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ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES AZMILS DATA

PRIMARY NAME: MINERAL HILL

ALTERNATE NAMES:

MOHAVE CHIEF CLAIM
NORMA CLAIM

LA PAZ COUNTY MILS NUMBER: 278

LOCATION: TOWNSHIP 10 N RANGE 17 W SECTION 3 QUARTER SE
LATITUDE: N 34DEG 13MIN 51SEC LONGITUDE: W 114DEG 00MIN 33SEC
TOPO MAP NAME: BLACK PEAK - 15 MIN

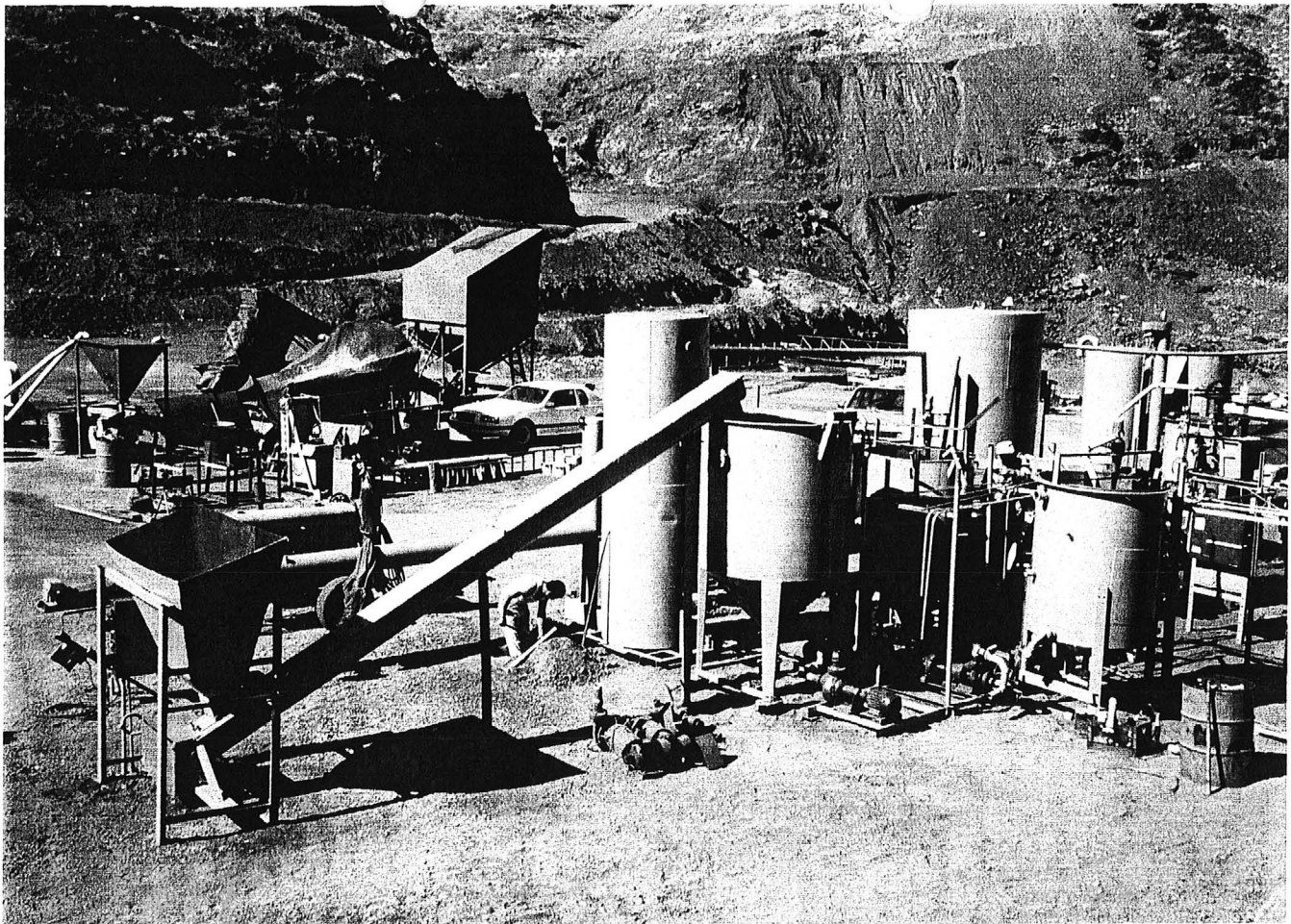
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COMMODITY:

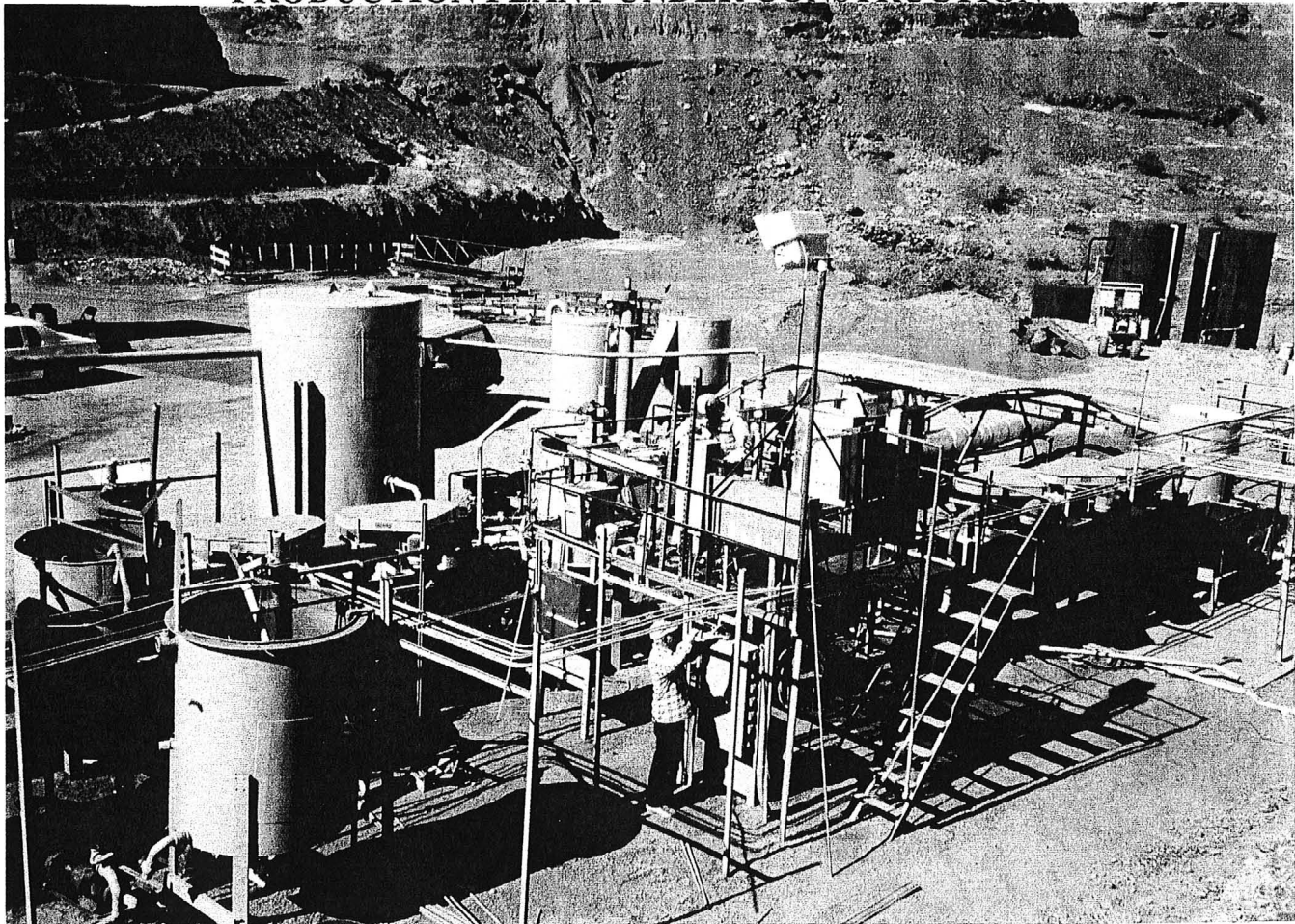
COPPER OXIDE
IRON
SILVER
GOLD LODE
BERYLLIUM

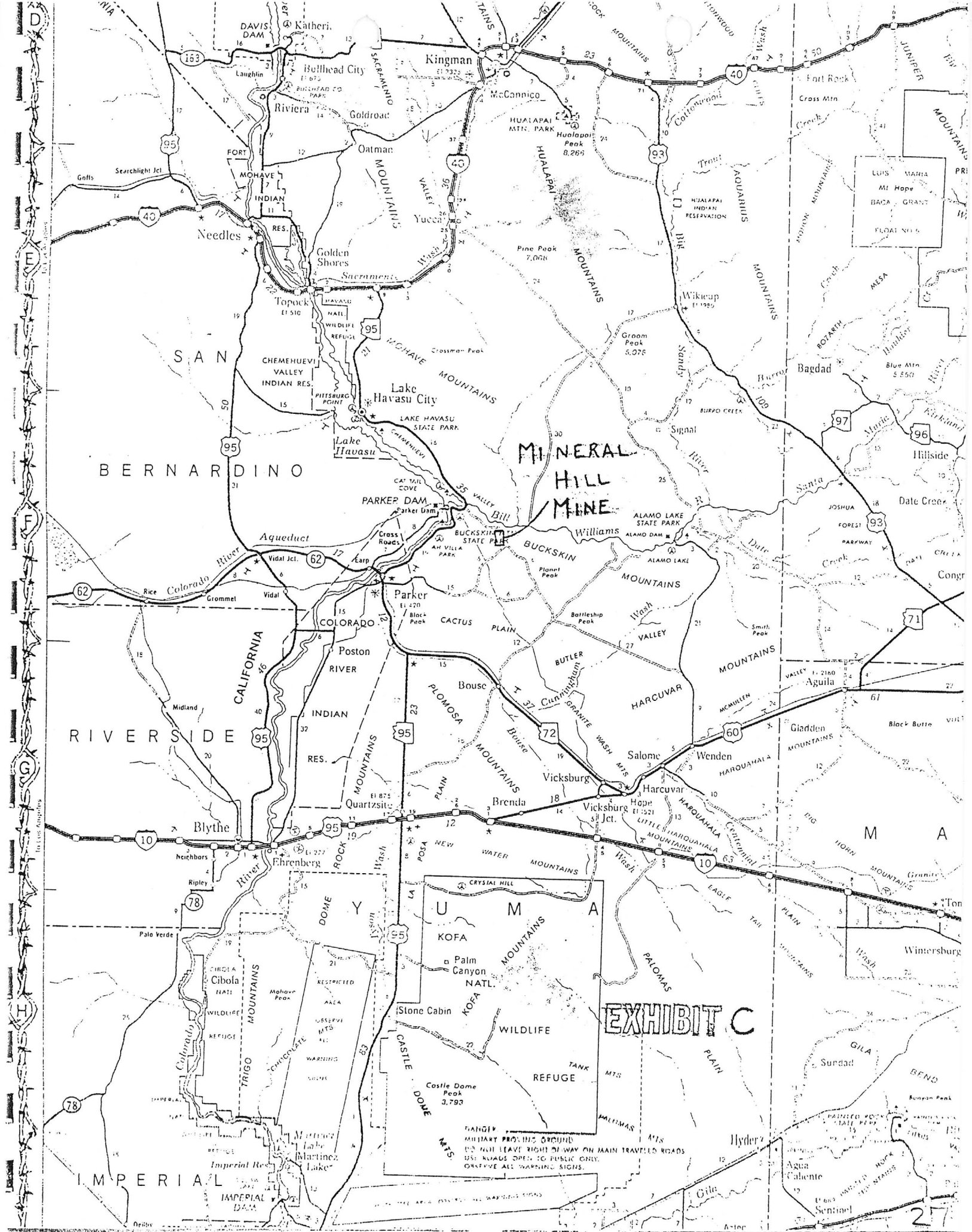
BIBLIOGRAPHY:

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ADMMR MINERAL HILL FILE
USBM OFR 2, 1961 P. BLOOM PERCOL. LEACH TESTS
ADMMR MINERAL HILL COLVO FILE
HARRER, C.M., 1964, RECONNAISSANCE OF IRON ORE
RESOURCES IN ARIZONA, USBM IC 8236,
PP 125-130
USGS BULL. 451, P. 58 / BULL. 180, P. 173, 178



PRODUCTION PLANT UNDER CONSTRUCTION





SAN BERNARDINO

RIVERSIDE

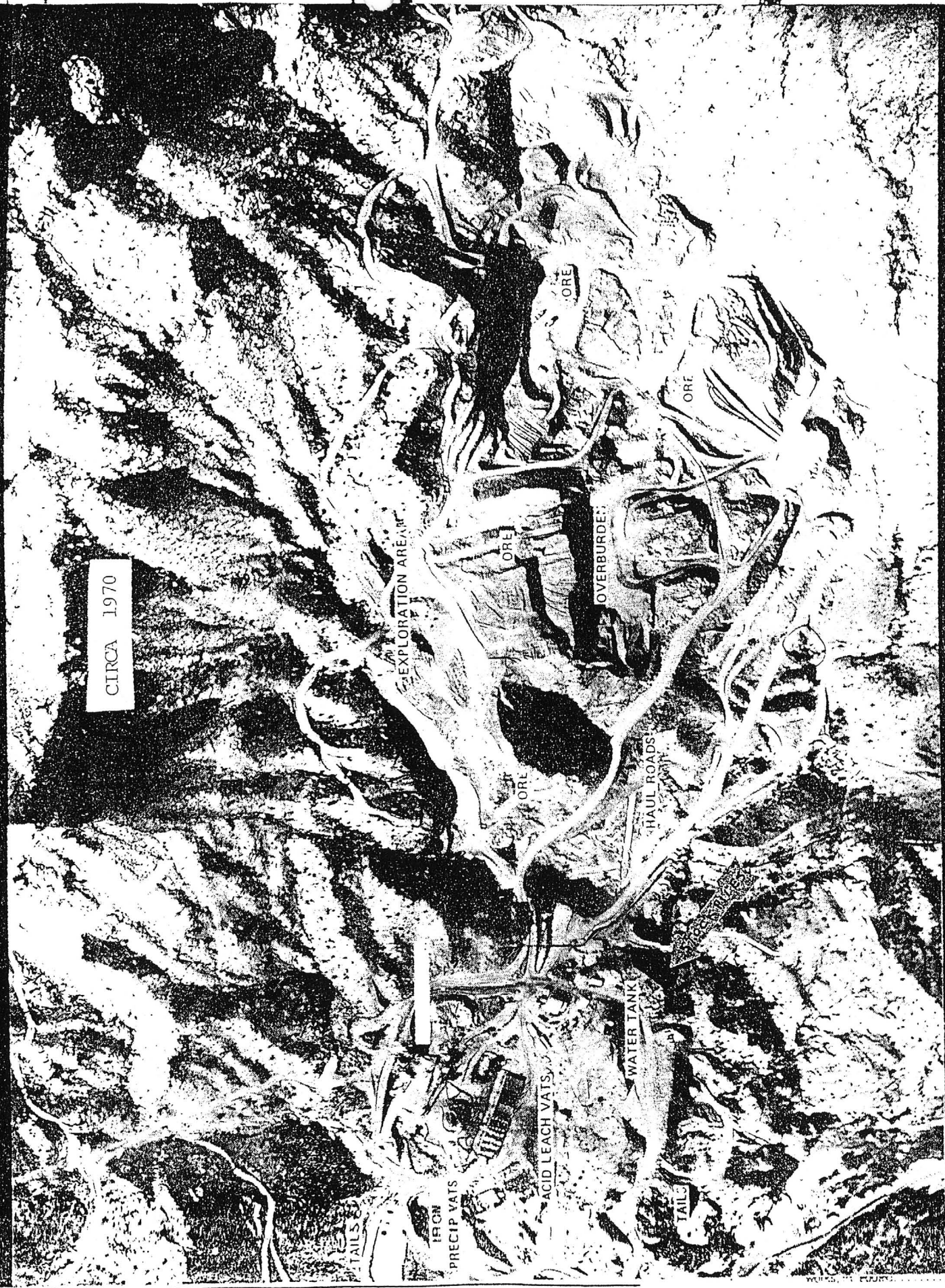
IMPERIAL

MINERAL HILL MINE

EXHIBIT C

LAPAZ - Table Records

NUMBER 278	FILE F	CONT 0	CONT1 N	PRNAME MINERAL HILL	ALTNAME1					
ALTNAME2				ALTNAME3						
ALTNAME4				ALTNAME5						
ALTNAME6				CURSTAT PAST PRODUCER		MNAME BLACK PEAK - 15 MIN			NL 34	
NLATMIN 13	NLATSEC 51	WLONGDEG 114	WLONGMIN 00	WLONGSEC 33	TOWN 10 N	RANGE 17 W	SECTION 3	QUARTER SE	COM1 CU	MOD1 OXIDE
COM2 FE	MODI2	COM3 AG	MODI3	COM4 AU	MODI4 LODE	COM5 BE	MODI5	COM6	MOD6	
COM7	MODI7	BIB1 AZBM BULL. 192. 1978. P. 173								
BIB2 ADMMR MINERAL HILL FILE										
BIB3 USBM OFR 2. 1961 P. BLOOM PERCOL. LEACH TESTS										
BIB4 ADMMR MINERAL HILL COLVO FILE										
BIB5 Harrer. C.M..1964. RECONNAISSANCE OF IRON ORE										
BIB6 RESOURCES IN ARIZONA. USBM IC 8236.										
BIB7 PP 125-130										
BIB8										



CIRCA 1970

EXPLORATION AREA

OVERBURDEN

HAUL ROADS

PRECIP VATS

ACID LEACH VATS

WATER TANK

TAILS

EXHIBIT "E"

