CONTACT INFORMATION
Mining Records Curator
Arizona Geological Survey
3550 N. Central Ave, 2nd floor
Phoenix, AZ, 85012
602-771-1601
http://www.azgs.az.gov
inquiries@azgs.az.gov

The following file is part of the G. M. Colvocoresses Mining Collection

**ACCESS STATEMENT**

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

**CONSTRAINTS STATEMENT**

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

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

**QUALITY STATEMENT**

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

copied

REPORT OF THE

ARIZONA COPPER BELT MINING COMPANY

BY

DELOS GARDNER, MINING AND METALLURGICAL ENGINEER

December 22, 1933

This Company's property consists of two groups of claims known as the Texas group and the Wren group. The Texas group comprises eighteen claims, a water right and a mill site, all of which are patented by the United States Government excepting two claims which were acquired later by the Company and which can be patented at any time. The Wren group consists of four patented claims in addition to the Texas group and are situated about two miles southeast of the Texas group.

This district was designated by the Federal Land Office as the Black Rock Mining District of Yavapai County.

The nearest railroad station is Wickenburg, on the Santa Fe Railroad, about twelve miles distance from the camp at Constellation, and is the Company's shipping point. A good mountain road has been built from Wickenburg to Constellation over which a 10-ton truck can easily haul 8 tons either direction, and all necessary roads have been built by this Company to the Texas No. 1 gold shaft, Texas No. 2 copper shaft, Texas No. 3 copper shaft, and Texas No. 4 gold shaft in Slim Jim Gulch, about four thousand feet north of Texas No. 1 shaft.

GEOLOGY:

The country rock in this district is composed chiefly of pre-Cambrian granite which is the earliest geological classification for rock. The granite in places is intermixed with large seams of diorite which is more likely a facies of the granite. The rock in places is partly decomposed and metamorphosed. The property is cut by many intrusive dykes which are principally Andesite, and other dykes of Rhyolite and Basalt are plainly in evidence. The dykes can be easily traced by their oxidized iron capping. This part of Arizona is very mountainous and the altitude is 3400 feet above sea level. There are numerous mountain ranges in this vicinity known as the Wickenburg Mountains, the Weaver Mountains and the Silver Mountains, which may be classified as the foothills of the Bradshaw Mountains.

There appear to be two systems of veins, those predominating in copper having a strike from the northwest to the southeast, and those predominating in gold having a strike almost east and west, and indicate a junction formation on this property. In general the dip of the gold veins is to the north, and the dip of the copper veins is to the west, and there appear to be at least thirty separate veins on the Texas group.

ORE DEPOSITS:

The Company has two shafts on the copper vein known as No. 2 shaft which is 300 feet in depth, and No. 3 shaft which is 250 feet in depth. About three years ago development work was suspended in these two shafts on account of the low price of copper, and development work was started on the No. 1 gold vein which now has a shaft 223 feet in depth. About a year ago a new shaft was started, known as No. 4, on the Judge Riggs gold vein about 4,000 feet north of No. 1 shaft, and is now about 50 feet in depth and in process of sinking to 75 or 100 feet in depth to cross-cut and develop what appears to be three or four large veins forming a contact near that shaft.

No. 1 shaft has been sunk on a large fissure vein which has a strike south 77° west and dips 42° north. The outcroppings of this vein are prominent and can be traced for several thousand feet on the surface. The vein is composed principally of light brown quartz in between green schist. The quartz varies from a few inches up to four feet in thickness. In places there are layers of schist and quartz characteristic of wide fissure veins. The long outcropping of the vein such as No. 1 gold vein usually indicates that the vein goes to a great depth. The hanging wall of the vein is well defined while the foot wall is not. There is a layer of green schist on the hanging wall side of the vein. Gold is practically the only metal of economic importance. The gold occurs in a free state and is distributed in the quartz. Practically no sulphides occur above the 150-foot level. At the 150-foot level the sulphides, which are chiefly pyrite, begin to appear. Some gold is associated with the pyrite. On the 150-foot level the vein remains constant for 300 feet and at that point enters a region of different mineralization in which the vein becomes temporarily lost. The dip of the formation changes from 45° to 81°. The first ten feet of this formation is composed of a quartz porphyry which contains specks of bright red hematite. As the drift continued approximately 20 feet further it is pulverized sugar quartz formation with dark seams or slips striking in various directions. The extent of this formation is not yet known and development work on this drift should be continued as soon as possible.

DEVELOPMENT WORK:

Development work of the No. 1 gold vein consists of an incline shaft and drifts at the 30, 60, 140, 150 and 200-foot levels, comprising a total of about 600 feet of drifts, the most extensive of which is the drift on the 150-foot level which is 368 feet in length. This shaft at the lower level made only two or three barrels of water per day. Several shallow shafts have been sunk on the vein from the surface and all are in mineral.

