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Erickson Gold Mining Corp.

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FILE No.

LETTER No

GOLD MILLING AT ERICKSON CREEK

Kristian Ross

Vice-President, C.E.O. Erickson Gold Mining Corp.

President, The Agnes & Jennie Mining Co. Ltd.

Roy Gould

Milling Supervisor. Co-Author

October 23rd, 1981.

ERICKSON GOLD MINING CORP.

Gold Milling At Erickson Creek

BIOGRAPHIES

Kristian Ross

Mr. Ross was born in Vancouver, British Columbia in 1949 and graduated from Sentinel High School in West Vancouver. He has prospected since graduation with his father, David Ross, Chairman of Erickson Gold Mining Corp. who was earlier associated with the founding of Lornex, Afton and Bathurst Norsemines. Kristian Ross has been involved with the Erickson Creek property throughout its exploration and development into a producing mine. He is Vice-President and Chief Executive Officer of Erickson Gold Mining Corp. which operates the Erickson Gold Mine Joint-Venture on behalf of its parents Nu-Energy Development Corp. and the Agnes & Jennie Mining Co. Ltd. of which Mr. Ross is President.

Roy Gould, Co-Author

Mr. Gould was born in Revelstoke, British Columbia in 1912; he was raised and educated in Golden, British Columbia. Mr. Gould has 36 years experience in milling operations including installation of equipment and the placing of numerous plants into production throughout British Columbia, the Yukon and North-West Territories. Some of the most interesting and challenging include the following :

Whitehorse Copper Mines (New Imperial)

Whitehorse, Yukon.

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BIOGRAPHIES cont'd

Endako Mines

Fraser Lake, British Columbia

Rehabilitation of Canadian Explorations (Tungsten)

Salmo, British Columbia.

Erickson Gold Mining Corp.

Cassiar, British Columbia.

ERICKSON GOLD MINING CORP.

Gold Milling At Erickson Creek

ABSTRACT

Described herein are history, location, buildings and milling operations. Problems in the use of second-hand equipment at a relatively remote northern mine site are also featured.

INTRODUCTION

The Erickson Gold Mine Joint-Venture is located 20 km. south-east of Cassiar, British Columbia near the British Columbia, Yukon Border. Nu-Energy Development Corp. and the Agnes & Jennie Mining Co. Ltd. each own 50 % of the operating Company, Erickson Gold Mining Corp., with the Agnes & Jennie Mining Co. Ltd. providing the Project Management.

HISTORY

The Jennie Vein system out-cropped only intermittantly over 60 ft. in Erickson Creek. The prospect was drilled in the mid 1930's and was dismissed as an interesting hi-grade curiosity. We did not agree, and began drilling in 1975. In early summer of 1976 we brought in Nu-Energy Development Corp. and drilling continued with the first underground exploration in the winter of 1977. The next summer saw an extensive surface drilling program, followed by more underground work in the late fall. The early spring of 1978 brought our final pre-production underground development.

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HISTORY cont'd

Detailed economic evaluation followed with the project go-ahead being received in the first week of September, 1978.

In mid-September, a used 150 T.P.D. mill was purchased. It was dismantled and moved to the Erickson site where the buildings were erected and equipment was installed.

The plant was operational on December 22nd, 1978.

LOCATION

The mill is situated 3/4 of a mile south of the Dease Lake Highway on the south side of McDame Lake at an elevation of 2,952 ft.

BUILDINGS

The buildings are of frame construction using local lumber covered with aluminum sheeting and insulated with 4 inch fibre glass bats. The mill was designed in a straight-line from the coarse ore bin down to the concentrate load-out area. This design takes advantage of heat rising from the lower floors up around the wooden fine ore bin, through to the crushing area and the coarse ore bin. This is beneficial during extreme cold weather when temperatures can fall to - 45^{o} C. During the winter months the mill and mechanical shop heating is supplied by waste heat picked-up from 3 Caterpillar Model 3412 and a 398 diesel-electric

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BUILDINGS cont'd

set. The system circulates hot anti-freeze solution to the strategically located electrically driven fan space radiators. This system currently saves us approximately 30 % of our fuel which is turned into heat. Propane heaters are available as emergency stand-by units.

All outside water-lines are insulated and heat taped using " Sclaircor " plastic pipe. We have found this to be good insurance against line freeze-ups and related production loss, etc.

CRUSHING

The ore truck dumps from a trestle directly onto a stationary steel rail grizzley with 10 " wide slotted openings, into a 75 ton coarse ore bin. The coarse ore bin discharge is controlled by a down-cutting guillotine type gate. The ore travels along a 20 " wide x 6 ' long conveyor belt and falls over a short 2 " wide slotted Grizzley. The oversize feeds the 10 " x 21 " Telsmith jaw crusher that is set to minus 1 1/2 ". No. 1 conveyor measuring 20 " wide x 30 ' long with Dings magnet suspended above the head pulley discharges to a 36 " wide x 6 ' long Dillon double deck vibrating screen. The upper deck is 1 " square and the lower deck is 3/8 " x 4 inch slotted in open circuit with a 2 ' Symons Cone Crusher, with a setting of 1/4 ". No. 2 conveyor, 20 " wide x 70 ' long, goes directly to the 125 ton fine ore bin on a 20^{o} incline. The dust collection

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CRUSHING cont'd

system, adequate at this time, is being replaced by a 4000 C.F.M. Roto-Clone Wet Scrubber which discharges directly into the mill circuit.

GRINDING

Two Mexican hat feeders of conventional design are used to control the feed to the 18 " wide x 26 1/2 ' long No. 3 conveyor. It discharges to the 6 ' x 6 ' Eimco ball mill in closed circuit with a 3 " x 3 " S.R.L. pump and a Krebs D6B-12^{o} cyclone classifier. The cyclone under-flow returns to the ball mill feed; the over-flow goes to the flotation circuit.