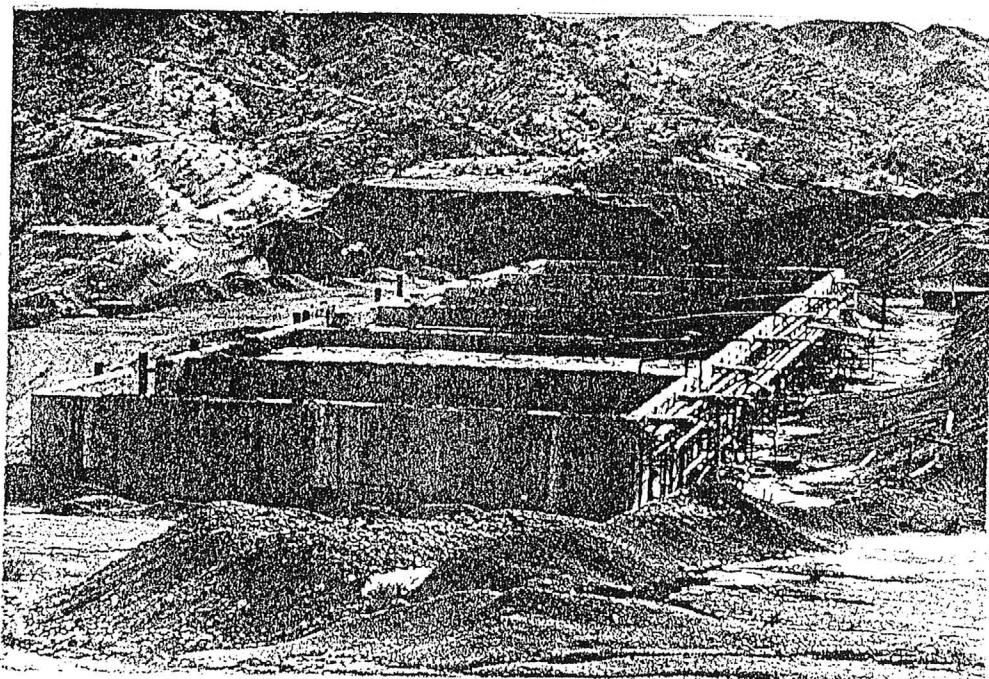
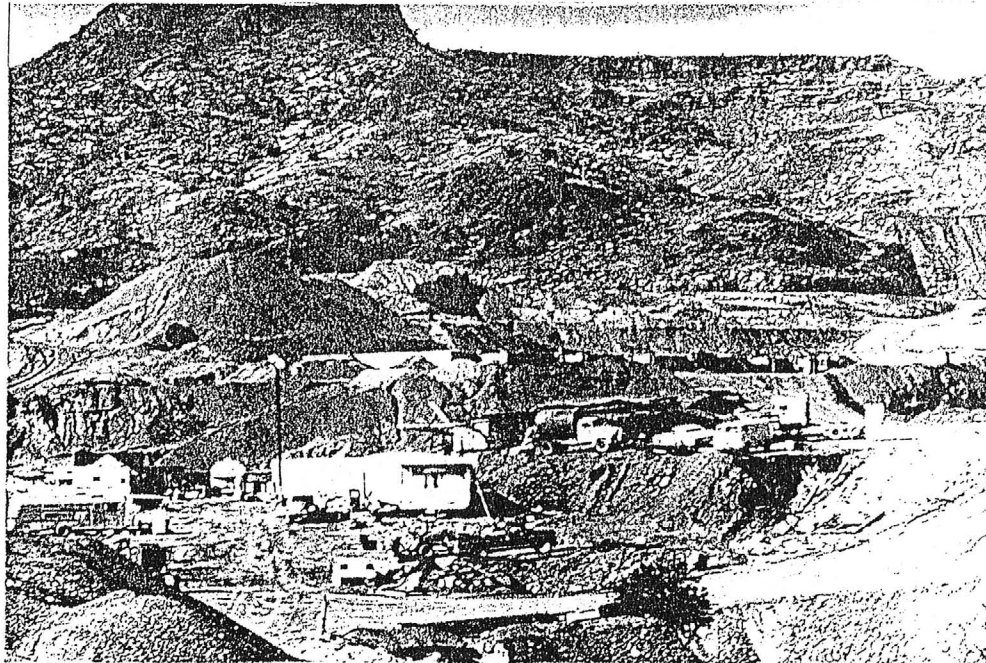
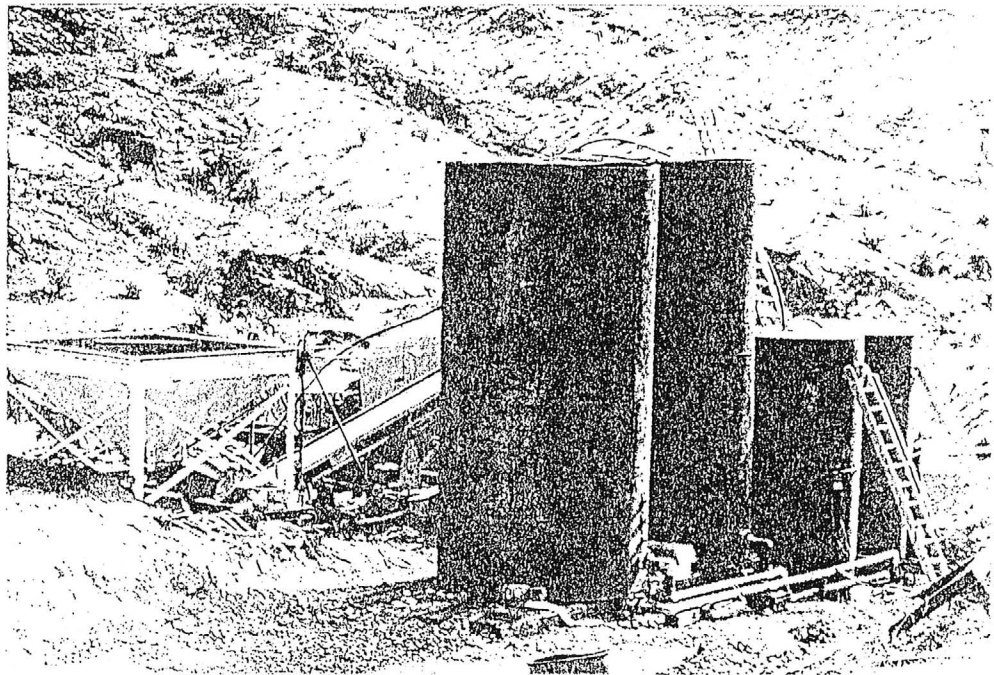
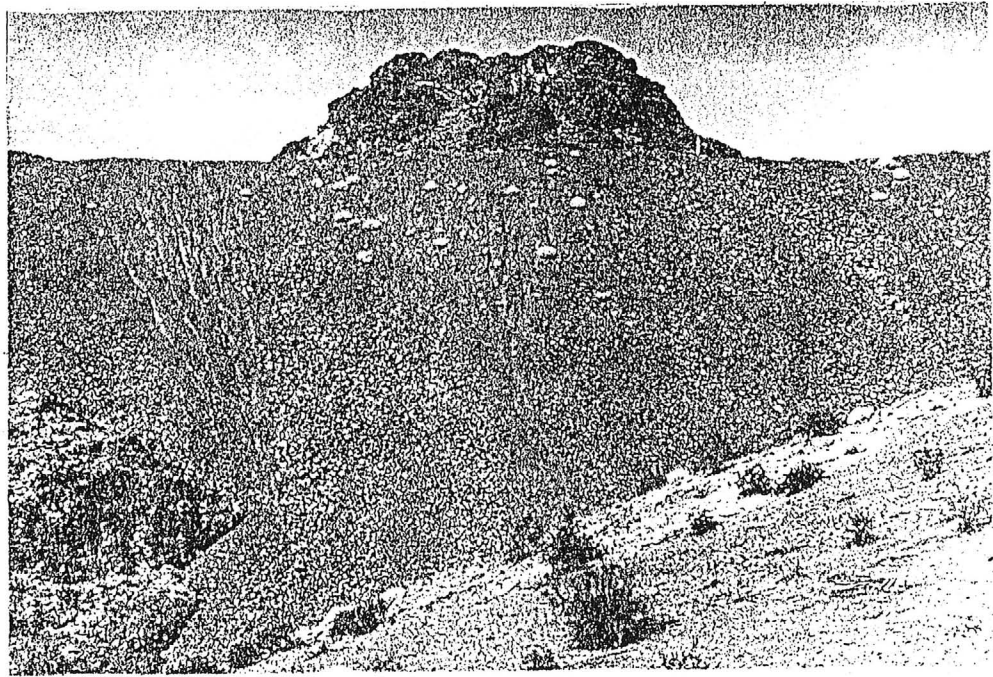
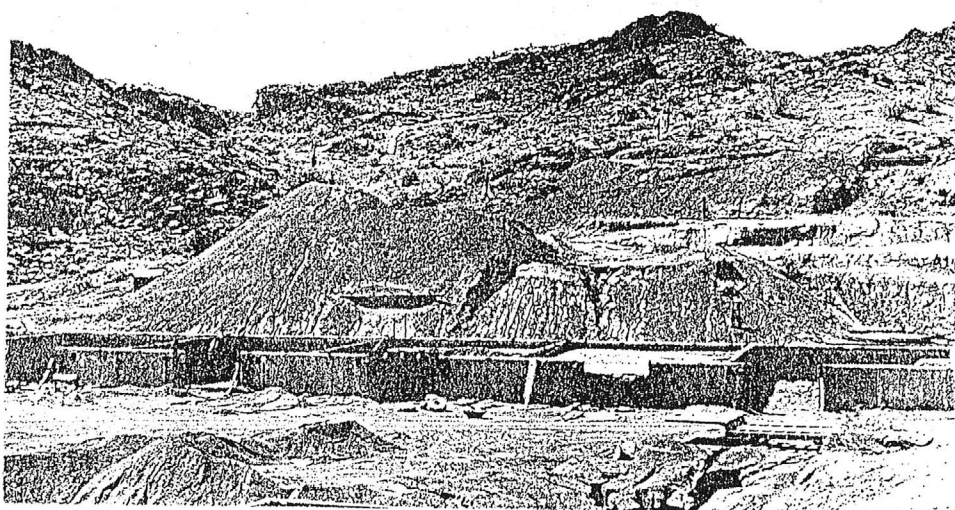
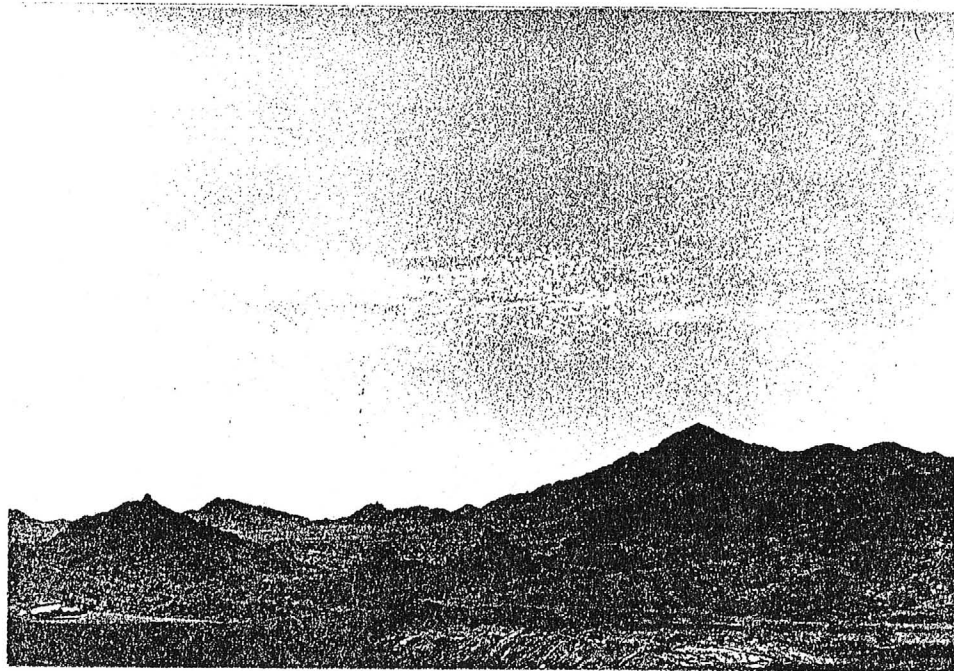
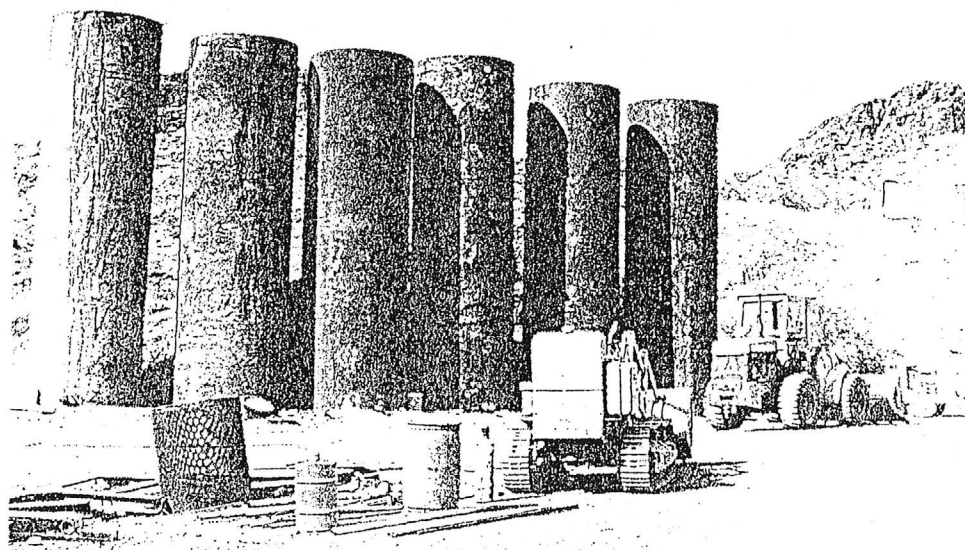
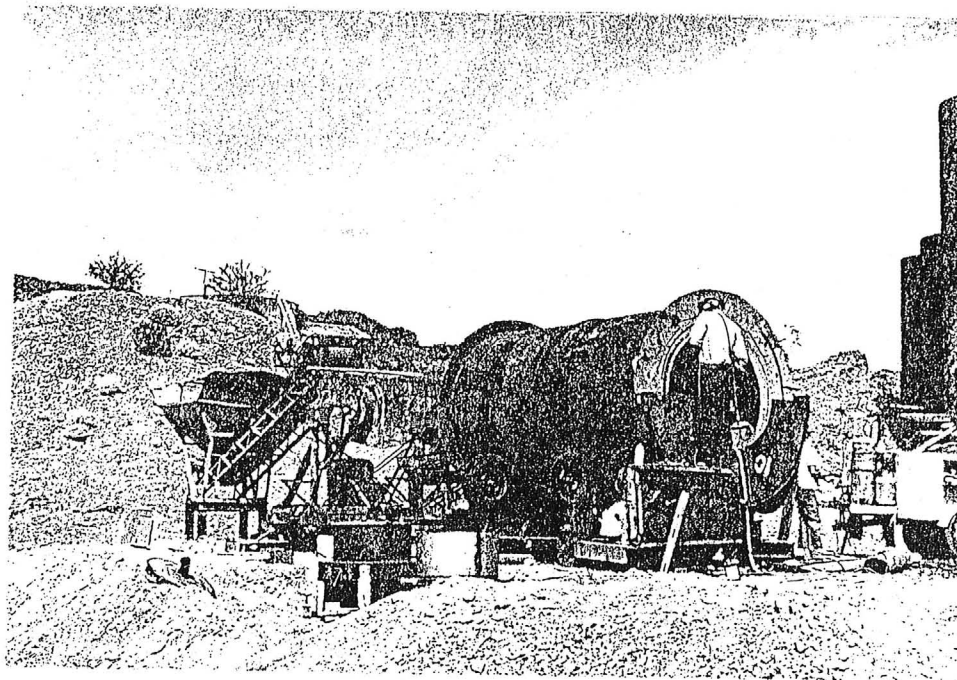
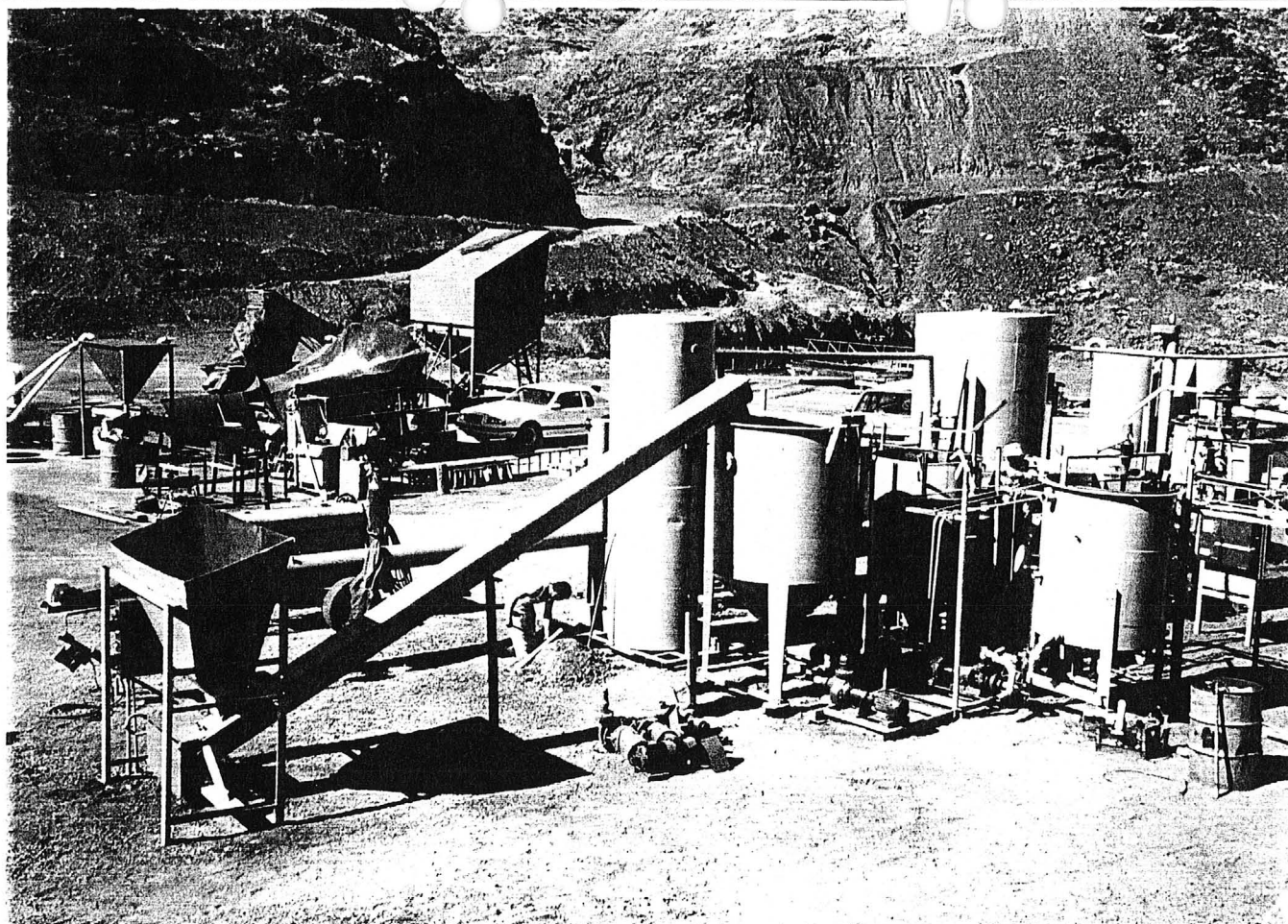


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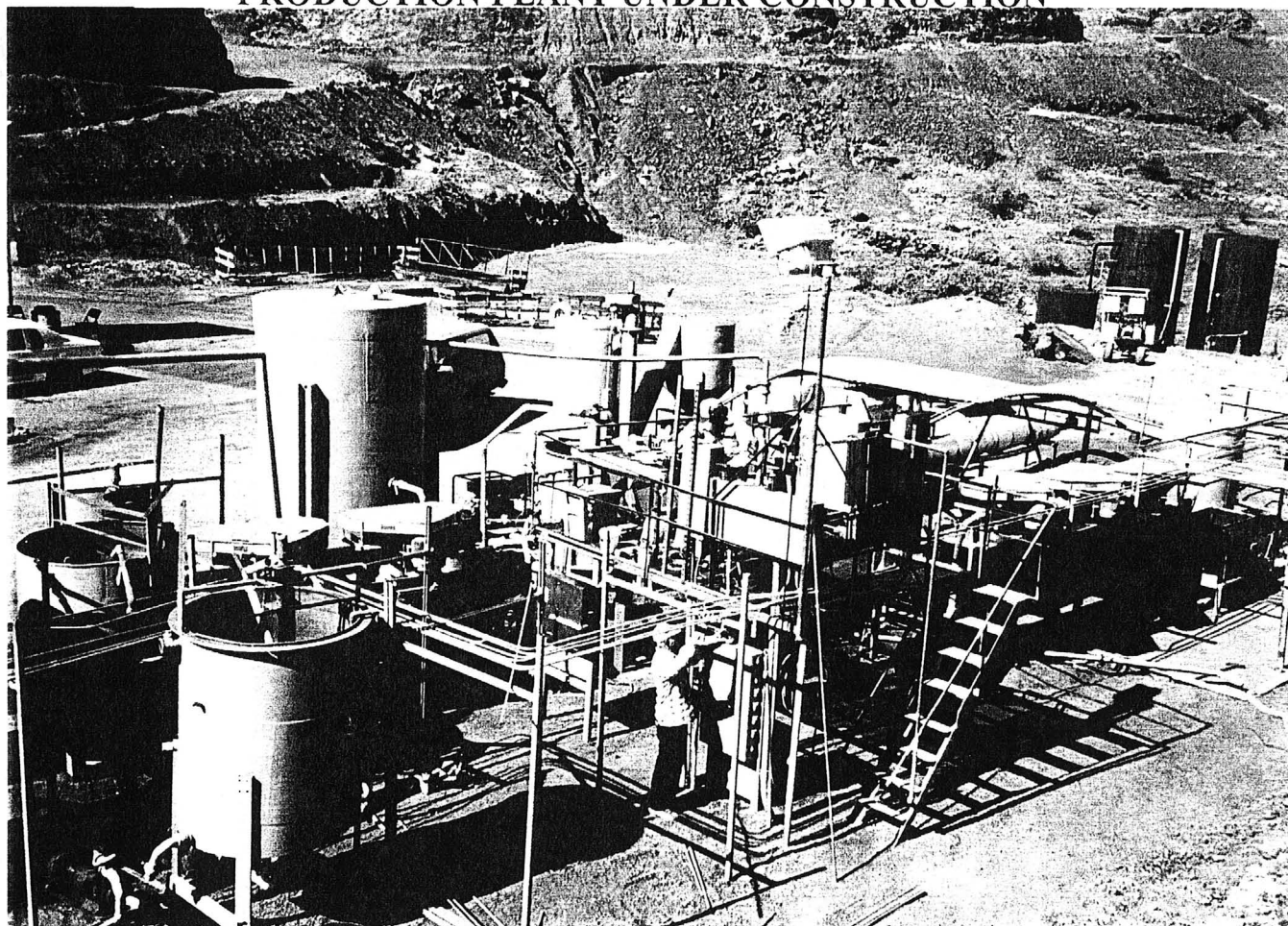


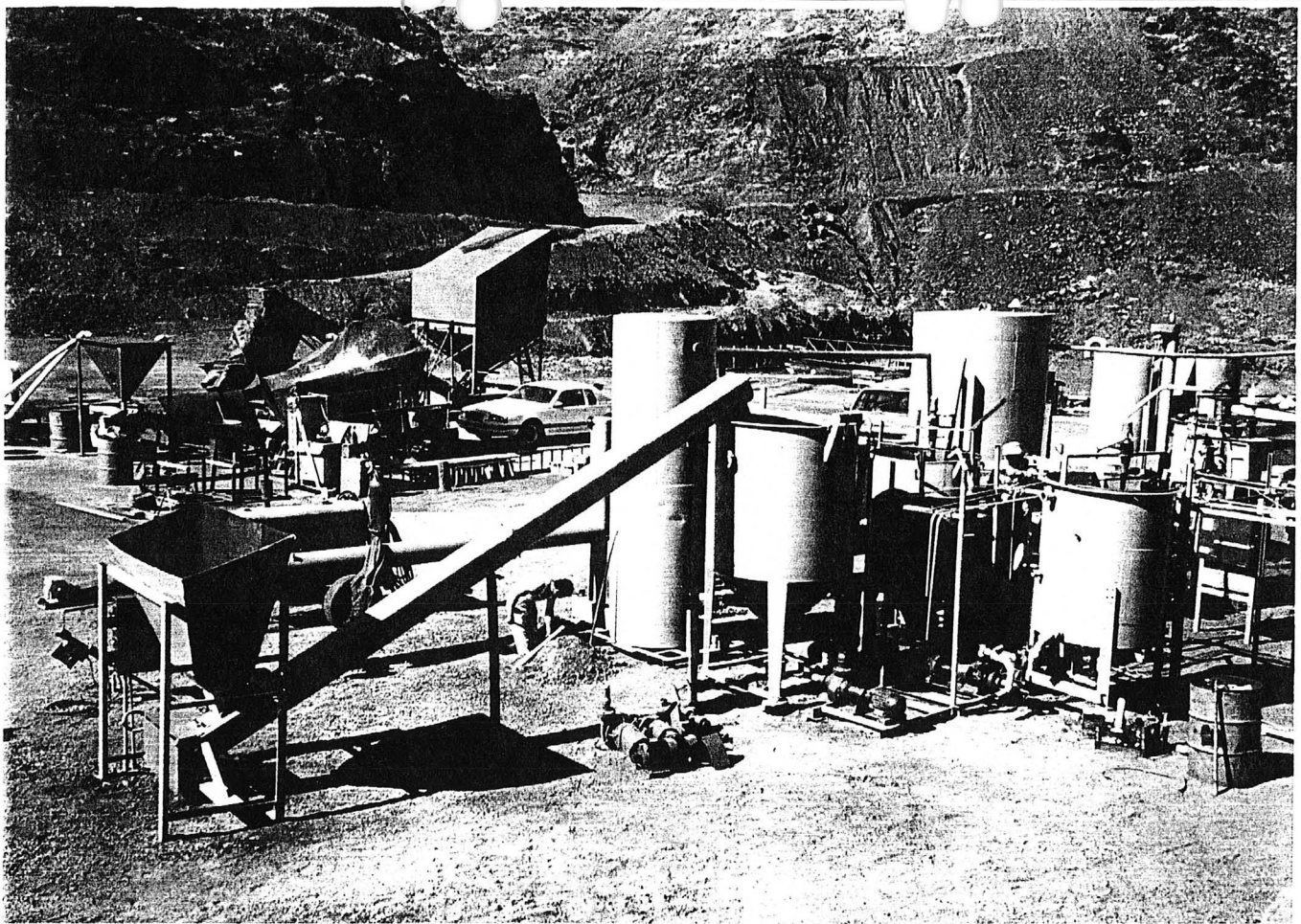




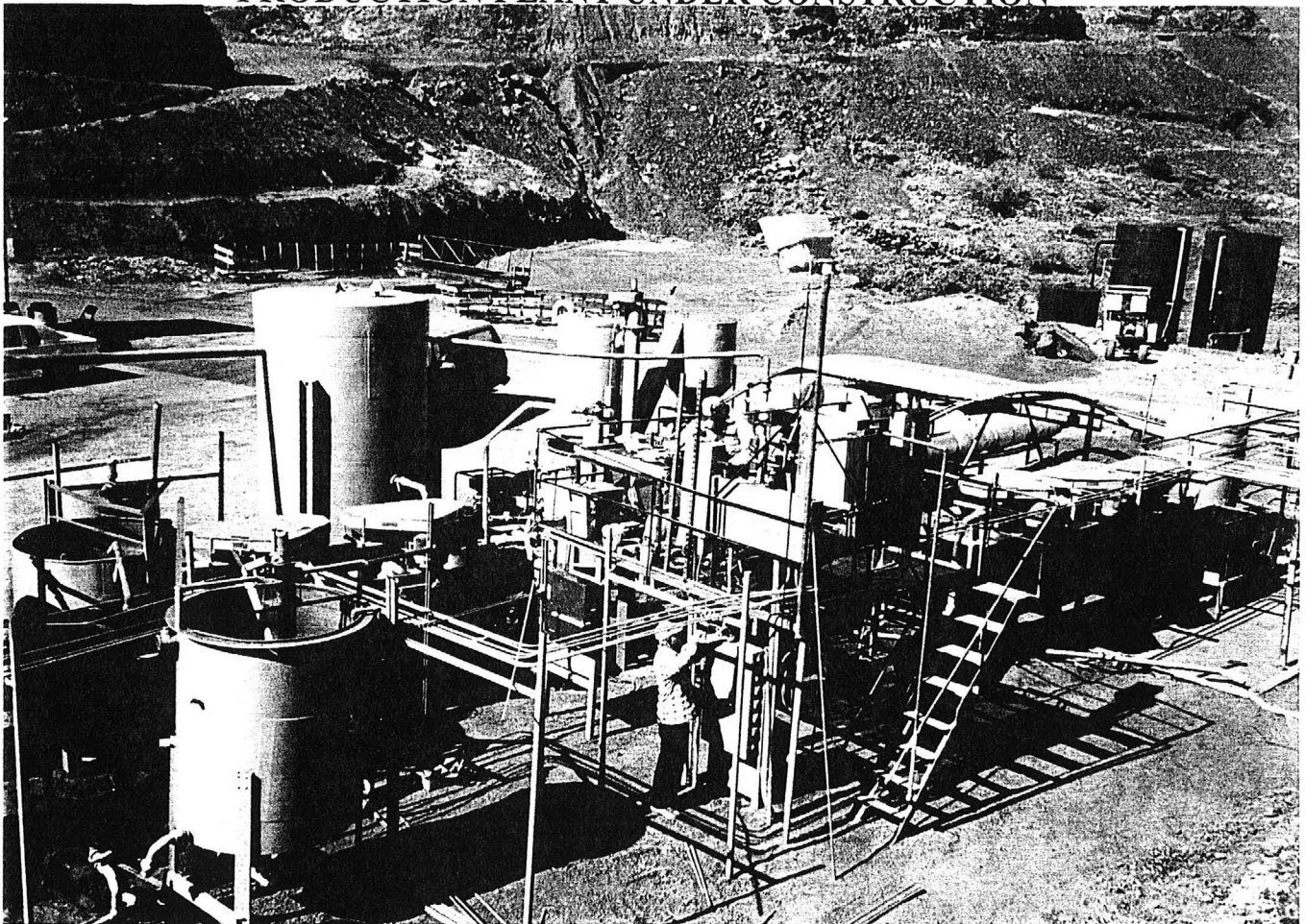


PRODUCTION PLANT UNDER CONSTRUCTION





PRODUCTION PLANT UNDER CONSTRUCTION



See: E&MJ Vol. 165 No.3 p124 3/1964

See: Metal Mining & Processing, June, 1964 p23

See; E & M J Vol 165 No.6 June 1964 p200

Mineral Hill Cupreous Hematite

from *RECONNAISSANCE OF IRON RESOURCES IN ARIZONA* By C. M. Harrer, 1964, US Bureau of Mines Information Circular IC 8236, pp. 125-130.

