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PRINTED: 11/08/2001

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES AZMILS DATA

PRIMARY NAME: KATHERINE

ALTERNATE NAMES:
CATHERINE

MOHAVE COUNTY MILS NUMBER: 332C

LOCATION: TOWNSHIP 21 N RANGE 21 W SECTION 5 QUARTER --
LATITUDE: N 35DEG 14MIN 01SEC LONGITUDE: W 114DEG 33MIN 08SEC
TOPO MAP NAME: DAVIS DAM - 7.5 MIN

CURRENT STATUS: PAST PRODUCER

COMMODITY:
GOLD
SILVER
COPPER OXIDE
BERYLLIUM
MANGANESE OXIDE

BIBLIOGRAPHY:
ADMMR KATHERINE MINE FILE
LAUSEN, CARL "GEOL. & ORE DPSTS OF THE OATMAN
& KATHERINE DIST, AZ" AZBM BULL 131; 1931
WARNER, L.A. ET AL "OCCUR OF NONPEGMATITE BER
YL IN US" USGS PP 318, P. 102; 1959
ENG. & MNG. JRNL., "MNG. & MILLING AT KATHERIN
GOLD MINE" APRIL-JUNE 1927, P. 716
SEE ADMMR GOLD STANDARD MINE CORP FILE P. 3
ADMMR KATHRINE GOLD MINING CO. (COLVO FILE)

Date Printed:7/6/98

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES

INFORMATION SUMMARY

Information from: Mohave county Assessor
Address: 315 Oak PO Box 7000
City, State Zip Kingman, Arizona 86402
Phone: (520) 753-0703
MINE: Katherine Mine
ADMMR Mine File: Katherine Mine
County: Mohave
AZMILS Number 332C

SUMMARY

Received a call requesting information on the Katherine Mine in Mohave County. Caller wanted to know who the owner was and if it was inside the Lake Mead Recreational Area.

I called the County Assessors office in Mohave County and she said that they list the owner a U. S. Department of Interior.

Ann Turney
ADmn. Assistant

Date: 7/6/98

3054 SE
(SPIRIT MTN. SE)

123

32' 30"

124

DAVIS DAM 7 1/2" 125 QUAD.

