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March 3, 1982

D.K. Martin c/o D.K. Martin & Assoc. 4728 N. 21st Ave. Phoenix, AZ 85015

Dear Doug,

Enclosed is a copy of the geological report supplied to Wilbur Dicus of International Mineral Services. I assume John Rothemal or Pat Patterson will want to use it for assessment work on the unpatented Rural claims.

Please accept our sincere sympathy concerning the loss of your good friend and neighbor.

Very truly yours, Bill Vanderwall Pacific Regional Operations, inc D. K. MARTIN & ASSOC. 315 W. MUNIERUSA PHOENIX, ARIZONA 35013

PERATIONS, INC. P.O. Box 716 • Scottsdale, Arizona 85252 • (602) 994-3147

GEOLOGICAL REPORT RURAL-BUCKEYE PROPERTY WALLAPAI MINING DISTRICT MOHAVE COUNTY, ARIZONA

## LOCATION:

The Rural-Buckeye Property consists of four contiguous mining claims, one patented, located approximately 20 miles northwest of Kingman, Arizona, and one and a half miles northeast of Mineral Park. At an elevation of approximately 5,100', the area is rugged and steep. The major workings are located either side of a wash and subject to flash flooding. The property is situated in the NW/4 of Section 18, Township 23N, Range 17W, G&SRM, Mohave County, Arizona, and is accessible by foot trail from the Mineral Park Road.

## SCOPE OF REPORT:

Time was the limiting factor in this investigation. One day was spent on the property, walking out traverses and investigating old workings. Facts and opinions in this report are based on a cursory field examination and on the Author's specific knowledge of the area and general familiarity with the published literature concerning the Wallapai District.

#### HISTORY AND PRODUCTION:

The Rural-Buckeye Property lies in an area rich and colorful in Arizona Mining History. Bonanza type silver lode discoveries brought miners to the District in the early 1860's. Oxidized ores were mined extensively during the 1880-1890 period principally for silver and gold. The rapid decline in silver prices between 1885-1895, the recession of 1905 and the exhaustion of rich, near surface, oxidized ores caused the suspension of mining operations in the area.

Mike Dunn, a California prospector, discovered the property in the latter 1880's and operated successfully for a number of years. During the early history of the mine, the property produced some of the richest ore ever taken from the District. Solid native silver specimens 6" to 8" thick, encrusted with masses of wire silver were reported taken from the shallow workings.

Bastin, 1924, (pp. 24) lists the early production from the Rural and Buckeye mines during 1886-87 as 152 tons containing 315 ounces silver per ton and 5.68 ounces gold per ton.

Schrader, 1909, (pp. 84) states: "The ore contains silver, gold and copper, with high silver and gold values. The display of ores from these mines (Rural and Buckeye), contaiing masses of solid silver and beautiful specimens of wire silver, is said to have been awarded the silver medal at the Louisiana Purchase Exposition." And he continues, "The production is reported to be considerable and much good ore is left in the (Rural and Buckeye( mines. "

Bastin, 1924, (pp. 24) states all the workings were inaccessible in 1913.

During the late 1920's, M. B. Dudley and Associates attempted to reopen the Rural and Buckeye mines and reportedly produced some ore from the upper workings. The shaft was increased to a depth of 200 feet and miners remarked that good ore was exposed when the property closed. No attempts have been made since to reopen the workings.

In 1943, the Tennessee Mine, 3 miles northwest of the Rural-Buckeye Property, and mining in the same vein system, was producing 150 tons of ore per day which averaged 20 ounces of silver per ton. Total production from the Tennessee Mine is reported to be in excess of 500,000 tons. (Dings, 1941, pp. 147).

The value of metals produced from the Wallapai District during the years 1904-1948, U. S. Bureau of Mines, 1948 Annual Report was about 22.5 million dollars at 1948 prices (nearly half a billion dollars at today's prices). Values were principally in lead and zinc but with substantial amounts of copper, silver and gold.

Currently inactive, Duval's Mineral Park open pit copper-molybdenum operation located one mile south of the Rural-Buckeye Property, is capable of producing 18,000-20,000 tons per day of .5% copper and .045% molybdenum ore.

#### GEOLOGY AND ORE DEPOSITS:

The Cerbat Mountains constitute one of the many north-south trending, fault-block ranges of the southwest desert. They consist primarily of metamorphosed pre-Cambrian igneous and sedimentary rocks, cut by later intrusions of Mesozoic (?) granite and monzonite porphyries, known locally as the Ithaca Peak Granite, and by Tertiary volcanic dykes. Centering around the Ithaca Peak intrusive, mineralization is typically copper and molybdenum sulfides, which were mined by Duval. Surrounding the intrusive is a zone several miles wide of lead-zinc-silver bearing veins which gradationally change into veins of intense silver-lead mineralization.

The vein type ore deposits occur in clefts or cracks in the country rock in which the mineral material precipitated from aqueous solution (hydrothermal fissure veins). It is probable that these fissures formed from forces accompanying the implacement of the Ithaca Peak intrusive. With the intrusive acting as a heat engine, a convecting hydrothermal system developed that set up a hypogene enrichment process which deposited ore and gangue minerals near the top of the convecting cell and extracted metals and sulfur from sources at depth. Conceivable, as the solution approached the fissure level, it boiled, thereby distilling the acid forming constituants  $CO_2$  and  $H_2S$ . Cooling and a slight pH rise of the residual liquids, due to

loss of acid forming constituants, may be regarded as a mechanism of sulfide precipitation. Exposure of the veins to normal weathering processes oxidized the ore and, to a point, enriched it by the downward migration of slightly acidic rainwater carrying metals in solution.

Many veins, occuring in nearly vertical fault fissures, strike northwest and outcrop for considerable distances. The fault fissures are largely occupied by breccia with abundant shearing and some gouge. Ore lenses, or shoots, though not continuous are numerous and tend to have greater vertical rather than horizontal extent. Concentrations of extremely high-grade ore appear to favor vein junctures. These concentrations are attributable to chemical and physical changes which enhanced mineral deposition at the fissure level of the convecting cell.

The main vein on the Rural-Buckeye Property strikes approximately N60°W, it is apparently faulted between the Rural and Buckeye mines since the Rural portion of the vein dips about 80°S while the Buckeye portion dips 70°N. The two mines are located on either side of a wash which is probably the trace of the fault with lateral throw. The country rock in the vacinity of the vein is a medium grained, granite gneiss of pre-Cambrian age. The gneiss is intruded by dykes of granite porphyry which are associated with the Ithaca Peak Granite of Mineral Park.

The underground workings are inaccessible but Schrader, 1909, (pp. 84), describes the underground features as follows: "The vein is two to four feet in width in the Rural and attains a maximum of eight feet in width in the Buckeye. In both mines it is associated with a dyke of granite porphyry. The gangue is quartz and is generally frozen to the walls. It shows ore shoots (in 1909) ranging from 4 to 20 feet in width... The principal developments in the Rural consist of 200 feet of shaft and 100 feet of drift and in the Buckeye 750 feet of drift."

The primary mineralization is one of chalcopyrite, pyrite, arsenopyrite and oxides of manganese. Silver cloride, native silver and native gold are present in the oxidized portion of the vein.

## ORE RESERVES:

The Rural-Buckeye Property contains base-metal silver veins, oxidized silver-gold veins and possibly a zone of enrichment in between. Data from past developments, publications and reports are insufficient or unavailable, to completely delineate the orebody.

Considering the extent and mineralized nature of the Rural-Buckeye vein, and its association with the dyke of granite porphyry which would provide a sizable locus for ore deposition, it is possible to anticipate considerable ore at depth, below the present workings.

The mine dumps may carry precious metal values amenable to cyanidation. This possibility should not be overlooked.

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#### CONCLUSION:

On the basis of surface observations and facts provided in the published literature it is the Author's conclusion the property contains a well developed structure with strong base-metal silver mineralization. It is also the Author's conclusion that the results of detailed geologic mapping and diamond drilling could justify initiating a mining venture.

Respectfully submitted,

PACIFIC REGIONAL OPERATIONS, INC.

En claudale

William C. Vanderwall Arizona Technical Registration No. GIT 34

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June, 1919.

finest silver ore which the district has ever yielded.

Late reports indicate that the three mining properties recently operated under the management of Mr. J. B. Hughes have been consolidated, and that active development of the entire group will be commenced at once.

The Emerald Isle Copper Company has recently shut down to make alterations in its electrolytic plant. This company has a large body of oxidized copper ore, occur-ing as a conglomerate, and it has already reached the production of two tors of reached the production of two tons of metallic copper.

West of Chloride, in the flat country, West of Chloride, in the flat country, the Tuckahoe is installing a heavy duty sinking pump, with the intention of sink-ing to the 1000-foot level; their ore as developed showing fine values in silver and gold with much less lead and zinc than is found in the ores of the main range. It is expected that the Diana will shortly resume work, as well as the Golden Gross Metals Co. Both of these proper-ties carry fine-grained pyritic gold ores in a quartz matrix, especially well adapted to easy concentration.

easy concentration. The Rural and Buckeye mines in Min-eral Park have been purchased by a syn-dicate represented by Mr. M. B. Dudley, and are being rapidly developed. The Rural is an old property which has not been worked in many years, but which has formerly filled the cabinets of Mohave County with the most magnificent speci-mens of native silver. After unwatering the shaft, conditions have been found of a much better character than could have been expected, and there is little doubt but the two properties will very soon bebut the two properties will very soon be-come heavy silver producers.

The Washington mine, also in Mineral Park, is being rapidly brought to the pro-duction stage, as the mill is practically finished, and has already passed the ex-perimental stage. The property shows sev-aral very interesting veins, with cartain and has already passed the ex-perimental stage. The property shows sev-eral very interesting veins, with certain ore-chutes carrying high values in ruby silver. It is being operated by a syndi-cate, with Mr. F. E. G. Berry in charge.

Cate, with Mr. F. E. G. Berry in charge. Beside these properties, many others are showing activity with the advent of many substantial operators, and new finds are frequently reported. Many of the former residents of Chloride, who left the camp shortly after the war conditions became active, are returning; all expressing their vast satisfaction at their ability to resume life in "the finest mining camp they ever saw."

## THE ARIZONA GEM MINES

(Special Correspondence)

(Special Correspondence) Located at Mineral Park, 20 miles north of Kingman, Arizona, is perhaps the greatest producing turquois mines in the world. A large percentage of the stone is, however, of the poorer grade consisting-of quartz and blended with turquoise and is called by the trade "matrix"; while quite attractive and has a large sale, it s never rated in price with the clear tone. The prices prevailing up to 1907 ranged from \$2.50 to \$12.50 per pound n the rough, but since that time prices have materially dropped, until for several years past these mines have been closed lown. lown.

The largest producing company, with he largest acreage, is that of the Aztec urquoise Company of New York. This ompany was the pioneer, being followed

## ARIZONA MINING JOURNAL

by the Southwest Turquoise Company of Los Angeles, the Los Angeles Gem Com-pany and the Arizona Turquoise Company of New York.

of New York. There is evidence that the mines were worked in the stone age as numerous stone hammers and hand clipping stones were found there. The inte Jas. W. Haas was the original discoverer of the turquoise at Mineral Park, operating the old Monte-zuma mine in the Turquoise mountains southwest of Ithica Peak, but upon find-ing the later mines in the Ithica Peak country the old Monte-suma mine was abandoned.

abandoned. Another important depent is that of Chrysophrase in the Biver range, some 18 miles north of Oatman. These properties are of late discovery and are expected to rival the famous old tarqueise output, as it is of more commercial value and very rare. This gem is remindful of the remotest antiquity; a hard semi-trans-luscent green stone, castying seripes and colored with nickel. Perhaps the only operating mine of this stone is American today is located at Porterville, California, and owned in New York.

Owing to its high market value. all grades are used, comprising a dozen dif-ferent grades from common to clear, and values run all the way from a few dollars to around \$400 a pound.

## STANDARD MINERALS DEVELOPING

A strike of gold and silver are has been made on one of the claims of the Stand-ard Minerals company, twenty miles east of Kingman. The company has been sink-ing a shaft on the Standard claim and at a depth of thirty feet ran into ore that gave results of from four to ten sumces gold and 325 ounces silver.

The vein in which the strike was made is about five feet in width, the rich streak having a width of from eighteen inches to thirty inches. The whole width of the ore-bearing streak is pay.

ore-bearing streak is pay. The Standard Minerals company has been operating a mill on its molybdenite properties and have been spening the ore bodies on the deep levels. The mill has been doing good work, a product of about sixty per cent molybdenite being secured. The company is understood to have con-tracts covering all the concentrates the mill can produce. mill can produce.

mill can produce. The mill is under the direction of S. S. Jones, who is also consulting engineer for the company. Mr. Jones is one of the best mining engineers and metallugists in the country and the Standard Minerals com-pany is to be congratulated on securing his services. George Williston, a young engineer and metallurgist, is assistant to Mr. Jones in the mill work and Gerald Stimpson is general manager.