About 250 feet from No. 1 shaft there is an intersection of this vein with another vein known as the contact vein. This vein, which strikes to the southwest, is a quartz vein similar to the main gold vein, but darker in color. Its outcroppings which weather to a dark gray can be traced for a thousand feet on the surface. The contact shaft is 36 feet in depth and has been sunk at the intersection of this vein and the main vein.

At the bottom of No. 1 shaft the gold vein forms an intersection with another vein which strikes to the southeast. This vein is composed chiefly

of quartz of a reddish color and carries values in gold and copper. The foot wall has not yet been exposed and is about six feet wide. Drifting for 15 to 20 feet to determine the formation on this vein should be done as soon as possible.

It is advisable that a raise be made from the 150-foot depth to the surface at the junction of the contact vein and the No. 1 vein, which is in accordance with the mining laws of Arizona as a second outlet and would greatly improve ventilation. An assay recently made all across this vein, which is at least four feet wide, shows an average in gold of $24.00 to the ton and is all good milling ore.

NO. 1 SHAFT EQUIPMENT

No. 1 incline shaft is 6 feet high and 7 feet wide, has a wooden head frame 20 feet high and a half-ton skip that runs on a 24 gauge tract of 12-pound rails.

The skip dumps into a half-ton ore car conveniently located to the mill and ore bin for speedy dumping. At present there is no hoist at the collar of the shaft, having been transferred to the Riggs shaft. It is proposed to set up the 40 H. P. electric hoist now at No. 3 copper shaft at No. 1 shaft. On the 150-foot level an 18 gauge track having 8-pound rails extends the entire length of the drift, 368 feet. There is also a 1-inch air line and a ¾-inch water line extending to the face of the drift. The air line and water line also extend to the bottom of the shaft, 223 feet in depth. Practically no timbering is required in the shaft or drifts. An incline ladder extends from the top to the bottom of the shaft.

Conveniently located to the shaft is a change room equipped with a shower, stove and hot water tank. As soon as active operations are resumed at No. 1 shaft, a 16 foot wide by 12 foot deep hoist house and blacksmith shop should be erected north of the head frame. There are sufficient concrete blocks left over from the mill building to build the walls of this hoist house, or the hoist house at No. 3 copper shaft could be used for No. 1 shaft. The camp is very conveniently located to No. 1 shaft.

NO. 2 SHAFT EQUIPMENT

This shaft has been sunk to a depth of 300 feet with about 2,000 feet of lateral workings now filled with water which will be used as a reservoir for the gold mill. The mine records show that this shaft made about 4,000 gallons of water a day. Work was discontinued there about three years ago and the development work at No. 1 shaft actually dates from that time on. The principal values in that shaft showed copper and gold ores.

No. 2 shaft is equipped with a 32-foot wooden head frame and is a vertical shaft, and has a 1,000-pound capacity bucket and an automatic dump. A 1½-inch compressed air line, a 2½-inch water line and a 10-inch fresh air pipe extend to the bottom of the shaft with lateral branches, and a fan

blower equipped with a 5 H. P. motor.

The operating machinery consists of a 15 H. P. Fairbanks-Morse hoisting engine, a 9 by 8 Ingersoll-Rand air compressor driven by a 25 H. P. Fairbanks-Morse gas engine and two air receivers. There is also a 50 H. P. Westinghouse electric motor with starting switch which was previously used for driving the air compressor. This air compressor will be used for No. 1 shaft operations and is in first-class condition. There is also a small centrifugal pump for circulating water through the air compressor. There are two 600-gallon galvanized water circulating tanks for the engines and compressor, and a 1,000-gallon black iron fuel tank. There is a large horizontal duplex station pump now at the collar of the shaft having a capacity of 30 gallons per minute, also a No. 3 Cameron sinking pump with a capacity of about 25 gallons per minute, and a Buffalo station pump having a capacity of 15 gallons per minute. All of this machinery is enclosed in a corrugated iron building.

Within 30 feet of the engine and hoist house there is a well-equipped blacksmith and machine shop with a change room adjoining having a shower, stove and hot water tank.

No. 2 shaft is located 600 feet north by northeast of No. 1 shaft and 120 feet lower than the collar of No. 1 shaft. If the water should be pumped out ultimately from No. 2 shaft and workings for the mill and the present crosscut at the 300-foot depth extended, a vertical depth would be gained of approximately 250 feet below the present bottom of No. 1 shaft.

