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Arizona Department of Mines and Mineral Resources Mining Collection

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02/20/98

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES FILE DATA

PRIMARY NAME: FORTUNA MINE

ALTERNATE NAMES:

YUMA COUNTY MILS NUMBER: 77

LOCATION: TOWNSHIP 10 S RANGE 20 W SECTION 16 QUARTER SW
LATITUDE: N 32DEG 33MIN 09SEC LONGITUDE: W 114DEG 19MIN 54SEC
TOPO MAP NAME: FORTUNA MINE - 7.5 MIN

CURRENT STATUS: PAST PRODUCER

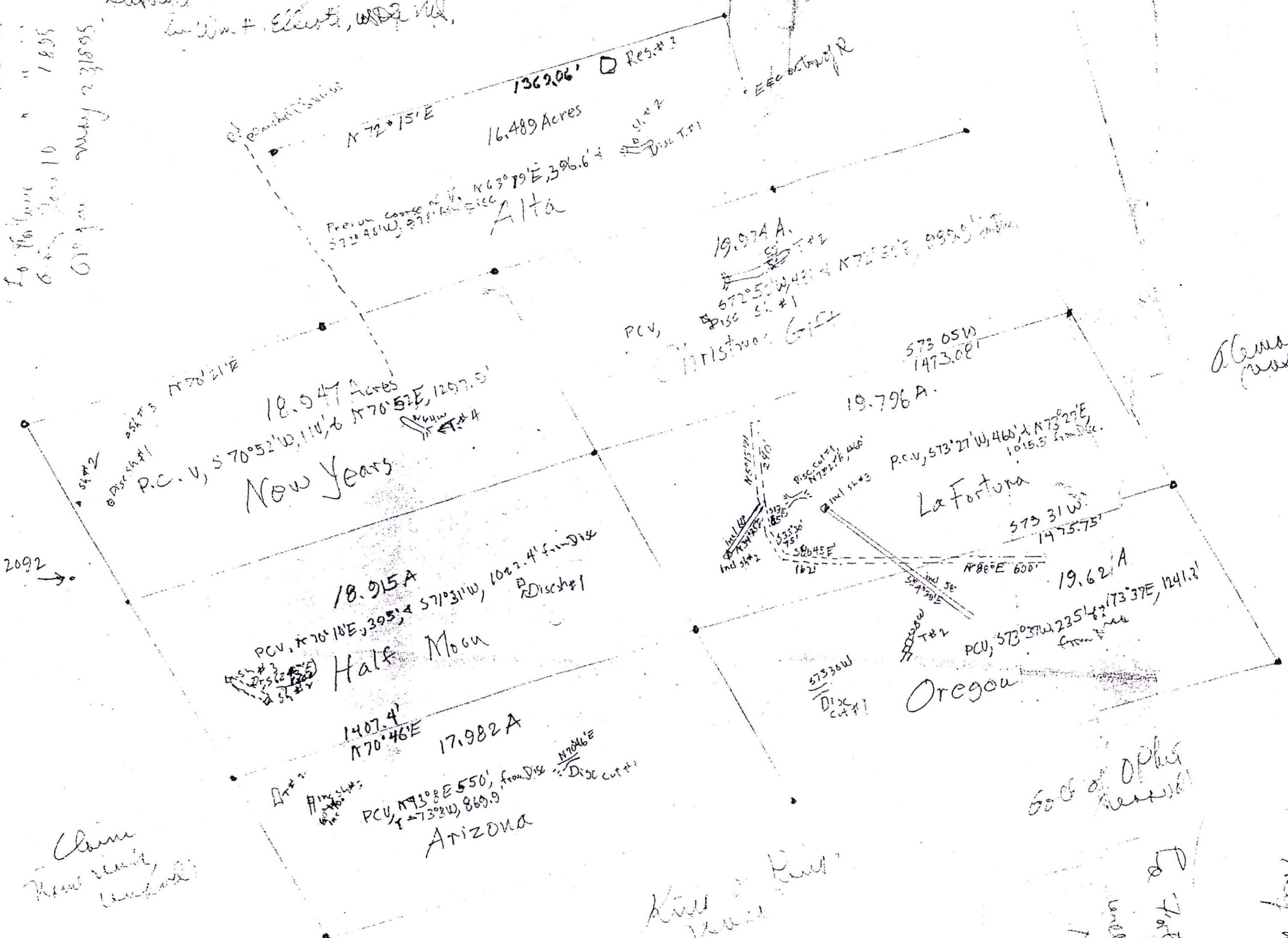
COMMODITY:
GOLD LODE
SILVER
STONE DIMENSION

BIBLIOGRAPHY:
KEITH, S.B., 1978, AZBM BULL. 192, P. 150
ADMMR FORTUNA MINE FILE
AGSU OFR 97-16 GEOLOGY OF THE FORTUNA MINE

Total 131.72 A

Scale 400 = 1"
Var. 14°10'E
Approx T10S, R20W.

La Fortuna Mining Co.



MICROFILMED DEC 1 '8

CHARLES H. DUNNING
MINING ENGINEER
PHOENIX, ARIZONA

OFFICE
817 W. MADISON ST.
PHONE ALPINE 3-6272

RESIDENCE
1635 W. EARLL DR.
PHONE AMHERST 5-1132

January 19, 1955

To: Los Angeles District
Corps of Engineers, U.S.Army,
751 So Figueroa St.,
Los Angeles,17,Calif.

Persuant to your order No 19-50325, and requisition No LK-4042, I have made an examination of the Fortuna Mine near Yuma, Arizona, and submit my findings herewith.

Purpose of Examination.

The purpose of the examination was to establish a fair cash value for the property involved,for mining purposes, under present conditions. Field examination was made on Jan 6th, 1955, preceeded and followed by various investigations and research study.

Mine Location - Acerage - Ownership.

The mining property in question constitutes the old Fortuna Mine and consists of five patented mining claims known as CHRISTMAS GIFT, HALF MOON, LA FORTUNA, ARIZONA, and OREGON, comprising 96.108 acres. To reach the group one travels approximately 16 miles east from Yuma on U.S.Highway 80, thence over a side road for about 16 miles in an east by south direction to the mine. Detailed patent maps are available but are not included with this report.

Title and ownership were not checked as they are not within the scope of this report.

Geology.

As this is not a geological report may it suffice to say that the commercial ore in the Fortuna was in the form of a short shoot or pipe of gold bearing quartz in an area of ancient schists that had been intruded by dikes of pegmatite and various phases of granite. The area is highly faulted, much of which is pre-mineral. The mineralization was probably related to the faulting but there is no evidence that any of the prominent dikes acted as mineralizers.

Some of the faulting may have been post-mineral - perhaps disasterously so. But experience with many so called faulted-off ore bodies in Arizona leads one

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to sometimes doubt whether the ore was actually displaced by a fault, or merely found its natural bottom.

Without viewing the details of the ore disappearance this question cannot be answered. We only know that history definately states that the ore was faulted on the 800 level and that heavy expenditures made to find the extension were unsuccessful.

Development.

Underground maps of the Fortuna were not available but surface evidence of dumps etc., together with common knoledge check with the following excerpts from a bulletin published under date of August 15, 1934, by the Arizona Bureau of Mines, entitled "ARIZONA LODE GOLD MINES AND MINING". :

> " The Fortuna mine workings included two inclined shafts which connect with several hundred feet of drifts, stopes, etc. The older shaft which is on a ridge above the mill and 250 feet southwest of the vein outcrop, inclines 60° in a N.34 E. direction and is 350 feet deep. The lower shaft which is 100 feet southeast of the outcrop inclines 58° in a south 54 east direction and is approximately 1000 feet deep. In 1929 these shafts were caved at the surface and the workings were reported to be partly filled with water."

At my visit on Jan 6, 1955 it was evident that the dump had caved into the deeper shaft and only by diligent search could I find where the older shaft had been. It was completely filled.(See photo next page).

History.

One might spend months in delving into all that has been written concerning the Fortune Mine. Up to the date of its publication the mine's history is well boiled down in the above mentioned Arizona Bureau

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The first four months run netted $284,000 from ore taken out within 150 feet of the surface. Full production was started in 1898 and during the following year a 100 ton cyanide plant was built to treat the accumulated tailings which contained about $5.00 per ton. In 1900 the vein was lost on a fault at the 800 foot level and only a small segment was found by further exploration. The total production of the mine from Sept 1896, to Dec 1904 was $ 2,587,987 in bullion sent to the Selby smelter.