Through the hospital system the work men of the Warren district get all me a cal care and surgical attention receiver for sickness and accident, and the families of the workmen get all medica: attented

The railroad from Center Giade to 1 make dale, the smelter town of the seted 's rice Copper company, runs through a we tature Grand Canyon; this has not be advertised to any extent, but it is rare scenic attraction

The Chloride Queen

Buckeye

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The Chloride Queen Mining Co. has five claims and two fractions, over one hundred and twenty acres of ground in one block side-lining on the north side of the Cerbat Silver Mines Co. (known as the Elkhart mine) and end-lining the Empire property northeast of Chloride about one and one-balf miles lf miles.

The equipment consists of one 12-H. P. hoist complete, one 60-H. P. oil burning Bessemer engine, Chicago Pneumatic com-pressor with capacity of 417 cubic feet, blacksmith shop fully equipped, change room, ore bins, and large galvanized iron building covering all the machinery.

room, ore bins, and large galvanized iron building covaring all the machinery. The main shaft is timbered down 260 feet, with manway and working shaft, with a drift run at the forty level, 100-foot drift at 100 level, and at the 200 level the drift is in two hundred feet going under the hill, which when in about 600 feet more will give a depth of about 600 feet. Crosscuts have been run on this level 21 feet to the south and 22 feet to the north without encountering either wall. A good vein of ore at times widening to thirty inches has been continuous for over 100 feet, with values at times running over \$150 a ton in silver, besides values in lead and gold. The drift is being pushed to the work on the east and west vein of the property, and well versed mining men say that the company will sure have a very large body of ore under the hill from all indications. One thing noticeable is that the work is being done on the east and west veins, which are so rich, leaving the north and south veins to be opened up later. These needs and south veins have given up millions in rich ores, to such wall known companies or properties as the lift-hart, Schuylkill, liftenff, Schenectady mill to run the drift under the hill and open

known companies or preparties as the life hart, Schuylkill, Distaff, Schenectady and Tannaise in the intension of the management to run the drift under the hill and open up the are and go on a producing basis. In fact, the first are of one will be shipped to the helly smaller within a month. The short hand of one mile with a good road from shaft to the railroad at the Tennee-see mine is an added functor of low pro-duction can't to the company. The Chloride Queen Mining Ce. has hundreds of feet of stopping risk values in silver ores, be-show the hundreds of foot of ground be-low the level which will be opened up as the property is developed, and which is assumed by what the Eithart and Tennes-see properties have proved, and which is assumed by what the Eithart and Tennes-see properties have proved, and which is assumed by what the Eithart and Tennes-see properties have proved, and which is assumed by what the Eithart and Tennes-see properties have proved, and which is assumed by shart the Eithart and Tennes-see properties have proved and which is assumed by what the Eithart and Tennes-see properties have proved and which is assumed by a start the Eithart and Tennes-see properties have proved and which is assumed by a start the Eithart and Tennes-see properties have proved and the base of a some sight of the fact that the Eithart, when a side lines the Chloride Queer of the south is reported to have produced over or allion dollars with deepast workings bet teet.

The management of the Chloride Queen M sag ( ... is confident that their propwith proper development in the next - years will produce its millions in rich over ores, and with present prices of silver the outlook for the company to go on the dividend-paring basis in the very near inture is of the best.

WHAM WER Jacobs Assay Office PHONE 822-0813 1435 SOUTH 10th AVENUE P.O. BOX 1889 Registered Assayers 85702 Tueson, Arizona, JEpt 18" 19.74 B Bothermil Submitted by Mr ... ..... Sample GOLD SILVER COPPER LEAD Per Cent Wet Assay GOLD Sample Per Oent Per Cent Wet Assay Per cent Per cent Value per ton ore • Ozs. per ton Ozs. per ton Marked Wet Assay Wet Assay ore Wet Assay ore 55 RAKHAM 06 00 57 2 161 110 6 100 ٠ MIXO 1 · · · · · · · 1 alter and the 74 11 4 1.1.1.1 Nº .\*\* TOTAL 1 600 645 45 206 35 857.75 SILVER OF3.10 Gold Figured \$ 100.00 per or. Troy Very respectfully, ٠ Charges \$ 5-50 Taid Pinhham Macobs Assay Office 1435 SOUTH 10th AVENUE PHONE 622-0813 BOX 1889 unleve Registered Assayers B Bottanmel CE 1974 tim Sample Submitted by Mr .... LEAD SILVER COPPER GOLD Per Cent Wet Assay GOLD Per Cent Wet Assay Per Cent Sample Per cent Value per ton ore \* Per cent Ozs. per ton Ozs. per ton Wet Assay Wet Assay Marked Wet Assay ore ore 5-5-10.6 2/ IA 59 1:0 6 110 3 111 - .. •... 74 . .... Very respectfully, · Gold Figured \$ 100.00 per oz. Troy Charges \$ 550 1126 Deu D. K. MARTIN & ASSOC. 315 W. MONTEROSA PHOENIX, ARIZONA 85013

# 82 MINERAL DEPOSITS OF MOHAVE COUNTY, ARIZONA.

by Charles E. Sherman, a well-known pioneer, in 1870. Its surface ores were very rich and carried high values in gold as well as in silver, by reason of which it soon became the first important producer, its ores being shipped to Swansea, Wales. It was later worked by the Mineral Park Mining Company, and the ore was locally milled in the Keystone mill. Later it was owned by James Uncapher, of Mineral Park, by whom it was sold to the present owner, the Keystone Mining Company, of Greensburg, Pa. The production of the mine to date is reported to be about \$50,000.

The mine is developed mainly by a shaft 450 feet deep and 500 feet of drifts, mostly down to the 150-foot level, above which the greater part of the ore is worked out. The principal surface equipments are

a steam hoist and a 5-stamp mill. The principal rock at the mine is the granite porphyry. There are two veins. The vein on which the mine is located strikes N. 60° W. and dips about 80° NE. The gangue is quartz in which the ore shoots occur mainly in the form of lenticular streaks about a foot thick. The ore contains pyrite, chalcopyrite, and zinc blende, with silver and some gold. The silver is present as argentite, in part. The better grade of ore runs about 200 ounces of silver to the ton, 21 per cent of copper, 8 to 10 per cent of zinc, and 12 per cent of iron. Toward the outside of the lenses it is irregularly and closely banded. It is richest where the vein pinches. Elsewhere it may be distributed in a thickness of 3 feet of quartz gangue, but it is good concentrating ore and is said to average \$12 to \$15 a ton, and by reason of its low grade should be milled on the ground. Some of the ore, however, runs considerably higher. That averaging \$20 or more a ton is now shipped to the Humboldt smelter. None lower than \$20 ore is now handled. The present rate of output is about 20 tons a month. About 50 feet northeast of the vein on which the mine is situated

About so feet northeast of the term of smaller vein, which and lying about parallel with it is a second or smaller vein, which looks well and whose ore is reported to be nearly all of shipping grade.

#### TYLEB MINE.

The Tyler mine is situated in the southeastern part of the district, 23 miles southeast of Mineral Park, near the summit of the range, on a steep northeastern slope, at an elevation of about 5,300 feet, or about 1,200 feet above Mineral Park. A good wagon road extends nearly to the mine, with which connection is made by a good trail of easy grade. The mine was discovered by Stephen A. Tyler, the owner, in 1901. It began to ship ore in 1905, but only necessary assessment work is now done. The mine is developed mainly by two crosscut tunnels and drifts, mostly situated within a vertical range of 100 feet, principally on the Gold Eagle claim.

The country rock is pre-Cambrian medium-grained gneissoid biotite granite. The vein strikes N. 37° W. and dips about 75° SW., into the mountains. It has a width of about 40 feet and seems to consist mainly of an altered and partly replaced crushed and recemented aplitic dike. The entire width is claimed to be low-grade ore, but the values occur chiefly in the first 6 or 7 feet of the hanging-wall side of the dike and are best near its contact with the granite. The hanging wall also carries 6 inches to 2 feet of slickensided gouge, between which and the country rock occurs quartz breccia containing some ore.

The mine produces gold-silver-lead ore. The principal ore minerals consist of galena and cerusite. The last carload shipped at the time of the writer's visit averaged gold 3.16 ounces to the ton, silver 8 ounces to the ton, and lead 17.5 per cent. At last accounts the mine is reported to be sold to a Los Angeles company.

#### LADY BUG MINE.

The Lady Bug, an old mine, is about half a mile southeast of the Tyler mine, close to the Tyler camp, at an elevation of about 5,000 feet. It was located in 1886 by Isaac Conkey, the owner, now residing at Mineral Park. It is developed principally by a 63-foot shaft, 100 or more feet of drifts, and a number of surface openings on the vein.

The country rock is pre-Cambrian biotite granite, the same as at the Tyler mine, and it is to a considerable extent intruded by the granite porphyry of Mineral Park. The vein is reported to be 7 to 6 feet thick. It lies nearly parallel with the Tyler vein, but differs from it in being composed of a gangue which is mainly quartz. The ore contains principally silver chloride and gold with a little galena. A considerable portion of the ore mined is reported to have averaged 5300 to \$500 a ton. The production is reported to be \$6,000.

BURAL AND BUCKEYE MINES.

The Rural and Buckeye mines are in the northeastern part of the district, 14 miles northeast of Mineral Park, near the south base of Cherum Peak, at an elevation of about 5,000 feet. They are reached by wagon road. They are situated but a few hundred feet apart on the same vein, the Rural being on the west and the Buckeye on the mist side of the same gulch. The Rural is owned by E. F. Thompon, of Kingman, and the Buckeye by C. E. Lovett and others, of Denver, Colo.

# MINERAL DEPOSITS OF MOHAVE COUNTY, ARIZONA.

The Rural is developed principally by a 200-foot shaft, about 100 feet of drift, and a winze. The drift extends westward, its face being about 110 feet distant from the shaft. The shaft contains some water. The Buckeye is developed principally by about 750 feet of drift, extending in an easterly direction. Toward the face of the drift the vein is faulted off to the northeast by a lateral throw of about 75 feet.

The country rock is medium-grained gneissoid biotite granite and associated schist. It is intruded by dikes of granite porphyry. The deposits occur in a fissure vein which is 2 to 4 feet in width in the **Rural and attains a maximum of 8 feet in the Buckeye.** In the **Rural** it dips about 80° S. and in the Buckeye about 70° N. In both mines it is associated with a dike of the granite porphyry, masses of which occur to the northeast near by. The gangue is quartz and is generally "frozen" to the walls. It shows ore shoots ranging from 4 to 20 feet in width, which consist mostly of pyrite and chalcopyrite, with parallel streaks of arsenopyrite, black oxide of manganese, gray chert, and quartz, the quartz being more prominent in the Buckeye than in the Rural mine.

The ore contains silver, gold, and copper, with high silver and gold values. The display of ores from these mines, containing masses of solid silver and beautiful specimens of wire silver, is said to have been awarded the silver medal at the Louisiana Purchase Exposition.

The production, exact figures of which are not available, is reported to mount well into thousands of dollars in silver and gold, and much good ore is said to be available in the mines.

#### WINDY FOINT MINE.

The Windy Point mine is in the northeastern part of the district, about a mile northeast of Mineral Park, on open sloping or hilly ground, at an elevation of about 4,800 feet. It is owned by the Arizona Gold Mining and Metallurgical Company, with headquarters at Kingman. It is developed mainly by a 105-foot shaft and a small amount of drift. The shaft starts in gneiss, but soon enters the granite. The mine is newly equipped with a gasoline hoist and electric drills.

The country rock is the pre-Cambrian gneissoid biotite granite and black amphibolite schist. The granite is less dark and micaceous than at the Rural and Buckeye mines. The structure or sheeting strikes N. 85° W. and dips about 75° S. Both the granite and the schist are more or less sericitized and impregnated with pyrite and arsenopyrite near the vein. About 50 feet from the vein, on its foot-wall side, the country rocks are cut by a peculiar greenish-gray porphyritic dike rock, which seems to be minette, and is apparently younger than the intrusive granite porphyry. The latter is also present in outcrops near by, and some of it was recognized in the dump débris derived from the mine.

The deposits occur in a fissure vein which strikes N. 42° W. and dips about 77° NE. It is 2 to 4 feet wide, and the pay streak or ore shoot ranges from 3 to 24 inches in width and favors the hangingwall side. The values are in silver, gold, and copper. The minerals are principally pyrite, arsenopyrite, and chalcopyrite. The last shipment of the ore is reported to have averaged 3 ounces of gold and 486 ounces of silver to the ton and 2½ per cent of copper.

#### GOLDEN STAR MINE.

The Golden Star (formerly Lone Star) mine is in the northeastern part of the district, about a mile northeast of Mineral Park, a short distance below the Windy Point mine, at an elevation of about 4,700 feet. It is situated on open, sloping, somewhat hilly ground. The mine was located in 1870 and soon became an important producer of rich ore. It continued to be prominent till 1902, when the ore seems to have fallen off in grade. The mine is now dismantled of all surface equipments. Its output during much of this period is said to have been the largest in the region.

