



## **CONTACT INFORMATION**

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PRINTED: 05/31/2002

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES AZMILS DATA

PRIMARY NAME: PIMA MINE

ALTERNATE NAMES:  
PIMA OPEN PIT MINE

PIMA COUNTY MILS NUMBER: 883

LOCATION: TOWNSHIP 16 S RANGE 12 E SECTION 36 QUARTER S2  
LATITUDE: N 31DEG 59MIN 19SEC LONGITUDE: W 111DEG 04MIN 19SEC  
TOPO MAP NAME: TWIN BUTTES - 15 MIN

CURRENT STATUS: PAST PRODUCER

COMMODITY:  
COPPER SULFIDE  
MOLYBDENUM SULFIDE  
SILVER

BIBLIOGRAPHY:  
ADMMR PIMA MINE FILE  
SKILLING, V. 61, NO. 12, MAR. 18, 1972,  
P. 16-19, V. 62, NO. 37, SEPT. 15, 1973,  
P. 1, 8-10  
AIME TRANS. V. 254, DEC. 1963, P. 297-300,  
MIN. ENGR., MAY 1973, P. 37-39  
AIME TUCSON MEETING, MAY 17, 1974, 29 PP  
E&MJ 6/77, P 104-5; 6/75, P 87-8  
USGS BULL. 1112-C, 1960, 103 PP.  
AIME 105TH ANNUAL MEETING LAS VEGAS, NV.,  
FEB. 1976, 15 PP.  
GEOPHYSICS, V. 19, NO. 3, JULY 1954, P.600-12  
MINING WORLD, OCT. 1954, P 42-45  
E/MJ JUNE 1977, P. 104  
PAYDIRT, JAN. 29, P 1, 3; 1973  
PART OF MISSION COMPLEX AFTER 7/86  
PIMA MINE STORY, 2000, HEINRICHS, W.E. JR.



35

36

31

MINE

MISSION MINE

MINE

PIMA MINE

Mineral Hill

Tailings Pond

Banner Mine

Mine Dump

Water Tank

Settling Tanks

Water Tanks

Tailings Pond

Tailings Pond

Settling Tanks

6

MINE DUMP

TWIN BUTTES 7.5'

S. RIDE Sec. 30  
N. RIDE Sec. 7

Whitcomb Hill

Helmet Peak

11

HELMET PEAK

Wash

3268

BM 3454

Twin Buttes 7.5'

13

18

3300

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES

INFORMATION FROM MINE CARDS IN MUSEUM

ARIZONA

PIMA COUNTY

PIMA MINE

MM 4476 Chalcopyrite

4493 Cuprite

4494 Cuprite

MM 660 Chalcopyrite

5 MILS # 883

1-AZ.

Pima mine

PIMA MINING COMPANY

IC 7822 ABM Bulletin 180, p. 134,135, 137, 140, 144

USGS Bull. 1112-C  
" " 725-J, p. 425

Cyprus Mines (file)

AIME Vol. 199, p. 197-202

Mining World, March, 1956  
" " November, 1958, p. 40-43  
" " September, 1961, p. 116  
" " September, 1963, p. 56-66  
" " December, 1963, p. 36

Metal Mining & Processing, January, 1964, p. 29, 30  
" " " May, 1964, p. 61  
" " " February, 1965, p. 39  
" " " April, 1965, p. 21

World Mining Catalog Directory, 1964, p. 163  
" " March, 1965, p. 85  
" " June, 1966, p. 30  
" " October, 1966, p. 39

PIMA MINING COMPANY

Mining Congress Journal, October, 1964, p. 106  
" " " March, 1966, p. 26-35  
" " " November, 1966, p. 5  
" " " July, 1967, p. 30  
" " " May, 1974, p. 13, 16  
" " " June, 1974, p. 7 (name change)  
" " " September, 1974, p. 7 (env. award)

Mining Engineering, May, 1965, p. 21  
" " February, 1965, p. 94  
" " June, 1965, p. (in file)  
" " February, 1973, p. 51, 119  
" " April, 1973, p. 47  
" " October, 1974, p. 14 (env. award)  
" " December, 1974, p. 65 (gen. info.)  
" " February, 1975, p. 88 (personnel)

E/MJ, June, 1958, p. 102  
" March, 1958, p. 100-106  
" May, 1960, p. 122  
" October, 1961, p. 116  
" January, 1963, p. 83  
" June, 1965, p. 276  
" November, 1965, p. 101  
" January, 1966, p. 76  
" March, 1966, (in file)  
" May, 1966, p. 125  
" June, 1966, p. 693  
" October, 1966, p. 139  
" December, 1966, p. 128  
" April, 1966, p. 146  
" January, 1967, p. 72  
" March, 1967, p. 13  
" April, 1967, p. 146  
" February, 1973  
" March, 1974, p. 198  
" February, 1974, p. 32  
" July, 1974, p. 27 (demonstration plant) p. 72-74(revegetation)  
" June, 1974, p. 211(name change)  
" September, 1974, p. 221 (env. award)  
" March, 1976, p. 9

PIMA MINING COMPANY

Mining Magazine, September, 1965, p. 237

Metals Week, March 13, 1972, p. 6  
" " Sept. 2, 1974, p. 3 (strike)  
" " Sept. 9, 1974, p. 6 (gen. info.)  
" " November 11, 1974, p. 3 (labor contract)

Pay Dirt, May 20, 1966

World Mining, January, 1968, p. 38

Skillings Mining Review, March 26, 1966, p. 14  
" " " April 2, 1966, p. 25  
" " " April 16, 1966, p. 8, 10  
" " " July 20, 1966, p. 12  
" " " October 1, 1966, p. 25  
" " " April 22, 1967, p. 20  
" " " August 26, 1967, p. 20  
" " " November, 4, 1967, p. 12 (in file)  
" " " November 11, 1967, p. 20  
" " " January 20, 1968, p. 18  
" " " May 13, 1972, p. 12  
" " " September 15, 1973, p. 1, 8-10  
" " " April 27, 1974, p. 7  
" " " January 26, 1974, p. 20  
" " " April 13, 1974, p. 23  
" " " May 19, 1973, p. 14  
" " " Aug. 3, 1974, p. 18 (env. award)  
" " " Feb. 28, 1976, p. 5 (new process improves molybdenite recovery)

Mining Journal, April 26, 1974, p. 344  
" " April 13, 1973, p. 302  
" " Aug. 2, 1974, p. 96 (conservation award)  
" " Aug. 9, 1974, p. 114 (inflation)

Mining Annual Review 1974, p. 297, 299

PIMA MINING COMPANY

1-1969

A.A. Friedman, V.P. & Gen. Mgr. retired  
G.A. Komadina, Resident Mgr.  
J.H. Bassarear, Mill Mgr.  
M.D. Martin, Mine Supt.  
M.W. Hood, Chief Mining Engr.

4-1-69 - Paul W. Allen, President

1970

George A. Komadina, V.P. & Gen. Mgr.  
Michael D. Martin, Res. Mgr.  
Robert M. Izard, Mine Supt.

Officials Attending Second Annual  
Mines Day Dinner 1-7-66

Pima Mining Company  
P.O. Box 7187 - Tucson, Arizona

Mr. & Mrs. A. A. Friedman  
Vice President - 7/67  
Mr. & Mrs. G. A. Komadina  
Asst. Resident Manager  
Mr. & Mrs. A. W. Griffith  
Mill Superintendent  
Mr. & Mrs. James F. Olk  
Mine Superintendent  
Mr. & Mrs. A. G. Beebower  
Electrical Superintendent  
Mr. & Mrs. H. E. Eckstein  
Purchasing Agent  
Mr. & Mrs. D. N. Tremper  
Office Manager

Mr. H. T. Mudd, President  
Pima Mining Co.

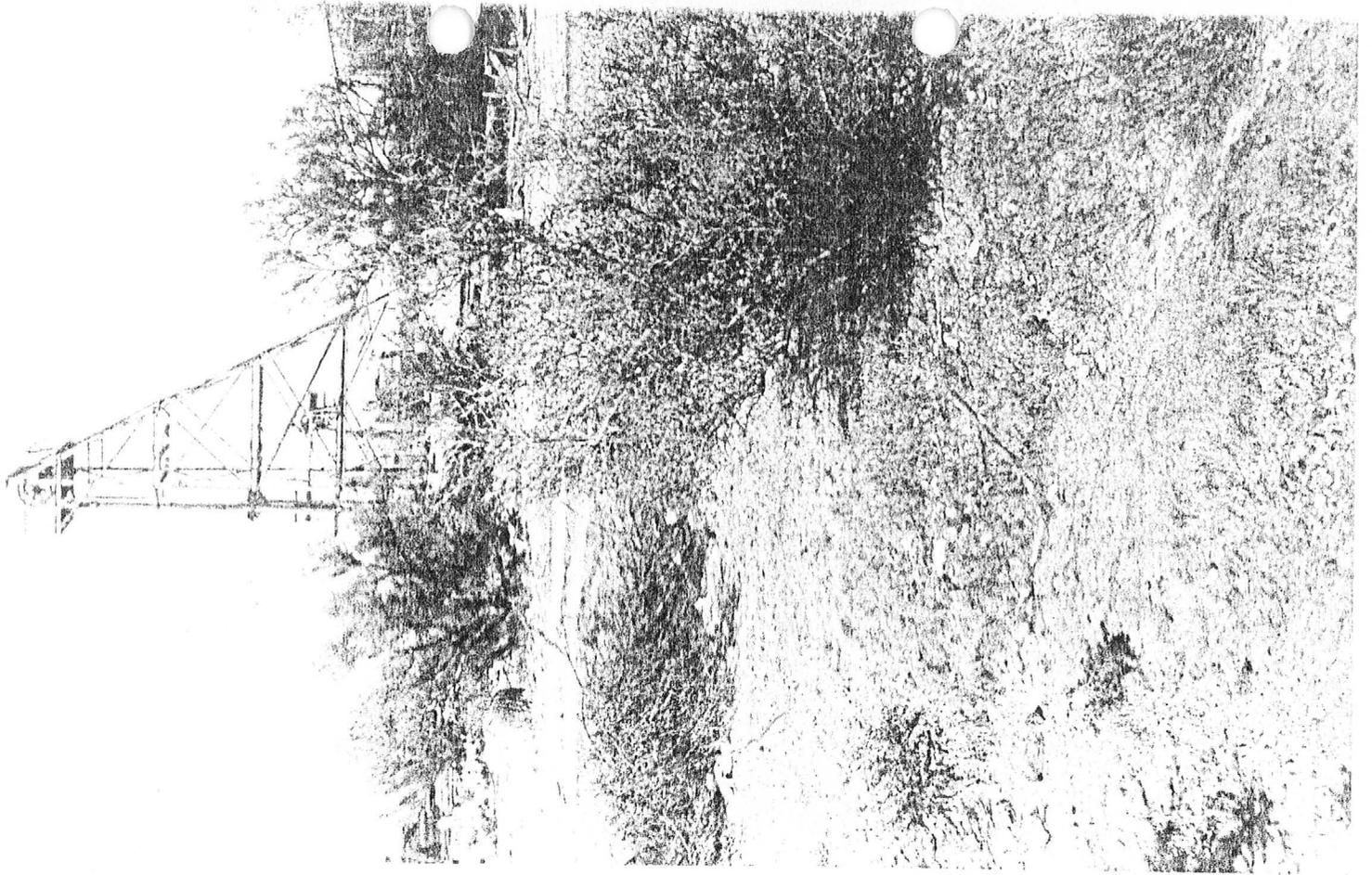
Information from MINE INSPECTOR'S OFFICE - August 15, 1957

PIMA MINING CO.                   (100 claims)   PIMA COUNTY                   6-14-57  
P.O. Box 7187  
Tucson, Ariz.

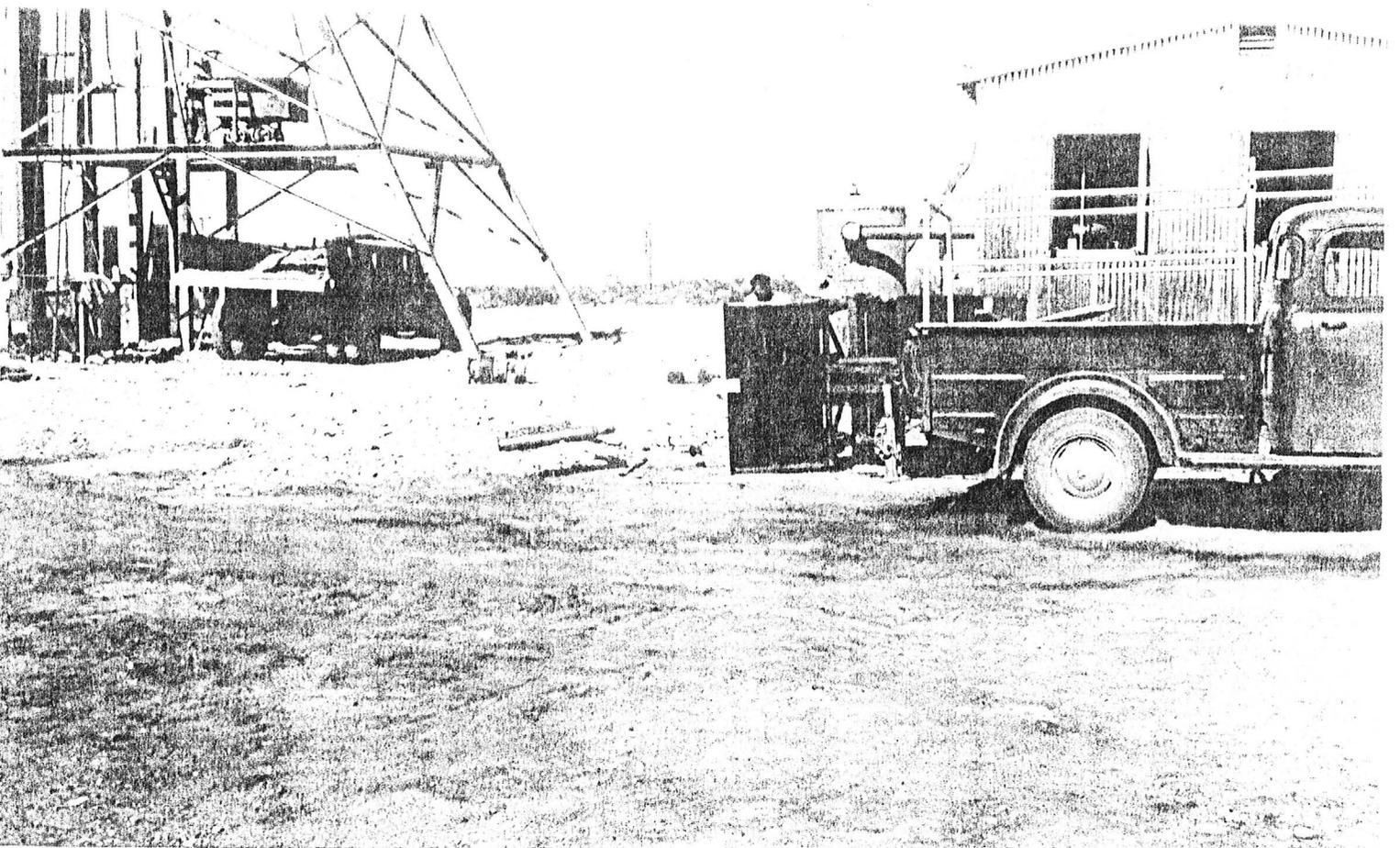
Henry Mudd, Pres., Los Angeles, Calif.  
Dave Evans, Sec.,       "       "       "  
Supt. - R. E. Thurmond, Box 7187, Tucson  
Mgr. - E. D. Spalding,       "       "       "