Specular hematite crops out prominently at Mineral Hill (fig. 50) in the Buckskin Mountains area (121, fig. 1) in secs 2, 3, 10, and 11, T 10 N, R 17 W, in the northwest corner of Yuma County, just west of Mineral Wash and about a 128 mile south of its confluence with the Bill Williams River. It is 3 miles west of the New Planet hematite deposit. The hematite occurrence is best reached by driving 24.7 miles northeast from Parker through Osborne and Mineral Washes. It can be reached also by driving north across desert terrain from Bouse about the same distance over poorer roads.

The hematite-rich area comprises 15 patented mining claims, 14 lode locations, and 2 placer claims, listed in appendix table A-2. The terrain is rugged between Mineral Wash, about 500 feet altitude, and the crest of Mineral Hill, about 1,200 feet altitude. Topography is characterized by shallow-walled canyons and isolated hills. Farther west, about 1,500 feet altitude, a basalt-covered plateau (figs. 50, 51) extends toward the Colorado River.

Specular hematite occurs as irregular hydrothermal replacements of metamorphosed Paleozoic sediments similar to those at New Planet and Swansea and the rocks forming Mineral Hill appear to be continuous with those overlying the Precambrian gneiss in the vicinity of the New Planet mine. Both areas were probably lifted, folded, and faulted at the same time. Dips range widely from horizontal to 50° SW due to folding and faulting.

Specularite occurs with the oxidized copper minerals malachite, azurite, and chrysocolla of later origin, since they are commonly found in fractures in the hematite. Massive hematite occupies several horizons. Outcrops more than 25 feet thick were noted. In addition, the host rock is heavily impregnated and stained with hematite. Veinlets, disseminations, and coatings of specularite occur between the beds of massive hematite. Specularite was observed also as films and layers from 1/64 inch to as much as 4 inches thick along jointing and fractures in the brownstained country rock. As shown on the map (fig. 52) two replacement beds of cupreous hematite crop out and can be traced east-northeast towards Specularite Point and southeast paralleling the Norma Fault more than 2,200 feet. The beds appear to merge to a composite thickness of more than 40 feet around Specularite Point. The average thickness between the top of the "Upper Iron Bed" and the bottom of the Basal Iron Bed is about 75 feet.

Mineral Hill has been sporadically explored (fig. 52) by shallow pits and cuts along the outcrop, shallow adits, and shafts in search of gold and copper. The workings did not expose the hematite to advantage. From January to May 1961 the property was explored further by Marvel Mining Co. of Salt Lake City, Utah, for copper and hematite. Exploration drilling (figs. 51, 52) was accomplished by a truck-mounted wagon drill (fig. 51). In the softer formations a rotary head was substituted for the percussion drill. Cuttings, about 25 pounds per 3 feet of hole, were blown out of the hole and collected in plastic containers and then split for storage and analysis. Drill roads required blasting and grading with a bulldozer.

A character grab sample taken by the Bureau in 1961 of the outcrop material at Mineral Hill contained 38.1 percent iron, 0.1 percent manganese, 0.1 percent titania, 5.55 percent copper, 0.07 percent phosphorus, 0.36 percent sulfur, and 27.6 percent silica; spectrographic analysis indicated the presence of 1 to 10 percent aluminum, calcium, and copper; 0.1 to 1.0 percent magnesium, manganese, and titanium; 0.01 to 0.1 percent cobalt and nickel; and 0.001 to 0.01 percent vanadium. Samples from 22 exploration holes taken by Marvel Mining Co. in 1961 throughout the Upper Iron Bed contained 35.8 to 55.7 percent averaging 45.1 percent iron; samples from 15 exploration holes through the lower bed of hematite contained 33.0 to 63.2 percent iron, averaging 49.3 percent iron.

In several places, particularly in the Upper Iron Bed, considerable copper is present. Sulfides were not visible at Mineral Hill. Two samples contained 4.6 and 6.4 percent manganese. Marvel Mining Co. has proven extensions southwest from about 2,200 feet of outcrop, comprising at least two beds with thicknesses of from 10 to 40 feet. The company estimated iron reserves, as of June 1961, at 3,356,000 tons of specularite ore, averaging 48.3 percent iron and, an additional million tons of lower grade siliceous copper-hematite ore represented by the Bureau of Mines 1961 character sample. In addition, considerably more siliceous and lower-grade hematitic material is known to exist in the area.

The Mineral Hill deposit is one of several similar cupreous hematite occurrences in the Buckskin (Williams) Mountain area.

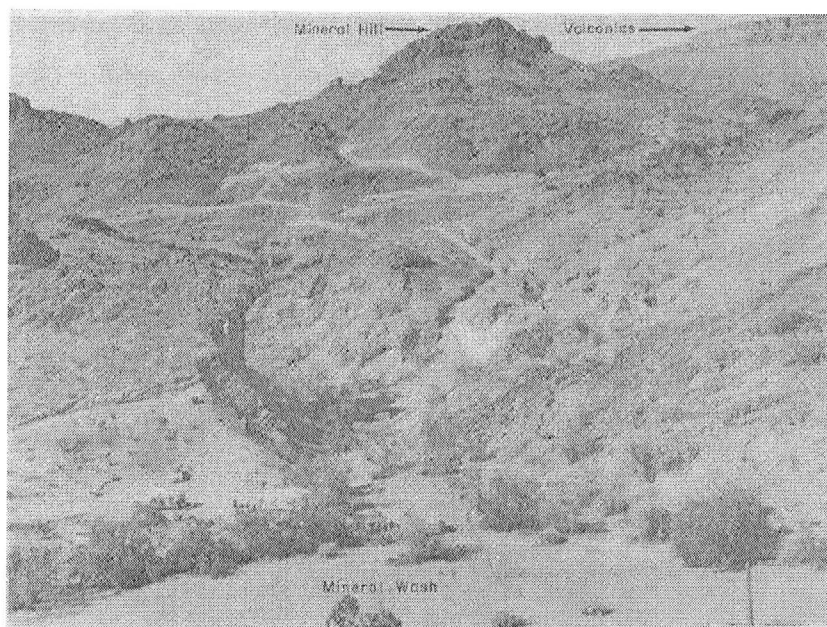


FIGURE 50. - Mineral Hill Cupreous Hematite Deposit, T 10 N, R 17 W, Yuma County, Ariz.

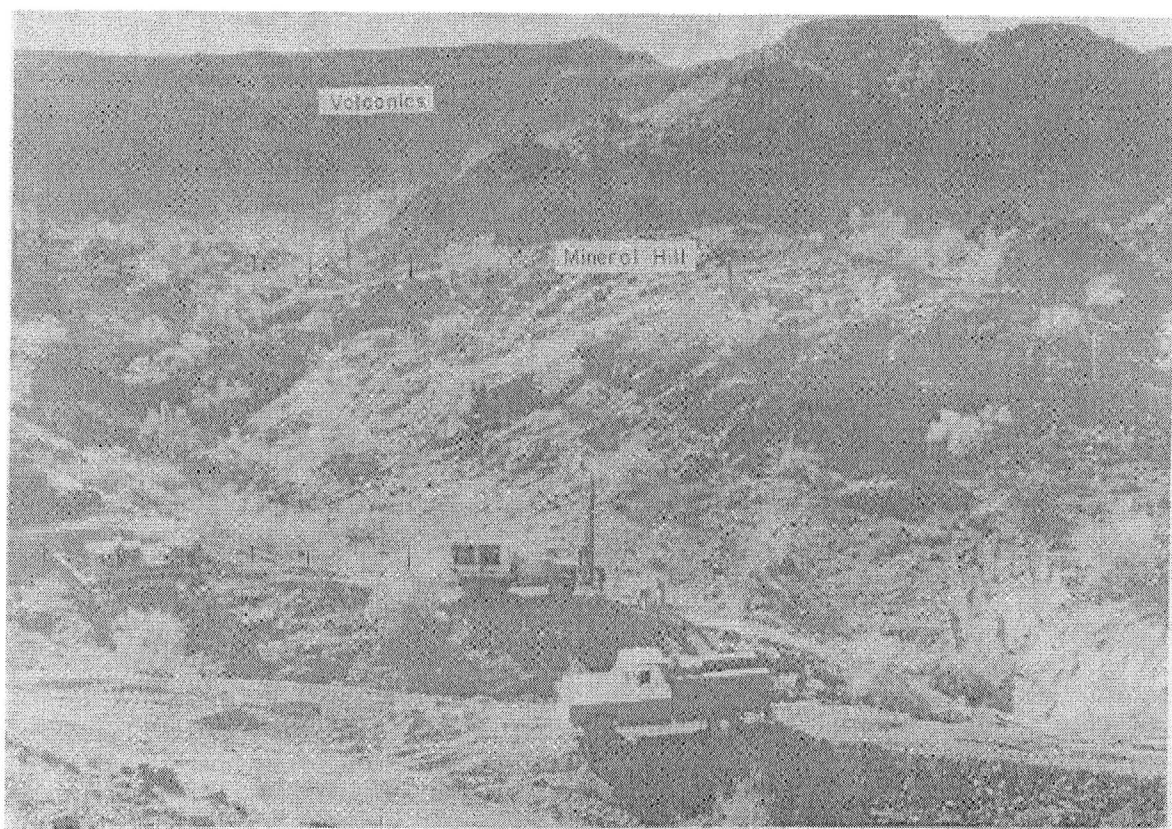


FIGURE 51. - Exploration Drilling, Marvel Mining Co., at Mineral Hill, T 10 N, R 17 W, Yuma County, Ariz.

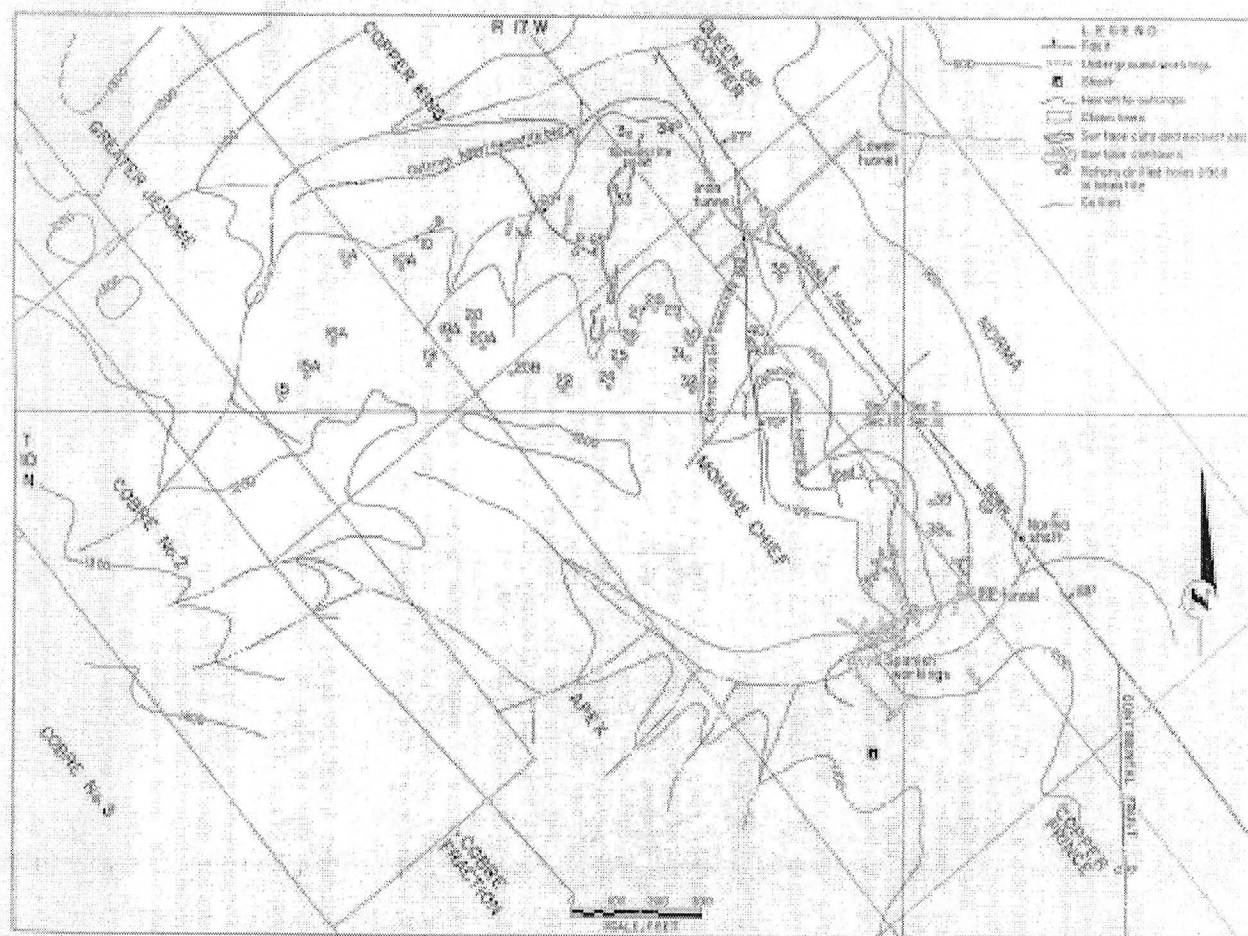


FIGURE 52. - Exploration Map, Cupreous Hematite Area, Mineral Hill, Yuma County, Ariz. (Adapted from surface map of Marvel Mining Co., Salt Lake City, Utah.)

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES

INFORMATION FROM MINE CARDS IN MUSEUM

USA Arizona, LaPaz Co.

Mineral Hill (file)

MILS # 278

O - AKA

MM N 415 Chrysocolla

N 416 "

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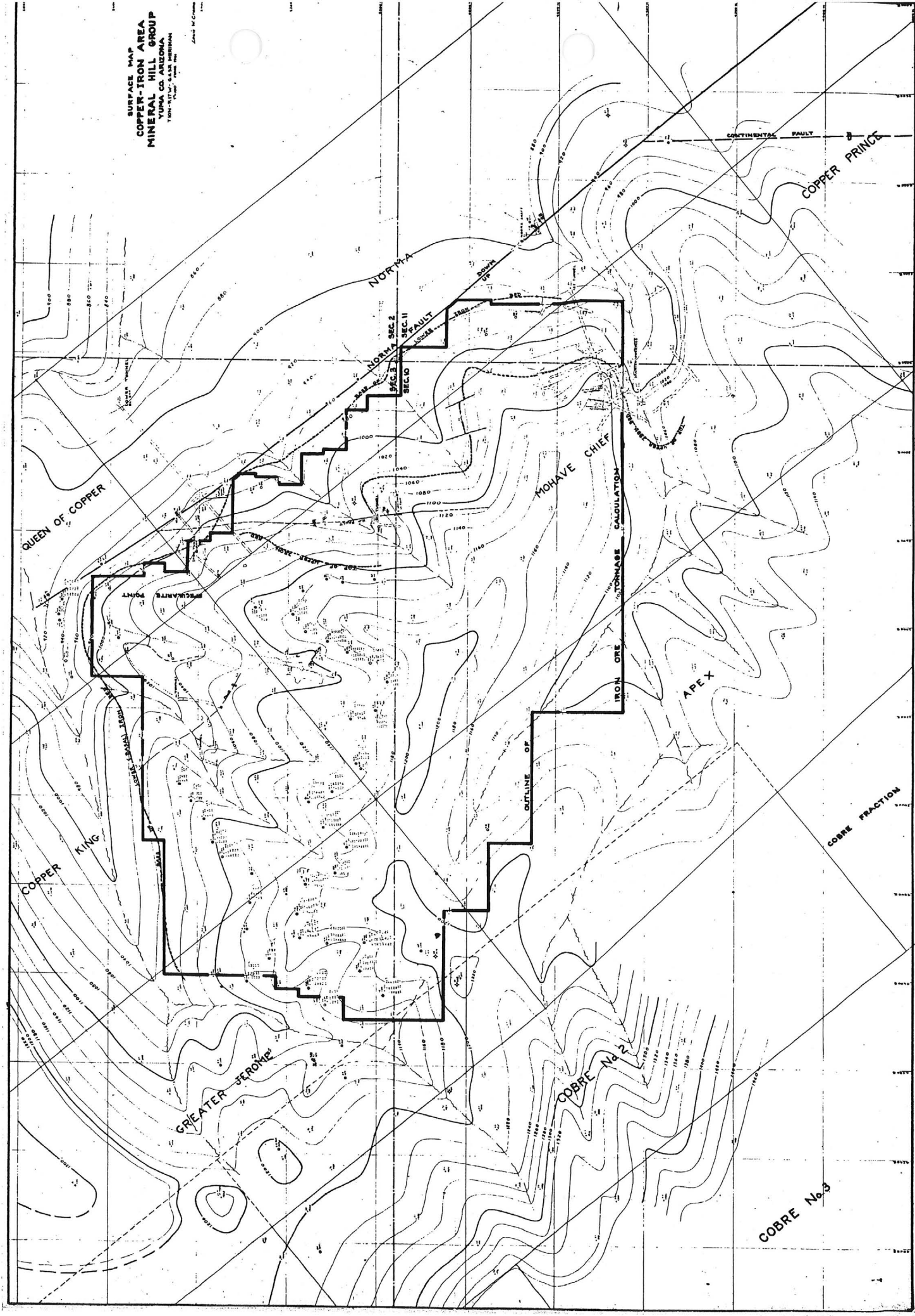
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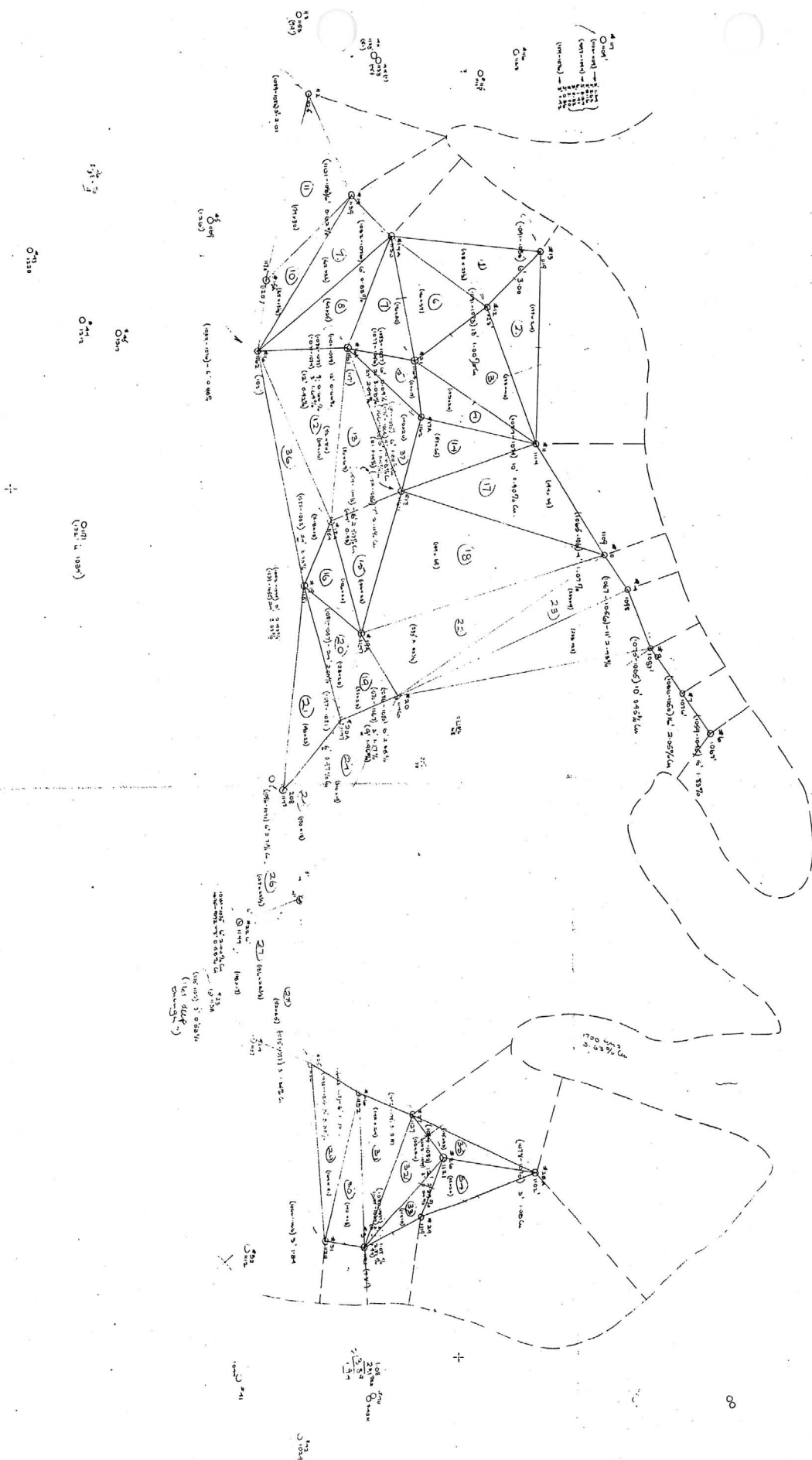
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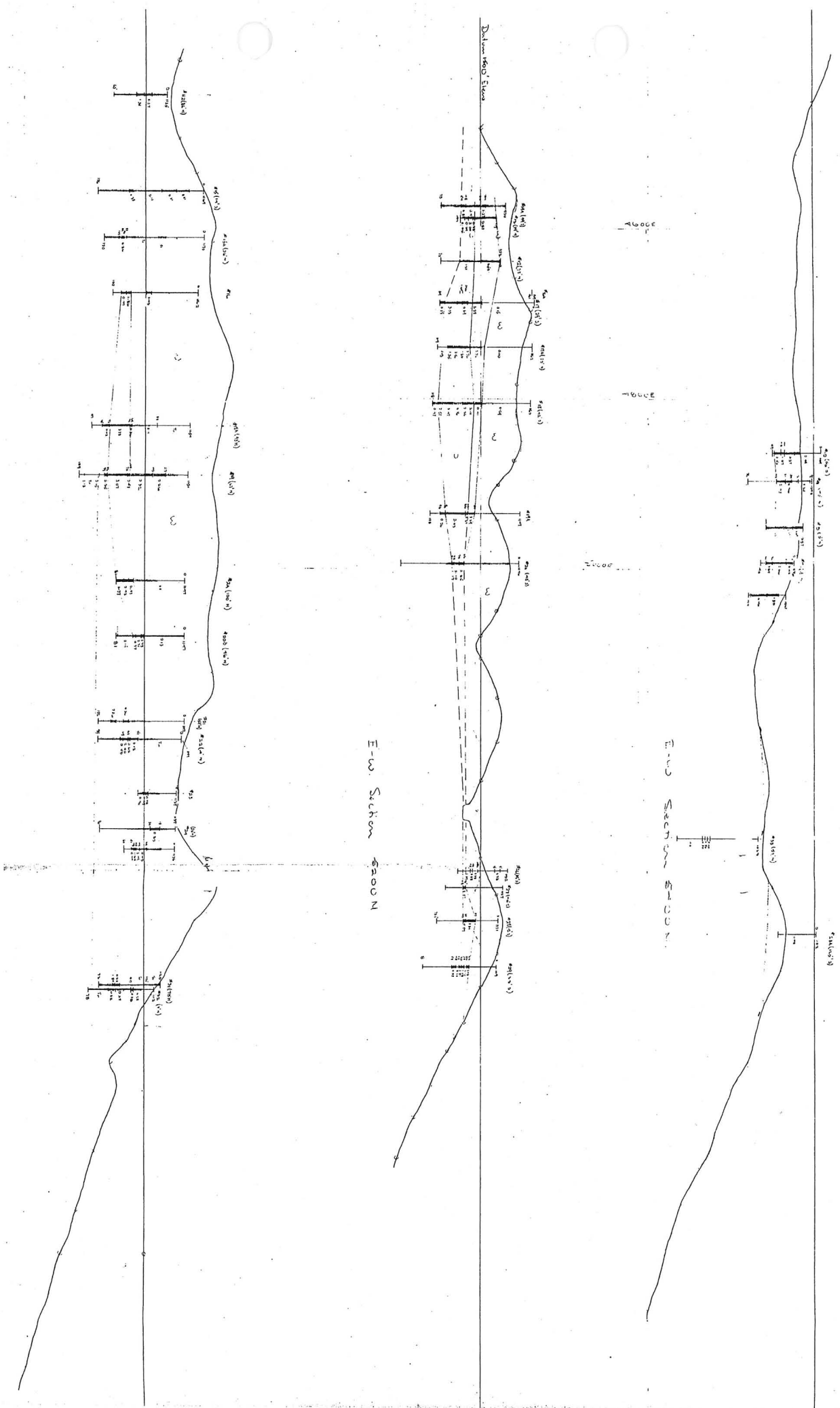
PAY DIRT 3/17/67

