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PRINTED: 11/08/2001

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES AZMILS DATA

PRIMARY NAME: KEYSTONE MINE

ALTERNATE NAMES:

HAGERMAN
BANNON GROUP

COCHISE COUNTY MILS NUMBER: 48

LOCATION: TOWNSHIP 15 S RANGE 22 E SECTION 36 QUARTER N2
LATITUDE: N 32DEG 05MIN 34SEC LONGITUDE: W 110DEG 03MIN 27SEC
TOPO MAP NAME: DRAGOON - 7.5 MIN

CURRENT STATUS: PAST PRODUCER

COMMODITY:

COPPER
ZINC
SILVER
MOLYBDENUM SULFIDE
GOLD LODE

BIBLIOGRAPHY:

KEITH, S.B., 1973, AZBM BULL. 187, P. 57
USBM RI 4504, 1949,
ADM MR KEYSTONE MINE FILE

KEYSTONE MINE

COCHISE COUNTY

Mining Operations at Johnson, Arizona -
article from Mining & Engineering World
"J" old mines (file) correspondence

Production Possibilities of the Marginal
Copper Mines in Arizona, 1941, p. 76

ABM Bull. 129 p. 74

USGS P.P. 416 p. 173 (Keystone, O.K., & St. George Mines)

RI 4504

Arizona Mining Journal July 1919 p. 26,
Oct. 1919 p. 26, Feb. 1920 p. 35, April 1920 p. 43

2 maps in area map drawer

ABM Bull. 187, p. 30

See: Cyprus Johnson Copper Co. Mine (file) Cochise Co. 7/6/79 a.p.

MAPS in flat storage upstairs - first drawer

NAME OF MINE: <u>KEYSTONE</u>		COUNTY: <u>COCHISE</u> S
		DISTRICT: _____
		METALS: <u>CU</u>
OPERATOR AND ADDRESS:		MINE STATUS
DATE:		DATE:
<u>5/1/44</u>	N. Rehg, Dragoon	<u>5/1/44</u> Idle

KEYSTONE COPPER MNG. CO.
 Cu., Zn, Ag
 Cochise 2 - 1 S 26, T 15 S, R 22 E
 Keystone Copper Mng. Co., Dragoon '44

Gung'l, John, Receiver
 Keyston Copper Mining Company
 712 Valley Nat'l. Bank Bldg.
 Phoenix, Arizona

6-7-40 .

See MK-7-Re Mine Owners Report (Owner-Keyston Copper Mg. Co.)

✓
KEYSTONE COPPER MINING CO.

✓ U. R. Miller
Dragoon, Ariz.

5/16 - 1st
complete

A&R - E.P.

'36

10 T. 2475 lb.

Nick Juyer
Box 1061 B Tucson.

John Grunzl, Receiver
712 Valley Bank Bldg. X

Handling Keystone Mine

2-6-1942

REPORT OF INVESTIGATIONS

UNITED STATES DEPARTMENT OF THE INTERIOR - BUREAU OF MINES

INVESTIGATION OF KEYSTONE AND ST. GEORGE COPPER-ZINC DEPOSITS
COCHISE COUNTY, ARIZ.^{1/}

By T. M. Romslo^{2/}

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^{1/} The Bureau of Mines will welcome reprinting of this paper, provided the following footnote acknowledgment is used: "Reprinted from Bureau of Mines Report of Investigations 4504."

^{2/} Mining engineer, Bureau of Mines, Tucson, Arizona.

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INTRODUCTION AND SUMMARY

The Keystone and St. George properties are in the so-called Johnson Camp area and adjoin a property that in recent years has become a steady producer of low- to medium-grade copper-zinc ores. The Keystone Copper Co. was active intermittently from 1908 to 1938 and during 1926 to 1937 produced a recorded 1,100 tons of 5 percent copper ore. There is no evidence that ore has been produced from the St. George property.

In the Johnson Camp area both igneous and sedimentary rocks ranging in age from pre-Cambrian to Quaternary are exposed. The ore bodies are in the Paleozoic rocks and occur principally in the Abrigo formation, which is composed mainly of limestones and shales. The rocks of the productive zones are metamorphosed and are cut by systems of fractures and faults. Chalcopyrite and sphalerite, the principal ore minerals, replace altered limestones to form deposits locally called mantos and chimneys.

Investigation of the Keystone and St. George deposits by the Bureau of Mines included topographical and geological mapping of the surface and the underground workings and diamond drilling from the surface. A total of 10,067.8 feet was drilled in 22 holes. The drilling started November 13, 1947, and was completed August 19, 1948.

This report records factual information obtained during the course of the investigation.

ACKNOWLEDGMENTS

These investigations were begun in 1942, when Walter R. Storms, an engineer of the Bureau of Mines, made a preliminary surface examination of the properties. In 1945, Thomas C. Denton also a Bureau of Mines engineer, surveyed both the surface and underground workings and obtained information from officials of the Coronado Copper & Zinc Co. This information was used solely as an aid in interpreting geology that might pertain to laying out an exploratory program on the Keystone and St. George properties.

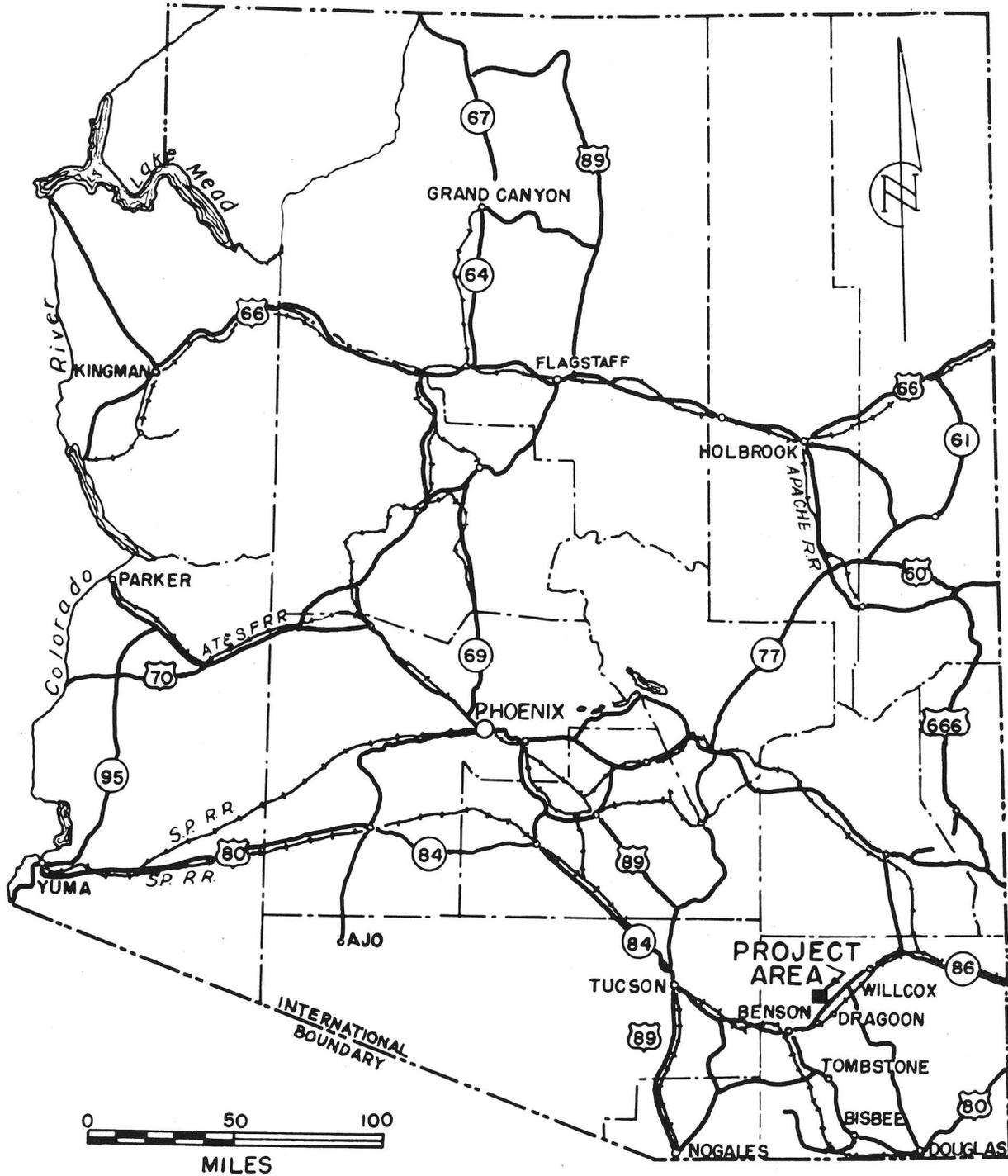


Figure 1. - Location map, Keystone and St. George copper-zinc deposits, Cochise County, Ariz.

Special acknowledgment is due Eldred D. Wilson, of the Arizona Bureau of Mines, and John R. Cooper, of the Federal Geological Survey. Wilson mapped both surface and underground geology during the examination. The geology and much of the history contained in this report have been abstracted from a paper prepared by Cooper for the Arizona Bureau of Mines. His report will be incorporated in an Arizona Bureau of Mines Bulletin on zinc and lead deposits in Arizona. Cooper also logged the drill holes.

The investigations were supervised by J. H. Hedges, chief, Tucson Branch, Mining Division, and samples were analysed by Ray Stiles under J. Bruce Clemmer, chief, Tucson Branch, Metallurgical Division.

Appreciation is extended to officials of the Coronado Copper & Zinc Co. for supplying information that was helpful in carrying out the investigations. The author also wishes to thank Norman M. Rehg for the living quarters made available to Bureau personnel during the drilling program.

LOCATION AND ACCESSIBILITY

The St. George claim and the property of the Keystone Copper Co. are in the so-called Johnson Camp of the Cochise Mining District, Cochise County, Ariz. Dragoon, a town on the Southern Pacific Railroad, is about 6 miles to the south over a graded country road that crosses State Highway 86 about 1 mile from the properties (fig. 1). The towns of Benson and Willcox, both on the Southern Pacific Railroad and State Highway 86, and 16 miles southwest and 17 miles northeast, respectively, of the above-mentioned road intersection.

PHYSICAL FEATURES AND CLIMATE

The Keystone group of claims and the adjoining St. George claim are in rolling hills, at an altitude of about 4,800 feet, that form the southeast flank of the Little Dragoon Mountains. The Little Dragoons, roughly 8 miles wide and 10 miles long, trend in a north-south direction and form the divide between the San Pedro and Sulphur Spring valleys. Lime Mountain is the highest peak with an elevation of about 6,500 feet above sea level.

Vegetation at the lower altitudes consists of prickly pear, Ocotillo, Yucca, and other plants common to the semi-arid regions of southeastern Arizona. Scrub oak, manzanita, and a few pinon pines grow on the higher hills.

The winters are mild and the summers are hot. Annual precipitation, about 11 inches, occurs mainly in July and August and during the winter months, when some snow falls.

The district obtains water for mining and milling, livestock, and for domestic use from wells.

PROPERTY AND OWNERSHIP

The Keystone claims are owned by the Keystone Copper Mining Co. of El Dorado, Kans. Norman M. Rehg is president and resident manager. The company's property comprises a group of 21 unpatented lode mining claims and fractions aggregating more or less 335 acres. The names of the claims are as follows:

Mary	Gustave	Dora
Calumet	Wolfrime	Ina
Ultimo	Louie	Esmeralda
Charles	Ernest	Florence
Nevertheless	Erika	Halderman
O.K.	Roswell	Gladys
Ella	Hagerman	Maher

The St. George claim is a patented lode-mining claim containing 17.7 acres. It is owned by Foreman M. Lebold and Samuel N. Lebold, Chicago, Ill.

Figure 2 outlines the properties and indicates the areas to which drilling was confined.

HISTORY AND PRODUCTION

It is reported mining was being carried on in Johnson Camp in the 1870's, when ore was shipped by ox team to the Colorado River and then by boat to a smelter in Wales. Since 1881, when the Southern Pacific Railroad was completed through Dragoon, the deposits have been worked by many operators, mainly during periods of high prices for copper. In 1882 the Russel Gold & Silver Mining Co. began smelting ores in the district. These operations were discontinued a few years later. The Peabody mine, which had furnished some of the smelting ores, was reopened in 1899 and was operated intermittently by various companies until 1918. The Black Prince Copper Co. explored at intervals from 1901 to about 1911. The Republic and Mammoth mines were reopened in 1905. In 1906 a railroad was constructed from Johnson to the Southern Pacific line at Dragoon. The Republic and Mammoth mines were acquired from the Arizona United Mining Co. by the Cobriza Mines Development Co. in 1914. During World War I, the camp was very active. In 1920 all the mines closed, and in 1925 the railroad track from Johnson to Dragoon was removed. The American Metal Co., operating under a lease-option agreement with Roy Wilson and Samuel Taylor, carried out a limited exploration program in 1939-40 on the Republic and Mammoth properties. In 1941 William A. Hooton, of Tucson, shipped ore from the Republic and Mammoth mines under a lease-option agreement with Wilson and Taylor. The Coronado Copper & Zinc Co. acquired Hooton's lease in 1942 and later purchased the property. In 1945 they completed a 150-ton selective flotation concentrator at the Republic mine and began to ship copper and zinc concentrates. At present the company is treating about 200 tons of ore daily and is preparing to sink a shaft to an ore body recently disclosed by diamond drilling.

The Keystone Copper Mining Co. was incorporated in 1908, and sinking of the Hagerman and O. K. shafts was begun in the same year. Development

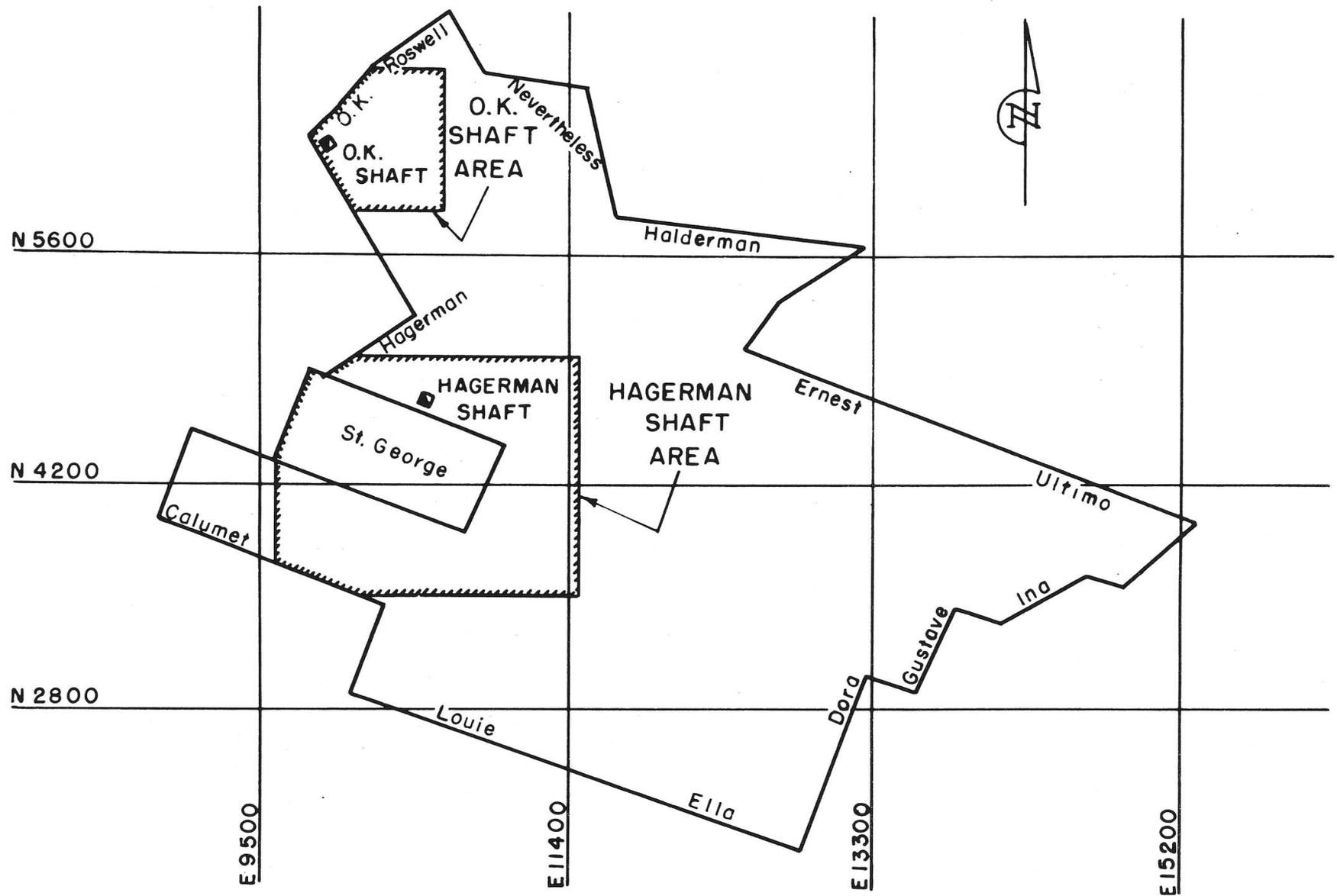


Figure 2. - Property map, Keystone and St. George copper-zinc deposits, Cochise County, Ariz.

at both shafts was carried out intermittently until 1938. The flotation mill was completed in 1925, and test runs were made during 1925-26. Reorganization of the company, with a complete change in management, took place in 1941. In 1944, part of the underground working were made accessible through expenditure of funds derived from an R.F.C. loan.

There is no record of when the small amount of development on the St. George claim was done.

Total production from Johnson Camp to the end of 1946 was approximately 31,000,000 pounds of copper, 9,000,000 pounds of zinc, 342,000 ounces of silver, and a minor amount of gold and lead. Over 99 percent of the production has come from the Republic, Mammoth, Peabody, and Copper Chief mines. Smelter returns show that the Keystone Copper Co. shipped about 1,100 tons of 5 percent copper ore during 1926-37. There is no evidence that ore has been produced from the St. George claim.

GEOLOGY

General

The Johnson Camp area of the Cochise mining district has exposed igneous and sedimentary rocks that range in age from Pre-Cambrian to Tertiary (?) and Quaternary. Pinal schist, the oldest formation, is overlain by the Apache group of the same age. Resting on the Apache group are Cambrian rocks consisting of the Bolsa quartzite, the oldest, and the Abrigo limestone. Overlying the Abrigo formation is the Devonian Martin limestone. Limestones of the Carboniferous period consisting of the Escabrosa, Black Prince, and Naco formations, in the order named, overlie the Martin limestone. Much of the area is covered to a depth of a few inches to several feet with Tertiary (?) and Quaternary gravels.

Quartz monzonite, Cretaceous or Tertiary in age, has intruded the Pinal schist and Apache group. Dikes of aplite and lamprophyre, products of quartz monzonite differentiation, cut both the quartz monzonite and country rock.

The ore bodies of the Johnson Camp area are in the Paleozoic rocks and are 1/4 to 1 1/2 miles from the quartz monzonite.

Rocks

The Abrigo formation, outside the metamorphic area, consists of a lower member about 300 feet thick that is predominantly shale. The middle Abrigo, the ore-bearing formation of the area, is about 240 feet thick and composed of thin-bedded limestone interbedded with shale and sandstone. The upper Abrigo, about 140 feet thick, is composed of sandy dolomite and dolomitic sandstone, with several thin quartzite beds.

In the mining area, metamorphism has caused a decrease in volume of the impure carbonate beds. The amount of thinning is proportional to the amount of silication, up to a maximum of 25 percent. The shale beds of the lower

Abrigo and several shale beds in the Martin limestone have been altered to a dark-green somewhat shaly hornfels. The middle Abrigo is more or less converted to granular brown garnet or, more rarely, greenish (epidote) tactite. Part of the middle Abrigo is slightly altered and, in other parts it is essentially unsilicated. The upper Abrigo is nearly white tactite characterized by diopside, tremolite, potash feldspar, and quartz. Parts of the Martin formation and the lower part of the Escabrosa formation, outside the metamorphic area, are nearly pure dolomite. Within the mining area these dolomites are generally dolomite marble, though in places they have been de-dolomitized into calcite-tremolite, calcite-forsterite, or calcite-serpentine rocks. Pure limestones, like most of the Escabrosa, Black Prince, and Naco limestones, have been converted to calcite marble.

Structure

The Keystone fault is the most prominent structural feature in the project area. It has a horizontal displacement of about 1,200 feet, the east block having moved relatively southwestward. All but a small part of the project area is in the block east of the fault. Here the Paleozoic rocks have an average strike of about S 75° E and a northeasterly dip of 30° to 40°. Two faults of small displacement and a rather strong fracture were mapped on the surface. Weak fractures are present at other places in this block, and diamond drilling indicated the presence of other faults.

The areas of the district at present productive and the remainder of the project area are west of the Keystone fault. Here the Paleozoic rocks have an average strike about S 45° E and dip 20° to 45° to the northeast. They are cut by well-defined faults and fractures striking N 5° to 30° E and dipping 60° to 80° SE. Less well-defined faults and fractures strike N 60° to 90° E and dip 30° to 60° S. Subsidiary fractures are commonly associated with the latter group of faults and fractures. Also present is a relatively unimportant group of faults and fractures. The faults are normal, with several minor exceptions. The displacement of most of the faults range from almost nothing to a few tens of feet. The displacements of three faults, not including the Keystone, each exceed 100 feet.

Mineral Deposits

The principal ore minerals are chalcopyrite and sphalerite. Other primary minerals in the ore are pyrite and bornite and minor amounts of molybdenite, scheelite, gold, and silver. The gangue is composed of lime-silicates, potash feldspar, quartz, and calcite. Generally the most abundant lime-silicates are garnet, diopside, and epidote. However, at the Peabody and Black Prince mines, vesuvianite and wollastonite also are abundant.

The ore occurs as tabular deposits, chimneys, and mantos. The largest deposits are chimneys, more or less oval in cross section, that lie on the plane of the beds and have their long axis parallel to the dip of the beds. A chimney is known as a manto if its long axis lies at a large angle to the dip of the beds. The largest ore body yet mined in the district is a manto 1,500 feet long, 30 to 100 feet wide and 15 to 40 feet thick, with several

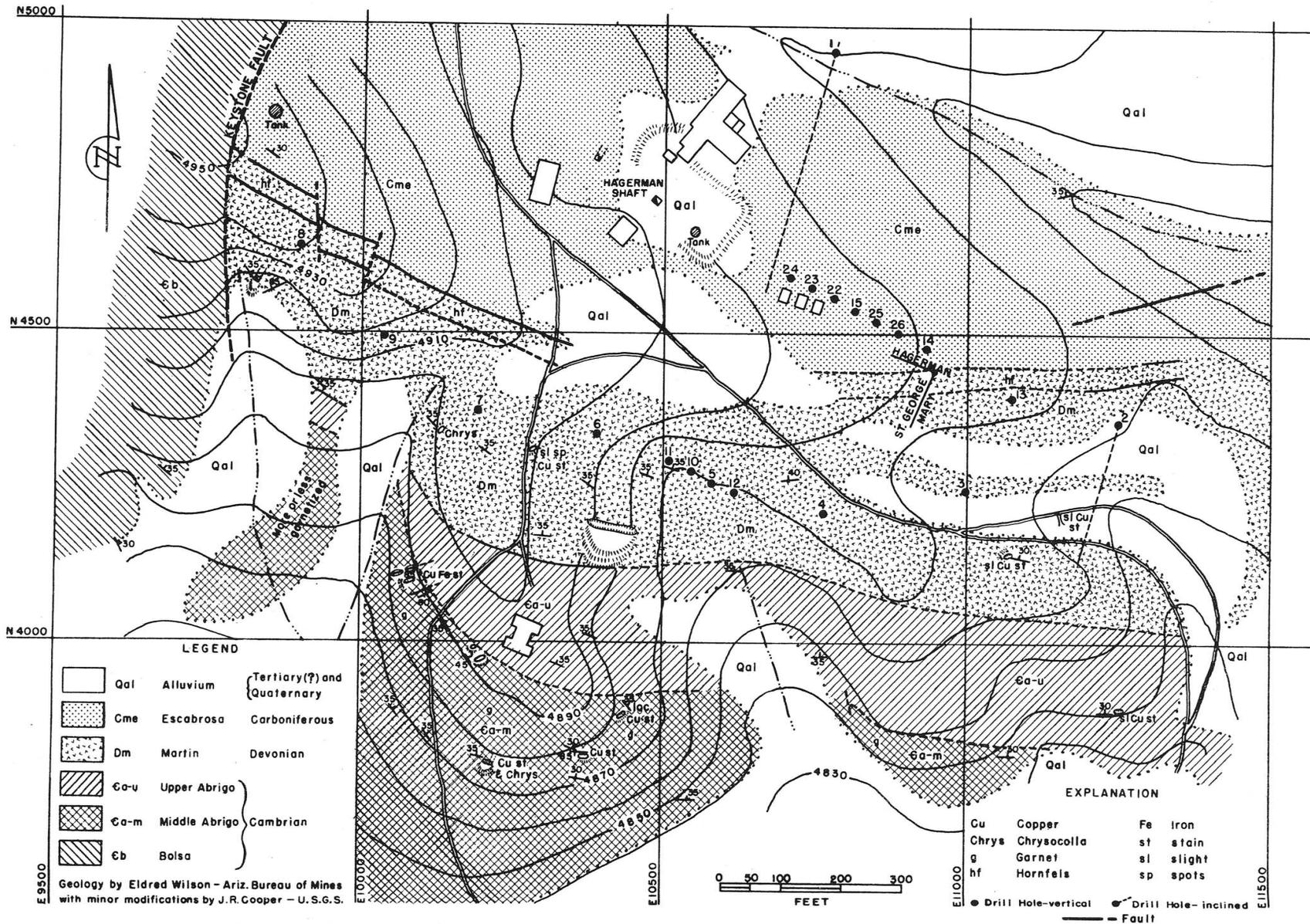


Figure 3. - Geologic map of Hagerman shaft area.

large extensions of the bedded type that become chimneylike where they follow the dip to greater depths. Small ore bodies at the Peabody, Black Prince, and O. K. mines were tabular deposits following fractures at considerable angle to the beds.

Although some ore is found replacing thin, more or less shaly layers in the Naco formation, as at the Peabody mine, the most productive ore bodies in the district occur in the middle Abrigo, commonly less than 50 feet, stratigraphically, below the top of the middle Abrigo formation. The best ore at the Republic mine occurs at the very top of the middle Abrigo. Local extensions of the Main Manto at this mine occur in beds as much as 90 feet below the top. Minor ore bodies occur in beds about 150 feet below the top. The ore bodies are adjacent to mineralizing fractures and are restricted to zones that show more or less rock alteration. Small masses of ore and zones containing meager disseminations of ore minerals have been found at other stratigraphic horizons.

MINE WORKINGS

The principal workings of the Keystone Copper Co. are the Hagerman and the O. K. shafts (figs. 3 and 4.)

The Hagerman shaft is vertical and during 1945 was accessible to the 600-foot level, which is about 565 feet below the surface. At that time water was standing in the shaft sump about 3 feet below the 600-foot level. It is understood that the sump may be as much as 100 feet deep and that the mine "makes" but a few gallons of water per minute. The other levels from the shaft are known as the 500, 300, 200, and the 60 and are 487, 325, 200, and 60 feet, respectively, below the collar. The workings above the 500 level were not readily accessible, and only the 500 and 600 levels were mapped by the Bureau (fig. 5). Where timbered, the hoisting compartment is 4 by 4 feet in the clear, and the manway compartment is 4 feet by about 2 feet. Access was by a bucket running on improvised guides consisting of two taut wire ropes. At present the shaft is not readily accessible.

The O. K. shaft is an incline with an average inclination of 34 degrees and measures 385 feet from collar to bottom. It contains a hoisting compartment and a manway. It averages about 6 1/2 feet from hanging to foot wall, measured perpendicular to the dip, and has an average width of about 10 feet. Hoisting was done by a skip running on a steel rail track. The shaft and its workings are shown on figure 6.

In addition to the principal workings, there are several other vertical and inclined shafts tens of feet deep. There are also numerous pits and a few small open stopes that were mined under-hand from the surface. The sites of the largest of these workings are shown on figures 3 and 4.

SURFACE PLANT AND EQUIPMENT

Surface structures consist of a hoist house and headframe at both the O. K. and Hagerman shafts. Near the latter shaft are a mill and power-plant building and several dwellings.