NO. 3 SHAFT EQUIPMENT

No. 3 copper shaft was sunk on the Amethyst vein approximately 75 feet from the northwest end line of the Monte Cristo claims and about 1,500 feet southeast of No. 1 shaft and about the same distance from No. 2 shaft. Work was stopped about three years ago at this shaft on account of the low price of copper. The shaft and underground workings are filled with water and can be used if necessary as an auxiliary supply for the mill. The shaft is 250 feet in depth with about 1,400 feet of lateral workings including several crosscuts. There is a corrugated iron hoist house about 14 by 16 feet and a former blacksmith and machine shop about the same size, conveniently located near the collar of the shaft.

NO. 4 SHAFT - Known as the Judge Riggs Gold Shaft.

This shaft is about 4,000 feet north of No. 1 shaft and located in Slim Jim gulch, near which shaft there is evidence and outcroppings of four large veins intersecting. The shaft is 50 feet in depth and in process of being sunk 75 to 100 feet to cut the dip of the high grade streak within the large Riggs vein. It is a vertical shaft and has recently been timbered from the collar to about 15 feet in depth. At the 37-foot depth there is a 25-foot crosscut to the main Riggs vein and about 100 feet of drifting has been done on this vein. The shaft has been sunk on about the center of the Black Rock vein. No further exploration work has been done on this vein. The crosscut, which has been extended about 25 feet, appears

to be all in the Judge Riggs vein formation which can only be determined with further development work.

The Judge Riggs vein is composed of white quartz in a green schist. In places pyrite is associated with the quartz. Considerable of the pyrite at this level has been oxidized producing hematite. Gold is about the only metal of economic importance, although some lead occuring as galena is found. Gold occurs in the hematite and is contained in the pyrite. A streak of high grade ore varying in width up to about three feet, from which assays have been made running up to $640.00 in gold to the ton with the price of gold at about $32.00, is found in this streak. A small stope has been started on this streak. The shaft makes approximately ten barrels of water per day.

RIGGS SHAFT EQUIPMENT

The Riggs shaft, or No. 4 shaft, is equipped with a 16-foot wooden head frame with a semi-automatic dump, a 600-pound capacity ore bucket, an Ingersoll-Rand tugger hoist capable of hoisting 1,000 pounds. The ore and waste rock are dumped into a steel ore car in which it is trammed about fifty feet to the ore pile.

Compressed air is furnished by a Rix portable air compressor of about 120 cubic feet displacement, sufficient for operating two jack-hammer drills. There is also a blacksmith forge and tools for sharpening the drill steel, and a pressure tank which supplies water for the hollow steel jackhammer drills. Fresh air for ventilation is furnished by a centrifugal fan driven by the compressor engine and is carried to face of the drift and crosscut by a 4-inch ventilating pipe. The compressor and jack-hammer drills were installed in August, 1933.

PROPERTIES ADJOINING THE ARIZONA COPPER BELT MINING CO.

The Monte Christo Gold Silver Co. adjoins on the east, southeast and south. The Amethyst vein on both properties has a strike from the southeast to the northwest. Their native silver vein appears to run parallel with the Amethyst vein.

The Black Rock Mines adjoin to the north and northeast of the Arizona Copper Belt Mining Co., and gold ore was being developed before the property changed ownership.

The Golden State Mines adjoin on the southwest, which also have changed ownership and work has been at a standstill for some years.

The Gold Bar Mines vein system strikes toward the Arizona Copper Belt Mining Co. property between No. 1 shaft and the Riggs shaft and are located east of the Copper Belt.

The Wren Group, comprising four claims are about two miles southeast of the Texas Group and will be reported later.

This Company owns a spring of pure water in Cottonwood gulch about

6,000 feet north of No. 1 shaft, and a pipe line has been installed permitting the water to flow by gravity into a 1,000-gallon galvanized iron tank. A triplex pump and gasoline engine installed near this tank and enclosed in a suitable building, pumps the water into a 1,500-gallon galvanized tank located near No. 1 shaft, a distance of about 2,100 feet, up an incline of approximately 200 feet. The source of the Company's pure water supply consists of a well sunk in granite reefs approximately 14 feet in depth, which has been walled up with masonry and cement work to prevent contamination. It is believed that if this well were sunk 25 feet deeper and a crosscut reservoir made, a much larger supply of water could be obtained.

Another source of water supply it is believed can be obtained on claim No. 19, known as Willow gulch, which will be explored later.

In view of the fact that this property is one of the greatest mineralized areas in Central Arizona, it has been impossible for me, during the short time I have been with the Company, to examine many parts of it, and which can be done later.