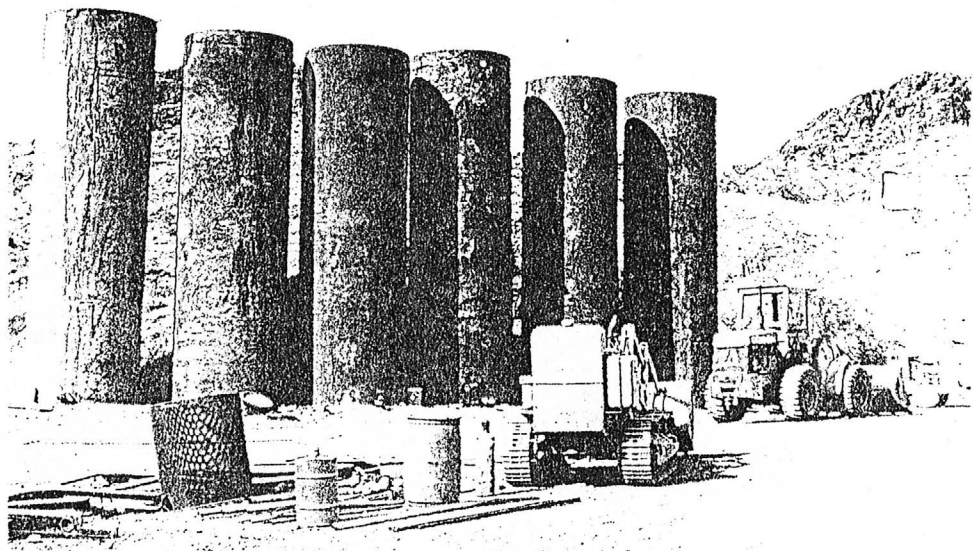
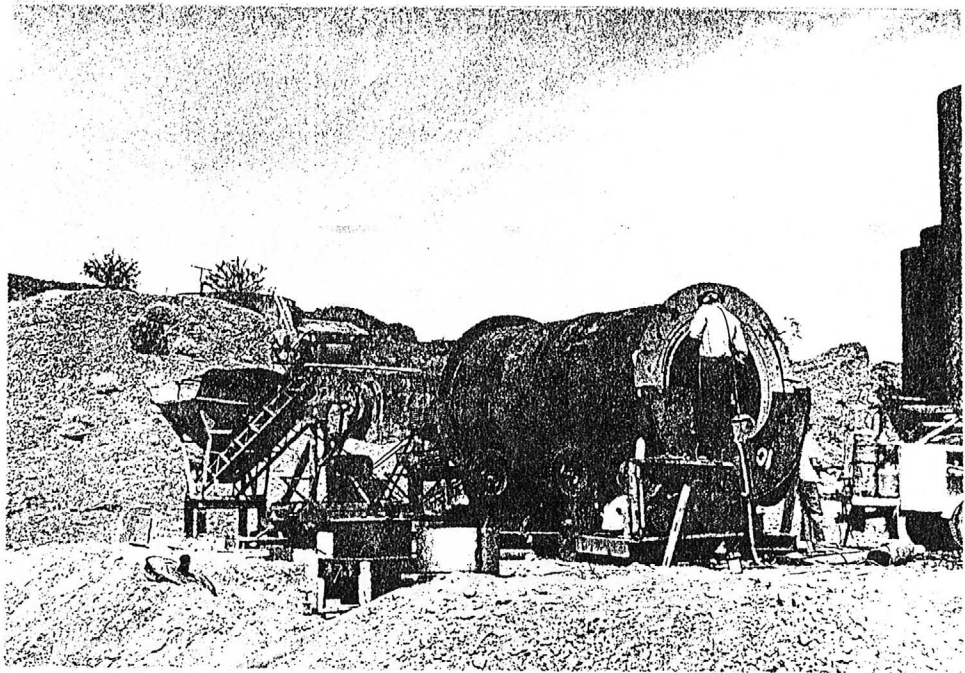
Pay Dirt 7/1967

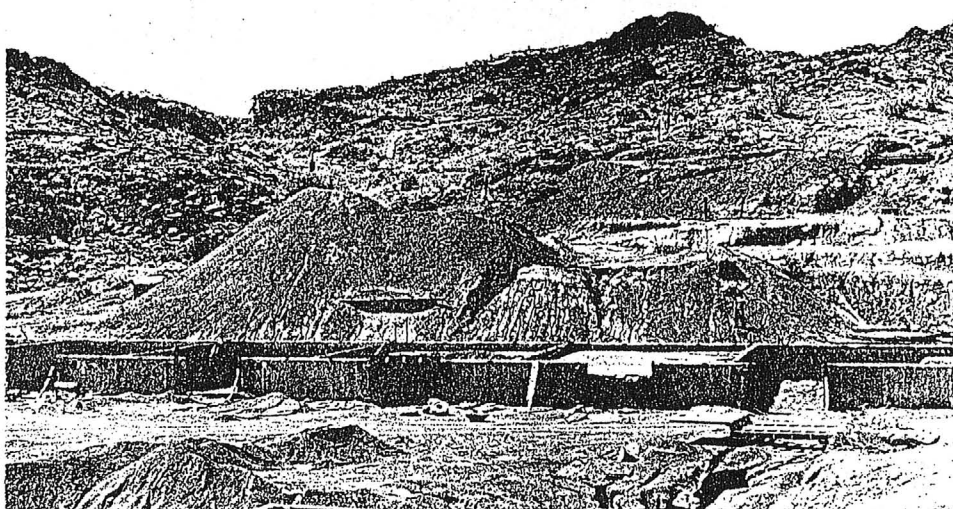
SURFACE MAP
COPPER-IRON AREA
MINERAL HILL GROUP
YUMA CO. ARIZONA
TOWN OF MINERAL HILL
1:25,000 Scale
Zoned M. G. 1900

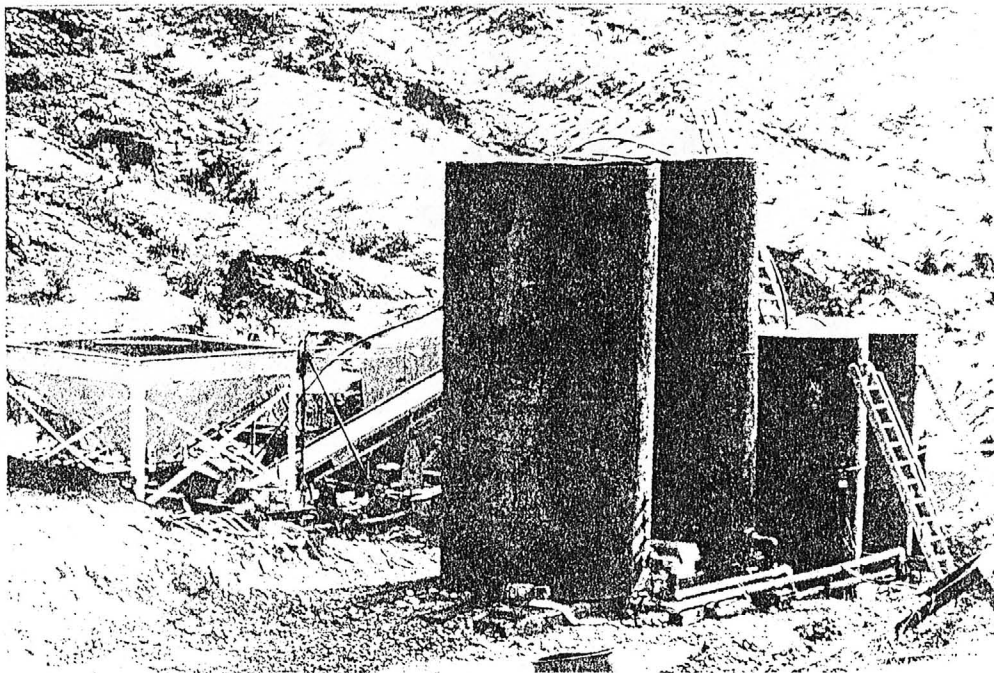
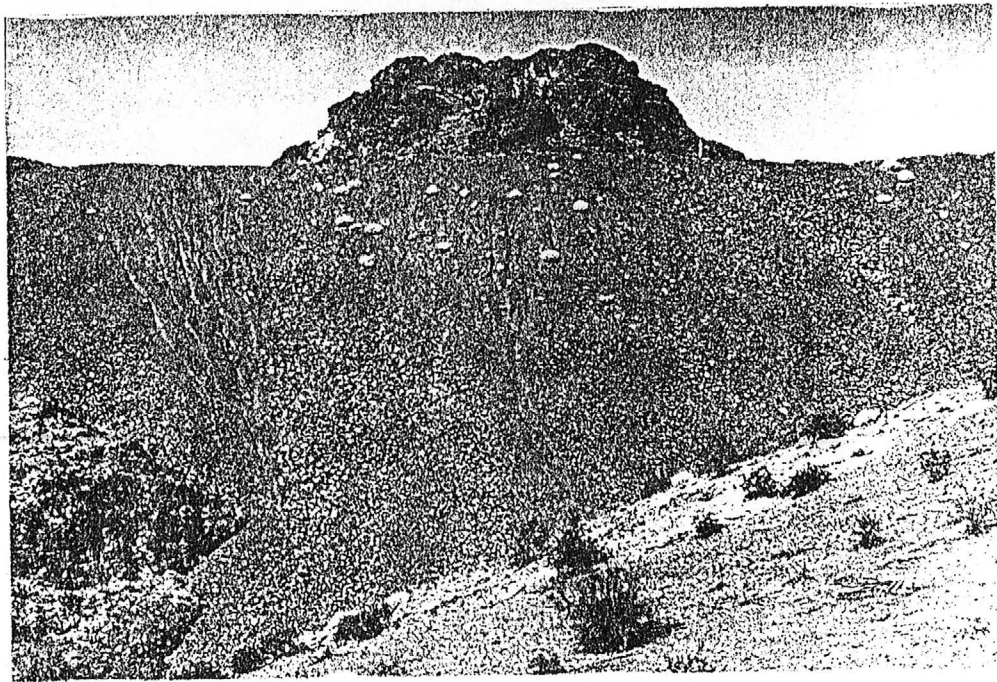












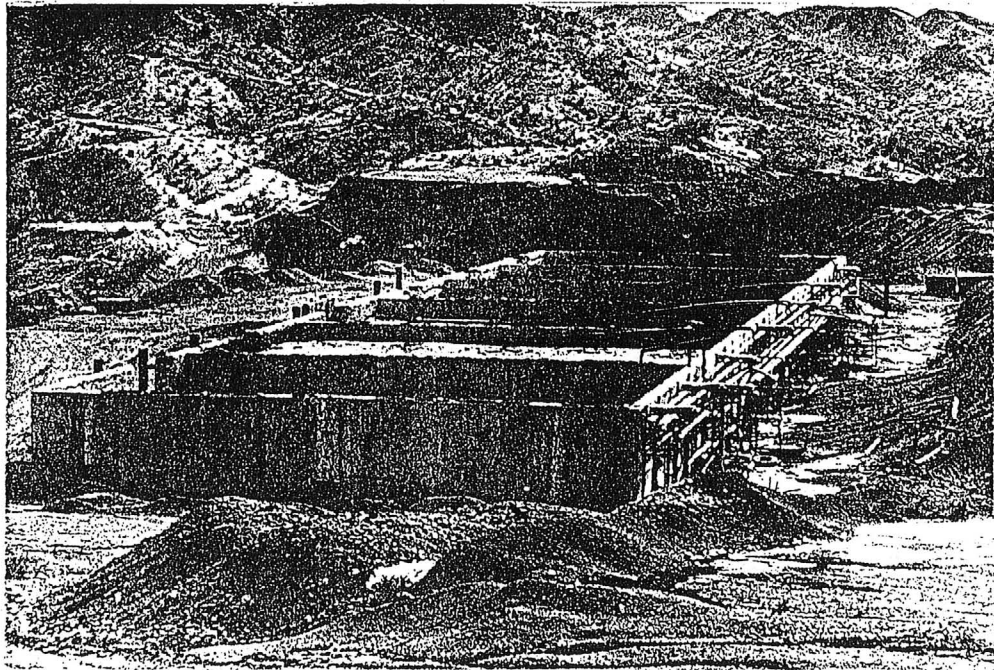
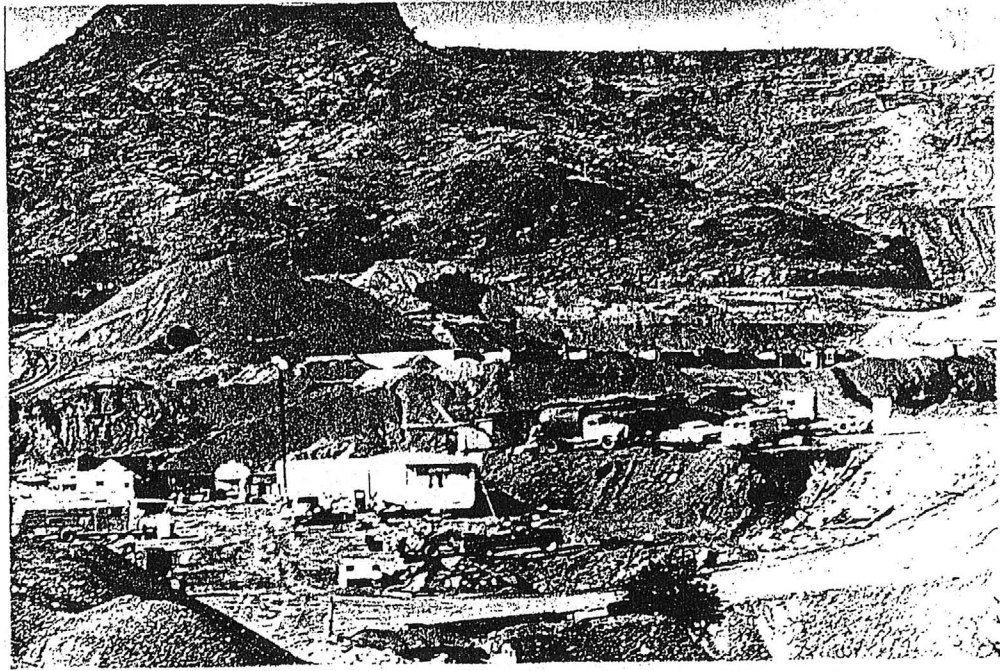


EXHIBIT "H"



9 / 01
**ARIZONA CHEMICAL
COMPANY**

Frederick E. Kallof
President

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Phoenix, Arizona 85016
Phone (602) 279-6474
Fax (602) 277-1148

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Phoenix, AZ 85064-2983
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NIN - S-2004

10-21-2002
Placed in file
by J.M./N.R.



Arizona Department of Mines and Mineral Resources

1502 West Washington, Phoenix, AZ 85007 Phone (602) 255-3795
1-800-446-4259 in Arizona FAX (602) 255-3777 www.admmr.state.az.us

Mineral Hill Mine
AZMILS LaPaz 278
By Ken A. Phillips

La Paz County

Information from field visit in December 2002 and telephone interview with Fred Kaloff on October 25, 2004.

There are two stockpiles of materials. The 200,000 tons in the specular hematite stockpile reportedly runs about 50% hematite and is mine run material sorted by dumping location from copper mining. There is also between 50,000 and 100,000 tons in crushed low grade copper "ore pile" that runs high enough in hematite to be considered part of a hematite stockpiled resource. It is predicted that gravity beneficiation would increase the hematite to a 56%. Content suitable for feed to the pilot iron pigment plant on the property.

There is a 3,000,000 ton oxide copper stockpile reported to run about 0.45 % Cu and about 30% hematite.

The Mineral Hill site includes a pilot beneficiation plant for production of MIO (micaceous iron oxide), red iron pigment, and black iron pigment. This plant was designed and built by Mountain State Engineers of Tucson.

Fred Kaloff, the property's owner has hopes that it can again be a producer. He states that it's copper production, while short lived, was profitable. He believes that the future for such a deposit and the stock piled material is as a producer of specialty iron and copper products such as pigment, copper powder, copper chemicals, and iron chemicals.

File: Mineral Hill
etc

(Note: Prepared for Jim McMulty 2/27/91)

February 27, 1991

To: Leroy Kissinger, Director
From: Ken A. Phillips, Chief Engineer

Subject:

Arizona Chemical Company, Fred Kallof, La Paz Precious Metals Partnership, Mineral Hill Mine, and Pacific Sentinel Gold Corporation and their relationships, if any

Mr. Frederick Kallof does business as Arizona Chemical Company and has been trying to promote money for his Mineral Hill Mine since at least 1985. La Paz Precious Metals Partnership (La Paz), circa August 1985, was one of those promotions. Both La Paz and Arizona Chemical purport to be able to produce highly refined copper foil and precious metals through the use of proprietary processes developed by Alvin Johnson. The unbelievably high values of precious metals were "assayed" by A.S.T. Labs' Sig Bremmer. Both Messrs Johnson and Bremmer are well known unregistered promoters of unduplicatable high values and unbelievable processes.

The Mineral Hill Mine is reported to currently be leased to Pacific Sentinel Gold Corporation along with a number of other properties in the district. The Mineral Hill property was once a producer of copper by vat leaching of acid soluble copper ores. It appears that Pacific Sentinel's interest is primarily in its potential as a gold deposit. The property is likely a worthwhile prospect when viewed separate from Mr. Kallof and his promotions. Copies of some recent releases of Pacific Sentinel along with a copy of a February 1991 *Paydirt Magazine* article are attached.

Also attached are copies of Pacific Sentinel's listing from the *Canadian Mines Handbook 1990-1991* and information on the Mineral Hill Mine from a Arizona Geological Survey publication.

Pacific Sentinel Gold Corporation is typical of Canadian junior exploration companies with no current producing mines. They are earning an interest in the properties that make up their Golden West project by carrying on an exploration program. They are planning a drilling project this spring. The *Paydirt* article summarizes their plans for their Golden West project which would include the Mineral Hill Mine if it has indeed been acquired as has been rumored.

VIS9.4

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES

VERBAL INFORMATION SUMMARY

1. Information from: Frederick Kallof
2. Address: Arizona Chemical Co., 25 W. Thomas Rd., Phoenix, AZ 85013
3. Phone: (602) 285-0921
4. Mine or property name: Mineral Hill
5. ADMMR Mine file: LaPaz
6. County
7. MILS Number:
8. Operational Status:
9. Summary of information received, comments etc.

Mr. Kallof reported they are trying to develop pigments from their hematite and magnetite material. He feels he can produce red iron paint pigment and "micaceous" hematite for the coatings industry.

Date: April 3, 1990

Ken Phillips



MINERAL HILL

LA PAZ COUNTY

NJN WR 3/22/85: John Challinor (c) reported that Fred Kaloff (sp?) is promoting a package called La Paz Precious Metals Lmtd. partnership to process the Mineral Hill/Planet Wash Tailings, La Paz County. They have a report from Alvin Johnson (c) claiming the tailings have a 133/ton of combined precious metals.

RRB WR 5/2/86: It was reported that Fred Kalloff^(c), Paul Konow^(c) and Ray Wreggett are promoting the Mineral Hill (f) Mine in La Paz County.

NJN WR 4/8/88: John Neal, M & M Mining, reported that he has been obtaining rough material, primarily chrysocolla and malachite, from Fred Kalloff who has been developing the Mineral Hill (file) La Paz County. This gem material has been selling well in the Phoenix area.

MINERAL HILL MINE

YUMA COUNTY

Met with Mr. Duncan E. Harrison, general manager, Mineral Hill mine, at the Planet Ranch. He said they were doing very well. Production was satisfactory.
GBG WR 2-14-69

Active Mine List April 1969 - 70 men

A Joseph Mueller, representing Swiss interests, might have taken an interest in Mineral Hill if he could have secured the Planet also. Standard Metals are interested in the Mineral Hill mine of Arizona Ranch and Metals Co. and are now investigating the property.. FPK WR 6-4-69

Work continues at the Mineral Hill property in northern Yuma County. This is the largest mining operation in the county. Interest continues in the nearby Planet and Signal (Clara-Swansea) areas. John Soule' QR 1968

Visited Mineral Hill. They are working 3 shifts. No mining but removing overburden 1,000,000 yards preparing for mining in about 30 days. Installing screening plant preparing to vat leach tailings which he said will assay .4% Cu. Dan Davis is general supt. FTJ WR 10-17-69

Active Mine List Oct. 1969 - 69 men

Powdered Metals Corp., Mineral Hill mine was active during the quarter mining both old tailings and new ore that has been stripped. Work on new plant continued during the year. FTJ QR 4-3-70

Active Mine List May 1970 - 30-40 men - Al Turtle, Gen. Supt.