The power plant consists of two oil-fired boilers and a steam engine. Among other items in the power house are a compressor and a rotary blower.

The mill is designed to treat 300 tons of ore daily by flotation. A bin for crude ore, a primary crusher, and a bucket elevator are outside the mill building. Within the building the principal items are an ore bin, rod mill, drag classifier, flotation units, filter, and wood tanks.

The hoist house contains a single-drum hoist with V-belt drive from an automobile engine. A compressor powered by an oil engine and other miscellaneous machinery and equipment also are in the hoist house.

There are no buildings or equipment on the St. George claim.

WORK BY THE BUREAU OF MINES

During the preliminary examination about 250 acres of surface and 380 lineal feet of inclined shaft and 775 lineal feet of underground workings were surveyed and mapped at the O. K. and Hagerman shafts.

Diamond drilling started November 13, 1947, and was completed August 19, 1948. After drilling 17 holes, the drill rig was moved to another part of the district where 4 holes (Nos. 18 to 21) totaling 778 feet were drilled for the U. S. Geological Survey. The drill rig was then returned to the Keystone claims, and five additional holes were drilled. A total of 10,067.8 feet was drilled in the 22 holes. Hole 22 was deflected at 376 feet and drilled to 444 feet in order to resample an interval that had been rejected because of poor core recovery. This drilling is included in the total footage. The locations from which the holes were drilled are shown on figures 3 and 4. Vertical cross sections through the holes and analyses of all samples are shown in figures 7 to 11, inclusive. The faults indicated on the sections are not discernable on the surface, nor were they recognized in the drill holes. Their presence is shown only by the omission of beds between the points of observation. The logs of the holes and sample records of each hole are appended to this report. More detailed logs of the holes are on file in the Tucson and Washington offices of the Bureau of Mines.

A diamond drill mounted on skids and powered by a 35-horsepower gasoline engine was operated two shifts a day except from February 12 to June 5, when drilling was on a 3-shift basis. Cast bits and core barrels 5, 10, and 20 feet long were used. The 20-foot barrel was used only in barren ground, where core recovery was generally 100 percent. Drill cuttings in mineralized ground were saved until the core had been inspected. Sludge samples were discarded if core recovery was over 90 percent. Drilling water was hauled by the drilling contractor from Willcox.

Mineralized sections of the core and dried sludges were weighed and split in the field. Half of each of 73 core samples and a portion of each of 5 sludge samples were sent to Tucson for analysis. All of the cores were placed in paper core boxes and stored in the Bureau corehouse in Tucson.

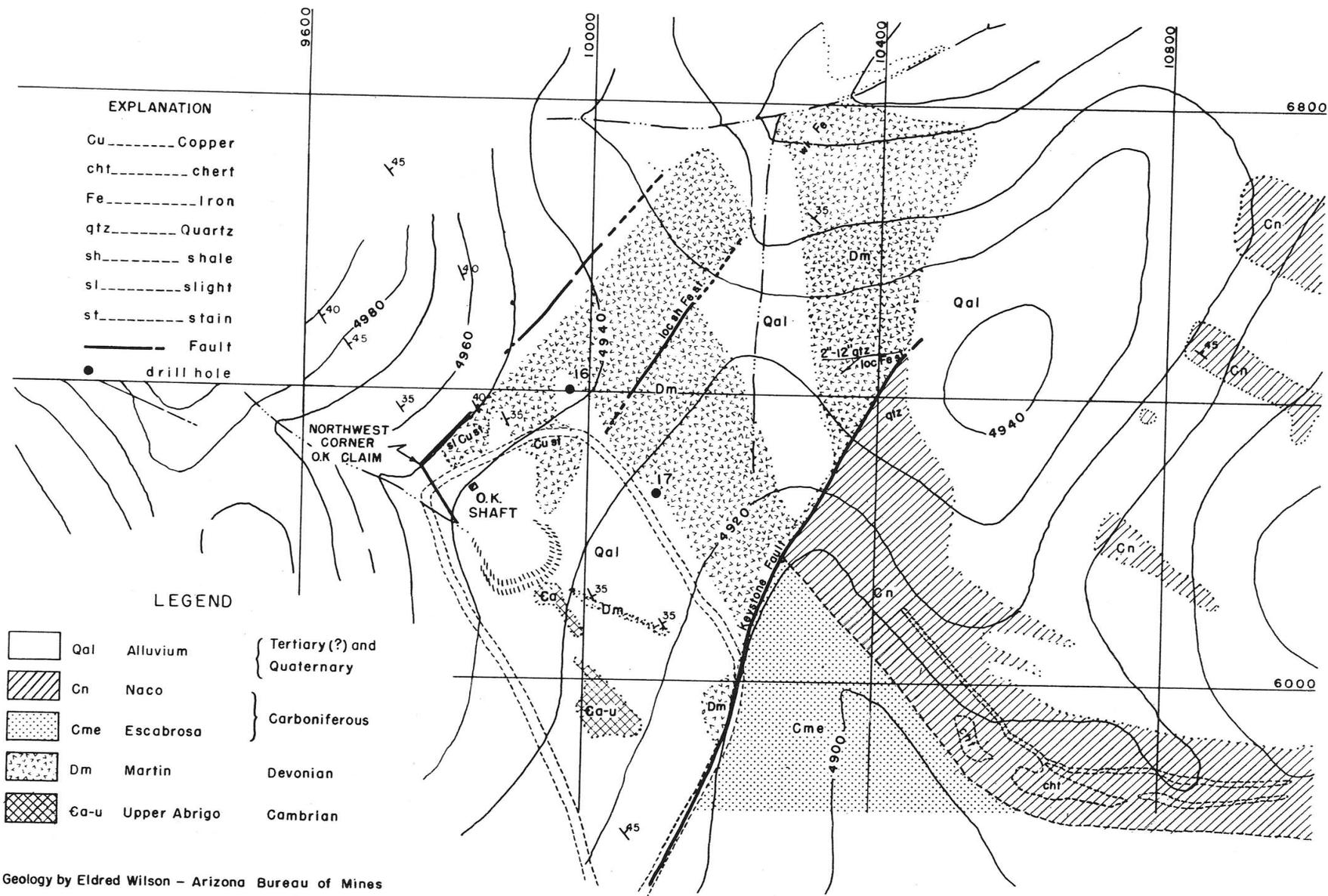
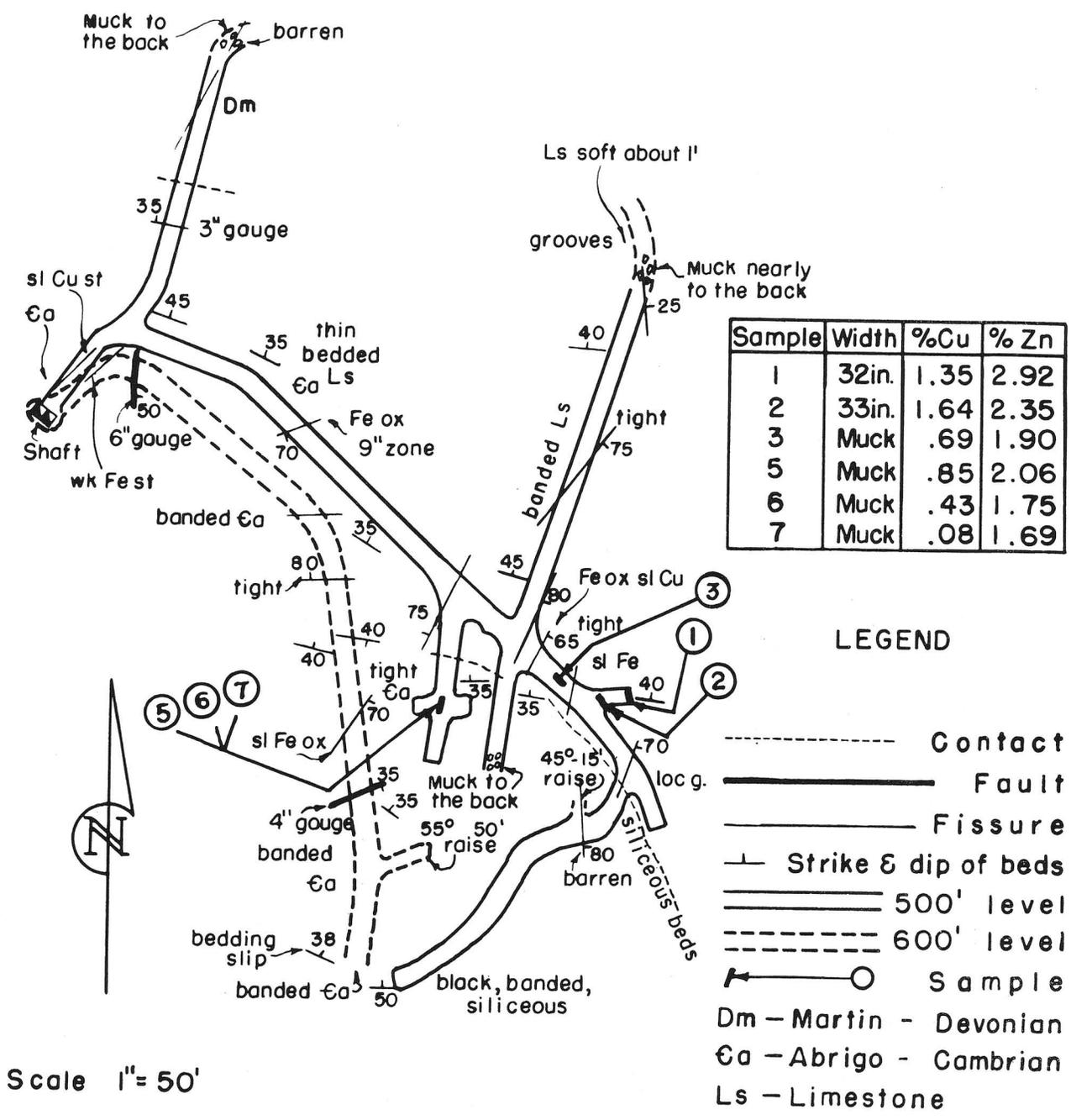


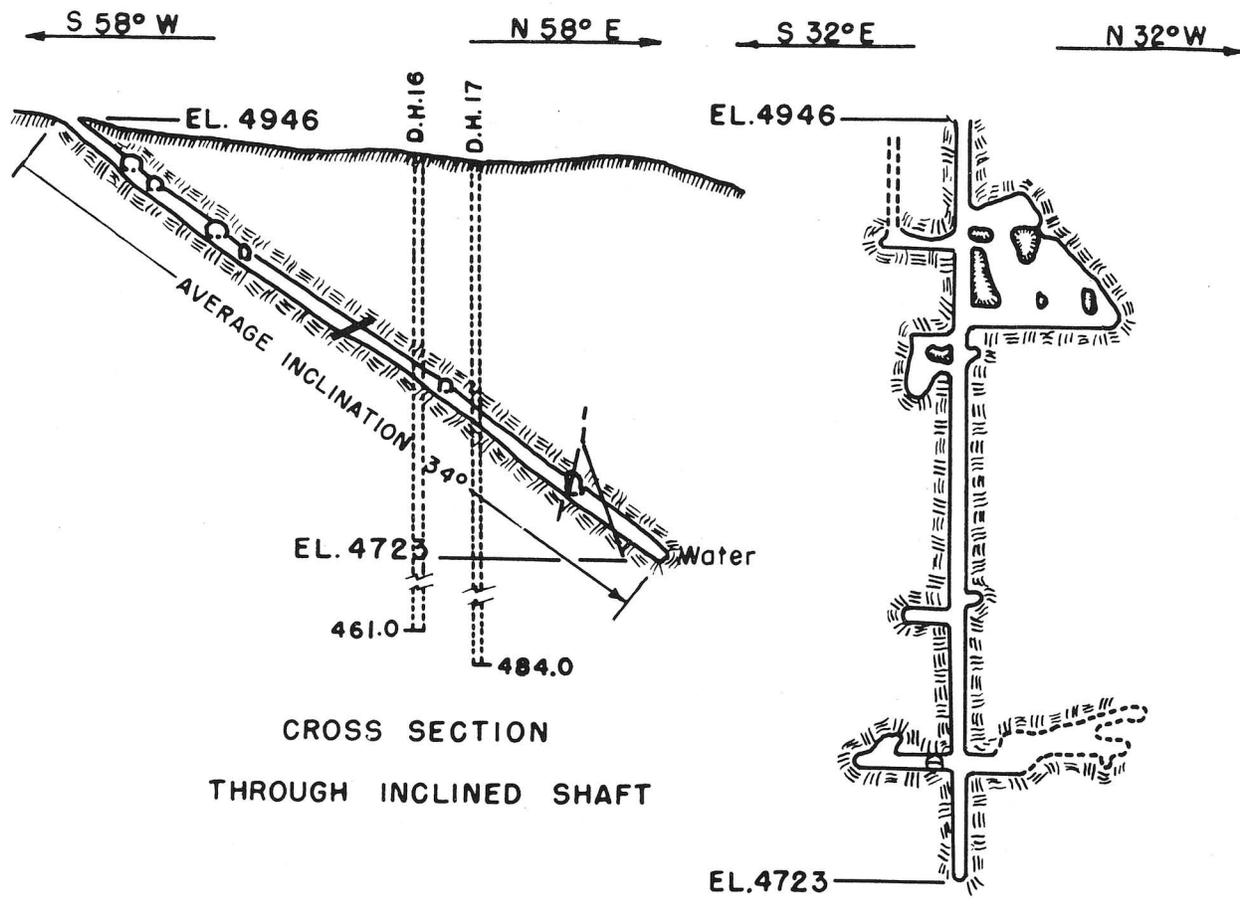
Figure 4. - Geologic map of O. K. shaft area.



Sample	Width	%Cu	%Zn
1	32in.	1.35	2.92
2	33in.	1.64	2.35
3	Muck	.69	1.90
5	Muck	.85	2.06
6	Muck	.43	1.75
7	Muck	.08	1.69

Geology by Eldred D. Wilson
 Arizona Bureau of Mines, Feb. 1945

Figure 5. - Workings from Hagerman shaft.



CROSS SECTION
THROUGH INCLINED SHAFT

LONGITUDINAL SECTION
IN THE PLANE OF THE WORKINGS



PLAN

EXPLANATION

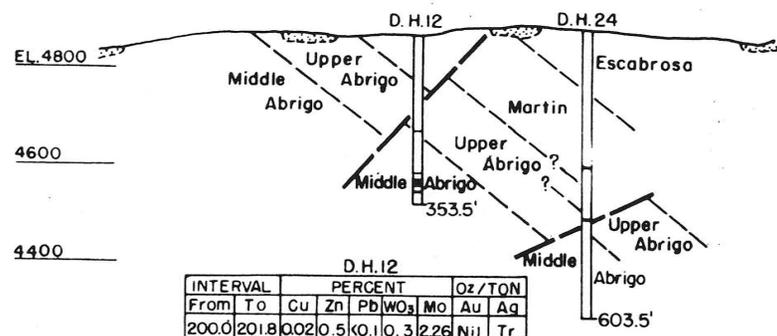
- Fault
- - - Fissure
- Strike & dip of beds

qtzt Quartzite
Ls Limestone
Chrys Chrysocollo
Fe ox Iron oxide

0 50 100 200
FEET

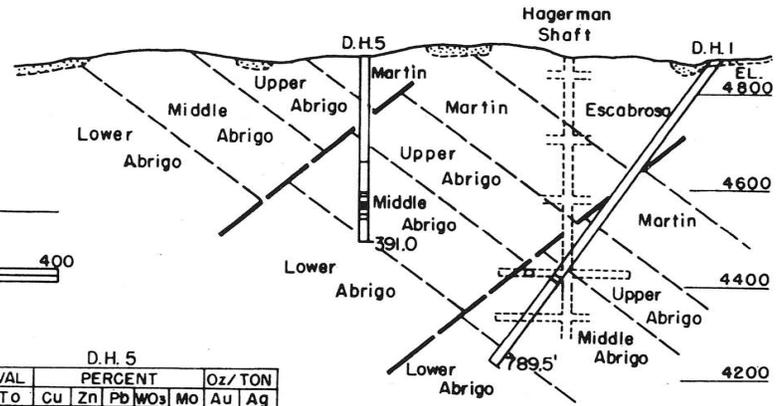
Geology by Eldred D. Wilson
Arizona Bureau of Mines, Feb. 1945

Figure 6. - Plan and sections of O. K. shaft and workings.



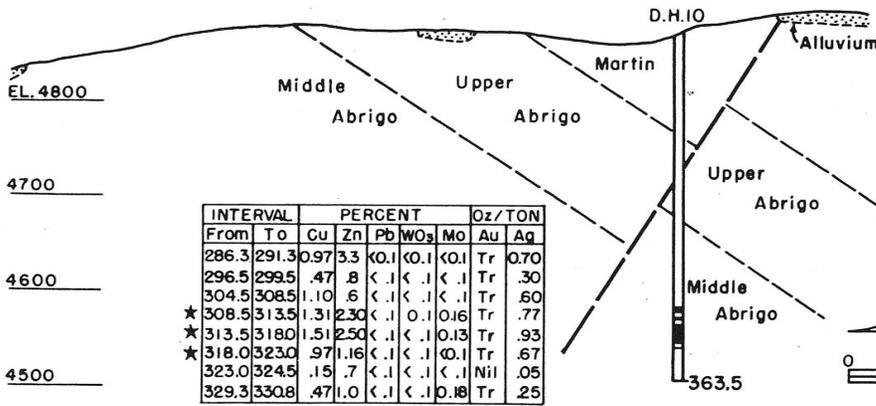
INTERVAL		PERCENT							Oz / TON	
From	To	Cu	Zn	Pb	WO ₃	Mo	Au	Ag		
200.0	201.8	0.02	0.5	<.1	<.1	0.3	2.26	Nil	Tr	
292.0	293.9	1.34	.2	<.1	<.1	.46	Tr	0.75		
305.5	310.5	.91	.1	<.1	<.1	.12	Nil	.40		
310.5	315.5	.93	.2	<.1	<.1	.26	Nil	.40		
315.5	318.2	.84	2.3	<.1	<.1	.02	Tr	.65		
328.2	330.4	.84	1.7	<.1	<.1	.12	Nil	.50		

INTERVAL		PERCENT							Oz / TON	
From	To	Cu	Zn	Pb	WO ₃	Mo	Au	Ag		
284.9	288.9	.12	Nil	<.1	<.1	<.1	Nil	0.20		
390.2	390.8	.03	0.1	<.1	<.1	.24	0.01	0.07		
392.2	392.8	.02	0.1	<.1	<.1	1.60	Nil	Tr		

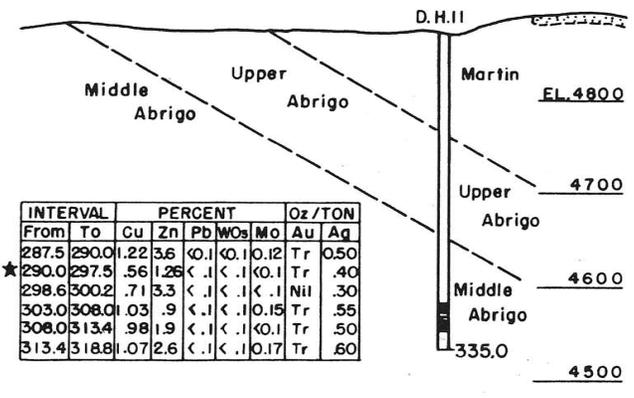


INTERVAL		PERCENT							Oz / TON	
From	To	Cu	Zn	Pb	WO ₃	Mo	Au	Ag		
227.2	229.6	0.38	2.8	<.1	<.1	<.1	Nil	Tr		
290.6	292.9	2.96	4.8	<.1	.12	.40	Tr	1.25		
296.0	295.6	7.14	.2	<.1	.33	.13	0.01	4.10		
310.7	315.0	1.07	1.0	<.1	<.1	.13	Tr	.24		
315.4	316.4	1.89	3.4	<.1	<.1	<.1	Nil	.20		
317.0	318.8	1.43	2.0	<.1	<.1	<.1	Nil	.40		
318.8	320.2	7.29	5.4	<.1	.12	.12	Tr	3.70		
320.2	326.5	1.79	3.9	<.1	<.1	<.1	0.06	1.15		
335.4	336.8	2.19	.9	<.1	<.1	.10	Tr	1.30		
346.1	346.5	2.73	.2	<.1	<.1	<.1	Nil	1.20		

INTERVAL		PERCENT							Oz / TON	
From	To	Cu	Zn	Pb	WO ₃	Mo	Au	Ag		
569.6	570.1	0.83	0.95	<.1	<.1	<.1	Tr	0.5		
570.1	570.4	3.50	7.1	<.1	<.1	<.1	0.01	.6		
570.4	570.9	.69	1.1	<.1	<.1	<.1	Tr	.1		
573.0	574.3	.57	.75	<.1	<.1	<.1	Tr	.2		
574.3	574.8	1.81	4.15	<.1	<.1	<.1	Tr	.7		
574.8	580.8	.55	.85	<.1	<.1	<.1	Tr	.1		



INTERVAL		PERCENT							Oz / TON	
From	To	Cu	Zn	Pb	WO ₃	Mo	Au	Ag		
286.3	291.3	0.97	3.3	<.1	<.1	<.1	Tr	0.70		
296.5	299.5	.47	.8	<.1	<.1	<.1	Tr	.30		
304.5	308.5	1.10	.6	<.1	<.1	<.1	Tr	.60		
★ 308.5	313.5	1.31	2.30	<.1	<.1	0.16	Tr	.77		
★ 313.5	318.0	1.51	2.50	<.1	<.1	0.13	Tr	.93		
★ 318.0	323.0	.97	1.16	<.1	<.1	0.1	Tr	.67		
323.0	324.5	.15	.7	<.1	<.1	<.1	Nil	.05		
329.3	330.8	.47	1.0	<.1	<.1	0.18	Tr	.25		



INTERVAL		PERCENT							Oz / TON	
From	To	Cu	Zn	Pb	WO ₃	Mo	Au	Ag		
287.5	290.0	.22	3.6	<.1	<.1	0.12	Tr	0.50		
298.6	300.2	.71	3.3	<.1	<.1	<.1	Nil	.30		
★ 290.0	297.5	.56	1.26	<.1	<.1	<.1	Tr	.40		
303.0	308.0	.03	.9	<.1	<.1	0.15	Tr	.55		
308.0	313.4	.98	1.9	<.1	<.1	<.1	Tr	.50		
313.4	318.8	1.07	2.6	<.1	<.1	0.17	Tr	.60		

★ — Weighted grade of core and sludge sample intervals

Figure 7. - Sections through drill holes 1, 5, 10, 11, 12, and 24.

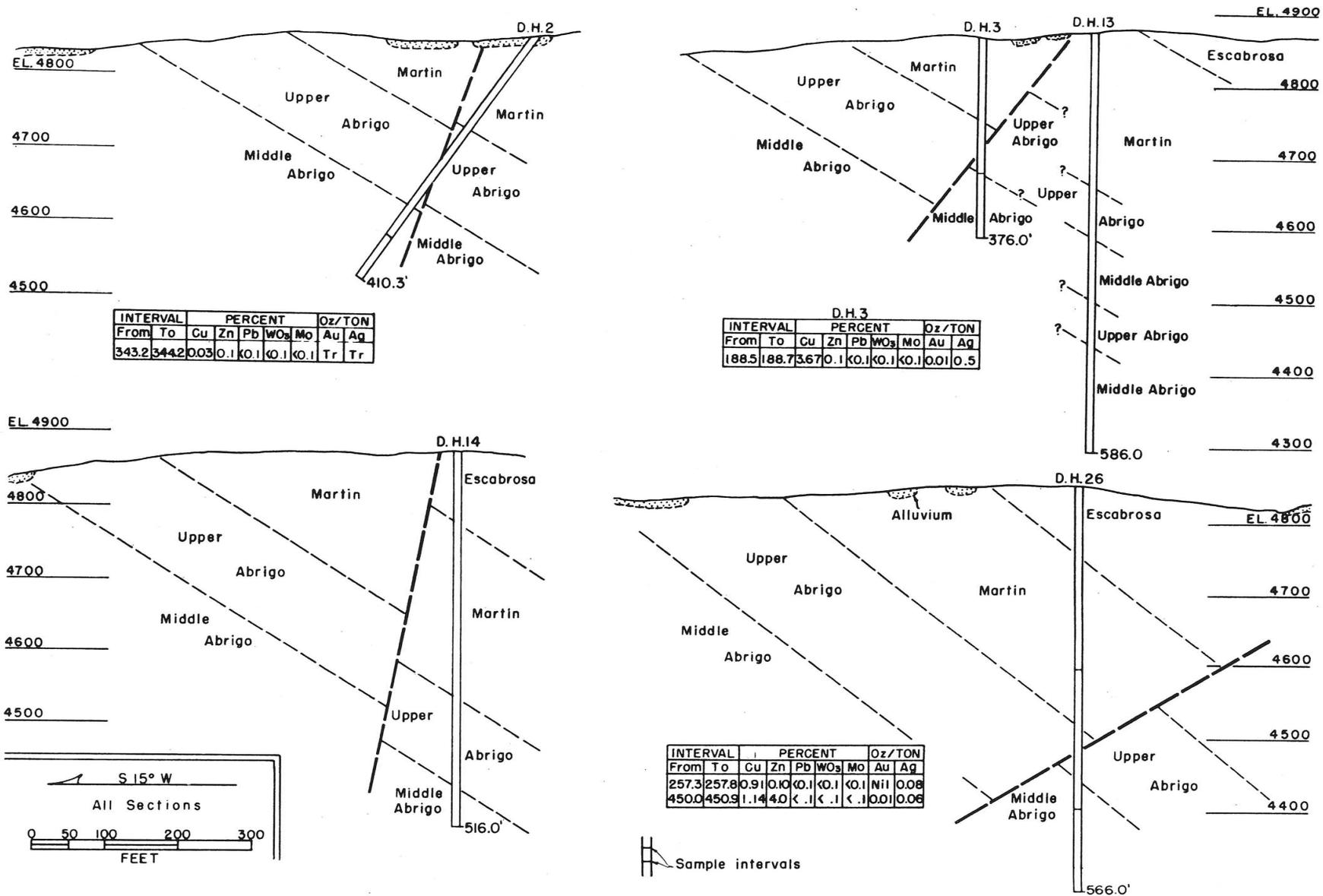


Figure 8. - Sections through drill holes 2, 3, 13, 14, and 26.

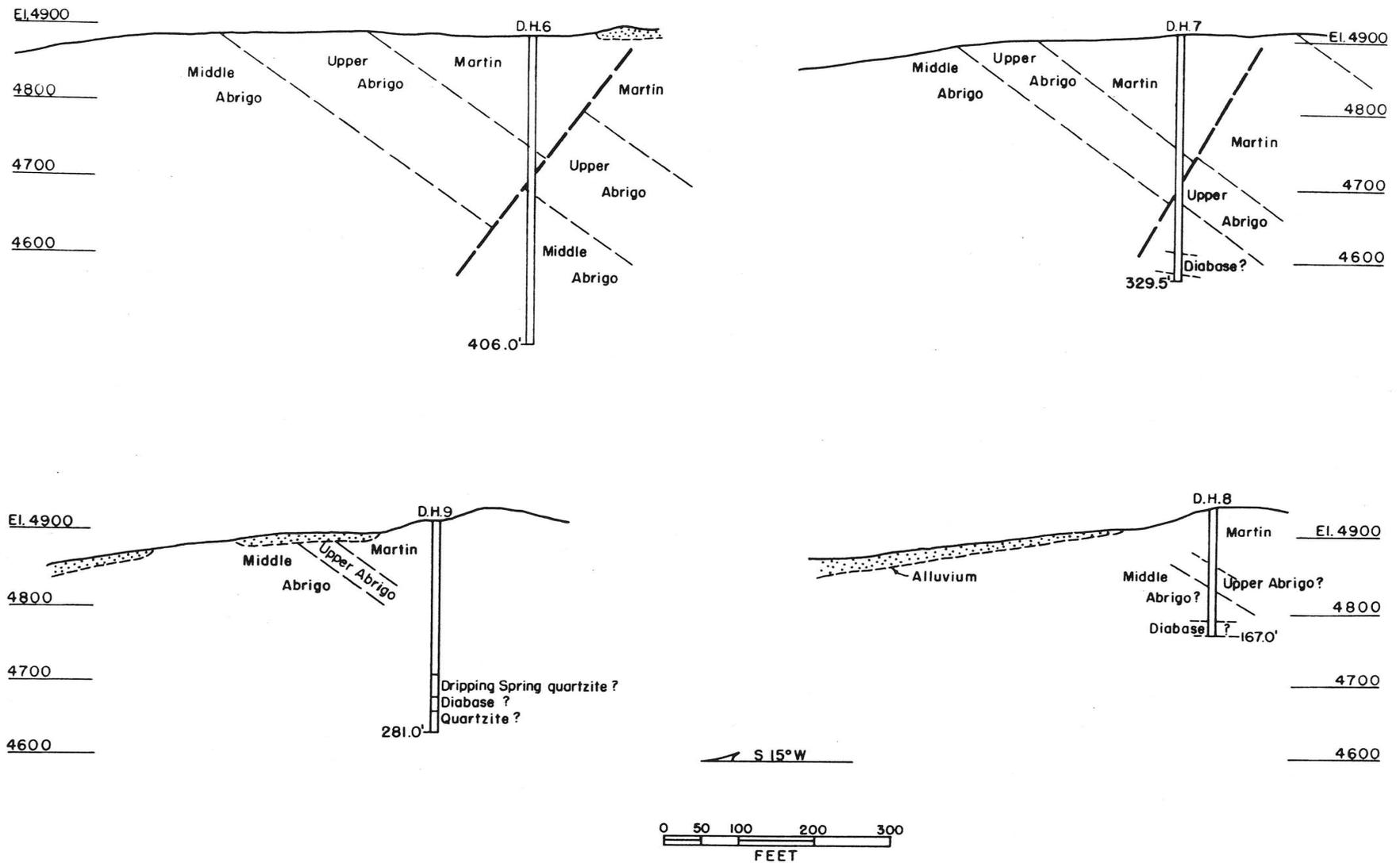


Figure 9. - Sections through drill holes 6, 7, 8, and 9.