The mine was first owned by W. F. Grounds, now of Hackberry, who took out much rich ore. It was later owned by Fred Harter and Isaac Conkey, of Mineral Park. The present owners, besides Mr. Conkey, are W. G. Blakely, C. D. M. Gaddis, and Doc. Hamilton, all of Kingman.

The mine is developed principally by a 300-foot shaft and two levels, each containing about 300 feet of drift, and the ore is said to be stoped out from the surface down to the first level.

The country rock is principally black amphibolite schist, mica schist, and gneissoid biotite granite. The fissure containing the deposits is 2 to 4 feet in width, all of which is said to consist of lowgrade ore. It strikes in general west northwest and dips about 65° S. At the shaft the strike is east and west, but a short distance east of the shaft the vein curves to the north and is said to split. At the surface west of the shaft it is 2½ to 3 feet thick, is dark and ironstained, is parallel streaked or banded, and, like the Windy Point vein, is very arsenical.

The ore, like that of the Windy Point, is sulphide ore. It contains argentite, ruby silver, native silver, gold, and a trace of lead, all in association with arsenopyrite and pyrite. The ore shoot ranges from a few inches to 20 inches in thickness. The ore is mostly of

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and both are attributed to descending condition manifolds. The alver content in the spectrum common in the descendary, are primary, in produce and polyhesite and in part secondary, sensitiver. The primary silver sequences in high sufficient in itself, spectrum a rich silver ore. Such abundance of primary subpload produce a rich silver ure. Such abundance of primary sulphonds of silver in ores from depths of only 10 to 80 feet is unusual but it due to the dama, highly quarteres, fine grained nature of the one pathle with that of chalcopyrife by one due to the dense, highly quartices, fine-grain which narrowly limits or idetion and enricht nearly vertical and from 2 to 8 feet wide. All workings were inco-cessible in 1913, the mines having been idle for miny years. Ground water stood at a depth of about 50 feet below the collar in the Rural Mineral Park and use a feedback of the second state of the granite grants and and the intruded by dikes of much younger grants pe vicinity of fractures. anair, Ores seen on the dumps showed pyrile, examplying, and galens as the dominant minerals, with chaloopyrite, sphelerite, and galens as the dominant minerals, with chaloopyrite, sphelerite, but native nearly solid native silver 11 inches across. One specimen in the collection of E. F. Thompson shows a mass of silver is abundant in specimens from this mine seen at Kingman. subordinate. No silver minerals ware seen on shaft. owned by James B. Uncopher, of Mineral Park, to whom the Park district, close to the cut-off trail to Chloride. The Rural and Buckeye mines are WILTER Tenor of smelting ores shipped from Bard and The following records show the tander of the richer ores: The Queen Bee mine is in the northwestern part of the Mineral CONTRANT TONS TO is indebted for valuable information and specimens. Net (pounds) 1 Pre 1 1 1 (ounces per ton). A Station 19853853 TANK SEE NEED (ounces (powda). (ounces -----ty. The voin in San and a start of TEARNER The mine is ver in 1886-87. (and upas aunt \*\*\*\*\*\*\* the ore is said to be somewhat exidined to a depth of about 70 feet. quartz and ferruginous caloite, all three minerals interlocking and eighths by one-half inch in dimensions was intercrystallized with the following minerals were neted in specimens from the mine having apparently been deposited contemporaneously. In one speciump and from Mr. Uncopher's collections: by calcite. men in Mr. Uncopher's collection proustite in vugs is wholly inclosed The prometite abundant in many of the ores from this mine ap primary (hypogene): Quartz, pyrfte, areenopyrite, manganiferous siderite, abundant proustite. Microscopic examination shows that in general A particularly that specimum of unoridized one domated by Mr. Uncopher shows the entire width of a Si-inch veinlet carrying satal sulphides; the evidence for this conclusion is given below. In one specimen studied a piece of proustits three fourths by three of proustite and sphalerite. The galana can not have been replaced ment. Figure 4 shows a contact between galena and an intergrowth tarnish the silver minerals) usually shows no evidences of replacewhen tarnished brown with hydrogen peroxide (which does not the proustite has not replaced other ore minerals. The galena solubly primary), argentite (probably in part polymery). by proustite alone, because there are no sphalerite areas posits is extremely rare. . The proustite is interpreted as hypogene he a part of the process of primary (hypogene) mineralization, for sphalerite is highly improbable and if is occurred would probably taneous replacement of galena by an intergrowth of proustite and galena corresponding to those so abundant in the proustite. Simulsame mineralizing solutions that deposited the common best eite (whitle), sphalerite, galena, tennantite, chalcopyrite, proustite, pearceite the deposition of sphalerite in the downward enrichment of ore deminute inclusions of chalcopyrite are abundant in the proustite but a replacement of galena is found in the and broadly contemporaneous with galena and sphalerite. peond \* Op. ett., p. 86. are absent from the adjacent galena. Additional evidence that most of the proustite is not the result of thary (supergene) : Argentite, untive allver, desargyrite (reported by Other well-formed crystals of promitite are coated with ted in 1918 had be fact that in many places

thed by Mr.

in the

SILVEB GRES NEAR CHILDREDS AND KINGMAN, ARIS.





anagonal crystals of pearceite in vugs. uns 3.- Veiniets of proustite following deavage planes in galena and contacts between galena and quarta, Queen Bee mina, Mineral Part, Arta. Galena Cleavage in guidna 0.1mm. On some of these small

SILVER

ORI

a is a qu

mirter of an inch in diameter, and in

MEAR CHILORIDE AND KINGMAN, ARIS,

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is rately a product of downward enrichment, this pearceite is probcrystals of chalcopyrite have later been deposited. As chalcopyrite ot demonstrably primary.

is manifestly formed by their alteration. Native silver also occurs in matted and teeth attached to argentite, proustite, and pearceite in vugs and ably though n Native allver is clearly secondary (supergene). It occurs as wires mes of wires and teeth along fractures in sulphide ore.

O CONTRIBUTIONS TO ECONOMIC GROLOGY, 1982-1986, PART L.

Here it is associated with remnants of argentite, from which it a probably derived. In a number of places the allers is in contact, we unstched crystals of calcite or of manganiferous sidentite, an argent tion which indicates that it was not deposited from solutions the were notably soid.

## The Kay claim is about half a mile northwest of the settlement of Mineral Park. A steeply dipping vein striking nearly due east is developed by a shallow shaft and a short tunnel, neither of which was accessible in 1913. The shaft is near the bottom of a small guich and ground water stood only 25 feet below its collar. The vein traverses medium-grained granite. Proustite is reported to have oc curred within a few feet of the surface in this vein. Specimens of ores were collected from the dump, and two were obtained from Mrs. Kay.

The minerals recognized in the ore, in the approximate order of abundance, are as follows:

Primary (hypogene) : Quarts, priite, sphalerite, tennantite, pearceite, proust ite, galena, chalcopyrite.

Secondary (supergene): Chalcorite, native silver, copper pitch ore, mainchite.

Of the primary minerals quartz, pyrite, sphalerite, and galent were the oldest; after their deposition some brecciation occurred, and additional quartz and chalcopirite, tennantite, parceite, and proustite were deposited in the fractures so produced. The pearceite and proustite are most abundant and occur in the largest masses near small vugs. The later quartz is white; the earlier is dark gray.

In the granite of the way disseminated grains of pyrite are abundant.

Evidence that the silver minerals pearceite and proustite are primary is found (1) in the absence of any indication that they have replaced earlier minerals and (2) in the intimate penetration of tennantite by crystals of these silver minerals, as sketched in Figure 9. In this figure proustite and pearceite are not differentiated by separate symbols, but both show similar relations, with characters istically sharp crystal outlines against tennantite. The narrow lathlike white areas in the tennantite of this figure are mostly pearceite; the larger white areas are mostly proustly. There is no evidence that the promitte of this specimen replaces either tennantite of pearceite. King claim, at Mineral Park, was located to develop a vein king nearly cast and dipping steeply south. Prior to 1913 two stra 35 and 50 feet deep, had been sunk on the vein, and two short mais had been run.

ORES MEAR CHILORIDE AND KINGMAN, ARIZ



Flattan 9. - Primary intergrowth of proveries and pearceits with tennantite, Kay mine,

The vain as exposed in the tunnels is 6 inches to 2 feet wide and shows gray quirt's carrying scattered pyrite. Ore seen on the dump scried the following minerals: Primary (appearse): Quartz, pyrite, sphaterite, gatena, chalcourris, Secondary (appearse): Covellite, chalcourse, native appear. A specimen from the mine dump when polished showed peripheral splacement of chalcopyrite and sphalerite by covellite. Ore from depth of 19 feet shows dendritic growths of native copper along

## RURAL AND BUCKEYE REOPEN

RURAL AND BUCKEYE REOPEN The reopening of the old Rural and Buckeye mining properties by the Rural Mines, Inc., has resulted in much activity in Mineral Park, where these properties where the real producers of the camp until ing the time they were in commission, shipments of upwards of \$500,000 were made and the specimens of silver taken from the mines were among the most beautiful ever taken from old Mother Earth. Today there is hardly a mineral a specimen of this ore. Solid masses of silver resembling a retort, have been found, from which radiated beautiful of wire silver, some of these silver masses rising to a height of five and six inches from the base. Others laced he rock together in fantastic shapes, is inches from the base. Others laced he rock together in fantastic shapes, is inches from the base. Others laced he rock together in fantastic shapes, is inches from the base. Others laced he rock together in fantastic shapes, is inches from the base. Others laced he rock together in fantastic shapes, is inches from the base. Others laced he rock together in fantastic shapes, is inches from the base. Others laced he rock together in fantastic shapes, is inches from the base. Others laced he rock together in fantastic shapes, is inches from the base. Others laced he rock together in fantastic shapes, is inches from the base. Others laced he rock together in fantastic shapes, is inches from the base. Others laced he rock together in fantastic shapes, is inches from the base. Others laced he rock together in fantastic shapes. He specimens of silver event is inches from the base. Others laced he rock together in fantastic shapes. He specimens of silver event is inches from the base. Others laced he rock together in fantastic shapes. He specimens of silver event is inches from the base. Others laced he rock together in fantastic shapes. He specimens of silver event is inches from the base. He specimens of silver event he spec

was high graded from the mine during operations. A few months ago the Rural and Buck-eye properties were purchased by M. B. Dudley for himself and New York asso-ciates after W. W. Widdowson, a promi-nent mining engineer, who now has charge of the consulting work on all of the Dud-ley properties, had made a favorable re-port on the properties following an ex-tensive examination. A complete electrically driven mining

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#### **RUSH TO WALLAPAI RESERVATION**

One of the greatest rushes into new ter-ritory that Mohave county has ever wit-nessed was when the Wallapai Indian

reservation was opened to mineral ex-ploration and location. The opening of the Wallapai reserva-tion to the prospector has been looked for-ward to for many years, the general belief being that large veins or deposits of cop-per were found, especially in that portion of the reserve in Coconino county. Con-siderable ore was shipped from some of the desopits and it is said that fully 1000 tons of ore are available on the one prop-erty that was a bone of contention. This claim was filed on by several people and

it is probable that some litigation will re-sult from the fact that Montain and Pa-cific time was considered in making the locations. The country there is well min-eralized, the exposures of copper being ex-tensive. It is probable that other deposits will be found beneath the lime and other sedementary cap rocks, but it will take time and considerable prospecting to bring it forth.

it forth. Kingman people report having secured 35 claims on the reserve over which there cannot be dispute and are in on other





**Rural-Buckeye** Camp









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Modernly Equipped Electric Power House, With Compressor and Electric Hoist at Rural-Buckeye Mine

properties that may be in dispute. W. K. Ridenour, who acted as head of the King-man party, is of the opinion that the prop-erty secured is of great importance. It was estimated that the copper showing in the outcrops and on the dumps had a value of approximately \$800,000 net. Indians were called in and made many locations, the red men staying with their claims for some time back. Just what the status of the Indians will be held to be is yet to be decided by the Interior Depart-ment, which has to be applied to to give them proper standing in the matter of making mineral locations. Some of these Indians have gone into the Diamond Creek section, where they are said to have made locations on excellent copper outcrops.

#### COPPER AGE

Paul White, in charge of the Copper Age, near Chloride, has had several men at work on that property this week clean-ing up and fixing up some timbers in the tunnels. It is reported that the Cop-per Age will reopen at an early date. The mine has been a big producer.

# **Globe-Miami District**

## **ARIZONA COMMERCIAL**

ARIZONA COMMERCIAL No mining company operating in the Globe-Miami district has made more satis-factory progress this year in developing its property than the Arizona Commercial Mining company, and at the same time, has maintained production at about 250 tons daily. The mine shows a greater tonnage of ore blocked out than ever before, and pro-duction is coming from every level from the seventh to the fifteenth, inclusive. Rapid progress is being made in open-ing the new shaft, which when completed and equipped will be the main production shaft. A depth of more than 700 feet has been reached in sinking and the opening of the shaft is being expedited by raising from several levels. It is expected that the new shaft including skip pockets, will be completed and fully equipped by next March. March.

