CONTACT INFORMATION
Mining Records Curator
Arizona Geological Survey
1520 West Adams St.
Phoenix, AZ 85007
602-771-1601
http://www.azgs.az.gov
inquiries@azgs.az.gov

The following file is part of the

Arizona Department of Mines and Mineral Resources Mining Collection

ACCESS STATEMENT

These digitized collections are accessible for purposes of education and research. We have indicated what we know about copyright and rights of privacy, publicity, or trademark. Due to the nature of archival collections, we are not always able to identify this information. We are eager to hear from any rights owners, so that we may obtain accurate information. Upon request, we will remove material from public view while we address a rights issue.

CONSTRAINTS STATEMENT

The Arizona Geological Survey does not claim to control all rights for all materials in its collection. These rights include, but are not limited to: copyright, privacy rights, and cultural protection rights. The User hereby assumes all responsibility for obtaining any rights to use the material in excess of "fair use."

The Survey makes no intellectual property claims to the products created by individual authors in the manuscript collections, except when the author deeded those rights to the Survey or when those authors were employed by the State of Arizona and created intellectual products as a function of their official duties. The Survey does maintain property rights to the physical and digital representations of the works.

QUALITY STATEMENT

The Arizona Geological Survey is not responsible for the accuracy of the records, information, or opinions that may be contained in the files. The Survey collects, catalogs, and archives data on mineral properties regardless of its views of the veracity or accuracy of those data.

OFFICE PHONE DAVIS 2-0841 RES. PHONE INGERSOLL 7-6952

LOUIS W. CRAMER
Geologist
514 ATLAS BUILDING
SALT LAKE CITY 1, UTAH

REPORT ON

MINERAL HILL GROUP

Yuma County, Arizona

Louis W. Cramer, Geologist
Salt Lake City, Utah

December 1, 1960

OFFICE PHONE DAVIS 2-0841 RES. PHONE INGERSOLL 7-6952

LOUIS W. CRAMER
Geologist
514 ATLAS BUILDING
SALT LAKE CITY 1, UTAH

December 1, 1960

Report On Mineral Hill Group
Of Mining Claims

Yuma County, Arizona

The investigation and report on this property was made at the request of Mr. Joseph Minton of the Marvel Mining Company of Salt Lake City, Utah. Mr. Charles A. Mardirosian assisted in the field and office work.

Property

The Mineral Hill Group consists of nine patented mining claims, as follows:

1 -- Queen of Copper	Sur No. 2785		
2 -- Copper King	"	"	"
3 -- Greater Jerome	"	"	"
4 -- Norma	"	"	"
5 -- Mohave Chief	"	"	"
6 -- Apex	"	"	"
7 -- Copper Glance	"	"	"
8 -- Copper Prince	"	"	"
9 -- Greater Bisbee	"	"	"

OFFICE PHONE DAVIS 2-0841 RES. PHONE INGERSOLL 7-6952

LOUIS W. CRAMER
Geologist
514 ATLAS BUILDING
SALT LAKE CITY 1, UTAH

These claims are owned by Mr. T. H. Newman, Sr. of Yuma, Arizona.

Location and Acessibility

The property is located in Sections 2, 3, 10, & 11, T 10N-R 17W, Gila and Salt River Meridian, Yuma County, Arizona.

It is reached by traveling a graded, graveled road easterly from Parker, Arizona some six miles to Osborne Wash. Thence easterly up Osborne Wash over an improved two track road some eight miles to the fork of the Planet Ranch road and the left fork down Mineral Wash. It is some 10 miles northeasterly down the Mineral Wash road to the Mineral Hill area. The Mineral Hill area is about two miles southerly from the junction of Mineral Wash with the Williams River. The section of road down Mineral Wash has been washed out in many places and is difficult to travel.

Water Supply

It is thought that sufficient water could be developed on the Williams River drainage to run a moderate sized leaching operation.

Sampling and Assay Data

Thirteen samples were taken, nine of which indicated the tenor of the ore.