Further exploration was carried on during 1913 and 1914 by the Fortuna Mines Corp, and from 1924 to 1926 by the Elan Mining Co. These two concerns produced about $25,000 worth of

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gold. Since that year the mine has remained inactive".

Following the period covered by the above bulletin there were several attempts made by various companies and individuals to find the faulted vein or develop new ore. Diamond drilling programs were included in these efforts.

There is no definate or detailed record of these attempts but it is self evident that they were all unsuccessful.

In 1940 Mr.William B. Maitland, a mining engineer of excellent ability, was in charge of such operations for the then owners, and in 1942 he was still operating as such or on his own account.The property was visited by Mr. Elgin B. Holt, field engineer for the Arizona Dept of Mineral Resources, on June 18, 1942, and at that time Mr. Hold reported the following information as given him by Mr. Maitland:

" Production 1941 500 tons avg $16.00 per ton.
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On June 18, 1942, 8 men were employed on exploratory work but operations were as of that day being discontinued because of disappointing results, scarcity of labor, and rising wages."

Mr. Maitland passed away three or four years later. I have contacted Mrs. Maitland and she told me: (a) that she at one time had some maps and reports re the property, but in the last few years she had been unable to locate any of them in spite of diligent search. And (b) That her husband was very disappointed in exploration results and had to give up the project.
She did not seem to have a clear idea of what exploration work had been done.

One must bear in mind that during all of these periods of exploration work, from 1934 through 1942, gold was at the same value of $35.00 per ounce as it is today, whereas miner's wages, even through 1942 were about $6.00 per day, as against about $18.00 at the present time.

I was much impressed by the extent of efforts

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made to find new ore. The hills surrounding the old ore pipe are covered with cuts, shafts and trenches. Seemingly every veinlet, fault, and mineralized showing has been thoroughly prospected. But nowhere, other than in the main old ore pipe could there have been any amount of commercial ore mined. Attempts to glean values from the old mine dumps by screening or hand sorting were also evident. But they must have been entirely unsuccessful for in no instance did such attempts proceed very far.

Sampling.

No attempt was made to sample these missceleanous prospect holes. It is self evident that were there any spots of direct-shipping ore, such would have long since been mined, and it was visually evident that no tonnages of mill grade ore existed because there was no vein material of any size or continuity.

Being advised that some claim was made re the occurrance of commercial tungsten ore such occurrance was especially sought. In some instances, especially at a location called "Mineral Hill"a red and yellow stake had been placed to mark the places where tungsten was found. At one place, outside a small tunnel entering Mineral Hill from the west, such a stake was marked "No 4-5-6-7 Drift Top!" Inside the tunnel certain spots had been circled or enclosed by blue chalk marks. Within these marks there was some fluorescence under the ultra violet light. To the experienced eye however, these spots did not have the characteristic blue white glow of sheelite (a common tungsten mineral) but more of the dull glow of opalescent quartz and/or some calcites. A few pin point specks of the gold glow of powellite were evident. Powellite is a molybedenum tungstate but seldom if ever has commercial value.

Sample #1 was taken as a general sample in this tunnel. Sample #2 was carefully picked from the fluorescent spots in order to prove or disprove that such fluorescence was due to sheelite.

At the top of Mineral Hill there was another colored stake near a small vein coursing down the hill to the east. This vein outcrop was 2" to 8" wide and was sampled in several places to constitute

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Sample #4 was taken by 4 vertical cuts from the pond of old mill tailings where a wash had cut through same and left vertical walls about 6ft high. In the cyanide process any tungsten in the ore would remain in the tailings.

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None of these samples showed more than a trace of tungsten, and very nominal values in gold and silver. Assayers certificate is attached.

Appraisal/Conclusion.

A review of its history shows that the Fortuna Mine was once a very well worth while gold mine. It also shows that it was very definately worked out either by faulting or bottoming at about the 800 ft level.

Many concerted, intelligent, not-so-intelligent, sporadic, and plain promotional attempts have been made to find a faulted extension of the old ore shoot, occurrance of new shoots or veins, or ore in any manner and in any place.

All such attempts have been failures.

In face of these failures, and especially in face of the greatly increased costs of exploration, development, and operating, during the past 12 years, I do not believe that a prudent miner or engineer would make any further expenditures in such attempts under anything like present conditions. And it seems that there is not a place where there is a remnant, pillar, or small showing that might be gleaned and shipped at a profit.

As a tungsten prospect the sampling and conditions prove that there is no probability that any commercial tungsten minerals could be mined therefrom, either on a small selective basis, or a large low grade basis.

If the claims were wide open to mineral location, or could be purchased at a nominal amount at a tax sale, I do not believe that a prudent miner would bother to do either. Cartainly if one desired a

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speculative gold prospect there are many wide open to mining location that have not been so thoroughly disproven, and as a tungsten prospect one would only need to shoot a dart at a wall map of all open domain in Arizona to find a better one.

Therefore my appraisal of the value of the above described mining claims, for mining purposes, is NIL.

However an historic location such as this, may have value due to its romantic history, its climate, the fact that patented land in Arizona is becoming somewhat scarce, and the possibility that some indiscreet mining-minded person might be lured into purchasing it because of its history. And gold being "where one finds it" it can never be said that further discoveries are impossible. It can be said that further expenditures are not justified due to the extreme unlikelihood of developing anything to repay such exploration costs.

Such intangible values are beyond the scope of this appraisal - but do exist. Surely a nominal value between $250.00 and $500.00 per claim should suffice and is probably more than any well publicised, open auction sale would bring.