A MODERN MILL AND BUILDING

October 16, 1933, ground was broken for a 25-ton mill which includes amalgamation, concentration and flotation of the ore. It is believed that this mill will recover nearly all the gold in the ores, and the by-products which are found such as lead, silver and copper and some gold will be saved in the form of concentrates. The machinery is made of Chrome steel and manganese and is considered unbreakable, and is the latest model and design for gold milling. The accompanying flow sheet shows the proposed method of ore treatment. The chemicals required for milling gold ores have been written out on a separate sheet and given to the president of the Company. The crusher which has been selected has a much greater capacity than the 25-ton size and will crush 64 tons in eight hours, thereby saving two men for a 24-hour day.

MILL BUILDING

The construction of the mill building for the lower part of the four terrace walls is of natural finish cement blocks, and above the walls the framework consists of 2 by 6 Douglas fir, likewise the roof beams, making a very strong and durable building. On the outside of this framework corrugated galvanized iron is securely nailed making a very attractive and practically fireproof building. The ore bin is constructed of 8 by 8, 8 by 10 x 10 Douglas fir lumber, and has a capacity of 52 tons. The timbers are bolted together with ¾-inch and 1-inch bolts and 5/8-inch drift pins.

A large steel tank has been erected about 300 feet distant from the mill at an elevation about 40 feet higher than the mill, and has a capacity of 62,000 gallons of water. A 2-inch black iron pipe line has been installed from the tank to the mill having ample capacity for all milling purposes. A 100-foot fire hose line and reel will be installed in the mill building on the second terrace under the open stairs.

The floors of the mill building will be smoothly finished in Portland cement. The windows and lighting facilities of the mill are of the best and will enable operation day and night if desired.

The Arizona Power Company's line is now within about 700 feet of the mill and will be extended to operate all the machinery and lighting. This line carries 44,000 volts to the Monte Christo sub-station, where transformers step it down, or reduce it, to 440 volts. For lighting purposes the Arizona Copper Belt Mining Company's own transformer steps it down to 110 volts. All the mill machinery, motors and pumps will be operated from this hydro-electric power line.

The Company has a well-established camp consisting of an executive building of four rooms, a cook house and commissary of four rooms and cold storage cellar, a men's bunk house which will accommodate eight men, a superintendent's house which will accommodate two men, and other conveniences. Long distance telephone connection enables the reception and sending of telegraphic and telephone messages with dispatch. The camp is illuminated with electric lights inside of the buildings and two 100-watt lights on the outside in front of the buildings.

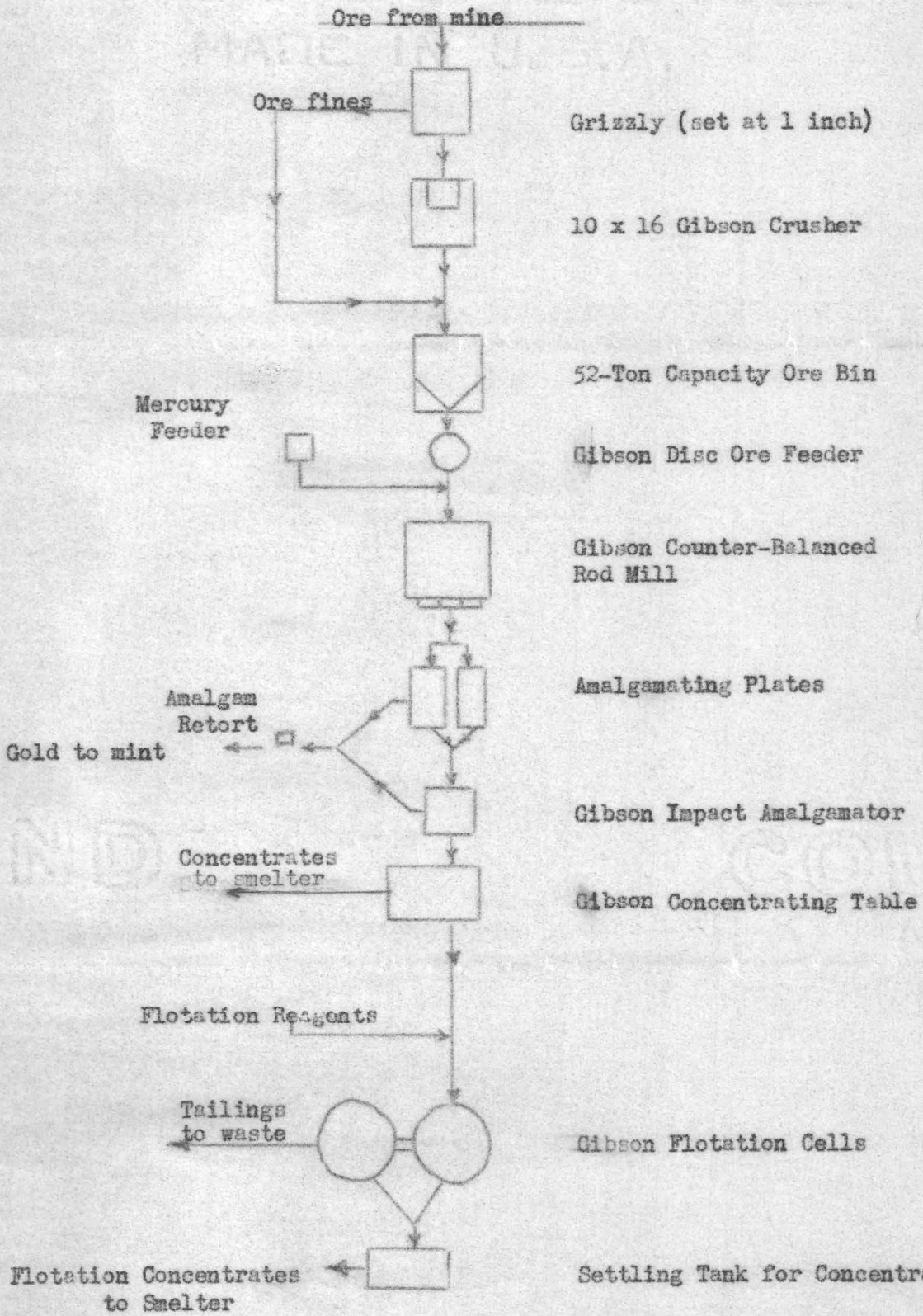
Work can be carried on in this mining district twelve months in the year and has an exceptionally fine winter climate.