33

32

Water
8'14

865

921

T21N, R21W

M E A D

Katherine

Tailings Pond

Katherine Mine

FILLED

Katherine Extension Mine

Gravel Pit

Sewage Disposal Pond

Deer Mohave Resort

Loaf Rock
Ranger Station

Campground

Claypit

A L

Water Tank

Hill
East Ranch

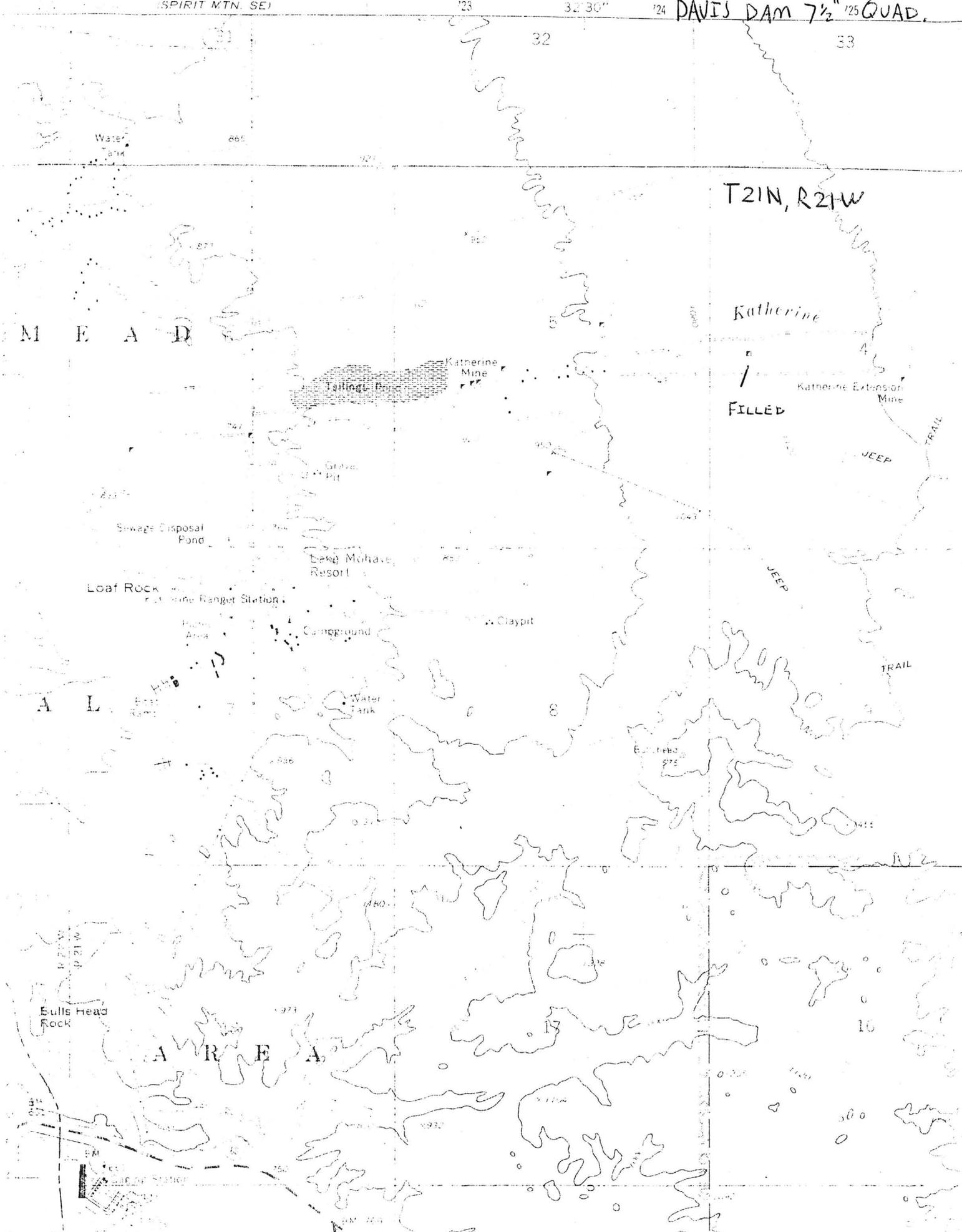
East Ranch
275

Eulls Head Rock

A R R E A

10

Station



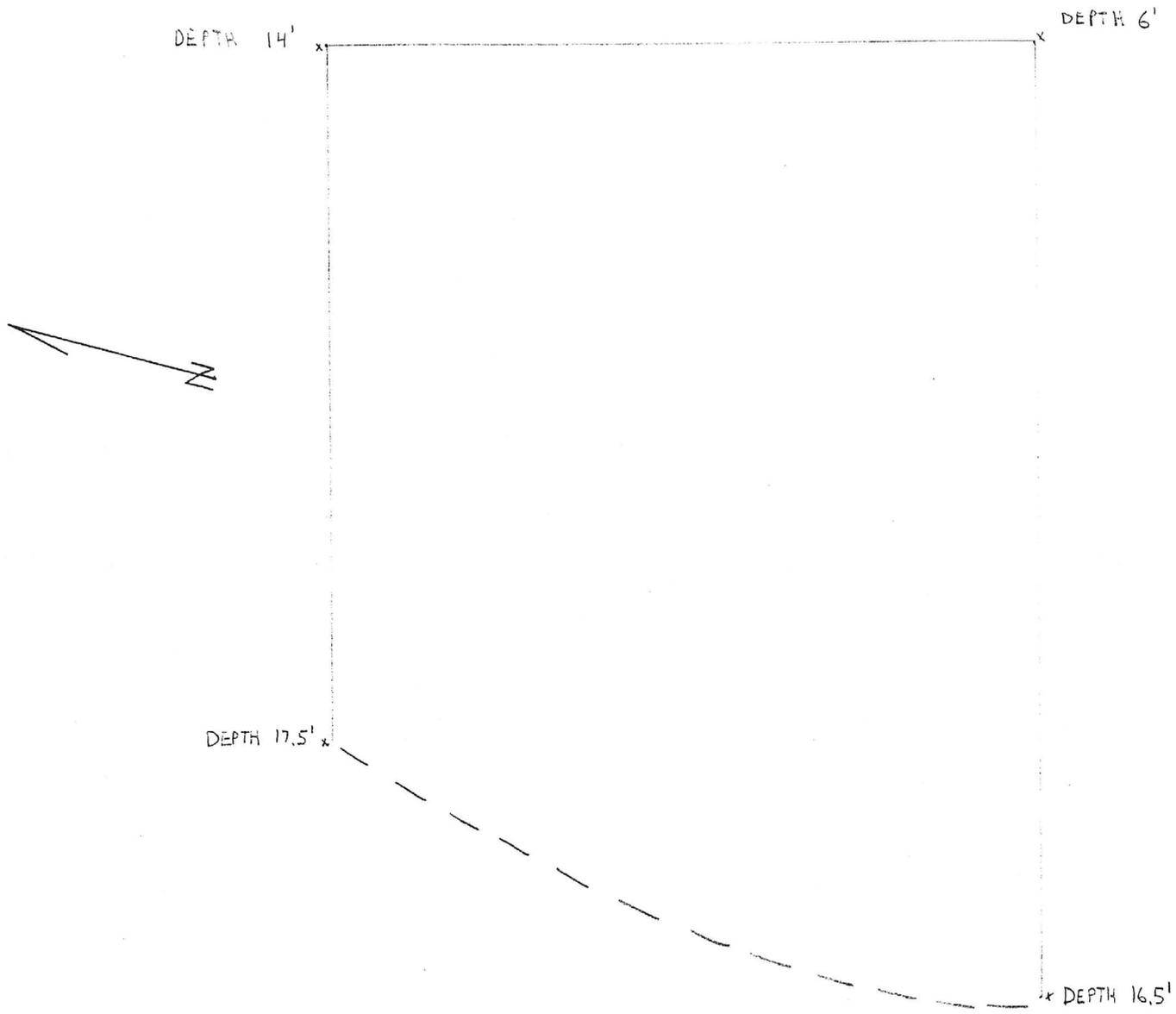
N 5 N

12-1-81

KATHERINE MINE
TAPE SURVEY OF MILL TAILINGS
LOWER LEVEL (OF 3)

1 3
(PHOTO IN FILE)

1" = 100'



NJN

12-1-81

KATHERINE MINE

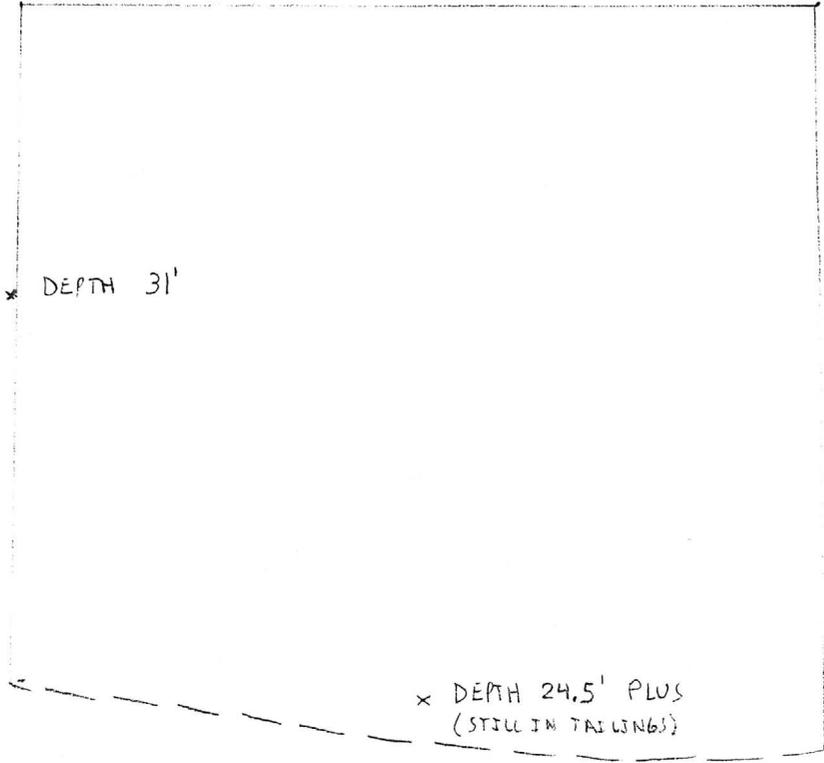
2 3

TAPE SURVEY OF MILL TAILINGS

MIDDLE LEVEL

(PHOTO IN FILE)

1" = 100'



NSJ

12-1-81

KATHERINE MINE

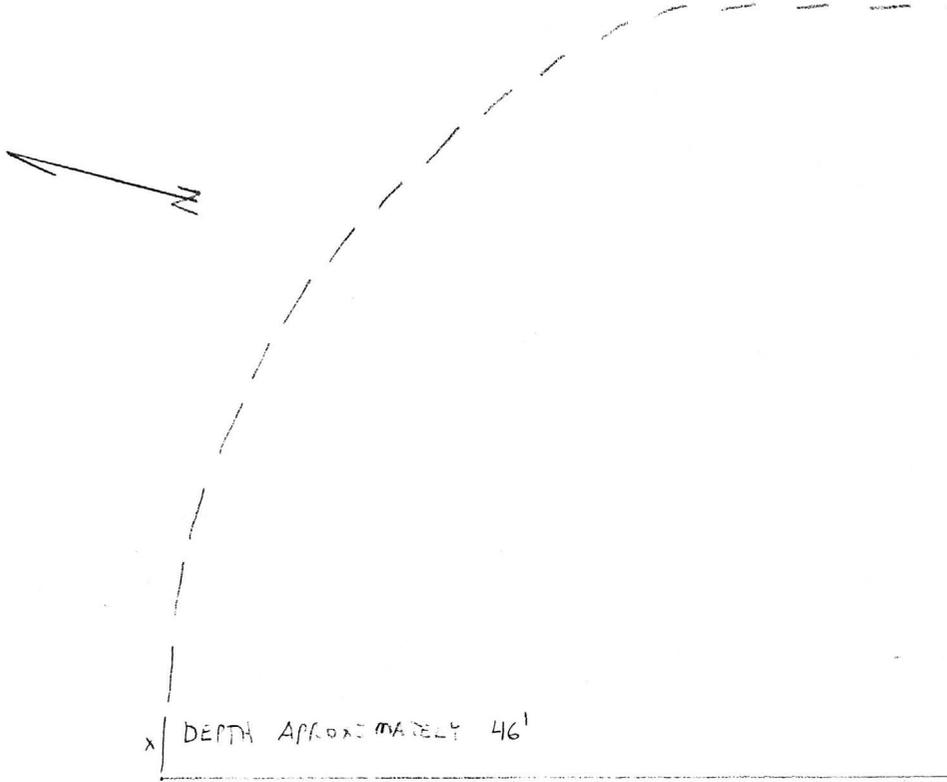
3

3

TAPE SURVEY OF MILL TAILINGS
UPPER LEVEL (OF 3)

(PHOTO IN FILE)

1" = 100'