## SUPERIOR AND BOSTON

SUPERIOR AND BOSTON The stockholders of the Superior and Boston Copper company of Globe, met re-cently for the election of five directors to serve for the ensuing year. The directors chosen are: Garret Mott, J. B. Hardon, W. F. Fitzgerald, J. F. Barry and T. R. Drummond. They will meet in Boston at an early date to choose their officers. Very satisfactory progress was made

their officers. Very satisfactory progress was made during the past year in the development of the company's mining property in this dis-trict, under the personal direction of Man-ager T. R. Drummond. The scheme em-braced diamond drilling and other exten-sive exploration work. An important strike of ore was made re-cently in the foot wall vein, on the 400-foot level. This vein where crosscut, is seven feet wide, and carries four feet of glance ore assaying 24 per cent copper and 92 ounces of silver.

## IRON CAP COPPER CO.

In a bulletin to the stockholders of the

## WINTBIBUTIONS TO BOUNOMI BOIANY, 1997, PART I.

66

It is developed by creancut tunnels and drifts, mostly within a vertial range of 100 feet. The country rock is sheared pre-Cambrian biotite granite. The vein has a width of about 40 feet, and dips steeply southwestward into the mountain. It seems to consist mainly of an altered and replaced crushed aplitic granite or rhyolite dike. The values favor the foot-wall side of the vein, being greatest near its contact with the granite. This mine produces gold-silver-lead ore. The last carload shipment made at the time of the writer's visit averaged: Gold 3.16 ounces and silver 8 ounces per ton, and lead 17.5 per cent.

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Roral and Buckeye mines .- These two mines are located in the northeastern part of the Mineral Park district, at an elevation of about 5,000 feet. They are but a few hundred feet apart and are situated on the same vain, the Rural being on the west and the Buckere on the stat side of the same gulch. The principal developments in the Rural consist of a 200-foot shaft and about 100 feet of drift, and in the Buckeye of 750 feet of drift, toward the face of which he wain is finited off to the north by a lateral throw of about 75 fast. The Eural shaft contains water. The vein in the Rural mine ps southward at angles of about 80°, but in the Buckeye it dips the north at angles of about 70°. It is 2 to 8 feet thick and is sisted with a dike of the aplitic granite intruded into the country the which is pre-Cambrian schist. It locally shows a 4-inch to so-inch ore shoot, mostly iron and copper pyrites, with streaks of armanopyrias, black exide of manganese, and some chert and quartz, the quarts being more prominent in the Buckeye than in the Rural. The walls are generally frozen. The ore contains silver, gold, and copper, with the values high in gold.

Golden Star mine.—The Golden Star (formerly Lone Star) mine is located about a mile northeast of Mineral Park, on open ground. It produced rich sulphides of silver, containing gold and lead, from 1970 until 1902, when the ore seems to have fallen off in grade and become base and refractory. The mine is developed principally by a shaft 300 feet in depth and two levels, with 600 feet of drift on each livel. The ore is stoped down to the 100-foot level. The vein dips steeply to the south. It is 2 to 4 feet in width, and the ore is all low grade. The total production is stated to be \$375,000.

Ark and See Antonio mines.—The Ark mine, located about 2 miles southwest of Mineral Park at the west base of the mountains, is developed by a 250-foot shaft and three levels, comprising about 1,300 feet of workings. It produces considerable water. The vein, which is is or of feet in width, dips steeply to the northeast. The ore is of a subplied character and contains gold, silver, and copper. It runs about 175 ounces of silver and 3.15 ounces of gold per ton. The production is about \$150,000. Adjacent to the Ark mine is the San Antonio, which has produced \$75,000.

## February,

## MOHAVE

MOHAVE The new shaft of the United American, Oatman, is now down 325 feet and aver-aging about 4 feet a day. A recent sur-vey of the property showed that the first vey of the property showed that the first vey of the south of the shaft, providing its dip is the same as the other ledges of the series, should be cut by the shaft at a depth of between 400 and 500 feet. In-amuch as this ledge has not yet been prospected it is not known what value it carries. At the present rate of sinking the 500 should be reached between the middle of March and the first of April and the crosscut run on the 500 to the big ledge by about the first of May. Development work on the Rural Mines.

Development work on the Rural Mines, Inc., is progressing rapidly, the new doub-le compartment workings shaft being sunk on the Buckeye claim is nearing a depth of 200 feet.

of 200 feet. Fred Hensing is understood to have a force of men at work on the Amalgamated property at Oatman. They are sinking the main shaft to about 400, and are now down about 360 feet. This property has been idle for two years and it took con-siderable time and money to put the shaft, machinery and buildings in shape for mining. They expect to do some cross-cutting on the 400, and it should be very interesting as the shaft is down at a junction of which seems to be a con-tinuation of the Gold Roads ledge. The Amalgamated owns over 6600 acres in blocks which they are operating. The Thumb Butte Mine has recently

The Thumb Butte Mine has recently purchased a 320 cubic-foot Chicago Pneu-matic compressor as an auxiliary to the one already on the ground. Also a 30 horse-power engine has been put in. They plan to soon unwater the old Colorado shaft which is down to a depth of 540 feet after which extensive development work will be done in this region.

work will be done in this region. The McCracken Silver-Lead Mine shipped a 40-ton car of concentrates ne-cently which will average about \$109 to the ton. Samples from the concentrating tables showed 12.24 ounces silver and 62 per cent lead, and another sample 16:40 runness silver and 69 per cent lead. It is understood that the two new tables will be added which will increase the mill to about 5 tons of concentrates a day.

The machinery is now being installed in the Dean Mill. The capacity of the plant will be about 400 tons in 24 hours. Capt. Gibson is living at the mine and giving his time to the development of the project.

C. H. Fay and C. B. Schoenmehl were in Kingman recently in the interest of the Bella Union. They report that they will at once start sinking on the shaft from 105 to the 500 level on the footwall of the vein, and then commence drifting on the 500.

Two shifts were started at the Gold Ore Mine, Oatman, recently and things are getting under way for a good sized development campaign, under the direc-tion of Joe Onetta.

tion of Joe Onetta. Recently a deal was consummated whereby the Tom Sickles group of six claims was taken over by a group of eastern men. The deal was handled by J. S. Withers who will be identified with the new company. This property is lo-cated in the Wallapai mountains and has a good showing of gold and silver, silver predominating. The outcrop and such development work as has been done makes the property look very promising. It

is understood that development work will be started soon.

The Mohave Miner says the work of re-timbering the old shaft of the Daisel Mine was completed recently, and the company is now sinking from the 300 level to was completed recently, and the complete is now sinking from the 300 level to deepen the sump. After this is done the 300 level will be cleaned up and timbered where there is caving, after which the drift will be continued to intersect the ore body opened in the west drift.

It is said that work at the Highland Chief in the Oatman district, is moving along in a satisfactory manner. The quartz ledge in the lower tunnel has been cut through and drifting is being done along the vein to a point where the high value were discovered in the Old High land Chief claims.

It is reported that the Telluride mine at Oatman, is at work on a new shaft, going 100 feet deeper. The ore found in the drift north of this shaft justifies sinking deeper and crosscutting again. In the crosscut on the 350, the vein is wider at the bottom of the drift than at the top. Jack McIver is president and directing head of this property.

It is understood that J. A. Mamme was in Kingman recently arranging for the starting up of the J. C. mine which has been taken over by the Gold Butte Mining Company, of which he is general manager and president. Sam Brethour has been se-cured as mine superintendent, a Fairbanks engine is on the ground and a compressor is on the way. Lumber for the buildings and timbering is also being hauled. A double-compartment will be sunk to the 200 level from which level drifting will be done both ways. Former owners of the J. C. not long ago shipped three cars of ore averaging \$40 per ton. This ore was taken from the bottom of the 50-foot shaft now on the property. A. C. Werden was in Kingman recently It is understood that J. A. Mamme was

shaft now on the property. A. C. Werden was in Kingman recently and reported that the Gold Ore, Oatman, will start operations again soon. While the mine has been shut down, a cave on the 50 level has arposed three feet of \$100 ore on the 250 level in the dis-covery shaft. Mr. Werden says ten feet of ore was exposed by this cave. It is the helief of Jack Jefferies, a mining man who recently made an examination of this property for Los Angeles people, that this cave had broken into the old ore shoot, that Mr. Werden had been trying to tap on the lower level for the past few years. N. Bieler, of the Gates Aiar Mining

on the lower level for the past few years. N. Bigler, of the Gates Ajar Mining Company, Kingman, returned recently from Oakland and Salt Lake City, where he was in conference with men interested in this property. One of the stockholders of the company returned to Mohave coun-ty with him for a stay of a month or so. Mr. Bigley says a larger force will be put on at the mine and the work of driving the tunnel will be pushed faster than here-tofore. The tunnel is now 356 feet, on the vein which at present is 9½ feet wide with four feet of quartz.

It is reported that splendid progress is being made at the Dean Mine & Mill. The 400-foot crosscut tunnel and the drift of 225 feet, on the vein, have been cleaned out and the track laid to the face of the drift, where the up-raise begins. The ex-traction of ore will be begun shortly and the first mining will be done on the in-termediate level.

A test run recently of Diamond Joe ore through the Arizona Molybdenum mill showed an 82 per cent extraction and re-

sulted in five tons of 300-ounc

sulted in five tons of 300-ount centrates. The solution is groun the ore in the ball mill. Colonel Aagaard visited the Tu-mine recently and was well please the progress being made. The mine ing well managed and is showing resi development. The Tuckahoe is now

the progress being made. The mine ing well managed and is showing res development. The Tuckahoe is now ing to the 500 level after which will drift on the vein which show good ore on the 300. The annual meeting of the stockle of the Arizona Moseback Company man, was held recently. The report officers showed the company to be cellent condition; the work of the year, which has been wholly develop has been most satisfactory. At a special meeting of the Quartz stockholders the following dir were elected. R. H. Hodges, pres L. Harpending, vice-president; C Bryant, secretary and treasurer. Frank Champion, director. Mr. Har ing will be located at Oatman. Some good looking silver samples been brought in from the Union Pas-tion, from Silver Coin No. 4, own Pete White and E. G. DuBois, Is about a mile beyond the Roadside, samples were taken about eight feet the surface. A 25-horsenower hoist has been surface. the

the surface. A 25-horsepower hoist has been chased by the I. X. L. and will be o ground shortly. After the installati the machinery the shaft will be sund depth of 300 feet, when drifts will b on the ledge both north and south the old stopes from which the high ore was shipped in the early days. It is reported that a marger of the

ore was shipped in the early days. It is reported that a merger of the terests of the <u>Tom Reed</u> and the U Eastern is proposed. The new shaft in the west ore bo the <u>Emerald Isle</u>, near Oatman, is to the depth of 50 feet. The Cerbat Silver Mines & Milling pany, Chloride, put a shift of men to cleaning up the machinery and inst an engine to operate the blower and H. Borriman, until recently with the nessee, is foreman of the work.

#### PIMA

PIMA Announcement is made by A. W. I well of Gunsight, that he and Detroit ties have purchased the Gunsight Gall Tungsten Mining Company's mill an equipment that goes with it as well a Wender No. 1 mining claim, upon the mill is erected. This property w membered as one upon which tungst the form of scheelite was discovered a year and a half ago and from whis hipment of scheelite was made to. T at that time. The ore was rathen grade in tungsten but the mine wou doubt have made an important prod of tungsten had it been discovered opened up when the price of tungsten high. In addition to tungsten the ore high. In addition to tungsten the ore ries gold. The gangue is a white qua

ries gold. The gangue is a white due The Arizona-Tonopah Mining Com eperating a group of claims eight southwest of Tucson, near the Ari Tucson Copper Company, made a of high grade silver ore at the of 100 feet in the new shaft. The ore was unexpectedly encountered a station was being cut in the shaft.

Application was being cut in the Mile-Wide per Company, Tucson, in the hands receiver was filed recently. The plan is Ralph W. Langworthy, who holds n against the company upon which he

(Continued on Page 44.)

## ASSAYS

LITTLE CHIEF: Excerpts from Mining Report, December 31, 1950. Banner Vein and the Dike Vein, both gold and silver veins, run through property. 20.4 deeded 60 acre mineral lease. "The veins on your property are strong and well defined and there is no question as regards their permanency and continuity to a very great depth." "Considerable ore has been shipped from some of these openings during the history of the property that is reported to be better than a hundred thousand dollars." "Serbart mining country has richest ore in Stockton Hill." Assays .03 gold, 62.17 silver oz/ton, July 2, 1930.

PINKHAM: 21 acres deeded, 20 acres mineral lease. Geologist Report, August 26, 1974. "Sampling indicates that approximately 8,000 tons of dump material near the main shaft contains .035 ounces gold, 4% to 8% silver; a predicted average would be .035 ounces gold and 6.5 ounces silver." Union Smelting and Refining states that the Pinkham Mine was considered the best copper mine in the area. Also have 62 assays of the dump. Phelps-Dodge processed 88 tons March 23, 1980, \$21,252.75.