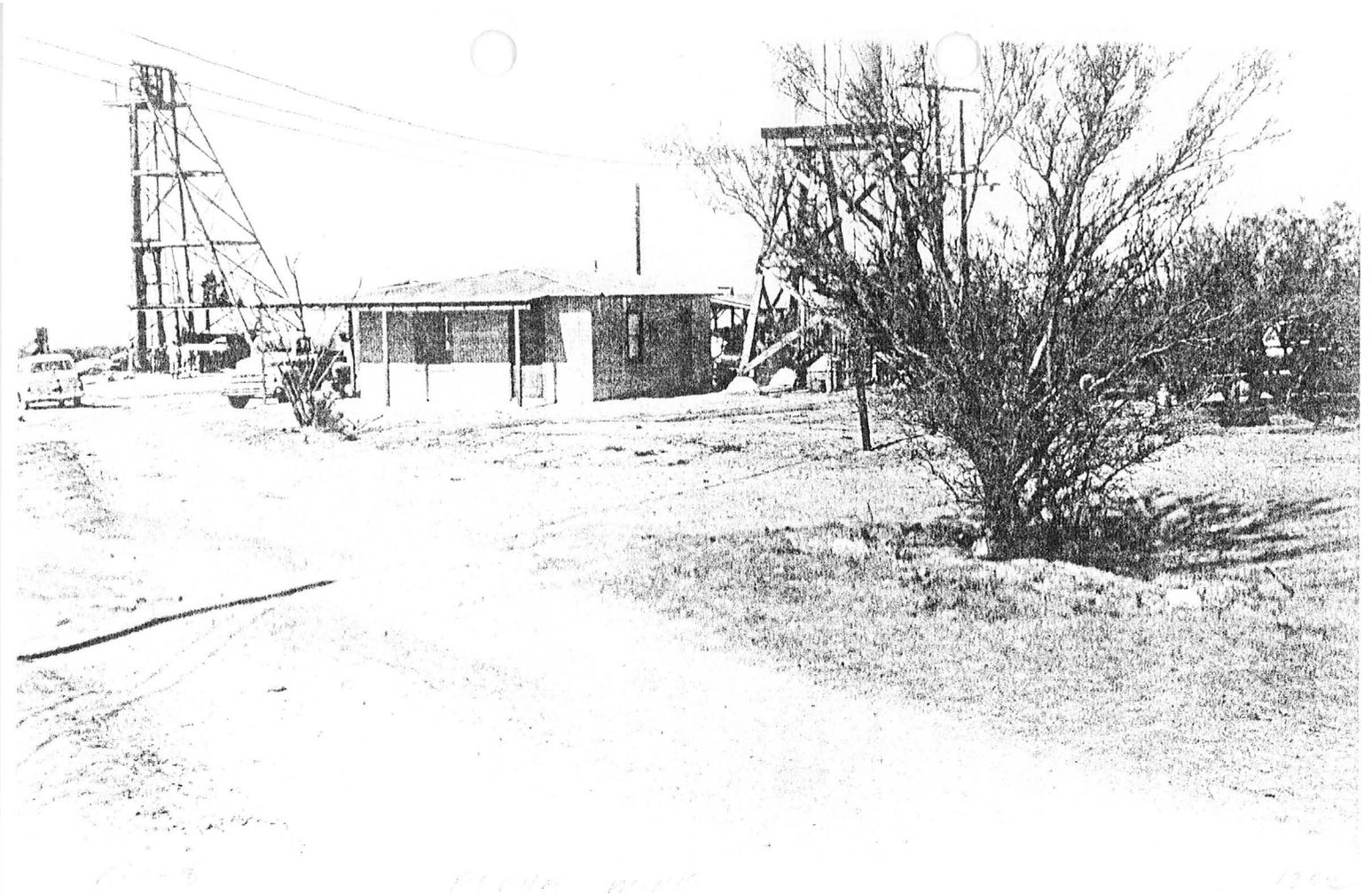
COPPER                   350,000 yds.       -       74 men

L.A.S.



CLIFF



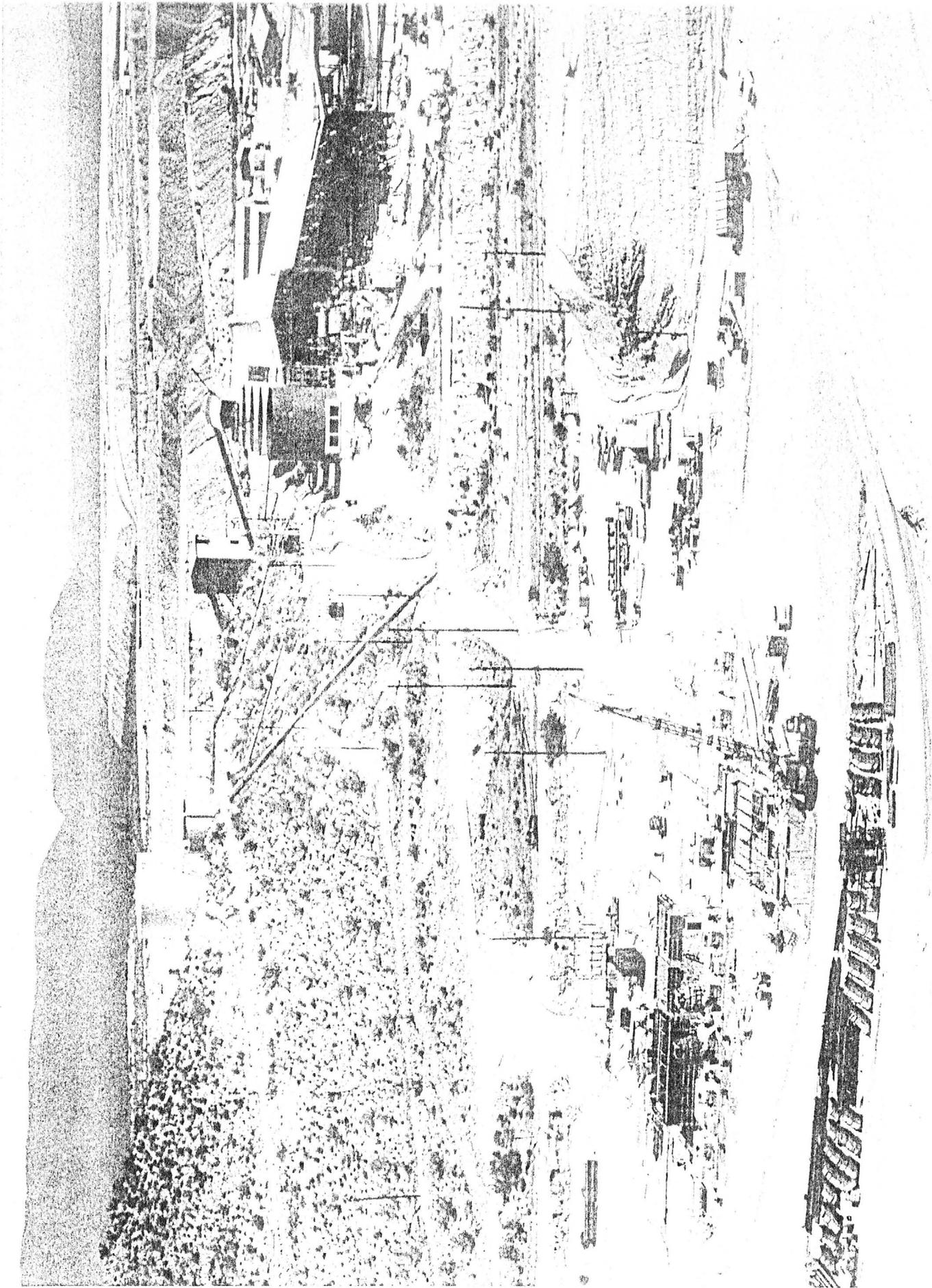


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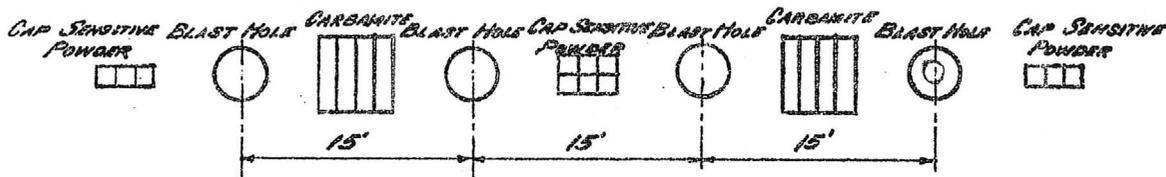


11-12-57

PIMA MINING COMPANY

PROCEDURE OF LOADING PRIMARY BLAST HOLES

The General Mine Foreman or powderman inspects and measures each hole, and then he calculates the amount of explosives needed. The powder truck driver is given the order to draw the required amount of explosives from the magazine. Meanwhile, the loading area is fenced off by rubber cones 30 inches high, painted yellow, and with a one-quarter inch rope fastened to the tops of the rubber cones. Just prior to the loading time, the powder truck delivers the explosives to the loading zone where it is stacked. The cap sensitive powder is stacked in separate piles away from the other explosives (see sketch).



All piles are separated by a distance of twelve and one-half to fifteen feet. During the actual loading each box or bag is carried over to the collar of the hole and either lowered or poured into the hole before any other explosive is brought over to the collar. The loading crew is composed of, on the average, four men; one of these men must be a powderman, two experienced powderman's helpers, and one apprentice.

The actual loading of the primary blast is done in the following manner when using stick powder as primer for carbamite. The powder rise is calculated. Then, three sticks of 1 1/4 x 16 forty per cent powder are tied at the end of a length of reinforced primacord. Additional sticks of 1 1/4 x 16 forty per cent powder are tied to the primacord, spaced six inches apart to rise even with the powder rise in the drill hole. The whole string is then lowered into the drill hole. An average of two sticks of powder per each bag of carbamite is used in addition to the first three sticks placed at the bottom of the hole. A single line of primacord is used down each hole.

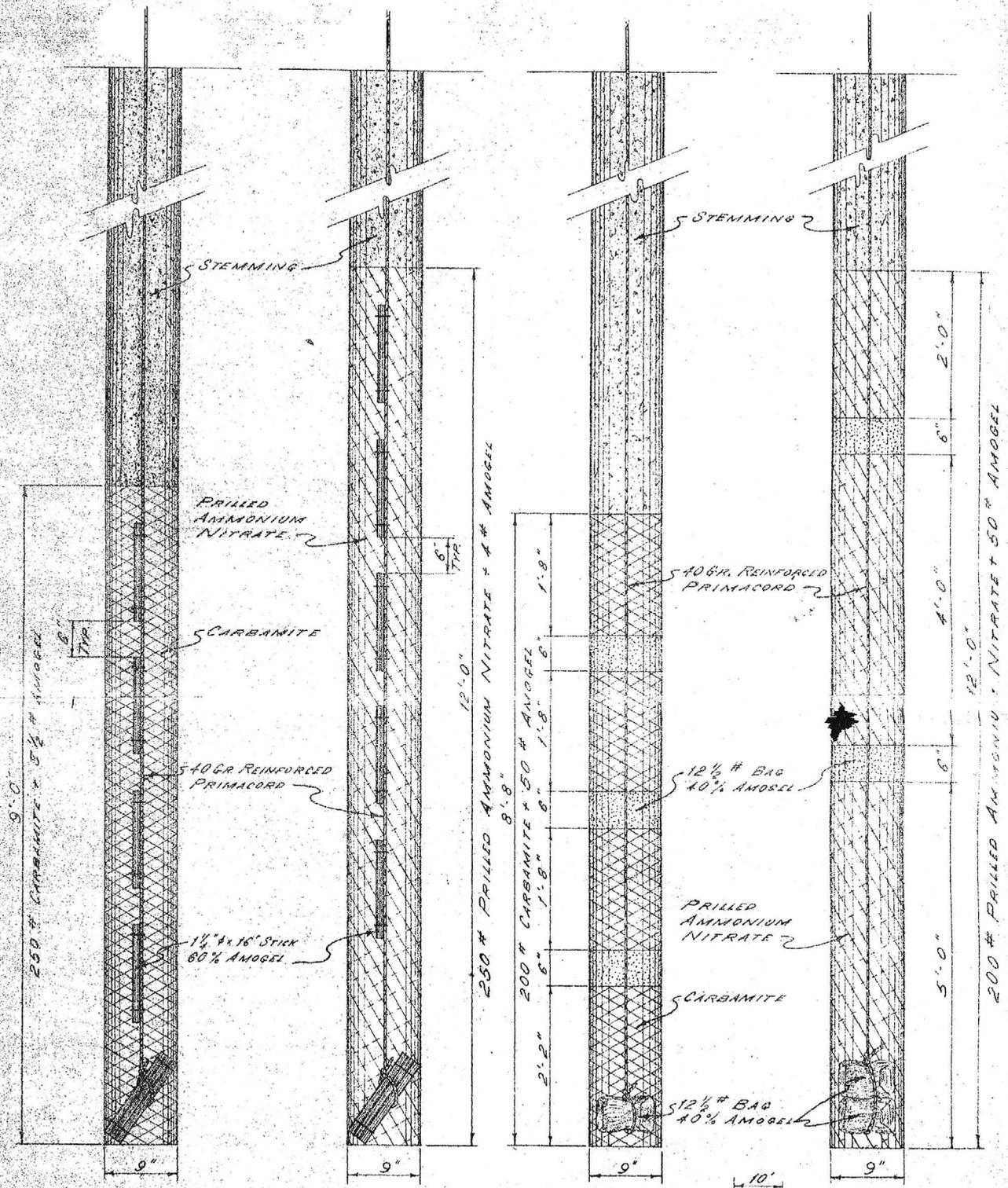
The powderman has lowered the primacord with the sticks attached down the hole. He then holds it while the powder crew pours the carbamite into the hole. When all of the charge is in the hole, it is then stemmed with cuttings from the rotary drill. When the hole has been stemmed, the powderman cuts the primacord, leaving not less than 18 inches out of the hole to be tied to the main trunk line after all of the holes in the shot are loaded. The number of people that are loading are held to a minimum to lessen the amount of personnel exposed.