Respectfully Submitted,

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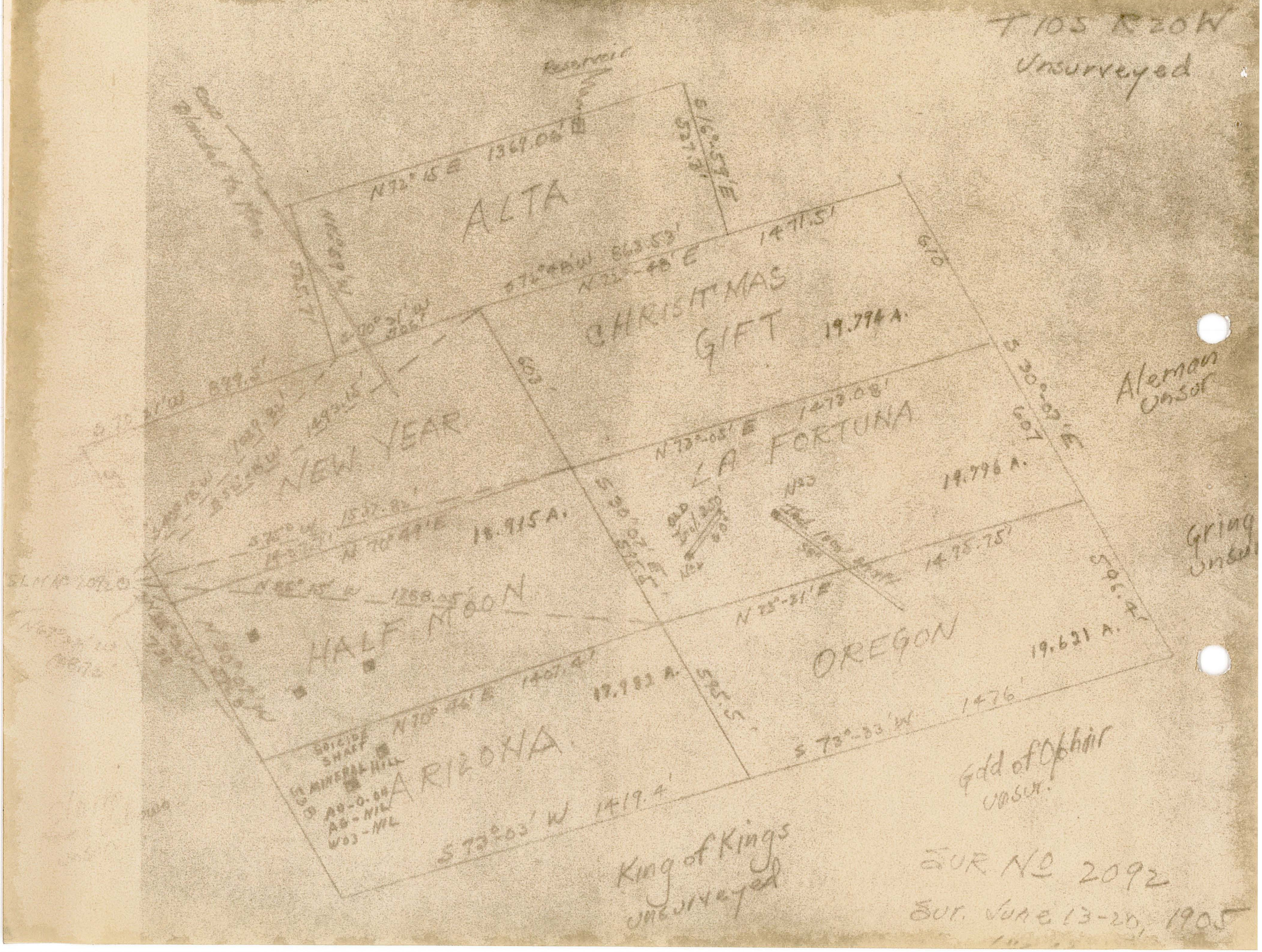
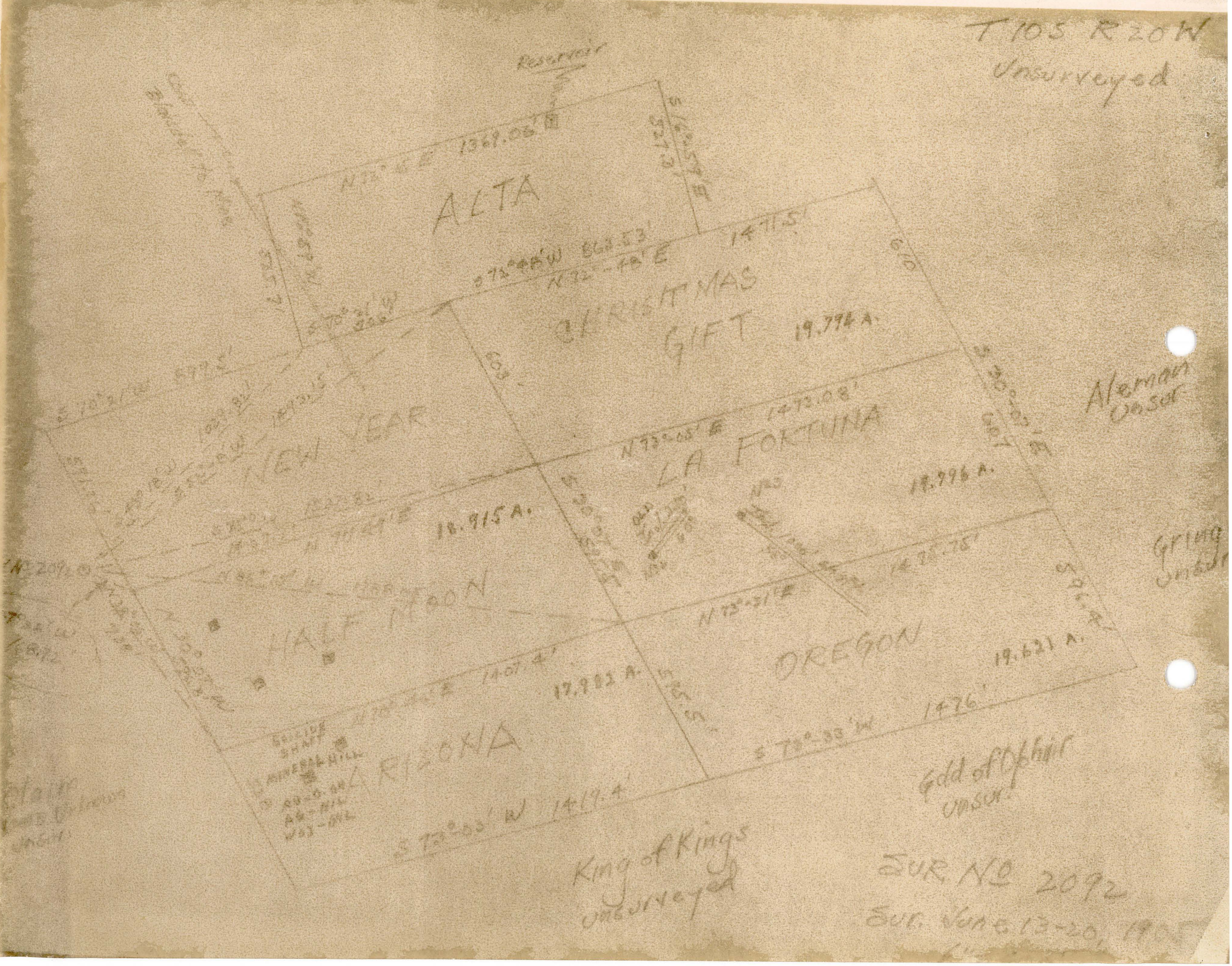


T 10S R20W
Unsurveyed
Reservoir
ALTA
N 72° 15' E 1369.06'
CHRISTMAS
GIFT
19.794 A.
1471.51'
NEW YEAR
LA FORTUNA
N 73°-08' E 1473.08'
19.796 A.
S 30°-02' E
18.915 A.
HALF MOON
1288.05'
N 73°-31' E 1475.75'
OREGON
19.621 A.
17.983 A.
N 70° 46' E 1401.42'
ARIZONA
Suicide Shaft
Mineral Hill
S 73°-03' W 1419.4'
S 73°-33' W 1476'
Alemán Unsur.
Gold of Ophir Unsur.
King of Kings Unsurveyed
Sur No 2092
Sur. June 13-20, 1905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Respectfully Submitted,

Chas H Dunning
Mining Engineer.

January 19, 1955.

FORTUNA MINE YUMA

Guido E. Caglieri, Jr., P.O. Box 5895, Carmel, California, 93921, is the president and major stockholder of this mine. info. from letter dated 8/15/75 received from Mr. Caglieri

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NJN WR 9/25/81: Dick Pricely of Phelps Dodge's Land Department called for information on the Fortuna Mine, Yuma County. His hope is to find a faulted segment or extension of the Fortuna's geology in non-withdrawn land. He is working on a project to come up with precious metal targets and is taking another look at some of the old large producers.

KAP WR 11/27/81: Richard Grondona reported continued interest in the La Fortuna Mine Yuma, County. The owners are currently negotiating a new lease with the government. The mine is located within the boundaries of the Luke Air Force Range.

J. Jett 3/26/82: Phownix office visit with Sidney S. Alderman Jr, Mining Geologist, 681 Market Street, Room 523, San Francisco, California 94105. Mr. Alderman said he was a partner in the firm of AIM Inc. in San Carlos, California. This was the firm that did an evaluation study for the U.S. Army Corps of Engineers on the Fortuna Mine.

He has separated from AIM and is now working alone. He is presently evaluating two prospects on the Cabeza Prieta for the Corps of Engineers. I discussed the Fortuna mine with him. He could not provide us with a copy of the evaluation study, however, he did mention that his recommendation was to separate the Fortuna area and release it from the bombing range withdrawal.

MG WR 7/3/87: Learned that all 12 patented claims of Fortuna mine property (file) Yuma County are owned by Z. A. Inc., c/o O.C. Pratt, VP, 220 Sansome St. 14th Floor, San Francisco, CA 94101.

KAP WR 9/25/87: Ben H. Slothower, P O Box 3226, Bozeman, Montana 59772, phone (406) 586-1735 and Sidney S. Alderman, Jr., 909 Hearst Building, 5 Thinrd Street, San Francisco, California 94103, phone (415) 974-1190 were in to obtain data on the Fortuna Mine (file) Yuma County located on the Luke Air Force Range. They have been hired by the Army Corps of Engineers to value the property for lease purposes.

December 8th, 1954.

San Francisco District Engineers,
180 New Montgomery St.,
San Francisco, Calif. Att. Mr. Dave Jones.

Dear Mr. Jones:-

Referring to our recent phone conversation I propose to make an examination and appraisal and report on the old Fortuna Mine, for you, for the lump sum of $325.00. This would include all time, travel and missceleanous expenses, except assays. I assume that the government can have its own assays made. However if it is more expedient to include the assays also this may be done for $25.00 extra.

I understand that possible values consist in recently discovered showings of tungsten and special attention would be given to that phase. Also a brief study made of past history and contacts made if possible with persons familiar with underground conditions.

Of course I would have to have someone representing the owner or familiar with the layout show me over the property.

As to my qualifications I was gradruated as a mining engineer from Yale in 1909 and have spent most of my life since in active mining in the southwest. This has included the management of small mines and as field engineer for exploration companies. In 1944 I was appointed Director the Arizona Department of Mineral Resources, leaving same in 1951 to open my own consulting office. You might refer to Marquis' "Who's Who in the West".