A phone call to Norman Hatcher, 502 W. Cambridge, Phoenix, revealed that the Mineral Hill mine in Yuma County was being acquired by Trinity Minerals, Inc., headed by Captain Delaney. Mr. Hatcher will manage the property. GW WR 3-10-71

Went to the Mineral Hill mine of PMC where James Heizer, the watchman, gave the same information as was seen in the recent news releases. The equipment was repossessed by "the bank" (which one). Aztec Mining Co., under direction of Mr. Podesta, has done some sampling of the tailings. Mr. Heizer understands they assayed 0.35 - 0.5% Cu.
GW WR 6-14-71

Went to the Mineral Hill Mine formerly operated by Powder Metals, Inc. Mr. John Hiezer is still the watchman and said he was told by Mr. Podesta last week that McIntyre's option expired Nov. 18, 1971. GW WR 1/20/72

MINERAL HILL MINE

YUMA COUNTY

Ranchers has decided not to exercise an option to acquire the Mineral Hill property of Arizona Ranch & Metals Co., near Lake Havasu City, Arizona. Skillings Mining Review Dec. 9, 1967

A visit was made to the Mineral Hill property which is again being operated by the Planet Ranch and Metals Co. since an option on the property was dropped by Arizona Ranch & Metals Co. late in 1967.

Mr. Harrison took me through the mine and leaching plant operations. About 800 tons of ore are being mined and treated each day. Leaching vats are loaded by front-end loaders. Solution from the vats now is running about 10 grs per Liter which is rather low for this type of operation. There has been an electro copper winning section delivered to the property, but it has not been installed. Precipitation is done on crushed de-tinned cans (instead of old car bodies previously used and reported in a cascading series of cells.) Interviews were held with Mr. R. L. Christy, mine supt, and Mr. Louis W. Cramer, geologist, 514 Atlas Building, Salt Lake City. Several potential buyers have been making inspections. CLH Conf. 2-14-68

Active Mine List Nov. 1967 - 55 men

Active Mine List April 1968 - 55 men

Active Mine List Oct. 1968 - 70 men

Visited Mr. Patterson - Mineral Hill. Mr. Harrison was not at the mine. Their operation normal they are pumping about 350 gpm through leach vats. FTJ WR 6-14-68

Trip to Ranch Metals milling and was taken through the leach process and pit operation.

Inferred ore - one million tons plus 1.7% Cu and are working on good ore in pit. Men employed - 62-70, 62 at present time. Shipping 25 to 45 tons per month. 80% recovery from 85 to 90% Cu. Crush and gangue 3/8"
KNG 10-1968

Mineral Hill Mine

Yuma County

R. L. Christie is now pit superintendent at Mineral Hill (he is a Colorado School of Mines man) according to J. A. Minton. The leaching so far, at Mineral Hill has had several bugs to iron out but it is improving. Extraction has not been as high as desired.

L&S WR 1/20/67

MINERAL HILL MINE

YUMA COUNTY

Conference with H. M. Osborne and Lelon Noblitt 10-15-64

The Mineral Hill mine is idle, reportedly due to a lack of finances. Noblitt had been out there a few weeks before. LAS Memo 10-15-64

It is reported that this property has been taken over by Canyon State Minerals, Inc.
LP 2-5-65

Mr. Duncan E. Harrison, Vice President of Arizona Ranch and Metals Company says they still own this property; that they are in litigation as yet but that the bankruptcy proceedings are over.

Canyon State Minerals, Inc. does not have an interest in this property. Mr. Harrison seemed to think officials of the Canyon State were in Nevada at the present time.
LP 9-28-65

MINERAL HILL DEPOSITS

YUMA COUNTY

MARVEL MINING COMPANY



Visited the field office of the Marvel Mining Co. at Desert Winds Motel in Parker. The Co. has recently begun drilling at the Mineral Hill prop. (Cu) near Planet. Joseph A. Minter^{on} is Pres.; Wm. Grote is Consulting Geologist. The main office address is: 366 So. 5th St. E., Salt Lake City, Utah. 6 men are employed.

TRAVIS P. LANE - Weekly Report - 2-18-61

OPEN-FILE report on "Percolation Leaching of Oxidized Copper Ores From the Mineral Hill Deposit, Yuma County, Ariz."

U.S.
Report can be seen at Bureau offices, Tucson, Ariz.
(New Publications- Bureau of Mines - March, 1961)

May 17, 1961 - Learned that Marvel Mining Co. (Joseph Minter^{on}, President) is continuing with diamond drilling of the Mineral Hill copper-iron deposits near Planet. Drove to Kingman.

TRAVIS P. LANE - Weekly Report - 5-20-61

July 19, 1961 - Learned that Joseph Minton, Pres., Marvel Mining Co., sold the Mineral Hill property to a California Co., who propose to build a mill near the Planet mine. Minton has personally bought the Planet ranch from Rusty Gibbons.

TRAVIS P. LANE - Weekly Report - 7-22-61

MINERAL HILL MINE

YUMA COUNTY

The Marvel Mining Company, Salt Lake City, Utah, has started exploratory drilling at the Mineral Hill copper property in Yuma County, Arizona. This property is in the Planet district, near the old Planet mine. A crew of six men is employed, with company field offices at the Desert Winds Motel in Parker, Arizona. Company officials include Joseph A. Minton, president; Duncan E. Harrison, mining engineer and vice president; and Louis W. Cramer of Salt Lake City, consulting geologist.
Mining World July 1961

This property active Oct. 1961

Interviewed Duncan E. Harrison, agent for J.A. Minton who recently sold his interest in the Mineral Hill property (Cu-Fe), and purchased the Planet Ranch and its attached grazing rights. He advised that the group which took over the Mineral Hill property plans to build a leach plant to treat the million tons plus of 2% surface copper ore proven by drilling; and plan later to mine and mill the underlying much larger iron deposit, also proven by drilling. TPL WR 2-17-62

Interviewed Ed Sloan at Bouse. He advised that he will have charge of the Mineral Hill Mining Company's mining and 1000 tpd copper leach project at the Mineral Hill property. TPL WR 3-17-62

Visited the Mineral Hill and Planet mines with Franklin Brice mining engineer from Vancouver, B. C. Two men surveying for a pipeline from a well to the Mineral Hill mill site. Interviewed Ed Sloan in charge of the work. He stated Pete Flemming has leased the Mineral Hill from the Arizona Ranch & Metals Co., Joe Minton, Pres., 218 W. Main, Scottsdale. Sloan stated that first Flemming was going to try some heap leaching and later build a mill. Interviewed D. E. Harrison, agent for Minton, at Planet Ranch. EGW WR 2-21-63

Visited this property June 12, 1963. A new road was being made up to the mine. Also bulldozers were making a site for the heap leach dumps and precipitating plant. Ed Sloan, Supt. EGW Memo 6-12-63

NAME: FRED KALLOF JOBE INV. CO. DATE: August 14, 1985

ADDRESS: P. O. Box 7765 Phoenix, AZ 85011

By hydrochemical and ferrometallurgical methods, the actual values recovered from your sample are as follows:

Sample	Au Oz/T	Au Value @ \$325	Ag Oz/T	Ag Value @ \$ 6.25	Pt Group Indication	Total Value Per Ton**
SAMPLE	.11	35.75	.29	1.81	+++	\$37.56

Based on your sample, the theoretical gold recovery for various methods commonly used is as follows:

Cyanide Heap Leach 30 % of fire recovery.

Flotation 65 % of fire recovery.

Specific Gravity 95 % of fire recovery.

The average theoretical recovery LOSS of gold values using the above methods is 5 % to 70 %.

Using the SYNERGISTIC RECOVERY SYSTEM, the total values recovered from your sample are as follows:

Sample	Au Oz/T	Au Value @ \$ 325	Ag Oz/T	Ag Value @ \$ 6.25	Pt Group Indication	Total Value Per Ton**
SAMPLE	2.063	670.48	.491	3.07	+++	\$673.73

The SYNERGISTIC RECOVERY of Au is 1875.4% of fire recovery on your sample.

This represents ADDITIONAL GOLD VALUES of \$ 634.73 /Ton using the SYNERGISTIC RECOVERY SYSTEM.

The SYNERGISTIC RECOVERY SYSTEM test we have done for you, while it is a three day lab test, is the same procedure as that used in the continuous flow production plant, except for the following:

1. Physical size of the vats.
2. The lab is a batch procedure; the plant is continuous flow.
3. A standard chemical formula is used in the lab, whereas the chemical formulation used in a plant is fine-tuned to the ore being processed.
4. Gold recovery is generally higher in a plant than in the lab. Sufficient data is not available to determine differences (if any) in the recovery of silver or platinum group metals.

**Not including Pt group value, if any.

70

• • •

(----- 100 TONS IN 1 SHIFT -----)

QUARTER	QUARTER	QUARTER	QUARTER
1	2	3	4

THIRD CUMMULATIVE

YEAR	TOTAL
------	-------

513,312 9,954,384

105,399	298,632
---------	---------

491,864 1,393,614

916,049 9,118,203

617,928 1,940,001

208.200	614.800
---------	---------

43.092	115.664
--------	---------

653.880 1.886.837

65 388	185 885
--------	---------

588 482 6 745 187

300,400 2,725,107

327 541 1 373 016

327,361 4,373,016
276,770 12,476,170

278,739 12,438,370

408,225	1,504,171
428,514	5,155,212

870,514 5,455,349

EXHIBIT G

MINERAL HILL PROJECT
ARIZONA CHEMICAL
AS TIONS
AND EXPLANATIONS

PRODUCTION RATE: 100 TONS FOR EACH 8 HOUR SHIFT, 22 SHIFTS PER MONTH DURING FIRST YEAR, 44 SHIFTS IN SECOND YEAR, AND 66 SHIFTS IN THE THIRD YEAR; THIS CONSTITUTES A 100 TON PER DAY PROCESS OPERATION IN THE FIRST YEAR, A 200 TON PER DAY IN THE SECOND YEAR, AND 300 TON PER DAY IN THE THIRD YEAR.

PRODUCTS: COPPER FOIL
ELECTROLYTIC GOLD & FREE GOLD
IRON OXIDES

PRODUCTS SOLD PER YEAR:

COPPER FOIL: 375,936 POUNDS FIRST YEAR
751,872 POUNDS SECOND YEAR
1,127,808 POUNDS THIRD YEAR

GOLD: 2,376 TROY OUNCES FIRST YEAR
4,752 TROY OUNCES SECOND YEAR
7,128 TROY OUNCES THIRD YEAR

IRON OXIDE: 7,128,000 POUNDS FIRST YEAR
14,256,000 POUNDS SECOND YEAR
21,384,000 POUNDS THIRD YEAR

PRODUCTION RECOVERY PER PRODUCT: COPPER: 80%
GOLD 90%
IRON OXIDE: 90%

VALUE PER SHORT TON OF RAW MATERIAL:

COPPER \$ 53.40 X 80% = \$ 42.72
GOLD 30.00 X 90% = 27.00
IRON OXIDE 70.40 X 90% = 63.36
TOTAL \$149.23 X 90% = \$133.08

\$ 3.00/LB. = 17.8 LBS. PER TON X 80% = 14.24 LBS.
\$ 300./TROY OUNCE = .1 TROY OUNCE X 90% = .09 TROY OUNCE
\$ 0.22 PER POUND = 320 POUNDS X 90% = 288 POUNDS

ALSO ASSUMING THAT THE PLANT CAN BE ON LINE WITHIN THREE MONTHS.

EXPLANATIONS TO SPREADSHEET

R1: FINANCING: EXPECTED TERM IS 2.5 YEARS & A YIELD TO MATURITY OF 300%, OR 120%/YR.

R2: PRODUCTION REVENUE: THIS IS DERIVED FROM SALES OF THE PRODUCTS AND BEGINS IN THE THIRD MONTH.

E1: DIRECT COSTS: THIS INCLUDES; OPERATING LABOR, MATERIALS AND CAPITAL EQUIPMENT, PLANT SUPPLIES, UTILITIES.

E2: INDIRECT COSTS: THIS INCLUDES; LABORATORY, PLANT OVERHEAD, AND PAYROLL OVERHEAD.

E3: FIXED COSTS: THIS INCLUDES; DEPRECIATION, PROPERTY TAXES, AND INSURANCE.

E4: GENERAL COSTS: THIS INCLUDES; ADMINISTRATION & SALES, RESEARCH, FINANCING AND ESCROW, AND LEASE ACQUISITION COSTS.

E5: CONTINGENCY: ALL COSTS EXCEPT GENERAL COSTS INCLUDE A TEN PERCENT CONTINGENCY FACTOR. IN ADDITION A CONTINGENCY OF TEN PERCENT OF THE GENERAL COSTS ARE SHOWN. ANY AMOUNTS NOT USED SHALL BE ADDED TO THE WORKING CAPITAL.

THE BALANCE OF THE SPREADSHEET IS SELF EXPLANATORY.

EXHIBIT G

MINERAL HILL PROJECT
DIRECT COSTS AND INDIRECT COSTS DEFINED

DIRECT COSTS BASED ON 100 TONS PER 8 HOUR SHIFT

		((----- CONSTRUCTION PERIOD -----))															
Job title	DAYS	Men total	Avg. hourly rate	MONTH 1	MONTH 2	MONTH 3	MONTH 4	MONTH 5	MONTH 6	MONTH 7	MONTH 8	MONTH 9	MONTH 10	MONTH 11	MONTH 12	Cost/year	
Operating Labor																	
Operations	25	4	\$10.00	\$8,000.00	\$8,000.00	\$8,000.00	\$7,040.00	\$7,040.00	\$7,040.00	\$7,040.00	\$7,040.00	\$7,040.00	\$7,040.00	\$7,040.00	\$7,040.00	\$87,360.00	
Supervisor	25	1	\$12.00	\$2,400.00	\$2,400.00	\$2,400.00	\$2,112.00	\$2,112.00	\$2,112.00	\$2,112.00	\$2,112.00	\$2,112.00	\$2,112.00	\$2,112.00	\$2,112.00	\$26,208.00	
Maintenance	25	2	\$9.00	\$3,600.00	\$3,600.00	\$3,600.00	\$3,168.00	\$3,168.00	\$3,168.00	\$3,168.00	\$3,168.00	\$3,168.00	\$3,168.00	\$3,168.00	\$3,168.00	\$39,312.00	
Administration	25	2	\$15.00	\$6,000.00	\$6,000.00	\$6,000.00	\$5,280.00	\$5,280.00	\$5,280.00	\$5,280.00	\$5,280.00	\$5,280.00	\$5,280.00	\$5,280.00	\$5,280.00	\$65,520.00	
Lab	25	2	\$25.00	\$10,000.00	\$10,000.00	\$10,000.00	\$8,800.00	\$8,800.00	\$8,800.00	\$8,800.00	\$8,800.00	\$8,800.00	\$8,800.00	\$8,800.00	\$8,800.00	\$109,200.00	
TOTAL		11		\$30,000.00	\$30,000.00	\$30,000.00	\$26,400.00	\$26,400.00	\$26,400.00	\$26,400.00	\$26,400.00	\$26,400.00	\$26,400.00	\$26,400.00	\$26,400.00	\$327,600.00	
																Total Cost/year	
				\$82,500.00	\$55,000.00	\$28,235.00	\$928.00	\$1,307.00	\$7,144.00	\$7,144.00	\$7,144.00	\$7,144.00	\$9,278.00	\$9,278.00	\$9,278.00	\$224,380.00	
Materials and Capital Equipment																	
																Total Cost/year	
				\$500.00	\$500.00	\$668.00	\$1,160.00	\$2,899.00	\$8,930.00	\$8,930.00	\$8,930.00	\$8,930.00	\$11,598.00	\$11,598.00	\$11,598.00	\$76,241.00	
Plant Supplies																	
				\$8,436.00	\$8,436.00	\$8,436.00	\$8,436.00	\$8,436.00	\$8,436.00	\$4,218.00	\$4,218.00	\$4,218.00	\$4,218.00	\$4,218.00	\$4,218.00	\$75,924.00	
Utilities																	
TOTAL				\$8,936.00	\$8,936.00	\$9,104.00	\$9,596.00	\$11,335.00	\$17,366.00	\$13,148.00	\$13,148.00	\$13,148.00	\$15,816.00	\$15,816.00	\$15,816.00	\$152,165.00	
																Total Cost/year	
Item		Cost/lb. of Raw Material Processed															
Summary of Direct Costs																	
Labor & supervision	\$0.00620	\$30,000.00	\$30,000.00	\$30,000.00	\$26,400.00	\$26,400.00	\$26,400.00	\$26,400.00	\$26,400.00	\$26,400.00	\$26,400.00	\$26,400.00	\$26,400.00	\$26,400.00	\$26,400.00	\$327,600.00	
Materials	\$0.00425	\$82,500.00	\$55,000.00	\$28,235.00	\$928.00	\$1,307.00	\$7,144.00	\$7,144.00	\$7,144.00	\$7,144.00	\$7,144.00	\$9,278.00	\$9,278.00	\$9,278.00	\$9,278.00	\$224,380.00	
Plant supplies	\$0.00144	\$500.00	\$500.00	\$668.00	\$1,160.00	\$2,899.00	\$8,930.00	\$8,930.00	\$8,930.00	\$8,930.00	\$8,930.00	\$11,598.00	\$11,598.00	\$11,598.00	\$11,598.00	\$76,241.00	
Utilities	\$0.00144	\$8,436.00	\$8,436.00	\$8,436.00	\$8,436.00	\$8,436.00	\$8,436.00	\$8,436.00	\$4,218.00	\$4,218.00	\$4,218.00	\$4,218.00	\$4,218.00	\$4,218.00	\$4,218.00	\$75,924.00	
TOTAL DIRECT COSTS	\$0.01334	\$121,436.00	\$93,936.00	\$67,339.00	\$36,924.00	\$39,042.00	\$50,910.00	\$46,692.00	\$46,692.00	\$46,692.00	\$46,692.00	\$51,494.00	\$51,494.00	\$51,494.00	\$51,494.00	\$784,145.00	
INDIRECT COSTS																	
																Cost/year	
Laboratory	Lab equipment		\$0.00	\$0.00	\$9,250.00	\$1,500.00	\$1,500.00	\$1,500.00	\$1,500.00	\$1,500.00	\$1,500.00	\$1,500.00	\$1,500.00	\$1,500.00	\$1,500.00	\$22,750.00	
	Lab supplies		\$0.00	\$0.00	\$2,000.00	\$750.00	\$750.00	\$750.00	\$750.00	\$750.00	\$750.00	\$750.00	\$750.00	\$750.00	\$750.00	\$8,750.00	
	TOTAL		\$0.00	\$0.00	\$11,250.00	\$2,250.00	\$2,250.00	\$2,250.00	\$2,250.00	\$2,250.00	\$2,250.00	\$2,250.00	\$2,250.00	\$2,250.00	\$2,250.00	\$31,500.00	
																Cost/year	
Plant overhead	Plant engineer		\$0.00	\$0.00	\$3,000.00	\$3,000.00	\$3,000.00	\$3,000.00	\$3,000.00	\$3,000.00	\$3,000.00	\$3,000.00	\$3,000.00	\$3,000.00	\$3,000.00	\$3,000.00	
	Accountant & Purchasing Agent		\$0.00	\$0.00	\$3,000.00	\$3,000.00	\$3,000.00	\$3,000.00	\$3,000.00	\$3,000.00	\$3,000.00	\$3,000.00	\$3,000.00	\$3,000.00	\$3,000.00	\$3,000.00	
	Sales agent		\$0.00	\$0.00	\$2,000.00	\$2,000.00	\$2,000.00	\$2,000.00	\$2,000.00	\$2,000.00	\$2,000.00	\$2,000.00	\$2,000.00	\$2,000.00	\$2,000.00	\$2,000.00	
	Telephone & Office Supplies		\$0.00	\$0.00	\$500.00	\$500.00	\$500.00	\$500.00	\$500.00	\$500.00	\$500.00	\$500.00	\$500.00	\$500.00	\$500.00	\$500.00	
	TOTAL		\$0.00	\$0.00	\$8,500.00	\$8,500.00	\$8,500.00	\$8,500.00	\$8,500.00	\$8,500.00	\$8,500.00	\$8,500.00	\$8,500.00	\$8,500.00	\$8,500.00	\$8,500.00	
Type of labor		No. of men															Cost/year
Payroll overhead (0.25%)																	
Operations	4	\$2,000.00	\$2,000.00	\$2,000.00	\$1,760.00	\$1,760.00	\$1,760.00	\$1,760.00	\$1,760.00	\$1,760.00	\$1,760.00	\$1,760.00	\$1,760.00	\$1,760.00	\$1,760.00	\$21,840.00	
Supervisor	1	\$600.00	\$600.00	\$600.00	\$528.00	\$528.00	\$528.00	\$528.00	\$528.00	\$528.00	\$528.00	\$528.00	\$528.00	\$528.00	\$528.00	\$6,552.00	
Maintenance	2	\$900.00	\$900.00	\$900.00	\$792.00	\$792.00	\$792.00	\$792.00	\$792.00	\$792.00	\$792.00	\$792.00	\$792.00	\$792.00	\$792.00	\$9,828.00	
Administration	2	\$1,500.00	\$1,500.00	\$1,500.00	\$1,320.00	\$1,320.00	\$1,320.00	\$1,320.00	\$1,320.00	\$1,320.00	\$1,320.00	\$1,320.00	\$1,320.00	\$1,320.00	\$1,320.00	\$16,380.00	
Lab	2	\$2,500.00	\$2,500.00	\$2,500.00	\$2,200.00	\$2,200.00	\$2,200.00	\$2,200.00	\$2,200.00	\$2,200.00	\$2,200.00	\$2,200.00	\$2,200.00	\$2,200.00	\$2,200.00	\$27,300.00	
TOTAL PAYROLL OVHD.		\$7,500.00	\$7,500.00	\$7,500.00	\$6,600.00	\$6,600.00	\$6,600.00	\$6,600.00	\$6,600.00	\$6,600.00	\$6,600.00	\$6,600.00	\$6,600.00	\$6,600.00	\$6,600.00	\$81,900.00	
																\$489,506.00	
TOTAL PAYROLL OF DC & IC																	

PMC-POWDERED METALS CORPORATION

Paul R. Beardsley

955-0800 - 277-4885

FOR IMMEDIATE RELEASE, Phoenix, Arizona, April 27, 1971

PMC JOINT VENTURE An agreement has been signed between PMC-Powdered Metals Corporation and Mineral Resources Company and Aztec Mining Company to process copper contained in "in-process ore" and stockpiled oxide ore at PMC's Mineral Hill Mine Located near Parker, Arizona.

The agreement calls for PMC to receive \$900,000.00 from profits of the operation involving the processing of the existing copper-bearing "in process ore" and oxide ores. When PMC has been paid the \$900,000.00 from profits, the Company will hold a 50% interest in the venture. The agreement is subject to existing contractual agreements affecting the Mineral Hill Property.

Mineral Resources Company is an investment partnership headquartered in Tempe, Arizona, and is headed by Ronald V. Frazier, President. Aztec Mining Company, with Donald Podesta as President, is located in Phoenix, Arizona.

Evaluation of preliminary operation techniques have already begun at Mineral Hill to process the copper-bearing material into copper cements.

Donald Podesta, President of Aztec Mining Company, is also President Podesta, Meyer, Rominger and Clift, an experienced mineral consulting firm.