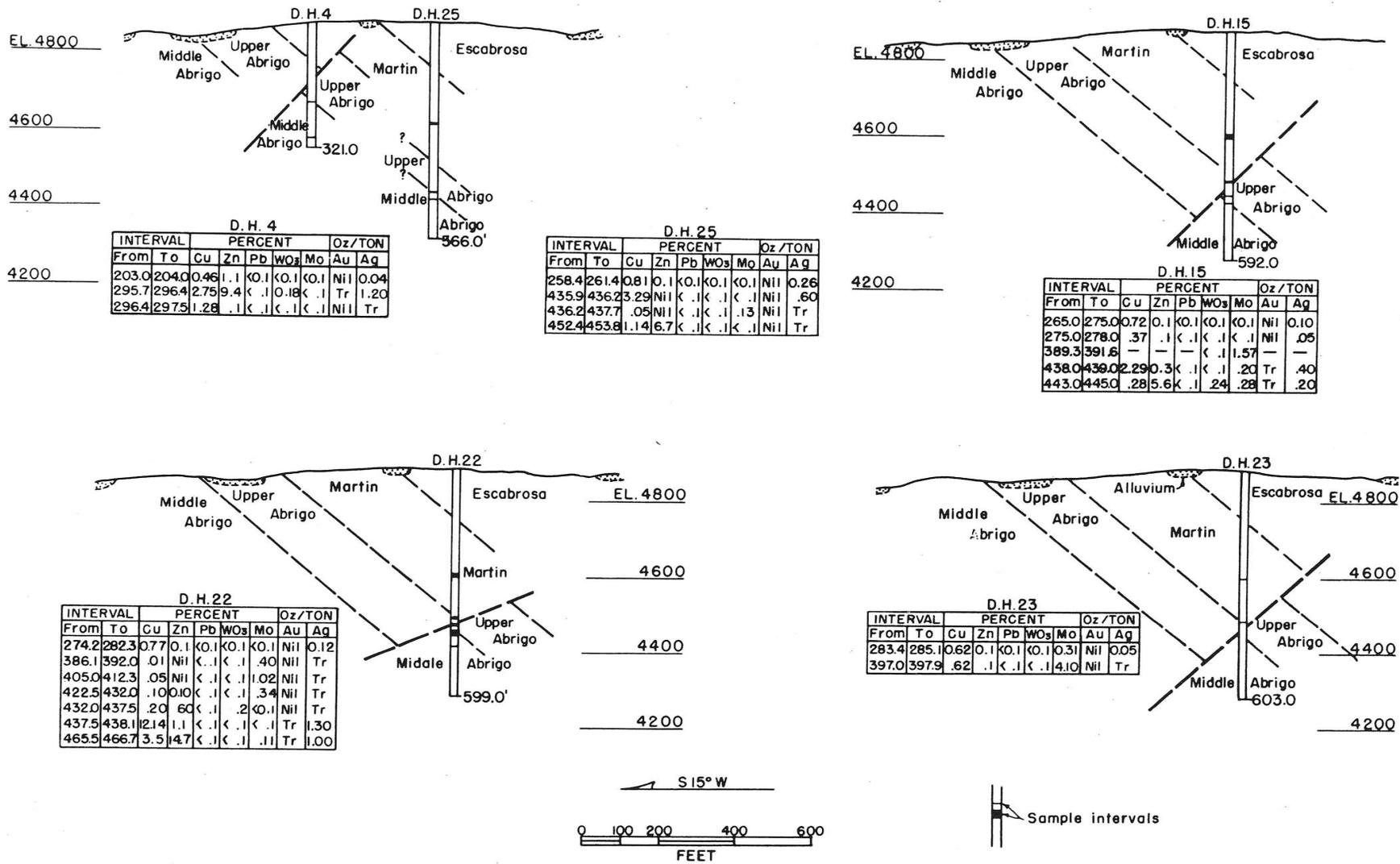
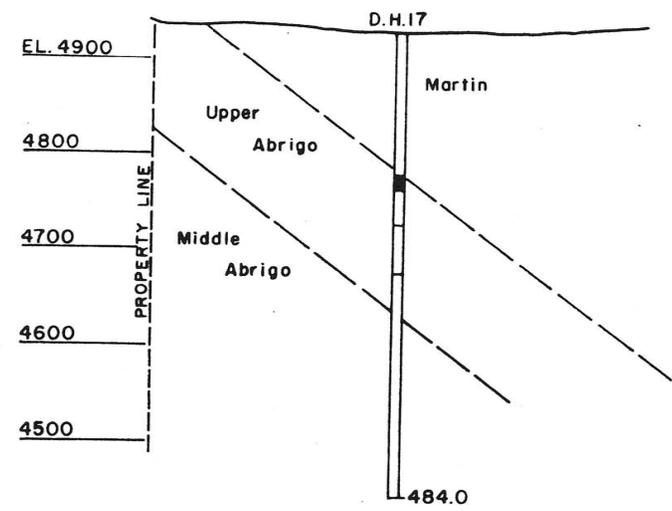
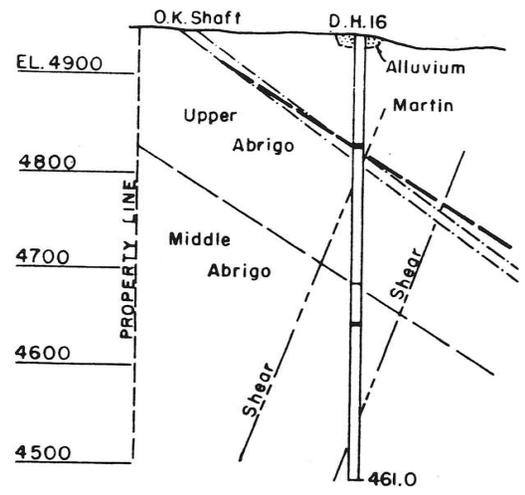


Figure 10. - Sections through drill holes 4, 15, 22, 23, and 25.

S 31° W



D. H. 16

INTERVAL		PERCENT						Oz/TON	
From	To	Cu	Zn	Pb	WO ₃	Mo	Au	Ag	
112.5	116.5	0.37	0.15	<.1	<.1	<.1	Nil	Tr	
259.0	260.6	.21	.20	<.1	<.1	<.1	Nil	Tr	
303.0	306.6	.09	.10	<.1	<.1	<.1	Nil	Tr	

D. H. 17

INTERVAL		PERCENT						Oz/TON	
From	To	Cu	Zn	Pb	WO ₃	Mo	Au	Ag	
148.8	158.8	0.36	0.1	<.1	<.1	<.1	Nil	Tr	
158.8	164.0	.44	.1	<.1	<.1	<.1	Nil	Tr	
164.0	164.6	.49	.1	<.1	<.1	<.1	Nil	Tr	
209.0	209.4	1.27	.1	<.1	<.1	<.1	Nil	0.12	
252.0	253.0	1.50	1.3	<.1	<.1	<.1	Nil	0.14	

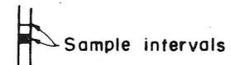


Figure 11. - Sections through drill holes 16 and 17.

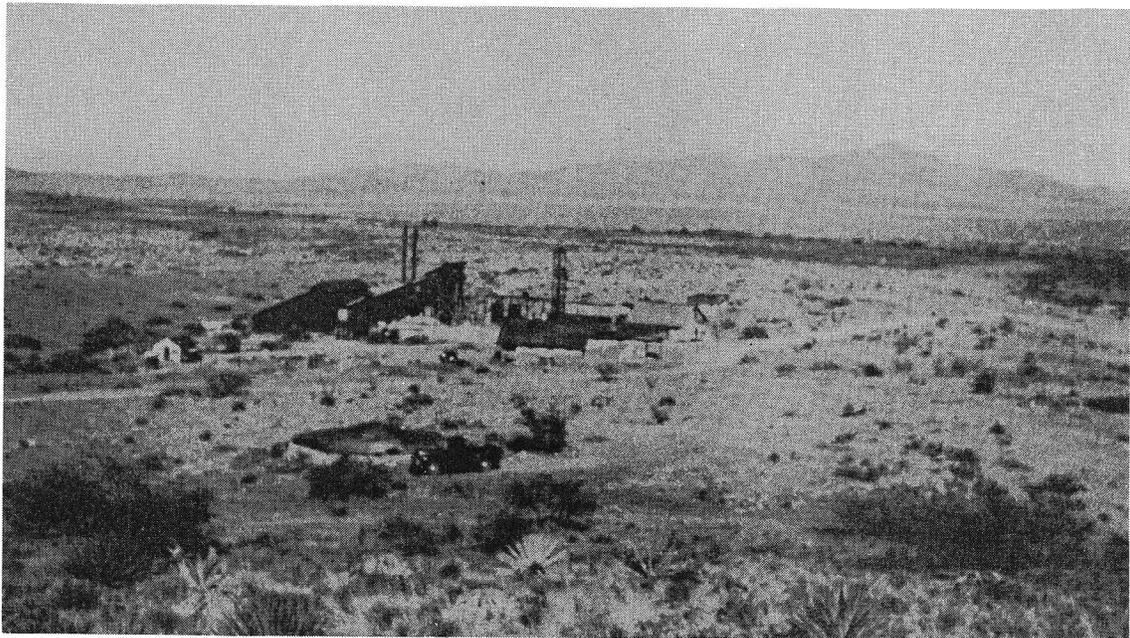


Figure 12. - Hagerman shaft from near northwest corner St. George claim.

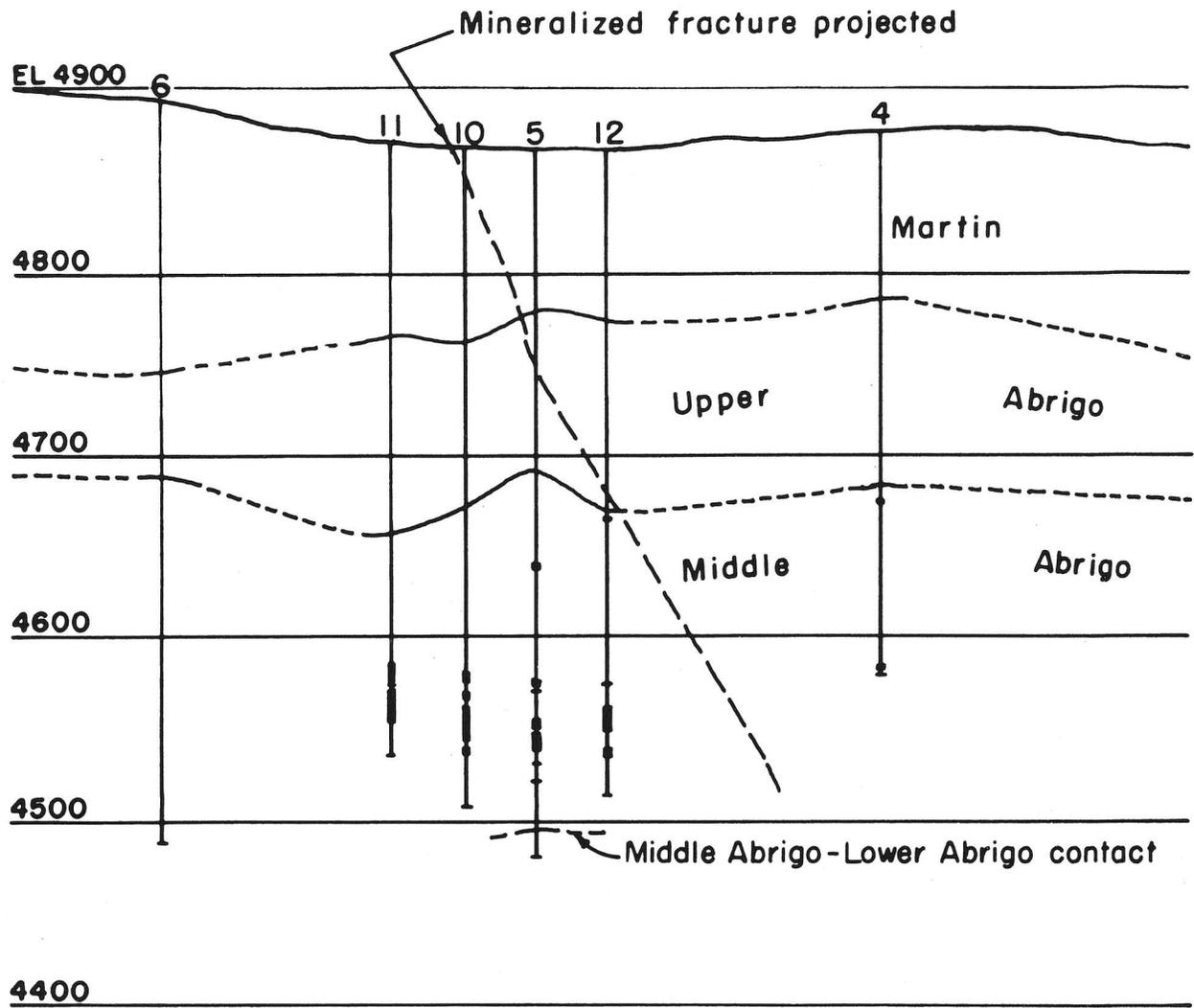


Figure 13. - Section through south line of holes.

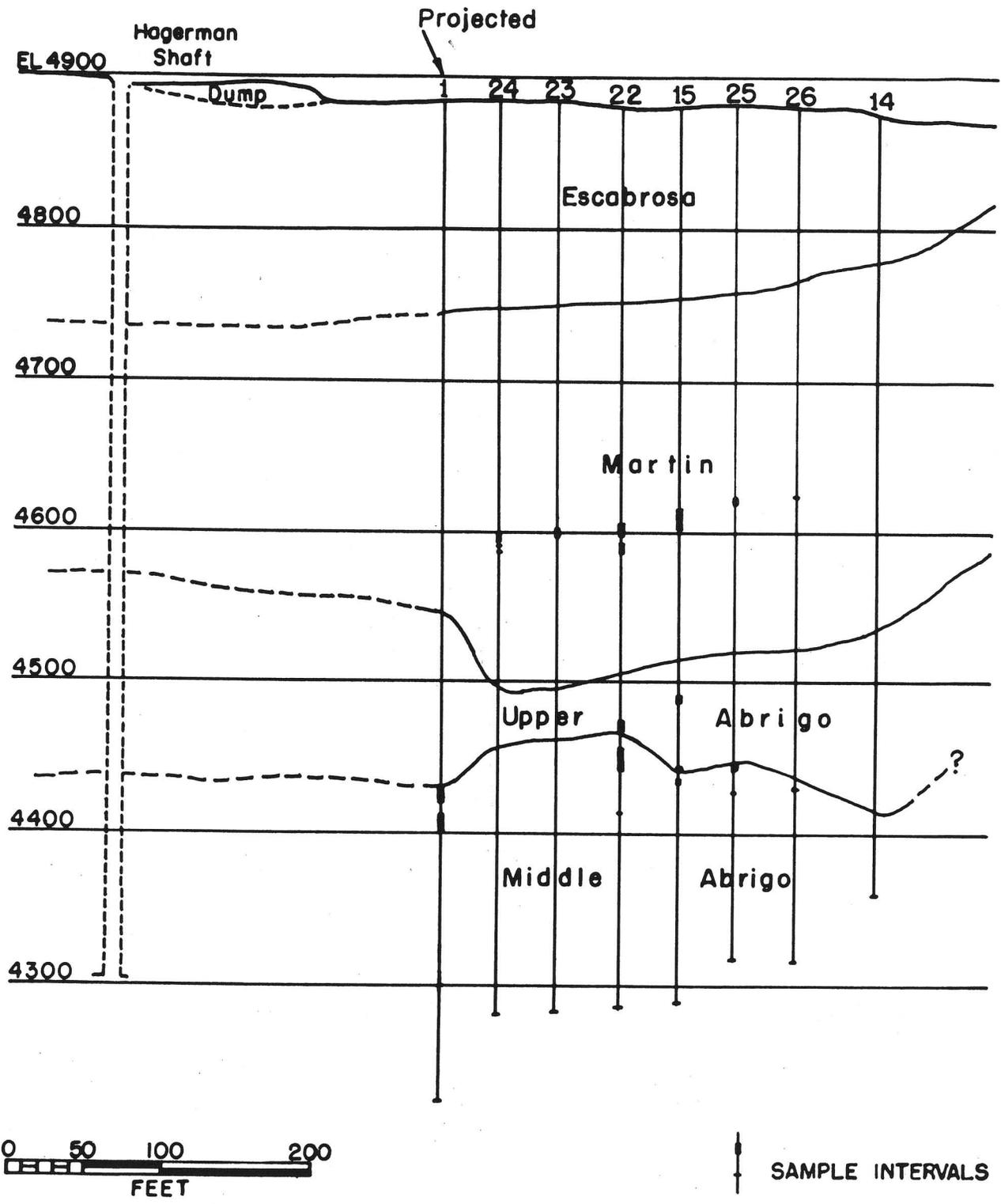


Figure 14. - Section through north line of holes.

Each drill hole was capped with a marker showing the hole number, date the hole was completed, and the project number.

Drilling, sampling, and core-recovery data are given in tables 1 and 2.

Figure 12 is a view of the Hagerman shaft area and a picture of a drill set-up.

Longitudinal sections through the south line of holes 6, 11, 10, 5, 12, and 4 and the north line of holes 1, 24, 23, 22, 15, 25, 26, and 14 are shown on figures 13 and 14, respectively.

TABLE 1. - Drilling data

Hole	Feet										
	Depth	Stand-pipe (4 inch)	Drilled bit size			Reamed			Cased		
			NX	BX	AX	NX to NC	BX to NX	AX to BX	NX	BX	AX
1	789.5	6.0	12.0	162.0	609.5	-	-	143.0	-	18.0	323.0
2	410.3	2.0	70.0	240.0	98.3	13.0	-	-	13.0	72.0	312.0
3	276.0	3.0	58.0	112.0	103.0	12.0	-	77.0	15.0	61.0	250.0
4	321.0	2.0	125.0	84.0	110.0	-	-	-	-	127.0	211.0
5	391.0	10.0	46.0	140.0	195.0	-	-	-	-	56.0	196.0
6	406.0	12.0	59.0	152.5	182.5	-	35.0	-	-	106.0	223.5
7	329.5	1.0	59.0	182.0	87.5	-	52.0	-	-	112.0	242.0
8	167.0	1.0	111.0	55.0	-	-	-	-	-	112.0	-
9	281.0	1.0	59.0	142.0	79.0	42.0	-	-	43.0	60.0	202.0
10	363.5	1.0	63.0	71.0	228.5	-	-	70.0	-	64.0	205.0
11	335.0	2.0	145.0	143.0	45.0	-	-	-	-	147.0	290.0
12	353.5	1.0	96.0	188.5	68.0	-	-	-	-	97.0	285.0
13	586.0	1.0	129.0	206.0	250.0	-	57.0	-	-	187.0	336.0
14	516.0	2.0	165.0	214.0	135.0	-	-	-	-	167.0	381.0
15	592.0	1.0	129.0	255.0	207.0	-	-	-	-	130.0	385.0
16	461.0	2.0	119.0	240.0	100.0	-	24.0	-	-	145.0	361.0
17	484.0	2.0	162.0	66.0	254.0	-	-	-	-	164.0	230.0
22	599.0	1.0	119.0	212.0	267.0	20.0	130.0	-	21.0	250.0	332.0
	68.0 ^{1/}				68.0						
23	603.0	1.0	166.0	101.0	335.0	69.0	-	-	70.0	161.0	268.0
24	603.5	1.0	166.0	108.0	328.5	64.0	-	41.0	65.0	167.0	316.0
25	566.0	-	172.0	85.0	309.0	-	-	-	-	172.0	257.0
26	566.0	1.0	111.0	142.0	312.0	29.0	-	68.0	30.0	112.0	322.0
Total ..	10,067.8	54.0	2,341.0	3,301.0	4,371.8	249.0	298.0	399.0	257.0	2,693.0	5,928.0

^{1/} Deflection drilling.

TABLE 2. - Sampling and core-recovery data

Hole.	No. of samples	Feet sampled	Core recovery, percent	Core recovery in ore horizon		Over-all core recovery	
				Feet	Percent	Feet	Percent
1	6	9.1	100	167.4	79.7	646.1	81.3
2	1	1.0	100	117.5	96.1	300.4	73.2
3	1	0.2	100	61.2	70.3	157.6	57.1
4	3	2.8	100	111.6	88.5	193.2	60.2
5	10	21.6	98.6	165.7	84.5	223.4	57.1
6	-	-	-	154.5	77.3	239.2	58.9
7	-	-	-	48.3	48.3	96.5	29.3
8	-	-	-	6.1	11.1	62.5	37.4
9	-	-	-	-	-	37.8	13.4
10	8	27.5	93.2	101.6	60.3	204.1	56.1
11	6	24.8	90.5	95.4	80.1	186.8	55.8
12	6	17.9	96.2	120.9	78.3	190.8	53.9
13	-	-	-	152.0	61.8	327.2	55.8
14	-	-	-	41.0	74.5	223.7	43.4
15	5	18.8	100	124.9	84.2	344.0	58.1
16	3	9.2	100	141.5	70.0	305.5	66.3
17	5	16.4	95.3	188.8	86.6	333.9	69.0
22 ^{1/}	8	37.3	97.9	121.6	67.2	295.2	49.3
23	2	2.6	100	141.8	78.3	320.7	53.1
24	3	4.8	100	135.7	75.6	332.6	55.1
25	4	4.8	100	96.6	75.5	294.8	52.1
26	2	1.4	100	93.8	77.5	249.5	44.1
Total .	79	200.2	96.0	2,387.9	75.4	5,565.5	55.3

^{1/} Hole deflected; two samples substituted for one rejected.

APPENDIX

Log of diamond-drill hole No. 1

Keystone and St. George Project 1484
 Location: N 4960, E. 10779 Dip: -55°
 Collar elevation: 4,870 feet Bearing: S 15° W
 Depth: 789.5 feet Date: 11/13 to 12/3/47

Footage		Description	Formation	Name
From	To			
0	6.0	Sand and gravel		
6.0	290.0	Limestone and dolomite		Escabrosa
290.0	302.0	Sheared hornstone		Martin
302.0	343.0	Dolomite limestone		"
343.0	394.0	Tactite		"
394.0	409.0	Hornfels		"
409.0	428.0	Tactite		"
428.0	466.0	Tactite, part hornfelsic		Abrigo
466.0	480.0	Limestone		"
480.0	506.0	Tactite		"
506.0	569.6	Tactite, tr. mineralization.		"
569.6	570.9	Mineralized garnet tactite.		"
570.9	573.0	Garnet tactite		"
573.0	580.8	Mineralized garnet tactite		"
580.8	595.0	Tactite		"
595.0	612.6	Limestone and hornfels		"
612.6	749.0	Crenulated limestone*		"
749.0	789.5	Hornstone, some crenulated limestone"		"

*Crenulated limestone as used in logs denotes gray limestone with abundant irregular partings of dark hornfels.

Hole No. 2

Location: N. 4360, E. 11249 Dip: -55°
 Collar elevation: 4862 feet Bearing: S 15° W
 Depth: 410.3 feet Date: 12/5 to 12/12/47

0	2.0	Sand		
2.0	76.0	Dolomite		Martin
76.0	88.0	Limestone		"
88.0	114.0	Tactite		"
114.0	130.0	Hornfels		"
130.0	159.0	Limestone		"
159.0	181.0	Tactite		Abrigo
181.0	184.0	Limestone		"
184.0	264.0	Tactite and limestone		"
264.0	288.0	Tactite		"

Hole No. 2, Continued

Footage		Description	Formation	Name
From	To			
288.0	328.0	Limestone and hornfels		Abrigo
328.0	335.0	Tactite		"
335.0	336.0	Limestone		"
336.0	343.2	Sandstone, limestone and hornfels		"
343.2	344.2	Like 336.0-343.2, with mineralization		"
344.2	372.0	Sandstone, limestone and hornstone		"
372.0	410.3	Crenulated limestone		"

Hole No. 3

Location: N. 4249, E. 10998 Dip: Vertical
 Collar elevation: 4,864 feet Date: 12/15/47 to 1/6/48
 Depth: 276.0 feet.

0	3.0	Sand and gravel		
3.0	30.0	Limestone		Martin
30.0	46.0	Tactite		"
46.0	48.0	Limestone		"
48.0	52.0	Tactite		"
52.0	73.0	Hornfels		"
73.0	113.0	Limestone		"
113.0	124.0	Tactite		Abrigo
124.0	130.0	Limestone		"
130.0	188.5	Tactite and limestone		"
188.5	188.7	Like 130.0-188.5, with mineralization		"
188.7	217.0	Tactite		"
217.0	245.0	Hornfels, garnet tactite and limestone		"
245.0	250.5	Limewtone with little garnet		"
250.5	255.0	Limestone		"
255.0	276.0	Sandstone, bands limestone and shale; lower part resembles crenulated limestone		"

Hole No. 4

Location: N. 4212, E. 10766 Dip: Vertical
 Collar elevation: 4,876 feet Date: 1/7 to 1/14/48
 Depth: 321.0 feet.