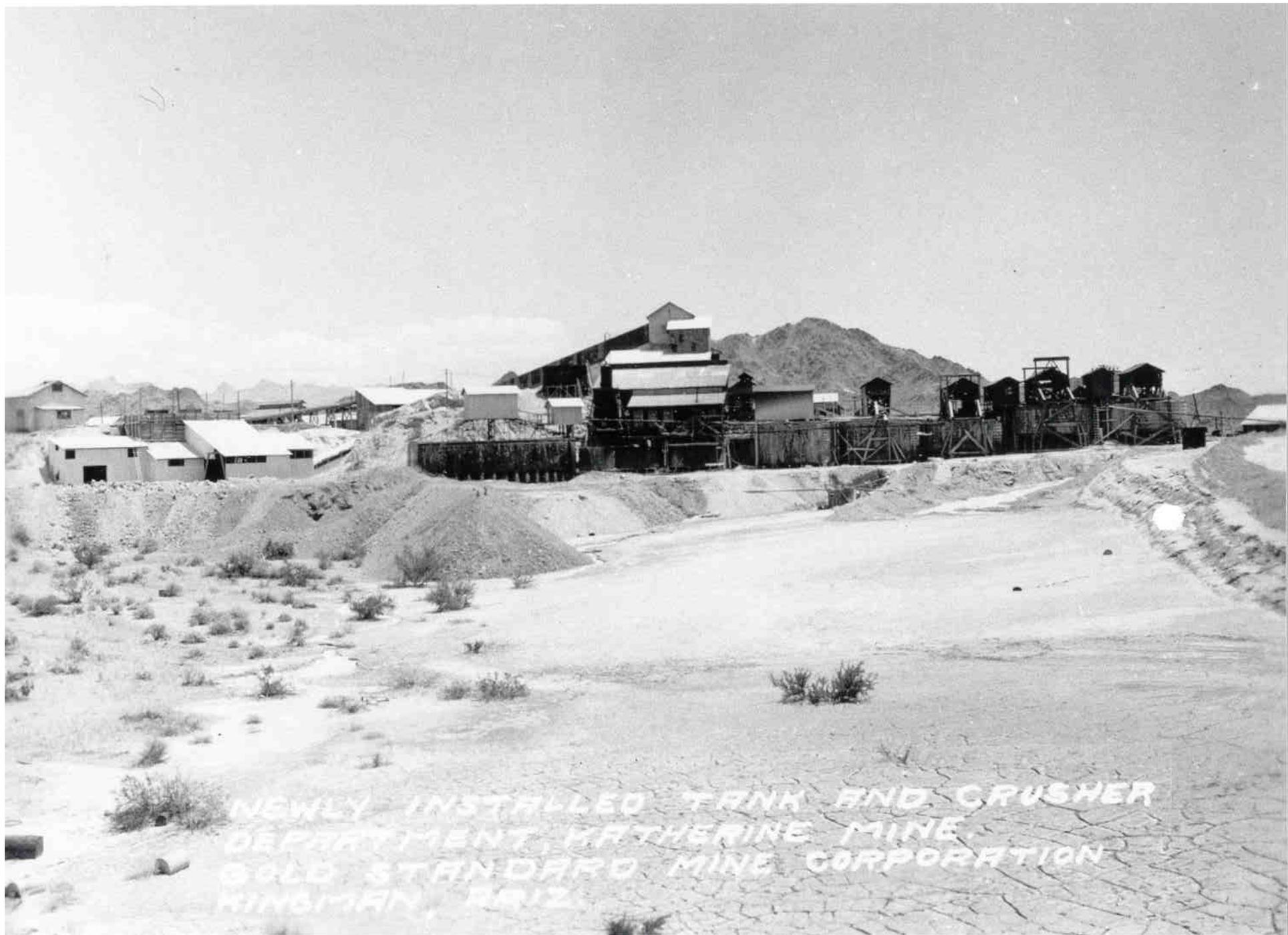
AIR VIEW, KATHERINE MINE
GOLD STANDARD MINES CORPORATION
KINGSMAN, ARIZONA



KETHERINE MINE, MILL AND CAMP
GOLD STANDARD MINE CORPORATION



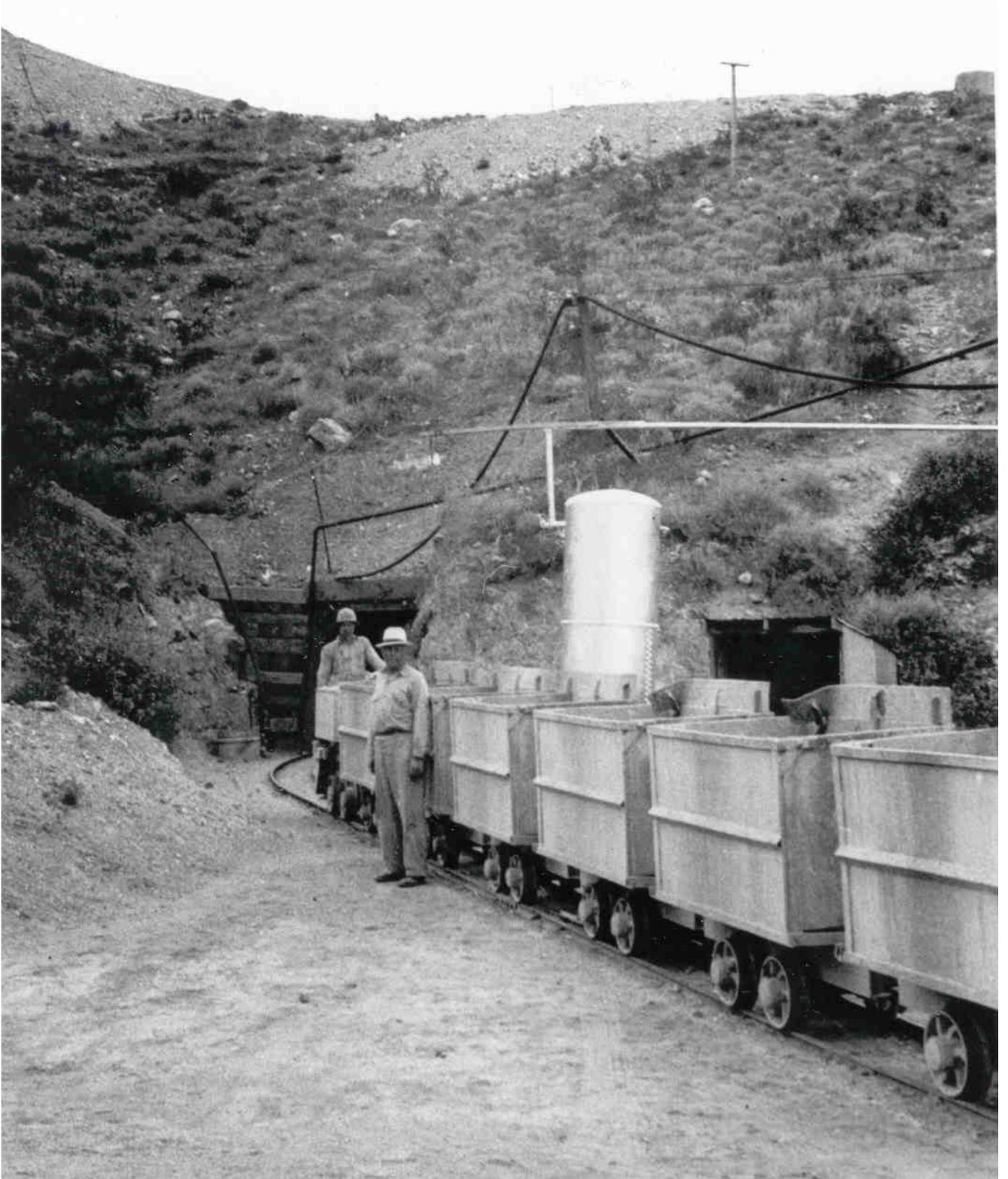
COLORADO RIVER BY CATHERINE MINE
GOLD STANDARD MINING CORPORATION
KINGMAN, ARIZONA



NEWLY INSTALLED TANK AND CRUSHER
DEPARTMENT, KATHERINE MINE,
GOLD STANDARD MINE CORPORATION
KINGMAN, ARIZ.