According to PMC President, Frederick E. Kallof, "We have believed for some time that a considerable amount of copper exists in the stockpiled "in process ore" as well as oxide ores that have already been mined. We are confident that this association with Aztec Mining Company and Mineral Resources Company will be successful and profitable to all concerned."

(Copy)

PMC-POWDERED METALS CORPORATION
December 28, 1970

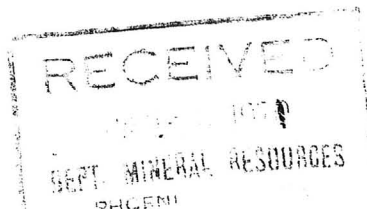
FOR IMMEDIATE RELEASE, PHOENIX, ARIZONA:

PMC-POWDERED METALS CORPORATION has announced that long term financing for operation of its Mineral Hill Mine at Parker, Arizona, has not been obtained as of this date. Pursuant to the terms of a security agreement and mortgage which is in default by PMC, a bank creditor has taken action pursuant to its agreements to cause certain assets secured thereunder to be sold. As a result the mine cannot be operated as it has been in the past.

PMC has been conducting feasibility studies in connection with the development of the Mineral Hill Mine and the use of extractive metallurgical techniques, substantially different from that previously used. It is believed that the new techniques will not require most of the present equipment used at the mine and will result in a substantial reduction of manpower and savings in operation.

The company has entered into a letter of intent with a group of private investors for financing. However, these discussions have not been completed, and are preliminary in nature.

-30-



Revised
1-4-71

DEPARTMENT OF MINERAL RESOURCES

STATE OF ARIZONA
FIELD ENGINEERS REPORT

Mine Mineral Hill Mine Date October 12, 1967
District Santa Maria District - Yuma County Engineer Robert F. Playter
Subject: Visit to property and interviews with D. E. Harrison, Manager and
Jim Shea, Supt. 10-12-67

Messrs. Harrison and Shea informed me that the property is now doing very well. About 850 tons is being mined and treated daily, say 25,000 tons per month. They employ 55 men. At present, the grade of ore is better than the average of the entire deposit, being better than 2% Cu. Drill holes ahead of the face indicate a thickness of ore of 30-50 feet in the flat dipping ore zone which overlies a thick bed of hematite. Reserves have not been calculated accurately, but when production started last November they were known to be about 1,000,000 tons. They are no less now, but not enough drilling has been done to permit a reliable new estimate.

Production has been quite satisfactory, of the order of 500,000 lbs. of copper, as cement copper, per month, with production in September considerably more than that. Thus far in October the rate has also been high. Recovery by leaching and precipitation on scrap iron is in excess of 80%.

Judging only from my observation of the pit, it will be necessary to do some more stripping before long, and a considerable tonnage will have to be moved, probably as much as $2\frac{1}{2}$ tons of waste per ton of ore exposed. If the ore to be exposed by additional stripping proves to be as good as that now being mined, a stripping ratio of $2\frac{1}{2}$ -1 is not prohibitive.

The big news at the Mineral Hill property at present is that the owner, Arizona Ranch and Metals Company, has put the property up for sale. On October 11, one group of examining engineers had spent the day on the property. On the day I was there, October 13, another group was there, and a third group was expected within a few days.

DEPARTMENT OF MINERAL RESOURCES

STATE OF ARIZONA

FIELD ENGINEERS REPORT

Mine MINERAL HILL MINE & LEACHING PLANT

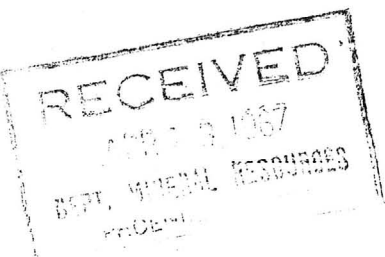
Date 6/14/67

District SANTA MARIA DISTRICT YUMA COUNTY

Engineer Lewis A. Smith, Field Engineer

Subject: Visit and Conferences with D. E. Harrison, Mgr. and Jim Shea, Metallurgist.
(See Gazette of June 14, 1967 for account of the Mineral Hill leaching plant and pictures)

The plant is doing nicely now, and is producing cement copper that assays 87 plus percent. Extraction from the ore had reached 80 percent during the past few days. The pregnant solution varies but recently has run between 25-32 grams per liter. The iron is mangled automobile body scrap (which contains some stainless steel) but the clean iron replaces well. Considerable discussion was held at the Parker Conference relative to the feasibility of removing the minus eight mesh fines prior to charging the vats. This possibly could amount to 10-15 percent of the total volume of ore. Screen and assay tests will soon be started, to determine if the grade of fines is sufficient to warrant erection of agitation leaching tanks to separately treat these fines. A study of a vat that was being unloaded revealed that these fines appeared to be more prevalent in the bottom two feet of the ore column (2½ feet deep) and it was felt that this seggragation could have been due to the leach water transporting the fines downward. The gangue is specularite (hematite) that shatters readily during blasting and is believed to decrepitate under sulphuric acid attack. If the fines show enough volume and copper content to warrant separate treatment, this refinement may be put in. The vats are now charged with 800 tons each. The leach cycle is 3-4 days.



DEPARTMENT OF MINERAL RESOURCES

State of Arizona

MINE OWNER'S REPORT

Date April 11, 1967

1. Mine: Mineral Hill
2. Location: Sec. 3 & 10 Twp. 10N Range 17W Nearest Town Parker Distance 23 Miles
Direction N.E. Nearest R.R. Santa Fe Distance 23 Miles
Road Conditions Bad
3. Mining District and County: Bill Williams Yuma County
4. Former Name of Mine: Mineral Hill
5. Owner: Arizona Ranch & Metals Co.
Address: 218 W. Main St. Scottsdale, Arizona
6. Operator: Arizona Ranch & Metals Co.
Address: 218 W. Main St. Scottsdale, Arizona
7. Principal Minerals: Copper
8. Number of Claims: Lode 15 Patented 20 Unpatented
Placer Patented 2 Unpatented
9. Type of Surrounding Terrain: Mountainous
10. Geology and Mineralization: Bedded Structure
11. Dimension and Value of Ore Body: App. 1,000,000 tons ore reserve.
Cr. 1,000,000 tons.

Please give as complete information as possible and attach copies of engineer's reports, shipment returns, maps, etc. if you wish to have them available in this Department's files for inspection by prospective lessors or buyers.

(over)

12. Ore "Blocked Out" or "In Sight": App. 1,000,000 tons ore reserve.

Ore Probable 750,000 Tons

13. Mine Workings—Amount and Condition:

No.	Feet	Condition
Shafts.....		
Raises.....		
Tunnels..... 1	400 ft.	
Crosscuts.....		
Stopes.....		

14. Water Supply: Well on Plant Ranch

15. Brief History: Property acquired by present owners in 1960. It was explored by limited drilling in 1961. An attempt was made to heap leach the ore in 1963 & 64. This program did not work so a leach plant of 800 tons capacity was built in 1966 and started processing the ore in November of 1966.

16. Remarks:

17. If Property for Sale, List Approximate Price and Terms:

18. Signature:

D. E. Harrison

MAR 17 1967

Visit and conference with D. E. Harrison, Manager, and R. L. Christie, Mine Supt.

The plant performance is beginning to improve after several "bugs" were corrected. Present operation is to charge each leach tank with 7' deep of $\frac{3}{8}$ inch or less ore and leach it with a sulphuric acid solution ($1\frac{1}{2}$ lb. of acid to 1 lb. of copper). The acid copper ratio is gradually being lessened to about $1\frac{1}{8} : 1$. Each vat holds 800 tons of ore containing 1:35 - 1:40 percent of copper. (Now 3:1)

This plant now yields about four 26-ton trucks of cement copper per week, precipitated by tin cans and scrap iron. There are usually 5 or 6 vats in the process of loading, leaching, and cleaning out; a three day cycle generally, but can vary at times. A crane with attached electro-magnet ~~above~~ ^{above} the vats with tin cans. The tailings are being stockpiled east of the vats for future re-leaching as they will run a few tenths of a percent copper. Low grade ore, 0.3 to 0.8% copper is also being stockpiled for future treatment.

The precipitation vats lie about 5' NE of the leaching vats and are divided into several contiguous units that are consecutively a little lower by a few inches from the adjacent vat on one side and the same amount lower than the one on the opposite side so as to permit a continuous flow, through the unit of pregnant solution. There are several such multiple units.

The percentage of copper recovered from the heads has improved gradually from 6 to 8 tons of precipitates per 800 tons of ore up to 9 to 10 tons per 800 tons of ore. The precipitate grade has gradually been decidedly improved over some types. From a leaching standpoint the heads have shown variable degrees of susceptibility so an attempt is under way to establish as much ore face length in the pit as practicable so as to set up a blending system of extraction that should remove the inequities previously existing in the vats.

The blending can be done in the 5,000-6,000 ton surge storage pile. This pile is about 70-75 feet high and conical in shape. Fines are not being separated, but they may be as soon as an additional screen and conveyor belt are set up. Two vats and considerable other equipment is now on hand after a long delay for electric wiring units and will soon be set up.

This will, if tests are correct, produce 99.97% copper sheet suitable for several uses. Acid is available due to the foresight of the management in anticipating the present situation. The copper is being shipped to Miami Copper Co. in Miami, at a very good price per pound of copper in the cement copper.

No attempt is as yet being made to separate the hematite from some of the ore. Employment is now about 50 men plus 2 supervisors. Cecil Truck Lines are hauling cement copper to Miami on a contract.

Harrison wants help to persuade the Yuma County Board of Supervisors to build a 5 mile road from the new Havasu Highway to Mineral Hill Planet Ranch.

MEMO LAS 2-16-67

DEPARTMENT OF MINERAL RESOURCES
STATE OF ARIZONA
FIELD ENGINEERS REPORT

Mine Mineral Hill

Date October 11, 1966

District Santa Maria (Buckskin Mountains) Yuma Co. Engineer Lewis A. Smith

Subject: Mine Visit with D.E. Harrison, Mgr. for Arizona Ranch & Metals Co., Room 20,
Desert Winds Motel, Parker or 218 W. Main, Scottsdale

Several hundred thousand tons of waste and low grade heap leach material have been stripped from the "flat" and other ore zones, three in all. Recent work has given an actual calculated reserve of nearly 1,500,000 tons or more that will average well above 1 percent copper, and mainly an iron oxide rich gangue. The area now under development would appear to have considerable potential ore which has not been blocked out, and an even greater area seems prospectable, especially along the Norma & Gulch Faults, and to the SW of the present pit.

The crushing and screening plant is nearly ready to work and Mr. Harrison believes it will be processing ore by Nov. 1st. However the completion of the electrolytic precipitation plant will not be ready for some time longer. Meanwhile precipitation will be done with scrap iron (old auto bodies and tin cans). The leach solution will enter the leach vats from the bottom and move upward through the ore. This will free CO₂ from the azurite and malachite and drive it off and will then leach the remaining copper. The vat bottoms are lined with coarse pebbles (4 inches in diameter and 2-3 inches thick) for nearly a foot deep, capped by a grid of timber which is filled with finer gravel. The pregnant solution and acid solution will enter ~~or be~~ ^{and the latter} drawn off through this gravel pad. The ore will be stacked on this. When it is leached out, the doors on the north side of the vats will be opened and a rubber tired front loader will remove the waste. The fine gravel layer between the timbers will prevent the ore from working down into the coarse gravel layer. The vats will be charged, for the present, by small dump trucks from a large surge ore pile at the discharge end of the crushing plant. This surge pile will be built up by a high belt conveyor on top of a long C.M.P. with feeder vents in its top. The feeder vents will in turn feed a belt conveyor to a small truck bin. Later it is hoped an additional conveyor system can be installed to distribute the ore into the vats. The small fines screened out of the feed will be stored for possible later treatment. Since the main gangue is specular hematite, or red hematite, the tailings could constitute a potential iron ore reserve, so will be stockpiled.

According to Harrison their copper production is contracted for, at a very good price.

Since the June visit, an area that is two hundred yards in length and 20-25 feet wide was stripped along the "gulch" fault (W side of the ore bearing block) and this disclosed ore all along the stripped area up to the "Norma" fault that borders the block on the northeast. Both are strong faults and both appear to be at least to a considerable extent, pre-mineral in age. However, there is said to be evidence of appreciable post-mineral reopening on both faults. Other faults (transverse to the block) also are mineralized by oxidized material, but they show some movement that is post-mineral. Some ore indications appear to be present for 1/2 mile south of the present mine where undetermined ore bed appears to be flat dipping and overlies a flat sill (?) of very fine grained, finely porphyritic igneous rock, that may extend well over, under the ore beds toward the present mine. This showing has been

DEPARTMENT OF MINERAL RESOURCES
STATE OF ARIZONA
FIELD ENGINEERS REPORT

Mine MINERAL HILL

Date June ^{18th}, 1966

District SANTA MARIA (Buckskin Mountains)

Engineer Lewis A. Smith

Subject: Mine visit with D. E. Harrison, Manager, Arizona Ranch & Metals Co., Rm. 20, Desert Winds Motel, Parker, or 218 W. Main, Scottsdale.

The project is progressing well and it now is hoped that copper can be produced in 3 to 4 months. At the pit considerable stripping has been accomplished. This has been done with a large, 2 yard, catapillar loader, a Gardner-Denver 600-Compressor, LeRoy 4½" air track, Denver wagon or jumbo drills, Buttons bits (Carbon inserts) which are said to last for 12,000 feet, 2 Catapillar dump trucks, 35 yds., a catapillar Diesel generator and 2 D-8 Cats. The stripping ratio is roughly about 1:1 currently, but still favoring waste.

The ore will be delivered to a head bin and crushed in a 22 x 36 in. Cedar Rapids jaw crusher, then two smaller jaw crushers, and finally by 2 Tellsmith cone type crushers (48FC & 489S). The entire crushing circuit is closed with screens between crushing units. The ore is to be reduced to 3/4" or less mesh which will be charged to the leach vats. The vats are of reinforced concrete 40 x 50 ft, by 10 ft deep inside, and compartmented into six leaching units of 1000 tons capacity and two solution vats. The north end of each of the six leach vats has a raisable door that will accomodate a front loader of considerable size for tailings removable. Leaching will be counter current and the cycle will probably be either 48 hrs. or 72 hrs. or possibly both depending upon how the various ore variations might be handled. The pregnant solution will be sent to electrolytic precipitation vats. The anode is of antimonial lead and the cathode of copper. The product will be high in copper content, possibly 99.95% or better.

Power is taken off the Bagdad-Parker power line at 69,000 volts. This line is a mile long up to the pump transformer where it is reduced to handle a pump with 300-600 GPM. The pump is connected to the mine by an 8" steel pipe line. Here the bulk of the power is transmitted over a mile to the mine at over 4,000 volts. The rest is put through 3 rectifiers and converted to 57 volts D.C. for copper precipitation where the copper plate will be made. The water storage above the leach plant at present is contained in two tanks with a total of 20,000 gal. capacity. This capacity is to be increased if need be.

Sulphuric acid will be stored in 250 ton, acid proof tanks, two of which are in place. A third is to be added shortly. The metallurgical testing was done at Colorado School of Mines and by Bob Porter, Leach Consultant of Salt Lake City, Utah. Porter is said to have had considerable leaching experience with a major copper company.

Part of the waste runs 0.2 to 0.3 per cent copper and this is being stored in a canyon west of the mine for heap or dump leaching at a future date.

Difficulty was being had with concrete pouring during the past week because of the 118 to 120° weather (shade). It probably is very much hotter in the sun. They now plan to pour very early in the morning or late in the evening.

The company also owns the Planet Ranch and the Planet Mine in addition to the Mineral Hill property.

bulldozed and uncovered intermittently along a deep canyon that trends NW and may be mainly of structural origin. On the southwest side of the canyon a comparatively steep and high mesa, composed of Precambrian and probable paleozoic rocks, is capped by three beds of volcanic flows that are nearly horizontal. The float from these seem to include coarse amygdaloidal basalt, underlain by a reddish tuffaceous bed, and bottom^{ed} by a much denser basalt, that from the place of observation seems to be columnar in nature. The contact between the flows and the older rocks is almost flat, except very locally, and probably on an erosional unconformity. This mesa is considerably higher in average elevation than the mine area in which no apparent volcanic rock seems to be^{immediately} present. Recent bulldozer stripping southwest of the pit shows that some of the country rock is fairly steep dipping.

D.E. Harrison

ARIZONA RANCH AND METALS CO. MINERAL RESOURCES

POXH 366 SOUTH 5TH EAST

Parker, Ariz

of Arizona
NER'S REPORT

RECEIVED

MAR - 7 1966

DEPT. MINERAL RESOURCES
PHOENIX, ARIZONA

Date Mar. 5, 1966

1. Mine: Arizona Ranch & Metals Co. Mineral Hill Mine
2. Location: Sec. 2, 5, 10, 11 Twp. 12 N. Range 17 W. Nearest Town Parker, Ariz Distance 2.5 Mi.
Direction Nearest R.R. Parker, Ariz Distance 2.5 Mi.
Road Conditions Fair
3. Mining District and County: Bill Williams or Guenega, Yuma Co.
4. Former Name of Mine: Mineral Hill
5. Owner: Arizona Ranch & Metals Co.
Address: 218 West Main St. Scottsdale, Ariz
6. Operator: Arizona Ranch & Metals Co.
Address: 218 West Main St., Scottsdale, Ariz
7. Principal Minerals: Ca.
8. Number of Claims: Lode 15 Patented 20 Unpatented
Placer Patented 2 Unpatented
9. Type of Surrounding Terrain: Mountainous
10. Geology and Mineralization: Flat bedded deposit
11. Dimension and Value of Ore Body:

Please give as complete information as possible and attach copies of engineer's reports, shipment returns, maps, etc. if you wish to have them available in this Department's files for inspection by prospective lessors or buyers.

(over)

12. Ore "Blocked Out" or "In Sight": 1,500,000

Ore Probable:

13. Mine Workings—Amount and Condition:

No.	Feet	Condition
Shafts.....	<u>150</u>	<u>Poor</u>
Raises.....		
Tunnels.....	<u>400</u>	<u>Good</u>
Crosscuts.....		
Stopes.....		

14. Water Supply: Well on ranch property, 1700 gallons per minute.

15. Brief History:

16. Remarks:

17. If Property for Sale, List Approximate Price and Terms:

18. Signature: O. E. Harrison

DEPARTMENT OF MINERAL RESOURCES

STATE OF ARIZONA
FIELD ENGINEERS REPORT

Mine Mineral Hill Mine

Date 2-10-66

District Santa Maria Dist., Buckskin Mtns. Yuma Co.

Engineer Lewis A. Smith

Subject: Interview with Duncan E. Harrison, Vice President - Arizona Ranch and Metals Company, at Parker conference

Address: - 218 W. Main St., Scottsdale, Arizona (Tel. 947-4651)
2500 S 15th East, Salt Lake City, Utah
Unit 20, Desert Wind's Motel, Parker (Box H)

Superintendent, Duncan E. Harrison, Parker
Foreman, ~~John Townsend, Parker~~

'Charles W Scheer, Parker, ARIZ.'

Present Status:

- (1) ~~A drill is being brought in for further and deeper exploration.~~ *Not now*
- (2) The "artillery shell casing pipe line" is being replaced by a $\frac{1}{2}$ inch standard pipe line
- (3) Preparations are being made for the building of a crushing plant and leaching vats.
- (4) During the past few months Colorado School of Mines have conducted extensive leaching tests and have shown that the ore leaches well. Earliest tests were conducted on a 72 hour cycle, but it now is believed that less time will be required, with similar results, if the ore is reduced to $\frac{3}{8}$ inch. (A preliminary CO₂ reduction leach is suggested.) ~~The leach consultant is Harmon Keyes.~~ The heads are figured at 1% copper and the tails are said to carry 30-35 percent iron.

Reserves are now figured at well over a million tons of ore that apparently averages about 1 percent copper and possibly a little over. This was calculated from previous drill records. The bulk of this reserve according to Harrison lies on top of the upper specularite replacement bed. The new drill program is aimed at checking the previous one and determining whether the area beneath the iron layer has workable copper also. ~~John Townsend is~~ *work consists of* At present working a few feet on the replacement of the old pipe line and preparing the area for the leach plant.

The favorable block lies between an acid porphyry dike and basin and range fault that is down dropped on the NE side. It is not now known how much throw is involved and the new drill program should eventually include holes northeast of the fault. The ends of the ore bearing block need better definition also. Harrison, who was present when Mineral Hill was drilled, said that the holes did not generally go below the iron bed.

Mining will be by open pit. No list of equipment is now available, but will be later. The stripping ratio is not thought to be excessive, as far as present reserves are concerned, except that a crusher and screens are available.

DEPARTMENT OF MINERAL RESOURCES
STATE OF ARIZONA
FIELD ENGINEERS REPORT

Mine Mineral Hill Mine Date Feb. 10, 1966
District Santa Maria District - Yuma County Engineer Lewis A. Smith
Buckskin Mountains
Subject: Interview with Duncan E. Harrison, V.P. - Arizona Ranch & Metals Co.,
at Parker conference.

Address - 218 W. Main Street, Scottsdale, Arizona (947-4651)
2500 S. 15th East, Salt Lake City, Utah
Unit 20, Desert Winds Motel, Parker, Arizona - Box H

Superintendent, Duncan E. Harrison, Parker
Foreman, Charles W. Scheer, Parker

Present Status:

- (1) The "artillery shell casing pipeline" is being replaced by a 8 inch standard pipeline.
- (2) Preparations are being made for the building of a crushing plant and leaching vats.
- (3) During the past few months Colorado School of Mines have conducted extensive leaching tests and have shown that the ore leaches well. Earliest tests were conducted on a 72 hour cycle, but it now is believed that less time will be required, with similar results, if the ore is reduced to 3/8 inch. (A preliminary CO₂ reduction leach is suggested). The heads are figured at 1% copper and the tails are said to carry 30-35 percent iron.

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



February 8, 1965

Corporation Commission reports:

The Canyon State Minerals, Inc. were issued a certificate of incorporation December 23, 1964. They have not filed the list of their elected officials. They elected to have their fiscal year end 9-30-65 at which time they should file a report, containing a list of the elected officials. They will have until January 1966 within which to file the report and pay their fee.

Incorporators of the Canyon State Minerals, Inc. were listed as:

Canyon State Mining Corp., 112 N. Central Avenue, Phoenix
A. J. Simon, 115 E. Pomona Road, Phoenix
James McWiggins, 3101 Gough Street, Apt. 207, San Francisco
Charles Thomas Jr., 10024 Lakeview Circle, Sun City
Ben C. Pearson, 1536 W. Bethany Home Rd, Phoenix (Statutory Agent)

Dr. G. C. Ridland, 207 W. Clarendon, Phoenix
Ike W. Kusisto, 1911 E. Van Buren, Phoenix
Delbert Harvey, 723 Gurley, Prescott
Joseph H. Muller, 3244 E. Osborn Rd., Phoenix

DEPARTMENT OF MINERAL RESOURCES
STATE OF ARIZONA
FIELD ENGINEERS REPORT

Mine VENEZUELA CLAIMS Date 6/11/64
District Signal District Yuma County Engineer Lewis A. Smith
Subject: Interview with Ed Sloan, at Parker 6/11/64

Sloan stated that Domingo Venezuela had claims that adjoined the Mineral Hill Claims to the east. He has a small trailer there.

Later a visit was made to the mine, but Venezuela was not there. The mineralized zone lies in a few low hills that are stained red by hematite with some scattered copper oxides in lenticular areas. However, Venezuela sporadically works the area for gold lenses. Several shallow adits and cuts were seen. The country rock was very severely altered but may have been limestone. Considerable fracturing and small faults were observed, and these may have caused the localization of the ore lenses.