0	2.0	Sand		
2.0	34.0	Tactite		Martin
34.0	35.0	Limestone		"
35.0	67.0	Tactite and hornfels		"
67.0	91.0	Limestone		"
91.0	195.0	Tactite		Abrigo
195.0	203.0	Limestone and hornfels		"
203.0	204.0	Mineralized limestone		"
204.0	226.0	Limestone and hornfels		"
226.0	252.0	Sandstone with little garnet		"
252.0	253.0	Rusty shear zone		"
253.0	295.7	Crenulated limestone		"
295.7	296.4	Mineralized crenulated limestone, garnet"		"

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Hole No. 4, continued

Footage		Description	Formation	
From	To		Name	
296.4	297.5	Mineralized crenulated limestone, garnet		
297.5	302.0	Crenulated limestone & little garnet	Abrigo	
302.0	321.0	Crenulated limestone	"	

Hole No. 5

Location: N. 4259, E. 10581 Dip: Vertical
 Collar elevation: 4870 feet Date: 1/15 to 1/23/48
 Depth: 391.0 feet

Footage From	Footage To	Description	Formation Name
0	10.0	Sand and gravel	
10.0	45.0	Tactite	Martin
45.0	60.0	Hornfels	"
60.0	90.0	Limestone	"
90.0	94.0	Quartzite and tactite	Abrigo
94.0	106.0	Tactite	"
106.0	116.0	Limestone	"
116.0	176.0	Tactite	"
176.0	216.0	Hornfels and garnetized limestone	"
216.0	227.2	Sandstone and garnetized limestone	"
227.2	229.6	Like 216.0-227.2, mineralized	"
229.6	246.0	Sandstone and limestone	"
246.0	288.0	Crenulated limestone	"
288.0	290.6	Crenulated limestone, garnet	"
290.6	292.9	Mineralized garnet tactite	"
292.9	295.6	Garnet tactite	"
295.6	310.7	Hornfels and garnet limestone	"
310.7	315.0	Mineralized garnet tactite	"
315.0	315.4	Garnet tactite and hornfels	"
315.4	316.4	Mineralized garnet tactite	"
316.4	317.0	Garnet tactite	"
317.0	326.5	Mineralized garnet tactite	"
326.5	335.4	Limestone garnet	"
335.4	336.8	Mineralized garnet limestone	"
336.8	346.1	Limestone, garnet	"
346.1	346.5	Mineralized garnet limestone	"
346.5	360.0	Limestone and garnet	"
360.0	367.5	Crenulated limestone	"
367.5	372.0	Garnet tactite	"
372.0	391.0	Hornstone and garnet	"

Log of diamond drill hole No. 6

Keystone and St. George Project 1484

Location: N. 4338, E. 10391 Dip: vertical
 Collar elevation: 4893 feet Date: 1/24/ to 2/5/48
 Depth: 406.0 feet

Footage		Description	Formation	
From	To		Name	
0	2.0	Sand		
2.0	29.0	Dolomite		Martin
29.0	77.0	Tactite		"
77.0	91.0	Hornfels		"
91.0	147.0	Limestone		"
147.0	205.0	Tactite and limestone		Abrigo
205.0	206.0	Limestone		"
206.0	214.0	Garnet-epidote tactite		"
214.0	248.0	Tactite		"
248.0	255.5	Rusty shear zone		"
255.5	296.0	Tactite, trace garnet		"
296.0	325.0	Tactite, garnet and limestone		"
325.0	330.0	Tactite and garnet		"
330.0	406.0	Crenulated limestone		"

Note: No samples taken.

Hole No. 7

Location: N. 4374, E 10196 Dip: Vertical
 Collar elevation: 4908 Date: 2/6 to 2/13/48
 Depth: 329.5

Footage From	Footage To	Description	Formation Name
0	1.0	Sand	
1.0	10.0	Dolomite	Martin
10.0	60.0	Tactite and limestone	"
60.0	105.0	Limy sludge	"
105.0	158.0	Limestone	"
158.0	221.0	Tactite and limestone	Abrigo
221.0	231.0	Tactite and trace garnet and epidote	"
231.0	233.0	Hornfels	"
233.0	245.0	Garnet tactite	"
245.0	289.0	Limestone, garnet and hornfels	"
289.0	321.0	Apache diabase?	?
321.0	329.5	Sandstone (Apache or Pinal)	?

Note: No samples taken

Log of diamond drill hole No. 8
Keystone and St. George Project 1484

Location: N. 4640, E. 9901
Collar elevation: 4940 feet
Depth: 167.0 feet

Dip: Vertical
Date: 2/14 to 2/16/48

Footage		Description	Formation	
From	To			Name
0	1.0	Sand		
1.0	30.0	Dolomite		Martin
30.0	44.0	Limestone		"
44.0	77.0	Dolomite		"
77.0	112.0	Tactite		Abrigo
112.0	137.0	Hornfels and limestone		"
137.0	149.0	No core - limy sludge.	?	
149.0	167.0	Altered Apache diabase?	?	

Notes: Poor core recovery. Formations penetrated and contacts below Martin formation are doubtful. No samples taken.

Hole No. 9

Location: N. 4493, E. 10040
Collar elevation: 4915 feet
Depth: 281.0 feet

Dip: Vertical
Date: 2/17 to 2/21/48

Footage		Description	Formation	
From	To			Name
0	1.0	Sand		
1.0	57.0	Dolomite		Martin
57.0	168.5	Tactite and limestone		"
168.5	187.5	Quartzite and hornfels		
187.5	202.0	No core - siliceous sludge	?	
202.0	236.5	Dripping Spring, Quartzite? and Schist	?	
236.5	255.0	Altered Apache diabase?	?	
255.0	281.0	Quartzite and soft zones	?	

Notes: Poor core recovery. Formation penetrated and contacts below Martin formation are doubtful. No samples taken.

Log of diamond drill hole No. 10
Keystone and St. George Project 1484

Location: N. 4274, E. 10545
Collar elevation: 4870 feet
Depth: 363.5 feet

Dip: Vertical
Date: 2/23 to 3/3/48

Footage		Description	Formation	
From	To			Name
0	1.0	Sand		
1.0	20.0	Limestone		Martin
20.0	63.0	Tactite		"
63.0	74.0	Hornfels		"
74.0	108.0	Limestone, hornfels and tactite		"
108.0	185.5	Tactite and limestone		Abrigo
185.5	195.0	Rusty shear zone		"
195.0	209.0	Garnet-epidote tactite		"
209.0	243.0	Garnet tactite and hornfels		"
243.0	286.3	Crenulated limestone		"
286.3	291.3	Mineralized garnet limestone		"
291.3	296.5	Garnet limestone		"
296.5	299.5	Mineralized garnet limestone		"
299.5	304.5	Garnet limestone		"
304.5	324.5	Mineralized garnet limestone		"
324.5	329.3	Garnet limestone		"
329.3	330.8	Mineralized garnet limestone		"
330.8	362.0	Garnet limestone		"
362.0	363.5	Hornfels with thin garnet bands		"

Hole No. 11

Location: N. 4290, E. 10507
Collar elevation: 4872 feet
Depth: 335.0 feet.

Dip: Vertical
Date: 3/3 to 3/6/48

Footage		Description	Formation	
From	To			Name
0	2.0	Sand		
2.0	20.0	Limestone		Martin
20.0	32.0	Limestone, tactite and hornfels		"
32.0	82.0	Tactite, hornfels and quartzite		"
82.0	107.0	Limestone		"
107.0	125.0	Tactite		Abrigo
125.0	161.0	Limestone		"
161.0	200.5	Tactite and hornfels		"
200.5	216.0	Garnet tactite, sheared and rusty		"
216.0	245.0	Garnet limestone and hornfels		"
245.0	287.5	Crenulated limestone		"
287.5	290.0	Garnet tactite and limestone		"
290.0	297.5	Mineralized garnet tactite		"
297.5	298.6	Garnet tactite and limestone		"
298.6	300.2	Mineralized garnet tactite		"
300.2	303.0	Garnet tactite and limestone		"
303.0	318.8	Mineralized garnet tactite		"
318.8	335.0	Limestone, hornfels and garnet		"

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Log of diamond drill hole No. 12
Keystone and St. George Project 1484

Location: N. 4243, E. 10617 Dip: Vertical
Collar elevation: 4870 feet Date: 3/8 to 3/12/48
Depth: 353.5

Footage		Description	Formation	
From	To		Name	
0	1.0	Sand		
1.0	12.0	Limestone	Martin	
12.0	40.0	Tactite and hornfels	"	
40.0	66.0	Hornfels	"	
66.0	176.0	Limestone, tactite and hornfels	Abrigo	
176.0	199.0	Tactite	"	
199.0	200.0	Garnet tactite	"	
200.0	201.8	Mineralized garnet tactite	"	
201.8	231.0	Garnet tactite	"	
231.0	245.0	Sandstone	"	
245.0	284.5	Crenulated limestone	"	
284.5	292.0	Garnet limestone and hornfels	"	
292.0	293.9	Mineralized garnet limestone	"	
293.9	305.5	Garnet limestone and hornfels	"	
305.5	318.2	Mineralized garnet limestone	"	
318.2	328.2	Garnet limestone	"	
328.2	330.4	Mineralized garnet limestone	"	
330.4	336.5	Garnet limestone	"	
336.5	353.5	Crenulated limestone	"	

Hole No. 13

Location: N. 4395, E. 11075 Dip: Vertical
Collar elevation: 4875 feet Date: 3/13 to 4/10/48
Depth: 586.0 feet

0	1.0	Sand		
1.0	129.0	Dolomite	Martin	
129.0	139.0	Limestone	"	
139.0	141.5	Tactite	"	
141.5	143.5	Soft limy breccia	"	
143.5	150.0	Limestone	"	
150.0	193.0	Tactite	"	
193.0	216.0	Limestone	"	
216.0	229.0	Tactite	Abrigo	
229.0	260.0	Tactite and limestone	"	
260.0	284.0	Tactite and hornfels	"	
284.0	286.0	Garnet-epidote tactite	"	

Hole No. 13, continued

Footage		Description	Formation	
From	To		Name	
286.0	346.0	Crenulated limestone and garnet	Abrigo	
346.0	375.0	Breccia and sheared; quartz and calcite seams	"	
375.0	405.0	Tactite	"	
405.0	407.0	Quartzite	"	
407.0	431.0	Tactite and hornfels	"	
431.0	433.5	Tactite and garnet	"	
433.5	453.5	Garnet limestone	"	
453.5	455.0	Rusty breccia	"	

Note: No samples taken.

Hole No. 14

Location: N. 4479, E. 10392 Dip: Vertical
Collar elevation: 4,879 feet Date: 3/20 to 3/29/48
Depth: 516 feet

0	2.0	Sand		
2.0	97.0	Dolomite	Escabrosa	
97.0	115.0	Hornfels	Martin	
115.0	235.0	Dolomite	"	
235.0	295.0	Tactite, limestone and olivine	"	
295.0	313.0	Hornstone	"	
313.0	337.0	Limestone, dolomite and hornfels	"	
337.0	392.0	Tactite	Abrigo	
392.0	401.0	Limestone	"	
401.0	459.0	Tactite and limestone	"	
459.0	461.0	Brecciated, sheared and rusty	"	
461.0	468.0	Limestone, garnet and hornfels	"	
468.0	496.0	Sandstone, limestone and hornfels	"	
496.0	516.0	Crenulated limestone	"	

Note: no samples taken.

Hole No. 15

Location: N. 4539, E. 10816 Dip: Vertical
Collar elevation: 4882 feet Date: 3/30 to 4/7/48
Depth: 592.0 feet

0	1.0	Sand		
1.0	124.0	Dolomite and limestone	Escabrosa	
124.0	146.0	Hornfels	Martin	
146.0	265.0	Dolomite	"	
265.0	278.0	Mineralized tactite	"	
278.0	284.0	Tactite	"	
284.0	295.5	Limestone, tactite and olivine	"	
295.5	324.0	Tactite	"	

Hole No. 15, continued

Footage		Description	Formation	Name
From	To			
324.0	344.0	Hornfels		Martin
344.0	365.0	Limestone		"
365.0	366.0	Breccia		Abrigo
366.0	389.3	Tactite and limestone		"
389.3	391.6	Mineralized tactite		"
391.6	438.0	Tactite and limestone		"
438.0	439.3	Mineralized, garnet, sheared and rusty		"
439.3	442.8	Sheared and rusty; garnet		"
442.8	445.0	Mineralized tactite		"
445.0	490.0	Sandstone		"
490.0	592.0	Crenulated limestone with much hornfels 537-561		"

Hole No. 16

Location: N. 6405, E 9963 Dip: Vertical
 Collar elevation: 4942 feet Date: 4/10 to 4/17/48
 Depth: 461.0 feet

0	2.0	Sand		
2.0	21.0	Limy sludge - no core.		
21.0	35.0	Limestone		Martin
35.0	75.0	Tactite and limestone		"
75.0	78.0	Hornfels and quartzite		"
78.0	112.5	Limestone		"
112.5	116.5	Mineralized altered quartzite		Abrigo
116.5	132.0	Altered quartzite		"
132.0	165.0	Tactite, limestone and sandstone		"
165.0	259.0	Limestone, sandstone and tactite		"
259.0	260.6	Mineralized limestone and hornfels		"
260.6	303.0	Limestone, hornfels and sandstone		"
303.0	306.6	Mineralized limestone, and hornfels		"
306.6	365.0	Limestone, hornfels and sandstone		"
365.0	461.0	Crenulated limestone		"

Hole No. 17

Location: N. 6262, E. 10088 Dip: Vertical
 Collar elevation: 4926 feet Date: 4/19 to 4/27/48
 Depth: 484.0 feet

0	2.0	Sand		
2.0	41.0	Dolomite		Martin
41.0	55.0	Limestone		"
55.0	87.0	Tactite		"
87.0	116.0	Limestone		"
116.0	148.8	Tactite		Abrigo
148.8	164.6	Mineralized tactite		"
164.6	174.0	Tactite		"

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Hole No. 17, continued

Footage		Description	Formation	Name
From	To			
174.0	209.0	Limestone		Abrigo
209.0	209.4	Mineralized limestone		"
209.4	229.0	Limestone and tactite		"
229.0	252.0	Tactite, quartzite and hornfels		"
252.0	253.0	Mineralized tactite		"
253.0	266.0	Tactite, quartzite and hornfels bands		"
266.0	316.0	Limestone and hornfels		"
316.0	364.0	Sandstone and hornfels		"
364.0	484.0	Crenulated limestone		"

Hole No. 22

Location: N. 4559, E. 10779 Dip: Vertical
 Collar elevation: 4882 feet Date: 6/4 to 6/19/48
 Depth: 599.0 feet

0	1.0	Sand		
1.0	129.0	Dolomite and limestone		Escabrosa
129.0	150.0	Hornfels		Martin
150.0	270.0	Dolomite		"
270.0	274.2	Tactite		"
274.2	282.3	Mineralized tactite		"
282.3	331.0	Tactite		"
331.0	349.0	Hornfels		"
349.0	375.0	Limestone		"
375.0	386.1	Tactite		Abrigo
386.1	392.0	Mineralized tactite		"
392.0	405.0	Tactite		"
405.0	412.3	Mineralized tactite		"
412.3	418.0	Tactite		"
418.0	422.5	Tactite and garnet		"
422.5	438.1	Mineralized garnet tactite		"
438.1	465.5	Tactite		"
465.5	466.7	Friable sphalerite and chacopyrite		"
466.7	480.0	Sandstone		"
480.0	498.0	Limestone and hornfels		"
498.0	599.0	Crenulated limestone		"

R.I. 4504

Log of diamond drill hole No. 23
Keystone and St. George Project 1484

Location: N. 4577, E 10743 Dip: Vertical
Collar elevation: 4,884 feet Date: 6/21 to 7/1/48
Depth: 603.0 feet

Footage		Description	Formation	
From	To		Name	
0	1.0	Sand		
1.0	132.0	Dolomite limestone	Escabrosa	
132.0	154.0	Hornfels	"	
154.0	279.0	Dolomite	Martin	
279.0	283.4	Tactite	"	
283.4	285.1	Mineralized tactite	"	
285.1	292.0	Tactite	"	
292.0	302.0	Limestone	"	
302.0	338.0	Tactite	"	
338.0	364.0	Hornfels	"	
364.0	385.0	Limestone; part dolomite	"	
385.0	397.0	Hornstone and tactite	Abrigo	
397.0	397.9	Mineralized tactite and hornfels	"	
397.9	422.0	Hornfels and tactite	"	
422.0	433.5	Hornfels, tactite and epidote	"	
433.5	474.0	Garnet limestone and hornfels	"	
474.0	488.0	Sandstone	"	
488.0	603.0	Crenulated limestone	"	

Hole No. 24

Location: N. 4594, E. 10708 Dip: Vertical
Collar elevation: 4,885 feet Date: 7/6/ to 7/17/48
Depth: 603.5 feet

0	1.0	Sand		
1.0	54.0	Dolomite	Escabrosa	
54.0	59.0	Dolomitic limestone	"	
59.0	96.0	Dolomite	"	
96.0	133.0	Limestone and dolomite	"	
133.0	156.0	Hornfels	Martin	
156.0	283.0	Dolomite	"	
283.0	284.9	Tactite	"	
284.9	288.5	Mineralized tactite	"	
288.5	297.0	Tactite	"	
297.0	315.0	Limestone	"	
315.0	343.0	Tactite	"	
343.0	361.0	Hornfels	"	
361.0	388.0	Limestone and hornfels	"	
388.0	390.2	Tactite	Abrigo	
390.2	390.8	Mineralized tactite	"	
390.8	392.2	Tactite	"	
392.2	392.8	Mineralized tactite	"	
392.8	424.0	Tactite and hornfels	"	
424.0	468.0	Limestone, hornfels and garnet	"	
468.0	498.0	Sandstone	"	
498.0	603.5	Crenulated limestone	"	

Hole No. 25

Location: N. 4521, E. 10851 Dip: Vertical
Collar elevation: 4,884 feet Date: 7/20 to 7/31/48
Depth: 566.0 feet

Footage		Description	Formation	
From	To		Name	
0	98.0	Dolomite	Escabrosa	
98.0	123.0	Limestone	"	
123.0	140.0	Hornfels	Martin	
140.0	257.0	Dolomite	"	
257.0	258.4	Tactite	"	
258.4	261.4	Mineralized tactite	"	
261.4	268.0	Tactite	"	
268.0	284.0	Limestone	"	
284.0	290.0	Tactite	"	
290.0	292.0	Limestone and serpentine	"	
292.0	310.0	Tactite	"	
310.0	332.0	Hornfels	"	
332.0	362.0	Limestone, hornfels and serpentine	"	
362.0	371.0	Quartzite	Abrigo	
371.0	411.0	Tactite	"	
411.0	413.0	Limestone	"	
413.0	424.0	Tactite	"	
424.0	435.9	Garnet-epidote tactite	"	
435.9	437.7	Mineralized garnet-epidote tactite	"	
437.7	452.4	Garnet-epidote tactite	"	
452.4	453.8	Mineralized garnet-epidote tactite	"	
453.8	465.0	Garnet-epidote tactite	"	
465.0	486.0	Limestone, hornfels and garnet	"	
486.0	566.0	Crenulated limestone	"	

Hole No. 26

Keystone and St. George Project 1484
Location: N. 4502, E. 10886 Dip: Vertical
Collar elevation: 4883 feet Date: 8/4 to 8/12/48
Depth: 566.0 feet.

0	1.0	Sand		
1.0	28.0	Dolomite	Escabrosa	
28.0	112.0	Limestone	"	
112.0	130.0	Hornfels	Martin	
130.0	256.0	Dolomite	"	
256.0	257.3	Tactite	"	
257.3	257.8	Mineralized tactite	"	
257.8	280.0	Tactite	"	
280.0	282.0	Limestone	"	
282.0	304.0	Tactite	"	
304.0	324.0	Hornfels	"	
324.0	362.0	Limestone, hornfels and serpentine	"	
362.0	370.0	Quartzite	Abrigo	
370.0	445.0	Tactite	"	
445.0	450.0	Hornfels; rusty and sheared	"	
450.0	450.9	Mineralized garnet-limestone	"	
450.9	456.0	Garnet-limestone	"	
456.0	473.0	Limestone, hornfels and garnet	"	
473.0	566.0	Crenulated limestone	"	

R.I. 4504

Sampling record of drill hole No. 1
Keystone and St. George Project 1484

Footage sampled			Recovery			Sample number	Assay							
From	To	Feet	Core Ft.	Sldg. %	Water %		Core	Sldg.	Percent			Oz./ton		
								Cu	Zn	Pb	WO ₃	Mo	Au	Ag
569.6	570.1	0.5	0.5	100		10351		0.83	0.95	0.1	0.1	0.1	Tr	0.5
570.1	570.4	0.3	0.3	100		10352		3.50	7.1	.1	.1	.1	0.01	.6
570.4	570.9	0.5	0.5	100		10353		.69	1.1	.1	.1	.1	Tr	.1
573.0	574.3	1.3	1.3	100		10354		.57	.75	.1	.1	.1	Tr	.2
574.3	574.8	0.5	0.5	100		10355		1.81	4.15	.1	.1	.1	Tr	.7
574.8	580.8	6.0	6.0	100		10356		.55	.85	.1	.1	.1	Tr	.1
<u>Hole No. 2</u>														
343.2	344.2	1.0	1.0	100		10357		0.03	0.1	0.1	0.1	0.1	Tr	Tr
<u>Hole No. 3</u>														
188.5	188.7	0.2	0.2	100		10358		3.67	0.1	0.1	0.1	0.1	0.01	0.5
<u>Hole No. 4</u>														
203.0	204.0	1.0	1.0	100		10359		0.46	1.1	0.1	0.1	0.1	Nil	0.04
295.7	296.4	0.7	0.7	100		10360		2.75	9.4	.1	0.18	.1	Tr	1.20
296.4	297.5	1.1	1.1	100		10361		1.28	.1	.1	.1	.1	Nil	Tr

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Sampling record of drill hole No. 5
Keystones and St. George Project 1484

Footage sampled			Recovery				Sample number		Assay						
From	To	Feet	Core Ft.	Core %	Sldg. %	Water %	Core	Sldg.	Percent					Oz/ton	
									Cu	Zn	Pb	WO ₃	Mo	Au	Ag
227.2	229.6	2.4	2.4	100		95	10362		0.38	2.8	0.1	0.1	0.1	Nil	Tr
290.6	292.9	2.3	2.3	100		95	10363		2.96	4.8	.1	.12	.40	Tr	1.25
295.0	295.6	0.6	0.6	100		95	10364		7.14	.2	.1	.33	.13	0.01	4.10
310.7	315.0	4.3	4.3	100		90	10365		1.07	1.0	.1	.1	.13	Tr	.24
315.4	316.4	1.0	1.0	100		95	10366		1.89	3.4	.1	.1	.1	Nil	.20
317.0	318.8	1.8	1.8	100		90	10367		1.43	2.0	.1	.1	.1	Nil	.40
318.8	320.2	1.4	1.4	100		90	10368		7.29	15.4	.1	.12	.12	Tr	3.70
320.2	326.5	6.3	6.0	95.2		95	10369		1.79	3.9	.1	.1	.1	0.06	1.15
335.4	336.8	1.4	1.4	100		85	10370		2.19	.9	.1	.1	.1	Tr	1.30
346.1	346.5	0.4	0.4	100		90	10371		2.73	.2	.1	.1	.1	Nil	1.20
<u>Hole No. 10</u>															
286.3	291.3	5.0	5.0	100		95	10372		0.97	3.3	0.1	0.1	0.1	Tr	0.70
296.5	299.5	3.0	3.0	100		95	10373		.47	.8	.1	.1	.1	Tr	.30
304.5	308.5	4.0	4.0	100		95	10374		1.10	.6	.1	.1	.1	Tr	.60
308.5	313.5	5.0	4.0	80.0	74.3	95	10375	10401	1.31	2.30	.1	.1	.16	Tr	.77*
313.5	318.0	4.5	4.0	88.9	83.7	95	10376	10402	1.51	2.50	.1	.1	.13	Tr	.93*
318.0	323.0	5.0	4.5	90.0	83.2	95	10377	10403	.97	1.16	.1	.1	.1	Tr	.67*
323.0	324.5	1.5	1.5	100		90	10378		.15	.7	.1	.1	.1	Nil	.05
329.3	330.8	1.5	1.5	100		90	10379		.47	1.0	.1	.1	.18	Tr	.25
<u>Hole No. 11</u>															
287.5	290.0	2.5	2.5	100		90	10380		1.22	3.6	0.1	0.1	0.12	Tr	0.50
290.0	297.5	7.5	5.8	77.3	70.0	90	10381	10404	.56	1.26	.1	.1	.1	Tr	.40*
298.6	300.2	1.6	1.6	100		90	10382		.71	3.3	.1	.1	.1	Nil	.30
303.0	308.0	5.0	5.0	100		90	10383		1.03	.9	.1	.1	.15	Tr	.55
308.0	313.4	5.4	5.0	92.6		90	10384		.98	1.9	.1	.1	.1	Tr	.50
313.4	318.8	5.4	4.9	90.7		90	10385		1.07	2.6	.1	.1	.17	Tr	.60

*Adjusted average of core and sludge assays

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Sampling record of drill hole No. 12
Keystone and St. George Project 1484

Footage sampled			Recovery				Sample number	Assay							
From	To	Feet	Core Ft.	Core %	Sldg. %	Water %		Percent					Oz./ton		
							Core	Sldg.	Cu	Zn	Pb	WO ₃	Mo	Au	Ag
200.0	201.8	1.8	1.8	100		95	10386		0.02	0.5	0.1	0.3	2.26	Nil	Tr
292.0	293.9	1.9	1.9	100		95	10387		1.34	.2	.1	.1	.46	Tr	0.75
305.5	310.5	5.0	4.6	92.0		95	10388		.91	.1	.1	.1	.12	Nil	.40
310.5	315.5	5.0	4.7	94.0		95	10389		.93	.2	.1	.1	.26	Nil	.40
315.5	318.2	2.7	2.7	100		95	10390		.84	2.3	.1	.1	.02	Tr	.65
328.2	330.4	2.2	2.2	100		95	10391		.84	1.7	.1	.1	.12	Nil	.50
<u>Hole No. 15</u>															
265.0	275.0	10.0	10.0	100		90	10395		0.72	0.1	0.1	0.1	0.1	Nil	0.10
275.0	278.0	3.0	3.0	100		90	10396		.37	.1	.1	.1	.1	Nil	.05
389.3	391.6	2.3	2.3	100		95	10392		--	--	--	.1	1.57	--	--
438.0	439.3	1.3	1.3	100		95	10393		2.29	0.3	.1	.1	.20	Tr	.40
442.8	445.0	2.2	2.2	100		95	10394		.28	5.6	.1	.24	.28	Tr	.20
<u>Hole No. 16</u>															
112.5	116.5	4.0	4.0	100		95	10399		0.37	0.15	0.1	0.1	0.1	Nil	Tr
259.0	260.6	1.6	1.6	100		90	10397		.21	.20	.1	.1	.1	Nil	Tr
303.0	306.6	3.6	3.6	100		90	10398		.09	.10	.1	.1	.1	Nil	Tr
<u>Hole No. 17</u>															
148.8	158.8	10.0	9.2	92.0		90	10400		0.36	0.1	0.1	0.1	0.1	Nil	Tr
158.8	164.0	5.2	5.2	100		90	10410		.44	.1	.1	.1	.1	Nil	Tr
164.0	164.6	0.6	0.6	100		90	10411		.49	.1	.1	.1	.1	Nil	Tr
209.0	209.4	0.4	0.4	100		90	10412		1.27	.1	.1	.1	.1	Nil	0.12
252.0	253.0	1.0	1.0	100		90	10413		1.50	1.3	.1	.1	.1	Nil	.14

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Sampling record of drill hole No. 22
Keystone and St. George Project 1484

Footage sampled			Recovery				Sample number	Assay							
From	To	Feet	Core Ft.	Core %	Sldg. %	Water %		Core	Sldg.	Percent			Oz./ton		
									Cu	Zn	Pb	WO ₃	Mo	Au	Ag
274.2	282.3	8.1	8.1	100		90	10414		0.77	0.1	0.1	0.1	0.1	Nil	0.12
386.1	392.0	5.9	5.9	100		90	10415		.01	Nil	.1	.1	.40	Nil	Tr
405.0	412.3	7.3	7.3	100		90	10416		.05	Nil	.1	.1	1.02	Nil	Tr
422.5	432.0	9.5	8.8	92.6		90	10417		.10	.10	.1	.1	.34	Nil	Tr
432.0	437.5	5.5	5.4	98.2		90	10431		.20	.60	.1	.2	.1	Nil	Tr
437.5	438.1	0.6	0.6	100		90	10432		12.14	1.1	.1	.1	.1	Tr	1.30
465.5	466.7	1.2	1.2	100		90	10419		3.5	14.7	.1	.1	.11	Tr	1.0
<u>Hole No. 23</u>															
283.4	285.1	1.7	1.7	100		95	10420		0.62	0.1	0.1	0.1	0.31	Nil	0.05
397.0	397.9	0.9	0.9	100		90	10421		.62	.1	.1	.1	4.10	Nil	Tr
<u>Hole No. 24</u>															
284.9	288.5	3.6	3.6	100		90	10422		1.22	Nil	0.1	0.1	0.1	Nil	0.20
390.2	390.8	0.6	0.6	100		90	10423		.03	0.1	.1	.1	2.42	0.01	0.07
392.2	392.8	0.6	0.6	100		90	10424		.02	.1	.1	.1	1.60	Nil	Tr
<u>Hole No. 25</u>															
258.4	261.4	3.0	3.0	100		90	10425		0.81	0.1	0.1	0.1	0.1	Nil	0.26
435.9	436.2	0.3	0.3	100		90	10426		3.29	Nil	.1	.1	.1	Nil	.60
436.2	437.7	1.5	1.5	100		90	10427		.05	Nil	.1	.1	.13	Nil	Tr
452.4	453.8	1.4	1.4	100		90	10428		1.14	6.7	.1	.1	.1	Nil	Tr
<u>Hole No. 26</u>															
257.3	257.8	0.5	0.5	100		90	10429		0.91	0.10	0.1	0.1	0.1	Nil	0.08
450.0	450.9	0.9	0.9	100		90	10430		1.14	4.0	.1	.1	.1	0.01	.06

Tucson, Arizona. January 19, 1942

APPRAISAL

OF

KEYSTONE COPPER COMPANY MINE

Johnson Mining District

Cochise County, Arizona

BY

James B. Tenney
Mining Engineer and Geologist

January 19, 1942

APPRAISAL
OF
KEYSTONE COPPER COMPANY MINE

Geological Occurrence The Johnson district in which the mine is located is covered by a sedimentary series consisting of quartzite and limestone overlying an old schist basement. This series can be divided into three main parts. The bottom 100 to 200 feet consists of quartzite, which is overlain by an impure somewhat sandy and metamorphosed thin-bedded limestone about 200 feet thick, covered in turn by a thick-bedded relatively pure limestone locally marbleized, several thousand feet thick. The general dip of this series is East about 35 degrees. Into this complex has been intruded a large mass of granite which did not generally reach above the quartzite, but whose effects was the production of much garnet, epidote and other contact metamorphic minerals, a general marbleization of the limestone and scattered bodies of pyrite-chalcopyrite-zinc blende replacements. Where the replaced beds, due to subsequent erosion, now outcrop, the sulphides were oxidized into copper carbonates silicates and oxides, associated with iron oxide, garnet and silica. Development of these oxidized zones usually lead down the dip into the primary sulphides.