This Company took the initiative some years ago in having the post office, known as Constellation Post Office, located at the entrance to the camp and is very convenient. United States mail is delivered daily except Sundays from Wickenburg to Constellation.

(Signed) Delos Gardner

Mining and Metallurgical Engineer

## FLOW SHEET FOR MILL




(Signed) Delos Gardner

Note by G. M. C.
Leo not considered trustworthy reliable, Company has gone broke + quit in 36

REPORT OF THE

ARIZONA COPPER BELT MINING COMPANY

BY

DELOS GARDNER, MINING AND METALLURGICAL ENGINEER

December 22, 1933

This Company's property consists of two groups of claims known as the Texas group and the Wren group. The Texas group comprises eighteen Claims, a water right and a mill site, all of which are patented by the United States Government excepting two claims which were acquired later by the Company and which can be patented at any time. The Wren group consists of four patented claims in addition to the Texas group and are situated about two miles southeast of the Texas group.

This district was designated by the Federal Land Office as the Black Rock Mining District of Yavapai County.

The nearest railroad station is Wickenburg, on the Santa Fe Railroad, about twelve miles distance from the camp at Constellation, and is the Company's shipping point. A good mountain road has been built from Wickenburg to Constellation over which a 10-ton truck can easily haul 8 tons either direction, and all necessary roads have been built by this Company to the Texas No. 1 gold shaft, Texas No. 2 copper shaft, Texas No. 3 copper shaft, and Texas No. 4 gold shaft in Slim Jim Gulch, about four thousand feet north of Texas No. 1 shaft.

GEOLOGY:

The country rock in this district is composed chiefly of pre-Cambrian granite which is the earliest geological classification for rock. The granite in places is intermixed with large seams of diorite which is more likely a facies of the granite. The rock in places is partly decomposed and metamorphosed. The property is cut by many intrusive dykes which are principally Andesite, and other dykes of Rhyolite and Basalt are plainly in evidence. The dykes can be easily traced by their oxidized iron capping. This part of Arizona is very mountainous and the altitude is 3400 feet above sea level. There are numerous moun-

tain ranges in this vicinity known as the Wickenburg Mountains, the Weaver Mountains and the Silver Mountains, which may be classified as the foothills of the Bradshaw Mountains.

There appear to be two systems of veins, those predominating in copper having a strike from the northwest to the southeast, and those predominating in gold having a strike almost east and west, and indicate a junction formation on this property. In general the dip of the gold veins is to the north, and the dip of the copper veins is to the west, and there appear to be at least thirty separate veins on the Texas group.

ORE DEPOSITS:

The Company has two shafts on the copper vein known as No. 2 shaft which is 300 feet in depth, and No. 3 shaft which is 250 feet in depth. About three years ago development work was suspended in these two shafts on account of the low price of copper, and development work was started on the No. 1 gold vein which now has a shaft 223 feet in depth. About a year ago a new shaft was started, known as No. 4, on the Judge Riggs gold vein about 4,000 feet north of No. 1 shaft, and is now about 50 feet in depth and in process of sinking to 75 or 100 feet in depth to cross-cut and develop what appears to be three or four large veins forming a contact near that shaft.