I should also add that I am leaving for three months in South America on Jan 20th so it would be necessary to complete the proposed examination and report before that date.

Trusting that the proposal is satisfactory and thanking you for suggesting that I make it,

Yours Very Truly,

Dec 20th, 1955

Mr. Dave Jones,
Corps of Engineers, U.S.Army,
180 New Montgomery St.,
San Francisco, Calif.

Dear Dave:-

I have just gotten off the Fortuna report consisting of one original and 7 photostatic copies to the Corps of Engineer's office at Los Angeles. I attached invoice billing. I do not think that you or Mr. Hamlin will be much surprised at the tenor of the report.

I am leaving for S.A. on Monday - back April 2nd. I trust I have not overlooked any technicality in the billing or other matters. There will be someone in my office to take care of mail, deposit checks etc, and who will have our itinerary. But I hope I have done nothing wrong to cause your offices delay or embarrassment.

Thank you for your part in the matter and please extend my best regards to Mr. Hamlin who was a most delightful companion and valuable assister.

Sincerely,

E X C E R P T S

C O V E R I N G

L A F O R T U N A M I N E

Y U M A, A R I Z O N A

C O N T A I N E D I N:

UNIVERSITY OF ARIZONA BULLETIN No. 134

ARIZONA BUREAU OF MINES, GEOLOGICAL SERIES No. 7

MINERAL DEPOSITS SOUTHERN YUMA COUNTY

LA FORTUNA MINE

MINERAL DEPOSITS

The only mineral deposits of the Gila Mountains that have been worked at a profit are the Fortuna gold-quartz vein and the Gila City gold placers. Other gold-bearing veins, as well as deposits of marble, mica, and copper have been prospected to a minor extent.

LA FORTUNA MINE

SITUATION AND ACCESSIBILITY: La Fortuna gold mine is situated at the western base of the Gila Mountains, about 11½ miles south-southeast of their northern extremity. From the railway at Blaisdell station, it is accessible by some fifteen miles of unimproved road that crosses the Yuma-Gila Bend highway at a point 16½ miles from Yuma and continues, as the dim, western fork of the Camino del Diablo, southeastward beyond the mine, to Tinajas Altas. In former years, a wagon road, some twenty miles long, led from the camp eastward across the range to Wellton, but it mountainous portions are no longer passable.

HISTORY: The Fortuna vein was discovered between 1892 and 1895 by Messrs. Chas. Thomas, Wm. Holbert, and two other prospectors. For some years previously, gold had been known to occur in these mountains, but this vein had been overlooked by hundreds of skilled prospectors who, half a century earlier, had passed along the Camino del Diablo, within a few hundred yards of the outcrop.

In 1896, Mr. Chas. D. Lane, of Angels Camp, California, bought the property for $150,000, and organized La Fortuna Gold Mining and Milling Company. This company built a twenty-stamp mill, laid a pipe line to a shallow well near the Gila River at Blaisdell, and operated actively until the close of 1904.

The mine and mill employed 80 to 100 men who lived in the flourishing town of La Fortuna. Blake has described this town as follows: "This camp has been built up entirely by the merit of the vein or mine, and is sustained by that mine alone, for there are no other claims or mines being worked to any extent in that region. The camp consists of the usual motley assemblage of improvised houses, tents, and adobes, grouped irregularly around the mill of the company. We drove to the hotel, kept by a Chinaman, where we got most excellent meals, with good ice water, such as it was, somewhat saline to the taste, and as I afterwards found, capable of eating holes in wrought and cast iron."

The following additional notes on the history and production of the mine have been compiled by J. B. Tenney: The first four months' run netted $284,600, from ore taken out within 150 feet of the surface. In the next two years, the two-compartment inclined shaft was deepened to 350 feet, the vein was developed at 100-foot intervals, and the mill was run intermittently on ore from the development faces. Full production started in 1898. About 75 percent recovery was made in the mill, and, by the end of 1899, a 100-ton cyanide plant was constructed to treat the accumulated tailings which ran $5 per ton. The banner year for the mine was 1900 when a production of $467,700 was made from ore and tailings.

In 1900 and 1901, another shaft was sunk to an inclined depth of 1,000 feet, and much deep lateral work was done in an unsuccessful attempt to find

the faulted segment of the vein. From 1901 to the end of 1904, the mill was run on pillars above the 800-foot level.

As shown by the table on page 198, the total production of the mine from September, 1896, to December, 1904, was $2,587,987 in bullion sent to the Selby smelter.

The property remained dormant until 1913 when it was acquired by the Fortuna Mines Corporation which repaired the shafts and made a small production from pillars. This company also conducted brief exploration underground, but without success, and abandoned the project at the end of 1914.

In 1924, the Elan Mining Company purchased the seven patented claims of the property and patented five more. Five stamps of the old mill were reconditioned, the mine was reopened, and a small production was made. In 1926, after an unsuccessful program of searching for the lost vein, the mine was again closed.

Since that year, all of the easily removable surface property has gradually been stolen, and the shafts have caved at the surface.

TOPOGRAPHY: The Fortuna mine is at the western foot of the Gila Mountains, at an elevation of about 775 feet above sea level. The mountains here consist of sharp, rugged spurs, separated by westward-trending canyons which, near the margin of the range, are floored by dissected benches of detrital gravel and boulders. Along the margin of the plain is a dissected bench, from 25 to 150 feet high and up to 1½ miles wide, that represents an elevated pediment. This pediment, which shows only narrow, limited exposures on the hard rocks, is cut mainly on unconsolidated Tertiary (?) sediments, mantled by a relatively thin cover of gravels. Immediately west of the mine, it is surmounted by several relatively low, sharp, isolated, northwestward-trending ridges. The Fortuna vein outcrops a few feet above the alluvium at the northwestern tip of one of these ridges.

GEOLOGY: As shown in Figure 7, the Gila Mountains in the Fortuna region are made up of schist and gneiss, intruded by granite, amphibolite, and pegmatite. The general character and structure of these formations has been described on pages 184-189.

Plates 26 and 28 are general views of the schist in the vicinity of the Fortuna mine. In the low ridge that contains the vein outcrop, the schist strikes S. 80° W. and dips 50° S. At the northern end of this ridge, the glory hole, from which the vein outcrop has been mined, shows a fault that strikes S. 40° W., dips 70° SE., and contains about two feet of gouge. A thin, irregular vein of white, granular quartz which contains small, brown garnets and small, shiny masses of specularite occurs in the schist near its hanging wall. On the footwall side of this fault, the northern end of the ridge shows the following section:

SECTION ON FOOTWALL SIDE OF FORTUNA GLORY-HOLE FAULT

	Thickness in feet
1. Gray schist, marked by stripes of biotite and hornblende up to 0.05 inch wide and from 0.1 to 0.3 inch apart. Weathered surfaces greenish with chlorite ...	6
2. Black laminated schist, with numberous spots of white quartz up to 0.1 inch in diameter. Examined in thin section, under the microscope, this rock is seen to consist of long, thin, banded leaves of hornblende, alternating with banded aggregates of semi-rounded grains of quartz and unaltered andesine. The whole is cut by veinlets of secondary quartz ...	2
3. Like 2, but more quartzose	15

Thickness in feet

4. Gray, speckled, quartz-biotite schist that weathers greenish brown. Cleavage surfaces show numerous, radiating yellowish-gray needles. Microscopic examination shows this rock to consist of irregular quartz grains, up to 0.025 inch in diameter, together with similar grains of orthoclase and andesine-labradorite. The quartz is approximately twice as abundant as the feldspars. A few shreds of biotite appear in the section. These minerals are penetrated by long, tabular, radiating crystals of andalusite and pyroxene 4

5. Like 2, but with abundant small spots of clacite ... 3.5

6. Resembles 3, but finer grained and more sharply banded. Weathers brown 0.5

7. Like 2 2

8. Dark-gray quartz schist, sharply banded with hornblende. Cleavage surfaces show radiating needles of andalusite and pyroxene 6.5

9. Dense, finely banded, black schist 3.5

10. Mined out for width of five feet. Contains remnants of granular, faintly straw-colored quartz. marked in places with iron and copper stain.

11. Black schist, with gray quartzose bands up to 0.1 inch wide. Base concealed by alluvium. Microscopic examination of a specimen adjacent to the vein quartz of 10 shows an aggregate of hornblende, pyroxene, andalusite, epidote, biotite, quartz, and calcite, cut by coarse-grained, secondary quartz .....