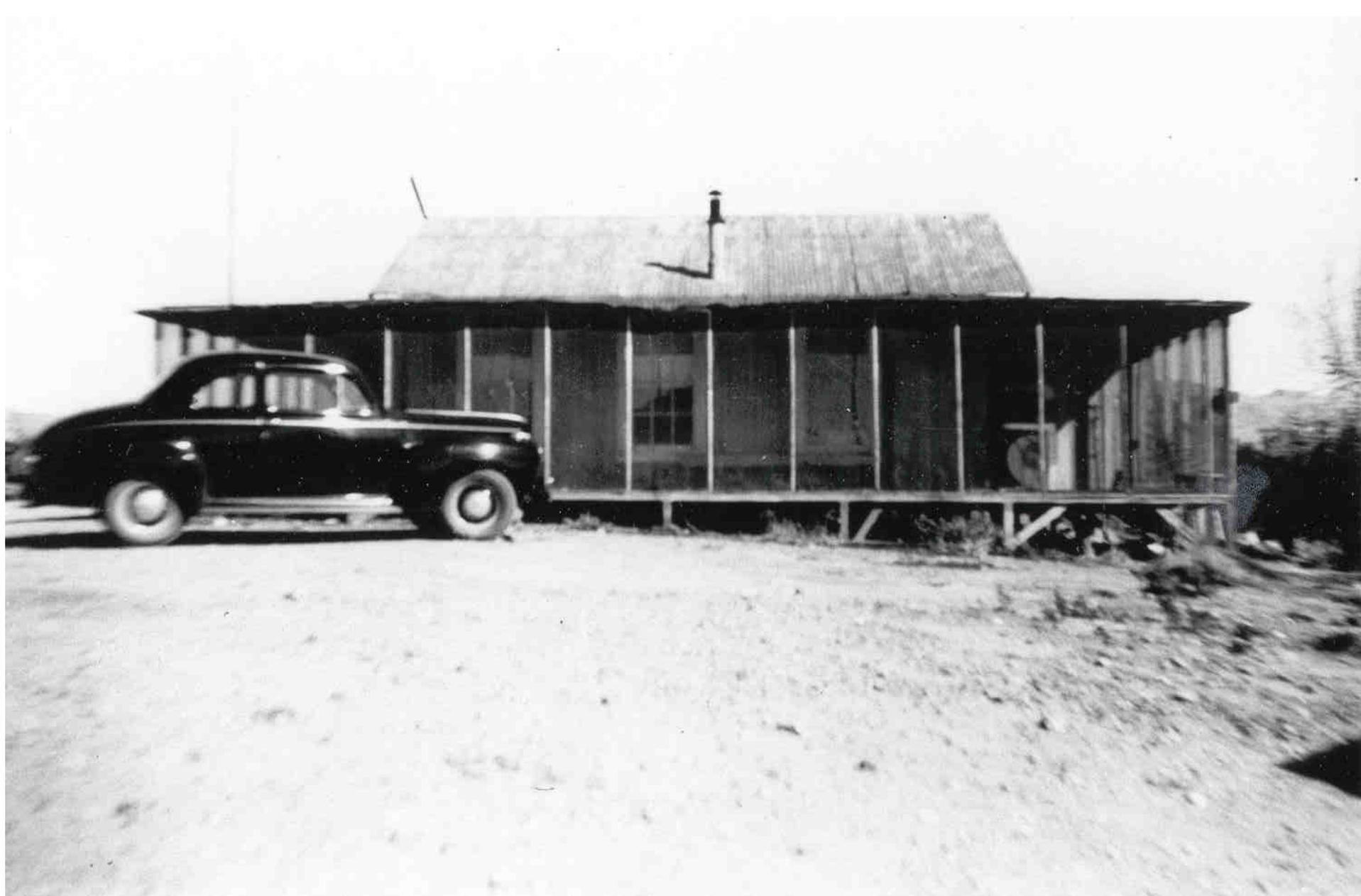
COMMISSARY, AT KATHERINE MINE
GOLD STANDARD MINE CORPORATION
KINGMAN, ARIZONA





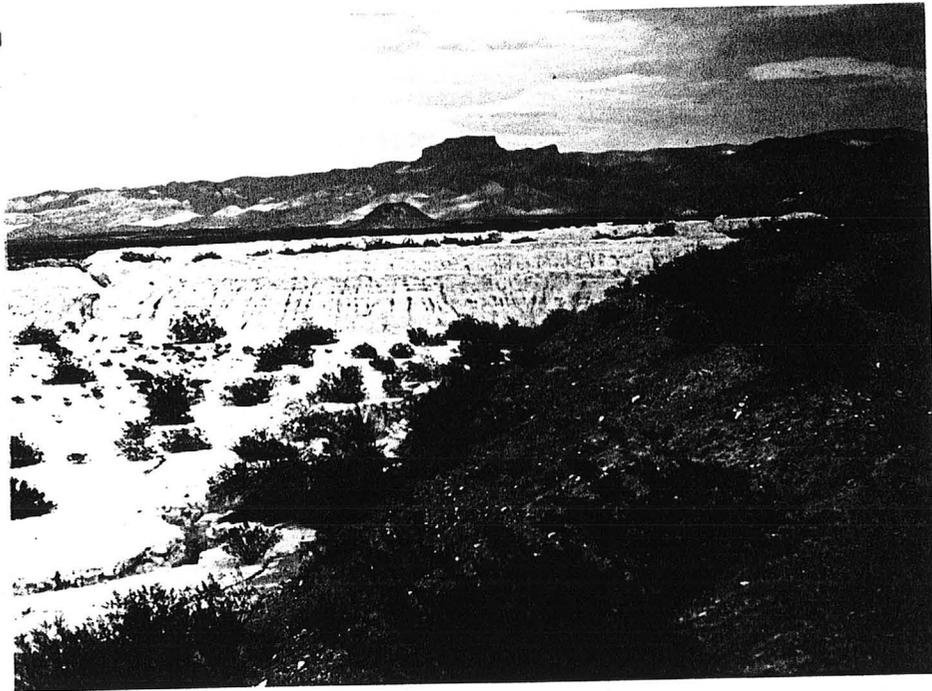


NEW CONVEYER BELT
AT KATHERINE MINE
GOLD STANDARD MINING CORPORATION





MILL AND CYANIDE TANKS KATHERINE
FINE GOLD STANDARD MINES CORP
KINGMAN, ARIZONA



KATHERINE MILL TAILINGS

October 1981

LOOKING NORTHEAST



NJN WR 10/9/81: On Saturday and Sunday in the company of and at the expense of Don Riedel, 3823 S. Atchinson Way, Aurora, CO 80014, a consulting geologist, I visited the Katherine and Oatman Mining Districts in Mohave County

The Katherine Mine and Mill tailings site was visited. The Katherine extension shaft (In west $\frac{1}{2}$ Sec. 4, just north of the road) has been back filed with dump material. The three levels of mill tailings at the Katherine were measured and my field notes will be added to the file.

CJH WR 4/30/82: Ribert B. Garcia, 7030 E. Broadway, Tucson, AZ 85710
Tel: 296-1417. Willis R. Dees, Lawyer, 7030 E. Broadway, Tucson, AZ 85710.
Tel: 296-1417. They reviewed the Katherine Mine file. Mountain States Engineers are retained to sample the mill tailings.

NJN WR 7/30/82: Ramon Shannon, mining engineer with Cimeta Engineering, Tucson, called seeking size and grade data for the tailings at the Katherine Mine, Mohave County. As our file has size and tonage estimates but little on grade, I advised he carefully sample the tailings. Apparently Springold, Mohave County, is his client and he is looking for something to run thru their mill in the Katherine District.

NJN WR 10/22/82: It was reported that the pipe line from the Katherine Mine across the Lake Mead National Recreational Area to the Tyro Mine is complete and supplying water to the mill at Tyro.

NJN WR 1/24/86: Benjamin Bonelli (c) owner of the Frisco Gold Mine (f) Mohave County, reported that Doug Bonelli (c) and Perry Durning (c) recently found a barrel of old maps of L.L. "Ed" Edgerton (c) and Los Angeles mining engineer Oscar Hershey on the Frisco (f) and Katherine (f) Mine both in Mohave County. One of the maps on the Frisco had a drift shown off of the 270' deep shaft to the footwall of a 50' wide (vein?) zone. This zone will become a drill target in the near future.

F/1-1

Mr. William F. Grounds
425 Beale St.
Kingman, Arizona (753-2274)

Interviewed in Kingman Mr. Grounds, owner of the Katherine mine, also George T. Martin lessee of the Katherine tailings. Also interviewed two people at the Recorder's office, and Edgerton at his place near Oatman.

Visited the Katherine mine and the tailings plant being constructed by Mr. Martin. Mr. Martin claims a volume of 6,000,000 cu. yds. of tailings with average grade of \$11 per ton in very fine free gold with very much higher grade material just below the site of the old mill. Arizona Bureau of Mines Bulletin 140 indicates a gold production of under \$3,500,000 to 1933 (at \$35 per oz. gold price). The material will be sluiced to a central pump and raised to an agitator from which it will flow by gravity to a series of patented tables which will make, by gravity, a high grade concentrate. The tables consist of rollers carrying 4 narrow riffled belts which travel slowly up slope without other motion. The tables are about 4 ft. wide by 5 ft. long with a 1/3 HP motor driving the rollers. 5 tables are installed and Mr. Martin expects to treat 3 tons per hour on each table. Also, he expected to be in operation within 2 or 3 days of my visit. A contractor with a patented amalgamation device will treat the concentrates to produce bullion.
TPL WR 9-28-59

Visited the Katherine mine and tailings treatment plant. Completion of the project has been delayed because of failure of the water supply - due to caving at 300' in the vertical main Katherine shaft. It is not possible to descend the shaft so the operators are using a churn drill expecting to ram thru the obstruction so that they can lower the pump bowls to the water below. The property is owned by a Mr. Grounds, who shares a real estate and business office with Robert Morrow, State Senator, in Kingman. The operating company is Searchlight Milling Corp. George T. Martin is the principal and directs the work. The address is Katherine Landing, Arizona. TPL WR 11-21-59

Kingman to Chloride - 2 interviews - No new development in the region. Visited the Katherine mine. The project was idle waiting on generator repairs and warmer weather. The blocked point in the shaft which was being drilled out at the time of my last visit was successfully opened and the pump bowls are now set at approximately 500'. The water level is at approximately 300' in the shaft. No tailings material has been treated as yet. Mr. W. E. Hines, Box 38, Bull Head City, is a participant in the venture. He lives in a trailer on the property. Information supplied by him seemed more reasonable and authentic than that I obtained from Martin during a previous visit. His estimates are: about a million tons at \$4 p.t. with very good values on the bottom (\$6-\$8) and some rich material (capillary efflorescence) on top. Also, about 2/3 of the total dump is not worth treating. Gold is contained in pyrite which makes a rich concentrate. The area tested to date contains considerable mercury indicating that the place is an old dump at the foot of the early day amalgamation mill. TPL WR 1-23-60

KATHERINE MINE

Sec 5, T21N R21W

MOHAVE COUNTY

The old tailings dump at the Katherine mine near Kingman, Arizona, has been leased by George T. Martin who plans to recover the gold values estimated to average \$11 per ton. He proposes to sluice the material to a central pump, then raise it to an agitator from which it will flow by gravity to a series of patented tables, five of which have been installed. Final recovery will be by amalgamation. Mining World January 1960 p. 67

Visited the Katherine Tailings plant at the Katherine mine. Martin and Hines, principals in the venture, were away rustling a motor for the sand pump into which the tails will be sluiced and pumped up to the concentrators. Mrs. Hines was present and said that they expect to put the plant into operation soon. An additional concentrating machine of a different type than those already installed has been set up. Also a drum and sluice plate to make a finished product (following two stages of table upgrading). The plant is full of novel contrivances and no satisfactory test runs have yet been made.
TPL WR 5-21-60

Interviewed William Grounds in Kingman. He stated that he had sold his Katherine property (10 patented claims) to Ed Schuetz, 770 Turquoise St., San Diego, California and that the latter had leased the tailings to George T. Martin, who formerly leased from Grounds. Schuetz has laid out most of the property as a real estate development.