RURAL & BUCKEYE: 20.4 deeded acres, 60 acres mineral lease. "The display of ores from these mines containing masses of solid silver and beautiful specimens of wire silver is said to have been awarded the silver medal at the Louisiana Purchase Exposition." Past production reported was 152.282 short tons of silver-gold ore averaging 315.3102 average ton silver.

Arizona-Montana primary mill site. Flat and has source for water.

DEPARTMENT OF MINERAL RESOURCES STATE OF ARIZONA FIELD ENGINEERS REPORT

Mine Rural Date

District Mineral Park, Mohave County Engineer

Subject: Present status

Owner: John Rothermel, 3016 W. Mercer Lane, Phoenix, 942-4470.

Claims: Rural (patented), Kural Anex, Rural Anex #1, Rural Extension (3 unpatented)

Location: One and one-half miles northeast of Mineral Park near the south base of Cherum Peak (Schrader, 1909, p. 83) NEZNWZ S. 18 T23N R17W (USGS Chloride Quad)

Commodity: Silver (gold, copper, zinc and lead)

Minerals: Dominant vein minerals; pyrite, arsenopyrite and quartz with subordinate chalcopyrite, sphalerite and galena. Silver was reported to occur primarily as native silver along with argentite and cerargyrite (Schrader, 1909, p. 83; Bastin, 1923, p. 24)

Geology: Country rock is medium-grained gneissic biotite granite and associated schist. It is intruded by dikes of granite porphyry. The mineralization occurs in a fissure vein 2-3 feet in width. The vein strikes west of north and dips 80 south. The mineralization is believed associated with a dike of the granite porphyry, most of which occur nearly to the north. The deposit has contained ore shoots ranging from 4 to 20 feet in width, which consist mostly of pyrite and chalcopyrite with parallel streaks of arsenopyrite, black oxide on manganese, gray chert and quartz. (Schrader, 1909, p. 84).

- Past production: The only reported production was 152.282-short tons of silvergold ore averaging 25.51 oz: Ag/ton and 6:41 oz Au per ton in 1886-87 (Bastin, 1924, p. 24)
- Present activity: John Rothermel reported that he has sampled the surface of the vein by small pits in 50 foot intervals over approximately 300 feet of exposure. Six samples ranged from 60-90 oz Ag/ton and 0.01 Au/ton. The vein is reported to pinch and swell from 2 to 8 feet in width.

References: Schrader, F.C.; 1909, Mineral Deposits of the Cerbat Range, Black Mts. and Grand Wosh Cliffs, Mohave County, Arizona; U.S. Geol. Survey Bull. 397, 226 p.

Bastin, Edson S., 1923; Origin of Certain Rich Silver Ores Near Chloride and Kingman, Arizona, in Contribtuions to Economic Geology; U.S. Ceol. Survey Buil. 750, p. 17-39







Rural - Buckeye 315 W. MONTEROSA 00,000 3,300 of Rural Vein PHOENIX ARIZONA 1 700 · tunnel with upraise and winz 2.44 .700' level runs off of winze ires . Kural contains 200' shaft and 110' tunnel with r. d. d DACTE 50' WINZE Property to west is held by Exxon and to the north, south and east is held by Duval Corp lineral ights (subsiding of Perman ) Duval has been drilling south of the mine property near the New Moon B Silver and gold ore visible in tunnel level And in the stopes Very little development on the Rural Portented There are sourced additional undeveloped veins on the Rural And Buckeye. Work is presently being done in Hren where MAIN working Ven is intersected by curwit. Another ven - contains rich silver and gold streak Rural No. 2. 15 patented, Buckeye is Minner Survey No.1165 Also contains Rural Extension, Rural Annix, Rural Annix 1 unpatiental lode claims - All. recorded with BLM. De Over 1 mile of veins Rural Anne has a strong, will defined vein structure. Bladed road access From open pit

6012 NORTH 47 ORIVE SEC. 18 T. 23 N., R. 17 W. GLENDALE, ARIZONA 85301 Scale 1" = 600' 1500' RURAL Book . DATE : MARCH 14,1976 Annex. GLO. Mop\_ West 13 300 Rural 24 7 D. K., MARTIN & ASSOC. 15010 39.53 A. 315 W. MONTEROSA RURAL 38.27 Aus PHOENIX, ARIZONA 85013 M.S. 2456 Nº2 (2) BUCKEYE Sur. No. 1165 0 RURAL ANNEX 2-30% 2544.96 1500' 3) 4844 40 1,24.20 N 820 GOLL 526/. E.1.4 Cor. 308 Sec. 2.4 28 Book 6) 36.22 714.5 N,5E.00N 079 7) -----690 0' 1. 50' 50 MT - 640 Nº1 FEO # 42 MS 4572 24 DEC #44 MS. 4993 REU 46 M3 4592 - 40 3 CLAMES ENTED UNFAT 23 sld. West T.23N, R.ITW. T23 N,R.IB W.. Be BOCK 641 PAGE 758 M

Reports from the Rural Buckey indicate that the property is opening up i better than the expectations of its owners, M. B. Dudley and associates, and a large milling plant is now under consideration. The office of the company is at Kingman.

inunal

deres to

The ere body opened recently on the

180 level is showing better values

shows one of high milling value in vir-

gin ground, and with the connection to

the west with the Eural the ore shout,

is maintained for many hundred fest.

level

foot

The drift from the to

from the Buckeye shaft, loward the Rural mine, at Mineral Park, is be-

ing driven in the richest ore thus far

encountered in that property. The streat is widening as progress is

made on the drift and the expectation

is for the opening of as large a vein

as that shown at the lower level.

From the 160 level a slope has been

opened and worderfully rich ore is be-

ing extracted. From four places in

the property are is now being taken

and sacked for shipment. The first

rhipment is expected to bring big re-

turns, the ore showing heavily in na-

With exploration on the lower low-

indications point to the development

of and of the richest silver properties

In the county. While the vein is not

as large as some of the other proper-

lies the values are exceptionally high.

tive and ruly silver.

with the additional work, have been opened and within the next week shipments will go out to the smelter. The ore in the stopes show heavily in native silver, while the main hady gives ligh values in silver and gold. The opening of this body of ore is of importance, showing as it dues, that the ore bodies are almost continuous throughout the Rural and Buckeye ground, where heretofore the shouls in the gld works were short, especially the rich ore hortnes. The tunnel to the cast on the Eackeye

spraise from the 100 level of ckeye-liural drift and close to I lines of the properties, hus a wonderful showing of ore. taken from the opening show us grade of ore that was found property in the early days and pression is that this shout will the surface, that section of the w being vi gin ground. The being curried from the Buck. akings into the Rural, where it . ted to get below the old worknd open up the ore bodies. crable ore has been found wherhe diffts have been run and treaks are found to be developat importance. The new shoot masses of native and silver ies, as well as big values in

: and Luckeye were only and to superficial depth by the ners, but there was taken a mage of wonderfully rich silver muts of notive silver ore was i in various parts of the mines cented sensations even among men who were used to seeing i.er ores. For beauty and value simeas taken from these mine never been duplicated, and we not by surprised to see the presmagement bringing in duplicate can of this old time ore. The found to be large and litere is derfal tonaage of mill ore now . Every day brings to light the and when the property is that the 500 level we may expect .ful things from it.

::. Duiley and his associates are steased with the new ore bodies " ught to light and ure having shed with all possible dispatch is development to the productive

From the new ore holy ship-... in new being sacked and shipwill probably soon be made to dellerra.

Bural-Buckeye Mine, Kingman, Ariz., built headframe, michouse for 50 men, and new motor truck road from Minat Early and installed electrically driven hoist, compressor, uap, drill sharpener.

D. K. MARTIN & ASSOC. 315 W. MONTEROSA PHOENIX, ARIZONA 85013

. that I Padant overland Gus Deuchnes departed

hast Wednesday morning to Luning, Nevada, where the Rural Mines company has taken over the Lodi mines, and where he is to assume charge. The Lodi mine is an old property,

the shaft having been carried down 1000 feet into the ove body and 6000 feet of drifts, raises and crosscuts have been run, opening up an estimated tonnage of 40,000 tons. This ore contains values of about \$39 in gold, silver and head, the silver values predominating. Three of the veine in a group of 18 claims, carry mili values. The mill has a capacity of 50 tons and may be increased materjully. Tests made on the ore show recovery of Sath. Water is supplied to the camp through a 3-inch pipe line, a distance of 18 miles.

The mine is equipped, with a hig hoist, compressor, machines and all necessary tools. It is situated about 14 miles from railroad, but is connected by an excellent highway. It is only about nine miles from Broken Hills, the new camp that is causing excitement in the Silver State.

The mill is to be started up, at once on the dump otes, estimated at 20,fou tons and good results are expected. The company is well financed and we feel save that it has picked a minner.

# ARIZONA TESTING LABOI ATORIES

A DIVISION OF CLAUDE E. MILEAN & SON LOBORATORIES IC. 815 WIST MINDISON OFREET PHOENIX, ARIZON 85007 PHONE 254-5181

Date April 7, 1976

For Rothco Mines 3016 West Mercer Lang Phoenix, Arizona 85029

## ASSAY CERTIFICATE

		OZ. PI	ER TON	q	EFCENTAGES
LAB NO.	IDENTIFICATION	GOLD	SILVER	COLGEN	
1.642	Rural Hill Vein	0.01	64.5		

Respectfully submitted,

ARIZON TESTING LABORATORIES

1

D. K. MARTIN & ASSOC. 315 W. MONTEROSA PHOENIX, ARIZONA 85013

13

Claude . McLean,

VALLEY ASSAY OF CE	your immale
AND ORE TESTING LABORATORY	Carrie Turk

MEMORANDUM OF ASSAY

Feb 10

#### Made for. John Rothermel Tempe, Arizona..... ..75 PER TON OF 2000 POUNDS AVOIRDUPOIS COPPER, OR LEAD, OR TO ZINC, OR SAMPLE NO. GOLD, PLATINUM SILVER Rural-1 AT PER OUNCE AT PER OUNCE AT PER LB. AT PER LB. AT PER LB. OZS. 100's \$ Cts OZS. 100's \$ Cts. % \$ Cts. % \$ Cts. % \$ Cts. \$ 0. 52 1 52 4 1 14 Ξ T. SO CE 31 1712 REMARKS: A NO.\_\_\_\_ BY... 0 Xu legistored Assa CHARGE \$ 5.00 Pd

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D. K. MARTIN & ASSOC. 315 W. MONTEROSA PHOENIX, ARIZONA 85013

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#### AIZONA ABCRATORIES TESTING

A DIVISION OF CLAUDE E. MELEAN & SON LABORATORI ., INC. 81 WEST MADISON STREET PHOENIX, ARIZ MA 850 7 PHONE 2 4-6181

Rothc Mines For Mr. John B. Rothermel. 3016 Vest Mercer Lane Phoen x, Arizona 85029

April 28, 1976 Date

RURAL

NTIFICATION	OZ. PE	ER TON	PERCENTAGES			
	GOLD	SILVER	COLPER			1
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## ASSAY CERTIFICATE

Respectfully submitted, ARIZONA T STING LABORATORIES

Clark Mit lea 1

Claude E. M. an, Jr.

DEPARTMENT OF MINERAL RESOURCES STATE OF ARIZONA

FIELD ENGINEERS REPORT

Mine Rural Date

District Mineral Park, Mohave County Engineer

Subject: Present status

Owner: John Rothermel, 3016 W. Mercer Lane, Phoenix, 942-4470.

April 8: 1976: Ken A. Phillips, A.M. R. O. M. R. O. M. C. M. S. C. C. M. S. M. S. M. S. M. C. C. M. S. M. S. M. C. C. M. S. M. Claims: Rural (patented), Rural Anex, Rural Anex #1, Rural Extension (3 unpatented)

One and one-half miles northeast of Mineral Park near the south base of Location: Cherum Peak (Schrader, 1909, p. 83) NEWNY S. 18 T23N R17W (USGS Chloride Quad)

Commodity: Silver (gold, copper, zinc and lead)

Minerals: Dominant vein minerals; pyrite, arsenopyrite and quartz with subordinate chalcopyrite, sphalerite and galena. Silver was reported to occur primarily as native silver along with argentite and cerargyrite (Schrader, 1909, p. 83; Bastin, 1923, p. 24)

Geology: Country rock is medium-grained gneissic biotite granite and associated schist. It is intruded by dikes of granite porphyry. The mineralization occurs in a fissure vein 2-8 feet in width. The vein strikes west of north and dips 80 south. The mineralization is believed associated with a dike of the granite porphyry, most of which occur nearly to the north. The deposit has contained ore shoots ranging from 4 to 20 feet in width, which consist mostly of pyrite and chalcopyrite with parallel streaks of arsenopyrite, black oxide on manganese, gray chert and quartz. (Schrader, 1909, p. 84).

- Past production: The only reported production was 152.282 short tons of silvergold ore averaging 375.31 oz. Ag/ton and 6.41 oz Au per ton in 1886-87 (Bastin, 1924, p. 24)
- Present activity: John Rothermel reported that he has sampled the surface of the vein by small pits in 50 foot intervals over approximately 300 feet of exposure. Six samples ranged from 60-90 oz Ag/ton and 0.01 Au/ton. The vein is reported to pinch and swell from 2 to 8 feet in width.