STRUCTURE: The schist west, north, and northeast of the Fortuna mine prevailingly strikes S. 80° W. and dips 50° S., but, in the area immediately south and southeast, the strike changes to S. 80° E. Such variations in strike and dip are due to faulting.

The rocks of this vicinity have been cut by a network of faults. In some places, the faults are clearly visible, but most of them are obscured by local creep and talus. As revealed by test-pits sunk in talus-covered saddles, the straight gulches and canyons follow fault lines. Due to the rather obscure stratigraphy of the schist, the faulting of this region can be analyzed only after much detailed geologic work. During the present brief study, faults trending S. 35° E., S. 50° E., N. 80° E., N. 40° E. N. 5° W., N. 5° E., N. 20° W., and S. 70° E. were observed. Most of them dip steeply, but a few lie at low angles and may be of reverse character. Certain faults of the first three directions mentioned seem to be of the greatest magnitude, with displacements of more than 100 feet. Part of this faulting preceded the mineralization, and part was later. The earlier structures were responsible for the localization of the vein, and the later faulting is reported to have cut it off.

VEIN: The outcrop of the Fortuna vein has been almost entirely mined out through the caved stope, or glory hole, mentioned on page 192. This outcrop was within a fault zone that strikes S. 40° W., dips 70° SE., and cuts schist that in turn strikes S. 80° W., and dips 50° S. According to

Mr. F. J. Martin, manager of the property during most of its activity, the vein outcropped in two branches of which the main one was twenty feet long by a maximum of twelve feet wide, and the lower one was thirty feet long by a maximum five feet wide. He writes that these branches were a few feet apart at the surface, but joined at a depth of approximately 500 feet below the surface, and formed a continuous ore body from 1½ to twelve feet wide. The ore body was lost by faulting at about the 800-foot level, and only a small segment, between the 900- and 1,100-foot levels was found by further exploration.

Blake, who visited the mine in 1897, stated that the lode was a south-westward-pitching chimney with two branches that joined in depth, and that the hanging wall, for a width of two or three feet, contained small quartz stringers running parallel to the main body. He gives the following description of the temporary loss of the vein near the 500-foot level. "When the workings reached, or came near, the point of intersection of this big vein they suddenly came into a lot of barren ground; in fact, they ran out of ore and into rock. The ground above this rock was considerably broken, and between this rock and the hanging wall there was the merest seam, not thicker than a knife blade, if so thick . . . .In the mining parlance of the Cornishman it was a 'horse,' and a dead horse at that. As soon as the superintendent had cut through this rock mass he came into the unchanged ore or quartz below."

Blake also stated that "The vein probably does not measure more than 100 feet horizontally on the line of the drifts (at a depth of about 500 feet) . . .

"The quartz is without lamination or ribbon structure. It carries the gold throughout its substance in little grains, or particles.... It is a free-milling ore. A little green stain here and there indicates the presence of some copper ore, and copper was found in the bullion in more abundance in the upper levels than below, where there has been less decomposition of the sulphides.

"The gold is very fine and high grade, averaging .890 fine, and gives a pure, clean bullion."

According to Mr. F. J. Martin, the ore down to the 200-foot level averaged more than $30 per ton, and all of the rock milled averaged between $15 and $16 per ton.

As seen in specimens, the gold bearing quartz is coarse grained, vitreous, pale straw colored, and locally stained with malachite. Examined microscopically in thin section, it is seen to consist of irregular, interlocking crystals, up to 0.15 inch long by 0.07 inch wide, as shown by Plate 27-A.

Microscopic examination of a polished section of the high-grade quartz shows minute grains and small, irregular to interlacing veinlets of hematite, locally altered to limonite. The gold appears as round grains within converging, hair-like cracks, and also as thin, irregular veinlets within the limonite. These relations are illustrated in Plate 27-B.

The wall-rock alteration accompanying the Fortuna vein consists mainly of carbonatization and silicification. Andalusite, garnet, epidote, and pyroxene also occur in the adjacent schist, but they may have been developed prior to deposition of the vein. The wall-rock alteration, structure, texture, and mineralogy of this vein point to deposition in the lower portion of the mesothermal zone.

WORKINGS: The Fortuna mine workings include two inclined shafts, illustrated in Plate 28, together with several hundred feet of drifts, stopes, etc. The older shaft, which is on the ridge above the mill and some 250 feet southwest of the vein outcrop, inclines 60° in a N. 34° E. direction and is 350 feet deep. The lower shaft, which is approximately 100 feet southeast of the outcrop, inclines 58° in a S. 54° E. direction and is approximately 1,000 feet deep. When visited by the writer, these shafts were caved at the surface, and the workings were reported to be partly filled with water.

MILL: Blake has described the Fortuna mill of 1897 as follows:

"The gold is free; very little sulphides are found . . . The mill is fitted for free milling ore exclusively. The rock is broken by a Blake crusher high up, so as to give extensive bin space . . . In the material hoisted there are fragments of the wall rocks, some of which are thrown out, but many pieces pass through the mill. They would prefer to reject most of this wall rock, but it would take more time and expense than it does to mill it, and there is a chance of some of it containing gold . . . The stamps are of unusual weight, 13,500 pounds each, and the arrangements for catching gold are simple. Long silver plates or aprons of continuous sheets of silvered copper are used for the collection of gold. There are two tiers of these silvered plates at a very sharp incline, and each tier 25 feet long, falling about one inch in eight inches, as about the incline of descent. The gold passes over fifty feet of apron, and most of it is caught upon the silvered plates with the exception of that which is caught in the battery. After passing these silvered plates of fifty feet, all the tailings, water, and pulp are carried together in an ordinary wooden box sluice, where the current is swift enough to carry off the tailings, but this box sluice is provided with riffles, and it is about 150 feet in length, carrying the tailings to considerable distance away from the mill, and emptying them into a pond, where they are saved. In this long-tailed sluice box some amalgam is saved, for when it is cleaned, about every month or six weeks, they gather some $400 or $500 out of the tail sluices.

"Instead of amalgamation in the battery they have a lining of corrugated steel plates of unusual construction. These corrugated steel plates are placed at the back and at the ends of the mortar instead of across and upon the chock block in front. They may be described as a series of steel shelfs; the corrugations is to catch amalgam and retain it when it is splashed and thrown up in the battery, and it is such an effective retainer of the amalgam that after a month's run these troughs are nearly filled with solid amalgam, and the amalgam

may be lifted out in solid bars, like bars of solder. The function, then, of these corrugated plates is to catch the amalgam and prevent it dropping back under the stamps, which saves the wear and breaking up of the gold, and of course saves the loss of the very fine particles of gold which might be carried off by the strong current of water. These corrugated plates are found to work in a most satisfactory way, and to successfully replace the ordinary amalgamating plates in a battery."

In another article, Blake stated that "The bars poured are of large size and great weight, for greater security in transportation. They weigh usually from 150 to 200 pounds.

"For the first four months' run of the mill the yield was as follows: Ore crushed per day, 52½ tons; assay value of the ore per ton, $40; amount saved in the mill per ton, $35."

In 1899, a 100-ton cyanide plant was built to treat the large accumulation of tailings that contained $5 or so per ton.

According to Mr. F. J. Martin, manager of the property during most of its producing period, about 2,000 tons of ore per month, and a total of 185,000 tons, went through the mill. Approximately eighty percent of the gold was saved in the mill, and sixteen additional percent of it was recovered by the cyanidation.

References Quoted:

Eng. & Min. Jour., vol. 93, p. 372. 1912.

Blake, Wm. P., Report of the Territorial Geologist, in Report of the Governor of Arizona, 1898: Misc. Repts., Washington pp. 251-254. 1898.

