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James Doyle Sell Mining Collection

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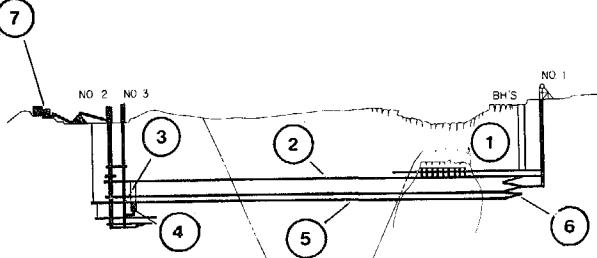
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4240.8
for PD

The Safford Branch

Tailings disposal will utilize two starter dams with a combined tailings pond capacity in excess of 400 million tons.



PRODUCTION AND DEVELOPMENT

LEGEND

- ① First Lift Cave.
- ② First Haulage Level.
- ③ Ore Passes.
- ④ Primary Crusher.
- ⑤ Second Haulage Level.
- ⑥ Ramp to Second Lift Haulage Level.
- ⑦ Concentrator.

This diagram illustrates caving of the first lift and the haulage of ore by rail to two ore passes that will lead to a primary crusher. The crushed ore is then to be hoisted up No. 2 and No. 3 Shafts to the surface.

Stope Panel

The stope panel cave system involves undercutting along the width of the ore body from the center outward and extracting the caved ore that drops into the drawbells. Rubber-tired loaders (LHDs) are used to extract the ore from drawpoints.

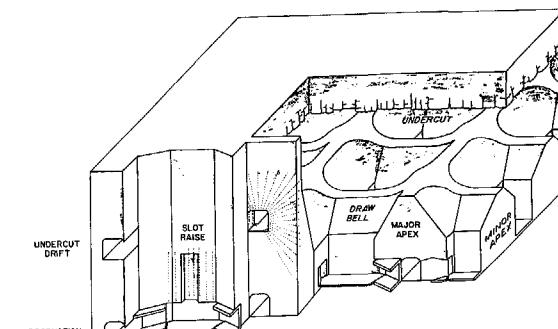
The wide openings of the drawbells provide means for boulders up to 10 feet by 15 feet by 20 feet to slip down close enough to the drawpoint so that they can be reduced in size. This reduction is accomplished by drilling and subsequent blasting of the oversized boulder. Run-of-the-mine muck is to be sized to four feet or less before extraction begins with five-yard loaders at the drawpoints.

One-way LHD hauls of ore through the production drifts will be up to a maximum of 320 feet. This muck will pass without further reduction through 8-foot diameter ore passes to 250-ton capacity trains on the rail haulage level below.

Panel development will begin with excavation of production drifts and interconnecting drawpoints. After a slot raise has been driven and enlarged, funnel-like drawbells will be drilled out from the undercut drifts and blasted just ahead of undercutting overhead.

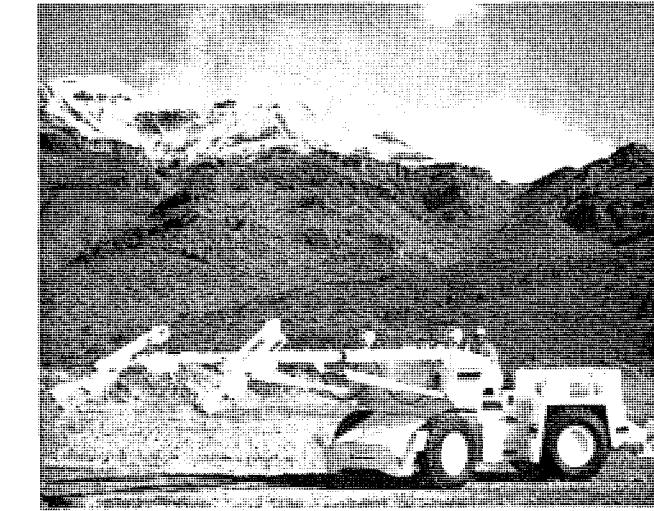
Approximately twenty production drifts will be needed to mine out the first cave lift. At present, several production drifts are being driven concurrently with haulage level development.

Thirty-five trackless vehicles are now in use.