When using bag Amogel as a primer, the following procedure is used:

One bag of Amogel is tied to the lower end of the primacord, and it is lowered down the hole. One bag of carbamite is poured into the hole. Then a bag of Amogel is poured into the hole. This procedure is followed, one bag of carbamite, one bag of Amogel, until the required amount is loaded in the blast hole. All blast holes are stemmed with cuttings left from the rotary drill as soon as loaded.

When two lines of primacord are used, a rock is tied on the first line of primacord and lowered to the bottom of the hole. Then one shovel (#3) full of stemming is put down the hole. The next line of primacord is tied onto a bag of Amogel, or stick powder as the case may be, and lowered to the bottom of the hole.

**BLAST HOLES**



- NOTES:**
1. POWDER RISE IN BLAST HOLE  
6" PER 12 1/2# BAG AMOGEL  
40" PER 100# CARBAMITE  
60" PER 100# PRILLS
  2. BLAST HOLE SPACING  
15' ON CENTERS
  3. CALCULATED YARDAGE  
400 CU. YDS. PER BLAST HOLE
  4. LOADING FACTOR  
.6# PER YD. BLASTED

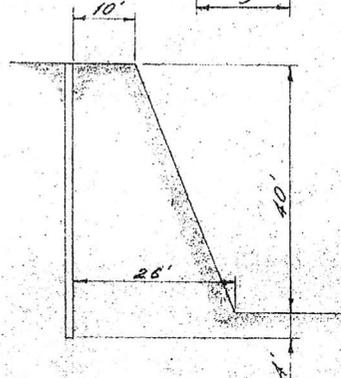
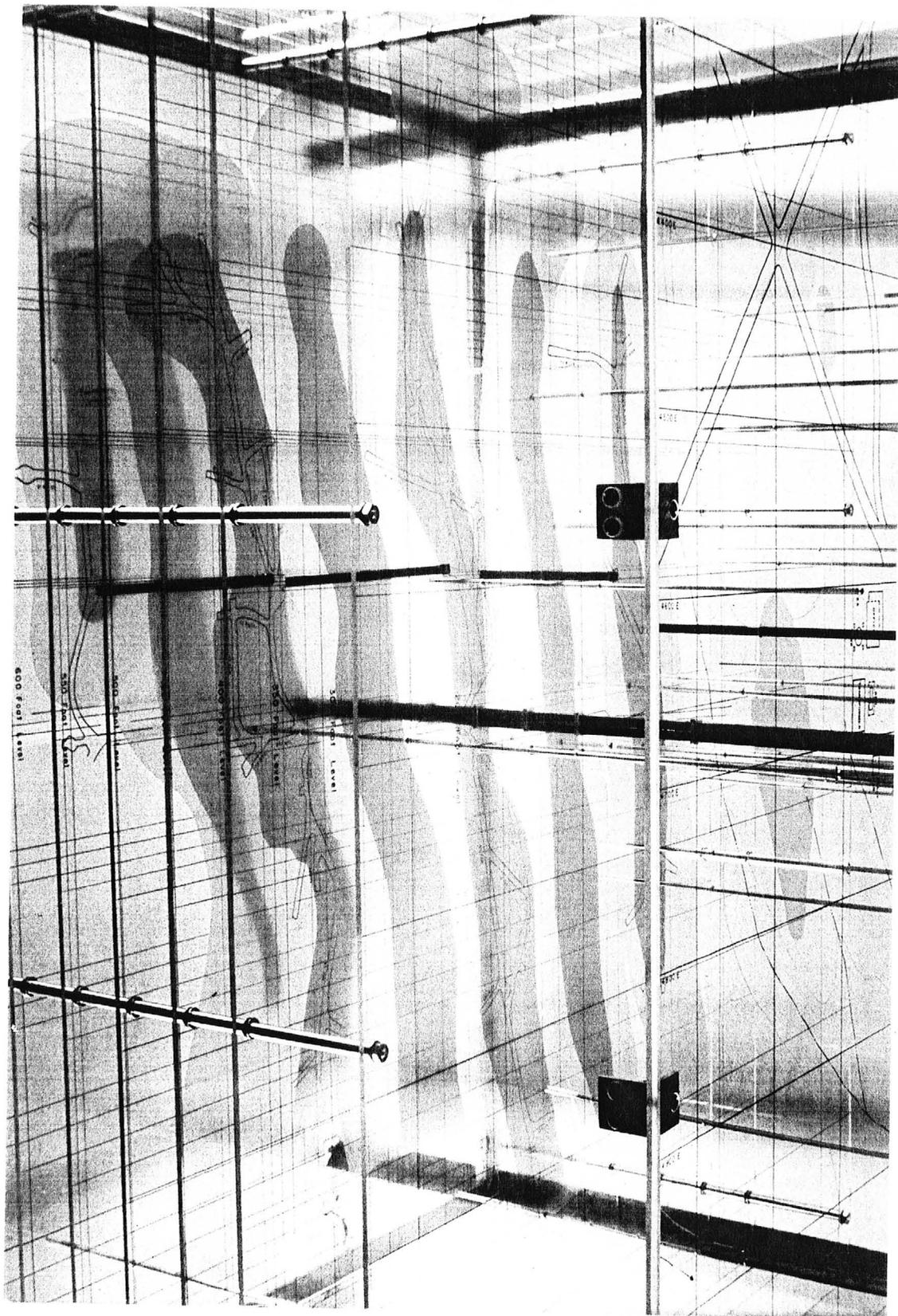


PHOTO OF MODEL OF TOP 600' OF PIMA MINE, AZ - NOW DUG OUT.

- BY CHAS. L. HEALD / MODEL BY ROBERT H. MANSFIELD 1953-54.  
BOTH OF UNITED GEOPHYSICAL CO AT THAT TIME.



2 PLASTIC ABNORMAL OVERLAYS  
NOT SHOWN / INCL. SURFACE  
LAY-OUT, HORIZONTAL LEVELS TO  
600', VERTICAL OPERATING SHAFT  
SLANT EMERGENCY EXIT, CORE  
HOLE ASSAYS, AND COPPER - RED = 5%  
YELLOW 3%.

SEE ALSO "GEOPHYSICS IN THE  
AFFAIRS OF MAN" C.C. BATES P327

Plastic model of Pima Mine  
located about 20 miles SW  
of Tucson, Arizona, as of  
1952-53. This model, designed  
and built, except drafting,  
\* by R.H. Mansfield, was shown  
at AIME meeting in New York  
and SEG meeting in St. Louis  
after serving its purpose  
in evaluation of the mine  
by the board of directors  
of Union Oil Co. of Cal.  
THEN OWNERS OF UGC.

Please return eventually  
to R.H. Mansfield  
1425 Teton Ave  
Billings, Mont.

\* FOR UNITED GEOPHYSICAL CO  
WHO DISCOVERED IT. 1953 ± / DR. R.A. PETERSON.

\* NOW AT PIMA MINE OFFICE.  
Stereos - Kodachromes taken without  
transparent MoMAc and Electric  
Induction anomaly maps at surface.  
This was a geophysical discovery  
by United Geophysical Co.

Cyprus Pima Mining Company

Pima County

NJN WR 5/21/82: Provided Gary Dillard of Pay Dirt magazine with 1981 production figures for the Cyprus-Pima Mine which is stopping mining, but continuing to mill a low grade stockpile.

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NJN WR 9/21/84: The Cyprus, Pima mine reports it is liquidating all equipment on the property except the mill. They estimate this will take about 2 years to accomplish.

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PIMA MINING COMPANY

Pima Mining Co. - in Pima Mining District - gave up their exploration project on the Reservation. GWI Quarterly Report 12/1968

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The Pima Mining Co. announced plans to increase production to 50,000 tpd is probably the major announcement for the county for this quarter. GWI Quarterly Report 12-31-70

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Pima Mining Co. is working on another expansion. This time from 30 to 50M tpd. GWI QR 4-1-71

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Pima Mining Co. is working on their expansion. GWI QR 6-30-71

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Directory of Mining - August 1971 - 890 men.

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Pima Mining Company expansion project continues on schedule. GWI QR 9/71

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Pima Mining Company project continued on schedule. GWI QR Oct-Dec '71

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Tucson Star carried an article regarding Pima County Board of Supervisors approving law suit against state to attempt to force an increase in mine valuations at Sierrita, Twin Buttes and Pima mines. The law firm selected by the county is Johnson, Hayes and Dowdall, Ltd. The attorney handling the case is Anthony D. Terry of Phoenix. The county's expert witness will be Alfred Patrick, Jr., Professor of Mineral Economics at Colorado School of Mines. VBD WR 10/9/74

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M.W. Hood, mine supt., J.Y. Bassarear, mill mgr., and A.G. Beebower, electric supt. have quit Pima Mining Co. Hood has joined Harry Winters in a consulting office in Redondo Towers. VBD WR 9/15/75

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MG WR 9/18/81: Cyprus Pima mill is installing 1,000 cu ft floatation cells to replace old 50 cu ft cells. Plans call for increasing mill capacity to original 55,000 tons/day.

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G WR 1/15/82: George Komadina, Vice President and General Manager of the Pima Mine, said that production continues at 32,500 TPD. A plan to install w 1,000-cu ft flotation cells in the mill has been postponed until the economic situation improves.

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Active Mine List Nov. 1967 - 659 men

Pima continued production during the strike. GWI QR 4-1968

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Active Mine List April 1968 - 714 men - George A. Komadina - Mgr.

The Pima Mine is in full production. The two pits are beginning to look like one. It has been reported that all of Pima concentrates are going to Phelps Dodge at Morenci and Douglas. They are supposed to be divided equally but Morenci receives about two cars to Douglas one. GWI QR 6-1968

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Copper Production - Pima reached their 30,000 tpd with pit expansion and mill expansion. GWI Annual Report 9-1968

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Active Mine List Oct. 1968 - 748 men

On a 3-shift, seven-day week, Pima is mining 36,000 tpd milling ore which averages less than 0.6% copper. An estimated 1 million pounds of molybdenum produced in 1968. Skillings 1-11-69

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Asarco and Pima are continuing the removal of the material between their pits so that it is beginning to look more like one open pit. Pima's mining rate is 30,000 tpd and that of the Asarco Mission pit 25,000 tpd. Pima Mining Co. is going to try out six of the Electro Haul 200 ton trucks. GWI QR 12-1968

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Active Mine List April 1969 - 751 men - George A. Komadina, Mgr. P.O. Box 7187, Tucson

Pima Mining Co. continues at a 30,000 tpd rate, depending on the grade of the ore. The 200 ton unit rig has been used and moved to another job. GWI QR 3-1969

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The Pima Mine is now the third largest producer in the State. GWI QR 9-1969

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Active Mine List Oct. 1969 - 750 men - George A. Komadina, Mgr.

The Pima and Mission Pits are becoming one as the remaining rock between them was being mined. GWI QR 4-1-70

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Active Mine List May 1970 - 780 men - George A. Komadina, Res. Mgr.

The Pima and Mission Pits are beginning to look like one operation with the removal of the rock between the two operations. It has been announced that Pima may increase production by another third. GWI QR 6-30-70

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Pima is working on their planned expansion. Mission and Pima continue to become one pit for all appearances. GWI QR 10-1-70

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Active Mine List Oct. 1970 - 844 men - George A. Komadina, Mgr.

Mine visit. Pima Mine (George Komadina) 10/27/71 (GWI WR)

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Pima is still increasing. GWI QR 9/71

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The Pima mine has completed their expansion program to 53,000 TPD; see June Pay Dirt for details. GWI 4 1/4 '72

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Active Mine List - October 1972 -

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Tucson Star carried an article regarding Pima County Board of Supervisors approving law suite against State to attempt to force an increase in mine valuations at Sierrita, Twin Buttes and Pima mines. The law firm selected by the county is Johnson, Hayes and Dowdall, Ltd. The attorney handling the case is Anthony D. Terry of Phoenix. The county's expert witness will be Alfred Patrick, Jr., Professor of Mineral Economics at Colorado School of Mines. VBD WR 10/9/74

August 13, 1975

**THE ARIZONA LEGISLATIVE REVIEW**

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**Effluent To Be Tested In Mining**

Four copper mines in the Tucson area have agreed to test a plan to substitute sewage effluent for clean water in their operations.

Tucson and Pima County water officials estimate that the substitution would free 33 million gallons of water per day for municipal use.

