

- copper molybdenum silver
- ~~rated~~ ^{rated} capacity of mill - 30,000 tons per day
- Gibraltar is owned 71% by Placer which in turn is owned 28% by Noranda Mines.

Mines Management are as follows:

J. D. Wright - Mine Manager
Bill Trythall - Mine ~~Manager~~ ^{Engineer}
Doug Bailey - Mine Superintendent
Anand Inemdar - Mill Superintendent
Ernie Brisbane - Mechanical Superintendent
Ted Carpenter - Mine Geologist
Mel Dodds - Safety Supervisor

Hourly employees are represented by the C.I.I.M.A.W. Local 18
Darcy Blonquist - President

- Gibraltar Mines has 4 principle copper molybdenum ore bodies known as Gibraltar East, Gibraltar West, Pollyanna, and Granite Lake. The first phase of mining in Gibraltar East has been completed and work is now being completed on the first phase of ore removal from the Granite Lake pit. It is expected that the Granite Lake pit will be completed in its first phase about the end of July this year. Stripping operations have begun on the Pollyanna pit and it will begin to enter production in August. The total ore reserve for the four pits at the commencement of milling in March 1972 were 358 million tons grading .36% copper and .016% molybdenite. At that time it is understood that the mining costs were approximately 22¢ per pound of copper and eventually was justified on the basis of a L.M.E. price of 45¢ per pound of copper with an approximate net smelter return of 35¢ per pound of copper. Millheads are now approximately .39% copper. Although the mill was designed to handle 30,000 tons per day of feed, it has handled up to 43,000 tons per day and is currently operating at a daily tonnage of 40,000 of feed.

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Mill feed is crushed in a primary crusher to approximately -7 inches. The primary crusher discharge is screened to remove the 1½ inch fraction with the oversize going to a 36,000 ton live storage stock pile. Four secondary crushers crush the 7 inch by 1½ inch primary product to 1½ inch by D. Three primary grinding circuits are used for preparing the crush rock for rougher flotation. Each circuit has a 13½ foot by 20 ft. rod mill and a 13½ ft. by 20 ft. ball mill. The average mill throughput is 41,500 tons per day at a bond work index of 9.3. Although the latter has varied between 8½ and 13. Cyclone overflow sizing is 30% plus 65 mesh at 52% solids. Overflow from the cyclone from each grinding circuit flows by gravity to a single bank of 16 Denver flotation machines. The first eight cells produce the rougher concentrate and the last eight cells produce the scavenger concentrate. The scavenger concentrate recycles to the head of the roughers for additional flotation and the rougher concentrate is reground to 75% - 325 mesh in a ball mill. The reground product is further processed in 3 stages of cleaning to produce a final concentrate of 28% copper. The copper third cleaner concentrate is pumped to an 80 foot thickener and is then adjusted and put into the Molybdenite recovery circuit. Ten stages of cleaning are used to upgrade the Molybdenite with stage adding of chemicals, etc. The Molybdenite circuit tailings become the final copper concentrate and is pumped to a thickener. Both copper and moly concentrates are separately dried and prepared for shipment. Moly concentrate is put into 33 gallon drums and is shipped in that manner. Copper concentrate is trucked to B.C.R. Railroad for bulk shipping in covered gondola cars. Final tailings consist of rougher and cleaner tailings which flow by gravity through a 36 inch steel line to the tailing impoundment area. The line is sloped at .5% to prevent sanding and a series of droptanks are used to compensate for vertical drop. The center-line method of dam construction is being used and is designed and built to withstand any seismic loading which might occur in the area. Finger drains are constructed under the sand portion of the dam to aid in drainage and maintain a suitable phreatic line. Cyclones are mounted on steel towers with skids on the bottom which allows a bulldozer to drag them to the necessary locations in building the dam.

A reclaim barge is located upstream from the main dam and recycles the tailing water back to the concentrator. A seepage dam and pumphouse are located below the main dam to collect any seepage or spills. This dam and automatic pumping system ensure that the disposal area is a closed system.

A more detailed outline of the Gibraltar operations is attached hereto. As a result of extensive fracturing, jointing, the number of local fault systems, and the present of some ^{sc}shist-like structures the competence of the pit walls are variable. A number of wedge type and slip type *failures* of the wall have occurred and require particular attention in order that the minerals in the Gibraltar East pit and the Granite Lake pit may be recovered in successive stages of development. In preparation for the development of the Pollyanna pit, perimeter drilling has been undertaken and it has been found that significant flows of ground water have been obtained. Ground water is being pumped from these perimeter holes and it is hoped that this will assist in the stabilization of the pit walls as the pit is developed. A number of slides of both the Gibraltar East and Granite Lake pits were taken as well as the area now being stripped for the Pollyanna pit. Stripping of the latter area is being done by Gibraltar using trucks and shovels.