Schrader, F.C.; 1909, Mineral Deposits of the Cerbat Range, Black References: Mts. and Grand Wash Cliffs, Mohave County, Arizona; U.S. Geol. Survey Bull. 397, 226 p. Bastin, Edson S., 1923; Origin of Certain Rich Silver Ores Near

Chloride and Kingman, Arizona, in Contribtuions to Economic Geology; U.S. Geol. Survey Bull. 750, p. 17-39

Study OF Kingman Silver Ores

1924, PART I.

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h for the parent ueral from which abenum sulphide as obtained from Cornu's short and leaves much sterial was really it he supposed to ns, such as those mineral belt, but

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## ORIGIN OF CERTAIN RICH SILVER ORES NEAR CHLORIDE AND KINGMAN, ARIZONA.

By EDSON S. BASTIN.

## INTRODUCTION.

The mineral deposits of the Cerbat Mountains between Kingman and Chloride, in northwestern Arizona, were described by Schrader<sup>1</sup> in 1909. The writer visited some of the silver mines and prospects of the Cerbat Mountains in 1913, in the course of a study of silver enrichment undertaken by the United States Geological Survey in many mining camps of the western United States. The work of preparing the results for publication has been delayed by the war and other causes.

The practical application of the results lies in the determination of the extent to which the several silver minerals of the ore are secondary or primary and hence to what extent they are likely to play out at moderate depths or to persist below the reach of surface processes of alteration. The results are summarized at the end of the report.

The mines described were reached from Kingman, on the main line of the Atchison, Topeka & Santa Fe Railway, and from Chloride, the terminus of a short railroad line from Kingman.

## GENERAL FEATURES OF THE AREA.

The area here considered is arid, with hot summers and mild winters. The annual precipitation is about 5 inches, almost never in the form of snow. The area is for the most part treeless, and its vegetation is of desert types.

The Cerbat Mountains constitute one of the numerous desert ranges of nearly north-south trend that form a characteristic feature of the Great Basin topography. In the parts of the range under discussion the altitude ranges between 4,000 and 6,000 feet.

The Cerbat Mountains consist in the main of pre-Cambrian igneous and metamorphic rocks, and these form the wall rocks at all the mines

Schrader, F. C., Mineral deposits of the Cerbat Range, Black Mountaing, ash Cliffs, Mohave County, Aria : U. S. Geol. Survey Bull, 397, 1909.

Depth OF RURAL-BUCKEYE WORKINGS Funal Shaft Buckeye Workings 2001 1701 Shaft 1801 deep 1251 from mou of Tunnel D.K. MARTIN & ASSOC

315 W. MONTEROSA PHOENIX, ARIZONA 85013 origin. In degree the replacement of proustite by silver is compatible with that of chalcopyrite by covellite in the same specimee, and both are attributed to descending oxidizing solutions.

The silver content in the specimens examined is therefore in part primary, in proustite and polybasite, and in part secondary, as native silver. The primary silver content is high—sufficient in itself v, produce a rich silver ore. Such abundance of primary sulphosahof silver in ores from depths of only 50 to 80 feet is unusual but idue to the dense, highly quartzose, fine-grained nature of the ore, which narrowly limits oxidation and enrichment to the immediate vicinity of fractures.

## RURAL AND BUCKEYE MINES.

The Rural and Buckeye mines are about 1½ miles northeast of Mineral Park and are a few hundred feet apart on the same vein. The wall rocks are granite gneiss and schist of pre-Cambrian age, intruded by dikes of much younger granite porphyry. The vein is nearly vertical and from 2 to 8 feet wide. All workings were inaccessible in 1913, the mines having been idle for many years. Ground water stood at a depth of about 50 feet below the collar in the Rural shaft.

Ores seen on the dumps showed pyrite, arsenopyrite, and quartz as the dominant minerals, with chalcopyrite, sphalerite, and galena subordinate. No silver minerals were seen on the dump, but native silver is abundant in specimens from this mine seen at Kingman. One specimen in the collection of E. F. Thompson shows a mass of nearly solid native silver 11 inches across.

The following records show the tenor of the richer ores:

## Tenor of smelling ores shipped from Rural and Buckeye mines in 1886-87.

Net	Silver	Gold	Nct	Silver	Gold
weight	(ounces	(ounces	weight	(ounces	(ounces
(pounds).	per ton).	per ton).	(pounds).	pet tou).	per ton).
9, 033 8, 024 13, 659	722 410 200	6.13 2.66 2.55	20, 862 21, 105 72, 650	266 249 490	5.85 4.00
28, 378	479	9. 16	10, 212	442	8.10
21, 575	119	4. 90	27, 142	172	4.70
31, 999	196	6. 05	87	4,467	4.80
9,898 20,314	109 73	5.12 7.29	167	4, 024	5. 35

#### QUEEN BEE MINE.

The Queen Bee mine is in the northwestern part of the Mineral Park district, close to the cut-off trail to Chloride. The mine is owned by James B. Uncopher, of Mineral Park, to whom the writer is indebted for valuable information and specimens. The

Catt to the at the Total

property zone of t beep, was The was

The ore is The follodump and

Primary culcite (wh) (probably ) Secondary' Schrader <sup>6</sup>)

The property pears clear the same

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A parti Uncopher abundant the prous when tari tarnish thi ment. Fi of prousti by proust galena co: taneous r sphalerite Le a part the deposit posits is a and broad

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Op. cit., 1

## MINERAL DEPOSITS OF MOHAVE COUNTY, ARIZONA.

84

The Rural is developed principally by a 200-foot shaft, about 100 feet of drift, and a winze. The drift extends westward, its far being about 110 feet distant from the shaft. The shaft contains some water. The Buckeye is developed principally by about 750 feet of drift, extending in an easterly direction. Toward the face of the drift the vein is faulted off to the northeast by a lateral throw of about 75 feet.

The country rock is medium-grained gneissoid biotite granite and associated schist. It is intruded by dikes of granite porphyry. The deposits occur in a fissure vein which is 2 to 4 feet in width in the Rural and attains a maximum of 8 feet in the Buckeye. In the Rural it dips about 80° S. and in the Buckeye about 70° N. In both mines it is associated with a dike of the granite porphyry, masses of which occur to the northeast near by. The gangue is quartz and is generally "frozen" to the walls. It shows ore shoots ranging from 4 to 20 feet in width, which consist mostly of pyrite and chalcopyrite, with parallel streaks of arsenopyrite, black oxide of manganese, gray chert, and quartz, the quartz being more prominent in the Buckeye than in the Rural mine.

The ore contains silver, gold, and copper, with high silver and gold values. The display of ores from these mines, containing masses of solid silver and beautiful specimens of wire silver, is said to haw been awarded the silver medal at the Louisiana Purchase Exposition.

The production, exact figures of which are not available, is reported to mount well into thousands of dollars in silver and gold, and much good ore is said to be available in the mines.

#### WINDY POINT MINE.

The Windy Point mine is in the northeastern part of the district. about a mile northeast of Mineral Park, on open sloping or hilly ground, at an elevation of about 4.800 feet. It is owned by the Arizona Gold Mining and Metallurgical Company, with headquarters at Kingman. It is developed mainly by a 105-foot shaft and a small amount of drift. The shaft starts in gneiss, but soon enters the granite. The mine is newly equipped with a gasoline hoist and electric drills.

The country rock is the pre-Cambrian gneissoid biotite granite and black amphibolite schist. The granite is less dark and micaceous than at the Rural and Buckeye mines. The structure or sheeting strikes N. 85° W, and dips about 75° S. Both the granite and the schist are more or less sericitized and impregnated with pyrite and arsenopyrite near the vein. About 50 feet from the vein, on its foot-wall side, the porphyritic dike r younger than the present in outcrop dump débris derive

The deposits oc dips about 77° NE shoot ranges from wall side. The va are principally pyr ment of the ore is a ounces of silver to

The Golden Star part of the district distance below the feet. It is situate mine was located in rich ore. It continto have fallen off in equipments. Its of been the largest in

The mine was fi who took out much Isaac Conkey, of Conkey, are W. G. of Kingman.

The mine is de levels, each contain be stoped out from

The country ro schist, and gneiss deposits is 2 to 4 f grade ore. It stril At the shaft the s the shaft the vein surface west of th stained, is paralle vein, is very arsen

The ore. like th tains argentite, ru all in association v from a few inches

D. K. MARTIN		END-MK JUDIM						
ASSAY MADE FOR ROTHCO MINES. 3016 W. Mercer Lane Phoenix, Ariz. 85029	IRON KING ASSA ASSAY CERT BOX 14 PHONE 6 HUMBOLDT, ARIZONA	Y OFFICE IFICAT 32-7410 86329	E		STERED 2978 WALTER STATLE STATLE State ALTONA	G. R.		Samoles
L .	oz/ton	ez/ton	10	)-22-7 % Fe	5 % Pb	% Z.n	X Cu	
DESCRIPTION	Au	Ag						
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CHARGES \$4.25 path

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723 NOT LOCATED APPROXIMATELY T23N RITW OR pcor.3 S. 7 9' 58 E. 1501.8 Fr. SURVEY Nell65 SURVEY Nº 2456 RURAL Nº2 BUCKEYE 4 618.24 605.6 A. SCOVERY INITIA N 7 9° 41: 35 W. 1500 Fr. LODE LINE M.S Counce 24.19 COR. 0R.20 1498.7 Fr. N.79. 30' W. 3 D. K. MARTIN & ASSOC. 315 W. MONTEROSA PHOENIX, ARIZONA 85013 RETORT (UNSURVEYED) ·----SEN NES

Kef: Rural /Buckeye Mines Wallapai Mining District Mohave County, Arizona



## Field Engineering Corporation

Albuquerque District Office

2201 San Pedro Dr. N.E. Building 3, Suite 220 Albuquerque, NM 87110

A Subsidiary of The Bendix Corporation

August 10; 1979

Mr. Dick Genova 2608 N. Potrero Phoenix, Az. 85006

Dear Dick,

Here are your long - awaited results of the analyses we promised you.

Sample # MGA-851 is from the road cut area near the Chico Mine where the scintillometer showed 2400 cps. Sample #MGA-852 is of the gossan above the Rural Mine. Sample #MGA-853 is the one we took from the vein exposed in the short, partially caved, adit at the Skyscraper Mine.

The enclosed analyses are all expressed in parts per million. I have also included a copy of a conversion table that will enable you to convert the ppm values into per cent and, for the silver values, into troy ounces per short ton.

Regards to John, and good luck.

Sincerely,

Wade Corder Geologic Technician

Encl. (2)

D. K. MARTIN & ASSOC. 315 W. MONTEROSA PHOENIX, ARIZONA 85013

L. C. MANUTAN STRAN ALIA (SHIL) A MANUALI (SHIL) A MANUALI (SHILAR) /

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BFEC SAMPLE NO.	MGA	851 M	GA	852	MGA	853	
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U308 R (ppm)		80.4		7.2		1.3	-
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Cu		< 10		2005	4	70	
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La		700		50		< 1	20
Li		< 10		< 700		< 1	
Mn		20		7!		>50	
Мо		< 1		< ]		<	וסב
Na		200		200		50	
Nb		7	20	5			101
Ni		< ]	n	< ]	,0		50
РЬ		-	70	100		7	
Sb	_	< 71		< 70		<	100
Sc			15	< :	10	1	15
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Zr		>]	000	<	10	1	20

Rural - 20 ounces Silver

Cut



PERATIONS, INC. P.O. Box 716 • Scottsdale, Arizona 85252 • (602) 994-3147 March 3, 1982

International Mineral Services Wilbur A. Dicus, President 5919 E. Charter Oak Road Scottsdale, Arizona 85254

Dear Wilbur:

Enclosed please find the Geological Report Pacific Regional Operations, Inc. agreed to provide to you as partial payment for the bulldozer work done on the Chico Property January 27, 1982.

The balance of the dozer charge will be forthcoming as we are awaiting receipt of funds from our client in the matter.

I wanted to get this report to you in a timely fashion. Enclosed, also, is a copy of our Corporate Profile. If you should have need of additional services, please call.

Sincerely,

Pacific Regional Operations, Inc.

William C. Vanderwall

WCV:dah

Enclosures (2)

Pacific Regional Operations, inc. D. K. MARTIN & ASSOC. 315 W. MONTEROSA PHOENIX, ARIZONA 85013

PERATIONS, INC. P.O. Box 716 • Scottsdale, Arizona 85252 • (602) 994-3147

## GEOLOGICAL REPORT RURAL-BUCKEYE PROPERTY WALLAPAI MINING DISTRICT MOHAVE COUNTY, ARIZONA

## LOCATION:

The Rural-Buckeye Property consists of four contiguous mining claims, one patented, located approximately 20 miles northwest of Kingman, Arizona, and one and a half miles northeast of Mineral Park. At an elevation of approximately 5,100', the area is rugged and steep. The major workings are located either side of a wash and subject to flash flooding. The property is situated in the NW/4 of Section 18, Township 23N, Range 17W, G&SRM, Mohave County, Arizona, and is accessible by foot trail from the Mineral Park Road.