Anamax Mining Co., Duval Corp., ASARCO and Pima Mining Co. have agreed to pay half the cost of a \$100,000 engineering study of the plan which calls for piping the treated effluent 26 miles from the treatment plant to the mines.

Alpha - "K"  
Subject - Cyprus Pima  
Mining Co.  
Copper Rpt.  
Copy - GM

April 26, 1977

Mr. George A. Komadina  
Vice President & General Manager  
Cyprus Pima Mining Company  
P. O. Box 7137  
Tucson, Arizona 85725

Dear Mr. Komadina:

The Department of Mineral Resources is compiling data for its annual report on the copper industry, A PROFILE OF ARIZONA'S PRIMARY COPPER INDUSTRY FOR 1976, VOLUME I. We would appreciate having your 1976 production figures for: (1) tons of ore mined (2) pounds of recoverable copper and (3) pounds of recoverable molybdenum. Please insert the Data in the space provided on the attached tabulation sheet.

Similar requests are being sent to all Arizona copper producers and a copy of the completed 1976 tabulations will be returned to you.

Thank you very much.

Sincerely,

Glenn A. Miller  
Mineral Resources Specialist

Enclosures

GAM/ap

STATE OF ARIZONA  
DEPARTMENT OF MINERAL RESOURCES  
MINERAL BUILDING, FAIRGROUNDS  
PHOENIX, ARIZONA 85007

July 20, 1976

C  
O  
P  
Y

Mr. George A. Komadina  
Vice President & General Manager  
Cyprus Pima Mining Company  
P.O. Box 7137  
Tucson, Arizona 85725

Dear Mr. Komadina:

Thank you very much for furnishing the Department of Mineral Resources with the 1975 production data for your Arizona mining operations.

Enclosed is a copy of the completed 1974-1975 tabulations for all large Arizona copper producers.

If the Department, or I, can be of assistance to you at any time, please contact us.

Sincerely,

Glenn A. Miller  
Mineral Resources Specialist

Enclosure

GAM:jm File: Cyprus Pima Mining Company  
Yellow Alpa "C", Copper Report, GAM file

STATE OF ARIZONA  
DEPARTMENT OF MINERAL RESOURCES  
MINERAL BUILDING, FAIRGROUNDS  
PHOENIX, ARIZONA 85007

April 21, 1976

C  
O  
P  
Y  
George A. Komadina,  
Vice President & General Manager  
Cyprus Pima Mining Company  
P.O. Box 7187  
Tucson, Arizona 85725

Dear Mr. Komadina:

The Department of Mineral Resources is compiling data for its annual report on the Copper Industry, "The Copper Industry Statistics For 1975 Compared With Other Years - Arizona, The United States and The World". We would appreciate having your 1975 production figures for: (1) tons of ore mined, (2) pounds of recoverable copper, and (3) pounds of recoverable molybdenum. Please insert the data in the space provided on the attached tabulation sheet.

Similar requests are being sent to all large Arizona copper producers and a copy of the completed 1974-1975 tabulations will be returned to you.

Thank you very much.

Sincerely,

Glenn A. Miller  
Mineral Resources Specialist

Enclosures

jm

cc: Cyprus Pima file  
Pink Reading, Yellow Alpha "C"  
Copper Report file, GAM file

880

DEPARTMENT OF MINERAL RESOURCES

STATE OF ARIZONA

FIELD ENGINEERS REPORT

Mine Pima Mine Date June 28, 1967  
District Pima Engineer G.W. Irvin  
Subject: Mine visit - information from A. A. Friedman, V.P. and Mgr.

The expansion program is 90% completed.

The Molybdenum sulfide plant is working satisfactorily.  
The expansion program should be completed by September 1967.  
All of the new equipment is on the site. New buildings are being constructed.

An experimental planting program is underway at the tailings site, trees and shrubs are being planted. It is hoped that this program will stop any dust being blown from the ponds.

The nominal capacity of the expansion is 30,000 tpd. This may go higher at times, especially when the ore is softer than normal.

DEPARTMENT OF MINERAL RESOURCES  
STATE OF ARIZONA  
FIELD ENGINEERS REPORT

Mine Pima Mine

Date June 2, 1966

District Pima, Pima County

Engineer G. W. Irvin

Subject: Mine visit, information from A. A. Friedman, Resident Manager.

Mine: The mine is now producing 18,000 TPD (not for immediate publication).

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DEPARTMENT OF MINERAL RESOURCES  
STATE OF ARIZONA  
FIELD ENGINEERS REPORT

Mine Pima Mines

Date March 10, 1965

District Pima District, Pima Co.

Engineer Axel L. Johnson

812 Adams, N.E., Albuquerque, N.M. 87188

Subject: Mine Visit. Information from John Journeay, Geologist.

9-13-65

References: Report of Dec. 9, 1964.

Present Mining Activity: Ore production amounts to about 8,000 tons per day, with the mine working 2 shifts, 6 days per week. At the same time, about 3,500 tons per day of waste rock is removed from the pit.

Stripping is now being done on the south side of the main pit and on the east end of the pit, working 3 shifts, 6 days per week. About 16,000 tons per day of alluvium stripping and 22,000 tons of waste rock stripping is now being done.

The mill operates three shifts per day 7 days per week milling an average of 7,000 tons per day or 49,000 tons per week.

348 men are, at present, employed with the company. 44 of these are salaried employees on administration and office work.

Exploration: Diamond drilling is being done on contract to Joy Manufacturing Co. Drilling Division, with one diamond drill rig operating two shifts.

B69

DEPARTMENT OF MINERAL RESOURCES

STATE OF ARIZONA

FIELD ENGINEERS REPORT

Mine Pima Mines

Date December 9, 1964

District Pima District, Pima Co.

Engineer Axel L. Johnson

Subject: Mine Visit. Information from John Journeay, Geologist.

References: Report of June 10, 1964 and previous reports.

Present Mining Activity: Ore production now amounts to about 8,200 tons per day, with the mine working two shifts per day, 6 days per week. Weekly production is about 49,000 tons.

28,000 tons of waste rock is removed from the pit daily.

Stripping is now being done on the south side of the main pit, with about 8,000 yards or about 12,000 tons of stripping removed daily. Stripping is carried on also on 2 shifts - 6 days per week.

348 men are, at present, employed with the company. 44 of these are salaried employees on administration and office work.

The mill operates three shifts per day 7 days per week milling an average of 7,000 tons per day or 49,000 tons per week.

Exploration: Diamond drilling is being done on contract to Joy Manufacturing Co. Drilling Division. One diamond drill rig is now operating two shifts inside the limits of the new Northeast ore body.

BUB

DEPARTMENT OF MINERAL RESOURCES

STATE OF ARIZONA

FIELD ENGINEERS REPORT

Mine Pima Mines

Date June 10, 1964

District Pima District, Pima Co.

Engineer Axel L. Johnson

Subject: Mine Visit. Information from John Journeay, Geologist.

References Report of Sept. 27, 1963, and previous reports.  
Article in Metal Mining & Processing, Jan. 1964, entitled "Pima Doubles Capacity" by John R. Bogert. ---Part 1, Mine expansion, and Part 2, Mill expansion.

Present Staff

- \* P. W. Allen, General Manager
- \* A. A. Friedman, Resident Manager
- \* R. E. Thurmond, Assistant Resident Manager
- \* James F. Olk, Mine Superintendent
- \* George A. Komadina, Mill Superintendent
- \* M. D. Martin, Chief Mine Engineer
- \* John A. Journeay, Resident Geologist
- \* M. H. Nicholson, Mechanical Superintendent
- \* A. G. Beebower, Electrical Superintendent
- \* D. N. Tremper, Office Manager
- \* D. C. Shelton, Metallurgist

Present Mining Activity Ore production now amounts to about 9,000 tons per day, with the mine working two shifts per ~~day~~ day, 6 days per week. 28,000 tons of waste rock is removed from the pit daily, also working two shifts, 6 days per week.

Stripping is being continued on the new Northeast ore body, at the east end of the present pit. About 12,000 tons per day of alluvium is removed from the stripping operations, and stripping operations are also continued on two shifts, 6 days per week.

340 men are, at present, employed with the company. 40 of these are salaried employees on office work and administration. ~~10~~ 10 of the remaining 300, are temporary, used as replacements for employees on vacation.

Mine equipment used is listed in full in the article in Metal Mining & Processing, Jan. 1964, on page 31.

Milling The mill operates three shifts per day, 7 days per week, milling an average of about 7,700 tons per day, or 54,000 tons per week. The mill heads run about 1.25 % copper.

The milling equipment in use is listed in the article in Metal Mining & Processing, Jan. 1964, on page 53; and 3 flowsheets, (crushing, grinding, and flotation,) are given on page 34.

Exploration Diamond drilling is being done on contract with Joy Drilling Co., with 2 diamond drill rigs working on 2 shifts each. Some of the holes are drilled within the limits of the northeast extension to obtain additional information on ore reserves and grade. Other drill holes are drilled around the periphery of the extension to obtain geological information, and possible additional ore reserves. Depth of the holes vary according to location and purpose. The article from M, M & P., quoted above states that they average 1,000 ft. in depth (see page 31) .

BL07

DEPARTMENT OF MINERAL RESOURCES  
STATE OF ARIZONA  
FIELD ENGINEERS REPORT

Mine Pima Mines

Date Sept. 27, 1963

District Pima District, Pima Co.

Engineer Axel L. Johnson

Subject: Field Engineers Report. Information from John Journeay, Geologist

References: Report of May 13, 1963 & previous reports.

Present Officers: Officers of the company now are: -  
A.A. Friedman, Resident Manager (replacing E.D. Spaulding, deceased)  
R.E. Thurmond, Assistant Resident Manager  
James Olk, Mine Superintendent  
M.D. Martin, Chief Engineer  
George A. Komadina, Mill Superintendent  
John A. Journeay, Geologist

Present Mining Activity: The present ore production is slightly over 7,000 tons per day. This will be gradually increased to 8,000 tons per day. The production was stepped up from about 4,000 tons per day to the present figure on August 26th at which time the new unit of the mill started operating.

361 men are now employed with the company, 321 of these are hourly employees, and the remaining 40 are salaried employees.

The mine is operated 6 days per week, 3 shifts per day on ore and waste rock, and as a rule, 2 shifts per day on surface stripping. About 6,000 cu. yd. of alluvium stripping, and about 27,000 tons of waste rock is removed daily.

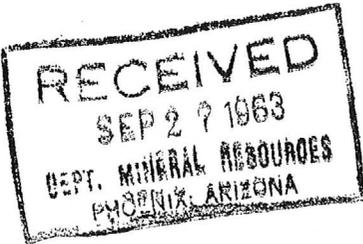
Stripping is now being done on the West end of the NE ore body and the East end of the main pit.

Milling Facilities: The mill construction of the new unit was finished about Aug. 24, increasing the mill capacity from 3,500 to 7,000 tons per day. Since Aug. 26, about 6,500 tons per day have been milled. This will be gradually increased to 7,000 tons per day - 7 days per week.

Although the new mill unit is completed, some minor changes, additions and modifications of the milling equipment is expected.

Exploration: The company discontinued their exploration work in the Helmet Peak area in the latter part of June, and the leases in this area have now been terminated.

B66



STATE OF ARIZONA  
DEPARTMENT OF MINERAL RESOURCES  
MINERAL BUILDING, FAIRGROUNDS  
PHOENIX 7, ARIZONA



Tucson, Arizona,  
Sept. 26, 1963

MEMORANDUM

To: Frank P. Knight, Director,  
From: Axel L. Johnson, Field Engineer  
Re: Pima Mine operations

Following information was obtained from John A. Journey, geologist, Pima Mining Co. during a short visit to the mine on Aug. 28, 1963. Another visit will be made shortly to obtain more detailed information, after which a full report will follow.

Present Mining Activity The present ore production is now from 6,000 to 7,000 tons per day. The production was stepped up from about 4,000 tons per day to this figure on Aug. 26 following the completion of the additions to the mill.

A total of 354 men are employed, 314 of these hourly employees, and 40 salaried employees.

The additions to the mill were completed by the contractors, Utah Construction Co. on Aug. 24 ---- that is essentially completed, with some modifications to be made later as required. Milling was started on a 6,000 to 7,000 tons per day basis on Aug. 26.

Stripping is now being done on the West end of the NE ore body, and the East end of the main pit.

Exploration Pima Mining Co. discontinued exploration of the Helmet Peak area, and terminated the lease the first week in June, 1963 (this exploration was mentioned in my May 17, 1963 report)

Present Officers As a result of the death of E. D. Spaulding on June 30, 1963, the following changes in the officers of the company were made:

- A. A. Friedman, Resident Manager (succeeding Mr. Spaulding)
- R. E. Thurmond, Asst. Resident Manager (succeeding Friedman)
- J. F. Olk, Mine Supt. (succeeding Thurmond)
- M. D. Martin, Chief Engineer (succeeding Olk)
- G. A. KOMADINA, Mill Superintendent (Mining World, now Metal Mining & Pro.)  
(January 1964 p53)

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DEPARTMENT OF MINERAL RESOURCES  
STATE OF ARIZONA  
FIELD ENGINEERS REPORT

Mine Pima Mines

Date May 13, 1963

District Pima District, Pima Co.

Engineer Axel L. Johnson

Subject: Field Engineers Report. Information from John Journeay, Geologist.

References: Report of Dec. 21, 1962 & previous reports.

Present Mining Activity: The present ore production varies from 3,800 to 4,000 tons per day, and averages about 4,000 tons per day. 319 men are employed with the company. Of these 143 men are working in the mine, 62 in the mill, 72 in the shops, and 41 on office work and administration.

The mine is operated 6 days per week, 3 shifts per day on ore and waste rock, and, as a rule, only 2 shifts per day on surface stripping. About 6,000 cu. yd. of alluvium stripping and about 27,000 tons of waste rock is removed daily.

Practically all the ore production now comes from the west end of the pit. A small part of this comes from across the line on the Banner Mining Co. property and is mined and milled by Pima Mining Co., as per agreement between the two companies.

All the alluvial stripping comes from the east end of the pit.