No. 1, general sample of siliceous material at prospect 4620N-3060E. It assayed Au, Trace; Ag, Trace; Cu, none.

OFFICE PHONE DAVIS 2-0841 RES. PHONE INGERSOLL 7-6952

LOUIS W. CRAMER
Geologist
514 ATLAS BUILDING
SALT LAKE CITY 1, UTAH

Sample	Description	Au. oz	Ag. oz	Cu%
2	Across 4' in tunnel 17 d flat fissure, in altered schist & tactite, including 10' hi-grade	.02	.10	2.55
3	Across 6' of Norma Fault fissure at 4650N-6800E	.01	.10	3.16

Flat Ore Zone Samples

Sample	Description	Au. oz	Ag. oz	Cu%
4	General of ore in Tunnel at 2 a	Tr	Tr	3.98
5	Face at 2 oo cut represents about 5' of flat ore zone	.003	.05	3.06
6	Face at 2 mm cut represents 10' of ore zone	Tr	Tr	2.55
7	Cut N 35 E 40' fr 2 l l, represents 7 feet of bed	Tr	.20	1.94
8	On surface S 75 E 15' from 2 h represents about 15 feet of ore zone	Tr	Tr	7.62
9	General of quartzite, hematite ore in cut north of 13 h	Tr	.16	7.51
10	Across 12' horizontal, between fissures in cut north of 13 h	Tr	Tr	.72
11	Across 9' of bed at cut 100' south 13 h	Tr	Tr	2.76
12	Across 12' in cut at l j	Tr	Tr	1.73

Sample 13 was taken at the cut at 5 a. It is representative of the mineralized bedding here adjacent the Norma Fault. It assayed Au 02 oz;

OFFICE PHONE DAVIS 2-0841 RES. PHONE INGERSOLL 7-6952

LOUIS W. CRAMER
Geologist
514 ATLAS BUILDING
SALT LAKE CITY 1, UTAH

Ag, tr; Cu, 1.02%.

The average of the samples taken in the flat ore zone is Cu, 3.54%.

Production

Early production from this property is not known but the workings indicate that it was very small.

In 1956, the property was under lease to R. A. Delano & Co. Settlement certificates are available for 24 shipments by this company. It is not known whether or not these are the entire shipments made by this company from the property.

These shipments total 1706.19 dry tons and contained the following:

Cu %	SiO_2%	Al_2O_3%	Fe%	CaO%
3.65	51.9	7.9	14.6	1.0

This ore was mined from the surface at the south end of the Copper King Claim.

The price of copper for this ore was 35.362 cents per pound and the ore had a net value of $11.43 per ton after smelting, freight and royalty.

Maps

Plane-table and alidade were used to establish horizontal and vertical control over the area. Attached are the following maps.

1. 100 scale topographic map with the underground workings.
2. 100 scale map of the geology.
3. 100 scale map of the ore structure.

OFFICE PHONE DAVIS 2-0841 RES. PHONE INGERSOLL 7-6952

LOUIS W. CRAMER
Geologist
514 ATLAS BUILDING
SALT LAKE CITY 1, UTAH

Cross-section maps

4500 North
5000 "
5100 "
5200 "
5300 "
5400 "
5500 "
6000 "

Sections 5000 to 5500 North were made to estimate the yardage of overburden on the ore zone.

Geology

The surface rocks are thought to be Cambrian limestone interbedded with sandy argillaceous beds, which strike northwesterly and dip 30-60 degrees southwesterly. These truncate on a flat structural feature (thrust?) with top and bottom plates 50-100 feet apart. Below the flat structure are Pre-Cambrian chlorite - serpentine schist and gneiss. These are seen in the drainage crossing the Copper King Claim and on the south part of the Norma Claim.

The formations have been altered to quartz-muscovite-chlorite semi-schists especially in the south Copper King - north Mohave Chief area.