No. 1 shaft has been sunk on a large fissure vein which has a strike south 77° west and dips 42° north. The outcroppings of this vein are prominent and can be traced for several thousand feet on the surface. The vein is composed principally of light brown quartz in between green schist. The quartz varies from a few inches up to four feet in thickness. In places there are layers of schist and quartz characteristic of wide fissure veins. The long outcropping of the vein such as No. 1 gold vein usually indicates that the vein goes to a great depth. The hanging wall of the vein is well defined while the foot wall is not. There is a layer of green schist on the hanging wall side of the vein. Gold is practically the only metal of economic importance. The gold occurs in a free state and is distributed in the quartz.

Practically no sulphides occur above the 150-foot level. At the 150-foot level the sulphides, which are chiefly pyrite, begin to appear. Some gold is associated with the pyrite. On the 150-foot level the vein remains constant for 300 feet and at that point enters a region of different mineralization in which the vein becomes temporarily lost. The dip of the formation changes from 45° to 81°. The first ten feet of this formation is composed of a quartz porphyry which contains specks of bright red menatite. As the drift continued approximately 20 feet further it is pulverized sugar quartz formation with dark seams or slips striking in various directions. The extent of this formation is not yet known and development work on this drift should be continued as soon as possible.

DEVELOPMENT WORK:

Development work of the No. 1 gold vein consists of an incline shaft and drifts at the 30, 60, 140, 150 and 200-foot levels, comprising a total of about 600 feet of drifts, the most extensive of which is the drift on the 150-foot level which is 368 feet in length. This shaft at the lower level made only two or three barrels of water per day. Several shallow shafts have been sunk on the vein from the surface and all are in mineral.

About 250 feet from No. 1 shaft there is an intersection of this vein with another vein known as the contact vein. This vein, which strikes to the southwest, is a quartz vein similar to the main gold vein, but darker in color. Its outcroppings which weather to a dark gray can be traced for a thousand feet on the surface. The contact shaft is 36 feet in depth and has been sunk at the intersection of this vein and the main vein.

At the bottom of No. 1 shaft the gold vein forms an intersection with another vein which strikes to the southeast. This vein is composed chiefly of quartz of a reddish color and carries values in gold and copper. The foot wall has not yet been exposed and is about six feet wide. Drifting for 15 to 20 feet to determine the formation on this vein should be done as soon as possible.

It is advisable that a raise be made from the 150-foot depth to the surface at the junction of the contact vein and the No. 1 vein,

which is in accordance with the mining laws of Arizona as a second outlet and would greatly improve ventilation. An assay recently made all across this vein, which is at least four feet wide, shows an average in gold of $24.00 to the ton and is all good milling ore.

NO. 1 SHAFT EQUIPMENT

No. 1 incline shaft is 6 feet high and 7 feet wide, has a wooden head frame 20 feet high and a half-ton skip that runs on a 24 gauge tract of 12-pound rails.

The skip dumps into a half-ton ore car conveniently located to the mill and ore bin for speedy dumping. At present there is no hoist at the collar of the shaft, having been transferred to the Riggs shaft. It is proposed to set up the 40 H. P. electric hoist now at No. 3 copper shaft at No. 1 shaft. On the 150-foot level an eighteen gauge track having 8-pound rails extends the entire length of the drift, 368 feet. There is also a 1-inch air line and a 3/4 inch water line extending to the face of the drift. The air line and water line also extend to the bottom of the shaft, 223 feet in depth. Practically no timbering is required in the shaft or drifts. An incline ladder extends from the top to the bottom of the shaft.

Conveniently located to the shaft is a change room equipped with a shower, stove and hot water tank. As soon as active operations are resumed at No. 1 shaft, a 16 foot wide by 12 foot deep hoist house and blacksmith shop should be erected north of the head frame. There are sufficient concrete blocks left over from the mill building to build the walls of this hoist house, or the hoist house at No. 3 copper shaft could be used for No. 1 shaft. The camp is very conveniently located to No. 1 shaft.

NO. 2 SHAFT EQUIPMENT

This shaft has been sunk to a depth of 300 feet with about 2,000 feet of lateral workings now filled with water which will be used as a reservoir for the gold mill. The mine records show that this shaft made about 4,000 gallons of water a day. Work was discontinued

there about three years ago and the development work at No. 1 shaft actually dates from that time on. The principal values in that shaft showed copper and gold ores.