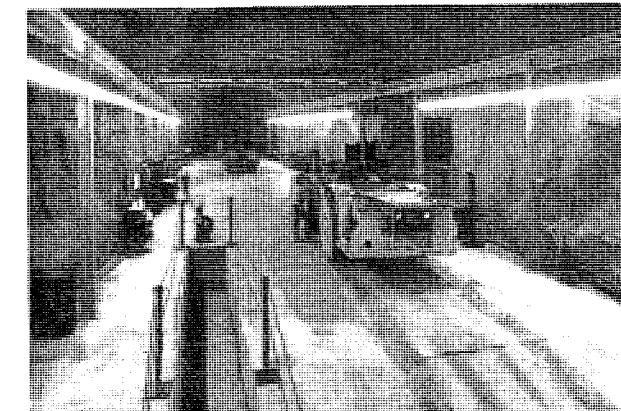


STOPE PANEL

The ore is expected to cave when the undercut has reached a 450-500 foot dimension in each direction.



Two boom drill jumbo, one of six used for drilling blast holes in the underground development headings.



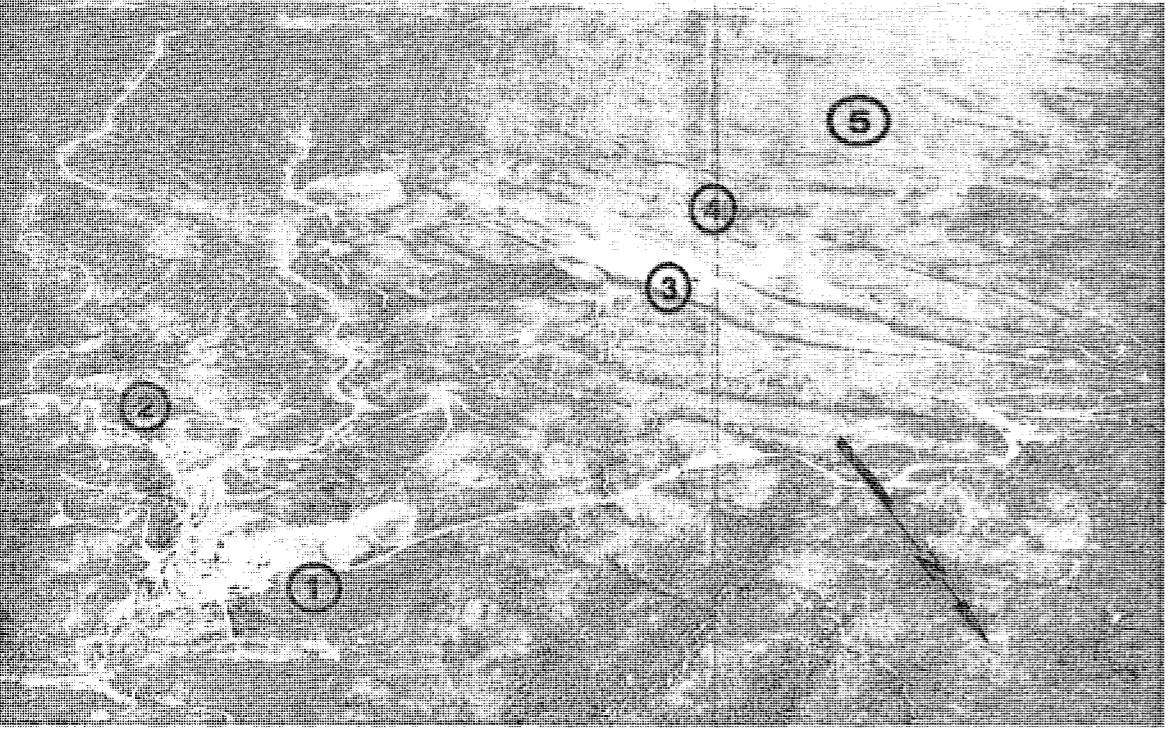
Safford Branch employees working on a 5 yard LHD hauler in the No. 1 mechanical repair bay.



FRONT · The No. 1 Shaft headframe at dawn—start of another dayshift.

phelps dodge Corporation

Safford, Arizona



The Mine Site

The Safford Branch of Phelps Dodge Corporation is an underground mine operation that is developing a large disseminated copper-bearing ore body. The operation presently consists of two shaft sites 10,000 feet apart which will be eventually interconnected underground. Two mine levels are currently expanding from the No. 1 Shaft. Future construction includes another shaft and several bore holes for hoisting and ventilation, a concentrator, and additional auxiliary shops and surface facilities for compressed air, water and power.