Milling Facilities: Additions are being made to the Pima mill, which will double its capacity, from 3500 tons per day to 7,000 tons per day.

The mill construction is being done by Utah Construction Co. on contract. The work was started shortly after the first of the year, and is scheduled to be completed in December.

Exploration: The Helmet Peak area is now being explored by diamond drilling, with Joy Drilling Co. doing the work on contract with 1 diamond drill rig working 2 shifts. Pima Mining Co. is leasing a number of mining claims in this area from Messrs. Wilson, Chilson and Todd of Tucson.

Helmet Peak area -  $\pm$  Sec. 13, T17S, R12E

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DEPARTMENT OF MINERAL RESOURCES  
STATE OF ARIZONA  
FIELD ENGINEERS REPORT

Mine Pima Mines Date Dec. 21, 1962  
District Pima District, Pima Co. Engineer Axel L. Johnson  
Subject: Field Engineers Report. Information from John Journeay, Geologist.

References Report of Aug. 28, 1962 and previous reports.

Present Mining Activity

The present ore production ranges from 4,000 to 5,000 tons per day, and averages about 4,250 tons per day. The total number of men employed by the company is 317. Of these, 141 men are working in the mine, 62 in the mill, 72 in the shops, and 41 on office work and administration.

The mine is operated 6 days per week, 3 shifts per day on ore and waste rock, and, as a rule, only 2 shifts per day on surface stripping. About 6,000 cu. yd. of alluvium stripping and about 27,000 tons of waste rock is removed daily.

Practically all the ore production comes from the west and the central portions of the pit. About 1/2 of the alluvium stripping comes from the west end of the pit and about 1/2 from the east end.

Part of the ore mined from the west side of the pit comes from across the line on Banner Mining Co. property, and is milled in the Pima mill, as per agreement between the two companies.

Ore Values

The high grade ore in the pit runs about 4 % copper, and the low grade runs 0.4 % and up. The ore is blended before being fed into the mill, so that the mill heads run from 1.25 % to 1.5 % copper.

Mr. Journeay states that molybdenum is present in the ore, but it is of submarginal grade. He stated that they operated a molybdenum test circuit for awhile, but did not solve the problem of recovering the molybdenum.

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DEPARTMENT OF MINERAL RESOURCES  
STATE OF ARIZONA  
FIELD ENGINEERS REPORT

Mine Pima Mines

Date August 28, 1962

District Pima District, Pima Co.

Engineer Axel L. Johnson

Subject: Present Status. Information from J.A. Journeay, geologist.

References: Report of Feb. 1, 1962 and previous reports.

Present Mining Activity: The present ore production is approximately 4,000 tons per day. The total number of men employed by the company is 336. Of these, 142 men are working in the mine, 62 in the mill, 75 in the shops, and 57 on office work and administration.

The mine is operated 6 days per week, 3 shifts on stripping, rock and waste, and 2 shifts on ore. The mill is operated 3 shifts, 7 days per week.

About 10,000 tons of waste rock is removed daily. Also approximately 7,000 cu. yd. per day of alluvium stripping is removed. About 1/2 of this stripping comes from the west end of the pit and the remaining 1/2 from the east end.

Practically all the ore production comes from west part of the pit, part of this ore coming from across the line on Banner Mining Co. property. The sulfide ore from the Banner property is weighed, sampled and milled as per agreement between the two companies, while the oxide ore is stockpiled on the surface on the Banner Mining Co. property, for future leaching operations by Banner.

Ble2

Taken from ENGINEERING & MINING JOURNAL, July 1962, p 107 -

BANNER'S NEW CATHODE COPPER-PRODUCING PROCESS BYPASSES SMELTING:  
PILOT PLANT TO TEST METHOD.

BANNER MINING CO. will pilot plant a process, which bypasses smelting, to produce "cathode copper" from low-grade copper-oxide-lime ores.

Allen Bowman, general manager, said that Stearns-Roger Manufacturing Co., had been commissioned to build a 5-tpd plant near Banner's Pima District properties, south of Tucson, Ariz.

Banner already has received two patents on the process, and other patents are being applied for, Bowman said.

He explained that economical extraction of copper could be attained in what is basically an alkaline process, even if ores involved ran as low as 1% Cu. As there are hundreds of million tons of low-grade, copper-oxide ores in the Free World, the implications of the Banner process are revolutionary.

Banner has been working on this process for four years. And on a batch basis, it works, Bowman said. The pilot plant will test out economics of continuous operation.

In anticipation of success, Banner has had Pima Mining Co. stockpile to Banner's account some 500,000 tons of low-grade copper-lime ores at a property in which Banner has interests and on which Pima is operator.

Bowman said that Banner also was researching the process as to application to lead-zinc oxide ores. Objective would be to take zinc-oxide ores directly to zinc oxide, by-passing pyro-metallurgical or electrolytic reduction.

He did not disclose the flow sheet, but said that "reagents" used were relatively inexpensive.

BL01

DEPARTMENT OF MINERAL RESOURCES

STATE OF ARIZONA

FIELD ENGINEERS REPORT

Mine Pima Mines

Date Feb. 1, 1962

District Pima District, Pima Co.

Engineer Axel L. Johnson

Subject: Present Status. Information from J. A. Journeay, geologist

References Report of July 26, 1961, and previous reports.

Present Mining Activity The present ore production is about 3,500 tons per day. The number of men employed by the company is 309. Of these, 149 are working in the mine, 57 in the mill, 63 in the shops and on surface, and 40 on office work and administration.

The mine is operated 6 days per week --- 3 shifts on stripping, and 2 shifts on ore and waste rock. The mill is operated 3 shifts, 7 days per week.

About 30,000 tons of stripping is removed each day. About one-half of this stripping comes from the west expansion of the pit, and the other half comes from the east end. All the ore now comes from the west side of the pit.

One diamond drill is now working on exploration drill holes. (Joy Drilling Co.)

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DEPARTMENT OF MINERAL RESOURCES

STATE OF ARIZONA

FIELD ENGINEERS REPORT

Mine Pima Mines

Date July 26, 1961

District Pima Mining District, Pima Co.

Engineer Axel L. Johnson

Subject: Present Status. Information from J. A. Journeay, Geologist.

References Report of Sept. 28, 1960 and previous reports.

Present Mining Activity

The present ore production is about 3,800 tons per day. A total of 309 men are employed by the company. Of these, 149 men are in the mine, 57 in the mill, 63 in the shops or on surface work, and 40 on office work or administrative duties.

The mine is operated 6 days per week ---- 3 shifts on stripping and 2 shifts on ore production. The mill is operated 7 days per week, 3 shifts.

Since the first of the year, there has been a major increase in the stripping operations. At the present time, about 30,000 tons of overburden, waste and rock are ~~is~~ moved each day. By far the greater part of this is alluvium material coming from the west expansion of the pit, some of it being on Banner Mining Co. ground and covered by an agreement with the Banner Mining Co.

DEPARTMENT OF MINERAL RESOURCES

STATE OF ARIZONA

FIELD ENGINEERS REPORT

Mine Pima Mines

Date Sept. 28, 1960

District Pima Mining District, Pima Co.

Engineer Axel L. Johnson

Subject: Present Status. Information from J. A. Journeay, Geologist.

References: Report of Jan. 21, 1960 and previous reports.

Present Mining Activity The present ore production is about 3,600 tons per day. A total of 317 men are employed by the company, 150 men in the mine, 60 men in the mill, 69 working in the shops and on the surface, and 38 on office work and administrative duties.

The mine is operated 3 shifts per day on stripping, and 2 shifts per day on ore production. Since my last report of Jan. 21, 1960, there has been a considerable increase in the stripping operations (estimated at least 50 % more), and a slight decrease in ore production. (about 10 %)

DEPARTMENT OF MINERAL RESOURCES  
STATE OF ARIZONA  
FIELD ENGINEERS REPORT

Mine Pima Mines Date Jan. 21, 1960  
District Pima Mining District, Pima Co. Engineer Axel L. Johnson  
Subject: Present Status. Information from J. A. Journeay & personal visit.

References: Report of Sept. 3, 1959 and previous reports.

Present Mining Activity: Ore production about 4000 tons per day. About 280 are now employed by the company, 116 men at the mine, 62 men in the mill, 59 men in the shops and on the surface, and 43 in the office and administration.

The mine is operated 3 shifts per day. Besides the 4000 tons of ore mined and sent to the mill, about 7700 cu. yd. of surface stripping and 4000 tons of rock and waste per day is removed. The surface stripping and the rock and waste from the upper levels is hauled out on the approach roads, while the rock and waste from the lower levels is hoisted up the skip system.

Milling & Marketing: The mill is operated 3 shifts - 7 days per week. The ores, as they enter the mill, are blended so as to obtain average mill heads of from 1.5% to 1.7% copper.

Concentrates produced from the milling operations are now shipped to the A.S. & R. smelter at Hayden, and the stockpiled concentrates, accumulated during the strike, are shipped to the International Smelter at Miami.

Stockpiling: Some of the oxides and carbonates are stockpiled on the surface for future milling or leaching. These are composed of tenorite, malachite, azurite, cuprite and native copper. If the oxides are very low grade (about 0.1% to 0.2%) they are put on the waste dump. No leaching is being contemplated at the present time.

Proposed Plans for Enlarging the Pit: Stripping operations are planned to uncover additional ore, which is located next to the Banner Mining Co. property line. Agreement was recently reached with the Banner Mining Co. in regard to this stripping and later mining of this ore body. See article from Mining World, January 1960, p 67.

DEPARTMENT OF MINERAL RESOURCES  
STATE OF ARIZONA  
FIELD ENGINEERS REPORT

Mine Pima Mines

Date September 3, 1959

District Pima Mining District, Pima County

Engineer Axel L. Johnson

Subject: Present Status - Information from Alex Monroe, Safety Engineer

References: Reports of September 23, 1958 and October 30, 1957.

Present Mining Activity: Production about 3280 tons per day. About 257 are now employed by the company, 112 men at the mine, 48 men in the mill, 50 in the shop and mechanical department, 12 men on the surface repairs, and 35 in office and administration.

The mine is being operated 3 shifts per day, two of these in mine production and the third shift is devoted entirely to the stripping of waste and overburden. Mr. Monroe reports that the surface stripping amounts to about 6000 tons per day which is hauled out on the approach roads, 4-15 yd. carryalls being used in the stripping operations. An average of 2000 tons of rock and 870 tons of unrecoverable ore per day is removed from the mine, being excavated with electric shovel and hoisted up the skip system. The unrecoverable ore is stockpiled on the surface for future leaching operations.

At the present time due to the strike the concentrates are being stockpiled at the mill.

DEPARTMENT OF MINERAL RESOURCES  
STATE OF ARIZONA  
FIELD ENGINEERS REPORT

Mine Pima Mines

Date Sept. 23, 1958

District Pima District, Pima Co.

Engineer Axel L. Johnson

Subject: Present Status. Information from J. A. Journey, Geologist. No Visit.

References Reports of Oct. 30, 1957.

Present Mining Activity Production about 3,300 tons per day. About 279 men are now employed with the company. Of these, 123 men are in the mine, 51 men in the mill, 43 men in the mechanical department, and the remaining 62 men in the office and miscellaneous services. Total 279 men.

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DEPARTMENT OF MINERAL RESOURCES

STATE OF ARIZONA

FIELD ENGINEERS REPORT

Not for publication

Mine Pima Mines (formerly called 'Alpha Mine') Date Oct. 30, 1957

District Pima Mining District, Pima Co. Engineer Axel L. Johnson

Subject: Field Engineers Report. Personal visit & information from Mr. Olk & Mr. Hernlund.

Location About 25 miles south of Tucson. Take new Pima Mines road about 2 miles N. of Sahuarita, and drive about 6 miles west to the mine.

Owners Pima Mining Co., Twin Buttes Road, P. O. Box 7187, Tucson, Ariz.  
See my report of the Alpha Mine under "Owners" on July 26, 1955.

Operators Same as above.

Principal Minerals Copper

Present Mining Activity Mining & milling copper ore. Production about 3,300 tons per day. About 225 men employed by the company, about 100 of these being in the mine, and the remainder in the mill, shops, & offices, and trucking.

Geology & Mineralization The main vein, containing the high grade ore, strikes almost due east and west and dips about 45 degrees to the south. It is from 50 ft. to 150 ft. in width, and extends about 1,000 ft. in length. The ore in this vein averages about 3 % in copper values, but contains some ore lenses, which run up to 10 %. The principal vein mineral is chalcopyrite, with some bornite, chalcocite and some altered & oxidized native copper. The footwall is silt stone breccia, which contains no commercial ore, running less than 0.4 % in copper values. The hanging wall is composed of rhyolite and syenite, highly altered and mineralized, and called "pyroclastic rocks" or "pyroclastics" by the mine officials. This material runs from 0.1 % to 1.0 % in copper values, and is the main source of the low grade material mined. This low grade ore is mixed with the high grade ore in the main vein to make a mill feed running about 1.7 % copper. The main part of the vein is a highly altered limestone, which, in some places, is also garnetized.

Ore Values Main ore vein runs about 3 % average in copper, with some lenses up to 10 %. The pyroclastic rocks, composing the hanging wall runs from 0.1 % to 1.0 % copper. The two kinds of ore are mixed in a proportion to obtain about a 1.7 % mill feed.

Milling and Marketing Facilities See separate report.

Past History & Production See reports on "Alpha Mine" under dates of July 26, 1955, March 30, 1955, March 31, 1954, and June 5, 1952.

Present Mining Operations This is an open pit operation. Three 2 1/2 yd. 54B Bucyrus Erie electric shovels are used in the pit. One of these is used for loading the high grade ore in the main vein, one is used for loading the low grade ore in the hanging wall, and one is used on stripping operations. Operations are conducted on 3 shifts, with 2 shovels operating on each shift. Average ore production is about 3,300 tons per day. 7 Kenworth trucks are used in the pit for hauling the ore from the shovels to the loading ramp, with 5 trucks operating per shift. These trucks dump the ore directly into skip cars at the loading ramp. A rockover skip system is used, with balanced hoisting at an incline of 38 degrees. The capacity of each skip is 22 tons, the same as each truck capacity. The vertical distance from the crest of the pit down to the loading ramp is now 280 ft. As the depth of the pit increases, the loading ramp will be lowered accordingly, 80 ft. at a time, until the maximum depth of 560 ft. vertical distance below the crest of the pit is reached.