COPYIRON KING MINE
P. O. BOX 68
HUMBOLDT, ARIZONA**SHATTUCK DENN MINING CORPORATION**P. O. BOX 1492
PRESCOTT, ARIZONA

Humboldt

March 19, 1964

MR. D. M. KENTRO

MINERAL HILL MINING COMPANY

The estimate of the ore reserves of Mineral Hill Mining Company which was promised in a memo dated 11th March is complete. The estimate was based on information shown on a map drawn by Louis W. Cramer and dated January, 1963. That map apparently records the results of drilling carried out by the vendor of the property, Arizona Ranch and Mining Company. The drill holes were extremely badly located for estimating ore reserves, being randomly scattered over the mineralized area and roughly concentrated along a line which contained the north side of the hill on which the mineralization outcrops. The vendors used hammer drills and sampled the cuttings at irregular intervals, varying from 3 to 50 or 60 feet.

Since it was necessary to compute the grade of the mineralized material in two benches (a lower one which constitutes the main mineralized area, and an upper one of lower grade which occurs in the western part of the mineralized area only), and also to estimate the tonnage of the waste or overburden, the drill hole data was projected to vertical sections spaced 200 feet apart and oriented north-south. A cutoff figure of 0.5% Cu was used for the lower, or high grade, bench, although this had to be reduced in a few places in order to make a regular bench, and the overall grade of the upper bench was, in fact, lower than this figure. The areas, and, consequently, volumes of ore and waste were computed and the grades of blocks were weighted accordingly. A tonnage factor of 12 cubic feet was used to convert the volume of both ore and waste to tons. The results are tabulated below:

<u>Material</u>	<u>Tonnage</u>	<u>Grade</u>
Waste	1,461,300	-
Ore - Upper Bench	220,092	0.43
Ore - Lower Bench	513,338	1.15
Ore - Total	733,425	0.93

The figures contrast sharply with the claimed reserves of 1.5 million tons containing 1.5% Cu, and the reason for the discrepancy is not known. Possibly Cramer's final ore reserve calculations took into account some drilling results which are not presently available to the writer. A copy of Cramer's report has been requested, but, pending its receipt, it is not possible to rely on the ore reserves being used by the company.

March 19, 1964

Accepting the ore reserve figures quoted above, the economic status of the property of Mineral Hill Mining Company might be briefly summarized as follows:

VALUE OF ORE

Based on:

1. 75% recovery of copper.
2. 25¢, net smelter, per pound of Cu produced.

Hence: 733,425 tons containing 0.93% Cu represents 13,641,705 lbs. Cu resulting in 10,231,278 lbs. recoverable Cu with a net value of \$2,557,819.

COSTS

Based on:

1. Mining ore and waste in three and a half years.
2. Stripping cost of 50¢ per ton, ore and waste.
3. Leaching in 6 years.
4. At a cost of 12¢ per lb. Cu.
5. Property acquisition \$300,000 to date, \$100,000 for each year of operation.
6. Plant and equipment \$360,000, made up of \$100,000 for construction and \$260,000 for equipment.

Hence:

Property acquisition	\$900,000
Plant and equipment	360,000
Amortization (plant and equipment only)	360,000
Stripping Waste	730,650
Stripping Ore	366,712
Leaching	<u>1,227,753</u>
Total	\$3,945,115

This would result in a loss of \$1,387,296.

Additional ore and an overall higher grade would undoubtedly improve this figure and might turn the projected loss into a profit. Pending receipt of Cramer's report and proof that the above ore reserves can be improved upon, no action is recommended.

In the meantime, it is not proposed to spend time writing a detailed report on the property. The writer has additional information on the access, water supply, equipment, geology of the property, and so on, which is available if required.

The writer is indebted to Mr. J. W. Still for figures on which to base the above estimates of cost.

P. L.

cc: Mr. W. J. La Morte
File

PAUL GILMOUR

COPY

IRON KING MINE
P. O. BOX 68
HUMBOLDT, ARIZONA

SHATTUCK DENN MINING CORPORATION

P. O. BOX 1492
PRESCOTT, ARIZONA

Humboldt

March 11, 1964

Mr. D. M. Kentro

PROPERTY OF MINERAL HILL MINING CO.

The afternoon of the 9th and the forenoon of the 10th of March, 1964, were spent at the property of the above-named company. The property is situated about 20 miles northeast of Parker in Yuma County, Arizona, and consists of 14 patented and 17 unpatented Lode Mining claims. Mineral Hill Mining Co. is owned by twelve individuals, six of whom hold the majority interest. The 14 patented claims are being purchased from the Arizona Ranch and Metal Co. for the sum of \$2.5 million.

The planning of the operation at Mineral Hill was based on studies made by Louis W. Cramer of Salt Lake City, Utah.

A small open pit mine is currently producing about 1,500 t. p. d. This material is being piled and leach-leached with a resulting daily production of about 2000 lbs. of copper cement. This contains approximately 80% Cu with a value of 25¢ per lb. of contained Cu. It is anticipated that expansion of the plant which is almost complete will raise production to 8,000 lbs. per day in about 2-3 weeks.

Owing to bottlenecks in the treatment of the Cu ore, the company has run out of operating capital and is in financial difficulties. The financial situation of the company is briefly as follows:

Outstanding bills and payments on bank loans (It is not clear at this time whether or not this includes a \$50,000 payment on the property due in April).	\$65,000
Loans for equipment	260,000
Loans for operating capital	<u>75,000</u>
	\$ 440,000

Total cash investment to date amounts to approximately \$450,000, which does not include the above loans, but does include \$300,000 paid on property.

The company's assets are an orebody reported to contain 1.5 million tons of ore averaging 1.5% Cu, and mining and leaching plant equipment which will be listed in a fuller report. A body of iron ore also occurs on the property, underlying the Cu ore, but it is of doubtful economic value and is being left out of consideration at the present time.

Mr. D. M. Kentro:

Page 2

March 11, 1964

The property merits attention and, using figures shown on a map drawn by Cramer, the writer is engaged in an estimate of ore reserves to determine whether or not the size and grade of the principal asset can be substantiated.

Yours sincerely,

P. G.

PAUL GILMOUR

PG:b

cc: Mr. W. J. La Morte
File

DEPARTMENT OF MINERAL RESOURCES

STATE OF ARIZONA FIELD ENGINEERS REPORT

Mine Mineral Hill Mine Date June 11, 1964
District Santa Maria District - Yuma County Engineer Lewis A. Smith
Subject: Mine visit and conferences with John McClure, Supt., Ed Sloan, Pit Boss, and Oreval Buttens, Assistant to McClure, at Mineral Hills Mining Corp. (This is largely composed of California people)

The previous operator was Arizona Ranch Metals Co. (formerly Planet Ranch & Metals Co.) See EGW report of Oct. 1963

Property: According to Sloan, the property consists of 15 patented and 40 unpatented claims.

Location: 27 miles northeast of Parker and 2 miles NW of Swansea.

Minerals: Copper and iron

Work: The older workings consist of open cuts, short adits and one longer adit said to be 350 feet long.

Production: (recent) 60 cars of ore that ran about 4.1 percent copper. The poor roads and high costs made further work impractical in 1957 (and low copper price). Last shipments were made in late 1957. Ed Sloan, lessee shipped the bulk of this ore, during 1956 and 1957. The ore shipped in 1957 ran 4.55 percent copper and that shipped in 1956, ran 3.65 percent copper. A 2½ mile pipeline, consisting of welded artillery shell cases, connects the leach plant with a well. The plant consists of 2 cement lined precipitation vats, 30 x 20 feet and 25 x 30 feet, respectively, that are separated by a wall. One contained tin cans and the other was empty. Above these a crane, with an electro magnet, 2 feet in diameter, attached, places the cans in the vats. Below the precipitation vats is a concrete apron, 60 x 25 feet on which was a small pile of cement copper. Below the apron is a dirt tank, 100 feet long and 25-30 feet wide, for water storage and decantation. This is lined by polyethylene and is equipped with pumps, to return the water to the heap leach dump. The dump is reported to contain between 30,000 to 40,000 tons of heap leach ore that is said to assay over 1 percent copper. Much of this dump is very coarse ranging up to several feet in diameter. The large boulders appeared to be more silicified than the finer material and many of these reportedly assay up to 4 percent. The dump also contains much hematite. The pregnant solution runs 1-1½ gm per litre (low). Because of the high iron it is necessary to keep the acidity at PH 1. The coarse, more or less, silicified and dense ore probably will take a long time to leach. The dump is underlain by polyethylene. A good road connects this area with the pit, that is about 150-175 feet higher than the leach dump, and about ½ mile west to southwest of the precipitation plant. 2 pit benches have, thus far been established. The bottom bench is almost half-mooned shaped, is about 125 to 135 feet in radius and 25 feet high. The upper bench is about 5-35 feet high and parallels the crest of the lower bench (it is now about 15-20 feet wide.) A 1½ yard Northwest shovel and 4 Kenworth 012 trucks service the shovel. (The trucks have a muck capacity of 16 yards and are loaded with about 28 tons or with a 5-ton underload). A D-8 Cat and a Chevrolet 5-yard truck with a water tank on it is used for sprinkling. Drilling is done with a Denver Wagon drill. Holes are spaced at about 5 feet and are loaded with a ratio of about ¾ to 1 lb. of powder per ton. The rock, excepting the locally more silicified areas is well shattered and breaks very well. A pay-loader, Model HP, is available (it has a yard bucket).

Power is furnished by 2 direct connected diesel-generator units. (Cleveland Jimmy). These each furnish 125 KW.

Geology: The immediate mine area consists of a block of highly altered limestone bordered on the southwest by an acid porphyry dike and on the northeast by a major fault. The block is roughly $3/4 - \frac{1}{2}$ mile in a NW-SE direction and possibly a $\frac{1}{4}$ to $3/8$ mile wide. This is crossed by several transverse fractures that appear to have been the avenues along which mineralization was introduced. The limestone was replaced by ore, 20 to 30 feet thick, that overlies a massive hematite bed (90-100 feet thick). A drilling program disclosed that ore also underlies the hematite bed. This ore was apparently lower grade than the ore above the hematite bed, that is mostly composed of specularite. The oreminerals are mostly malachite and chrysocolla the latter occupying a set of fractures that cut the malachite veinlets that also occupy fracture planes. Some melaconite is locally abundant. Cuprite and brochantite are minor constituents. The latter could have been derived from chalcocite. No sulphides were seen. Some of the best ore was found, in or in close approximation to the transverse fractures. The hematite massive bed does not appear to carry much copper except along these transverse fractures as it apparently is relatively much less replaceable than the limestone that both overlies and underlies it. Some primary clay accompanies the metallization (probably halloysite). This could have developed in the more argillaceous phases of limestone. Considerable drilling was done under Franklin L. C. Price, Professional Mining Engineer, 514 Burrard Bldg., Vancouver, B. C., Canada, interviewed by EGW, and according to him, the results were not considered favorable enough to warrant removing the heavy hematite bed in order to mine the underlying relatively low grade ore. It is also possible that this ore would be more concentrated in, or near to, the transverse fractures and other structures and therefore may be in replacement lenses, rather than in a blanket form.

Mr. John McClure's address in the Parker area is at the Branson Resort (669-2588) near Parker. (McClure was formerly associated with the Bluebird leaching at Miami.)

Mr. Ed Sloan lives at the Corral Motel and Trailer Court in Parker.

SHAFRICK DENN MINING CORPORATION

and

SUBSIDIARIES

Humboldt.....Office

Date.....March 19, 1964.....

TO: MR. D. M. KENTRO

SUBJECT: MINERAL HILL MINING COMPANY

The estimate of the ore reserves of Mineral Hill Mining Company which was promised in a memo dated 11th March is complete. The estimate was based on information shown on a map drawn by Louis W. Cramer and dated January, 1963. That map apparently records the results of drilling carried out by the vendor of the property, Arizona Ranch and Mining Company. The drill holes were extremely badly located for estimating ore reserves, being randomly scattered over the mineralized area and roughly concentrated along a line which contained the north side of the hill on which the mineralization outcrops. The vendors used hammer drills and sampled the cuttings at irregular intervals, varying from 3 to 50 or 60 feet.

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Ore - Upper Bench	220,092	0.43
Ore - Lower Bench	513,333	1.15
Ore - Total	733,425	0.93

The figures contrast sharply with the claimed reserves of 1.5 million tons containing 1.5% Cu, and the reason for the discrepancy is not known. Possibly, Cramer's final ore reserve calculations took into account some drilling results which are not presently available to the writer. A copy of Cramer's report has been requested, but, pending its receipt, it is not possible to rely on the ore reserves being used by the company.

March 19, 1964

Accepting the ore reserve figures quoted above, the economic status of the property of Mineral Hill Mining Company might be briefly summarized as follows:

VALUE OF ORE

Based on:

1. 75% recovery of copper.
2. 25¢, net smelter, per pound of Cu produced.

Hence: 733,425 tons containing 0.93% Cu represents 13,641,705 lbs. Cu resulting in 10,231,278 lbs. recoverable Cu with a net value of \$2,557,819.

COSTS

Based on:

1. Mining ore and waste in three and a half years.
2. Stripping cost of 50¢ per ton, ore and waste.
3. Leaching in 6 years.
4. At a cost of 12¢ per lb. Cu.
5. Property acquisition \$300,000 to date, \$100,000 for each year of operation.
6. Plant and equipment \$360,000, made up of \$100,000 for construction and \$260,000 for equipment.

Hence;

Property acquisition	\$900,000
Plant and equipment	360,000
Amortization (plant and equipment only)	360,000
Stripping Waste	730,650
Stripping Ore	366,712
Leaching	<u>1,227,753</u>
Total	\$3,945,115

This would result in a loss of \$1,387,296.

Additional ore and an overall higher grade would undoubtedly improve this figure and might turn the projected loss into a profit. Pending receipt of Cramer's report and proof that the above ore reserves can be improved upon, no action is recommended.

In the meantime, it is not proposed to spend time writing a detailed report on the property. The writer has additional information on the access, water supply, equipment, geology of the property, and so on, which is available if required.

The writer is indebted to Mr. J. W. Still for figures on which to base the above estimates of cost.

cc: Mr. W. J. La Morte
File

Paul Gilmour
PAUL GILMOUR

DEPARTMENT OF MINERAL RESOURCES
STATE OF ARIZONA
FIELD ENGINEERS REPORT

Mine MINERAL HILL

Date 2/12/64

District Santa Maria

Engineer E. G. Williams

Subject: Visit

At the time of visit 12 men were laying a polyethylene mat on the remainder of the leach area that had not already been covered. The covered area had about 18-20,000 tons of leach dump on it and it was being sprayed with water-acid solution.

The precipitating plant has only 4 small cone-shaped steel cells. A decant pond and a drying slab. At the time of visit about 50 gpm were going thru the plant.

The leach dump is run of mine with lots of large boulders. The trucks dump ore at the edge of the leach area and bulldozers level it off. Because of the size of some of the boulders it is a question what damage if any, is being done to the mat.

The mine is open pit. Working day shift only. 9 men including the truck drivers doing the mining.

The precipitating plant is working 3 shifts. 3 men on day shift and 2 each on the other two shifts.

Ed Sloan, Supt.

Mr. Corley said work at the Mineral Hills Mine north of Parker had been suspended.

E. G. WILLIAMS WR 4/29/64

Arizona Daily Star - Tucson
May 24, 1964

Star 5-24-64



DEPARTMENT OF MINERAL RESOURCES

STATE OF ARIZONA

FIELD ENGINEERS REPORT

Mine MINERAL HILLS Date October, 1963
District SANTA MARIA, YUMA CO. Engineer E. G. Williams
Subject: Information received on visits to the property.

Mine is located 2 miles west of the Planet Mine and 27 miles in a northerly direction from Parker.

OWNER: Arizona Ranch Metals Co. (formerly Planet Ranch & Metals Co.)
Joe Minton, President, 218 W. Main, Scottsdale.

LESSEE: Pete Flemming

Superintendent: Ed Sloan, Parker, Arizona

ORE: The principal mineral - copper

The mine consists of several patented claims.

Development consists of a number of open cuts and several tunnels, one of them about 350 feet inlength. There is a great deal of faulting running in all directions, and it is in the faults, copper mineral has been exposed. There are bands of hematite thru which fractures have cut and copper occurs in the iron as well as the adjoining rocks. The minerals are all oxidized, the copper seen being mostly chrysocolla and malachite. No sulphide ore seen.

On the writer's last visit a pipe line had been installed some 2½ to 3 miles from a well to a reservoir above the leach area. Also a large area had been cleared for a leach dump and 2 large concrete slabs poured. No work was in progress at the time of the visit.

DEPARTMENT OF MINERAL RESOURCES

STATE OF ARIZONA

FIELD ENGINEERS REPORT

Mine MINERAL HILL MINE

Date 10/17/63

District SANTA MARIA

Engineer E. G. Williams

Subject: MINE VISIT

At the time of visit property was idle. A good deal of work has been done since the last visit. A new road has been completed to the leach area and the pipe line has been completed to the leach area. A large area has been cleared for leach dump and two large concrete slabs poured. A used pump with a new U.D. 282 International Harvester Diesel engine has been installed at the well.

Ed. Sloan is Supt., Pete Fleming, Lessee

The property is posted as belonging to the Arizona Ranch and Metals Co., a Nevada Corp., Joseph A. Minton, Pres.



UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF MINES
REGION III

DIVISION OF MINERAL RESOURCES
TUCSON FIELD OFFICE

3928
BOX ~~4897~~ UNIVERSITY STATION
TUCSON, ARIZONA

July 27, 1962

Mr. Axel L. Johnson
Department of Mineral Resources
State of Arizona
Box 54
Tucson, Arizona

Dear Mr. Johnson:

As per your telephone request on July 24, I am enclosing a copy of the open file report "Percolation Leaching of Oxidized Copper Ore From the Mineral Hill Deposit, Yuma County, Ariz." for transmittal to Frank Knight. This report was never published but is available on open file basis at the Tucson Metallurgy Research Laboratory, 1724 N. Vine Ave., Tucson, Ariz.

With best personal regards

Sincerely yours,


William R. Hardwick
Mining Engineer

REPORT OF INVESTIGATIONS

PERCOLATION LEACHING OF OXIDIZED
COPPER ORE FROM THE MINERAL HILL
DEPOSIT, YUMA COUNTY, ARIZ.

By: Philip A. Bloom and Carl Ranspach

USBM OPEN FILE REPORT #2 , 1961

Work on manuscript completed July 1961

PERCOLATION LEACHING OF OXIDIZED COPPER ORE FROM MINERAL HILL DEPOSIT, YUMA COUNTY, ARIZ.

by

Philip A. Bloom ^{1/} and Carl Rempcek ^{2/}

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- ^{1/} Extractive metallurgist, Tucson Metallurgy Research Laboratory, Region III,
Tucson, Ariz.
- ^{2/} Research director, Tuscaloosa Metallurgy Research Center, Region V,
Tuscaloosa, Ala.
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SUMMARY

Bench-scale tests were made of a sample of oxidized copper ore containing chrysocolla and malachite from the Mineral Hill group of claims, Yuma County, Ariz., to determine if the material was amenable to percolation leaching with dilute sulfuric acid. The sample was representative of the grade and type of ore being considered for commercial treatment by the process.

Portions of the ore, crushed to pass 3/8, 1 and 2 inches, were treated by upward flooding and downward percolation, using 5-percent sulfuric acid. Upward flood leaching of the minus 3/8-inch feed recovered about 95 percent of the copper during a 2.5-day period, whereas downward percolation leaching of the same size feed gave a copper recovery of 72 percent. Treating coarser feeds for a similar length of time by either method gave substantially lower copper recoveries. Other tests of the ore revealed that a copper extraction of 90 percent could be obtained by percolation leaching the minus 2-inch ore for 16 days.

Because of the hard, consolidated character of the sample, the leach solutions percolated readily through the ore beds indicating that no particular difficulty should be encountered in a larger scale commercial leach operation.

INTRODUCTION

Copper ores containing appreciable chrysocolla or hydrated copper silicates are currently being treated by dilute acid leach methods. The finely ground feeds are leached by agitation or the coarse crushed ore is treated by upward flooding

with dilute sulfuric acid. 3 4 5/ The copper is recovered from the leach liquors by

3/ Anaconda Copper Mining Company (Editorial Staff), Yerington-Anaconda's Latest Contribution to Copper Metallurgy: Min. World, vol. 16, No. 8, July 1954, pp. 44-69.

4/ Ramsey, R. H., Anaconda's — Nevada Project — A New Approach to Copper Mining: Eng. Min. Jour., vol. 155, No. 8, August 1954, pp. 74-93.

5/ Kettering, C. B., and Power, K. L., The Metallurgical Story at Inspiration: Preprint No. 5817P10, Paper presented at Annual Meeting of AIME, New York, February 16-20, 1953, 12 pp.

electrolysis, precipitation on scrap iron or by precipitation-flotation. Another proposed acid leach method for treating oxidized ores is by downward drainage percolation of the coarse crushed feed in heaps. 6 7/ Although flood leach

6/ Keyes, H. E., Innovations in Copper Leaching Employing Ferric Sulfate-Sulfuric Acid: Bureau of Mines Bull. 321, 1930, 67 pp.

7/ McKinney, V. A., and Rampacek, Carl, Acid Leaching of Oxidized Copper Ores by Downward Percolation: Bureau of Mines Rept. of Investigations 5629, 1960, 16 pp.

recognized as being more efficient than downward percolation, the latter method is simpler from the standpoint of equipment requirements, resulting in a lower capital expenditure for plant construction.

During the past several years the Tucson Metallurgy Research Laboratory has tested a number of typical oxidized ores from promising Southwestern deposits using the upward flooding and downward percolation leach procedures. This report presents the results of such bench-scale tests of a sample of oxidized ore

from the Mineral Hill group of claims, Yuma County, Ariz. The sample was received for the specific purpose of ascertaining if acid leaching the ore to recover the copper would be technically feasible on a commercial scale, and if so, what leach method should be employed.

DESCRIPTION OF SAMPLE

The sample received for testing was representative of material taken from seven locations along an outcrop in the Mineral Hill group of claims, N. E. quarter, T-12-N, R-17-W, Yuma County, Ariz. The ore was a dense, reddish-colored vein material composed predominantly of quartz, specularite and hematite, with some chrysocolla, feldspar, clay, calcite and malachite. Most of the copper silicate and carbonate occurred as thin films and veinlets in the fracture planes of the ore; some of the veinlets were as thick as 1/8 inch. Upon crushing the ore to minus 2 inches the material broke along the fracture planes and exposed some of the copper silicate and carbonate veinlets. A partial chemical analysis of the ore is given in table 1.

TABLE 1. - Partial chemical analysis of ore

<u>Constituent</u>	<u>Assay, percent</u>
Cu	
Total	3.94
H ₂ SO ₄ soluble	3.77
Fe	14.43
SiO ₂	55.6
Al ₂ O ₃	7.1
CaO	0.7
MgO	0.6

LABORATORY TESTS

The leach procedure followed in the tests approximated a commercial operation whereby advancing acid solution would be passed over a number of ore charges undergoing various stages of treatment. The tests were made on portions of the ore crushed to minus $3/8$, 1 and 2 inches. Screen analyses of the different leach feeds are given in table 2. The feeds were treated by upward flooding or downward percolation leaching with dilute sulfuric acid solution in standard glass percolation tubes having about 6 kilograms capacity. One series of tests was made in which the ore was treated for a period of 2.5 days and a second series of tests was made using a 16-day leach.