Visited the Katherine mine. Two men were operating Martin's tailings plant for recovery of gold by gravity concentration. Martin was absent. TPL WR 6-24-61

Charles Stoll has lease and option on the old Katherine mine and mill tailing. He estimates 12,000 tons of ore blocked out on the White Chief which carries 0.4 ounces of gold and about 2 ounces of silver. He has made test holes on a short spaced grid of the Katherine tailing dumps. He estimates 300,000 tons which contains 0.03 ounces of gold and 0.7 or 0.8 ounces silver. Over 90% of the value is contained in the plus 50 mesh material. Mr. Stoll stated that he would not start any plan of operation until there is final settlement of his appeal and settlement of a countersuit with the Treasury Department, Division of Narcotics. VBD WR 10/8/75

DEPARTMENT OF MINERAL SOURCES
STATE OF ARIZONA
FIELD ENGINEERS REPORT

Mine Katherine

Date 10/3/81

District Katherine (Mohave County)

Engineer Nyal J. Niemuth

Subject: Property Visit

In the company of Don Ridel, the Katherine Mine was visited. The patented claims and tailings are within the Lake Mead National Recreation Area. The patented claims which are east of the main shafts and tailings, have been subdivided and now have approximately 25 houses on them.

One of the Katherine Extension shafts in the west half of Sec. 4, T21N, R21W has been backfilled with material from its dump. The shafts in the granite knob of the original discovery are open at the surface.

Of interest on this visit was the Katherine Mill tailings. The tailings are located in a wash which drains into Lake Mohave. What runoff occurs, flows on the north side of the wash. The tailings being somewhat cemented, have not suffered from much erosion or underground tunneling.

A Brunton and tape survey was made of the three levels of mill tailings and where possible, thickness measurements were made. Maps of the three levels and a photograph of the tailings are attached with this report.

The tailings consist of 100-200 mesh material. The layers show color changes with depth reflecting the ores of the various mines that supplied the Katherine Mill with ore. No attempt was made to sample the various levels.

NJN:at

STATEMENT OF MR. R. L. DIMMICK, SUPERINTENDENT KATHERINE GOLD MINING CO., KINGMAN, ARIZ.

Mr. HAMILTON. Mr. Dimmick, will you state your name, occupation, and place of residence?

Mr. DIMMICK. R. L. Dimmick, Kingman, Ariz.; superintendent of the Katherine Gold Mining Co.

Mr. HAMILTON. Will you give a brief description of the Katherine mine, Mr. Dimmick—the distance from Kingman?

Mr. DIMMICK. The Katherine mine is located about 38 miles in a westerly direction from the town of Kingman, Ariz., and in the River Range, about 15 miles north of Oatman.

Mr. HAMILTON. How long has the property been developing?

Mr. DIMMICK. The property was originally located in 1900, and was operated until about 1907. The ore at that time was milled through what is known as the Sheep Trail mill on the river, which was built by the same owners in conjunction with the Sheep Trail mine, which was about 6 miles from the river in an easterly direction. What its production was during that time, and its costs are not available, owing to the earthquake in San Francisco, which destroyed all of the old records of the company. Then an active campaign of development was started in the early part of 1918.

Mr. HAMILTON. How is the mine opened, and to what extent?

Mr. DIMMICK. The mine is opened by a vertical shaft, drifts and crosscuts, a good many thousand feet.

Mr. HAMILTON. To about what depth is it opened?

Mr. DIMMICK. Six hundred feet deep; that is, the main shaft is 400 feet, and a vein in the ore body down to the 600-foot level.

Mr. HAMILTON. Have you wide ore bodies in the mine?

Mr. DIMMICK. The average width of the vein after a good many thousand feet of cross-cutting shows about 30 feet to be the average in width.

Mr. HAMILTON. You spoke of the width of the vein?

Mr. DIMMICK. That is the quartz-bearing area.

Mr. HAMILTON. That is not all ore body?

Mr. DIMMICK. No, sir. The vein is made up in its structure of a very similar structure to that of the Oatman veins, being a replaced calcite quartz but confined in porphyritic granite walls, that being the only difference between that and the geology of the Oatman district. They are up in the andecites and we are in the granite.

Mr. HAMILTON. Is there any evidence of faulting?

Mr. DIMMICK. There is considerable faulting; the vein is broken up into many segments; the displacement is not great.

Mr. HAMILTON. Is development work proceeding at the present time, Mr. Dimmick?

Mr. DIMMICK. No, sir. Active development was suspended last year after completing a number of diamond drill holes to a greater depth than the present working, and owing to high costs and so forth the work was discontinued.

Mr. HAMILTON. But the ore bodies and formation persist in depth, do they?

Mr. DIMMICK. Yes, sir. Our deepest diamond drill hole intersects the vein about 890 feet and passes out of it at nine hundred and some odd feet. It shows the same structure at that depth, showing commercial values in sections of the core. The greatest trouble in that district has been, in my judgment, the cost of developing a prospect. Those costs, which I think Mr. Moore and all can substantiate, in this district run anywhere from \$17 to \$20 a foot.

Another point which I think is of paramount concern to the mining interests in this State is the uncertainty of establishing costs; and it has been brought about more particularly by our present laws in regard to compensation and liabilities, in which a company can not figure what a case is going to cost them. There have been a number of lawsuits in this county for damages growing out of personal injury cases that have run into many thousands of dollars. The liability companies charge an exorbitant rate for protection in comparison with the other mining States that surround us here.

Mr. HAMILTON. With no limitation on the amount to be recovered?

Mr. DIMMICK. Yes; as to what they can collect.

Mr. HAMILTON. Then it does not seem that the payment of compensation and insurance premiums would guarantee any protection to the companies?

Mr. DIMMICK. The rate is high; runs about \$8.96 now, with a 5 and 10 or a 5 and 20 limit—that is, \$5,000 for any one individual case or 10 or 20 for any

accident. In a majority of the cases the companies carry a \$10,000 limit. I understand that in a number of accidents here in the past two or three years that that would not cover, and personal damages have been brought about by lawsuits in equity where judgments have been received anywhere from ten to fifteen thousand dollars for an individual case.

Mr. HAMILTON. That is for injury alone?

Mr. DIMMICK. Yes, sir. I think the experienced rating that different insurance companies name in competition in Colorado and other States is no higher here than there, and the rate is less than half. The reason for that is the form of law here in this State that gives compensation and liability benefits to the employer with no set condition as to how much it is worth.

Mr. HAMILTON. Does the State carry any compensation insurance?

Mr. DIMMICK. No, sir; none whatever. The law can not be changed without a constitutional amendment. It was voted on here four or six years ago and turned down. The mining companies could not afford to get out and work for the bill on account of the ordinary sentiment that goes with it, that it was a corporation law. The result was that the doctors and lawyers of the State defeated the bill.

In a recent talk before the Rotary Club here of the State, I drew up a set of comparative figures based along this line to find out the general sentiment that existed toward the ratification of the law, and I found the opposition just where I expected to find it. Before my mouth had closed, the doctors jumped up and claimed that unless some proper law was drawn to protect them, they would oppose it as a State-wide organization. But I look at it from a conservative viewpoint; for banking, commercial, or merchandising concerns will go into a piece of business, and they are going to figure out what it is going to cost them, and what they can make out of it. They have an exact basis to determine that on; a mine has nothing. They can not tell what it will cost until the jury verdict is given as to what those costs will be.

Mr. HAMILTON. Does an injured party have to choose as between a suit or compensation under the compensation act?

Mr. DIMMICK. Yes. He can either accept compensation or deny it and bring suit.

Mr. HAMILTON. If a party injured should bring suit and not endeavor to win anything through compensation insurance, does that absolve the insurance company from any liability?

Mr. DIMMICK. No; only up to their limit. The insurance companies are really the local advisers in the situation. I think the law takes up to the limit of that individual case, which would be \$5,000.

Mr. HAMILTON. Well, in the cases that have come to your notice, has it been necessary for companies to employ their own attorneys or have they done it through the insurance company attorneys?

