3420 0002

(242)
Item 2

June 19. NORTHUMBERLAND MINING CO. - 8600 ft. elevation.
Location - 80 mi. NE of Tonopah

POWER:-

Furnished by 4 G.E. A.C. gen. driven by 4 Chicago Pneumatic diesels. Diesels 225 HP 720 rpm 6 cyl. At this altitude (8600 ft.) gen 175 H.P. A.C. gen.: 150 KW 187 KVA at 80% P. F. Diesel consumption 18,000 gals. per month @ 9¼¢ per gallon. Present overall power factor about 50-60%. Can be increased with capacitors.

Two Gardner-Denver compressors 870 r.p.m. 100# low pressure cyl. - 7", high pressure - 5-3/4" - stroke 5" - one has 60 H.P. G. E. induction motor, 1175 r.p.m. other International diesel. Cost of electric power about 1-1/2¢ per K.W.H. Now treating 240-280 tons per day. When third ball mill put in flow sheet - 350 tons possible. New 150 H.P. induction motor on new Allis-Chalmers 8' ball mill - motor and switches @ $2,000. Synch. motor @ 6,000 with better p. f., but cost of improving p. f., with capacitors more economical. Third ball mill will grind class. overflow from secondary ball mill. Ore very abrasive quartzite - wears out secondary grinding units rapidly - cones and plates at 2000 to 2500 tons. With some of ore at lower pit that is carbonaceous and arsenious, 60-65% extraction best. Quartzite ore 85-90% extraction.

Flow-Sheet - NORTHUMBERLAND MILL - 280 ton.

10" grizzly

bin

12" Traylor gy.

Coarse ore bin

2 deck Allis-Chalmers vibrating screen

Undersize fine ore bin

Traylor gyratory

Dust House

Dust pan

2-deck A.C. screen

Oversize Symons cone

all to first screen

Fine Ore

1. A. C. Ball mill
2. Classifier
3. Smaller ball mill
4. Classifier
5. Thickener - 1
6. Agitators - 3.
   Thickeners - 2

Oliver Filter

Pregnant solution

Butters leaves

Merrill Crowe

with Butter leaves for precipitate

Note: 936# CaO per 24 hrs. 300# NaCN (American Cynamid) Titration 0.6-0.8# CaO per ton, free - 1.1# NaC per ton, free. 30-4- 5" balls per 24 hrs. in No. 1, 40 3" balls per 24 hrs. in No. 2. No. 2 class. overflow 5% plus 65, 65% -200 mesh. Milling cost: $1.80 per ton. No. 1 ball mill direct herringbone gear drive by 150 H.P. induction Rheostat starter. No. 2 100 H.P. induction, V-belt drive.

When slimes too heavy, feed split between No. 1 and No. 2 thickeners. Butters leaves sprayed with Bentonite or diatomaceous earth after cleanup - 3 times per mo. 55 tons barren solution per hour. Special (venturi tube) direct reading meter for tons per hour.

June 20 NORTHUMBERLAND MINING COMPANY

Mr. James Perkins, Superintendent & General Manager
Mr. Kirkland, American Cynamid Co.
Mr. Newton, Mill Expert
Mr. Schneider, Mill Superintendent
Mr. Tom Morris, Pit Superintendent

MINE

Two pits being mined. Lower pit has black metamorphosed shale and fractured quartzite. This ore very refractory and 65% extraction is best made. Below is 100' quartzite, then granite. Both are fractured and granite carries gold values for 40 ft. Ore is outlined by churn drill holes which have been cased only to 2'-3' due to quartzite drilled through.

GEOLOGY

Granitic rock is principal intrusive and is in contact with quartzite, limestone and shale. Mr. Perkins thinks that mineralization took place in two periods, one having gold particles coated with refractory material because tails always go at least 0.02 ozs. Au. Prof. Anderson of Cal. Tech. believes gold to be sub microscopic. American Cynamid Company finds 0.08% to 0.19% arsenic in ore in form of arsenopyrite and scorodite oxidation produce, using photomicrographs. This with pyrite make up main minerals. Sericite found disseminated in ore and replacing quartzite grains. Petrographic study shows original rock to be tuffaceous and shaly with small amounts of sphalerite, gallium, etc. total of 26 elements but 90% SiO_2.

METALLURGY

Not worked out yet. Both Southwestern Engineering Co., Los Angeles, Calif., and American Cynamid Co., of Azuza, Calif., and Stamford, Conn., working on problem. NaOH tried in mill for awhile in place of $Ca(OH)_2$, but no apparent difference in extraction in laboratory tests; however, fresh ore may react differently. Ore in Pit No. 2 amenable to cyanidation but East Pit contains arsenic and carbon and is refractory. Recent tests by American Cynamid using combined flotation and cyanidation of tailings in ½% NaOH solution gave 83.61% extraction. (Float recovery 63.84% and cyaniding of tails 19.77% more recovery - 83.6)

EQUIPMENT

4 International 6-ton dump trucks; one Bucyrus-Erie churn drill; one 1-yard gasoline shovel; one 3/8th yard gasoline shovel; one Chicago Pneumatic wagon drill; one bulldozer; one large lathe for turning down crusher cones after building up with electric welding; two portable electric welders; steel sharpener.