In the south part of the Greater Jerome Claim and the north part of the Apex Claim are several small areas of a granite porphyry. This porphyry is described from a thin section as "probably an altered

OFFICE PHONE DAVIS 2-0841 RES. PHONE INGERSOLL 7-6952

LOUIS W. CRAMER
Geologist
514 ATLAS BUILDING
SALT LAKE CITY 1, UTAH

rhyolite porphyry, phenocrysts of quartz and sanidine, crystalline ground mass of potash feldspar (orthoclase or sanidine). Primary and secondary quartz and sericite. Hematite".

This porphyry appears to be intrusive of a cross-cutting and sill nature. It may be the mineral source.

Structure

The flat structure and the Norma Fault are the two strong structural features in the area. The Norma Fault strikes N 40W through the Norma Claim and dips 80-88 degrees northerly.

It does not seem to cut the flat structure northwest in the Queen of Copper Claim.

Several minor north-south faults exist in the central area and displace the ore horizon. These also appear to make better ore thicknesses where they cut the ore horizon.

Alteration

The rocks in the central area are well altered, the alteration minerals being quartz, muscovite, and chlorite. Some iron sulfide was noted at station 15, and the black mineral in the rock is probably hematite.

Mineralization

In the Mineral Hill Area the main mineralization has spread on the flat structure. The lower iron (specularite) horizon conforms with the lower plate. In most cases observed the iron becomes very

OFFICE PHONE DAVIS 2-0841 RES. PHONE INGERSOLL 7-6952

LOUIS W. CRAMER
Geologist
514 ATLAS BUILDING
SALT LAKE CITY 1, UTAH

siliceous near the base. In several places massive specularite was mapped above the upper plate.

Small occurences of copper are found in the limestone on the Norma Claim. These are on small fissures and as kidneys. All the copper minerals noted were copper carbonates and silicates.

The upper plate of the flat structure is the main copper bearing horizon, and it is from this zone that the production has been obtained. The copper zone is 6-10 feet thick, is sometimes schisty and other places it is a fractured hematitic, altered quartzitic rock, which is well fractured. The fractures are generally healed with copper carbonates and silicates.

The Norma Fault is a mineral fissure as indicated by samples 3 and 13. A car of ore is reported to have been produced from the Lower Tunnel from bedded ore adjacent this fault.

Ore Reserves

The attached map delineates the area which is thought to contain the ore in the flat zone.

Copper

The measured ore is designated as such because it is thought that the cuts from which the above production was obtained prove that the ore extends at least 100 feet behind the outcrop.

Measured Ore

130,000 square feet.

Horizon estimated to be 8 feet thick.

OFFICE PHONE DAVIS 2-0841 RES. PHONE INGERSOLL 7-6952

LOUIS W. CRAMER
Geologist
514 ATLAS BUILDING
SALT LAKE CITY 1, UTAH

130,000 x 8 ÷ 12 = 86,500 tons

Indicated Ore

120,000 square feet x 8 ÷ 12 = 80,000 tons

Inferred Ore

250,000 square feet x 8 ÷ 12 = 165,000 tons

The grade of the measured ore is indicated to be 3.5% copper, that of the indicated and inferred ore should approximate this.

Limestone Copper Ore

Considerable work has been done in the limestone area on the south end of the Mohave Chief Claim. This work indicates that small kidneys, lenses and streaks of high grade copper ore were mined. There is no appreciable tonnage indicated.

Fissure Ore

The Norma Fault is seen in three places, at 5 a, in the gulch at 18 c, and in the Lower Tunnel. Each place carries values. Therefore, it is thought that development on the Norma Fault would result in finding sizeable ore reserves.

Iron (Specularite)

The basal iron bed is exposed along the south side of the drainage crossing the Greater Jerome, Copper King, and Queen of Copper Claims. The top of the iron is exposed in the floor of the cuts from which the copper ore was mined. It was traced southeasterly along the west side of the Norma Claim. It is exposed above the Flat Structure in the 18 e Tunnel, 300 feet southwesterly from the outcrop.