Mr. DIMMICK. As to that I can only cite our own personal experience. We had quite a serious accident out there two years ago and our own insurance company denied liability after we had been insured under them for a good many years. The result of it was we had to start in and face the condition ourselves, putting up the money to take care of the disposition of the bodies and the injuries, and starting suit against our own insurance company to make them admit liability. The result of it was, after a year and a half of disputes, the insurance company finally admitted liability and paid the claims as they would have paid them if they had handled the case themselves. But as the corporation had to handle it, it cost more money. The result was that the case cost us considerable more money than the insurance company allowed.

Mr. HAMILTON. Is there any aid given to the mining industry by the State of Arizona?

Mr. DIMMICK. Not that I know of. The method of taxation and the method of legislation seems to be trending entirely toward getting the largest revenue possible out of the mines, and the result has been it has turned capital away from the State and made those that are operating within the State more or less bitter toward the methods they have employed. The result is the present depression in the mining conditions, I think, all over the State.

Mr. HAMILTON. Arizona does not maintain any mining bureau or any department of mines?

Mr. DIMMICK. Not in particular; no. Almost all of the large operating companies think, as well as myself, if there was one mine on one side of the Colorado River and one on the other side, we would take the one on the other side, owing to the conditions that exist in the State.

Mr. HAMILTON. How long since your property shut down?

Mr. DIMMICK. About six months ago.

Mr. HAMILTON. Is it contemplated that you will reopen in any near period?

Mr. DIMMICK. Well, that is uncertain. My personal view of the situation is that the majority of the operating companies that have been approached toward financing the construction of a mill do not care to enter the State of Arizona.

Mr. HAMILTON. Will the closing down of the Tom Reed and the United Eastern make it more difficult for operations of the Katherine mine, because of the labor shortage or anything of that kind, or will it affect the operations of the Katherine?

Mr. DIMMICK. It naturally will have more or less of an effect on the general welfare of the county, and that naturally will affect any individual property.

Mr. HAMILTON. Are the wages paid out there the same as in the other mines in the district?

Mr. DIMMICK. The same as in the Oatman district.

Mr. HAMILTON. What power do you use out there?

Mr. DIMMICK. We develop our own power by semi-Diesel engines.

Mr. HAMILTON. How does the cost of that power compare with the cost of power at the nearest hydroelectric power line, Mr. Dimmick?

Mr. DIMMICK. Well, it would not compare with hydroelectric, but it compares more favorably than the steam generation. Take into consideration the Frisco line to base my figures on, because they were in operation a good deal longer than the Katherine. During the pre-war period we were able to generate horsepower for \$4.66 a month, as I remember it. At the Katherine during the period of 1921 and 1922 and part of 1923, with the same type engine, we were able to develop a horsepower there for a fraction over \$6 per month per horsepower. A semi-Diesel engine in an isolated district seems to be the only solution of power question. It is only a question of the number of units to be installed as to the liability of a shutdown, as an engine like that runs into money. It is the number of units, constant units, which makes the initial cost higher. Constant power can be generated with them cheaper than by steam. I have a set of figures given to me by Allis-Chalmers & Co., given to me for the installation of a mill, in which they guarantee a kilowatt for a cent and nine-tenths (1.9 cents) at the switchboard. Taking depreciation, taxes, and depletion of the plant into consideration, over a period of four and one-half years, placed the cost of power at 2.155 cents per kilowatt.

Mr. HAMILTON. What are your haulage costs here?

Mr. DIMMICK. \$8 a ton.

Mr. HAMILTON. Over how great a distance?

Mr. DIMMICK. Thirty-eight miles.

Mr. HAMILTON. How does that haulage compare with yours, Mr. Maxcy?

Mr. MAXCY. Ours is \$8 a ton.

Mr. HAMILTON. What is the distance?

Mr. MAXCY. Forty-one miles.

Mr. DIMMICK. We pay upon merchandise \$9 a ton; oil, \$8 a ton. Of course, we had steady hauling like at a producing property that could be materially reduced, Mr. Hamilton.

Mr. HAMILTON. That is by contract?

Mr. DIMMICK. Yes, sir; by contract.

Mr. HAMILTON. Are there any other properties operating in your district at the present time?

Mr. DIMMICK. Yes, sir.

Mr. HAMILTON. What are they?

Mr. DIMMICK. The Illinois-Katherine is operating quite a force of men. Mr. Phelps has been doing a little prospecting. Those are the only two operating companies in there right now.

Mr. HAMILTON. Are there any other points that you want to bring out at this time?

Mr. DIMMICK. No. The only point that really can be brought out is the comparative difference in the cost of development between this State, or this section, and Colorado or some points in Nevada. I find in our workings in Cripple Creek we are able to do the same type of development for \$11.40 a foot as against \$17 to \$20 a foot here. That is the actual cost—

Mr. HAMILTON. In general, what is that difference attributable to, Mr. Dimmick?

Mr. DIMMICK. That difference is attributable to practically three things. There is very little difference in labor. There is a tremendous difference in power

and a difference in the taxation—that is, which includes insurance and taxes. That is a very peculiar coincidence. We are insured in the same company in Colorado as we are here, and we pay \$8.96 here and \$4.25 up there. Our total underground costs in Cripple Creek, mining at a greater depth than here, nothing less than 1,500 feet, outside of administration expenses, runs \$9.75 a foot, and with the overhead it makes it \$11.40 a foot, which includes a split-check system of leasing, in which the company supplies the materials for the leasers and they perform the labor, and we split the check on the proceeds. That makes the cost \$11.40. And under four or five thousand feet of development here I think the lowest cost we had was \$16.85 and the highest \$20, running over a period from 1920 to 1923.

Mr. HAMILTON. What is the reason for closing down operations now? Is it the fact it is not possible to finance your milling operations?

Mr. DIMMICK. Yes, sir.

Mr. HAMILTON. In general, what is the grade of ore that will be milled?

Mr. DIMMICK. It runs around \$11. The vein in itself, as Mr. Phelps stated, contains an enrichment along both walls of the vein, varying in width from 5 to 24 or 25 feet, not in the narrower widths of commercial, but there is an intermediate area of low-grade material that varies considerable in its value that under present conditions could not be considered as ore.

Mr. HAMILTON. Have you made any estimates as to what that type of ore could be milled for, or what profit there might be in that sort of ore?

Mr. DIMMICK. Well, the only basis of figures is taking the United Eastern and the Tom Reed into consideration, what their costs have been, and I imagine ours would be somewhere near it; estimated around \$7.

Mr. HAMILTON. Are there any other points that you wish to bring out, Mr. Dimmick?

Mr. DIMMICK. Not that I know of.

Mr. HAMILTON. All right. Thank you very much. Mr. Foster, have you anything to add for the record?

Mr. FOSTER. No, sir; I don't believe that I have a thing, Mr. Hamilton.

Mr. HAMILTON. Have you had any difficulties in your mining experience?

Mr. FOSTER. No, sir; I never did.

Mr. HAMILTON. Mr. Wishon, will you take the stand, please?

STATEMENT OF MR. W. W. WISHON, PRESIDENT WISHON EXPLORATION CO., KINGMAN, ARIZ.

Mr. HAMILTON. Will you state your name and connections, please.

Mr. WISHON. W. W. Wishon; president of the Wishon Exploration Co.

Mr. HAMILTON. Where have you been carrying on your exploration work mostly, Mr. Wishon?

Mr. WISHON. In this county. We have been over it pretty thoroughly in the past two years, and prior to that, having lived close here in Nevada, I came in here occasionally for the last eight years.

Mr. HAMILTON. What do you find to be the chief obstacles in the development of this district, Mr. Wishon?

Mr. WISHON. Well, the oxidized bodies have already been taken out pretty well and the cleaner sulphides from nearer the surface likewise, so that in the base ores we have chiefly lead and zinc, which have to be separated by concentration, and the zinc—it is almost impossible at present to ship any of that.

Mr. HAMILTON. Have there been any attempts made for the separation of the lead and zinc ores?

Mr. WISHON. Not lately. There will probably be a plant in the near future by Mr. Campbell on the Fountain Head here. He is developing a very fine body.

Mr. HAMILTON. Fountain Head mine?

Mr. WISHON. The Fountain Head mine; yes, sir.

Mr. HAMILTON. Where is that located?

Mr. WISHON. In the Cerbat Range. Then in the southern portion of the county there are some wonderful prospects for galena and lead and some copper, the high price of lead having made them attractive to capital; and also the working of the Signal Mines Co. by Mr. Maxcy has made us look to that region. I believe that portion of the county would have been developed had they had transportation some time ago. The distance of the transportation—40 to 60 miles—makes quite a difference, trucking from the railway point.