No. 2 shaft is equipped with a 32-foot wooden head frame and is a vertical shaft, and has a 1,000-pound capacity bucket and an automatic dump. A 1½ inch compressed air line, a 2½ inch water line and a 10-inch fresh air pipe extend to the bottom of the shaft with lateral branches, and a fanblower equipped with a 5 H. P. motor.

The operating machinery consists of a 15 H. P. Fairbanks-Morse hoisting engine, a 9 by 8 Engersoll-Rand air compressor driven by a 25 H. P. Fairbanks-Morse gas engine and two air receivers. There is also a 50 H. P. Westinghouse electric motor with starting switch which was previously used for driving the air compressor. This air compressor will be used for No. 1 shaft operations and is in first-class condition. There is also a small centrifugal pump for circulating water through the air compressor. There are two 600-gallon galvanized water circulating tanks for the engines and compressor, and a 1,000-gallon black iron fuel tank. There is a large horizontal duplex station pump now at the collar of the shaft having a capacity of 30 gallons per minute, also a No. 3 Cameron sinking pump with a capacity of ab ut 25 gallons per minute, and a Buffalo station pump having a capacity of 15 gallons per minute. All of this machinery is enclosed in a corrugated iron building.

Within 30 feet of the engine and hoist house there is a well-equipped blacksmith and machine shop with a change room adjoining having a shower, stove and hot water tank.

No. 2 shaft is located 600 feet north by northeast of No. 1 shaft and 120 feet lower than the collar of No. 1 shaft. If the water should be pumped out ultimately from No. 2 shaft and workings for the mill and the present crosscut at the 300-foot depth extended, a vertical depth would be gained of approximately 250 feet below the present bottom of No. 1 shaft.

NO. 3 SHAFT EQUIPMENT:

No. 3 copper shaft was sunk on the Amethyst vein approximately

75 feet from the northwest end line of the Monte Cristo claims and about 1,500 feet southeast of No. 1 shaft and about the same distance from No. 2 shaft. Work has stopped about three years ago at this shaft on account of the low price of copper. The shaft and underground workings are filled with water and can be used if necessary as an auxiliary supply for the mill. The shaft is 250 feet in depth with about 1,400 feet of lateral workings including several crosscuts. There is a corrugated iron hoist house about 14 by 16 feet and a former blacksmith and machine shop about the same size, conveniently located near the collar of the shaft.

NO. 4 SHAFT - Known as the Judge Riggs Gold Shaft.

This shaft is about 4,000 feet north of No. 1 shaft and located in Slim Jim gulch, near which shaft there is evidence and outcroppings of four large veins intersecting. The shaft is 50 feet in depth and in process of being sunk 75 to 100 feet to cut the dip of the high grade streak within the large Riggs vein. It is a vertical shaft and has recently been timbered from the collar to about 15 feet in depth. At the 37-foot depth there is a 25-foot crosscut to the main Riggs vein and about 100 feet of drifting has been done on this vein. No further exploration work has been done on this vein. The crosscut, which has been extended about 25 feet, appears to be all in the Judge Riggs vein formation which can only be determined with further development work.

The Judge Riggs vein is composed of white quartz in a green schist. In places pyrite is associated with the quartz. Considerable of the pyrite at this level has been oxidized producing hematite. Gold is about the only metal of economic importance, although some lead occuring as galena is found. Gold occurs in the hematite and is contained in the pyrite. A streak of high grade ore varying in width up to about three feet, from which assays have been made running up to $640.00 in gold to the ton with the price of gold at about $32.00, is found in this streak. A small stope has been started on this streak. The shaft makes approximately ten barrels of water per day.

RIGGS SHAFT EQUIPMENT

The Riggs shaft, or No. 4 shaft, is equipped with a 16-foot wooden head frame with a semi-automatic dump, a 600-pound capacity ore bucket, an Ingersoll-Rand tugger hoist capable of hoisting 1,000 pounds. The ore and waste rock are dumped into a steel ore car in which it is trammed about fifty feet to the ore pile.

Compressed air is furnished by a Rix portable air compressor of about 120 cubic feet displacement, sufficient for operating two jackhammer drills. There is also a blacksmith forge and tools for sharpening the drill steel, and a pressure tank which supplies water for the hollow steel jackhammer drills. Fresh air for ventilation is furnished by a centrifugal fan driven by the compressor engine and is carried to face of the drift and crosscut by a 4-inch ventilating pipe. The compressor and jackhammer drills were installed in August, 1933.

PROPERTIES ADJOINING THE ARIZONA COPPER BELT MINING CO.