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## DEPARTMENT OF MINERAL RESOURCES

STATE OF ARIZONA

## FIELD ENGINEERS REPORT

Not for publication

Mine Pima Mines (formerly called "Alpha Mine") Date Oct. 30, 1957

District Pima Mining District, Pima Co. Engineer Axel L. Johnson

Subject: Field Engineers Report (continued from page 1)

Present Mining Operations (continued)

The vertical distance from the loading ramp to the top of headframe where the skips dump is 330 ft. (50 ft. above the crest of the pit). The skips dump into 2--100 ton ore bins. The ore or rock from either skip can be diverted to either ore bin. In this way, rock encountered in the pit can be stored in one of the bins for hauling out to the rock dump. This rockover skip system used is manufactured by the National Iron Co. of Duluth, Minnesota.

The ore is hauled from the ore pockets at the headframe of the skip system to the concentrating plants by trucks. 4--50 ton Kenworth trucks are used for this work. These trucks also haul any rock hoisted out of the pit. The ore is dumped into the ~~primary crusher at the mill. However, when the crude ore bin is full, the ore is~~ crude ore bin, feeding the primary crusher at the mill. However, when the crude ore bin is full, the ore is dumped on a stockpile above the ore bin, and later pushed into the ore bin with a bulldozer. Also, if the ore is very high or very low grade, it is also dumped in the stockpile, blended with the bulldozer and then the blended ore is pushed into the ore bin.

40 ft. banks are used in the pit. The holes for blasting are drilled with a 4OR Bucyrus Erie Rotary drill, using a tricone rotary bit. Diameter of the holes are 9 inches. Holes are drilled to a depth of 45 ft. The holes are loaded with pearled (pelletized) ammonium nitrate (fertilizer grade) and fuel oil. # 2 fuel oil is used for this purpose. Charge is set off with primer cord and fuse.

The ore body is overlain with about 200 ft. of alluvial material and caliche. Below this, is from 10 to 20 ft. of conglomerate. Below the conglomerate, is about 80 ft. of rock and non recoverable oxidized material, running from 0.2 % to 0.8 % of copper, mostly chrysocolla. The company has one shovel on stripping on the south side of the pit. This shovel is working part time ----part of the time in alluvial material, and part of the time in the rock and lean oxidized material. The oxidized material is considered non recoverable, as it is mostly chrysocolla. However, some of the best grade is put in a separate waste dump. Material from the stripping shovel is loaded into 22 ton trucks and hauled out of the pit up the access roads (not up the skipway).

Officers Some of the officers of the company are:

- ✓ E. D. Spaulding, Resident Manager
- ✓ R. E. Thurmond, Mine Superintendent
- ✓ George Komadina, Plant Superintendent
- ✓ James Olk, Chief Engineer
- ✓ R. W. Hernlund, Chief Metallurgist
- ✓ Alex Monroe, Safety Engineer

References Reports under the name of "Alpha Mine", dates July 26, 1955, March 30, 1955, March 31, 1954, and June 5, 1952. Also reports of Pima Mining Co. development under dates of June 5, 1952, and Jan. 11, 1952.

Article in the "Mining World" ---- March, 1956 issue.

## DEPARTMENT OF MINERAL RESOURCES

STATE OF ARIZONA

## FIELD ENGINEERS REPORT

Not for publication

Mine Pima Mining Co. Mill

Date Oct. 30, 1957

District Pima Mining District, Pima Co.

Engineer Axel L. Johnson

Subject: Field Engineers Report. Personal visit &amp; information from R. W. Hernlund, Metallurgist

Location About 25 miles south of Tucson. Take new Pima Mines road about 2 miles N. of Sahuarita, and drive about 6 miles west to the mill.

Owners Pima Mining Co., Twin Buttes Road, P. O. Box 7187, Tucson, Ariz.  
See my report of the Alpha Mine under "Owners" ---July 26, 1955.

Operators Same as above.

Principal Minerals Copper ores.

Present Milling Activity Milling the ore mined in the Pima Mine. Milling about 3,300 tons of ore per day. This is about the capacity of the mill.

Type of Mill Flotation

The material is crushed to a minus 1 inch by means of a jaw crusher, and two Symons crushers. See attached flow sheet on "Crushing".

The material is ground to about 65 mesh by means of an Allis Chalmers Rod Mill, and two Allis Chalmers Ball Mills, with the aid of Krebs Cyclones for classifying. See attached flow sheet on "Grinding".

Fagergren Flotation cells are used in the flotation, followed by a thickener, and then an Eimco Filter. See attached flow sheet on "Concentration".

The reagents used and the amount of each used per ton are as follows:

(1) Slacked lime ---- 6 lb. per ton, added in varying amounts in the rod and ball mills. The lime is obtained from the Paul Lime Plant, Douglas, and the company have their own slacking plant at the mill.

(2) Sodium sulphide ----- 0.2 lb. per ton, added to the flotation circuit in stages. This is used to sulphidize the oxides and native copper in the ore.

(3) Xanthates Z-6 and Z-11 flotation reagents ---- 0.08 lb. per ton, added in both the rod mill and the flotation cells in the proportions required.

(4) MIBC isobutyl (a methyl carbinol) frothing reagent ----- 0.15 lb. per ton

Water used for the milling is pumped to the mill from 3 wells in the Santa Cruz River valley about 6 miles away. These wells are 750 ft. deep. The water consumption for the milling operations is about 2,500 gal. per min. About 40 %, or 1,000 gal. per min. of this water is reclaimed. Thus the mill is using 1,000 gal. of reclaimed water and 1,500 gal. of fresh water per minute.

The concentrates obtained from the Eimco Filter goes to a concentrate bin. From the bin, it is loaded with a scraper into a 25 ton truck and hauled about 6 miles to the loading ramp at the railway, about 2 miles north of Sahuarita. All the loads of concentrates are weighed and sampled. The concentrates run about 25 % in copper, 10 % in moisture content, with 3 oz. of silver, but not enough Gold to get paid for. At present, the concentrates are shipped to the A. S. & R. smelter at El Paso, as the A. S. & R. smelter at Hayden has not adequate facilities at the present time.

BB

# DEPARTMENT OF MINERAL RESOURCES

STATE OF ARIZONA

FIELD ENGINEERS REPORT (accompany Axel L. Johnson report on  
October 30, 1957)

Mine PIMA MINES Date October 6, 1957  
District Pima Mining District Engineer Frank P. Knight  
Subject: Visit on March 30th. (went through grounds with E. D. Spaulding)

The ore is in irregular bodies in altered sediments along a Major E-W thrust fault with considerable crossfracturing. The high grade shoots are surrounded by halos of lower grade. Grade ranges from 0.4% to 30% Cu and ore goes to about the 800 level. They expect to pit to the 640. Water is at elev. 2940. Pit on March 30th was at Elev. 3020. They plan to case a shaft and pump from it. Stripping was being done with scrapers fed by dozers on bank above.

Rockover skip installation cost half a million. Hoist cost over \$200,000. It has plug type, positive action brakes, a key factor in the high speed automatic operation. The unloaded skips weigh 15 tons.

The 40 R rotary drill averages about 450 ft per day.

Considerable oxide ore is stockpiled.

Crusher capacity 700 tons per hour. Minus 4" goes to one of 2 vibrating screens. Minus 1" to rod mill. Plus 3" to standard cone and 1" to 3" to short head cone crushers.

Mill feed goes to two 3,000 ton circular bins.

They were getting some oversize from the cyclones and were uncertain of its effect.

Ball mill circulating load 250%. Were getting fine grind, about 90 mesh.

Planned for regrinding but at that time thought they wouldn't need it.

A 3 drum slusher loads a 25 ton concentrate truck in 6 minutes.

Rod mill 8'x10'. Ball mills 6' x 8'.

Started milling 12-31-56

No publicity until bugs are ironed out, then will present papers at AIME meeting.

Ble

DEPARTMENT OF MINERAL RESOURCES  
STATE OF ARIZONA  
FIELD ENGINEERS REPORT

Mine Alpha Mine Date July 26, 1955  
District Pima Mining Dist., Pima County. Engineer Axel L. Johnson  
Subject: Present Status. Personal Visit and information from R. E. Thurmond, Pima Mining Co.

Location Two miles north-east of the San Xavier Mine.

Owners Mr. Turmond reports that the Cypress Mining Co. has now exercised their option to buy the property. The company will still be called the Pima Mining Co., which will be owned, as follows:

✓ The Cypress Mining Co. -----	50 %
✓ The Union Oil Co. -----	25 %
✓ Utah Construction Co. -----	25 %

Operators The Pima Mining Co., under the new ownership.

Officers Officers of the new company have not been announced as yet.

Principal Minerals Copper ores.

Number of Men Employed 8 men ---- 4 underground and 4 on surface. One shift.

Production The mine has been, and still is, working on a standby basis, pending new operating plans to be made by the new ownership. Production same as my report of March 30, 1955.

Ore Values See my report of March 30, 1955.

Milling and Marketing Facilities See my report of March 30, 1955.

Mine Workings See my report of March 30, 1955.

Recent Operations See my report of March 30, 1955.

Remarks Announcement of proposed plans for future operation of the property, and announcement of the new mine officials is expected to be made in a week or 10 days.

DEPARTMENT OF MINERAL RESOURCES  
STATE OF ARIZONA  
FIELD ENGINEERS REPORT

RECEIVED  
MAY 5 1955  
DEPT. MINERAL RESOURCES  
STATE OF ARIZONA

Mine Alpha Mine ✓

Date March 30, 1955.

District Pima Mining Dist., Pima County.

Engineer Axell. Johnson

Subject: Mine Report. Present Status. Personal Visit & Information from Dave Turberville, Mine Foreman.

Location Two miles north-east of the Eagle Picher's San Xavier Mine.

Owners M Pima Mining Co., 3407 S. Park Ave., Tucson, Ariz. (a subsidiary of Union Oil Co.)  
The Cypress Mining Co. has an option to purchase the property from Pima Mining Co.  
This option was extended an additional 30 days to ----April 23, 1955.

Operators Same as above. The Cypress Mining Co. has done considerable exploration work, ore testing, and assaying since they took an option on the property.

Officers R. E. Thurmond, Mining Engineer in charge for the Pima Mining Co.  
Dave Turberville, Mine Foreman for the Pima Mining Co.

Metals Found Copper principally. Occasionally a small amount of zinc is found.

Number of Men employed ----8 men----4 underground and 4 on surface. One shift only.

Production The mine is working on a stand-by basis, pending the outcome of the option and proposed sale to the Cypress Mining Co. A production of 20 tons per day is obtained from the one stope that is being worked at present. The best grade material is shipped direct to the A. S. & R. smelter at El Paso, Texas, while the lower grade material is stockpiled for future milling. About 50 tons of ore per week is shipped to the A. S. & R. smelter at El Paso, Texas.

Ore Values Direct shipments of the ore to El Paso have run from 4 1/2 % to 6 % in Copper. Operators have tried to keep it up to 6 %, as they consider that about marginal for that small tonnage. Stockpiled ore runs from 1 % to 4 %.

Milling and Marketing Facilities The Cypress Mining Co. is reported to have sunk 3 wells, and developed sufficient water for milling operations. They have also, according to reports, purchased or leased the ground for a mill site. Wells and mill site ground is said to be near Sahuarita.

Mine Workings 1 shaft --- vertical ---- 600 ft. deep, with <sup>drifts</sup> levels on the 300ft., 400 ft., 500 ft., and 600 ft. levels, from said shaft.

1 exit shaft ---- vertical ----300 ft. deep, with connecting raise of 300 '  
About 3,000 to 4,000 ft. of drifting on the 4 levels of the mine, and about 1,000 ft. of raising.

The ore starts approximately on the 200 ft. level, and the sulphide zone starts in about the 300 ft. level.

Recent Operations Cypress Mining Co., since taking an option to purchase this property, has done considerable diamond drilling on same. Mr. Turberville reports that they have sunk 18 diamond drill holes to determine the size and grade of the ore body.

Cypress Mining Co. also is reported to have sunk 3 wells near Sahuarita, and has developed enough water for milling from these wells. They are also reported as having made arrangements for the purchase of a mill site.

In the meanwhile, the Pima Mining Co. is working the mine on a stand-by basis, subject to the outcome of the Cypress Mining Co.'s option to purchase.

DEPARTMENT OF MINERAL RESOURCES  
STATE OF ARIZONA  
FIELD ENGINEERS REPORT

Mine <sup>✓</sup> Alpha Mine

Date March 31, 1954

District Pima Mining District, Pima County.

Engineer Axel L. Johnson

Subject: Report of Mining Operations ----Personal Visit.

For location, ~~xxxxxx~~ and general information, see report of June 5, 1952.

Owners Pima Mining Co., 3407 S Park Ave., Tucson, Arizona.

Operators Same as above.

Officers E. D. Spaulding, ~~Manager~~ General Manager.  
✓ R. E. Thurmond, Mining Engineer in charge.

Principal Minerals Ores of copper.

Number of Men Employed 30 men (3 shifts operating)

Production Rate 150 tons per day of copper ore mined and shipped.

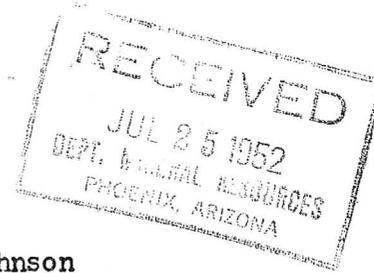
Marketing Facilities Ore is shipped to the A. S. & R. smelter at El Paso.

Present Mine Workings

The two compartment 5' x 9' vertical shaft was sunk 600 ft. deep. Four levels were opened up ----the 300, 400, 500, and 600 ft. levels. Over 7,000 ft. of drifting has been done on these four levels, and also considerable connecting raises.

Present Operations Company is still doing exploration work and development work in the mine, and doing some stope preparation work. No actual stoping has been done thus far. All the ore production of 150 tons per day come from the mine development work.