CONCENTRATION

The ball mill discharge flows over a 12 " x 18 " Denver duplex mineral jig. The hutch concentrate is then passed over a 3 ' wide x 4 ' long Deister shaking table for final up-grading with table tails circulated back to the ball mill discharge. Approximately 65 % of the gold is recovered in this operation.

Flotation is comparatively simple. Bulk flotation plus cleaners makes a final recovery of 95 - 96 %. Reagents used are free of potentially environmentally harmful pollutants. For P.H. control, lime at .62 lbs. per ton is fed to the No. 1 rougher flotation feed cell or to the cleaner cells to give a P.H. of 10.0, without depressing gold. Xanthate Z-6 is introduced into the grinding

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CONCENTRATION cont'd

circuit at .178 lbs. per ton and at .08 lbs. per ton to the 3rd rougher cell. M.I.B.C. as a frother is added at .109 lbs. per ton to the 1st rougher cell.

Ball Mill is	80 % Critical
Circulating Load	300 %
Grinding Circuit Feed	- 3/8 mesh
Flotation Density	30 %
Flotation Circuit	40 % - 200 mesh
B.M. Discharge	25 % - 200 mesh
Steel Consumption	3.20 lbs. per ton

FILTERING

The final flotation concentrate is pumped to a 8 ' x 8 ' Denver thickener tank. The thickened under-flow is pumped to a Denver 4 ' - 1 leaf vacuum filter. The discharged cake drops to a loading area into 45 gallon drum containers for shipment to the smelter.

METALLURGY

When developing a small gold-silver operation of apparently similar mineralization to a near-by existing operation, it is important not to assume the characteristics of the minerals will be identical.

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METALLURGY cont'd

It is essential that a semi quantitative spectrographic analysis be prepared as well as metallurgical investigations as a guide for the following reasons :

(a) To determine what impurities may be present.

(b) To give some insight into possible metallurgical problems which might be encountered in a full scale operation.

TAILINGS POND

Fortunately, our ore contains no contaminates such as arsenic, mercury or radioactive material and is mainly inert quartz. Similarly, the milling process does not add harmful chemicals of any kind that could be a potential environmental hazard.

The tailings dam was constructed of competent compacted material to a height of 8 ' over an impoundment area of about 650,000 square ft.

During severe cold weather layers of ice build-up within the dam. This occasionally causes a water shortage to the re-cycling water pumps which is alleviated by pumping from our fresh water make-up supply, obtained from a near-by creek.

PREAMBLE TO NEW AND USED EQUIPMENT

During the 1960's and 1970's as metal prices remained depressed and labour costs rose rapidly the swing in mining was to large low grade, open pit mines. The

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PREAMBLE TO NEW AND USED EQUIPMENT cont'd

equipment used increased in size as mining companies sought to reduce costs. As a result of this changing demand the equipment manufacturer's commenced re-tooling their plants to produce larger equipment. Smaller plants, that had for years been used on high grade, low tonnage mining operations were shut down and lay idle with the result that stock items for most of this equipment was depleted. Because lack of demand for replacement parts, the manufacturer's inventories were seldom re-stocked and in some instances ceased to be available. Since low tonnage concentrators are again being put into operation most of the available equipment in these plants has been purchased, with the result that any such equipment is now significantly more expensive. In some cases, because of the age of these machines and scarcity for this kind of used equipment, the lack of available replacement parts can cause considerable problems before and after commencement of operations.

NEW EQUIPMENT

It is most desirable to be able to install new equipment as operating instructions and parts lists are up-to-date and supplied with each machine. Unless something unexpected arises, a lengthy run, free from break-downs can be generally expected while the manufacturer's warranties are still in effect.

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USED EQUIPMENT

Generally speaking, the reasons for selecting used equipment would be a matter of budget control and quick delivery as compared to the more lengthy delivery of new equipment. However, in the case of a break-down long delays can arise and result in loss of production.

Usually, a reasonably good piece of used equipment could be selected, however, this takes time and it is not always possible to get the age and work history of the piece of equipment from the supplier. This is most important from the stand-point of wear on major parts and availability of these parts. Also, lack of the information supplied by parts lists for ordering of parts at the time of purchasing the equipment makes ordering of replacement spares difficult. Often suppliers will make one serviceable machine by taking components from two or more machines of different models. Confusion results unless one knows the exact serial number for each of the component parts taken from the original machines.

As some equipment may be imported from different countries, drawings, parts lists and history may not be available.

In short, especially in remote northern areas, care must be taken to have all possible information on used equipment parts readily available, in order to insure continuity of operation.

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USED EQUIPMENT cont'd

It is essential to have a good preventive maintenance program in these small northern mills and to keep a good inventory of hard to replace parts on hand as air freight is expensive and delays can be expected.

A small well equipped machine shop is very useful in a plant where second-hand equipment is installed. In our first year of operation there were times when production could have been maintained when a mechancial part failed if we could have fabricated it at the mine site.

EXPANSION

This seasons exploration program at Erickson has culminated with the decision to increase our milling rate to 200 tons per day. All equipment installation is scheduled for late spring and is expected to come on stream in June of 1982. The necessary equipment has been assembled to avoid delivery problems.

Expansion equipment includes a 7 ' x 8 ' Marcy Ball Mill, 6 more No. 21 Denver Flotation Cells, 2 more Cleaner Cells, a 6 ' x 6 ' Conditioner Tank, a Krebs D10 Cyclone and a 12 ' x 18 " Denver Duplex Mineral Jig. Miscellaneous other equipment will increase our tonnage by 200 tons per day, which when completed would give the mill capacity a total of 300 plus tons per day operation.

October 23rd, 1981.