Blake, Wm. P., The Fortuna gold mine, Arizona: Eng. & Min. Jour., vol. 63, p. 664. 1897

PRODUCTION, LA FORTUNA MINE

Data compiled by J. B. Tenney

Date	Price Silver	Ounces Silver	Ounces Gold	Total Value	Remarks
1896	$0.68	1,208.41	14,872.08	$ 308,224	June to December, La Fortuna Mining & Milling Co.
1897	0.60	1,283.09	15,789.92	361,522	La Fortuna Mining and Milling Co.
1898	0.59	1,563.48	15,976.13	331,121	La Fortuna Mining and Milling Co.
1899	0.60	1,595.12	21,078.75	440,770	La Fortuna Mining and Milling Co.
1900	0.62	1,447.40	22,596.58	467,960	La Fortuna Mining and Milling Co.
1901	0.60	783.35	11,994.46	248,411	La Fortuna Mining and Milling Co.
1902	0.53	662.09	9,576.94	198,319	La Fortuna Mining and Milling Co.
1903	0.54	603.88	6,730.95	139,820	La Fortuna Mining and Milling Co.
1904	0.58	1,032.59	4,414.69	91,840	
Total 1896-1904		10,179.41	123,030.50	$2,587,987	
1913-1914			435.00	9,000	Fortuna Mines Corporation (est.)
1926			774.00	16,000	Elan Mining Company (est.)
Total 1896-1926			124,239.00	$2,612,987	

IN REPLY REFER TO:

United States Department of the Interior

OFFICE OF HEARINGS AND APPEALS
INTERIOR BOARD OF LAND APPEALS
4015 WILSON BOULEVARD
ARLINGTON, VIRGINIA 22203

Savage

UNITED STATES
v.
EVA M. POOL ET AL.

IBLA 82-39 Decided January 6, 1984

Appeal from the decision of Administrative Law Judge Robert W. Mesch declaring mining claims and millsite claim null and void. AZ 13970 through AZ 13973.

Affirmed in part, reversed in part.

1. Evidence: Burden of Proof--Mining Claims: Contests--Mining Claims: Determination of Validity--Mining Claims: Discovery: Generally

When the Government contests the validity of a mining claim on the basis of lack of discovery, it bears only the burden of going forward with sufficient evidence to establish a prima facie case. Once a prima facie case is presented, the claimant must present evidence which is sufficient to overcome the Government's showing on those issues raised.

Where the Government fails to present sufficient evidence to establish a prima facie case, the claimant need not present evidence in order to prevail. If a claimant, however, does present evidence, the determination of the validity of a claim must be made on the basis of the record as a whole, and not just a part of the record. A claimant need not affirmatively establish the existence of a discovery where there has been no prima facie case. The only risk that the claimant runs in such a situation is the risk that the evidence as a whole will establish by a preponderance of the evidence that an element of discovery is not present.

APPEARANCES: Stephen P. Shadle, Esq., Yuma, Arizona, for appellants.

INDEX CODE: None

OPINION BY ADMINISTRATIVE JUDGE BURSKI

Eva M. Pool and others 1/ have appealed from the decision of Administrative Law Judge Robert W. Mesch, dated September 1, 1981, declaring 10 lode mining claims and 1 millsite claim null and void. 2/

This case involves consolidated contest proceedings, AZ 13970 through AZ 13973. On July 7, 25, and 29, 1980, the Bureau of Land Management (BLM), on behalf of the Army Corps of Engineers, filed contest complaints against appellants' mining and millsite claims. The claims at issue are within the Luke Air Force Gunnery and Bombing Range. They are also immediately adjacent to the patented La Fortuna mining claims which had been the site of a substantial gold discovery, around the turn of the century. The La Fortuna mine closed in 1904 when the main vein was lost at the Queen fault. No gold production has occurred from the La Fortuna since that time.

With respect to the lode mining claims involved herein, BLM charged, inter alia, that all of the subject mining claims were invalid because valuable mineral deposits had not been discovered as of August 24, 1962, or at the time of the hearing, and that the land within the claims was nonmineral in character. 3/ In addition, BLM contended that the claims were not marked or monumented on the ground so that their boundaries could be readily traced. With reference to the Pool millsite claim, BLM contended that it was invalid because (A) the land was not being used or occupied for mining or milling purposes in connection with the associated mining claims, and (B) the land did not contain a quartz mill or reduction works.

A hearing was held on March 30, 1981, at Yuma, Arizona. On September 1, 1981, Judge Mesch issued his decision holding all of the claims and the millsite to be invalid. Claimants have appealed to this Board.

Initially, prior to analyzing the testimony and evidence presented with respect to the individual claims, it is necessary to address a factual question which was the source of much confusion at the hearing, i.e., the situs of the claims on the ground. Since at least the early 1960's 4/ the property has been leased by the Department of Defense for use as a part of a

1/ The appellants are Eva M. Pool, Wilda Louise Myrick, Silvia Marjorie Pool, Ronald A. Pool, Phillip A. Emanuel, and Jean Emanuel.
2/ The claims are: Barbara, White Rock, and Beehive lode mining claims (AZ 13970); Arizona and Red Top lode mining claims (AZ 13971); Hillside, Little Gem, and Red Rock lode mining claims (AZ 13972); and Water Hole Nos. 1 and 2 lode mining claims and Pool millsite claim (AZ 13973).
3/ The contest also charged that the claims (with the exception of the Arizona and the Red Top claims) had not been properly recorded pursuant to section 314 of the Federal Land Policy and Management Act of 1976, 43 U.S.C. § 1744 (1976). No evidence was presented by the Government as to this allegation and this charge was dismissed by Judge Mesch at the hearing. See Tr. 121. The Government has not challenged this action before the Board.
4/ While the lease was signed in 1962, contestees' access to the claims was affected nearly a decade earlier. As Emanuel testified, in the early 1950's "one morning when we got up and went out to work on our mine, why, here was the airplanes over the top of us. * * * [W]e knew we had to get out of there, because, yes, they started the gunnery work and bombs" (Tr. 167).

bombing range. During this period of time, the monuments have been destroyed. Moreover, the actual location notices were tied to each other, rather than to a fixed landmark, so it is impossible to independently reestablish the claim locations at this time.

The Government introduced a map prepared by the Department of the Army showing the claims and upon which had been placed location of sample sites (Exh. E). This map, however, which served as the basis of reference for the Government's expert testimony, contradicted the recollection of Phillip H. Emanuel, a co-locator of a number of the claims who had actually worked the claims.

Emanuel had accompanied the Government mineral examiners in their sampling, and had indicated on which claims he thought values could be found. The conflict became obvious when the sample sites were placed on the Government map. Thus, samples which Emanuel thought should be on the Waterhole No. 2 claim were placed on the Hillside claim, samples from the Little Gem claim were placed on the Red Rock claim, and, in fact, the relative placement of the adjacent Waterhole Nos. 1 and 2 claims was reversed from what Emanuel thought it should be. One anomalous result was that while Emanuel told the examiners that there were no values on the Hillside claim, the Government map showed that the highest values occurring anyplace were on that claim.

In his decision, Judge Mesch noted that he accepted Emanuel's identification of the claims over the identification shown on the Corps of Engineers map (Decision at 6). We agree with this approach for a number of reasons. First of all, there was no real foundation laid as to how the Corps' map was developed. While the Government examiners utilized the map, they had no knowledge of who made it or on what basis the claim boundaries were delineated (Tr. 23). Second, the only person who possessed actual knowledge as to the claim boundaries was Emanuel, and on this question we believe his testimony should be accorded substantial weight.

Finally, we are mindful of the fact that the claims were apparently well monumented prior to the Government's acquisition of a leasehold interest (Tr. 147-48). The destruction of the monuments was, at a minimum, the result of Government neglect if not affirmative Governmental action in using the claims as part of a gunnery range. Having deprived the contestees of the only independent means to establish the claim corners since the location notices are inadequate for this purpose the Government should not now be allowed to challenge contestees' assertion of where the claims actually were.

In this regard, we view the Government's contention that the claims should be declared invalid because "the claims are not marked or monumented on the ground so that the boundaries can be readily traced" with incredulity. In the first place, as written, the allegation fails to state an adequate ground for the invalidation of a mining claim. While it is true that a lode claimant must monument claim corners in locating a claim (30 U.S.C. § 28 (1976)), the subsequent obliteration of these monuments does not invalidate the claim where the destruction is not caused by the claimants. See, e.g., Larned v. Dawson, 90 F. Supp. 14 (D. Alaska 1950). Absent an allegation that claimants were responsible for the present lack of monumentation or that the claims had never been monumented, the charge in the complaint was premised on a misperception of law.

We recognize that there could be situations where it is impossible to establish the exact situs of the claims from the location notices and thus the failure to maintain monuments might make it impossible to delineate the claims. Such, indeed, occurred in United States v. Independent Quick Silver Co., 72 I.D. 367 (1965),[a] aff'd sub nom. Converse v. Udall, 262 F. Supp. 583 (D. Ore. 1966), aff'd, 399 F.2d 616 (9th Cir. 1968),[b] cert. denied, 393 U.S. 1028 (1969). But, as a reading of that decision makes clear, the result in such a case is not invalidation of the claims. The holding of the Department was not that the disputed Bonanza claim was invalid for lack of monumentation, but rather that there was no discovery within that claim. Id. at 378-79. An inability to locate claim boundaries which results from failure to maintain monuments may make it more difficult for a claimant to establish that discoveries exist on specific claims, but it does not, by itself, necessarily invalidate the claim. See United States v. Christensen, A-27549 (May 14, 1958).