DEPARTMENT OF MINERAL RESOURCES  
STATE OF ARIZONA  
FIELD ENGINEERS REPORT



Mine Alpha Mine

Date June 5, 1952.

District Pima Mining Dist., Pima Co.

Engineer Axel L. Johnson

Subject: Mine Report----- Personal Inspection, and information R. E. Thurmond.

Location 2 miles north-east of the Eagle Picher's San Xavier Mine.

Owners Pima Mining Co. 3407 S. Park Ave., Tucson, Ariz.

Operators The Centennial Development Co., Eureka, Utah is doing the work for the Pima Mining Co. on contract.

Officers R. E. Thurmond, Mining Engineer in charge, Pima Mining Co.

Metals Copper

Men Employed 18 men employed, and ~~work~~ work conducted on 3 shift basis.

Production Rate Shipping 30 tons per day of copper ore from development work to the A. S. & R. smelter at El Paso, Texas.

Milling Facilities None.

Geology Information not available

Ore Values No information given out.

Old Workings & Past Production None. This is a new mine.

Present Operations A two compartment 5' x 9' vertical shaft (5' x 5' hoisting compartment ~~and~~ and 4' x 5' manway) has been sunk to a depth of 425 ft., and drifting has now been started on the ore vein on the 400 ft. level. About 30 tons of ore per day is shipped at present from this development work. The ore is shipped to the A. S. & R. smelter at El Paso, Texas.

Proposed Work Extensive development of the ore body on the 300 ft. and 400 ft. levels is being planned to prove up the ore body, and to provide information for future mining operations.

Remarks This ore body was located with the aid of extensive geophysical work conducted by the United Geophysical Co., 3407 S. Park Ave., Tucson, Ariz., a close affiliate of the Pima Mining Co. Later on, a number of diamond drill holes were sunk by the United Geophysical Co. to prove up this geophysical work. This diamond drilling program gave them information on which to base their present mining activity.

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DEPARTMENT OF MINERAL RESOURCES  
STATE OF ARIZONA

~~FIELD ENGINEERS REPORT~~  
NEWS ITEM (No Publicity Wanted)

Mine (~~no name given~~) *Alpha Mine*

Date Jan. 11, 1952

District Pima Mining Dist., Pima Co.

Engineer Axel L. Johnson

Subject: News Item --- Source of Information--- R. E. Thurmond (Confidential--No Publicity)

Location About one mile east of San Xavier

Owners Pima Mining Co., Tucson, Ariz. (same ownership as United Geophysical)

Operators Same as above when mine gets into operation.

Contractors Centennial Development Co., Eureka, Utah, has a contract to sink a 2 compartment (5' x 9') Exploration Shaft, a pproximately 450 ft. deep.

Officers R. E. Thurmond, Field Supt., Pima Mining Co.

Metals Understood to be copper, lead and zinc. Don't know as to what amounts.

Men Employed Centennial Development Co., now employs 10 men-- all on day shift. They expect shortly to put on 2 more shifts, with 5 men more on each shift, making a total of 20 men in all.

Production Rate No production---- shaft sinking.

Milling Facilities None at present.

Present Operations Shaft sinking. Sinking a 2 compartment (5' x 9') Exploration Shaft. The shaft is vertical, and tentative plans is to sink it to a depth of 450'. Shaft has a 5' x 5' hoisting compartment and a 4' x 5' manway. The shaft is now down to a depth of 10 feet.

Past Operations United Geophysical Corp. did extensive geophysical work over the area. This was later followed by a number of diamond drill holes. The shaft now sunk is for exploration purposes, principally to test the nature of the ground, preparatory to the commencement of large scale mining operations.

Florida Mining & Materials Corp. will invest \$68 million this year to double cement production capacity to 1.2 million tons per year at its Brooksville plant, 30 miles north of Tampa.

## COBALT

Sozacom, the Zairian marketing agency of GECAMINES, reportedly lowered its world list price of cobalt for electrolytic broken cathodes from \$17.26 per pound to \$12.50 per pound effective February 1. The price reduction brings the producer price in line with current spot market prices, which were consistently well below the producer price throughout 1981.

## COPPER

It is estimated that domestic copper mine production was curtailed from 12% to 15% in early 1982 by shortened work schedules and closed-down mines. The average producer's price for delivered wirebar copper was 78.8 cents per pound in February, compared with 78.6 cents in January and 80.3 cents in December.

In Pima County, Arizona, the copper industry experienced the following:

1982 As of February 1, Cyprus Pima Mining Co. announced a 43% reduction in copper and molybdenum production for a minimum of 3 months. The company put over 700 employees on a 4-day work week and has plans to lay off 175 workers.

- o Magma Copper Co. scheduled a cutback at its San Manuel smelter from 40 hours to 35 hours per week because of the reduction in the amount of copper concentrate being received from other mining companies. About 360 smelter workers will lose an average of \$50 per week.
- o Anamax Mining Co. reportedly has requested a freeze on cost-of-living pay increases until the price of copper rises significantly. The company employs 1,300 people at its Twin Buttes mine.

Michigan White Pine Copper, a division of Copper Range co., announced on February 8, that mine production would be cut back affecting 125 hourly employees. Construction of the firm's new refinery complex is continuing.

## GOLD

Standard Metals Corp., which operates the Sunnyside mine near Silverton, Colorado, announced a reduction in its workforce from 300 to 125 effective March 1. The mine is Colorado's largest producer of gold, producing about 1,000 tons of ore per day, and the sixth largest primary producer of gold in the United States. Silver, lead, zinc, and copper are also produced at the mine.

## IRON ORE

The first price increase for Lake Superior pellets in 13 months was announced by Hanna Mining Co., effective February 15, raising the price 9% to 88 cents per long ton unit of iron contained, delivered rail-of-vessel at lower lake

DEPARTMENT OF MINERAL RESOURCES

STATE OF ARIZONA

FIELD ENGINEERS REPORT

Not for publication

Mine Pima Mines (formerly called 'Alpha Mine') Date Oct. 30, 1957

District Pima Mining District, Pima Co. Engineer Axel L. Johnson

Subject: Field Engineers Report. Personal visit & information from Mr. Olk & Mr. Hernlund.

Location About 25 miles south of Tucson. Take new Pima Mines road about 2 miles N. of Sahuarita, and drive about 6 miles west to the mine.

Owners Pima Mining Co., Twin Buttes Road, P. O. Box 7187, Tucson, Ariz.  
See my report of the Alpha Mine under "Owners" on July 26, 1955.

Operators Same as above.

Principal Minerals Copper

Present Mining Activity Mining & milling copper ore. Production about 3,300 tons per day. About 225 men employed by the company, about 100 of these being in the mine, and the remainder in the mill, shops, & offices, and trucking.

Geology & Mineralization The main vein, containing the high grade ore, strikes almost due east and west and dips about 45 degrees to the south. It is from 50 ft. to 150 ft. in width, and extends about 1,000 ft. in length. The ore in this vein averages about 3 % in copper values, but contains some ore lenses, which run up to 10 %. The principal vein mineral is chalcopyrite, with some bornite, chalcocite and some altered & oxidized native copper. The footwall is silt stone breccia, which contains no commercial ore, running less than 0.4 % in copper values. The hanging wall is composed of rhyolite and syenite, highly altered and mineralized, and called "pyroclastic rocks" or "pyroclastics" by the mine officials. This material runs from 0.1 % to 1.0 % in copper values, and is the main source of the low grade material mined. This low grade ore is mixed with the high grade ore in the main vein to make a mill feed running about 1.7 % copper. The main part of the vein is a highly altered limestone, which, in some places, is also garnetized.

Ore Values Main ore vein runs about 3 % average in copper, with some lenses up to 10 %. The pyroclastic rocks, composing the hanging wall runs from 0.1 % to 1.0 % copper. The two kinds of ore are mixed in a proportion to obtain about a 1.7 % mill feed.

Milling and Marketing Facilities See separate report.

Past History & Production See reports on "Alpha Mine" under dates of July 26, 1955, March 30, 1955, March 31, 1954, and June 5, 1952.

Present Mining Operations This is an open pit operation. Three 2 1/2 yd. 54B Bucyrus Erie electric shovels are used in the pit. One of these is used for loading the high grade ore in the main vein, one is used for loading the low grade ore in the hanging wall, and one is used on stripping operations. Operations are conducted on 3 shifts, with 2 shovels operating on each shift. Average ore production is about 3,300 tons per day. 7 Kenworth trucks are used in the pit for hauling the ore from the shovels to the loading ramp, with 5 trucks operating per shift. These trucks dump the ore directly into skip cars at the loading ramp. A rockover skip system is used, with balanced hoisting at an incline of 38 degrees. The capacity of each skip is 22 tons, the same as each truck capacity. The vertical distance from the crest of the pit down to the loading ramp is now 280 ft. As the depth of the pit increases, the loading ramp will be lowered accordingly, 80 ft. at a time, until the maximum depth of 560 ft. vertical distance below the crest of the pit is reached.

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## DEPARTMENT OF MINERAL RESOURCES

STATE OF ARIZONA

## FIELD ENGINEERS REPORT

Not for publication

Mine Pima Mines (formerly called "Alpha Mine") Date Oct. 30, 1957

District Pima Mining District, Pima Co. Engineer Axel L. Johnson

Subject: Field Engineers Report (continued from page 1)

Present Mining Operations (continued)

The vertical distance from the loading ramp to the top of headframe where the skips dump is 330 ft. (50 ft. above the crest of the pit). The skips dump into 2--100 ton ore bins. The ore or rock from either skip can be diverted to either ore bin. In this way, rock encountered in the pit can be stored in one of the bins for hauling out to the rock dump. This rockover skip system used is manufactured by the National Iron Co. of Duluth, Minnesota.

The ore is hauled from the ore pockets at the headframe of the skip system to the concentrating plants by trucks. 4--50 ton Kenworth trucks are used for this work. These trucks also haul any rock hoisted out of the pit. The ore is dumped into the ~~primary crusher at the mill, or dumped into a stockpile~~ crude ore bin, feeding the primary crusher at the mill. However, when the crude ore bin is full, the ore is dumped on a stockpile above the ore bin, and later pushed into the ore bin with a bulldozer. Also, if the ore is very high or very low grade, it is also dumped in the stockpile, blended with the bulldozer and then the blended ore is pushed into the ore bin.

40 ft. banks are used in the pit. The holes for blasting are drilled with a 4OR Bucyrus Erie Rotary drill, using a tricone rotary bit. Diameter of the holes are 9 inches. Holes are drilled to a depth of 45 ft. The holes are loaded with pearled (pelletized) ammonium nitrate (fertilizer grade) and fuel oil. # 2 fuel oil is used for this purpose. Charge is set off with primer cord and fuse.

The ore body is overlain with about 200 ft. of alluvial material and caliche. Below this, is from 10 to 20 ft. of conglomerate. Below the conglomerate, is about 80 ft. of rock and non recoverable oxidized material, running from 0.2 % to 0.8 % of copper, mostly chrysocolla. The company has one shovel on stripping on the south side of the pit. This shovel is working part time ----part of the time in alluvial material, and part of the time in the rock and lean oxidized material. The oxidized material is considered non recoverable, as it is mostly chrysocolla. However, some of the best grade is put in a separate waste dump. Material from the stripping shovel is loaded into 22 ton trucks and hauled out of the pit up the access roads (not up the skipway).

Officers Some of the officers of the company are:

- ✓ E. D. Spaulding, Resident Manager
- ✓ R. E. Thurmond, Mine Superintendent
- ✓ George Komadina, Plant Superintendent
- ✓ James Olk, Chief Engineer
- ✓ R. W. Hernlund, Chief Metallurgist
- ✓ Alex Monroe, Safety Engineer

References Reports under the name of "Alpha Mine", dates July 26, 1955, March 30, 1955, March 31, 1954, and June 5, 1952. Also reports of Pima Mining Co. development under dates of June 5, 1952, and Jan. 11, 1952.

Article in the "Mining World" ---- March, 1956 issue.

DEPARTMENT OF MINERAL RESOURCES

Not for publication

STATE OF ARIZONA

FIELD ENGINEERS REPORT

Mine Pima Mining Co. Mill

Date Oct. 30, 1957

District Pima Mining District, Pima Co.

Engineer Axel L. Johnson

Subject: Field Engineers Report. Personal visit & information from R. W. Hernlund, Metallurgist

Location About 25 miles south of Tucson. Take new Pima Mines road about 2 miles N. of Sahuarita, and drive about 6 miles west to the mill.

Owners Pima Mining Co., Twin Buttes Road, P. O. Box 7187, Tucson, Ariz.  
See my report of the Alpha Mine under "Owners" ---July 26, 1955.

Operators Same as above.

Principal Minerals Copper ores.

Present Milling Activity Milling the ore mined in the Pima Mine. Milling about 3,300 tons of ore per day. This is about the capacity of the mill.

Type of Mill Flotation

The material is crushed to a minus 1 inch by means of a jaw crusher, and two Symons crushers. See attached flow sheet on "Crushing".

The material is ground to about 65 mesh by means of an Allis Chalmers Rod Mill, and two Allis Chalmers Ball Mills, with the aid of Krebs Cyclones for classifying. See attached flow sheet on "Grinding".

Fagergren Flotation cells are used in the flotation, followed by a thickener, and then an Eimco Filter. See attached flow sheet on "Concentration".

The reagents used and the amount of each used per ton are as follows:

(1) Slacked lime ---- 6 lb. per ton, added in varying amounts in the rod and ball mills. The lime is obtained from the Paul Lime Plant, Douglas, and the company have their own slacking plant at the mill.

(2) Sodium sulphide ----- 0.2 lb. per ton, added to the flotation circuit in stages. This is used to sulphidize the oxides and native copper in the ore.

(3) Xanthates Z-6 and Z-11 flotation reagents ---- 0.08 lb. per ton, added in both the rod mill and the flotation cells in the proportions required.