Name of Mine or Prospect: Katherine - Florence Group	Town 11N	Range 21W	Section 4 & 5	Corner C
Principal Minerals: Gold, Silver	Scale 1:250,000 Quad Kingman	Quad 7.5' - 15' Quad Davis Dam		
Associated Minerals: Quartz, Calcite	District San Francisco	Principal Product Gold, Silver		
Type of Operation: Claims: Prospects	County Mohave	State Ar.	Type of Deposit Vein	

Ownership or Controlling Interest:
Consult current USBLM mining claim records

Access: From the intersection of Arizona 68 and Katherine Wash Road proceed north on Katherine Wash Road for 4.5 miles. Claims are not shown on topographic quadrangle.

Structural Control or Geological Association:

"Precambrian granite."¹

Age of Mineralization: Miocene

Production History	Geochemical Analyses

References

- 1) Lausen (1931) p. 21 (from map)
- 2) CETA map file Rack #2, claim map.

MINES OF THE UNION PASS DISTRICT

KATHERINE MINE¹³⁰

The Katherine mine is 2 miles east of the Colorado River, in Sec. 5, T. 21 N., R. 30 W.

This deposit was discovered in 1900. The New Comstock Mining Company developed the mine to the 300-foot level and, in 1903, leased the property to the North American Exploration Company which mined out the richer parts of the vein above the 300 level and closed in 1904. The Katherine Gold Mining Company sank a new shaft, built a 150-ton cyanide mill, and operated from 1925 until late 1929. Lessees made a small production from ore and old tailings during 1930 and 1931. The mine has been closed since 1930.

May 27, 1957

APPROXIMATE PRODUCTION OF KATHERINE MINE, 1925-1931.

(Data compiled by J. B. Tenney)

1925	.....	\$ 200,000
1926	.....	400,000
1927	.....	300,000
1928	.....	150,000
1929	.....	25,000
1930	.....	9,400
1931	.....	2,600
Total	.....	\$1,087,000

Of total value, about 85 per cent was in gold and 15 per cent in silver.

In 1931 the Katherine mill and the rights to the water of the Katherine mine were purchased by E. F. Niemann and associates who later formed the Gold Standard Mines Corporation. Early in 1934 this Company was employing about forty men. The mill, which has a capacity of 300 tons, was treating about 60 tons per day. Most of this ore was from the Roadside and Arabian mines (see pages 105-106), and part was customs ore.

The Katherine mine is on a small knob of granite, about 150 feet across, that rises slightly above the general level of the surrounding gravel-floored plain. The collar of the shaft is 990 feet above sea level, or 450 feet above the Colorado River, and the water table is at approximately the 350-foot level.

The vein strikes N. 62° E. and dips about vertically. It is a stringer lode that has a width of more than 60 feet at the surface but narrows underground. This lode has been opened by a 900-foot shaft and for a length of 1,700 feet. Lausen described the vein as follows: "Vein filling at the Katherine mine usually consisted of a series of closely spaced stringers in the granite. At

KATHERINE MINE

MOHAVE COUNTY

This property idle since 1942.

MARK GEMMILL

¹³⁰ Largely abstracted from Lausen, Carl, Geology and ore deposits of the Oatman and Katherine districts, Arizona: Univ. of Ariz., Ariz. Bureau of Mines Bull. 131, 1931.

REPORT ON GEOLOGY

OF
KATHERINE MINE.

PHILLIP I. MANSON
ATTORNEY AT LAW
KOHL BUILDING SAN FRANCISCO, CAL.

*Copy of Sealed original
March 20, 1919.*

COPY

BURCH, HERSHEY & WHITE

Consulting Engineers

Crocker Bldg. San Francisco, Cal.

REPORT ON GEOLOGY OF KATHERINE MINE.

By OSCAR H. HERSHEY,

Oatman, Arizona. March 20, 1919.



Mr. Charles Sutro, President
New Comstock Mining Company,
care of Sutro Brothers,
130 Broadway, New York.

Dear Sir:

About ten days ago, in compliance with your request, I made a geological study of the Katherine mine, situated in Mohave County, Arizona. It required practically three days for, while the ground accessible for study both at the surface and underground, is much more limited than at most properties I investigate, there is a very complicated system of faults of relatively small displacement that necessitated much close study. I will anticipate the formulation of my conclusions by remarking that the proposition impresses me as presenting an excellent chance for the development of a valuable mine.

I have prepared and will transmit with each copy of this report a print containing geologic sketches of the surface and three principal underground levels of the mine. These sketches will make it unnecessary for me to describe in detail every fault and segment of vein in the mine and I can confine my discussions largely to the general principles governing the occurrence of the ore.

The general geology is very simple. The lode occurs in the midst of a large area of porphyritic granite. In the immediate vicinity of the mine it is largely buried under debris, but it forms mountains in various directions from the mine and I have no doubt that it constitutes a large fairly uniform body that extends in every direction from the mine, under the debris. It will be found to extend as deep as mining operations may be carried. Therefore, the

mine has no problems based upon the possibility of a change of wall rocks. The only other formation observed is an aplitic or fine-grained phase of the granite that occurs at the surface as a narrow dike and was observed as a 12-inch dike on the 300 level. It is of practically no significance.

Running through the granite in a northeast direction there is a zone from 50 to 80 feet wide in which the granite has been extensively fractured and partly replaced by quartz and calcite, forming the strong Katherine lode. The lode was formed in stages and the product of each stage is characteristically different from that of other stages. In the first stage there were formed seams and lenses of a white quartz in large part of a coarsely combed structure. At the same time the intervening rock was silicified. A small amount of pyrite and probably traces of chalcopyrite were deposited. This variety of quartz, as the superintendent, Mr. W.C. Howard, pointed out, carries very little gold and practically never constitutes commercial ore.

In the second stage seams and large lenses of coarsely crystallized calcite were deposited locally in the lode, particularly near its borders. Not much of this calcite remains for in the third stage it was nearly all replaced by quartz. This quartz has a pale greenish tint and in part retains the internal structure of the calcite, from which fact we described it as pseudomorph after calcite. It is usually traversed by narrow wavy bands of ribbon quartz consisting of alternating laminae of greenish yellow waxy and white quartz. It is the peculiar aggregate of pale greenish waxy ribbon seams and remnants of coarse calcite stained with manganese oxide that constitutes the ore, a fact pointed out by Mr. Howard. The rock contains little trace of oxidized

Among two reasons why I look upon the Katherine with special favor is the character of its ore. The nearest gold camp of importance is that of Oatman. In this camp there are two mines of importance, the United Eastern and Tom Reed. In these mines there are two kinds of quartz, corresponding to the two varieties at the Katherine. The ore consists in part of quartz pseudomorph after calcite, but the gold is present, chiefly in greenish yellow waxy ribbon seams. There is less of this ribbon quartz, but more calcite than at the Katherine. However, in both districts the ore is so nearly alike in character that in hand specimens it can be discriminated with difficulty. Now in the Oatman district there are many veins of the older quartz and much money has been spent in a vain effort to make them into mines. It seems clear that only those veins make mines that have the peculiar quartz present in the Tom Reed, United Eastern, Gold Road and perhaps a few others with which I am not acquainted. I was, therefore, highly pleased to find large quantities of this particular kind of quartz in the Katherine mine.

While the known facts regarding the Oatman district bear favorably on the Katherine mine, the latter bears favorably upon the question of probable depth for the Oatman mines. In the Oatman district the veins are in a series of Tertiary lavas, chiefly andesite, that rest upon the granite. Many have supposed that where these veins pass from the lavas into the granite they change the character of the vein filling and become unfavorable for commercial ore. But at the Katherine we have one of the veins down in the granite and it contains both the good varieties of quartz and commercial ore.

At Oatman very little ore came within 100 feet of the surface. The Bonanza ore was found between 300 and 800 feet from the surface. Not much good ore has been found below 800 feet. There seems to have been some leaching of the gold from within 100 to 300 feet of the surface. The ore was not produced by secondary enrichment

related to the surface. The distribution of the ore is governed by the distribution of the ribbon seams. The latter tends to have a lenticular form, but as it was doubtless deposited from ascending solutions and as the Katherine mine proves that it may extend down into the granite, there are reasons to expect that other ore lenses may be found deeper. This may seem like a discussion of the Oatman district, but the point is that it indicates that the good variety of quartz at the Katherine mine should extend deep.

Quartz of the ore-forming stage at the Katherine occurs chiefly in two roughly parallel belts that have given rise to the idea of a "North vein" and a "South vein". Obviously they are only two pay streaks in a single broad lode. They are probably not continuous along the lode, but occur in sections or shoots. These shoots may rake. The problem is to locate them from level to level.