Development now proceeds at a modest rate with highly skilled crews who were transferred to the Safford Branch following the shutdown of the Bisbee mines.

Industrial water used at the mine site is pumped from the underground workings. Electrical power is generated on site.

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LEGEND

- ① No. 1 Shaft Site.
- ② Ore Body.
- ③ No. 2 Shaft Site.
- ④ Concentrator Site.
- ⑤ Tailings Disposal Site.

Telephone communication is beamed to the Branch from the city of Safford by a microwave system.

Origin of a Mine

Phelps Dodge Corporation optioned the Ruskin Lines group of claims in September of 1957. Following detailed field work, geochemical sampling and interpretive geology by Richard T. Moolick, Mike Fitzgerald and Vance Bacon, the Corporation commenced exploratory drilling on November 21, 1957.

Concurrent core drilling of holes RL #1 and RL #2 encountered copper mineralization within 30 feet of the surface in both holes. The success of the initial two holes enabled Phelps Dodge to employ four drill rigs and commence accelerated exploration drilling of the property. This drilling program was conducted on an 800-foot grid spacing. The Dos Pobres Ore Body, as

it is now called, was well bracketed by 1959. As a result, the Corporation exercised its option to purchase the claim group in 1960. By January 1, 1976, more than 143,500 feet of rotary drilling and diamond core drilling had been completed in more than 50 holes.

Mineralization by iron, copper, molybdenum, gold and silver is associated with a granodioritic intrusive of highly irregular shape that has invaded the Late Cretaceous-Early Tertiary aged Safford volcanics. This mineralization occurs as a weak but persistent vein system within andesite porphyry of the Safford volcanics. The geometry of the Dos Pobres Ore Body resembles an inverted funnel with copper ore values wrapping around and over a relatively barren granodiorite stock at depth.



During the present program of mine development all men and materials enter the mine through No. 1 Shaft. The mine dump shown on the right contains over one-third million tons of stockpiled ore.

Test Block

In August 1967, following preliminary mine feasibility studies, a stope block to test cavability was designed for the center of the ore body.

The project involved sinking of the No. 1 Shaft, level and caving block development, additional core drilling and construction of a bulk sample preparation plant.

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Although the 160-foot by 200-foot test block did not cave, significant information was gained on rock fabric strength, ore continuity and mining costs.

Currently the primary consideration is how coarse the rock will cave. Ore extraction designs based upon the test block results address the safety and cost effectiveness of caving the rock in the undercut panel for haulage and hoisting to the surface. The mine design is based upon handling rock as large as 4 feet in diameter.

Present Development

The Dos Pobres Ore Body has been sectioned into three vertical mine lifts. A single panel cave system will be operated for each lift. Pre-production development of the second lift will be phased in as production on the first lift is culminating.

Pre-operating development of the first lift panel is being performed concurrently with driving of the connecting drifts from No. 1 Shaft to No. 2 Shaft. All drift headings are driven by employees using rubber-tired diesel equipment.

Three haulage trains of 250 tons each will be loaded below the panels from ore chutes and will unload into the ore passes. Both operations will be conducted while the train is in motion.

A 54-inch gyratory crusher will size the coarse rock to 8 inches prior to skip loading.

The mine ventilation network will distribute 1,300,000 cubic feet per minute of air through three geographically independent ventilation systems. No mine work area will reuse vitiated air from another section of the mine. Each air supply and flow is vented to an independent exhaust system.

The No. 2 Shaft service cage will handle 200 men per trip on a double deck cage or up to 54,000 pounds on a single deck.

Ore will be conveyed from the No. 2 and the No. 3 shafts to a stockpile and transported as needed to the concentrator nearby. Waste rock will be hoisted through No. 1 or No. 2 shafts for surface disposal.

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FROM: W. L. KURTZ

P.D. - Sufford
Aug 8, 1983

To: RCBrown

J. Bell report that PD will consider disposing of ID Sufford (Das Poses) — as you recall original reported reserves were ± 225 M @ .92 Cu as br. copy Considerable d.w. has been done — shafts, rooms, trial block cave that did not work (too small a try?)

Any interest for us to inquire and make study with help of Mining Department

cc: J. Bell / SA Angolane