In any event, even if it could be argued that the failure to maintain monuments might work to invalidate claims in some circumstances, 5/ such a standard could scarcely be applied in the instant case where the Government was either the direct or indirect agent of the monuments' obliteration. We expressly reject this charge.

In his decision Judge Mesch bifurcated his examination of whether the Government had presented a prima facie case. Insofar as the Barbara and the Hillside claims were concerned, Judge Mesch noted that Emanuel had indicated to the Government mineral examiners that there was nothing worth sampling on the claims (Tr. 64). Judge Mesch found this sufficient to establish a prima facie case, noting:

> The sole function of a Government mineral examiner in examining a mining claim is to verify whether the mining claimant has, in fact, found a valuable mineral deposit. He has no obligation to explore or sample beyond those areas which have been exposed by the claimant and which, according to the claimant, constitute the discovery of a valuable mineral deposit. Hallenbeck v. Kleppe, [590 F.2d 852 (10th Cir. (1979)]; United States v. Porter, [37 IBLA 313 (1978)].[c] The recognition made by the contestees' representative that the two claims were not worthy of sampling constitutes a prima facie case in support of the allegations that the claims are invalid because they were not timely perfected and are not presently supported by the discovery of a valuable mineral deposit.

(Decision at 7-8). We agree.

5/ We do recognize that a lack of monumentation together with an inadequate description may render a location so indeterminate as to leave the ground open to subsequent location by another. See Flynn v. Velvelstad, 119 F. Supp. 93 (D. Alaska 1954). But, as noted in that decision, actual knowledge of the claims would be equivalent to valid record notice. Id. at 96. Given the facts of this case, such knowledge must clearly be imputed to the Government.

a) GFS(MIN) SO-40(1965)
b) GFS(MIN) JD-4(1968)
c) GFS(MIN) 114(1978)

With respect to the other claims, however, Judge Mesch found that no prima facie case was presented by the Government. The reason for his finding lay in the unwillingness of the Government's mineral examiner, William Nelson, to express an expert opinion as to the existence of a discovery once he was apprised of the fact that, contrary to his instructions, the assay of the samples which he had taken was performed by atomic absorption rather than fire assay (Tr. 102-03, 122-28). Judge Mesch quoted the following exchanges from the transcript:

> JUDGE MESCH: Well, do you feel comfortable with the assay certificate that you received? Bear in mind, you're using that to base a professional opinion on as to the validity of these claims. Now in view of what has all developed, do you feel comfortable with that assay certificate in stating this professional opinion?
>
> THE WITNESS: No. Not as comfortable as I would be if I had the -- I don't believe that the -- I believe that the fire assay would be the way to have done these things. I couldn't — I'm not as comfortable with these samples here, the results.
>
> JUDGE MESCH: Do you think that in view of what has developed that the proper thing to do would be to get a fire assay on the samples?
>
> A. Yes, at least spot check these against something that we've already sampled through here, yes.
>
> * * * * * * *
>
> JUDGE MESCH: * * * Do you feel, under the circumstances, that the claims ought to be reexamined and new samples taken, rather than base your professional opinion on this assay certificate?
>
> THE WITNESS: I think that would be a proper thing to do, but — I can't refute that these samples may not be good samples. (Tr. 126, 127)

(Decision at 6-7). We agree with Judge Mesch that Nelson's disclaimers totally undermined his prior testimony as to a lack of discovery and rendered his expert opinion valueless in the instant hearing.

A word of caution, however, is in order. In United States v. Hooker, 48 IBLA 22 (1980),[d] we held that where a mineral examiner utilizes an erroneous standard in determining whether a discovery has been shown to exist, his expert opinion that there has been no discovery is insufficient, of itself, to establish a prima facie case. But we noted that "while the mineral examiner's ultimate conclusion of invalidity may have been rendered fatally defective because of the application of improper standards, this in no way tainted the other testimonial evidence which he gave." Id. at 31. In the instant case, while obviously no value could be placed in Nelson's earlier expressed opinion as to the claims' invalidity, we do not believe the assay report to be totally worthless.

While the atomic absorption method is not as universally accepted in the mining industry as is the standard fire assay, it is, nevertheless, a

d) GFS(MIN) 126(1980)

recognized test of gold content. 6/ In point of fact, a number of the assays showed appreciable amounts of gold. Thus, sample Little Gem #1 showed 1.04 ounces per ton gold and 0.25 ounce per ton silver. See Exh. I. While Nelson had conceded that these assays showed high quality he contended that there was insufficient quantity of such material to warrant the development of a mine (Tr. 116). We will examine the question of the quantity of minerals exposed, infra. But, it is our view that, despite the failure of the Government to establish a prima facie case, it is not necessary to totally ignore the values disclosed in the assays which were performed. This point becomes relevant since, as Judge Mesch noted, appellants failed to move to dismiss the contest but rather proceeded to present their case. And, it is here that their problems arose.

[1] As has been well established, when the Government contests the validity of a mining claim on the basis of lack of discovery, it bears only the burden of going forward with sufficient evidence to establish a prima facie case. Once a prima facie case is presented, the claimant must present evidence which preponderates sufficiently to overcome the Government's case on those issues raised. United States v. Springer, 491 F.2d 239, 242 (9th Cir.), cert. denied, 419 U.S. 834 (1974); Foster v. Seaton, 271 F.2d 836 (D.C. Cir. 1959); United States v. Rice, 73 IBLA 128 (1983).[e]

If the Government fails to present sufficient evidence to establish a prima facie case, the claimant not need present any evidence in order to prevail. But, should the claimant proceed to present evidence, the evidence which he tenders must be considered and the deficiencies in the Government's presentation may, in effect, be remedied where the contestees' evidence supports the allegations made in the contest complaint. United States v. Rice, supra; United States v. Beckley, 66 IBLA 357 (1982);[f] United States v. Taylor, 19 IBLA 9, 82 I.D. 68 (1975).[g] We wish to make it clear, however, that the mere fact that the contestee elects to proceed with the presentation of his case does not mean that he therefore must preponderate on the issues raised in the contest. The requirement of preponderation only arises as to issues for which the Government has presented a prima facie case. Where there is no prima facie case, there can be no issue on which a claiment must preponderate. The only risk that the claimant runs is the risk that the evidence as a whole will prove that an element of discovery is not present. Inasmuch as contestees chose to present evidence, Judge Mesch proceeded to consider contestees' testimony.

After setting forth relevant parts of the testimony of Emanuel and his expert witness, John O. Rud, Judge Mesch stated:

> The contestees did not present any evidence from which any conclusions might be drawn as to (1) the amount of mineralization within any one of the contested claims that might be available for extraction, or (2) the value of the mineralization that might be extracted. Without some information relating to each of the factors, no one could conclude that a mineral deposit has, in

6/ Indeed, it is generally accepted that fire assaying should not be used to sample placer gold. See Wells, Placer Examination: Principles and Practice at 91.

e) GFS(MIN) 13(1983)
f) GFS(MIN) 26(1982)
g) GFS(MIN) 1(1975)

> fact, been found within any one of the contested claims of sufficient quantity and quality to justify the development of a mine. Accordingly, I cannot find from the contestees' evidence that any one of the claims was timely perfected and is presently supported by the discovery of a valuable mineral deposit.

The problem we have with this analysis is that it presupposes an affirmative obligation on the contestees to establish the existence of various elements necessary to sustain a finding of discovery where the Government has failed to establish a prima facie case on any one of them. No such obligation existed except for the Barbara and Hillside claims for which the Government did establish a prima facie case, and even for those claims, contestees were only required to preponderate over the Government's showing. See United States v. Hooker, supra; United States v. Taylor, supra. The decision imposed a burden of proof where no such burden existed.

While the application of an erroneous test might normally result in the reversal of a decision on appeal, our independent review of the evidence and testimony adduced, particularly that supplied by Rud, convinces us that all of the mining claims involved, with the exception of the Waterhole Nos. 1 and 2, and the Little Gem claims, were properly declared null and void. We shall set out in some detail the testimony that impels us to this conclusion.