The above indicates that about 975,000 square feet of the basal

OFFICE PHONE DAVIS 2-0841 RES. PHONE INGERSOLL 7-6952

LOUIS W. CRAMER
Geologist
529 ATLAS BUILDING
SALT LAKE CITY 1, UTAH

flat should be mineralized with iron.

The thickness varies considerably from 15 to 60 feet. Twenty-five feet is thought to be a conservative average thickness.

975,000 x 25 ÷ 11 = 2,215,000 long tons.

There are several sizeable iron ore bodies indicated above the basal bed.

Overburden

As seen on the maps and cross-sections there is not a great amount of overburden on the measured and indicated ore. Only five cross-sections were used to estimate this yardage, which is therefore only roughly approximate.

Block	Type of Ore	Yards
4900N - 5000N	Inferred	150,000
5000N - 5100N	Inferred-Indicated	300,000
5100N - 5200N	About ½ inferred, ½ measured and indicated	231,000
5200N - 5300N	Measured and Indicated	153,000
5300N - 5400N	Measured	77,000
5400N - 5500N	Measured	22,000
	TOTAL	933,000

A rough estimate would be 583,000 yards over the inferred ore and 350,000 yards over the measured and indicated ore. A yard of overburden would be approximately 2 tons. Therefore, the stripping ratio of overburden to measured and indicated ore would be about four to one.

OFFICE PHONE DAVIS 2-0841 RES. PHONE INGERSOLL 7-6952

LOUIS W. CRAMER
Geologist
529 ATLAS BUILDING
SALT LAKE CITY 1, UTAH

Development

There are several short tunnels in the limestone area on the south end of the Mohave Chief Claim. These are driven into the hill at various directions and elevations.

The major work in this area is the 18 e Tunnel at an elevation of 940 feet. It is driven S 75W some 300 feet with several cross-cuts and raises and evidently connects with some workings above. Most of the level is on the basal flat structure with the basal iron bed showing in the raises. (1)

The Lower Tunnel, elevation 847, is in the north part of the Norma Claim. It is driven some 450 feet southwesterly to the Mohave Chief sideline. At 300 feet from the portal it cuts the Norma Fault at its junction with a N-S spur fissure. Fissure and bedded ore was mined here. (2)

The formations dip southwesterly and are mostly argillites, even southwest of the Norma Fault.

Tunnel 1 a, elevation 1003, is in northwest part of the Norma Claim. It is driven southwesterly 110 feet in specularite. Near the face is a raise, which is inaccessible, and is thought to have raised to the ore horizon. (3)

Tunnel 2 a, elevation 1023, is in the south part of the Copper King Claim. It is driven southerly 100 feet. It is in specularite some 20 feet from the portal, then cuts the ore bed (sample No. 4) on the northeast side of the fault. At the end is a raise to the ore on (4)

OFFICE PHONE DAVIS 2-0841 RES. PHONE INGERSOLL 7-6952

LOUIS W. CRAMER
Geologist
529 ATLAS BUILDING
SALT LAKE CITY 1, UTAH

the southwest side of the fault.

The tabulated shipped ore came from the surface and near surface in this area.

There were several wagon drill holes or jack-hammer holes noted, which were located near the copper horizon. The results of this drilling are unknown.

Proposed Development

It is thought that additional drilling as above should be done. All holes should penetrate to the basal structure which would evaluate the basal iron bed.

Some surface cuts should be dug on the outcrop and a few of the copper showings above the copper horizon, such as near the tunnel at 11 i on the Mohave Chief Claim.

Two or three deep holes should be drilled through the basal structure in the area of the granite porphyry outcrops.

Norma Fault

The mineralization at the cut at 5 a (sample 13) should be further explored.

The Lower Tunnel should be rehabilitated and the Norma Fault be drifted upon northwesterly and southeasterly. The North-south spur fissure should be opened up to the south.

Conclusions and Recommendations

The Mineral Hill area has a favorable halo of alteration and silicification. The flat structure is ideal for spreads of mineralization.

OFFICE PHONE DAVIS 2-0841 RES. PHONE INGERSOLL 7-6952

LOUIS W. CRAMER
Geologist
529 ATLAS BUILDING
SALT LAKE CITY 1, UTAH

The sericitic altered porphyry is a favorable intrusive rock.