The Monte Christo Gold Silver Co. adjoins on the east, southeast and south. The Amethyst vein on both properties has a strike from the southeast to the northwest. Their native silver vein appears to run parallel with the Amethyst vein.

The Black Rock Mines adjoin to the north and northeast of the Arizona Copper Belt Mining Co., and gold ore was being developed before the property changed ownership.

The Golden State Mines adjoin on the southwest, which also have changed ownership and work has been at a standstill for some years.

The Gold Bar Mines vein system strikes toward the Arizona Copper Belt Mining Co. property between No. 1 shaft and the Riggs shaft and are located east of the Copper Belt.

The Wren Group, comprising four claims are about two miles southeast of the Texas Group and will be reported later.

This Company owns a spring of pure water in Cottonwood gulch about 6,000 feet north of No. 1 shaft, and a pipe line has been installed permitting the water to flow by gravity into a 1,000-gallon galvanized iron tank. A triplex pump and gasoline engine installed near this

tank and enclosed in a suitable building, pumps the water into a 1,500 gallon galvanized tank located near No. 1 shaft, a distance of about 2,100 feet, up an incline of approximately 200 feet. The source of the Company's pure water supply consists of a well sunk in granite reefs approximately 14 feet in depth, which has been walled up with masonry and cement work to prevent contamination. It is believed that if this well were sunk 25 feet deeper and a crosscut reservoir made, a much larger supply of water could be obtained.

Another source of water supply it is believed can be obtained on claim No. 19, known as Willow gulch, which will be explored later.

In view of the fact that this property is one of the greatest mineralized areas in Central Arizona, it has been impossible for me, during that short time I have been with the Company, to examine many parts of it, and which can be done later.

A MODERN MILL AND BUILDING

October 16, 1933, ground was broken for a 25-ton mill which includes amalgamation, concentration and flotation of the ore. It is believed that this mill will recover nearly all the gold in the ores, and the by-products which are found such as lead, silver and copper and some gold will be saved in the form of concentrates. The machinery is made of Chrome steel and manganese and is considered unbreakable, and is the latest model and design for gold milling. The accompanying flow sheet shows the proposed method of ore treatment. The chemicals required for milling gold ores have been written out on a separate sheet and given to the president of the Company. The crusher which has been selected has a much greater capacity than the 25-ton size and will crush 64 tons in eight hours, thereby saving two men for a 24-hour day.

MILL BUILDING

The construction of the mill building for the lower part of the four terrace walls is of natural finish cement blocks, and above the walls the framework consists of 2 by 6 Douglas fir, likewise the roof beams, making a very strong and durable building. On the outside of this framework corrugated galvanized iron is securely nailed making a

very attractive and practically fireproof building. The ore bin is constructed of 8 by 8, 8 by 10 x 10 Douglas fir lumber, and has a capacity of 52 tons. The timbers are bolted together with 3/4 inch and 1 inch bolts and 5/8 inch drift pins.

A large steel tank has been erected about 300 feet distant from the mill at an elevation about 40 feet higher than the mill, and has a capacity of 62,000 gallons of water. A 2-inch black iron pipe line has been installed from the tank to the mill having ample capacity for all milling purposes. A 100-foot fire hose line and reel will be installed in the mill building on the second terrace under the open stairs.

The floors of the mill building will be smoothly finished in Portland cement. The windows and lighting facilities of the mill are of the best and will enable operation day and night if desired.

The Arizona Power Company's line is now within about 700 feet of the mill and will be extended to operate all the machinery and lighting. This line carries 44,000 volts to the Monte Christo substation, where transformers step it down, or reduce it, to 440 volts. For lighting purposes the Arizona Copper Belt Mining Company's own transformer steps it down to 110 volts. All the mill machinery, motors and pumps will be operated from this hydro-electric power line.

The Company has a well-established camp consisting of an executive building of four rooms, a cook house and commissary of four rooms and cold storage cellar, a men's bunk house which will accommodate eight men, a superintendent's house which will accommodate two men, and other conveniences. Long distance telephone connection enables the reception and sending of telegraphic and telephone messages with dispatch. The camp is illuminated with electric lights inside of the buildings and two 100-watt lights on the outside in front of the buildings.

Work can be carried on in this mining district twelve months in the year and has an exceptionally fine winter climate.

This Company took the initiative some years ago in having the post office, known as Constellation Post Office, located at the entrance to the camp and is very convenient. United States mail is

delivered daily except Sundays from Wickenburg to Constellation.

(signed) Delos Gardner

Mining and Metallurgical Engineer.

NOTE BY: G. M. COLVOCORESSES

Do not consider this report reliable, Company has gone broke and quit in 1936.

G. M. C.