In the sketch showing the surface geology, I have indicated all of the granite and vein outcrop except a small projection toward the west. It constitutes a small island-like area that projects above the debris. In the porphyritic granite northwest of the main vein outcrop there are several bands of the older variety of quartz. However, the chief outcrop of this variety occurs in the vicinity of cuts Nos. 1 and 2. Because it is in the form of several rather strong bands in a 20-foot zone of granite I have mapped it with broken lines. This belt doubtless extends under the debris to and beyond cut No. 4.

The "Glory Hole" is a large open cut in the so-called North vein. Mr. Howard says that he recovered about \$7.00 per ton from the ore mined in this cut. The deposit was nearly vertical and had no uniform walls, grading irregularly into altered porphyritic granite abounding in quartz seams. Toward the northeast the ore was mined down to a fault that dips southward 45 degrees. The fault has given Mr. Howard much trouble and to facilitate its discussion I will name it the Howard fault. From the southwest end of the Glory Hole the band of practically pure quartz that constitutes the "North vein"

may be traced for 120 feet to a junction with the "South vein". Between these main quartz bands there is a wedge-shaped area 36 feet in maximum width consisting of altered porphyritic granite abounding in large quartz seams of the ore-forming variety.

About 30 feet down the working shaft there is a landing in the midst of a stope 90 feet long on the "South vein". Howard says that he milled between 2000 and 3000 tons of ore from it and recovered \$12.00 per ton by the cyanide process. The ore was cut off sharply by the Howard fault. This fault is well exposed in a small intermediate a short distance below the stope where it dips southward 20 degrees. Quartz below it carries \$6.00 to \$7.00 per ton per Mr. Howard. But it represents the "North vein" indicating that the fault is a reverse or thrust fault. The fault is strongly grooved on a course S. 60 degrees W. This indicates that the block over the Howard fault has moved N. 60 degrees E, I cannot accurately determine the distance of the movement, but it seems to have been not less than several hundred feet. Therefore, I would expect to find the Glory Hole and South ore-shoots below the fault toward the southwest.

On the 100 level the "North vein" near the shaft is slightly displaced by three southward dipping faults, but it may be traced southwest from the shaft for 55 feet. The quartz was all milled but proved low in grade per Mr. Howard. Near the face of the drift the quartz of the ore-forming variety pinches out in a body of the earlier quartz. In the corresponding section of the "South vein" the same thing occurs, namely the good variety of quartz is displaced and the "Vein" becomes mostly coarse-combed white quartz. Apparently both drifts expose the southwest end of the shoots of later stage quartz. The ground between is silicified porphyritic granite with many quartz seams but they are of the coarse-combed white quartz. Apparently both drifts expose the southwest end of the shoots of later stage quartz. The ground between is silicified porphyritic granite with many quartz seams but they are of the

coarse-combed white variety and not like the seams in the belt between the two "veins" at the surface, thus furnishing additional evidence of shifting by the Howard fault. My impression is that we have here two sections of the lode in which the good variety of quartz has been extensively developed, separated by a section of nearly barren white quartz. The Glory Hole and South stope section represents that southwest of the nearly barren section. It is, however, useless to search for it on the 100 level by driving the southwest drifts ahead because the Howard fault would soon be encountered.

The shaft practically follows the "North vein" to the 200 level where it is 20 feet wide. On the northeast side of the cross-cut it has the appearance of ore and carries about \$4.00 per ton per Mr. Howard. On the southwest side it does not appear so promising in appearance. I regard this cross-cut as practically at the southwest end of the northeast shoot of good variety of quartz. All the remainder of quartz exposed on the level is of the nearly barren coarse-combed white variety, representing the nearly barren middle section. By driving the level farther southwest along the lode the southwest ore-section should be found. It is not recommended that that be done now, because more important work can be done first.

About 25 feet below the 200 level another important thrust fault crosses the shaft. It appears on the 300 level as the fault that dips southward 30 degrees to 40 degrees and has apparently displaced the vein about 80 feet horizontally toward the west on the hanging-wall side. It is probable, however, that the movement had approximately the same course as that on the Howard fault, in which case it was not less than several hundred feet. All the quartz exposed on the 300 level is of the early stage and hence nearly barren.

The 400 level was not accessible because of water. I understand that it exposed the same relatively barren section of the lode. The fact that the quartz seemed to get poorer in average grade with depth doubtless discouraged early operators on the lode, but if my

explanation of the reason for this apparent decrease is correct, it is not fatal to the attractiveness of the proposition.

At the collar of shaft No.3 and in out No.5 there is what practically amounts to small outcrops of a shoot of ore on the "South vein". I understand that some of the same shoot was found in out No.6 but the debris was deep. The same shoot in a low-grade condition is exposed in cut No.4. But to learn much about this shoot we must go to the 100 level. In driving northeastward on the "South vein" from survey station 3 the quartz carried about \$6.00 or \$7.00 per ton per Mr. Howard. At Station 4 the ore was out off by a fault and thrown into the left wall. It was out again beyond station 5. Here a cross-cut exposed a wide body of quartz. I have been supplied with the assay results of some sampling done by Mr. R.L.Dimmick; one sample in this cross-cut went \$20.80. Beyond station 5 the ore streak has been repeatedly thrown toward the left and then toward the right by a series of faults. Sampling along the walls has shown rather indifferent results, but my belief is that if the samples were carefully taken across the band of quartz of the ore-forming stage, a very different result would be secured. In a short left-hand cross-cut one sample assayed \$15.58. From station 8 the drift is driven directly on the good band of quartz and for 50 feet assays ran so high as to suggest the bonanza orebodies at Oatman. They were then rather low for about 30 feet, but gradually increased in the next 70 feet to apparently \$20. ore at and near the face at the time of my visit.

Now without systematically sampling the quartz I cannot assume responsibility for any statements as to the length of the pay-shoot and the average content of the ore, but assuming that such assays as have been made have been fairly accurate, I can easily believe that there has been practically developed an ore-shoot over 300 feet in length, with the northeast end not in sight. This showing certainly warrants more energetic development of the property. Because of some discrepancy between the position of the ore in shaft No.3 and on the 100 level Mr. Howard and I expect that a fault that is not now in

sight will displace the ore between the shaft and the level. But I suggest that as long as ore continuous in the face of the drift on the 100 level, driving be continued. One hates to quit driving on good ore. In the meantime a drift should be started on the "North vein" on the 200 level at a place selected by Mr. Howard and me and driven north-eastward. Thus this shoot should be developed progressively down to the 400 level.

You are fortunate in having a shaft already down to that level.

I am now able to state the second reason why I look upon the Katherine with special favor. It is because the lode is so extensively buried under debris. I have no doubt that it extends many hundreds, probably not less than several thousand feet. There is a chance for a series of important ore-shoots along it under the debris. By the time the exploration work has been carried along the lode as far as in the Gold Road, United Eastern and Tom Reed mine the showing may be very much greater than it is at present. For the amount of work done it is quite encouraging.

I do not want to raise expectations that perhaps may not be realized, for I cannot see beyond the development faces any farther than anyone else can, but the proposition appeals to me as an unusually attractive speculation, because of the possibilities. I will be very much surprised if an energetic campaign of development does not make of the Katherine a valuable mine. Exploration will be subjected to temporary difficulties of the faulting, but the faults are not a serious menace to the mine.

I also made a rapid reconnaissance of the Pyramid group, owned by your company. The Pyramid vein has been developed 225 feet along the footwall and 5 to 20 feet wide in the Pyramid tunnel. The vein proper consists largely of rather fine-grained slightly waxy quartz and calcite, bearing some resemblance to the ore in the Katherine mine, but not so typically a pale greenish quartz pseudomorph after calcite and not so typically seamed by yellowish waxy ribbon quartz. Mr. Howard says it carries \$2.50 to \$5.00 or \$6.00 per ton in gold, rarely reaching a commercial grade.

Outside of the vein proper there is a zone of more or less altered porphyritic granite traversed by seams of white coarsely combed quartz carrying very little gold. From the surface near the top of a raise Howard got 20 tons that yielded about \$20.00 per ton by amalgamation. It seems to have been a lens not over 20 feet long and 2 feet thick.

The vein has a prominent outcrop traceable at least several thousand feet. Toward the southwest it has old cuts and a shaft made in the 60s. In places it shows some quartz pseudomorph after calcite but nowhere as characteristic as in the Katherine. Howard says the outcrop assays usually about \$2.50, rarely up to \$5.00 and \$6.00. The vein seems valueless unless it is free-milling and considerable bodies exceed \$5.00 per ton, or unless there is an increase of gold content with depth on account of leaching near the surface. The tunnel does not encourage the latter idea. Mr. Howard concedes that the rock in the tunnel is no richer than that at the surface. However, I suggested that sometime, when the company has an assayer at the Katherine mine, the Pyramid vein be thoroughly sampled.

Respectfully submitted