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James Doyle Sell Mining Collection

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AMERICAN SMELTING AND REFINING COMPANY
Deming New Mexico

June 14, 1952

Mr. Norman Weiss, Milling Engineer
American Smelting and Refining Company
600 Pacific National Life Building
Salt Lake City 1, Utah

CONFIDENTIAL
Notes from Mr. Norman Weiss

Dear Sir:

COPPER, MOLYBDENUM SEPARATION IN OPERATION AT MORENCIE, ARIZONA

The following is a short description of the Morencie flotation pulp flow.

The first four roughers constitute the rougher copper concentrate which is cleaned. The scavenger cells of the rougher section, together with the copper cleaner tails, go to a regrind mill then returned to the rougher feed. Rougher flotation PH is about 10.5.

COPPER-MOLYBDENUM SEPARATION

The Copper concentrates containing about 0.2% molybdenum are conditioned with sufficient H_2SO_4 to drop the PH from 10.5 to 7.4. Sodium polysulphide and sodium ferrocyanide are the copper depressants and are added to the conditioner. Since both reagents are slightly alkaline, sulphuric acid is stage fed to the molybdenum rougher section to maintain a 7.4 PH at all times. This PH is important. Conditioners are used ahead of molybdenum roughers and molybdenum cleaners.

The molybdenum rougher concentrate is reground to micron size and conditioned prior to 12 state cleaning in 12 cell Denver flotation machines. Sodium cyanide is added to the last stage of copper cleaning.

The final molybdenum concentrate, which assays 80 to 85% molybdenum, 9.0% insoluble, and 0.5% copper, shows 70% recovery. The molybdenum concentrate from each shift is kept separate and if, after assaying, shows 1% copper or more it is returned back into the regrinding circuit. This concentrate is thickened, filtered and dried in an 18" screw type steam jacket dryer.

The operation is facilitated by automatic PH recorders.

It is of interest to note that this molybdenum section operates with a head assaying 27.0% copper and 0.20% molybdenum.

Very truly yours,

A. B. Romney
Metallurgist

ABR/mbe
cc: HWKaanta

PHELPS DODGE CORPORATION - MORENCI BRANCH

GENERALIZED FLOWSHEET

CONCENTRATOR

MORENCI REDUCTION WORKS

1- Ore Car from Pit
2- Rail Grizzly - 6" spacing
3- 60" Traylor Gyratory Crusher
4- Intermediate Storage Bin
13,000 tons capacity
5- 2 TyRock Double Deck Mechanical Rod Grizzly
3" openings
6- 2 7' Symons Standard Cone Crushers
2" setting
7- 8 TyRock Rod Deck Screens
11/16" openings
8- 4 7' Symons Shorthead Cone Crushers
5/8" setting
9- Mill Storage Bin 16,000 tons capacity
10- 16 10' x 10' Marcy Grate Mills
11- 32 54" Duplex Submerged Spiral Akins Classifiers
12- 80 66" Level Fagergren Flotation Cells
Primary Roughing Cells
13- 160 66" Level Fagergren Flotation Cells
Secondary Roughing Cells
14- 40 56" Level Fagergren Flotation Cells
Primary Cleaning Cells
15- 3 54" D.S.S. Akins Classifiers -
Regrind Circuit
16- 9 8'-6" x 12' Vulcan Ball Mills
Regrind Circuit
17- 52 56" Level Fagergren Flotation Cells
Secondary Cleaning Cells
18- 2 100' Concentrate Thickeners
19- 4 American Filters, 8'-6" dia., 7 discs
20- 4 300' Tailings Thickeners