The mineralized belt has a length of about three miles, north and south, and a width of about a mile. The north end of the belt has been developed quite extensively in the Republic, Mammoth, Copper Chief and Peabody mines, and has produced a considerable tonnage of ore, mostly mined during the high copper prices of the first World War. The lower limestone series has been the most productive of ore in the north end of the belt, and, would have, from surface outcrops evidence, the best chances in the Keystone ground at the south end of the belt. The Keystone Copper Company claims cover the southern half mile of the mineralized belt. Where the lower limestone series outcrops on the ground there are numerous oxidized ore replacements which were stoped down the dip for shallow depths during the high copper prices.

Mine Development Two deep shafts were sunk to prospect the deeper sulphides. The first shaft, the O.K. shaft, was sunk on the dip of an outcrop of oxidized ore, 35 to 40 degrees east. It penetrated sulphides at a depth of 350 feet on the incline. A little development work was done on the sulphide ore cut by a drift about 100 feet long, and some stoping was done and ore shipped. The shaft was sunk another 100 feet on the incline and a crosscut is said to have been driven, partly in low grade sulphides. The work below the 350 foot level is now flooded. While sinking this shaft, the best spots of oxidized ore were stoped from the 150 foot level to the surface. Low grade oxidized ore was stacked on the surface. This material amounting to from 300 to 400 tons has a grade of about 2.5% copper. It cannot be treated (concentrated) and would have to be shipped direct. It is possible that with the high copper prices now obtainable for new copper, a profit of a few hundred dollars might be realized from shipping this material.

The second deep shaft sunk was the Main or Haggerman shaft, about 1800 feet south of the O.K. shaft. This shaft was sunk vertical to prospect the downward extension on the dip of oxidized ore beds outcropping to the west. The shaft is now inaccessible due to a cave-in below the 150-foot level. It is said to have struck sulphides in two horizons, one on the 300 and the second on the 500-foot level. Very little work was said to have been done in developing these ore showings. The grade and character of material cut, from samples I saw, is about the same as that of the Republic-Mammoth mine to the north. The ore is probably too low grade and zincy to stand shipment direct, that is it would have to be concentrated to make it marketable at a profit. There is not, from all I can gather, more than a few hundred tons blocked.

VALUATION

There is little ore blocked. Therefore, the mine, as far as developed ore is concerned, has a value not to exceed \$1,000,000. However, its location on the southern end of a strong mineralized belt, the northern end of which has been highly productive, makes the ground have considerable although unknown potential value. At both shafts, sulphide ore of a grade comparable to that of the Republic and Mammoth mines, has been cut. It is quite possible that the development of these sulphide showings might produce ore bodies of considerable size. It would, however, take considerable money and time to prove or disprove this possibility. I would therefore suggest a valuation dependent on selling the mine on a bond and lease basis of three years duration, with no down payment but a final payment of \$100,000, any ore mined treated and shipped to pay a royalty of 10% net smelter, to apply on the purchase price.

I did not attempt to value the machinery on the property. I examined it to determine if it was sufficient to carry on a deep development campaign, and also to determine if it were appropriate, with further additions, to treat any ore found. The equipment, I judge would be a decided asset to any one undertaking to develop the mine. However, in order to make an attractive deal to a possible purchaser of the mine, I would suggest making the appraisal of the equipment entirely separate from that of the mine. If this were done, a purchaser of the mine could, if he so chose, pay cash for the equipment and could then use it for further mine development and for treatment of any ore found. If no ore or insufficient ore were found, he could sell the equipment and would then be out little more than what went into the mine as development work. This kind of a deal would work to the best interests of the creditors and stockholders in that they would realize a small sum from the sale of the equipment and would have a fair chance to realize a relatively large sum from royalties and final purchase price. There would be little likelihood of finding a purchaser willing to pay more than a nominal cash price for the mine in its present undeveloped state. The probably grade of any ore found is low and would probably not be profitable except under high War prices for copper and zinc contained. Any money to be made would probably have to be made during the present emergency.

Presented by

S/ James B. Tenney
Mining Engineer and Geologist
Registered Mining Engineer and Geologist.

THE COCHISE MINING DISTRICT, COCHISE COUNTY ARIZONA.
1913 REPORT.

THE PROPERTY:

This consists of 15 full lode mining claims and one fraction, in all about 310. acres of mining ground, or nearly a half section. The property is held by possessory rights, none of the claims having as yet been patented. The claims are held in three groups as follows, all contiguous, and forming a solid block of ground;-- The Calvate Group consisting of the Calvate, Wolfpack, Dora, Ella, and Louie; The Heppner Group, consisting of the Heppner, Charles, Ida, Gustave, and Mary; and the U. K. Group, consisting of the U. K., Aureka, Ernest, Utter, Roswell, and the Never Shes Less, fraction.

MINES NOW REACHED.

The easiest route is from Dragoon Station on the Southern Pacific Railway, by wagon road, a distance of 4.1 $\frac{1}{2}$ miles over a nearly level road.

A small branch railroad of standard gauge also runs from the station to Johnson Mining Camp and Postoffice, a distance of nine miles and passes within one fourth miles of the Property. another route is by wagon road from Cochise Station, a distance of nine miles, the roads are first class and the grades very easy.

TOPOGRAPHY AND ALTITUDE.

The region in the immediate vicinity of the mines is gently rolling, the ground gradually rising on the westward to the summit of the Little Dragoon Mountains. Owing to the gentle slopes, tunnel development is impossible, all workings consisting of shafts, incline and drifts. The altitude at the mines is about 6000 feet.

GEOLOGY OF THE DISTRICT.

It may be stated in a general way that a marked similarity exists between most of the copper mining regions of Ariz. The rock most in evidence are limestone, quartzite and schist, lying upon each other in a marked conformity and at the Cochise District having a strike of approximately N 40 Deg. W. with a dip approximately 40. Deg to the northeast. The axis or core of the Little Dragoon Mountains consists of a porphyritic granite approaching in character granodiorite. Lying upon this is a wide belt of schist now generally known in the copper regions as the Pinal schist and the original source of the copper in many places lying upon the schist is a comparatively narrow belt of quartzite, which is now recognized by many geologists as resulting from extreme metamorphism, and silicification of the same schistose material, as the foregoing, lying conformably upon the quartzite is very thick, wide belt of limestone, generally in thin stratas, rather than massive and blocky, and ranging in all colors from blue and pure white into gray, yellowish and black. The entire series evidently belongs to the sub-carboniferous, and the limestone them selves are probably attributable to the Devonian. The main ore belt of the region closely follows the contact line between the quartzite and limestone, but does not lie in the actual contact. In width the various formations quoted vary greatly along their strike, but in general may be estimated as follows; Pinal Schist, 2000 feet, quartzite 1000. feet, Devonian lino 25000 feet.

#2.

Intercalated with the lime are various stratifications of silicious schist and metamorphic slate, the latter carrying bands of iron ore. The most heavily mineralized portion of the region is in the lower strata of the limestone series, and from 500 to 1000 feet from the main quartzite contact, No eruptives of definite character exist within the confines of the ore belt proper.

THE VEINS:

The ore follows the line of stratification, being in fact of the type known as bedded veins. In most cases more or less garnet rock follows the ore deposition and marks the course of the veins. Some of the limestone strata within the ore zones are entirely replaced by garnet and carry iron and aluminous oxidation products, and this when fairly saturated with copper minerals constitute the important veins of the district. The known veins vary in size from a few inches to 100 feet, and upwards. All dip to the northeast at a slope varying from 35 deg to 50 deg. from horizontal. Upon the property of the Keystone Company exist at least a dozen of these parallel veins or ore strates. All have a general northwesterly course and dipping at quite a flat angle to the northeast.

THE ORES:

The ores themselves are entirely of copper, soft, highly colored and mainly in a gangue of garnet and altered lime. The main copper ore at the surface is malachite, with some chrysocolla, the analagous blue carbonate, azurite, appearing only in a very limited quantities. The black and red oxides of copper appear only as a mere stain. None of the native metal appear to occur, and besides the green malachite, the only other oxidation product of importance is the dark brown chalcopissite, the iron-copper silicate. When it is considered that the mineral is known as the first and direct oxidation product of chalcopyrite, the evidence at once points to this mineral, copper pyrite, as being the original ore of the district. Comparatively little iron oxides occur, and none in the large masses so characteristic of other copper regions. Below the carbonates and at a depth from the surface varying from a few feet to several hundred, sulphide appears generally a mixture of chalcopyrite and pyrite and this we believe to be the permanent ~~###~~ ore type of the Cochise District or Johnson Camp. A very notable occurrence of the zone blends occurs as a capping of the copper-iron sulphides at the Hagerman shaft of the Keystone Company. In grade, the copper ore now in evidence on the claims of the Keystone, run from 2% in copper for the low grade mixed earthy carbonates up to 31% in copper of the nearly clean chalcopyrite. The average grade will not be far from 7%.

THE PRECIOUS METALS:

Very little silver or gold exists in the oxidized ores, generally not over 1 oz. in silver and traces of gold, but in the unaltered copper pyrite, the normal value appears to be 2/10 Oz. of gold and 4 ozs of silver per ton, in addition to the copper, or a total precious metal content of about \$ 6.50 per ton.

EXTENT OF DEVELOPMENT.

#3.

Considerably over 1000 feet of development work exists upon this group, mainly in the form of shallow shafts or crosscuts, ranging from 10 to over 70 feet in depth. In addition to these, however, are two main working shafts, the O. K. a shaft of large size and 60 feet in depth, with upwards of 100 feet of drifts and crosscuts, and the Hagerman shaft, 212 feet in depth and containing about 800 feet in drifts, crosscuts and winzes. Most of the entire workings referred to are in ore of a low grade, consisting of altered lime, variously stained with copper carbonates previously noted.

EQUIPMENT:

Three good buildings exist upon the property, being located upon the Hagerman claim, used respectively for the office, boarding house and blacksmith shop, besides these, there is a barn or stable of cheaper construction. The Hagerman shaft has an ordinary whim-tripod in lieu of a head frame, and a common screw # winch, unhoused. At the O. K. shaft are two large windlasses, the other workings being unequipped.

THE O. K. ORE ZONE:

This shaft is sunk in a large mass of blocky limestone, heavily stained at the surface with copper carbonates, some good ore exists but does not appear to improve with depth or crosscutting. A belt of calcareous schist outcrops some 50 feet to the northeast of the O. K. and certain indications point to this belt as carrying possibly the disseminated variety of copper deposit, and furnishing the copper oxidation products so much in evidence at the underlying limestone formation at the O. K. shaft. This can only be cheaply demonstrated by churn drilling, as at Bay and Miami.

THE HAGERMAN SHAFT:

This the main workings of the Property is worthy of more than passing mention, the shaft was started about at the convergence of three or more prominent veins at the surface, two at least of which passes very interesting features. one consists of a very curious wave or roll, over a very hard mass of rounding limestone, both limbs of opposite dip being ore bearing. besides this there is a very prominent garnet vein apexing to the southeast of the shaft and dipping through it at the 40 ft level. At the surface this vein carries large bunches of very high grade ore, but the trend of these shoots has not been explored from the shaft. A large cave or room in the limestone, struck at about 50 feet below the surface is of mere passing interest, and appears to have no material relation to the ore deposits, other than that it exists in the lime fissuring. Below the 40 foot level nearly unaltered unchanged lime occurs, evidently not ore bearing, for a further depth of 110 feet, but below the 150 ft. level as evidenced by the dump material, a very silicious cherty lime is found rather heavily impregnated with pyrite and some chalcoprite, but not of a commercial grade. The existence however of this thick but low grade sulphide ore body below unaltered lime points to a possible ore body of great size and of the disseminated variety below the smaller irregular surface fissures and bedding planes, which may be regarded as

#4.

cutlets or vents to some deep seated source of copper mineralization. That this theory has some foundation in fact is evidenced by a recent great strike of low grade ore on the 700 ft. incline level of the Arizona United Copper Mine, lying contiguous to the Keystone upon the northwest. This ore body is locally reported to be 300 feet wide at one point and to average 5% in copper. The 700 ft incline level of the Arizona United corresponds to the 341 ft level at the Hagorman Keystone and at this level water should appear as the permanent water level of the Camp seems to be reached at this point, this shaft should be sunk until water is encountered, and from this point exploration be carried on in the sulphide zone. Another very prominent reason for the continuing the work in the present shaft is as follows. At a distance of 510 ft to the south of the shaft outcrops a very beautiful prominent vein of large size and good grade and from which a great deal of ore has been shipped by other owners. This dips from 34 to 36 deg. from horizontal and will inevitably cross the shaft at about 385 feet from the surface, and its intersection would prove a great asset to the Keystone Co.

OTHER MINES OF THE DISTRICT:

Besides the Arizona United just referred to, occurs also the famous Peabody Mine, a shipper of millions of dollars, the Copper Chief, Black Prince and the Johnson Development Co. all at one time producers. It is believed that with the recent great strike in the United, the old district will take on a new lease of prosperity.

RECOMMENDATIONS:

It is necessary for further sinking. that the present whim be supplanted by a gasoline or distillate hoist of at least 15 H. P. This will cost with a headframe and housing about \$ 1000.00 set up. Provision should be made to sink the shaft about 200 ft further if water conditions permit. This may be contracted for 10 a foot or 2000.00 for labor a lone, \$ 2000.00 will cover cost of timbering and hoisting, together with supplies so that a further expenditure of \$ 5000.00 in all should reach water level and the large south vein, and this expenditure I consider as warranted by the conditions now evidence.

RESPECTFULLY SUBMITTED.

HENRY J. JORRY.

MINING ENGINEER.

REPORT

ON

KEYSTONE COPPER MINING COMPANY

COCHISE MINING DISTRICT

DRAGON, ARIZONA

Pages one to six and maps.

Date of report: January 21st, 1928.

By:

H. G. Humes,
521 N. Oakhurst Drive,
Beverly Hills, California.

Beverly Hills, California, January 21, 1928.

Keystone Copper Mining Company,
Dragoon, Arizona.

Gentlemen:

I beg herewith to submit to you my report on the mines owned and controlled by your company.

LOCATION:

The property is situated in the Cochise Mining District Cochise County, State of Arizona, five miles from Dragoon a station on the main line of the Southern Pacific Railroad.

GENERAL DESCRIPTION:

There are sixteen full claims and two fractions in the group, approximately 335 acres. None of the claims are patented, title being vested in the company by virtue of location under United States Mineral Laws:

O.K.	Rosewell.	Ernest.
Ella.	Gustava.	Calumet.
Dora.	Ultime.	
Ina.	Wolverine.	Hagerman.
Louie.	Charles.	Eureka.
Mary	Never The Loss	Maher Fraction.

160 acres has been added to this property since this survey was made, which makes approximately 495 acres.

PRODUCTION:

The mine has shipped considerable ore in the past, probably 20,000 tons all from shallow workings, the deepest not being over 150 feet. There has only been about 600 tons put through the mill; about 60 tons of concentrates were produced and shipped to the smelter. The ratio of concentration was 10 to 1, and the value of the concentrate from 10/50 to 16.37 per cent in copper with very little silver and no gold. The value of the concentrate now at the mill show a value of 29% copper, and from tests made in the mill the ratio of concentration has been increased to 15 to 1.

TOPOGRAPHY:

The mine is at an elevation of 5000 feet above sea level the main mountain level probably 1000 feet higher. The mine is on the eastern slope in the low rolling hills. Vegetation is scarce consisting mainly of sage and cacti native to this section. The climate is ideal the year around, very little rain or snow and the temperature both summer and winter are not extreme.

ECONOMIC CONDITIONS:

Labor is plentiful, Mexicans being used mostly, wages are from \$3.00 per

day for common up to \$5.00 per day for skilled mechanics. Supplies can be obtained in the near by cities of Tucson, Phoenix or El Paso. Ore shipments can be made to any of five different smelters in Arizona and Texas. Freight rates are from \$1.50 to \$2.50 per ton.

GENERAL GEOLOGY:

The main part of the Little Dragoon mountains is granite; the eastern slope for several miles in either direction is comprised of limestones, shales, Schist and garnet. The development work so far has proven that the main ore bodies occur as replacement bodies in the limestone at or near the contact of the limestone and garnet, and as deposits in the fissures. In places the ore makes into the garnet for short distances. On all the ore sheets opened up so far the garnet is the hangingwall and the limestone the footwall.

ORE GEOLOGY:

The predominant mineral is copper although high values in gold and silver have been found in places, but all shipments so far have been shown only small values in these metals. The upper portions of the deposits so far opened up are characterized by the presence of the oxidized ores of copper, Cuperite, Malachite, and Asurite, to depths of 150 feet, at this depth the primary ore Chalcopyrite with some Bournite is found. The gangue contains considerable quartz and Calcite.

So far opened up there are six different deposits that have produced and still have ore in places. Some of those veins can be traced for 1500 feet or more.

DEVELOPMENT:

The most important work is the development at the Miller and Hagerman shafts.

The Miller shaft is 450 feet deep sunk at an angle of 40 degrees on the dip of the lime beds. For the first 60 feet the shaft was in ore, ore was again found at the 350 foot level in the north and south fissure dipping 80 degrees to the northwest. This fissure is cut by a fault diagonally across the shaft, strike N20 degrees dip 80 degrees southwest. Very little ore was found in the fissure south of this fault but for 130 feet to the north a good ore body has been opened up, with ore still showing in the face of the drift and the back of the stope. The ore in the bottom of the drift has widened out as shown by two winzes 14 and 8 feet deep respectively from 18 inches to 3 feet and as this is in the lime it has every chance of opening out into a large ore body.

From the 60 foot level to the surface an ore body 150 feet in length with an average thickness of 6 feet was mined to the surface on both sides of the shaft. There is still considerable ore left in this stope and no doubt this will connect with the ore opened up on the 350 foot level.

Sixty feet below the 350 level another ore body was found 12 feet in thickness and from there to the bottom of the shaft a mineralized zone was passed through. No development work has been done on this ore.

The ore as now exposed from the 60 foot level up is not suitable for milling in the present plant; at some future date a leaching plant will have to be installed to handle this ore; the ore on the 350 level and below is an easy ore to float and from tests already run in the present mill will concentrate with a ratio of 15 to 1 and a saving of 90% or better should be made.

The indications at the Miller shaft are good for the opening up of a large body of milling as well as shipping ore.

The Hagerman shaft is the main working shaft, 650 feet deep vertical; levels are spaced at the 60-210-350- and 475 foot points.

At the 60 foot point an ore body was found that was rich in copper and zinc, considerable ore was shipped from here in the early days. The level is now filled and caved. This ore has not been found on the lower levels.

No ore was found on the 210 level. I do not believe the development work done here was extensive enough to determine the ore zone.

On the 350 level a zone of ore was found 150 feet in length and 20 feet in thickness. Very little work has been done here; two winzes sunk 50 feet and one 14 feet deep, a raise 35 feet high; all this work is in ore with occasional bunches of high grade.

The 450 level has been driven 250 feet and from surveys made will have to go 50 feet more to reach the ore zone developed on the level above.

The ore here occurs in the lime beds which dip 35 degrees to the north-east; it is of the same character and occurs under the same conditions as the Miller shaft. When this ore is found on the 450 level and raised through to the 350 level it will develop a large tonnage, at the same time it should be followed up on its dip from the 350 level to its upper limit.

On the Calumet very little work has been done, shallow shafts and open cuts. Some ore has been shipped by lessors. This section should be developed from the Hagerman shaft by a crosscut.

There are other open cuts and shallow workings that were made by early day lessors.

Since its incorporation the company has spent in actual cash over \$150,000.00 for equipment, and at least that amount in underground development.

EQUIPMENT:

The mine is one of the best equipped properties in this section of the state. The mill has a capacity of 300 tons per day and with slight changes could be made into a 500 ton plant when found necessary.

- 2-Scotch marine boilers 125 HP each.
- 1-Corless engine 250 HP.
- 1-10 by 20 Blake type crusher.
- 1-30 by 14 set of rolls.

- 1-Allis Chalmers ball mill.
- 1-Marthon Rod Mill.
- 1-10 KW-125 Generator.
- 1-8 by 12 engine.
- 1-6 inch Buffalo blower.
- 1-4 foot by 8 foot air receiver.
- 1-4 " " 10 " " "
- 1-5 " " 10 " " "
- 1-4 " " 8 " " "
- 1-14 by 12 by 7 $\frac{1}{2}$ Imperial type Ingersoll Rand Compressor.
- 1-10 by 10 ER 1 Ingersoll Rand Compressor.
- 1-Portland filter.
- 1-Vacuum air compressor and tank.
- 1-8 by 12 Troy steam engine.
- 1-#3 Roots blower.
- 1-1 $\frac{1}{2}$ Wilfley sand pump.
- 1-2 " " "
- 3-Flotation machines 4 cells each.
- 1-24 foot Door thickner.
- 1-Automatic Oil feeder.
- 2 Challenge ore feeders.
- 1-Automatic boiler fuel oil feeder.
- 1-30 HP Stober oil engine.
- 1-8 by 14 steam hoist.
- 1-10 by 12 steam hoist.
- 1-#6 Cameron sinking pump.
- 1-#5 Ingersoll drill sharpener.
- 2-Drill presses.
- 1-Power grinder.
- 7-Machine drills.
- 1-Republic truck.
- 1-Ford truck.
- 1-Assay office equipped.
- 2-Boiler feed pumps.
- 2-10,000 gal. oil tanks-galvanized iron.
- 2-15,000 gal. water tanks, steel.
- 1-32,000 gal. water tank, concrete.
- 1-8,000 gal. water tank, concrete.
- 1-5 room house.
- 1-2 room house.

SAMPLES:

Samples taken at points as indicated on maps and otherwise and assayed in the company assay office.

Sample No.	Description	% of Copper
1	Face of 350 level-6 inches wide	7.15
2	North side of #2 winze 10 feet south #1-2 feet	11.05
3	South side of #2 " 2 feet wide.	20.08
4	North side of #1 winze 18 inches wide.	8.45

5	North end of stope 5 feet thick.	18.20
6	South end of stope 5 feet thick.	3.90
7	File of ore from #2 winze in bottom of drift.	5.20
8	40 foot level south side of shaft 6 feet wide.	9.75
9	40 foot level north side of shaft 6 feet wide.	3.90
10	Miller shaft dump (approximately 1500 tons on the dump)	2.60
11	60 foot stope fill from Mayflower side.	5.20
11-a	60 foot stope fill from Mayflower side.	3.75
12	60 foot stope 5 feet wide.	8.45
12-a	60 foot stope 5 feet wide.	9.75
13	60 foot stope " "	3.90
14	60 foot stope " "	0.33
15	60 foot stope " "	0.15
15-a	60 foot stope shows considerable cuprite.	5.85
16	60 foot stope grab	13.00
16-a	60 foot grab.	3.90
17	Ore from 60 feet below 350 level.	8.45
17-a	" " " " " " "	8.45
17-b	" " " " " " "	9.25
18	" " " " " " "	11.70
19	Mill feed taken from mill ore bin about 100 tons in the bin, crushed to $\frac{1}{2}$ inch.	2.75
20	Mill feed taken from ball mill, crushed to 40 mesh.	3.42
21	Concentrate from filter.	29.47
22	" " flotation cells.	30.94
23	Tailings.	0.68
24	Special sample of red rock taken from surface outcrop.	0.00
25	Ore from 350 level Hagerman shaft.	1.95
26	" " " " " "	1.82
27	" " " " " "	6.37
28	" " " " " "	3.90
29	" " " " " "	1.17
30	" " " " " "	3.82
31	" " " " " "	2.50
32	" " " " " "	3.34
33	Dump Hagerman shaft. (fines)	2.50
34	Dump Hagerman shaft. (coarse)	1.82
	There is approximately 2000 tons of ore on the Hagerman shaft dump.	

OTHER PROPERTIES:

There has been other properties in the district that have been large producers. The most important known as the Republic lies adjacent to the Keystone and has a reported production of over \$20,000,000.00. The Marmoth and Copper Chief also have been good producers.

WORKING COSTS:

Per ton of crude ore produced.

Development.	\$ 0.25
Mining 100 tons per day.	1.00
Milling 100 tons per day (ratio 15 to 1)	1.25
Trucking concentrate (10% water)	0.15
Freight to smelter.	0.15
Smelting concentrate	1.00
Converting, refining, marketing,	2.50
Overhead, taxes, etc.	0.15
	\$ 6.46

SHIPMENTS:

Following is an incomplete list of ore shipments as taken from Smelter settlement sheets at company office at mine.

Date	Weight	% of Copper	Net amt. received.
March 1916	57.817	3.57	\$ 511.56
Sept. 1916	40.451	6.50	534.91
Oct. 1916	56.998	4.04	487.26
Nov. 1916	32.462	3.60	353.19
Dec. 1916	32.400	3.70	428.82
March 1917	24.80	3.42	418.13
March 1917	11.235	11.77	690.73
March 1917	43.867	3.48	608.87
April 1917	52.101	3.94	784.64
June 1917	48.215	3.34	580.03
Dec. 1917	32.462	3.70	428.82
March 1918	44.424	6.33	824.07
May 1918	40.189	6.32	713.76
June 1918	34.395	5.55	519.71
June 1918	34.562	5.34	497.00
Sept. 1918	26.707	3.83	286.83
Sept. 1918	16.000	15.86	942.94
April 1918	41.259	6.04	692.74
May 1918	40.189	6.32	713.76
	<u>710.533</u>	<u>5.02</u>	<u>3568</u>

CONCENTRATE.

April 1925	4.369	16.37	122.65
April 1925	14.425	10.45	249.54
May 1925	2.747	15.84	71.86

RECOMMENDATIONS:

I would recommend that a crosscut be driven from the bottom of the Miller shaft to the ore that is shown on the 350 foot level in the fissure, and that also cut in the shaft to feet below, when this ore is reached it should be developed by drifts and raises. The stope on the 350 foot level should be repaired and put in shape for mining.

The 450 foot level of the Hagerman should be continued to the ore body and when found be developed by drifts and raises, and stopes started; at the same time the 350 level ore body should be raised on and stoped put in shape for mining.

It will take approximately six months to do this work and when finished there should be enough ore developed to keep the mill operating continuously on a basis of 10 tons per day. After this work is done and the mill in operation both the Miller and Hagerman shafts should be sunk a further 100 or 200 feet, and the ore bodies developed so that your development will keep ahead of your extraction thereby providing a constant supply of ore for the mill and at the same time increasing the production until the mill is running at capacity.

CONCLUSIONS:

In conclusion I wish to state that this report does not do the mine full justice as it is impossible to state any tonnage of ore blocked out where it is only exposed on one or two sides; nevertheless it is difficult to make an examination of the mine without realizing that it has possibilities. There has been considerable of a production from shallow workings, and from conditions as soon on the surface and underground a very large area should carry values, as well as what is exposed in the old workings.