## SCOPE OF REPORT:

Time was the limiting factor in this investigation. One day was spent on the property, walking out traverses and investigating old workings. Facts and opinions in this report are based on a cursory field examination and on the Author's specific knowledge of the area and general familiarity with the published literature concerning the Wallapai District.

## HISTORY AND PRODUCTION:

The Rural-Buckeye Property lies in an area rich and colorful in Arizona Mining History. Bonanza type silver lode discoveries brought miners to the District in the early 1860's. Oxidized ores were mined extensively during the 1880-1890 period principally for silver and gold. The rapid decline in silver prices between 1885-1895, the recession of 1905 and the exhaustion of rich, near surface, oxidized ores caused the suspension of mining operations in the area.

Mike Dunn, a California prospector, discovered the property in the latter 1880's and operated successfully for a number of years. During the early history of the mine, the property produced some of the richest ore ever taken from the District. Solid native silver specimens 6" to 8" thick, encrusted with masses of wire silver were reported taken from the shallow workings.

Bastin, 1924, (pp. 24) lists the early production from the Rural and Buckeye mines during 1886-87 as 152 tons containing 315 ounces silver per ton and 5.68 ounces gold per ton.

Schrader, 1909, (pp. 84) states: "The ore contains silver, gold and copper, with high silver and gold values. The display of ores from these mines (Rural and Buckeye), containng masses of solid silver and beautiful specimens of wire silver, is said to have been awarded the silver medal at the Louisiana Purchase Exposition." And he continues, "The production is reported to be considerable and much good ore is left in the (Rural and Buckeye( mines. "

Bastin, 1924, (pp. 24) states all the workings were inaccessible in 1913.

During the late 1920's, M. B. Dudley and Associates attempted to reopen the Rural and Buckeye mines and reportedly produced some ore from the upper workings. The shaft was increased to a depth of 200 feet and miners remarked that good ore was exposed when the property closed. No attempts have been made since to reopen the workings.

In 1943, the Tennessee Mine, 3 miles northwest of the Rural-Buckeye Property, and mining in the same vein system, was producing 150 tons of ore per day which averaged 20 ounces of silver per ton. Total production from the Tennessee Mine is reported to be in excess of 500,000 tons. (Dings, 1941, pp. 147).

The value of metals produced from the Wallapai District during the years 1904-1948, U. S. Bureau of Mines, 1948 Annual Report was about 22.5 million dollars at 1948 prices (nearly half a billion dollars at today's prices). Values were principally in lead and zinc but with substantial amounts of copper, silver and gold.

Currently inactive, Duval's Mineral Park open pit copper-molybdenum operation located one mile south of the Rural-Buckeye Property, is capable of producing 18,000-20,000 tons per day of .5% copper and .045% molybdenum ore.

## GEOLOGY AND ORE DEPOSITS:

The Cerbat Mountains constitute one of the many north-south trending, fault-block ranges of the southwest desert. They consist primarily of metamorphosed pre-Cambrian igneous and sedimentary rocks, cut by later intrusions of Mesozoic (?) granite and monzonite porphyries, known locally as the Ithaca Peak Granite, and by Tertiary volcanic dykes. Centering around the Ithaca Peak intrusive, mineralization is typically copper and molybdenum sulfides, which were mined by Duval. Surrounding the intrusive is a zone several miles wide of lead-zinc-silver bearing veins which gradationally change into veins of intense silver-lead mineralization.

The vein type ore deposits occur in clefts or cracks in the country rock in which the mineral material precipitated from aqueous solution (hydrothermal fissure veins). It is probable that these fissures formed from forces accompanying the implacement of the Ithaca Peak intrusive. With the intrusive acting as a heat engine, a convecting hydrothermal system developed that set up a hypogene enrichment process which deposited ore and gangue minerals near the top of the convecting cell and extracted metals and sulfur from sources at depth. Conceivable, as the solution approached the fissure level, it boiled, thereby distilling the acid forming constituants  $CO_2$  and  $H_2S$ . Cooling and a slight pH rise of the residual liquids, due to loss of acid forming constituants, may be regarded as a mechanism of sulfide precipitation. Exposure of the veins to normal weathering processes oxidized the ore and, to a point, enriched it by the downward migration of slightly acidic rainwater carrying metals in solution.

Many veins, occuring in nearly vertical fault fissures, strike northwest and outcrop for considerable distances. The fault fissures are largely occupied by breccia with abundant shearing and some gouge. Ore lenses, or shoots, though not continuous are numerous and tend to have greater vertical rather than horizontal extent. Concentrations of extremely high-grade ore appear to favor vein junctures. These concentrations are attributable to chemical and physical changes which enhanced mineral deposition at the fissure level of the convecting cell.

The main vein on the Rural-Buckeye Property strikes approximately N60°W, it is apparently faulted between the Rural and Buckeye mines since the Rural portion of the vein dips about 80°S while the Buckeye portion dips 70°N. The two mines are located on either side of a wash which is probably the trace of the fault with lateral throw. The country rock in the vacinity of the vein is a medium grained, granite gneiss of pre-Cambrian age. The gneiss is intruded by dykes of granite porphyry which are associated with the Ithaca Peak Granite of Mineral Park.

The underground workings are inaccessible but Schrader, 1909, (pp. 84), describes the underground features as follows: "The vein is two to four feet in width in the Rural and attains a maximum of eight feet in width in the Buckeye. In both mines it is associated with a dyke of granite porphyry. The gangue is quartz and is generally frozen to the walls. It shows ore shoots (in 1909) ranging from 4 to 20 feet in width... The principal developments in the Rural consist of 200 feet of shaft and 100 feet of drift and in the Buckeye 750 feet of drift."

The primary mineralization is one of chalcopyrite, pyrite, arsenopyrite and oxides of manganese. Silver cloride, native silver and native gold are present in the oxidized portion of the vein.

#### ORE RESERVES:

The Rural-Buckeye Property contains base-metal silver veins, oxidized silver-gold veins and possibly a zone of enrichment in between. Data from past developments, publications and reports are insufficient or unavailable, to completely delineate the orebody.

Considering the extent and mineralized nature of the Rural-Buckeye vein, and its association with the dyke of granite porphyry which would provide a sizable locus for ore deposition, it is possible to anticipate considerable ore at depth, below the present workings.

The mine dumps may carry precious metal values amenable to cyanidation. This possibility should not be overlooked.

## CONCLUSION:

On the basis of surface observations and facts provided in the published literature it is the Author's conclusion the property contains a well developed structure with strong base-metal silver mineralization. It is also the Author's conclusion that the results of detailed geologic mapping and diamond drilling could justify initiating a mining venture.

Respectfully submitted,

PACIFIC REGIONAL OPERATIONS, INC.

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William C. Vanderwall Arizona Technical Registration No. GIT 34

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The Rural is developed principally by a 200-foot shaft, about 100 feet of drift, and a winze. The drift extends westward, its face being about 110 feet distant from the shaft. The shaft contains some water. The Buckeye is developed principally by about 750 feet of drift, extending in an easterly direction. Toward the face of the drift the vein is faulted off to the northeast by a lateral throw of about 75 feet.

The country rock is medium-grained gneissoid biotite granite and associated schist. It is intruded by dikes of granite porphyry. The deposits occur in a fissure vein which is 2 to 4 feet in width in the Rural and attains a maximum of 8 feet in the Buckeye. In the Rural it dips about 80° S. and in the Buckeye about 70° N. In both mines it is associated with a dike of the granite porphyry, masses of which occur to the northeast near by. The gangue is quartz and is generally "frozen" to the walls. It shows ore shoots ranging from 4 to 20 feet in width, which consist mostly of pyrite and chalcopyrite, with parallel streaks of arsenopyrite, black oxide of manganese, gray chert, and quartz, the quartz being more prominent in the Buckeye than in the Rural mine.

The ore contains silver, gold, and copper, with high silver and gold values. The display of ores from these mines, containing masses of solid silver and beautiful specimens of wire silver, is said to have been awarded the silver medal at the Louisiana Purchase Exposition.

The production, exact figures of which are not available, is reported to mount well into thousands of dollars in silver and gold, and much good ore is said to be available in the mines.

#### WINDY POINT MINE.

The Windy Point mine is in the northeastern part of the district, about a mile northeast of Mineral Park, on open sloping or hilly ground, at an elevation of about 4,800 feet. It is owned by the Arizona Gold Mining and Metallurgical Company, with headquarters at Kingman. It is developed mainly by a 105-foot shaft and a small amount of drift. The shaft starts in gneiss, but soon enters the granite. The mine is newly equipped with a gasoline hoist and electric drills.

The country rock is the pre-Cambrian gneissoid biotite granite and black amphibolite schist. The granite is less dark and micaceous than at the Rural and Buckeye mines. The structure or sheeting strikes N.  $85^{\circ}$  W. and dips about  $75^{\circ}$  S. Both the granite and the schist are more or less sericitized and impregnated with pyrite and arsenopyrite near the vein. About 50 feet from the vein, on its foot-wall side, the country rocks are cut by a peculiar greenish-gray porphyritic dike rock, which seems to be minette, and is apparently younger than the intrusive granite porphyry. The latter is also present in outcrops near by, and some of it was recognized in the dump débris derived from the mine.

The deposits occur in a fissure vein which strikes N. 42° W. and dips about 77° NE. It is 2 to 4 feet wide, and the pay streak or ore shoot ranges from 3 to 24 inches in width and favors the hangingwall side. The values are in silver, gold, and copper. The minerals are principally pyrite, arsenopyrite, and chalcopyrite. The last shipment of the ore is reported to have averaged 3 ounces of gold and 486 ounces of silver to the ton and 24 per cent of copper.

#### GOLDEN STAR MINE.

The Golden Star (formerly Lone Star) mine is in the northeastern part of the district, about a mile northeast of Mineral Park, a short distance below the Windy Point mine, at an elevation of about 4,700 feet. It is situated on open, sloping, somewhat hilly ground. The mine was located in 1870 and soon became an important producer of rich ore. It continued to be prominent till 1902, when the ore seems to have fallen off in grade. The mine is now dismantled of all surface equipments. Its output during much of this period is said to have been the largest in the region.

The mine was first owned by W. F. Grounds, now of Hackberry, who took out much rich ore. It was later owned by Fred Harter and Isaac Conkey, of Mineral Park. The present owners, besides Mr. Conkey, are W. G. Blakely, C. D. M. Gaddis, and Doc. Hamilton, all of Kingman.

The mine is developed principally by a 300-foot shaft and two levels, each containing about 300 feet of drift, and the ore is said to be stoped out from the surface down to the first level.

The country rock is principally black amphibolite schist, mica schist, and gneissoid biotite granite. The fissure containing the deposits is 2 to 4 feet in width, all of which is said to consist of lowgrade ore. It strikes in general west northwest and dips about 65° S. At the shaft the strike is east and west, but a short distance east of the shaft the vein curves to the north and is said to split. At the surface west of the shaft it is  $2\frac{1}{2}$  to 3 feet thick, is dark and ironstained, is parallel streaked or banded, and, like the Windy Point vein, is very arsenical.

The ore, like that of the Windy Point, is sulphide ore. It contains argentite, ruby silver, native silver, gold, and a trace of lead, all in association with arsenopyrite and pyrite. The ore shoot ranges from a few inches to 20 inches in thickness. The ore is mostly of

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by Charles E. Sherman, a well-known pioneer, in 1970. Its surface ores were very rich and carried high values in gold as well as in silver, by reason of which it soon became the first important producer, its ores being shipped to Swansea, Wales. It was later worked by the Mineral Park Mining Company, and the ore was locally milled in the Keystone mill. Later it was owned by James Uncapher, of Mineral Park, by whom it was sold to the present owner, the Keystone Mining Company, of Greensburg, Pa. The production of the mine to date is reported to be about \$50,000.

The mine is developed mainly by a shaft 450 feet deep and 500 feet of drifts, mostly down to the 150-foot level, above which the greater part of the ore is worked out. The principal surface equipments are a steam hoist and a 5-stamp mill.

The principal rock at the mine is the granite porphyry. There are two veins. The vein on which the mine is located strikes N. 60° W, and dips about 80° NE. The gangue is quartz in which the ore shoots occur mainly in the form of lenticular streaks about a foot thick. The ore contains pyrite, chalcopyrite, and zinc blende, with silver and some gold. The silver is present as argentite, in part. The better grade of ore runs about 200 ounces of silver to the ton, 21 per cent of copper, 8 to 10 per cent of zinc, and 12 per cent of iron. Toward the outside of the lenses it is irregularly and closely banded. It is richest where the vein pinches. Elsewhere it may be distributed in a thickness of 3 feet of quartz gangue, but it is good concentrating ore and is said to average \$12 to \$15 a ton, and by reason of its low grade should be milled on the ground. Some of the ore, however, runs considerably higher. That averaging \$20 or more a ton is now shipped to the Humboldt smelter. None lower than \$20 ore is now handled. The present rate of output is about 20 tons a month.