The copper mineralization is wide spread, but is concentrated in the upper plate of the flat structure. It is later than the specularite mineralization.

The investigation indicates that there is enough copper ore in sight and to be developed to support a moderate leaching operation, 200-400 tons per day. No leaching tests were made. However, Mr. Duncan Harrison of your company states that the ore is amenable to leaching.

There are about 2,500,000 tons of iron ore indicated and possibly another 1,000,000 tons in deposits higher than the basal bed.

It is therefore recommended that the property be acquired.

Louis W Cramer

Louis W. Cramer, Geologist
Salt Lake City, Utah

December 1, 1960

Phone ELgin 9-9962

L. W. Cramer
Atlas Building
City

NICHOLS LABORATORIES, INC.
ASSAYERS & CHEMISTS
C. Ivan Nichols, Mgr.
160 South West Temple Street
Salt Lake City 1, Utah

WE HAVE ASSAYED 13 SAMPLES

DESCRIPTION	NO.	GOLD OUNCES	SILVER OUNCES	WET LEAD %	COPPER %	ZINC %	INSOL %	%	%	%	VALUE OF GOLD PER TON
		ASSAY PER TON OF 2000 POUNDS									
	#1	Trace	Trace		None						
	#2	0.02	0.10		2.55						
	#3	0.01	0.10		3.16						
	#4	Trace	Trace		3.98						
	#5	0.003	0.05		3.06						
	#6	Trace	Trace								
	#7	Trace	0.20		2.55						
	#8	Trace	Trace		1.94						
	#9	Trace	0.16		7.62						
	#10	Trace	Trace		7.51						
					~~0.72~~ (0.72)						
	#11	Trace	Trace								
	#12	Trace	Trace		2.76						
	#13	0.02	Trace		1.73						
					1.02						

November 16, 1960

CHARGES $ 39.00

C. Ivan Nichols.

MINERAL HILL MINE

YUMA CO. ARIZONA

T 10N - R 17W - G. & S.R. MERIDIAN

1 inch = 100 ft. Oct. 28 - Nov. 13 incl., 1960

Louis W. Cramer
Charles A. Mardirosian

● Drill Hole

Fault Fissure

Copper mineralization

Iron mineralization, specularite

Granite Porphyry

Silica & silicified limestones, argillites

Tactite, bedded tactite, argillites, quartzites (argillites, limestones)

Limestone

Schist

Basal gneissic schist, serpentine, chlorite

Formations

Mineralization

QUEEN OF COPPER Surv. No. 2785

COPPER KING

GREATER JEROME 2785

MOHAVE CHIEF 2785

APEX 2785

NORMA 2785

COPPER GLANCE 2785

COPPER PRINCE 2785

GREATER BISBEE 2785

CONTINENTAL No. 1 2391

CAVERN 2391

Sec 3

Sec 10

Lower Tunnel

44 Tunnel

44A Tunnel

44B Tunnel

46 Tunnel

46A Tunnel

46B Tunnel

Tunnel

Adamson Tunnel

Tunnel

Tunnel

7000 N

6500 N

6000 N

5500 N

5000 N

4500 N

4000 N

3500 N

3000 N

2500 E

3000 E

3500 E

4000 E

4500 E

5000 E

5500 E

6000 E

6500 E

7000 E

7500 E

8000 E

MINERAL HILL MINE

YUMA CO. ARIZONA

T10N-R17W G.& S.R. MERIDIAN

1"=100' Nov. 1920

Louis W. Cramer
Charles A. Mardirosian

COPPER KING

GREATER JEROME

QUEEN OF COPPER

NORMA

MOHAVE

CHIEF

APEX

Flat structure

ore mined

Norma Fault

Surface contour, 20' interval

Copper mineralization & contour on copper bearing horizon, 10' interval

Flat structure outcrop & contour on 'Flat', 50' interval

Fault

Granite Porphyry