There is no question but what the property is a good mine and will in time make a large producer. With the mine equipped as well as it is there is no reason why it should not become a paying proposition with copper selling at 14 cents or better.

Respectfully submitted,

(Signed) H. G. Humes.

321 N. Oakhurst Drive,
Beverly Hills, California.

ENGINEERS REPORT.
MINES OF THE KEYSTONE COPPER MINING COMPANY.

Tucson, Arizona.
Feb 24th 1931.

James R. Hubbard.
Registered Mining Engineer.
For Arizona.

GEOLOGY.

The ore bodies of the Keystone Copper Mining Company, form an important part of the mineralization of the Cochise Mining District, this district is located in Cochise County, Arizona, about five miles north of Drieston Station, of the S. P. R. R. The mineralization occurs in a zone running northerly and southerly. Showing strongly for a distance of five miles, The Keystone properties cover the southern half of the zone, while the Properties of the Republic Mine covers the northern half. This area of mineralization is one of the largest important tracts of replacement ores of ~~the~~ southern Arizona and is probably the largest area of such ore which has not yet been brought to a state of large production.

The mineralized structure consists of sedimentary rocks which have been uplifted by a granitic intrusion rock, and by this igneous intrusion rock have been broken and faulted and subjected to mineral enrichment.

The enrichment is the heaviest in those limestone sedimentary rocks which are closest to the granites, such mineralization following the fractures and faulted planes of the sedimentary rocks and spreading out in a general dissemination of mineralization in those rocks. Along the zone of enrichment, such planes of replacement ores vary from a few feet in thickness to four hundred feet in thickness, fault planes control the the location and extent of enrichment, to the general systems of faults occur throughout the district north-south and east-west systems, the richest ore occurs at the intersection of an east-west fault with a north-south fault, some of these ores are rich enough for direct shipping to the Smelter, such ore shipped from the Republic Mine by the Arizona United Co, amounted to several millions of Dollars in return, a less amount of this class of ore has been mined and shipped from the property of the Keystone Co, but it should be realized that this district as a whole, both the Republic and the Keystone properties are of great value and long life from the existence of a large bodies of low grade milling ores which have been developed and proven to exist in both properties. such ore bodies are the extension of the richer ores of the faulted zone into the surrounding limestone, the grade of ore lessening with the distance from the faulted zone. replacement ore bodies also occur along the bedding planes of the limestone with the accompanying enrichment of the surrounding limestone.

As developed to date in the zone such ore bodies have reached width up to four hundred feet, notably in the main shaft of the Republic mine. while in the 337. ft level of the Keystone in the Hagerman shaft such ore body has been ~~not~~ cross-cut for a thickness of 125 ft with the foot wall not yet reached. such ore bodies vary in various places throughout there thickness from 1.1/2 % to 4. % copper with values in zinc, while the high grade ores of the fissures run up to 6. % and 8. % in shipping lots, in some places in this district zinc values are equal in percentage to those of copper.

ORE BODIES.

By means of a shaft located 1200. ft apart in the ore zone two propotions of the Keystone property have been some what developed at depth. The Miller shaft of the O. K. Claims has been sunk in the dip of the limestone to the depth of 450. ft. This shaft passed through more or less mineralized ground for its entire depth and at the depth of 350. ft cut a distinct ore body occupying a north-south fissure, this ore body has been developed for a length of 150. ft, showing a width of 5. % copper ore varying from one to three feet, the western limit of this ore body has not been reached by development.

The construction of the developed portion of the ore body to the surface will make available 10,000. tons of copper ore.

Development from the 350. ft level to the bottom of the shaft showed quantities of milling ore, which probably replacement ore related to the fissure developed at the 350. ft and which likely indicates the existence of a large body of milling ore, the amount which at this time can not be estimated. developed ore at the Miller shaft was measured by J. M. Libby, Registered Engineer and estimated to contain 9000. tons and from various samplings has been found to yeald values of 3. 1/2 % copper:

The other main working shaft of the property, the Hagerman shaft located 1200, ft southerly from the Miller shaft has been sunk vertically through mineralized ground to the depth of 650. ft. levels have been run at the 60. 210. 350. and 475. ft points of these the 350. and 475. ft levels are of the greater imprtance. altho some shipping ore has been mined from the upper levels.

On the 350, ft level an ore body has been opened-up which has been developed to a length of 150. ft with a thickness of 20. ft development has not reached the limits of this ore body, either in length or thickness.

By continuation of this ore body to the surface there would be available 95,454. tons of ore, samplings taken across the ore body on the 350. ft level shows a value of 3.11 % copper.

On the ^{See} 475. ft level another ore body has been opened up for a length of 135. ft and crosscut for a width of 30. ft, development has not reached the limit of this ore body in length or thickness by a continuation of this ore body to the surface there would be available 161,932. tons of ore, samples taken from the ore body shows it to have an average value of 3. 1/2 % copper with an oz of silver to the ton. A survey of the ore body shows its location to be the extension with depth of an ore body which has been mined from the surface of the ground.

The ore development of the 350. ft and 475, ft levels are in a separate locations in the Keystones property, being 250, ft apart along the strike of the ore zone, it is possible that these two ore showings with further development will be found to connect, in which case the available ore is greatly increased, recent measurements and sampling of the ore dumps at the Hagerman shaft by J. M. Libby Registered Mining Engineer for Arizona, gave 22,000 tons of mill ore averaging 3. % in copper.

#3.

CHARACTER OF THE ORE.

Surface ores and ores mined at a shallow depth up to approximately 100. ft consists of carbonate and oxidized ores of copper secondary enrichment has made some of this ore very rich. however the quantity of such ore is limited, and as developed has been mined and shipped.

The most important ore bodies are large enrichments of sulphides of copper ~~secondary enrichments may be made of this ore very rich~~ chalcopyrite. occurring with this are sulphides of zinc and iron. in some places in the mineralized zone the percentage of zinc is equal to that of copper, and eventually the production of zinc will become an important by-product of this ore, producing a revenue which is not taken into consideration at this time. The gangue material is heavily siliceous.

METHOD OF TREATMENT.

The sulphide minerals separate easily from the gangue by flotation. Differential flotation will separate the zinc from the copper. Mill runs shows extraction of better than 90.% with a tailing pile from 3.% ore running from two tenths to three tenths of one percent copper. Copper concentrates are shipped to a choice of Smelters at either El Paso or Douglas. Ariz.

Concentrates shipped from trial mill run have assayed from 10.% to 16.% copper. From information obtained from mill runs it has been determined that concentrates with a copper content of 33.% can be produced.

HISTORY.

The active history of the Keystone Copper Mining Company extends over a period of twenty years. The first ten years was expended in development mining and shipping the high grade carbonate surface ore the last ten year period has been expended in developing the deeper sulphide ore. during the period the deep shafts were sunk and lateral workings and development eventually opened up the sulphide ore bodies above noted.

RECENT RESULTS.

The most important development made during the last two years is in the opening up of a large body of disseminated ore on the 475. ft level of the Hagerman shaft, which together with the previously developed ore body on the 350. ft level, shows the presents of ore bodies in this property of great magnitude. The production from year to year has been confined to moderate quantities of carbonate and oxidized ores encountered while developing the bodies of sulphide milling ore. Of this latter the production has been confined to that produced from mill run tests.

ORE RESERVES.

Ore reserves have been doubled by development of the last two years, the grade of such ore averages a little over 3.% copper. From sampling and measurements made by J. M. Libby registered Mining Engineer and estimates made Feb 15th 1931. The available and indicated mine and dump ores is as follows.

#4.

Miller shaft ---10,000 tons of 5% copper ore available.

" " Dump 9000. tons of 3.1/2 % copper ore " "

Hagerman Shaft 350.ft level 95,454 tons of 5.11 % copper ore indicated.

Hagerman Shaft estimated by myself from Libbey's measurements and samplings, 475. ft level. 161,932. tons of 3.1/2% copper ore indicated.

Dump ore estimated by Libbey. 22,000 tons of 5% copper ore available.

The above ores reserves are sufficient to keep a concentrat~~ion~~ ion mill running three years. however the development is very incomplete and the tonnage estimates made are for developed width up to 25 or 30, ft where as in the Republic Mine a similar ore body has been crosscut for a width of 400, ft. if continued crosscutting of the Keystone ore bodies show such width of ore the life of the mine may be expected to extend over a very long period, 20 or more years.

MILLING.

A mill has been erected on the Property with a rated capacity of 500. tons a day. This is a Flotation plant. a simple process, in which the chief expense is the crushing of the ore.

This mine and mill is five miles from the railroad, with which it is connected with a good truck road.

MILL PRODUCTION.

This ore can be milled at the ratio of eight tons of crude ore to one ton of concentrates, with mill feed of 5% and a 90% saving, such concentrates will assay 21.6% copper. A high grade concentrates can be made from this ore with a greater ratio of concentration than 8 to 1. but I believe that greater profits will be made from this degree of concentration. The cost of production and treatment of each ton of crude ore. I estimate as follows.

Development	.30
Mining.	.75
Milling.	1.50
Trucking Concentrates.	.09
Freight To Smelter.	.31
Smelting Concentrates.	1.50
Converting Refining and Market.	.15

Cost each ton of Crude ore. 5.05

With a saving of 54.lbs of copper from each ton of crude ore, we have thus a cost of 9.08 of copper produced.

CONCLUSION.

#5.

I would recommend continued development of the known ore bodies. I would also recommend the remodeling of the crushing plant to treat 500. tons per day.

Signed. James R. Hubbard.
Registered Mining Engineer for Arizona.

How long would it take, after it is provided, to produce the above...

Arizona Department of Mineral Resources, Capitol Building, Phoenix, Arizona

QUESTIONNAIRE

Relating to survey of potential copper production from Arizona small and marginal mines for national defense purposes;

Name of mining property.....Keystone Copper Mining Co.....

Location.....Cochise Mining District, Dragoon, Ariz.....

Ownership.....Keystone Copper Mining Co.....

Name of Manager.....U. R. Miller.....

Post Office address.....Dragoon, Ariz.....

Copper production (pounds) during each of the past five years:

1936..... 1937.....4,500 #..... 1938.....
1939..... 1940.....

1941 rate of copper production based upon first four months.....

How much copper could this property produce annually

- on a 14 cent price? ..3,005,000 # Probably more than that.
- on a 16 cent price? 2,127,000
- on an 18 cent price?.....
- on a 20 cent price?.....

What price copper is necessary for this property?14.....cents per pound?

What plant facilities would be required and how much is the estimated cost in the event a 14 cent price could be assured? None.....

a 16 cent price could be assured?

18 cent price?

20 cent price?

For what length of time would assurance of price and sale of full production be necessary? I think we should have a five year plan.....

How long would it take, after financing has been provided for, before production on the above basis could be reached? Six months

Does your organization have the facilities for raising the necessary capital to increase production to the amount stated? Not under existing conditions

If not, do you believe that your company would be amenable and agreeable to government financing? Yes

Do you believe that you could finance the capital investment yourself on some such basis as a guarantee of sale of output at a fixed price and for a definite period, with damages to cover unamortized portion of capital investment in the event the government failed to take the output for the agreed upon time - or some similar arrangement?

Please let us have your comments on the probability or possibility of your organization participating in such a program for national defense purposes. Our Engineer

that made a thorough examination of the Property said copper could be mined at a profit with a price of 14 cent at the Smelter

What would be your ideas on financing and carrying out such a plan as is indicated by these questions? Under the Government supervision of financing we are not familiar, but will take a chance because Government restrictions makes it to great a risk to try any financing on a mine by selling stock

Kindly list names and addresses of other potential copper producers in Arizona whose operations should be included within this survey. United Arizona Copper Co. known as the Republic Mine. Keystone Copper Mining Co. Peacock Mine

Date 5/22/41 Signed F. C. Miller

Chad Airst

Arizona Department of Mineral Resources, Capital Building, Phoenix, Arizona

QUESTIONNAIRE

Relating to survey of potential copper production from Arizona small and marginal mines for national defense purposes;

Name of mining property Keystone Copper Mining Co.

Location Cochise Mining District, Dragoon, Ariz.

Ownership Keystone Copper Mining Co.

Name of Manager U. R. Miller.

Post Office address Dragoon, Ariz.

Copper production (pounds) during each of the past five years:

1936..... 1937 4,500. #..... 1938.....

..... 1939..... 1940.....

1941 rate of copper production based upon first four months..... none.

How much copper could this property produce annually

on a 14 cent price? 2,126,700 2,127,000

on a 16 cent price? We could increase our volum by handling

on an 18 cent price? lower grade ore. " " "

on a 20 cent price? " " "

What price copper is necessary for this property? 14 cents or better. 14 cents or better. 14 cents or better.

What plant facilities would be required and how much is the estimated cost in the

event a 14 cent price could be assured? If we could get the Financial assistance

to put this property into production, which would take approx-

imately \$50,000.00 fifty thousand dollars. We would like to

a 16 cent price could be assured? make a few changes, in our concentrating plant, such as new

Laundrys, we have the Forster sells in at present. our Electric

18 cent price? plant is a little small. and would like to equipt it with a larger dinamo, that would cut down the cost of production. this ore carries a good percent of zinc with the copper.

20 cent price? We could increase our ^{volume} volum by handling lower grade ore.

For what length of time would assurance of price and sale of full production be necessary?

I should think a five-year plan.

(over)

How long would it take, after financing has been provided for, before production on the above basis could be reached? 6 month we might be ready in less time

Does your organization have the facilities for raising the necessary capital to increase production to the amount stated? We are willing to go along with the Government. all though we are not familiar with this plan of

If not, do you believe that your company would be amenable and agreeable to government financing?

Do you believe that you could finance the capital investment yourself on some basis as a guarantee of sale of output at a fixed price and for a definite period, with damages to cover unamortized portion of capital investment in the event the government failed to take the output for the agreed upon time or some similar arrangement? We have to have finances in order to start up

Please let us have your comments on the probability or possibility of your organization participating in such a program for national defense purposes.

What would be your ideas on financing and carrying out such a plan as is indicated by these questions?

Kindly list names and addresses of other potential copper producers in Arizona whose operations should be included within this survey:

United Arizona Copper Co
which is called the Republic Mine. Roy Wilson Globe Ariz.

Keystone Copper Mining Co, also the Peacock, U. R. Miller

Draagoon, Ariz.

(150)

Date

Signed

Arizona Department of Mineral Resources, Capitol Building, Phoenix, Arizona

QUESTIONNAIRE

Relating to survey of potential copper production from Arizona small and marginal mines for national defense purposes;

Name of mining property... *Keydons Copper Mining Co.*

Location... *Cochise Mining District, Dragoon Ariz*

Ownership... *The above Co.*

Name of Manager... *U. R. Miller*

Post Office address... *Dragoon Ariz*

Copper production (pounds) during each of the past five years:

1936... *none* 1937... *1 car* 1938... *none*

1939... *none* 1940... *none*

1941 rate of copper production based upon first four months... *none*

How much copper could this property produce annually

on a 14 cent price? *4 - a month*

on a 16 cent price? *8*

on an 18 cent price? *12*

on a 20 cent price? *20*

What price copper is necessary for this property? *16* cents per pound?

What plant facilities would be required and how much is the estimated cost in the event a 14 cent price could be assured? *11.4*

We that is the Keystone has a Milling Plant and should have

a 16 cent price could be assured? *The same as above*

18 cent price? *"*

20 cent price? *"*

For what length of time would assurance of price and sale of full production be necessary? *It should be 5 years*

(over)

How long would it take after financing has been provided for before production on the above basis could be reached? *Three month*

Does your organization have the facilities for raising the necessary capital to increase production to the amount stated? *That I do not know at this time*

If not, do you believe that your company would be amenable and agreeable to government financing? *yes*

Do you believe that you could finance the capital investment yourself on some such basis as a guarantee of sale of output at a fixed price and for a definite period with damages to cover unamortized portion of capital investment in the event the government failed to take the output for the agreed upon time - or some similar arrangement? *I think so*

Please let us have your comments on the probability or possibility of your organization participating in such a program for national defense purposes. *I am most sure the Keystone would for we lack just about 3 to 4 month work in order to get our ore bodies in shape for production and develop our water supply for the mill which is partly developed at this time*

What would be your ideas on financing and carrying out such a plan as is indicated by these questions? *If the Government will give us a Permit I am most sure we can raise the necessary funds*

Kindly list names and addresses of other potential copper producers in Arizona whose operations should be included within this survey

The Ariz united Copper Co as it is called Republic for they shipped thousands of tons during the world war and they own the top land and Leacock Ground and in fact mined over to the Leacock line before they had to shut down.

Date *5/17/41* Signed *W.R. Miller by J.C. Miller*

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ARIZONA DEPARTMENT OF MINERAL RESOURCES
Capitol Building, Phoenix, Arizona

Name of property. **Keystone Copper Mining Co.**

Location and accessibility of property. Cochise Mining District. 5 miles north and west of Dragoon. Ariz. a good highway down to the S. P. RR. There are 16 full claims and two fractions. approximately 335. Acres. None patented. but have been surveyed. that is 13. claims have been surveyed. by a Government surveyor for patent, and all papers made out to be patented but we lacked the necessary funds to complete the Patent. We did add 160. acres more but we do not consider them of any value.
History of ownership. The title of the property is perfect, the owners and their grantee having been in quiet Possession for 30 years or more, and was organized under the Arizona Laws, and the same is on file in Phoenix. Ariz.

Production history. The following was taken from J. M. Libbeys and J. R. Hubbards Engineers report.
350. ft and 475 ft levels in the Hagerman shaft, were of greater importance, some shipping ore has been mined from the upper levels. On the 350. ft level an ore body has been opened up, which has been developed to a length of 150. ft with the thickness of 20 ft. Development has not reached the limit of this ore body, either in length or thickness, for there has been a winze sunk 48. ft all in ore. By continuation of this ore body to the surface there would be available 95,454. tons of ore. Samplings taken across the ore body on the 350. ft level shows a value of 3.11 percent copper. On the 475. ft level another ore body has been opened up for a length of 135. ft and a crosscut cut for a width of 30. ft developed and has not reached the limit of this ore body in length or thickness. by a continuation of this ore body to the surface there would be available 161,932 tons of ore. Samples taken from the ore body shows it to have an average value of 3. percent copper and a like amount or more in zinc and 1.0z in silver to the ton.

General geology (brief)

Mining Engineer H. G. Humes says there is no question but what the property is a good mine and will in time make a large producer with the mine equipped as well as it is, there is no reason why it should not become a paying property with copper selling at 14 cents or better.

Geology. THE enrichment is the heaviest in these limestone sedimentary rocks which are closest to the granite, such mineralization following the fractures and fault planes of the sedimentary rocks and the spreading out in a general dissemination of mineralization in those rock. along the zone of enrichment such planes of replacement ores vary from a few ft in thickness

over

to four hundred ft thickness, fault lines (total the location and extent of enrichment, to a general system of faults occur throughout the district, north-south and east-west system of faults the richest ore occurs at the intersection

Ore occurrence.

of the east-west faults with a north-south fault. some of these ores are rich enough for direct shipment to the smelter such ore shipped from the Republic amounted to several million dollars in returns.

Treatment. The sulphide minerals separate easily from the gangue by flotation. Differential flotation will separate the zinc from the copper. Mill runs show extraction of better than 90% with a tailing pile from 3% ore running from two tenths to three tenths of one percent. copper concentrates are shipped to a choice of smelters at either EL Paso or Douglas.

Ore reserve (quantities and values).

Character of the ore. The most important ore bodies are the large enrichments of sulphides of copper, chalcopyrites, occurring with this are sulphides of zinc and iron. In some places of the mineralized zone the percentage of the zinc is equal to that of copper and eventually the production of zinc will become an important by product of this ore. producing a revenue which is not taken into consideration at this time. The gangue material is heavily siliceous.

Accessory metals of value.

Copper. Zinc. Molybdenum, a little in each

ton of ore concentrated. also scheelite the same. and 1 oz of silver.

Development work done.

Main shaft 650. ft perpendicular. main shaft. drifts on the 475. also on the 327. ft level and 600. ft level. in all about 1000. ft.

O.K. shaft incline 450. ft. with drift of about 400. ft.

Here is the cost that Mr H. G. Humes our Engineer has in his report.

Working cost. Per Ton of Crude ore.

Plants (with capacity) already on property.

200. tons.

Development.	0.25
Mining 100. tons per day.	1.00
Milling 100. tons per day. (ratio# 15 to 1.	1.25
Trucking Concentrates. (10% water)	6.15
Freight to Smelter.	0.15
Smelting Concentrates.	1.00
Converting, Refining. Marketing.	2.50
Overhead taxes and etc.	0.15

666-----

6.46

Date 6/2/41

Signed J.C. Miller

Production history: The following was taken from J. M. Libbeys and J. R. Hubbards Engineers' report.

350 ft. and 475 ft. levels in the Hagerman shaft are of greater importance, some shipping ore has been mined from the upper levels. On the 350-foot level an ore body has been opened up which has been developed to a length of 150 feet with the thickness of 20 feet. Development has not reached the limit of this ore body, either in length or thickness, for there has been a winze sunk 48 feet all in ore. By continuation of this ore body to the surface there would be available 95,454 tons of ore. Samplings taken across the ore body on the 350-foot level shows a value of 3.11 per cent copper. On the 475-foot level another ore body has been opened up for a length of 135 feet and a crosscut cut for a width of 30 feet developed and has not reached the limit of this ore body in length or thickness. By a continuation of this ore body to the ~~ex~~ surface there would be available 161,932 tons of ore. Samples taken from the ore body show it to have an average value of 3.0 per cent copper and a like amount or more in zinc, and 1.0 ounce in silver to the ton.

Property: The Bannon group, 16 claims, Cochise district, Cochise County, 1-1/2 miles from the Arizona United property and 5 miles north of Dragoon.

Development: By 2 shafts, the 650-foot Hagerman and the 450-foot Miller incline with an aggregate of 3,000 feet of workings said to block out 500,000 tons of 2 to 10 per cent sulphide ore. (The Mines Handbook, 1931, p. 352)

Property: 26 claims, 2 groups, in Cochise County, near Dragoon, Arizona, showing complex sulphide ore containing copper, silver, gold, molybdenum and scheelite. Development: by 400-foot and 700-foot shafts and 4 tunnels totalling about 1,800 feet. Ore reserves/~~mak~~^{estimated} at 365,000 tons.

Mill: 100-ton flotation. (Mines Register-1940, p. 328)

Keystone Copper Mng. Co.

Positive ore: ORE RESERVES
 Probable ore: Tons Copper % Copper, lbs.

- Insert -

Year	Tons	Pb, %	<u>PAST PRODUCTION</u> XXXX		Cu, %	Cu, lbs.
			Ag, ozs	Au, ozs		
1936	—	—	—	—	—	2,175
1937	—	—	—	—	—	4,500

No other production figures available, either from Miller's reports, or in hand books.

<u>PRODUCTION POSSIBILITIES</u>			
14¢	16¢	18¢	20¢
2,127,000			

For mill, improve- ment } #50,000	<u>CAPITAL INVESTMENT REQUIRED</u> XXXXXXXXXX			
	14¢	16¢	18¢	20¢

<u>TIME REQUIRED TO START PRODUCTION</u> XXXXXXXXXX			
14¢	16¢	18¢	20¢
6 months.			

REMARKS:

It seems there is now a 200-ton concentrating plant on property; and that \$50,000 is needed to put it in shape to produce.

KEYSTONE MINE

COCHISE CO.

MG Engineer's Report, 6/27/79 - The unpatented claims of the Keystone mine area were purchased by the company from Norman M. Rehg (and associates?) of El Dorado, Kansas. This property is westerly and adjacent to the Johnson mine area and is needed for waste disposal. The company has been negotiating with the BLM for some time to use the Keystone area for dumping of waste. The BLM however has delayed action; it is apparently worried about surface damage to cactus, the old jail, etc. 7/6/79 a.p.

Cyprus Mines Corp.

KEYSTONE MINE

COCHISE COUNTY

Found that the lessees, Strong and Mosely, had discontinued shipping ore from the property, but were shipping some low grade high silica ore from the adjoining claim owned by Coronado Copper and Zinc. ALJ WR 9-8-58

Norman M. Rehg, Dragoon, Arizona - Discussion of terms of leasing of the Keystone mine and discussion of legal action against previous lessees. ALJ WR 9-30-58

Mr. Rehg discussed with field engineer a proposed lease and option on his property (Keystone mine) to McFarland and Hullinger. ALJ WR 12-24-60

Discussion by Norman Rehg of his proposed option of his Keystone Mining claims to the Cyprus Mining Company. ALJ Meeting Report 9-13-61

Visited Keystone Mine - no activity - Mr. Rehg was not in. GWI WR 6-10-67

Mine visit - Mr. Rehg not in. GWI WR 11-16-68

Visited Keystone mine - no one around. Looked at and photographed interesting old mill with Corliss steam engine, etc. GWI WR 4-5-69

Report re claims. GWI 12-13-69

Visited Keystone mine at Johnson Camp - plant being dismantled. GWI WR 10-17-70

Mine visit to the Keystone mill - the mill being dismantled. GWI WR 12-5-70

The machinery has been removed from the old Keystone mill. The Aztec Mining Co. have pulled their equipment off of the Mame mine at Courtland. It has been reported that they have left Cochise County for the 16 to 1 mine in Nevada. GWI QR 12-31-70

Mine visit - Keystone mine - Surface plant nearly dismantled. GWI WR 2-8-71

Nearly all of the old mill, hoist house, equipment and other buildings have been removed from the Keystone mine. GWI QR 4-1-71

Mine visit - Keystone mine - nearly cleaned out. GWI WR 4-19-71

Mine visit - Keystone mine. GWI WR 6-7-71

KEYSTONE MINE

COCHISE COUNTY

Personal visit. Present status. Visited property on Sept. 13. Found no one working and no evidence of mining operations. Shovel had been removed.
ALJ 9-13-58

ARIZONA DEPARTMENT OF MINERAL RESOURCES
Mineral Building, Fairgrounds
Phoenix, Arizona

1. Information from: No one in camp
Address: _____
2. Mine: Keystone 3. No. of Claims - Patented _____
Unpatented _____
4. Location: Johnson Camp
5. Sec 36 Tp 19S Range 22E 6. Mining District _____
7. Owner: Keystone Copper Mining Co.
8. Address: Dragoon, Arizona
9. Operating Co.: Not
10. Address: _____
11. President: Norman M. Rehg 12. Gen. Mgr.: _____
13. Principal Metals: _____ 14. No. Employed: 0
15. Mill, Type & Capacity: _____
16. Present Operations: (a) Down (b) Assessment work (c) Exploration
(d) Production (e) Rate _____ tpd.
17. New Work Planned: _____

18. Misl. Notes: _____

Date: Jan. 9, 1969

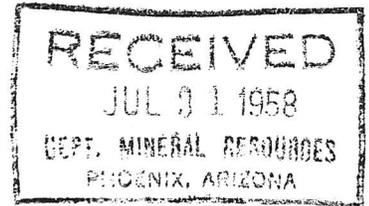
(Signature)

G. W. Irvin

G. W. Irvin
(Field Engineer)

1-20

DEPARTMENT OF MINERAL RESOURCES
STATE OF ARIZONA
FIELD ENGINEERS REPORT



Mine **Keystone Mine**

Date **July 22, 1958**

District **Cochise (Johnson) District, Cochise Co.**

Engineer **Axel L. Johnson**

Subject: **Mine Report of present status. Information from Norman M. Rehg.**

References Reports of Jan. 10, 1958, Sept. 6, 1957, Feb. 15, 1956

Location Near Johnson Camp, adjoining the Coronado Copper & Zinc properties on the west.

Number of Claims 16 unpatented claims.

Owners Norman M. Rehg, Box 34, Dragoon, Ariz. & El Dorado, Kansas, et. al.

Lessees ✓ Strong and Mosely

✓ Earl Strong, Silver City, N. Mex.

✓ Ira L. Mosely, Box 512, Lordsburg, N. Mex.

Lease contract has, as yet, not been completed. Mr. Rehg states that the agreement to date specifies a 10 % royalty in the area of the O. K. shaft, where mining operations are now conducted. He expects that all 16 claims eventually will be included in the lease agreement.

Principal Minerals ✓ Copper ores. Oxidized copper ore from the O. K. dump now being shipped.

Present Mining Activity The lessees are now shipping oxidized copper ore from the O. K. dump to the A. S. & R. smelter at Hayden. Production about one carload (about 50 tons) per day. 2 men working.

