosphere set at ¾ inch. The discharge from the secondary crusher is conveyed by a 20-inch by 150-ft. conveyor to the 200-ton fine-ore bin.

From the fine bin the ore is drawn by a Stephens-Adamson feeder and fed to a 6x8-ft. Dominion ball mill which is in closed circuit with a 54-inch Wemco spiral classifier. Overflow from the classifier goes to a 3x3-inch Canadian Allis-Chalmers SRL pump, feeding to a bank of four No. 21 Denver Equipment rougher flotation machines for lead recovery. The rougher concentrate passes through two cleaning cells with the overflow to two recleaner cells. The cleaners and recleaners are all Denver No. 18 Sub A type machines.

Tailings from the lead roughers flow to a bank of six No. 21 Denver roughers. The zinc rougher concentrate is cleaned and recleaned in three No. 18 Denver cells.

The concentrates from both the lead and zinc circuits discharge to 8x8-ft. surge tanks and are pumped directly by 2x2-inch Allen Sherman Hoff rubber lined pumpers to a 7-disc by 8-foot, 6-inch Dorr-Oliver-Long filter. Five leaves are for zinc concentrates and two leaves for lead concentrates.

The concentrates discharge into a 75-ton lead and a 150-ton zinc concentrate bin. They are hauled by the company-owned Mack truck to Wasa where they are loaded on Canadian Pacific Railway cars for shipment to Trail.

Average daily production is 28 tons of zinc grading plus 52% zinc and 10 tons of lead grading plus 65% lead.

Surface Establishment

The mine plant consists of a 20-man dry compressor house and machine shop for the repair of underground

equipment. In addition, there is a 40 by 80-foot garage and warehouse for surface equipment.

Surface buildings include a 30-man bunkhouse, a 30 by 60-foot dining hall, two 6-man bunkhouse trailers, an 8x30-foot office trailer, an 8x38-foot house trailer and a two-bedroom manager's residence.

Two ½-ton G.M.C. light trucks do all the necessary work in connection with surface transportation on the property. In addition, for road maintenance, there is the following machinery: a No. 12 Caterpillar grader, a D6 Caterpillar tractor and a John-Deere front-end loader.

Water supply is obtained from the mine workings for both the mill and domestic use.

Power is generated by a 200-kw and 100-kw generator, driven by three Model 671 General Motors diesel engines.

The mill construction and machinery installation was done by Regent Construction Ltd., the electrical work was done by Boundary Electric Ltd., the detailed structural work by J. Verkerk and a large percentage of the machinery was supplied by Grizzly Mine, Mill Equipment Ltd.

Thirty-five men are employed at the mine. In charge of the entire operation is A. G. "Bud" Ditto, Resident Manager. He has assembled an experienced and enthusiastic staff who are entirely responsible for the success of this particular job. T. Welthers is Mechanical Superintendent; R. Gould, Mill Superintendent; D. Summers, Mine Engineer; J. McLellan, Mine Foreman.

Giant Soo Mines Ltd., a private company, is controlled 60% by Giant Mascot Mines Ltd. and 40% by Copper Soo Mining Company Limited.

The directors are W. C. Gibson, M. Pezim, L. P. Starck, T. G. Wilson and S. Clarke.

The officers are W. C. Gibson, President; M. Pezim, Vice-President; L. P. Starck, General Manager; A. H. Ainsworth, Secretary; S. Clarke, Treasurer; and Ruth Ditto, Accountant.

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