TABLE 2. - Screen analyses of leach feeds

Screen size	Weight, percent		
	2-inch feed	1-inch feed	$3/8$ -inch feed
-2 inch + 1.06 inch	39.1	-	-
-1.06 inch + 0.375 inch	46.6	82.7	-
-0.375 inch + 10 mesh	11.0	14.2	80.5
-10 mesh + 35 mesh	1.8	1.6	12.0
-35 mesh + 65 mesh	0.4	0.3	2.4
-65 mesh + 200 mesh	.7	.6	2.8
-200 mesh	.4	.4	2.8
Composite	100.0	100.0	100.0

In the short leach tests, the ore was treated with 5-percent H_2SO_4 throughout the 2.5-day period. Fresh acid solution was added to the ore at 8-hour intervals to maintain the acid concentration on the charge as near to 5 percent as

practicable. When leaching for the extended period of time only enough 5 percent sulfuric acid was added to the ore at the start of the test to assure a 1-percent concentration of acid in the final leach solution. At the termination of the leaches, the ore charges were washed with water either by flooding or downward percolation. About 24 hours were required for washing. Results of the different tests are summarized in table 3.

No difficulty was encountered in percolating the leach solutions through the ore beds regardless of the feed size treated. Flood leaching proved more rapid and efficient than downward percolation, requiring less time and yielding higher copper extractions. Flood leaching of the minus 3/8-inch ore recovered 94 percent of the copper in 2.5 days as compared to a 72-percent copper recovery by downward percolation. However, extending the leach period to 16 days increased the copper recovery by downward percolation to 91 percent.

Leaching for only 2.5 days was inadequate when treating the minus 1- and 2-inch feeds, whereas, acceptable copper recoveries were obtained by extending the leach periods to 16 days. The copper recoveries in the extended flood leaches of the 1- and 2-inch feeds were about 90 and 94 percent, respectively, as compared to 84-percent copper recoveries by downward percolation.

The acid consumed in leaching the ore was nominal, comparing favorably with acid requirements of commercial operations. The leach liquors obtained from treating the ore were relatively free of dissolved impurities. For example,

TABLE 3. - Summarized results of upward flood and downward percolation leaching of Mineral Hill ore

Feed size	Leach Method	Length of leach, days	Leach solution strength, percent H_2SO_4	H_2SO_4 consumed, lb. per ton feed	H_2O for washing, tons per ton feed	Leach residue assay, percent total Cu	Copper recovery, percent	H_2SO_4 consumed, per lb. Cu recovered, lb.
Minus 2 inch	U.F.	2.5	$\frac{2}{1}$	195	0.5	1.11	74.3	2.41
	U.F.	16	$\frac{3}{1}$	236	.5	.43	37.9	2.93
	D.P.	2.5	$\frac{2}{1}$	202	.4	1.93	54.9	2.56
	D.P.	16	$\frac{4}{1}$	197	.5	.66	34.4	2.82
Minus 1 inch	U.F.	2.5	$\frac{2}{1}$	191	.5	.81	82.6	2.42
	U.F.	16	$\frac{3}{1}$	205	.5	.28	93.5	2.89
	D.P.	2.5	$\frac{2}{1}$	206	.4	1.64	59.4	2.62
	D.P.	16	$\frac{4}{1}$	206	.5	.68	34.2	2.82
Minus 3/8 inch	U.F.	2.5	$\frac{2}{1}$	182	.5	.29	94.7	2.31
	U.F.	16	$\frac{3}{1}$	204	.5	.34	92.1	2.81
	D.P.	2.5	$\frac{2}{1}$	215	.4	1.34	72.4	2.73
	D.P.	16	$\frac{6}{1}$	237	.5	.41	90.6	2.91

U.F.	Upward flood leach	$\frac{3}{1}$	H_2SO_4 concentration dropped to 2 percent after 16 days
D.P.	Downward percolation leach	$\frac{4}{1}$	H_2SO_4 concentration dropped to 1 percent after 16 days
$\frac{1}{1}$	One additional day required for washing	$\frac{5}{1}$	H_2SO_4 concentration dropped to 1 percent after 3 days
$\frac{2}{1}$	Maintained at 5 percent H_2SO_4	$\frac{6}{1}$	H_2SO_4 concentration dropped to 1 percent after 9 days

a typical leach solution produced by flood leaching the 3/8-inch feed for 16 days assayed 19.6 grams Cu, 0.5 gram Fe and 3 grams H_2SO_4 per liter. Silica and alumina analyses of the solutions were less than 0.5 gram per liter.

CONCLUSIONS

The bench-scale leach tests of the Mineral Hill ore demonstrated that a recovery of about 95 percent of the copper could be obtained by flood leaching minus 3/8-inch feed with 5-percent sulfuric acid for a period of 2.5 days.

Treatment of 1-inch and 2-inch feeds by flooding procedure gave lower recoveries in the short leach periods but the recoveries were improved by extending the treatment time to 16 days. Downward percolation leaching of the different size feeds was inferior to the upward flood procedure.

No difficulty was encountered in percolating the leach solutions through the ore beds regardless of the feed size treated. The acid consumed in leaching the ore was nominal, comparing favorably with acid requirements in commercial operations.

LEE HAMMONS reports -

1-22- 58

✓ Pete Neuman Property near Mineral Hill
(between Swansea and Parker)

✓ Franklin Price, Engr.,
Desert Winds Motel,
Parker, Ariz.

Completed a drilling program. Local rumor
says that they were satisfied with results and
will build a 500 ton mill.

Mine Mineral Hill

Date Jan. 31, 1957

District Santa Maria

Engineer Mark Gemmill

Subject: Present operations

OWNERSHIP

The property consisting of several patented mining claims was recently acquired at tax sale by Pete Newman (Sheriff of Yuma County) and is leased to Fred DeLano who has been operating it in recent months.

LOCATION

It is located about 2 miles west of the Planet Mine and is about 30 miles in a Northerly direction by road from Bouse, the present shipping point.

HISTORY AND DEVELOPMENT

Exact information is not available, but it was probably located around 1880 but not patented until sometime later. Considerable prospecting and exploration work was done in the early years but there is no recorded production and the property has been idle since about 1910 until the present operation.

Development consists of a number of open cuts and several tunnels one of them about 350 feet in length.

GEOLOGY AND ORE DEPOSITS

The area is very broken with many steep sided canyons indicating much faulting. The basement rock is probably gneiss over which are several hundred feet of schists and shales interlaminated in places with limestone. It would take considerable study to get a true picture of the surface formation.

There is a great deal of faulting running in all directions and it is in these faults that copper mineral has been so far exposed. These showings are scattered and the relationship is difficult to explain. There are some bands of Hematite through which fractures have cut and copper occurs in the iron as well as in the adjoining rocks. The minerals are all oxidized, the copper seen being mostly chrysocolla and malachite. No sulphides were seen in any of the workings and it may be that the copper is secondary. However the workings are all shallow so no definite opinion can be given on this point.

PRODUCTION

A number of cuts have been run in the exposed ore. Information given by men workings on the property for the Lessee was that 27 cars (about 60 tons each) had been shipped to Smelters running 3.1 % to 6.5% copper. (weighted average 4.1%) Work is continuing but it was stated that with the recent drop in the price of copper it is hardly profitable. It was stated that the Lessee plans a drilling program to determine if a continuous body of ore exists anywhere on the property.

Note: Mr. DeLano was not at the property when visited so complete information was not available

9-57

From the desk of

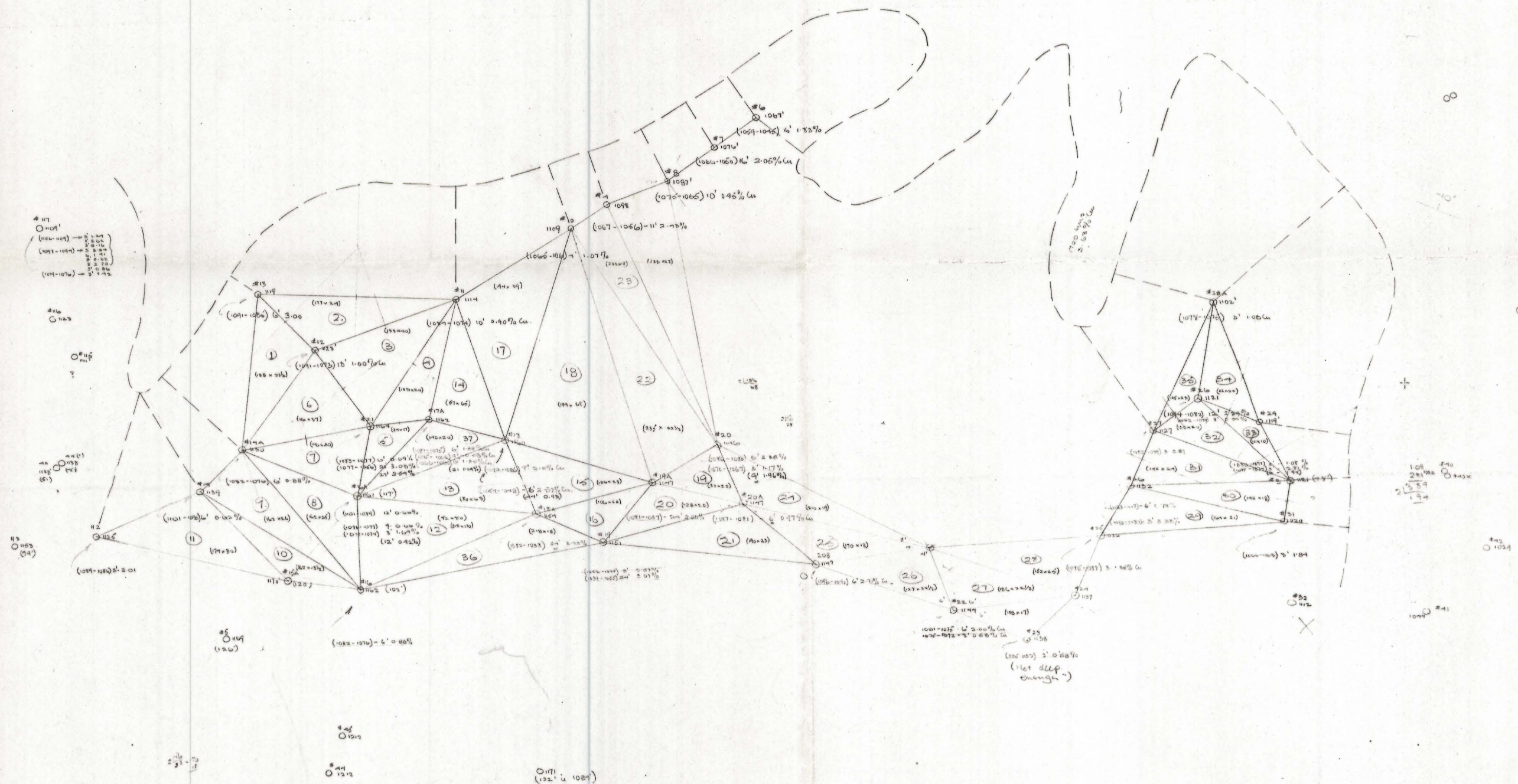
FRANK P. KNIGHT

MINERAL HILL - Santa Maria District

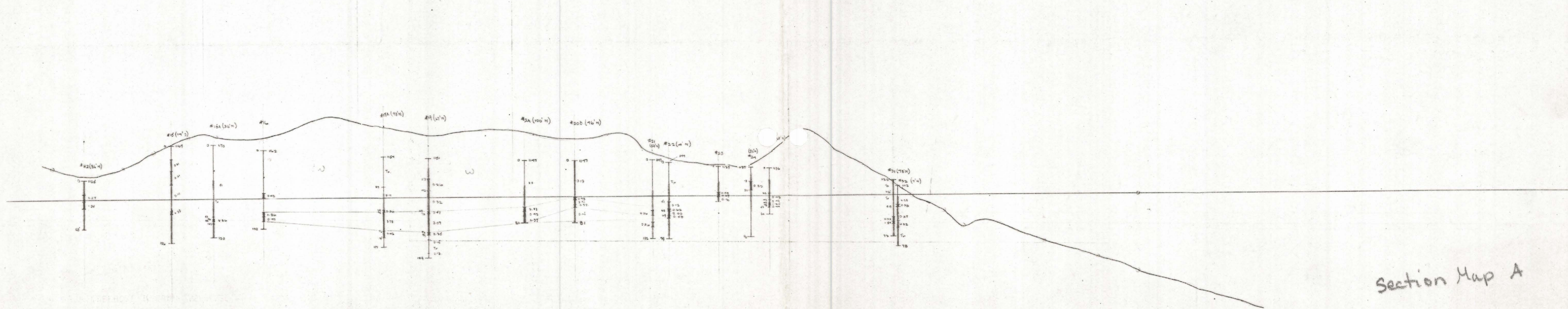
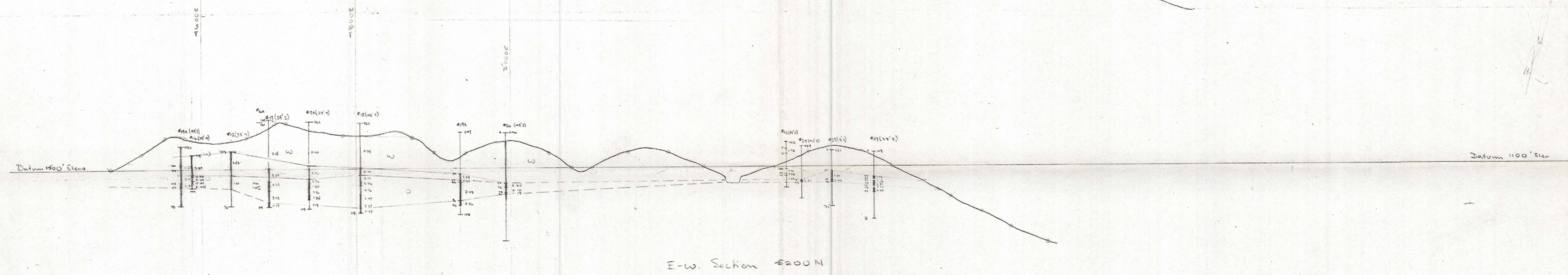
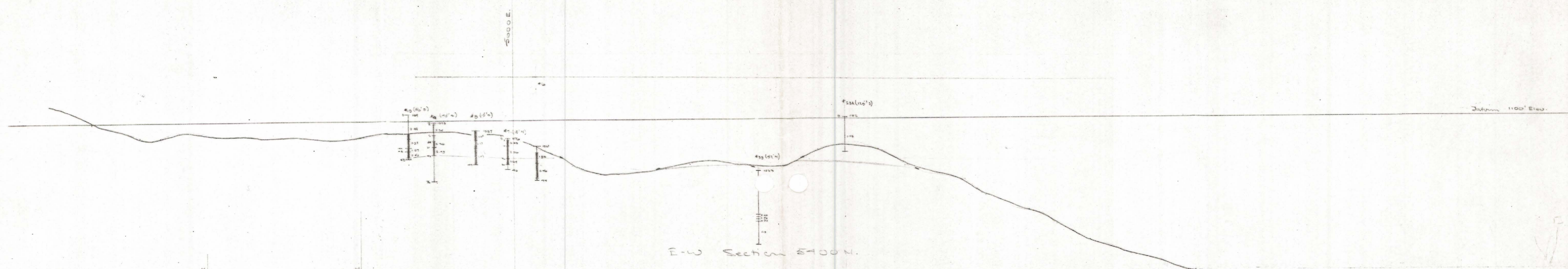
Clara Botzum at Parker said this property is owned by Pete Neuman of Yuma; that Franklin Price and ✓ R. F. DeLano had an option; and that a Canadian firm plans to build a 500 ton mill.

J. C. Townsend at Bouse said that a Canadian outfit had bought the property and that another Canadian operator has it optioned.

Drill Hole

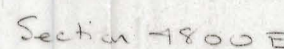
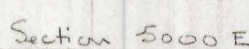


Drill Hole



Mineral Hill

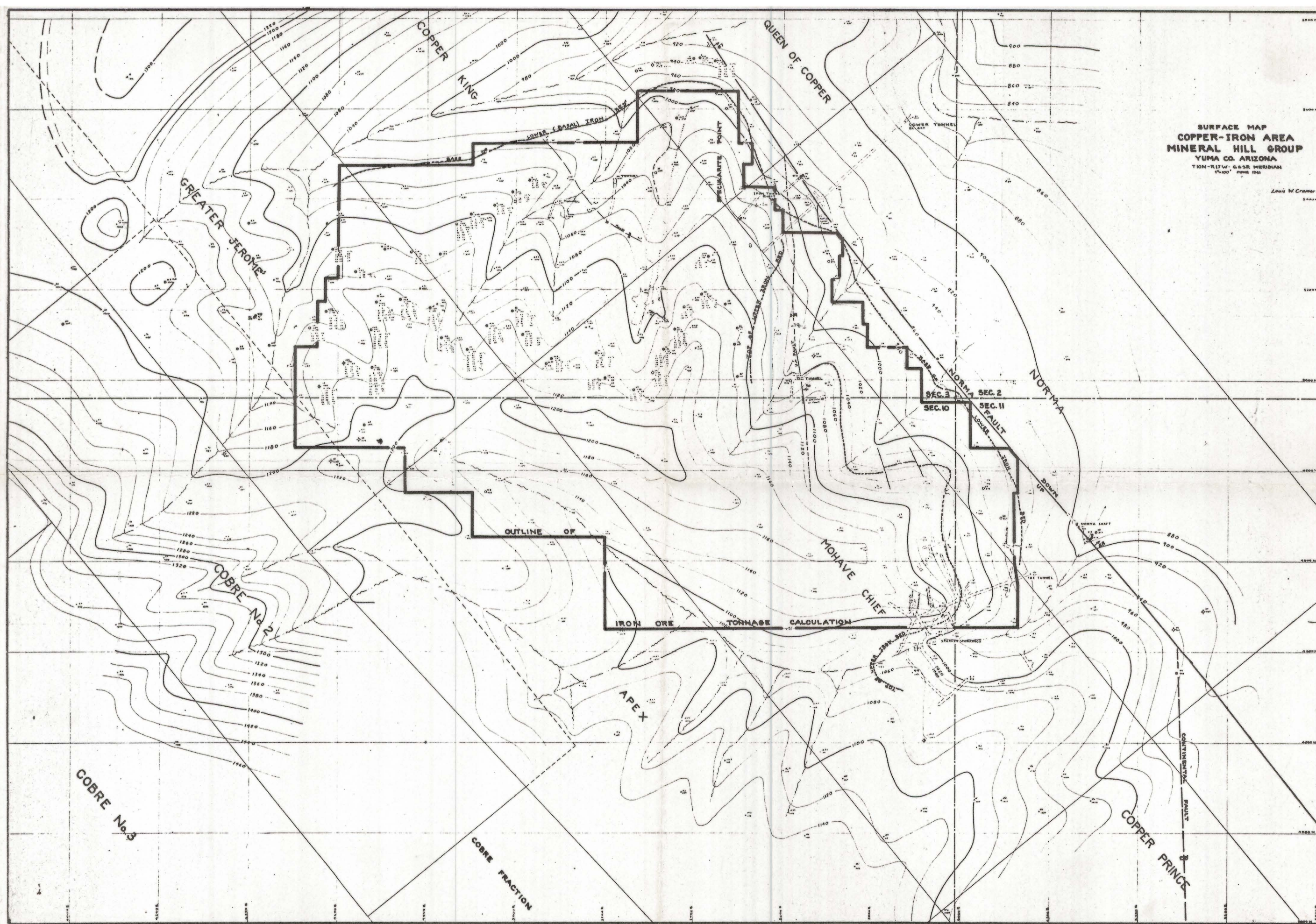
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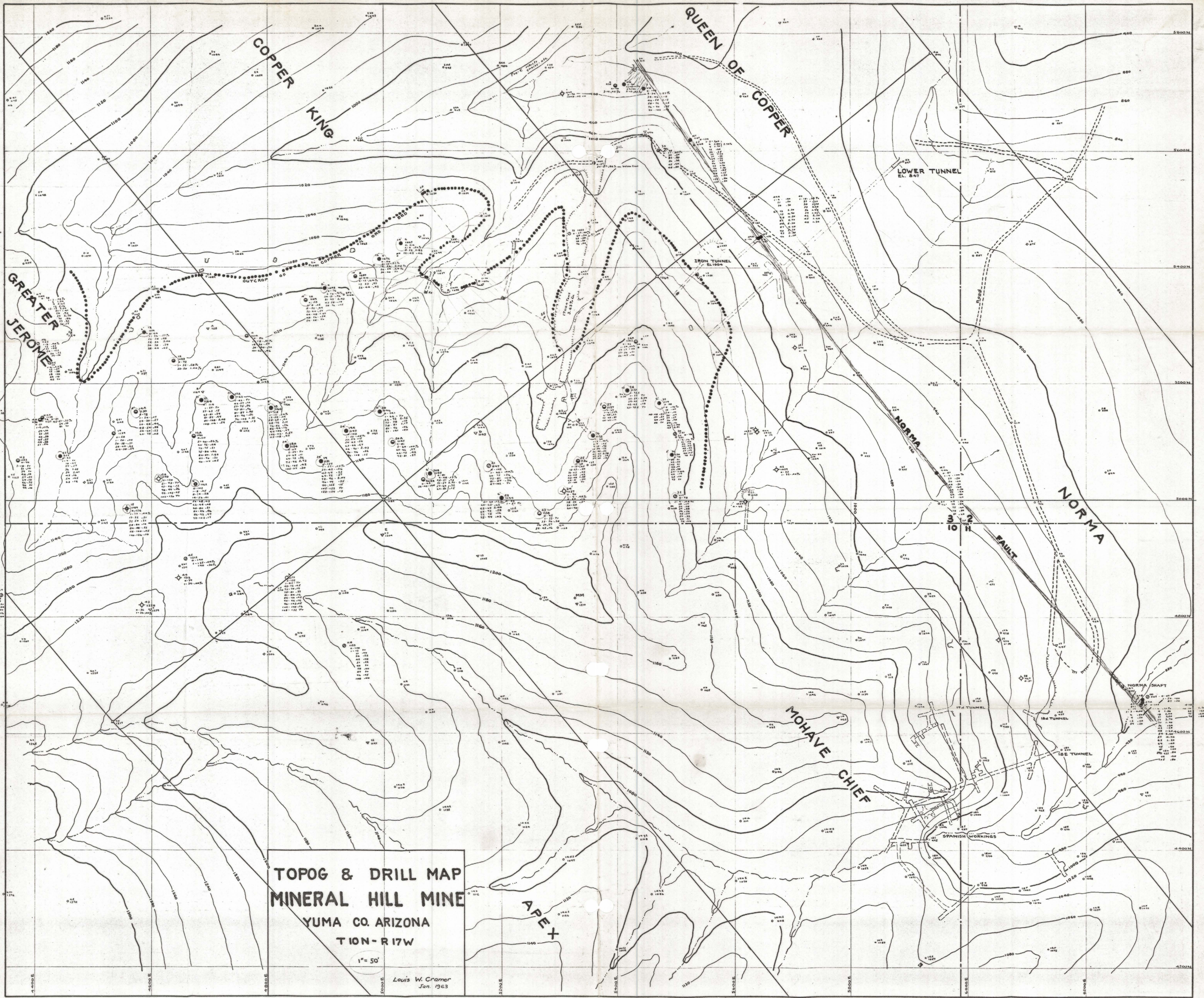


Section Map B

Musical Life

Louis W. Cramer





TOPOG & DRILL MAP
MINERAL HILL MINE
YUMA CO. ARIZONA
T 10N - R 17W

1" = 50'

Louis W. Gramer
Jan. 1963