Geology & Mineralization See report of Feb. 15, 1956

Surface Dumps The tonnage and analysis of the dumps are estimated by Mr. Rehg to be as follows:

(1) O. K. Dump ---- 10,000 to 12,000 tons, averaging about 2 % copper.

(2) Miller Dump --- 2,500 to 3,000 tons, averaging about 3.5 % copper.

He states that this ore will run fairly high in silica.

Present Mining Operations The lessees, Strong & Mosely are, at present, shipping the ore to the A. S. & R. smelter at Hayden, under an agreement with the A. S. & R. to ship one carload per day for 10 days as a trial shipment. If the trial shipment proves to be acceptable, they expect to increase this to 2 carloads per day. At present, they have a shovel loading the ore into a truck, which hauls the ore to Dragoon, a distance of about 4 miles, from where it is shipped to Hayden.

DEPARTMENT OF MINERAL RESOURCES

STATE OF ARIZONA

FIELD ENGINEERS REPORT

Mine **Keystone Mine**

Date **January 10, 1958**

District **Cochise (Johnson) Dist. Cochise Co.**

Engineer **Axel L. Johnson**

Subject: **Field Engineers Report, Information from Harold Stevens.**

Location: **Near Johnson Camp.**

Number of Claims: **16 unpatented claims.**

Owners: **Norman M. Rehg, et al, Dragoon Arizona & ~~El~~ Dorado, Kansas.**

Lessees: **✓ Aztec Mining & Development Co.
✓ Harold Stevens and Phil Stevens, Box 52, Dragoon, Ariz.
Lease executed July 1957, and calls for a straight 15% royalty for ten years with the privilege of renewal.**

Principal Minerals: **Copper Ores.**

Present Mining Activity: **Installation of leaching equipment.**

Geology & Mineralization: **See report of Feb. 15, 1956.**

Ore Value: **See report of Feb. 15, 1956.**

Milling & Marketing Facilities: **Installation of a leaching plant for leaching the ore by the Scott sponge-copper process.**

Mine Workings: **See report of Feb. 15, 1956**

Past History: **See report of Feb. 15, 1956**

Present Operations: **Underground mining operations were shut down about Nov. 15, pending completion of leaching plant. Previous to the shutdown, one additional carload of ore was shipped to Inspiration Smelter from ore stoped from the 110 ft level of the J.K. shaft. This ran 3.12% copper, with $\frac{1}{2}$ oz. Silver.**

Since Nov. 15, the following work has been done on the installation of the leaching plant;

- (1) Installed 1 - 10,000 gal solution tank (wooden)**
- (2) Installed 2 - 40'X30' concrete platforms (for heap leaching)**
- (3) Now installing 10 troughs, each 2' wide X 3' high and 10 ft. long, built out of cement block (for precipitation of the copper with iron cans)**

Proposed Leaching Operation: **The Scott Sponge Copper Process will be used for the leaching operations. This process was perfected by Harry Scott of Globe, Arizona.**

A special solution prepared by Mr. Scott of Globe will^{be} used for leaching the ore. The formula of this solution is secret.

DEPARTMENT OF MINERAL RESOURCES

STATE OF ARIZONA

FIELD ENGINEERS REPORT

Mine

Date

District

Engineer

Subject:

Page 2

It is prepared by Mr. Scott as a dry white powder which is to be mixed with a special amount of water to form the leaching solution. This powder will be purchased from Mr. Scott at 10¢ per pound, and will be mixed with water at a ratio of 10 pounds per ton of ore treated. In cold weather and in treating ore with a substantial amount of sulphides the solution will be heated to 70°F. Water will be obtained from the O.K. shaft supplemented by water from the Hagerman shaft. Heap leaching will be used and the solution will be sprayed from overhead for 20 hours. The solution percolates through the ore pile, into wooden troughs where it will be precipitated with iron cans placed in the troughs. The solution is reported to have a capacity of a Maximum of 4% copper in solution.

Proposed Plans:

- (1) Complete installation of leaching plant which is estimated to require from 30 to 60 days.
- (2) Resume mining operations in from 30 to 60 days, leaching the ore as mined.

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DEPARTMENT OF MINERAL RESOURCES

STATE OF ARIZONA

FIELD ENGINEERS REPORT

Mine **Keystone Mine**

Date **Sept. 6, 1957**

District **Cochise (Johnson) District, Cochise Co.**

Engineer **Axel L. Johnson**

Subject: **Field Engineers Report. Information from Norman Rehg and Harold Stevens.**

Location **Near Johnson Camp, adjoining the Coronado Copper & Zinc properties on the W.**

Number of Claims **16 unpat. claims.**

Owners **Norman M. Rehg, et. al., Dragoon, Ariz.**

Lessees **Aztec Mining and Development Co.,
Harold Stevens and Phil Stevens, 7151 S. Missiondale Rd., Tucson, Ariz.
Harry Lehman, 3643 S. Liberty, Tucson.**

Lease executed in July, 1957. Calls for a straight 15 % royalty for 10 years with the privilege of renewal.

Principal Minerals **Copper ores.**

Present Mining Activity **Bringing in machinery and getting ready for mining operations.**

<u>Geology & Mineralization</u>	See report of Feb. 15, 1956.	also see U. S. Bureau of Mines
<u>Ore Values</u>	" " " " " "	Report ---- RI 4504
<u>Ore in Sight & Prob</u>	" " " " " "	"
<u>Milling & Marketing</u>	" " " " " "	"
<u>Mine Workings</u>	" " " " " "	"
<u>Past History</u>	" " " " " "	"

Surface Stock pile **Mr. Rehg estimates about 10,000 tons of copper ore on the Miller and O. K. dumps. This is oxidized copper ore. Estimated analyses are about as follows: Copper --- 3.5 %; Silica -- 56 %; Calcium 20 %; Aluminum 12 %.**

Mining Operations to Date **(started operations 7/23)**

- (1) Repaired headframe and ore bin at the O. K. shaft.
- (2) Repaired shaft collar. (reports shaft as 440 ft. deep on the incl. with 45 ft. of water at the bottom of the shaft.)
- (3) Removed broken ore from stopes on the 110 ft. level. (not shipped yet).
- (4) Shipped 2 carloads of ore from the surface stock piles to Phelps Dodge at Douglas. First car reported to have run 3.85 % copper, and the second car only 1.8 % copper. Poor results of the second car may have caused them to discontinue further shipments from the stockpile.

Proposed Plans

- (1) To start mining ore on the 110 ft. level, as soon as air compressor is obtained.
- (2) To ship the ore to the International Smelter at Inspiration, Ariz.
- (3) Interested in the beneficiation of the large amount of oxidized ore, which extends all the way to the 400 ft. level of the mine.
- (4) Interested in the Scott sponge copper process.

References **Report of Feb. 15, 1956 under name of Keystone Copper Co.
U. S. Bureau of Mines Report ----- RI 4504**

DEPARTMENT OF MINERAL RESOURCES
STATE OF ARIZONA
FIELD ENGINEERS REPORT

Mine **Keystone Copper Mining Co.**

Date **Nov. 3, 1954**
Feb. 15, 1956

District **Cochise (Johnson) Dist., Cochise Co.**

Engineer **Axel L. Johnson**

Subject: **Present Status. Personal Visit and information from Mr. Rehg on Nov. 3, 1954.**

Location **Near Johnson Camp, adjoining the Coronado Copper and Zinc properties on the west.**

Number of Claims **16 unpatented claims.**

Owners **Norman M. Rehg, Dragoon, Ariz., et. al.**

Operators **Not in operation.**

Principal Minerals **Copper**

Geology **Surface examination showed a number of small irregular fissures in limestone, and some small ore concentrations along the bedding planes in the limestone. Shafts were inaccessible to examination. Ores found on the surface were chrysocolla and malachite, with a limited amount of azurite. Ores in depth were reported to be chalcopyrite and sphalerite.**

Ore Values **Ore is of too low a grade for direct shipping. Oxidized portion of the ore body would be very difficult to concentrate. Small stockpile of oxidized ore is reported by Mr. Rehg to average 2.5 % copper.**

Ore in Sight and Probable **No ore blocked out, as reported by H. G. Humes, Geol. 1928. A few hundred tons of ore blocked out, as reported by James B. Tenney, Geologist, 1942.**
Probable Ore. **Ore veins found to date have been too small and of too low a grade to be regarded as 'commercial ore'. Please refer to U. S. Bureau of Mines RI 4504.**

Milling and Marketing **No mill on the property that would be able to treat this ore. Ore of too low a grade for direct shipping.**

Mine Workings **(1) O. K. shaft ----- 34 deg. incline----450 ft. deep in the incline., with one drift about 100 ft. long from this shaft. Some additional development, with some stoping.**

(2) Main or Haggerman shaft (1800' S. of O. K. shaft)-----Vertical---650 ft. deep. Inaccessible ~~to~~ due to cave in. Little development work done from same. Ore showings too low grade for direct shipping

(3) Surface stock pile. 300 to 400 tons of low grade oxidized copper ore, reported by Mr. Rehg to run about 2.5 % copper. Very little Ag, and no Au.

(4) Drill holes put down by the U. S. Bureau of Mines. See Bureau of Mines report---RI 4504.

Past History **Past shipments from the property is reported to be about 20,000 tons. 600 tons of ore is reported to have been milled at the mill on the property, producing 60 tons of copper concentrates. Mill now B. O.**

Present Operations **None, except for annual assessment work.**

References **See U. S. Bureau of Mines report-----RI 4504.**

K-17

DEPARTMENT OF MINERAL RESOURCES
STATE OF ARIZONA
MINE OWNER'S REPORT

Date 6/7/40.

1. Mine Keystone Copper Mining Co.
2. Location 5. miles from Dragoon. Ariz.
3. Mining District & County Cochise.
4. Former name None
5. Owner Keystone Copper Mining Co.
6. Address (Owner) K. C. M. Co.
7. Operator " " " "
8. Address (Operator) Dragoon. Ariz.
9. President, Owing Co. U. R. Miller. ✓
- 9A. President, Operating Co. U. R. Miller.
10. Gen. Mgr. " "
14. Principal Minerals Copper, Zinc, Molybdenum, Silver, Scheelite. ✓
15. Production Rate
11. Mine Supt. T. C. Miller.
16. Mill: Type & Cap. Select flotation.
12. Mill Supt. Have none at this time
17. Power: Amt. & Type Steam. and Hot Head
13. Men Employed has been as high as 35. ##
18. Operations: Present None.
19. Operations: Planned To finish developing our water supply, by sinking deeper in our Main perpendicular shaft which is down now 650. ft. and opening up our ore bodies that we have discovered. one at the 327. ft level, but a big cave in at that level as caused us to ## to cement up that level, for we cemented the shaft there for over sixty feet on four sides, so we expect to drift from the 500, ft level and connect up with the ore, we have a drift out 248. ft and another 200 ft will put to the ore, for the ore on the 327. ft level is 150. ft that we have drifted 16 load and 10 that through ore and it is over 40. ft wide, and extends up and are not of much value down very near 60. ft, and on the 500, ft level we struck that was the same as the Republic mined and shipped over \$ 3.500.000.00 grove during the World War, and we crosscutted through ore of a rich mineral formation for over 200. feet. and drifted about 100. ft through the ore. we we have just started a drift, (that just before we had to shut down in 1938. and we are in extra good ore, in fact I believe we are on the right road to open up a large body of shipping and milling ore, as good and perhaps better then the Republic shipped ed, from 1913 to 1919. now this 200 ft or more of mineralized zone is milling ore.
20. Number Claims, Title, etc.
21. Description: Topography & Geography
22. Mine Workings: Amt. & Condition 2000.ft in very good condition.

. Geology & Mineralization

Engineers report enclosed.

. Ore: Positive & Probable, Ore Dumps, Tailings

A. Dimensions and Value of Ore body

. Mine, Mill Equipment & Flow-Sheet

. Road Conditions, Route Good.

. Water Supply Started to develop our water supply by sinking the shaft deeper.

. Brief History

. Special Problems, Reports Filed

. Remarks

We just lack money right at this time in order to go ahead, we believe \$ 25,000.00 will put every thing in shape so that we can start to producing.

1. If property for sale: Price, terms and address to negotiate.

Account in ...

32. Signature.....

J. E. Miller

3. Use additional sheets if necessary.

DEPARTMENT OF MINERAL RESOURCES
STATE OF ARIZONA
MINE OWNER'S REPORT

Date June 7, 1940

Mine Keystone Copper Mining Co. 2. Location 5 miles north from Dragoon
Mining District & County Cochise Dist.
Cochise Co.
Former name
Owner Keyston Copper Mining Co. 6. Address (Owner) Dragoon, Arizona
Operator *John Gungl, Receiver* 8. Address (Operator)
President, Owing Co. U. R. Miller 9A. President, Operating Co.
Gen. Mgr. U. R. Miller 14. Principal Minerals Copper, zinc, molybdenum,
silver, scheelite, tungsten.
Mine Supt. T. C. Miller 15. Production Rate
Mill Supt. None 16. Mill: Type & Cap. 200 ton per day select
flotation.
Men Employed Has been 35 17. Power: Amt. & Type Steam and Hot Head.
Operations: Present None

9. Operations: Planned To finish developing our water supply by sinking deeper in the main perpendicular shaft which is down now 650 ft. and opening up ore bodies we have discovered. One at the 327 ft. level, but a big cave in, at that level has caused us to cement up that level. We cemented the shaft for over 60 ft. on four sides so we expect to drift from the 500 ft. level and connect with the ore. We have a drift out 248 ft. and another 200 ft. will put us to the ore. The ore on the 327 ft. level is 40 ft. wide. On the 500 ft. level we crosscut through 200 ft. of mineralized zone of milling grade ore and drifted about 100 ft. through the ore, just before we shut down in 1931.

10. Number Claims, Title, etc.
16 claims and one fraction unpatented.
10 claims that are not valuable.

11. Description: Topography & Geography Gently rolling, gradually rising to westward.
Altitude approximately 6000 ft.

22. Mine Workings: Amt. & Condition
Miller shaft 450 ft. on dip. Hagerman shaft 650 ft.
1000 ft. development work in form of shallow shafts and crosscuts.

Geology & Mineralization

Replacements in limestones 400 ft. in width, in gauge of garnet, precious metal content scant in oxides, sulphides contain up to \$6.50 i. precious metals.

Ore: Positive & Probable, Ore Dumps, Tailings

Miller shaft contains 1.5% copper to 4% copper with some values in zinc. Highgrade 6% to 8% copper. 10,000 tons of 3% copper (according to engineers report) and dump of 9,000 tons of 3 1/2%. Hangerman shaft area 150' x 20' ore projected 95,454 tons 3.11% copper above 350' level. Ore projected 161,932 tons 3.5% copper above 500 ft. level 1 oz. silver. 22,000 tons 3.0% dump ore. (according to engineers report.)

Dimensions and Value of Ore body

Mine, Mill Equipment & Flow-Sheet

200 ton flotation mill(selective)

Load Conditions, Route

Good truck road, 5 miles from railroad. 1913 report describes 3 good buildings, office, boarding house, and blacksmith shop.

Water Supply

Started to develop our water supply by sinking deeper.

Brief History.

20 years, first 10 years shipping high-grade carbonate ores. Second 10 years in developing sulphide ores.

Social Problems, Reports Filed

2 engineers reports available.

Remarks

We just lack money right at this time to go ahead. We believe \$25,000 will put everything in shape so we can start producing.

property for sale: Price, terms and address to negotiate.

1940 from mine owners report.

1931 from report by James R. Hubbard

1913 from report by Henry J. Jorry

32. Signature.....(Signed).....T. C. Miller.....

Assist in financing. Write Owner

Rich Meyer
Box 1061

Theam

se additional sheets if necessary.

amended copy

DEPARTMENT OF MINERAL RESOURCES
STATE OF ARIZONA
OWNERS MINE REPORT

Date **June 7, 1940**

1. Mine **Keystone Copper Mining Co.**
2. Mining District & County **Cochise Dist. Cochise Co.**
3. Former name
4. Location **5 miles north from Dagoon.**
5. Owner **Keystone Copper Mining Co.**
6. Address (Owner) **Dagoon, Arizona**
7. Operator
8. Address (Operator)
9. President **U. R. Miller**
10. Gen. Mgr. **U. R. Miller**
11. Mine Supt. **T. C. Miller**
12. Mill Supt. **None**
13. Principal Metals **Copper, zinc, molybdenum, silver, scheelite**
14. Men Employed **Has been 35**
15. Production Rate
16. Mill: Type & Cap. **200 ton per day select flotation**
17. Power: Amt. & Type **Steam and Hot Head.**
18. Operations: Present **None**

19. Operations Planned
- To finish developing our water supply by sinking deeper in the main perpendicular shaft which is down now 650 ft. and opening up ore bodies we have discovered. One at the 327 ft. level, but a big cave in at that level has caused us to cement up that level. We cemented the shaft for over 60 ft. on four sides so we expect to drift from the 500 ft. level and connect with the ore. We have a drift out 248 ft. and another 200 ft. will put us to the ore. The ore on the 327 ft. level is 40 ft. wide. On the 500 ft. level we crosscut through 200 ft. of mineralized zone of milling grade ore and drifted about 100 ft. through the ore, just before we shut down in 1931.
20. Number Claims, Title, etc. **16 claims and one fraction unpatented. 10 claims that are not so valuable.**

21. Description: Topography & Geography **Gently rolling, gradually rising to westward. Altitude approximately 6000 ft.**

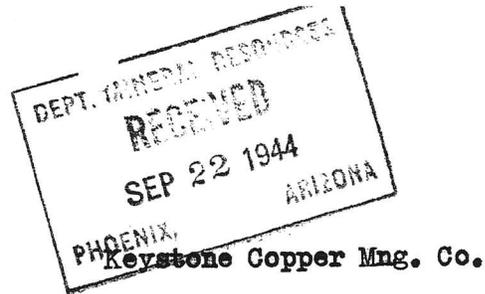
22. Mine Workings: Amt. & Condition **Miller shaft 450 ft. on dip. Hagerman shaft 650 ft. 1000 ft. development work in form of shallow shafts and crosscuts.**

23. Geology & Mineralization **Placements in limestones 400 ft. in width, gangue of garnet, precious metal content scant in oxides, sulphides contain up to \$6.50 in precious metals.**
24. Ore: Positive & Probable, Ore Dumps, Tailings **Miller shaft contains 1.5% copper to 4% copper with some values in zinc. Highgrade 6% to 8% copper. 10,000 tons of 3% copper (according to engineers report) and dump of 9,000 tons of 3 $\frac{1}{2}$ %. Hangerman shaft area 150' x 20' ore projected 95,454 tons 3.11% copper above 350' level. Ore projected 161,932 tons 3.5% copper above 500 ft. level 1 oz. silver. 22,000 tons 3.0% dump ore. (according to engineers report).**
- 24-A Vein Width, Length, Value, etc.
25. Mine, Mill Equipment & Flow Sheet **200 ton flotation mill (selective)**
26. Road Conditions, Route **Good truck road, 5 miles from railroad. 1913 report describes 3 good buildings, office, boarding house, and blacksmith shop.**
27. Water Supply **Started to develop our water supply by sinking deeper.**
28. Brief History **20 years, first 10 years shipping highgrade carbonate ores. Second 10 years in developing sulphide ores.**
29. Special Problems, Reports Filed **2 engineers reports available.**
30. Remarks **We just lack money right at this time in order to go ahead. We believe \$25,000 will put everything in shape so we can start producing.**
31. If property for sale: Price, terms and address to negotiate. Assist in financing. Write ~~owner~~
- 1940 from mine owners report
 1931 from report by James R. Hubbard
 1913 from report by Henry J. Jorjy
32. Signed..... **T. C. Miller**
33. Use additional sheets if necessary.

*Nick Neuge,
 Box 1061*

T. C. Miller

Sept. 20, 1944



MEMORANDUM

To: Director, Dept. Mineral Resources
From: George A. Ballam

Bert Miller, Keystone Copper, Dragoon, informed me yesterday that he had been notified by his Kansas associates that Norman Rehg is in town preparing to have everyone connected with this case indicted by Prescott grand jury (including yours truly) This procedure appears to be an annual affair with Rehg, - he got Rasur of RFC among others last time. My conscience is fairly clear, although the confidential files will show that I stuck my neck out a rod or two in a letter to Broadgate and at his request. Rehg seems to have access to a lot of confidential stuff.

I met him this AM going up to John Lyons' office where he claimed to have a delegation of FBI's and others awaiting him. He was very cordial and informed me that he was indicting everyone. I asked him if my name was on the blacklist and he told me that I was the only friend he had west of the Mississippi. From my observation of this case, I know he was overstating, so if I am included I will be "e pluribus unum."

You might transmit this information to CFW who has been very much interested in the guerilla warfare in this end of the state in which the Miller Bros. and Rehg have been principals.

Handwritten signature: G. A. Ballam

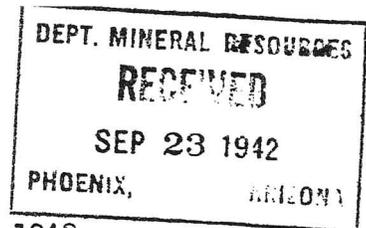
Handwritten notes: mailed 9-28

KEYSTONE COPPER CO. U. R. Miller, President, Dragoon, Arizona. Sam
W. Seaney, Trustee, Tucson, Arizona.

The Keystone Mine adjoins the Republic Mine, the latter was
described in a previous report. This property is equipped with a 200
ton concentrator, rehabilitation of which would be somewhat expensive
but would result in a satisfactory plant.

A stalemate exists among the stockholders concerning bankruptcy
proceedings. Various companies, including Shattuck-Denn have expressed
their interest in the mine and, if legal difficulties were solved, an
early and substantial production could be anticipated.

DEPARTMENT OF MINERAL RESOURCES
STATE OF ARIZONA
FIELD ENGINEERS REPORT



Mine Keystone Copper Co.,

Date Sept. 21, 1942

District Johnson-Cochise Dist.

Engineer George A. Ballam

Subject: PRODUCTION POSSIBILITY SURVEY

This property is situated about 2 miles north of state highway 86 and 5 miles north of the S.P. station of Dragoon, on a good road. There are 16 unpatented claims. U.R. Miller of Dragoon is president of the company which is now in voluntary bankruptcy.

The report on the property prepared by this department in 1941 for Mr. Leon Henderson at the request of the Ariz. Copper Tariff Board has been reviewed against records in possession of the trustee and is substantially correct, hence is not repeated.

Mr. Sam W. Heaney, 11 E. Pennington St., Tucson, was appointed trustee by the creditors of this company in Oct. 1941. He states that the stockholders in Kansas are divided into two camps, both of which employ attorneys in Tucson. If the voluntary bankruptcy status can be lifted, the company will go into involuntary bankruptcy, when a settlement of indebtedness can be readily reached. A stalemate exists at present.

Mr. Seaney has been approached by a number of interested parties including Shattuck-Denn. All agree that the property is a big potential producer. In addition he has had numerous requests for equipment consisting of a 200 ton mill. The War Production Board has endeavored to acquire the twin marine boilers and Corliss steam engine. He stated that if Judge Sames will permit the property to go into involuntary bankruptcy, it can be brought into immediate production. There seems at present to be no alternative if the property is to be released.

APPRAISAL MADE BY JOR NORMANT
OF
MACHINERY AND EQUIPMENT
THE KEYSTONE COPPER MINING COMPANY

TOTAL AT MINE \$44,212.30

1	Steam Hoist 8"x10" double cylinder 36"x17" Drum, band clutch and brake	7500#	1,200.00
1.	1200 Ft. of 1" hoisting cable	1920#	132.00
1	30H.P. Boiler	1 4000#	480.00
1	30 H.P. Storey semi-diesel hoist 20"x17" Drum	6500#	975.00
1	800 Ft. 3/4" hoisting cable	1 504#	96.00
1	1 1/2 H.P. Storey Gasoline engine	1 304#	20.00
1	I.R.C. 10"x10" ER-1 Belted Compressor	3600#	800.00
1	IRM-5 Drill Sharpener		250.00
1	IRG8 Air Grinder		125.00
1	5"x4"x6" Center outside packed Sarrow Duplex Pump	1 800#	80.00
1	9 H.P. St. Marys gasoline engine	1 2000#	200.00
1	2 1/2 H.P. Storey Gasoline Engine	1 600#	45.00
1	35"x6" Dean Triplex pump belted	1 1000#	120.00
1	24" Stroke Storey pump jack	1200#	100.00
2	Steel tanks 8 ft. Dia. 10 ft. high Cap. 1 3800 gal. 1 2080# en.	4140	621.00
1	Simons Cone Crusher	1 10,000#	1,500.00
1	5 1/2 x 5 ft. Ball Mill	1 24,000#	3,000.00
1	4 ft. door classifier	1 600#	450.00
1	Rod Mill	22,000#	2,750.00
1	10"x20" Blake Crusher	18,000#	<u>1,200.00</u>
			9,986.00
1	16"x36" Nidder Mfg. Co. Corless Engine	1 28,000#	2,000.00
1	9"x9" Troy Engine & Rute Rotary Blower No. 3	4,000#	640.00
2	100 H.P. Marine Boilers, complete with fittings and 60 ft. stack		2,500.00
1	5 1/2 x 3 1/2 x 5 Duplex Feed pump	500#	100.00
1	Feedwater Heater Buffalo		
1	I.R.Co. Imperial No. 10 Cross Compound Compressor, Belted 14x12x7 1/2 x 12	8400#	1,500.00

1	Singly Cyliner steam hoist 8"x12" 28"x9" drum	± 2000#	250.00	
1	400 ft. 5/8 hoisting cable		24.00	
2.	I.R.CO. drifter drills		500.00	
1	" " " sinker drills		150.00	
2	Drill Columns		150.00	
1	20 Ft. thickener wood tank		<u>355.00</u>	8169.00
	600 ft. 4" column pipe in shaft @ .30		180.00	
	50 ft. 4" pipe @ .30		15.00	
	40 ft. 4" pipe @ .45		18.00	
	500 ft. 1" pipe @ .05		25.00	
	4500 ft. 2" pipe @ .15		675.00	
	1800 ft. 1½" " @ .08		144.00	
	1800ft. 3" " @ .20		360.00	
	500 ft. 3" " @ .20		100.00	
	300 ft. 2" " @ .10		30.00	
	300 ft. ¾" " @ .04		12.00	
	600 ft. pump rods @ .20 ft.		120.00	
	1 pump cylinder		36.00	
1	42"x84" Circ. Receivers	1500#	180.00	
1	36"x84" " "	1400#	168.00	
1	48"x96" " "	4000#	480.00	
1	10KDC Generator 1800 R.P.M.		300.00	
1	Oil Feed Set 2-3x2x3 Pump and Base		200.00	
1	7x12 Horizonatal automatic engine	2750#	<u>330.00</u>	5,373.00
1	No. 0 Buffalo Blower		25.00	
1	Anvil		15.00	
1	Hand Blower		12.00	
1	No. 2 Krought sand pump 2½" discharge		100.00	
1	Portland Vacuum Filter ± 8 ft. dia. 4 ft. wide		960.00	
1	Vacuum Pump		500.00	
1	Belt driven concrete Mixer		20.00	
1	1500 gal. galv. iron tank		54.00	
1	1000 gal galv.		43.00	
1	No. 6 Cameron Sinking Pump	1435#	400.00	
1	Cage		75.00	
1	20" drill press		100.00	
1	Emery Grinder		<u>20.00</u>	2,324.00
1	30x6 steel pulley		7.00	
1	24x8 CI "		6.50	
2	20x10 " "		6.00	
1	44x11 " "		20.50	
2	20x16 " "		16.50	
1	36x6 steel "		9.75	
1	24x10 " "		7.75	
1	24x4 " "		4.40	

1	24x10 Steel Pulley		7.75	
2	36x12 " "		33.50	
1	26x12 " "		10.50	
1	26x10 CI "		8.50	
1	20x6 Steel Pulley		4.50	
1	36x14 " "		19.90	
1	50x10 " "		26.00	
1	18x10 " "		5.25	
1	60x20 CI "		66.00	
1	30x12 Clutch Pulley		73.00	
1	26x11 Clutch Pulley		49.50	
1	60x14 " "		186.00	
1	30x8 " "		34.50	
1	Clutch Shaft Coupling		50.00	653.30
	63 ft. 2/11/16 shafting	1228#	85.00	
	16 ft. 2/15/16 shafting	332#	23.00	
12	Shaft bearings		60.00	
	Crude Oil		200.00	
	Mill Building		9,700.00	
	Elevator		100.00	
	Oil Feeder		72.00	
1	1½ ton Chev. Truck		200.00	
1	1936 Dodge Coupe		300.00	
	2300 ft. 12# rail 4.6 tons @ 5.00 C 50		230.00	
	Guest house and furniture		1,100.00	
	2 Labor Houses		600.00	
	2 Frame Houses		1,000.00	
	Power House		300.00	
	B.S. shop		75.00	
	Assay Outfit & Bldg.		150.00	
1	Incline Shaft Skip		250.00	14,449.90
2	Flotation Cells 38 ft. long		100.00	
4	Ore cases		300.00	
	Ball Mills Balls		150.00	
	Rod Mill Rods		150.00	
	Miscellaneous tools and supplies		400.00	1,100.00

CLASS OF SERVICE

This is a full-rate Telegram or Cablegram unless its deferred character is indicated by a suitable symbol above or preceding the address.