About 50 feet northeast of the vein on which the mine is situated and lying about parallel with it is a second or smaller vein, which looks well and whose ore is reported to be nearly all of shipping grade.

#### TYLER MINE.

The Tyler mine is situated in the southeastern part of the district,  $2\frac{3}{4}$  miles southeast of Mineral Park, near the summit of the range, on a steep northeastern slope, at an elevation of about 5,300 feet, or about 1,200 feet above Mineral Park. A good wagon road extends nearly to the mine, with which connection is made by a good trail of easy grade. The mine was discovered by Stephen A. Tyler, the owner, in 1901. It began to ship ore in 1905, but only necessary assessment work is now done.

MINERAL PARK DISTRICT.

The mine is developed mainly by two crosseut tunnels and drifts, mostly situated within a vertical range of 100 feet, principally on the Gold Eagle claim.

The country rock is pre-Cambrian medium-grained gneissoid biotite granite. The vein strikes N. 37° W. and dips about 75° SW., into the mountains. It has a width of about 40 feet and seems to consist mainly of an altered and partly replaced crushed and recemented aplitic dike. The entire width is claimed to be low-grade ore, but the values occur chiefly in the first 6 or 7 feet of the hanging-wall side of the dike and are best near its contact with the granite. The hanging wall also carries 6 inches to 2 feet of slickensided gouge, between which and the country rock occurs quartz breccia containing some ore.

The mine produces gold-silver-lead ore. The principal ore minerals consist of galena and cerusite. The last carload shipped at the time of the writer's visit averaged gold 3.16 ounces to the ton, silver 8 ounces to the ton, and lead 17.5 per cent. At last accounts the mine is reported to be sold to a Los Angeles company.

#### LADY BUG MINE.

The Lady Bug, an old mine, is about half a mile southeast of the Tyler mine, close to the Tyler camp, at an elevation of about 5,000 feet. It was located in 1886 by Isaac Conkey, the owner, now residing at Mineral Park. It is developed principally by a 63-foot shaft, 100 or more feet of drifts, and a number of surface openings on the vein.

The country rock is pre-Cambrian biotite granite, the same as at the Tyler mine, and it is to a considerable extent intruded by the granite porphyry of Mineral Park. The vein is reported to be 7 to 8 feet thick. It lies nearly parallel with the Tyler vein, but differs from it in being composed of a gangue which is mainly quartz. The ore contains principally silver chloride and gold with a little galena. A considerable portion of the ore mined is reported to have averaged \$300 to \$500 a ton. The production is reported to be \$6,000.

#### RURAL AND BUCKEYE MINES.

The Rural and Buckeye mines are in the northeastern part of the district,  $1\frac{1}{2}$  miles northeast of Mineral Park, near the south base of Cherum Peak, at an elevation of about 5,000 feet. They are reached by wagon road. They are situated but a few hundred feet apart on the same vein, the Rural being on the west and the Buckeye on the east side of the same gulch. The Rural is owned by E. F. Thompson, of Kingman, and the Buckeye by C. E. Lovett and others, of Denver, Colo.

It is developed by crosscut tunnels and drifts, mostly within a vertical range of 100 feet. The country rock is sheared pre-Cambrian biotite granite. The vein has a width of about 40 feet, and dips steeply southwestward into the mountain. It seems to consist mainly of an altered and replaced crushed aplitic granite or rhyolite dike. The values favor the foot-wall side of the vein, being greatest near its contact with the granite. This mine produces gold-silver-lead ore. The last carload shipment made at the time of the writer's visit averaged: Gold 3.16 ounces and silver 8 ounces per ton, and lead 17.5 per cent.

Rural and Buckeye mines .- These two mines are located in the northeastern part of the Mineral Park district, at an elevation of about 5,000 feet. They are but a few hundred feet apart and are situated on the same vein, the Rural being on the west and the Buckeve on the east side of the same gulch. The principal developments in the Rural consist of a 200-foot shaft and about 100 feet of drift. and in the Buckeye of 750 feet of drift, toward the face of which the vein is faulted off to the north by a lateral throw of about 75 feet. The Rural shaft contains water. The vein in the Rural mine dips southward at angles of about 80°, but in the Buckeye it dips to the north at angles of about 70°. It is 2 to 8 feet thick and is associated with a dike of the aplitic granite intruded into the country rock, which is pre-Cambrian schist. It locally shows a 4-inch to 20-inch ore shoot, mostly iron and copper pyrites, with streaks of arsenopyrite, black oxide of manganese, and some chert and quartz, the quartz being more prominent in the Buckeye than in the Rural. The walls are generally frozen. The ore contains silver, gold, and copper, with the values high in gold.

Golden Star mine.—The Golden Star (formerly Lone Star) mine is located about a mile northeast of Mineral Park, on open ground. It produced rich sulphides of silver, containing gold and lead, from 1870 until 1902, when the ore seems to have fallen off in grade and become base and refractory. The mine is developed principally by a shaft 300 feet in depth and two levels, with 600 feet of drift on each level. The ore is stoped down to the 100-foot level. The vein dips steeply to the south. It is 2 to 4 feet in width, and the ore is all low grade. The total production is stated to be \$375,000.

Ark and San Antonio mines.—The Ark mine, located about 2 miles southwest of Mineral Park at the west base of the mountains, is developed by a 250-foot shaft and three levels, comprising about 1,300 feet of workings. It produces considerable water. The vein, which is 5 or 6 feet in width, dips steeply to the northeast. The ore is of a sulphide character and contains gold, silver, and copper. It runs about 175 ounces of silver and 3.15 ounces of gold per ton. The production is about \$150,000. Adjacent to the Ark mine is the San Antonio, which has produced \$75,000.

#### CERBAT DISTRICT.

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General outline.—The Cerbat district, an area about 4 miles in diameter, is situated south of the Mineral Park district, in the foothills at an elevation of 3,500 to 5,000 feet, 3 miles east of the Arizona and Utah Railroad. It has produced more than \$2,000,000. It is drained principally by Cerbat Wash, which leads westward into Sacramento Valley. The mines north of this wash are gold bearing; those to the south yield silver and lead. The principal mines are the Golden Gem, Vanderbilt, Champion, Oro Plata, Paymaster, Cerbat, New London, St. Louis, Flores, and Twins, the three first named being among the most important present producers.

Golden Gem mine.—The Golden Gem mine, located on Cerbat Wash, is developed principally by a 430-foot shaft and four levels comprising 1,200 feet of drift and stopes. The stoping is on the 130foot level, and extends 166 feet horizontally and from 62 to 81 feet vertically. This mine yields considerable water. The vein dips steeply to the northeast. It ranges from 6 to 14 feet in width, and usually carries 2 to  $6\frac{1}{2}$  feet of pay ore running from \$10 upward per ton. The values favor the foot wall. The gangue is quartz. The ore is gold ore and carries also silver, locally 60 ounces per ton, lead 5 to 6 per cent, antimony and zinc a trace, and some iron pyrites. The production to date is \$190,000. A 40-ton mill is now turning out about \$350 worth of concentrates a day from ore formerly left on the dump.

*Idaho mine.*—The Idaho mine adjoins the Golden Gem on the west, and the ore is similar to the Golden Gem ore. The mine has been worked in a small way since 1871, and the total production is reported to be about \$200,000.

Cerbat mine.—The Cerbat mine, located about a mile northeast of the Golden Gem mine, is 200 feet in depth. The vein is 4 to 10 feet thick, and the total production is stated to be about \$300,000 in gold and silver.

Paymaster mine.—In the Paymaster mine, about  $1\frac{1}{4}$  miles northcast of the Golden Gem mine, the vein dips steeply to the north. The ore contains silver and gold, runs high in values, and carries much ruby silver. The production to date is said to be \$200,000. Considerable water is found in this mine.

Oro Plata mine.—The Oro Plata mine, located about a mile northeast of the Paymaster mine, is 280 feet deep and is developed by about 7,000 feet of underground work. It produces considerable water. The pre-Cambrian country rock is here intruded by the aplitic granite. The ore values are chiefly in gold and sulphide of silver, with locally some lead. They run about \$37 per ton. The total production is given as \$500,000. The ROOMONTO GEOLOGY, 1923-1924, PART I.

origin. In degree the replacement of proustite by silver is compatible with that of chalcopyrite by covellite in the same specimen, and both are attributed to descending oxidizing solutions.

The silver content in the specimens examined is therefore in part primary, in proustite and polybasite, and in part secondary, as native silver. The primary silver content is high—sufficient in itself to produce a rich silver ore. Such abundance of primary sulphosalts of silver in ores from depths of only 50 to 80 feet is unusual but is due to the dense, highly quartzose, fine-grained nature of the ore, which narrowly limits oxidation and enrichment to the immediate vicinity of fractures.

#### RURAL AND BUCKEYE MINES.

The Rural and Buckeye mines are about  $1\frac{1}{2}$  miles northeast of Mineral Park and are a few hundred feet apart on the same vein. The wall rocks are granite gneiss and schist of pre-Cambrian age, intruded by dikes of much younger granite porphyry. The vein is nearly vertical and from 2 to 8 feet wide. All workings were inaccessible in 1913, the mines having been idle for many years. Ground water stood at a depth of about 50 feet below the collar in the Rural shaft.

Ores seen on the dumps showed pyrite, arsenopyrite, and quartz as the dominant minerals, with chalcopyrite, sphalerite, and galena subordinate. No silver minerals were seen on the dump, but native silver is abundant in specimens from this mine seen at Kingman. One specimen in the collection of E. F. Thompson shows a mass of nearly solid native silver  $1\frac{1}{2}$  inches across.

The following records show the tenor of the richer ores:

Tenor of smelting ores shipped from Rural and Buckeye, mines in 1886-87.

Net	Silver	Gold	Net	Silver	Gold
weight	(ounces	(ounces	weight	(ounces	(ounces
(pounds).	per ton).	per ton).	(pounds).	per ton).	per ton).
9,033 8,024 13,089 28,376 23,575 30,999 9,898 20,314	722 440 200 479 119 196 109 73	$\begin{array}{c} 6.13\\ 2.66\\ 2.55\\ 9.46\\ 4.90\\ 6.05\\ 5.12\\ 7.29\end{array}$	29, 862 21, 106 72, 680 10, 212 27, 142 87 167	$266 \\ 249 \\ 480 \\ 442 \\ 172 \\ 4,467 \\ 4,024$	5.85 4.00 8.25 8.16 4.70 4.80 5.35

#### QUEEN BEE MINE.

The Queen Bee mine is in the northwestern part of the Mineral Park district, close to the cut-off trail to Chloride. The mine is owned by James B. Uncopher, of Mineral Park, to whom the writer is indebted for valuable information and specimens. The property when visited in 1913 had been idle for many years, and none of the workings could be entered. The main shaft, 225 feet deep, was filled with water within 60 feet of the surface.

The wall rock at the mine is mica schist of pre-Cambrian age. The ore is said to be somewhat oxidized to a depth of about 70 feet. The following minerals were noted in specimens from the mine dump and from Mr. Uncopher's collections:

Primary (hypogene): Quartz, pyrite, arsenopyrite, manganiferous siderite, calcite (white), sphalerite, galena, tennantite, chalcopyrite, proustite, pearceite (probably primary), argentite (probably in part primary).

Secondary (supergene): Argentite, native silver, cerargyrite (reported by Schrader<sup>6</sup>).

The proustite abundant in many of the ores from this mine appears clearly to be a primary (hypogene) mineral deposited from the same mineralizing solutions that deposited the common basemetal sulphides; the evidence for this conclusion is given below.

In one specimen studied a piece of proustite three-fourths by threeeighths by one-half inch in dimensions was intercrystallized with quartz and ferruginous calcite, all three minerals interlocking and having apparently been deposited contemporaneously. In one specimen in Mr. Uncopher's collection proustite in vugs is wholly inclosed by calcite. Other well-formed crystals of proustite are coated with calcite.

 $\Lambda$  particularly rich specimen of unoxidized ore donated by Mr. Uncopher shows the entire width of a 21-inch veinlet carrying abundant proustite. Microscopic examination shows that in general the proustite has not replaced other ore minerals. The galena when tarnished brown with hydrogen peroxide (which does not tarnish the silver minerals) usually shows no evidences of replacement. Figure 4 shows a contact between galena and an intergrowth of proustite and sphalerite. The galena can not have been replaced by proustite alone, because there are no sphalerite areas in the galena corresponding to those so abundant in the proustite. Simultaneous replacement of galena by an intergrowth of proustite and sphalerite is highly improbable and if it occurred would probably be a part of the process of primary (hypogene) mineralization, for the deposition of sphalerite in the downward enrichment of ore deposits is extremely rare. .The proustite is interpreted as hypogene and broadly contemporaneous with galena and sphalerite.

Additional evidence that most of the proustite is not the result of a replacement of galena is found in the fact that in many places minute inclusions of chalcopyrite are abundant in the proustite but are absent from the adjacent galena.

<sup>6</sup> Op. cit., p. 86.