(4) MIBC isobutyl (a methyl carbinol) frothing reagent ----- 0.15 lb. per ton

Water used for the milling is pumped to the mill from 3 wells in the Santa Cruz River valley about 6 miles away. These wells are 750 ft. deep. The water consumption for the milling operations is about 2,500 gal. per min. About 40 %, or 1,000 gal. per min. of this water is reclaimed. Thus the mill is using 1,000 gal. of reclaimed water and 1,500 gal. of fresh water per minute.

The concentrates obtained from the Eimco Filter goes to a concentrate bin. From the bin, it is loaded with a scraper into a 25 ton truck and hauled about 6 miles to the loading ramp at the railway, about 2 miles north of Sahuarita. All the loads of concentrates are weighed and sampled. The concentrates run about 25 % in copper, 10 % in moisture content, with 3 oz. of silver, but not enough Gold to get paid for. At present, the concentrates are shipped to the A. S. & R. smelter at El Paso, as the A. S. & R. smelter at Hayden has not adequate facilities at the present time.

DEPARTMENT OF MINERAL RESOURCES

STATE OF ARIZONA

FIELD ENGINEERS REPORT (accompany Axel L. Johnson report on  
October 30, 1957)

Mine PIMA MINES Date October 6, 1957  
District Pima Mining District Engineer Frank P. Knight  
Subject: Visit on March 30th. (went through grounds with E. D. Spaulding)

The ore is in irregular bodies in altered sediments along a Major E-W thrust fault with considerable crossfracturing. The high grade shoots are surrounded by halos of lower grade. Grade ranges from 0.4% to 30% Cu and ore goes to about the 800 level. They expect to pit to the 640. Water is at elev. 2940. Pit on March 30th was at Elev. 3020. They plan to case a shaft and pump from it. Stripping was being done with scrapers fed by dozers on bank above.

Rockover skip installation cost half a million. Hoist cost over \$200,000. It has plug type, positive action brakes, a key factor in the high speed automatic operation. The unloaded skips weigh 15 tons.

The 40 R rotary drill averages about 450 ft per day.

Considerable oxide ore is stockpiled.

Crusher capacity 700 tons per hour. Minus 4" goes to one of 2 vibrating screens. Minus 1" to rod mill. Plus 3" to standard cone and 1" to 3" to short head cone crushers.

Mill feed goes to two 3,000 ton circular bins.

They were getting some oversize from the cyclones and were uncertain of its effect.

Ball mill circulating load 250%. Were getting fine grind, about 90 mesh.

Planned for regrinding but at that time thought they wouldn't need it.

A 3 drum slusher loads a 25 ton concentrate truck in 6 minutes.

Rod mill 8'x10'. Ball mills 6' x 8'.

Started milling 12-31-56

No publicity until bugs are ironed out, then will present papers at AIME meeting.

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DEPARTMENT OF MINERAL RESOURCES  
STATE OF ARIZONA  
FIELD ENGINEERS REPORT

Mine Alpha Mine Date July 26, 1955  
District Pima Mining Dist., Pima County. Engineer Axel L. Johnson  
Subject: Present Status. Personal Visit and information from R. E. Thurmond, Pima Mining Co.

Location Two miles north-east of the San Xavier Mine.

Owners Mr. Turmond reports that the Cypress Mining Co. has now exercised their option to buy the property. The company will still be called the Pima Mining Co., which will be owned, as follows:

The Cypress Mining Co. -----	50 %
The Union Oil Co. -----	25 %
Utah Construction Co. -----	25 %

Operators The Pima Mining Co., under the new ownership.

Officers Officers of the new company have not been announced as yet.

Principal Minerals Copper ores.

Number of Men Employed 8 men ---- 4 underground and 4 on surface. One shift.

Production The mine has been, and still is, working on a standby basis, pending new operating plans to be made by the new ownership. Production same as my report of March 30, 1955.

Ore Values See my report of March 30, 1955.

Milling and Marketing Facilities See my report of March 30, 1955.

Mine Workings See my report of March 30, 1955.

Recent Operations See my report of March 30, 1955.

Remarks Announcement of proposed plans for future operation of the property, and announcement of the new mine officials is expected to be made in a week or 10 days.

DEPARTMENT OF MINERAL RESOURCES  
STATE OF ARIZONA  
FIELD ENGINEERS REPORT

RECEIVED  
APR - 5, 1955  
DEPT. MINERAL RESOURCES  
MINE Alpha MINE

Date March 30, 1955.

District Pima Mining Dist., Pima County.

Engineer Axell. Johnson

Subject: Mine Report. Present Status. Personal Visit & Information from Dave Turberville, Mine Foreman.

Location Two miles north-east of the Eagle Picher's San Xavier Mine.

Owners M Pima Mining Co., 3407 S. Park Ave., Tucson, Ariz. (a subsidiary of Union Oil Co.)  
The Cypress Mining Co. has an option to purchase the property from Pima Mining Co.  
This option was extended an additional 30 days to ----April 23, 1955.

Operators Same as above. The Cypress Mining Co. has done considerable exploration work, ore testing, and assaying since they took an option on the property.

Officers R. E. Thurmond, Mining Engineer in charge for the Pima Mining Co.  
Dave Turberville, Mine Foreman for the Pima Mining Co.

Metals Found Copper principally. Occasionally a small amount of zinc is found.

Number of Men employed ----8 men----4 underground and 4 on surface. One shift only.

Production The mine is working on a stand-by basis, pending the outcome of the option and proposed sale to the Cypress Mining Co. A production of 20 tons per day is obtained from the one stope that is being worked at present. The best grade material is shipped direct to the A. S. & R. smelter at El Paso, Texas, while the lower grade material is stockpiled for future milling. About 50 tons of ore per week is shipped to the A. S. & R. smelter at El Paso, Texas.

Ore Values Direct shipments of the ore to El Paso have run from 4 1/2 % to 6 % in Copper. Operators have tried to keep it up to 6 %, as they consider that about marginal for that small tonnage. Stockpiled ore runs from 1 % to 4 %.

Milling and Marketing Facilities The Cypress Mining Co. is reported to have sunk 3 wells, and developed sufficient water for milling operations. They have also, according to reports, purchased or leased the ground for a mill site. Wells and mill site ground is said to be near Sahuarita.

Mine Workings 1 shaft --- vertical ---- 600 ft. deep, with <sup>drifts</sup> levels on the 300ft., 400 ft., 500 ft., and 600 ft. levels, from said shaft.

1 exit shaft ---- vertical -----300 ft. deep, with connecting raise of 300 '  
About 3,000 to 4,000 ft. of drifting on the 4 levels of the mine, and about 1,000 ft. of raising.

The ore starts approximately on the 200 ft. level, and the sulphide zone starts in about the 300 ft. level.

Recent Operations Cypress Mining Co., since taking an option to purchase this property, has done considerable diamond drilling on same. Mr. Turberville reports that they have sank 18 diamond drill holes to determine the size and grade of the ore body.

Cypress Mining Co. also is reported to have sunk x 3 wells near Sahuarita, and has developed enough water for milling from these wells. They are also reported as having made arrangements for the purchase of a mill site.

In the meanwhile, the Pima Mining Co. is working the mine on a stand-by basis, subject to the outcome of the Cypress Mining Co.'s option to purchase.

DEPARTMENT OF MINERAL RESOURCES  
STATE OF ARIZONA  
FIELD ENGINEERS REPORT

Mine Alpha Mine

Date March 31, 1954

District Pima Mining District, Pima County.

Engineer Axel L. Johnson

Subject: Report of Mining Operations ----Personal Visit.

For location, ~~summary~~ and general information, see report of June 5, 1952.

Owners Pima Mining Co., 3407 S Park Ave., Tucson, Arizona.

Operators Same as above.

Officers E. D. Spaulding, ~~Manager~~ General Manager.  
R. E. Thurmond, Mining Engineer in charge.

Principal Minerals Ores of copper.

Number of Men Employed 30 men (3 shifts operating)

Production Rate 150 tons per day of copper ore mined and shipped.

Marketing Facilities Ore is shipped to the A. S. & R. smelter at El Paso.

Present Mine Workings

The two compartment 5' x 9' vertical shaft was sunk 600 ft. deep. Four levels were opened up ----the 300, 400, 500, and 600 ft. levels. Over 7,000 ft. of drifting has been done on these four levels, and also considerable connecting raises.

Present Operations Company is still doing exploration work and development work in the mine, and doing some stope preparation work. No actual stoping has been done thus far. All the ore production of 150 tons per day come from the mine development work.

DEPARTMENT OF MINERAL RESOURCES  
STATE OF ARIZONA  
FIELD ENGINEERS REPORT

RECEIVED  
JUL 25 1952  
DEPT. MINERAL RESOURCES  
PHOENIX, ARIZONA

Mine Alpha Mine

Date June 5, 1952.

District Pima Mining Dist., Pima Co.

Engineer Axel L. Johnson

Subject: Mine Report----- Personal Inspection, and information R. E. Thurmond.

Location 2 miles north-east of the Eagle Picher's San Xavier Mine.

Owners Pima Mining Co. 3407 S. Park Ave., Tucson, Ariz.

Operators The Centennial Development Co., Eureka, Utah is doing the work for the Pima Mining Co. on contract.

Officers R. E. Thurmond, Mining Engineer in charge, Pima Mining Co.

Metals Copper

Men Employed 18 men employed, and ~~work~~ work conducted on 3 shift basis.

Production Rate Shipping 30 tons per day of copper ore from development work to the A. S. & R. smelter at El Paso, Texas.

Milling Facilities None.

Geology Information not available

Ore Values No information given out.

Old Workings & Past Production None. This is a new mine.

Present Operations A two compartment 5' x 9' vertical shaft (5' x 5' hoisting compartment ~~and~~ and 4' x 5' manway) has been sunk to a depth of 425 ft., and drifting has now been started on the ore vein on the 400 ft. level. About 30 tons of ore per day is shipped at present from this development work. The ore is shipped to the A. S. & R. smelter at El Paso, Texas.

Proposed Work Extensive development of the ore body on the 300 ft. and 400 ft. levels is being planned to prove up the ore body, and to provide information for future mining operations.

Remarks This ore body was located with the aid of extensive geophysical work conducted by the United Geophysical Co., 3407 S. Park Ave., Tucson, Ariz., a close affiliate of the Pima Mining Co. Later on, a number of diamond drill holes were sunk by the United Geophysical Co. to prove up this geophysical work. This diamond drilling program gave them information on which to base their present mining activity.

DEPARTMENT OF MINERAL RESOURCES  
STATE OF ARIZONA

~~FIELD ENGINEERS REPORT~~  
NEWS ITEM (No Publicity Wanted)

Mine ~~(no name given)~~ *Alpha Mine*

Date Jan. 11, 1952

District Pima Mining Dist., Pima Co.

Engineer Axel L. Johnson

Subject: News Item --- Source of Information--- R. E. Thurmond (Confidential--No Publicity)

Location About one mile east of San Xavier

Owners Pima Mining Co., Tucson, Ariz. (same ownership as United Geophysical)

Operators Same as above when mine gets into operation.

Contractors Centennial Development Co., Eureka, Utah, has a contract to sink a 2 compartment (5' x 9') Exploration Shaft, a pproximately 450 ft. deep.

Officers R. E. Thurmond, Field Supt., Pima Mining Co.

Metals Understood to be copper, lead and zinc. Don't know as to what amounts.

Men Employed Centennial Development Co., now employs 10 men-- all on day shift. They expect shortly to put on 2 more shifts, with 5 men more on each shift, making a total of 20 men in all.

Production Rate No production---- shaft sinking.

Milling Facilities None at present.

Present Operations Shaft sinking. Sinking a 2 compartment (5' x 9') Exploration Shaft. The shaft is vertical, and tentative plans is to sink it to a depth of 450'. Shaft has a 5' x 5' hoisting compartment and a 4' x 5' manway. The shaft is now down to a depth of 10 feet.

Past Operations United Geophysical Corp. did extensive geophysical work over the area. This was later followed by a number of diamond drill holes. The shaft now sunk is for exploration purposes, principally to test the nature of the ground, preparatory to the commencement of large scale mining operations.

Florida Mining & Materials Corp. will invest \$68 million this year to double cement production capacity to 1.2 million tons per year at its Brooksville plant, 30 miles north of Tampa.

## COBALT

Sozacom, the Zairian marketing agency of GECAMINES, reportedly lowered its world list price of cobalt for electrolytic broken cathodes from \$17.26 per pound to \$12.50 per pound effective February 1. The price reduction brings the producer price in line with current spot market prices, which were consistently well below the producer price throughout 1981.

## COPPER

It is estimated that domestic copper mine production was curtailed from 12% to 15% in early 1982 by shortened work schedules and closed-down mines. The average producer's price for delivered wirebar copper was 78.8 cents per pound in February, compared with 78.6 cents in January and 80.3 cents in December.

In Pima County, Arizona, the copper industry experienced the following:

- 1982 o As of February 1, Cyprus Pima Mining Co. announced a 43% reduction in copper and molybdenum production for a minimum of 3 months. The company put over 700 employees on a 4-day work week and has plans to lay off 175 workers.
- o Magma Copper Co. scheduled a cutback at its San Manuel smelter from 40 hours to 35 hours per week because of the reduction in the amount of copper concentrate being received from other mining companies. About 360 smelter workers will lose an average of \$50 per week.
- o Anamax Mining Co. reportedly has requested a freeze on cost-of-living pay increases until the price of copper rises significantly. The company employs 1,300 people at its Twin Buttes mine.

Michigan White Pine Copper, a division of Copper Range co., announced on February 8, that mine production would be cut back affecting 125 hourly employees. Construction of the firm's new refinery complex is continuing.

## GOLD

Standard Metals Corp., which operates the Sunnyside mine near Silverton, Colorado, announced a reduction in its workforce from 300 to 125 effective March 1. The mine is Colorado's largest producer of gold, producing about 1,000 tons of ore per day, and the sixth largest primary producer of gold in the United States. Silver, lead, zinc, and copper are also produced at the mine.

## IRON ORE

The first price increase for Lake Superior pellets in 13 months was announced by Hanna Mining Co., effective February 15, raising the price 9% to 88 cents per long ton unit of iron contained, delivered rail-of-vessel at lower lake