WESTERN UNION

1201

(43)••

SYMBOLS

DL=Day Letter

NL=Night Letter

LC=Deferred Cable

NLT=Cable Night Letter

Ship Radiogram

A. N. WILLIAMS
PRESIDENT

The filing time shown in the date line on telegrams and day letters is STANDARD TIME at point of origin. Time of receipt is STANDARD TIME at point of destination

TA99 WM1 8

1946 OCT 25 PM 1 58

W.SNA158 33 GOVT=SN WASHINGTON DC 25 341 P

C H DUNNING, DIRECTOR=

ARIZONA STATE DEPT OF MINERAL RESOURCES 304 HOME BUILDERS

BLDG PHOENIX ARIZ=

PLEASE WIRE ME IN DETAIL CARE OF SENATOR HAYDEN WHETHER OR NOT
ALLOCATION OF MONEY FOR DIAMOND DRILLING AND OTHER EXPLORATORY
WORK ON THE KEYSTONE COPPER COMPANY COCHISE COUNTY TO BE
EXPENDED BY THE FEDERAL GOVERNMENT WOULD BE WARRANTED=

W C BROADGATE.

Charge to the account of _____

Dept. Mineral Resources, 304 Ariz. Bldg. \$

CLASS OF SERVICE DESIRED	
DOMESTIC	CABLE
TELEGRAM	ORDINARY
DAY LETTER	URGENT RATE
SERIAL	DEFERRED
NIGHT LETTER	NIGHT LETTER

Patrons should check class of service desired; otherwise the message will be transmitted as a telegram or ordinary cablegram.

WESTERN UNION

1206

A. N. WILLIAMS
PRESIDENT

CHECK
ACCOUNTING INFORMATION
TIME FILED

Send the following telegram, subject to the terms on back hereof, which are hereby agreed to

NL

Phoenix, Arizona, October 25, 1946

**FOR VICTORY
BUY
WAR BONDS
TODAY**

Mr. W. C. Broadgate
c/o Senator Carl Hayden
Room 131 Senate Office Building
Washington, D. C.

Personally think Keystone has excellent possibilities disclosing important orebodies by proper exploration but title to property has been so involved with apparent crooks on both sides that constructive progress has so far been stymied.

Chas. H. Dunning

Aztec

Aztec Mining & Dev.

Credit Bureau of Benson

MARGUERITE N. JENNINGS, MANAGER

Keystone Mine

TELEPHONE
JU 6-2505

October 16, 1957

P. O. BOX 2
BENSON, ARIZ.

replied on Dept. of
see card

Department of Mineral Resources
Capitol
Phoenix, Arizona

Gentlemen:

We would appreciate any information you can supply us on
AZTEC MINING & DEVELOPMENT CO., Box 52, Dragoon, Arizona. There are
at least four men involved: Two Stephens or Stevens, father and son;
a Wright, and a Miller.

Credit Bureau of Benson

RECEIVED
OCT 17 1957
DEPT. MINERAL RESOURCES
PHOENIX, ARIZONA

May 24, 1944

Messrs. Bert and Clyde Miller
Dragoon
Arizona

Gentlemen:

I have just had a report from George Ballam regarding his conversation with you requesting Mr. Charles F. Willis, as consultant for the RFC, which he is not, (he being a consultant for the Metals Reserve Company) regarding certain questions as to why Mr. Rehg was able to obtain a loan on the Keystone property when he has no title.

As stated, Mr. Willis is consultant for the Metals Reserve Company, and that company has no connection with the Reconstruction Finance Corporation in granting RFC mine loans.

If there is any question in your mind as to the granting of the loan, I would suggest that you write Mr. Frank Kuehl, Legal Department, Reconstruction Finance Corporation, Mine Loan Division, Washington, D. C. Before any loans are granted by the RFC, the question of title is passed upon by the Legal Department and, from the evidence submitted, they were evidently satisfied with the title to the extent of being willing to grant the loan. What happens after the loan is granted is another matter and will undoubtedly at the proper time be investigated.

Very truly yours,

J. S. Coupal

JSC:JES

DEPARTMENT OF MINERAL RESOURCES
STATE OF ARIZONA
FIELD ENGINEERS REPORT

DEPARTMENT OF MINERAL RESOURCES
RECEIVED
MAY 16 1944
PHOENIX, ARIZONA

Mine **Keystone**
District **Johnson**
Subject:

Date **May 13, 1944**
Engineer **George A. Ballam**

Talked with Bert and Clyde Miller who are resident on this property. They allege that RFC loan for unwatering and rehabilitating Okay and Hagerman shafts was granted to Norman Rehg and that he has expended no money on property but claim he is using it to obtain legal possession.

Miller Bros. requested me to ask CFW as consultant for RFC, 'by what representations Rehg was able to obtain a loan when he has no title'

You will recall that we made a rather strong protest against the granting of this loan for reason of incapacity and incompetency of applicant, and were rather surprised to hear that it was granted.

However, I am transmitting the request of Miller Bros., and you may be sure I do not wish to be further involved.

*had met B. Miller that
intentionally Frank Knight, legal poss.
made loan to Rehg, evidently for
family on Rehg's property before
made - Rehg up to Miller to
Frank Knight*

February 5, 1944

Mr. Norman M. Rehg
Room 628
Hotel Raleigh
Washington, D. C.

Dear Mr. Rehg:

I am sorry for the delay in replying to your letter of January 24.

I have talked with Mr. Gohring, Mr. Willis, and Mr. Nebeker and am pleased to certify as follows regarding the purchase of a truck for the Keystone Copper Mining Company's operations at Dragon:

The property has received an RFC loan for \$5,000 for making the workings accessible. This loan was granted after careful examination of the records and was justified due to the tonnage of commercial copper ore obtainable from the old workings. It is manifestly impossible to operate a property located as is the Keystone property as to the distance from the railroad without the use of a truck. As close examination of the records show that the property justified a loan, the natural conclusion is that the property justifies the purchase of a truck.

I am sending a copy of this letter to Mr. Nebeker of the War Production Board and he will advise the Washington end of his department as to his views and probably accompany his suggestions with a copy of this letter.

Very truly yours,

J. S. Coupal, Director

JSC:JES
c.c.A. C. Nebeker

KEYSTONE COPPER MINING COMPANY

DRAGOON, ARIZONA

Room 628, Hotel Raleigh,
Washington, D.C.

NORMAN M. REHG
PRESIDENT & GENERAL MANAGER

EXECUTIVE OFFICE
EL DORADO, KANSAS

January 24, 1944.

Dear Mr. Coupal —

Today R.D.C. wired Mr. Gohring & King disbursements on the Keystone loan, etc.

Referring to our conversation last month regarding you assisting Keystone in obtaining a Certificate of Purchase for the truck which is ready for delivery to us, in Kansas, our application therefor having been denied, Mr. A.C. Nebeker urged that each of you, Mr. Willis and Mr. Gohring send to me a letter (air-mail) addressed to Mr. M. E. Kane, Chief Allocation Section, Division of Motor Transport, Washington, D.C., to supplement my oral argument that the truck be allocated to us. Recite therein all the good reasons to justify our request.

Then, Mr. Nebeker suggests that each of you give to him a signed copy of said letter to Mr. Kane, and he will proceed thru W.P.B. channels for us.

Will you kindly look after this matter right away, as I shall await the arrival of said letters here in Washington.

Certainly, we cannot proceed to rehabilitate, or produce from Keystone property, or get ready to mill ore for Coronado Copper & Zinc Co., without a truck.

Sincerely yours,

Norman M. Rehg.

January 25, 1943

Mr. George A. Ballam
Box 495
Tucson, Arizona

Dear George:

Will you kindly check into the requirements of the Keystone Copper Mining Company mine adjoining the Republic mine as soon as convenient to do so? Norman M. Rehg is now president of that company and can be reached at 905 Valley National Bank Building, Tucson. I understand that all of their difficulties have been cleared up, receivership dismissed, so that now they can do business. We have known right along that, due to their mix-up, there was no one who could legally do business for them, but that now has been cleared up.

Their proposition looks to be something of this nature - immediate rehabilitation of their mill with such remodeling as is necessary to handle their ores and possibly to act as a custom plant for Republic ores; a deal with Republic to immediately start making use of their mill after rehabilitation and the running of the mill while Keystone is developing and making ready its own property for production; then at a later date furnishing at least a part of the ore for the mill from their own properties.

You should get Mr. Crabtree to check into the mill with you, that is, as to process equipment necessary, cost of remodeling, etc. With Mr. Rehg you should check into a prospective deal with Nicholson at the Republic so that when an application is sent in to Washington we can give them the details of their prospective deal. You likewise should check into the needs of the mine as to cleaning up, production possibilities, and development needed. In other words, it should be quite a complete report as to the best program to be followed under the circumstances, with advice to Mr. Rehg as to procedure and information necessary to be submitted.

They have quite a few old reports on the property, maps and other things which will be helpful. Please emphasize to Mr. Crabtree that provision should be made for recovery of tungsten and molybdenum as well as copper-zinc.

This not alone has possibilities as to production from Keystone but can readily serve to increase production from Republic; therefore, something should be put in the statements relative to that angle and the capability of the Republic mine to supply the tonnage necessary for the mill.

Also check as to whether or not a \$5,000 accessibility loan might be needed first for the purpose of making the mine accessible for

August 4, 1942

Mr. U. R. Miller
Dragoon, Arizona

Dear Mr. Miller:

Your letter of July 20 to Mr. Charles F. Willis and the clipping from the El Dorado News, El Dorado, Kansas, has been referred to this office and we will place this information in the file on the Keystone property.

Regarding the Keystone, if you can pick up an application for a preliminary mining development loan or a straight development loan from the RFC it might be possible to get government aid in opening up the Keystone Mine. There is little chance for private capital to do this work at this time and the government is willing to investigate those properties where sufficient information is available to justify their making a loan for development or operating purposes.

I would suggest that you write to the RFC Mine Loan Division, 325 Heard Building, Phoenix, and ask for application blanks for the preliminary development loan and then study them over carefully to see whether or not you can present sufficient data to warrant the government in making one of the three different types of loans which are now available.

With best wishes and kindest regards, I am

Yours very truly,

J. S. Coupal, Director

JSC:LP

Keystone

June 2, 1943

Miller Brothers
Dragoon, Arizona

Gentlemen:

I am enclosing additional papers that
Mr. Shanklin gave me to send to you.

Yours very truly,

J. S. Coupal, Director

JSC:LP
Enc.

April 15, 1943

MEMORANDUM

Keystone Property

TO: George A. Ballam

FROM: J. S. Coupal

I expect to be in Tucson probably on Wednesday of next week and one thing I would like to look up would be the legal status of the Keystone Mine.

Please make note and let me know who to see and the pitfalls to be avoided.

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



October 18, 1957

Mrs. Marguerite N. Jennings, Manager
Credit Bureau of Benson
P. O. Box 22
Benson, Arizona

Dear Mrs. Jennings:

Replying to your inquiry of October 16th:

The Aztec Mining and Development Co. has leased the Keystone Mine in the Cochise (Johnson) District from the owner, Norman M. Rehg, et al, of Dragoon, who gave our engineer this information:

"The following men are associated with Aztec Mining and Development Co.:

Harold Stevens, 7151 S. Missiondale Road, Tucson, Arizona
Phil Stevens, 7151 S. Missiondale Road, Tucson, Arizona and
Harry Lehman, 3643 S. Liberty, Tucson.

Reconditioning of the mine was started July 23rd. Two cars of stockpiled material were shipped."

We are not in a position to pass judgment upon the mine or men. There is a United States Bureau of Mines Report of Investigations, No. 4504 concerning the mine and the Bureau's diamond drilling there during 1947-8. A copy of this probably can be obtained from the Bureau at University Station, Tucson, or at least reviewed at their office at the University.

Yours very truly,

FRANK P. KNIGHT,
Director.

FK:lp

C
O
P
Y

*File
Keystone
Mines*

Dragoon. Ariz,
7/20/42.

Dear Mr Willis:-

I am sending you the El Dorado News, El Dorado, Kans, showing the Trial and Conviction of Norman M. Rehg, This man has kept Keystone out of Production for the last four years, bringing suits in Kansas and Arizona against the Officers and Directors, and the Keystone Copper Mining Co. to gain Possession of the Property and retard production of stratgic metals, which the Country needs to fight this War. Mr Craig of Fenamore, Craig and Bloodso can give you a full history of this mans activities in persecuting some of the best citizens in Kansas, and also stoping the Keystone from production. I wish you would consult Mr Craig, and show him this paper.

Mr Ballam spent several days in this camp last week, and said he would be back this week, he looked over the Milling Plant that is idle at the present time, through this man Rehg activities, We would like to get the Keystone producing also the Peacock, for we know would furnish a lot of copper and Zinc, to help in this War, and now is the time we need it. I am with kindest regars.

Yours Very Truly.

E. P. Miller

June 4, 1941

Mr. T. C. Miller
Keystone Copper Mining Co.
Dragoon, Arizona

Dear Mr. Miller:

I want to thank you for yours of the second and for the complete information that you sent us regarding the Keystone Copper Mining Company properties. Your company certainly does qualify for our report.

Thanking you again, and with kindest personal regards, I am

Yours very truly,

Chairman, Board of Governors
Arizona Department of Mineral Resources

CFW:LP

Dragoon. Ariz.
6/2/41.

Chas F. Willis. Chairman, Board of Governors.
Arizona Dept of Mineral Resources.
Phoenix. Ariz.

Dear Mr Willis.

I am very sorry I have been delayed in getting this report to you, but other business came up that we had to attend too.

Here is the cost, that Mr R. G. Humes our Engineer has in his report.

Working cost.		Per ton of crude ore.
Development	\$	0.25
Mining 100 tons per day.		1.00
Milling 100 tons per day. ratio 15 to 1.		1.25
Trucking Concentrates (10% water)		.15
Freight to Smelter.		.15
Smelting Concentrates.		1.00
Converting, Refining. Marketing.		2.50
Overhead taxes and etc.		.15

		6.46

Thanking you in advance for any favors you can extend to us, in getting the Keystone into production. We are.

Yours Sincerely.
Keystone Copper Mining Co.

J. C. Miller

May 23, 1941

Mr. T. C. Miller
Keystone Copper Mining Co.
Dragoon, Arizona

Dear Mr. Miller:

I have received the questionnaire relative to the Keystone Copper Mining Company and we note that you believe that property could produce three million pounds of copper a year on a 14¢ price. You do not say anything about what it could produce at the higher prices mentioned.

One thing, however, on your report that I question and that is you say that no plant facilities would be required nor would there be any preliminary costs to get under production. I am sure that you must be wrong, as there are hardly any properties that could get into production at that rate without a considerable capital cost. It is probable that you misunderstood the question. While you may have a milling plant and equipment at the present time capable of handling that amount of copper, I feel sure that you would have to have a considerable amount of money before you would begin to get the smelters' returns that would keep you going.

I am sending you another copy of the questionnaire in order that you may more fully fill out that portion.

It does look, however, as though your property will qualify for inclusion into the report, and, therefore, we would like to get some additional information as we hope to include a brief statement regarding each property that is being reported upon.

I am enclosing another questionnaire which will give us the data that we want for this brief statement. We would appreciate your making it concise.

Trusting we will hear from you soon, and with kindest regards,

I am

Yours very truly,

Chairman, Board of Governors
Arizona Department of Mineral Resources

CFW:LP
Enc.

May 19, 1941

Mr. T. C. Miller
Keystone Copper Mining Co.
Dragoon, Arizona

Dear Mr. Miller:

I have received the questionnaire that you sent relative to the possible production of copper from the Keystone Copper Mining Company properties in the event we are able to get a higher price and make the proper financial arrangements.

The data which you gave us is not such as we can use in our survey and report. We cannot use any information on carloads of ore or tons of ore, but it has to be in pounds of copper. You state that in 1937 you produced one car. We would have to know how many pounds of recoverable copper. Likewise you state that on a 14¢ price you could produce "four a month". This would be meaningless on a report. May we presume that you mean carloads of copper ore, but we would have to know how many pounds of copper annually.

I would take it from your report that the property needs a 16¢ price in order to make a go of it.

One question which I am sure that you did not understand, as the answer indicates, is "What plant facilities would be required and how much is the estimated cost in the event a 14¢ price could be assured?". What we meant by that question was what capital investment would be required and what plants or equipment would you have to put in. Also, you gave the same answer for 16¢, 18¢ and 20¢ price as you did for 14¢. Yet you stated at those different prices you could produce 8 carloads a month or 12 or 20. Is it possible that this could be done without any change in your plant capacity, with no additional machinery, and at no capital investment? It does not sound reasonable, and, therefore, I am calling it to your special attention. You stated on another part of the report that it would be necessary to develop a water supply. This is in the nature of a capital investment.

We are very anxious to get full details from every potential copper producer, but we have to get them in the same form from each one in order that they may be tabulated properly for government use.

Hoping that you can give us this information shortly, and thanking you,
I am

Yours very truly,

Chairman, Board of Governors
Arizona Department of Mineral Resources

Dragoon. Ariz.
5/17/41.

Mr Chas F. Willis.
Chairman. Board of Governors.
Arizona Dept of Mineral Resources.
Phoenix. Ariz.

Dear Mr Willis.

Your Questenmaier at hand, and I am taking the liberty to fill the same out for My Pro, for he is in Wichita Kans at this time, and as I do most of his work it is just the same as if he had filled it out for the Keystone Copper Mining Co. but I think very shortly say in side of 30 days there will be a new bunch in, and we will be out but we will still retain our interest just the same, which is C. K. with me, for then it will give us a chance I hope, to put over our own individual Property formely the Peacock Ground, that joins the Republic on the east.

The United Ariz, but is called the Republic most of the time, mined during the World War over to our side line, thousand and thousands of tons of ore, in fact they say shipped over three million dollars worth of ore from that property, by the Cabreza Mining Co, they shipped from 1913 to 1919 from two to five cars a day, they may have mined under our ground for all we know, lots of Miners and Engineers say it is the best property in the Camp.

We have a tunnel run in the mountain about one hundred ft in good carbonate ore, and if copper should come up to 14 or 16 cents a lb, we have a party that would put in a leaching plant, and I know that part of the ground could be put into production.

We also have a perpendicular shaft down 245. ft, and there was some sulphides coming in, in one corner fo the shaft when we had to shut down on account of finances. We have an Engineers report on this Property, that we would gladly send you to look over, perhaps you could help us to finance and put this property into production, for it would not take long. for the Republic really needs this ground.

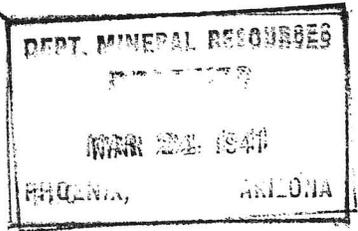
If copper was 14 or 16 cents a lb, there would be at least two or three hundred men at work, but today there is none, but during the World War there was fifteen hundred people in this camp, the Republic alone was employing three hundred men, and six school teachers here in Camp, so you can see the men that could be employed at good wages, instad of walking the street looking for work, and not only Ariz, but a number of Western States, for they are at lest ten million men idle to day as you well know, so there could be a lot of slack taken up, if this Government would just let the little fellow have a chance to make a decent living, instead of the most of us being on the verge of hiveing to get on the Relief role. You see them walking the Streets of your City. I know.

Wishing you all the success possible, for I know your undetaking a worthy cause for humanity, and with kindest Personal regards, I am.

Yours Very Truly.

J. C. Miller

Carpenter



Tucson, Arizona March 21, 1941

MEMORANDUM

TO: J.S. Coupal, Director
FROM: Field Engineer, Southern District
SUBJECT: Keystone Copper Mining Company

Copy was made of the enclosed letter from the Keystone Copper Company and I shall arrange to visit this property and do all that I can to carry out your instructions of the 17th inst.

Miles M. Carpenter

*Made up & properly
took samples for
identification & Bureau
Assumed J.C. Miller direct.
Found no cobaltite in Keystone Minerals*

March 17, 1941.

Mr. T. C. Miller
Keystone Copper Mining Co.,
Dragoon, Arizona.

Dear Mr. Miller;-

I have noted your letter dated March 17th and have added to your mine owners report on the Keystone Copper Mining Company property the facts mentioned regarding scheelite.

I am sending a copy of your letter and also a copy of this letter to Miles M. Carpenter, field engineer for the Department in the southern district and am asking him to visit your property the next time he is in that area and advise with you regarding the scheelite and the steps to be taken to bring this to the attention of the Bureau of Mines as a new scheelite showing.

Very truly yours,

J. S. Coupal.
Director.

Keystone Copper Mining Co.

MINES AND GENERAL OFFICE

U. R. MILLER, PRES.
DR. G. R. DEAN, V. PRES.

DRAGOON, ARIZONA
3/17/41,

T. C. MILLER, Sec'y
F. H. CROFT, TREAS.

DEPT. MINERAL RESOURCES

RECEIVED

MAR 17 1941

PHOENIX, ARIZONA

Mr J. S. Coupal. Director of the Department of Mineral Resources.
Phoenix. Ariz.

Dear Mr Coupal.

I am writing to you in regards to the Keystone Copper Mining Co's Property. Some time ago I sent you a mine owners report of this property, and since I find in the last ore we went into just before we had to shut down, in May the 5th 1938. is Scheelite and this is a metal that the Government needs badly, and I believe this ore will carry one hundred lbs to the ton if not more, for you can see the scheelite all through the Garnet rock, but it has to be milled in order to save the other metals, which are as follows. Copper. Zinc. and some silver and molybdenum.

You have been through the mill and know what it is like. I wish you could come down or send some one, for I would like to show them the rocks I have that came from the five hundred feet level, but at this time we cant get down in the shaft on account of bad air and timbers being rotten, but I have the rocks that come from that level.

I am most positive we have a scheelite mine as well as other metals, when these two bodies of ore are fully opened up.

Perhaps you may be in a position where by you could help us a lot to get new capital invested, for scheelite is needed badly at this time. You might be able to help us get a Government permit in order to help us raise the necessary fund to get this property on a paying bases, we have the mill, and have our water partly developed, for a hundred feet more will give us enough water to handle one hundred and fifty to two hundred tons per day, that is in 24 hours. We are willing to pay you for your trouble in getting us the necessary help.

Thanking you very kindly for past and future favors. We are.
Yours Very Truly.
Keystone Copper Mining Co.

T. C. Miller

*Miller -
note + return to
this office.
J.S.C.*

3 December 1940

Mr. T. C. Miller,
Dragoon,
Arizona.

My dear Mr. Miller:

I thank you for your letter of November 29.
I appreciate the news regarding the camp, and I shall
look forward to additional news as the property
develops.

With kindest personal regards, I am

Yours very truly,

J. S. Coupal
Director

JSC-jrf

Keystone Copper Mining Co.

MINES AND GENERAL OFFICE

U.R. MILLER, Pres't.
DR. G. R. DEAN, V. Pres't.

DRAGOON, ARIZONA

T. C. MILLER, Sec'y
F. H. CRON, Treas.

LL/29/40.

Mr J. C. Coupal, Director of Mineral Resources.
Phoenix, Ariz.

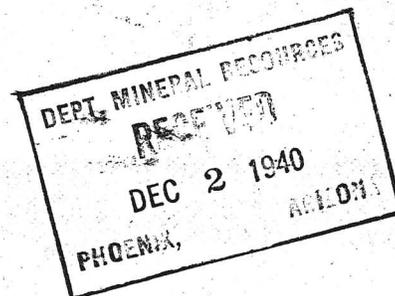
Dear Mr Coupal,

Your kind favor at hand and in reply, I havnt a thing more to say then what you have, for every thing is quiet here at the Keystone, I am back here once again as watch man, and I will tell you mining or promotion of mines is a back number for the little fellow, unless there is a change in the Security Exchange in order to help prospect for new mines in Ariz, for they are here but it takes money to develop a mine as you well know, we have a good mine here but it takes money to finish the job, in order to open up the bodies of ore we have found and open up stoping ground, and finish developing our water in the bottom of our main shaft, that we have started and before we had to quit we were getting more water at each round of holes,

All lines of business is pretty quiet around here. Except that American Metal Co have taken over the United Ariz, called the Republic, and are Diamond Drill at this time, they have put down two holes and are on their third now, one 859 ft and one 900. ft, they will probably drill fifteen or twenty holes, perhaps more before they are through, I believe they are going to make this camp come back, if they find what they want, and I believe it is here.

With kindest personal regards. I am,
Yours Sincerely.

T. C. Miller



Make corrections

5 September 1940

Mr. T. C. Miller,
Keystone Copper Mining Company,
Dragoon, Arizona.

My dear Mr. Miller:

In the absence of Mr. J. S. Coupal, I am taking the liberty of acknowledging receipt of your letter of August 20.

The corrections suggested will be made on your mine owners report.

Assuring you of our desire to be helpful, I am

Yours very truly,

Jess R. Fickas
Secretary to Mr. Coupal

jrf

Keystone Copper Mining Co.

MINES AND GENERAL OFFICE

U.R.MILLER, PRES.
DR.G.R.DEAN, V.PRES.

DRAGOON, ARIZONA
8/20/40.

T.C.MILLER, Sec'y
F.H.CRON, TREAS.

Mr J. S. Coupal. Director.
Phoenix. Ariz.

Dear Mr Coupal;-

In that Mine owners report, you sent me. I would like to make a few suggestions.

Where it says just before we shut down in 1938, that should be in 1931, for in 1938. we only got to mine four or five days, for the most of the time we were sinking the Main shaft deeper, in order to develop our water supply, but for the four or five days we were breaking down ore of a good grade.

The Keystone has 16 claims and a fraction. also 10 others, that are not considered very valuable, took them up in order to have more ground years ago. and in regards to the mill perhaps you had better put that at 200. although you have been through the mill, you can place it at what you think it will handle.

Thanking you very kindly for sending that report to me, before sending it out, if that is what you expected to do, with kindest personal regards. We are.

Yours Very Truly.
Keystone Copper Mining Co.

T. C. Miller

Dragoon. Ariz.
6/7/40.

Mr Coupal;-

I am enclosing you the Keystone Copper Mining Company's Engineers Report, also the Peacock or Nabob Mining Co's report,

Now on the Peacock or Nabob property that we own individually, we have a shaft down perpendicular about 245. ft, and have gone through the capping and have been in a garnet formation for about 50, feet, and in one corner of the shaft we are begging to get sulphides of copper just started to come in as we had to shut down on account of the lack of fund to carry one, and I am most positive in side of a hundred feet deeper we will be in milling and shipping ore, you can read over the Engineer's report, now this information Mr Hubbard got from Mr Libbey, for he was the one that discovered the big body of ore in the Republic property, and that they shipped from 3 to 5 or more cars a day from 1913 to 1919. This property will be a deep mining proposition, and the ore from the Republic dips right through the property.

In regards to the Keystone, we have opened up two ore bodies, but the ore is not blocked out yet, a little more money will very easily do that. by running a drift from the five hundred to connect up with the 327. ft level ore and running a drift from the 600, ft level north east for a hundred ft and we will have the same ore we have on the 500, ft level. the Keystone has a large iron dike running east and west through the property, and at places it is 100, ft wide, then there is a ledge of iron about 3, ft wide running east and west, east and north of the main shaft, and is right in line with the two ore bodies that we have partly opened up east of the main shaft. and direct north of the 327. ft level ore. also direct north from the 500, ft level ore, so I content that we are on the right road to open up a big ore body right on the Keystone ground from the Main shaft, and will also open up another at the O. K. or Miller shaft which is in the northwest part of the property and which will in time connect up with the Main shaft.

J. C. Miller