First of all, we would point out that none of the evidence presented by contestees contradicted their earlier statements that the Hillside and Barbara claims were invalid. Indeed, their only concern with these two claims was the fear that the workings which they had assumed were on the Waterhole No. 1 and Waterhole No. 2 claims might actually be on the Hillside and Barbara claims if the Government's placement of the claims was correct. 7/ Since, however, we agree with Judge Mesch's determination that Emanuel's recollection should control the situs of the claims, all of the workings do, in fact, fall within the Waterhole Nos. 1 and 2 claims. Therefore, the decision of Judge Mesch as to the Hillside and Barbara claims is affirmed.

Emanuel testified at some length concerning matters surrounding the original location of the claims. According to Emanuel, the claims were originally located in the 1940's by Will Pool (Tr. 139). Emanuel became involved about 1950 when he commenced working on the vein which traversed the Waterhole Nos. 1 and 2 claims (Tr. 142). He noted that just before the Air Force moved in they had sunk a shaft approximately 30 to 40 feet on the Waterhole No. 2 claim and discovered a vein of nearly pure tungsten (Tr. 145-46). Emanuel testified that while they had removed and stockpiled a good

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7/ Thus, Emanuel noted that:

"Well, now that we find that what we thought was Waterhole No. 2 shows to be on the Hillside claim, I had a first doubt that the Hillside didn't have anything on it, but according to their map and the information we have now, the Hillside claim is our main claim. So the Waterhole claim is also a main claim, and Mr. Pool told me when I went out there with the engineers, that the Barbara claim had a very nice showing of gold on it, but I never could find it. But he claimed that there was a nice showing of gold on there." (Tr. 169-70).

amount of tungsten, they had been forced to abandon it when the Air Force commenced using the land and subsequently acquired the lease, and he asserted that the Air Force had apparently allowed various trespassers to remove the stockpiled ore as none was now present (Tr. 159, 185-86). No samples were taken for tungsten as the shaft had caved by the time the mineral examiners visited the claim (Tr. 147).

It is evident that the main focus of activities was on the two Waterhole claims, as is made clear in the following exchange relating to the possibility that the main workings were, as the Government contended, within the Hillside claim:

> Q. [By Shadle] Is that one of the reasons that you blanketed the area with claims, so that you'd be sure and have your location within one of the claims?
>
> JUDGE MESCH: Workings.
>
> Q. Workings within one of the claims?
>
> A. We knew the whole area to be mineralized, and all this property that you see on this BLM-E map was open for location. And we did it to protect ourselves, which is of course a general practice in a mining area, to locate a lot of claims to protect your main discovery claim, and also because we did think that the other claims had merit. And we wanted to locate them and get them secured before somebody else did it, because they were open to location at that time.

(Tr. 155).

When asked what where the values on the various claims Emanuel testified that in addition to the Waterhole claims, which he referred to as "main claims"

> [t]he Beehive claim has got good values on it; the Red Rock claim has got good values on it. The Little Gem has got good values on it. The Red Top might be questionable; I'm not going to say because it seems as though there's a controversy over where the location of that shaft is, whether it's on the Red Top or whether it isn't. The White Rock, I think when you receive the testimony from our geologist, you'll find that the White Rock has tremendous potential, and also the Arizona. And the Red Top.
>
> Anyway, I would say, looking over the whole deal, that as a mining property the entire thing should be retained as a unit, yes.

(Tr. 170).

Subsequently, Emanuel stated that he had located the Red Top claim because of the existence of a "very nice-appearing shaft with nice-looking quartz on it, and also it was in an area that we wanted to take control of" (Tr. 181). When the Government's counsel examined the witness as to the area of the strongest showing, Emanuel replied:

A. Well, we're going to refer to it as Waterhole 2, because I still think that's where it is. Yes, that has been our strongest showing, and however, there is a very strong, heavy vein on Waterhole 1 that I would like very much to follow up someday. And there are other claims that have a tremendous potential due to the geological structure of the area, and I think you'll get further information on that from my geologist.

(Tr. 184-85).

Appellant's geologist, John O. Rud, who specialized in small mines, testified that he visited the claims at the contestees' request and took a number of samples. Because of the importance of his testimony we will set it out in some detail. Rud testified that he spent 2 days on the claims and took eight samples from the Waterhole Nos. 1 and 2 claims (Tr. 195). Rud stated that he took his samples to show the continuity of the mineralization within the structure (Tr. 197). Four of the samples showed no gold, one showed a trace, and the highest of the remaining three was 0.096 ounce per ton substantially less than a number of the Government samples. Compare Exh. T with Exh. 27. It should be noted, that all of Rud's samples showed higher silver values than any of the Government samples, with one sample assayed at 2 ounces per ton.

More critical, however, were some of the conclusions which Rud drew from his examination of the claims, particularly related to the question of whether there was sufficient tonnage to warrant development:

Q. [By Shadle] At today's price of gold, first of all, and then we'll relate it back to 1962, but what about at today's price of gold with the assays that you found, what are your conclusions and recommendations concerning the mineral deposits on the Emanuel-Pool claims?

A. Well, if you're -- if you had such an excellent producer -- it is a good gold producer with this much interest in gold today, and so forth, and any claims surrounding that Fortuna district would be of value to -- if you could get in there and do some work. Mainly exploration work, structural, stratigraphic, work to find this faulted sgement. It would -- it would just -- it's just an excellent target. [Emphasis added.]

(Tr. 205-06).

Q. [By Goreham] So based on your -- as you stated in your report, Exhibit 26, based on your examination on the ground and also your readings of the La Fortuna -- the history of the La Fortuna, you'd recommend exploration work?

A. Yes, I would. I wouldn't -- like I say, I would recommend stratigraphic structural studies and then put the drills out there. And drilling the anomalous zones as you -- putting that structure back together to find that lost segment. Now where it is, everybody's got their own opinion, it's to the

southwest. That covers a lot of ground, of course, but it's got to be there. [Emphasis added.]

(Tr. 212-13)

It is clear from the record that Rud thought the contestees' claims had value as an area to search for the old Fortuna segment. As was noted above, the La Fortuna mine had closed in 1904 when they lost the vein they had been mining at the Queen fault. What Rud was hypothesizing was that contestees might be able to find the continuation of the Fortuna vein on their claims. That is the basis of his expert opinion as to the claims' validity. Indeed, his testimony merely reiterated the conclusions of his written report. Thus, he had noted:

> At today's prices of gold the faulted segment of the Fortuna vein represents a excellent and viable exploration target. The exploration would be guided by thorough stratigraphic and structural studies that would include the Emanuel mineral claims.
>
> Primary targets are located on the White Rock and Arizona mineral claims since they lie in the area of the known strike of the Fortuna vein. The faulted segment of the vein has been searched for by past prospectors but no modern day attempt has been made utilizing geochemical and geophysical techniques presently available.

(Exh. 26 at 3-4).

The entire thrust of Rud's testimony leads to the inescapable conclusion that, however good a prospect these claims may be, they are still, nevertheless, only a prospect. As Judge Mesch noted, evidence which merely shows that the claims might warrant further exploration does not establish the existence of a discovery of a valuable mineral deposit. Barton v. Morton, 498 F.2d 288 (9th Cir. 1974); Henault Mining Co. v. Tysk, 419 F.2d 766 (9th Cir. 1969).[h]

We noted above that, in the absence of a prima facie case, no burden devolves upon a claimant to affirmatively show the existence of a discovery. In the instant case, however, contestees' testimony, particularly that of Rud, would, we believe, justify the conclusion that no discovery existed on any of the claims. The values disclosed by Rud on the Waterhole Nos. 1 and 2 claims were minimal and his sampling to show the continuity of the vein structure actually supported the Government's assertion that the high values disclosed on the Waterhole Nos. 1 and 2 claims were isolated showings. Indeed, Rud actually discounted the highest Government assay noting that "there's no way you're going to hold tonnage at an ounce and a half, you know" (Tr. 208). But, the proper test requires advertence to the entire record and when the Government assays are considered in conjunction with the testimony of Emanuel we feel that the contest should be dismissed with reference to three claims: the Waterhole No. 1, the Waterhole No. 2, and the Little Gem.

First of all, the Government assays of these claims were sufficiently high to support a finding of a discovery if sufficient quantity could be shown to exist. While the Government mineral examiners expressed the view

h) GFS(MIN) JD-3(1970)

that quantity was lacking, the subsequent confusion over the taking of the assays deprived this opinion evidence of much of its force. Emanuel, on the other hand, was quite certain in his own mind as to the value of the two Waterhole claims. We wish to make particular advertence to the issue of the discovery of tungsten in the caved shaft.

Normally, a claimant is expected to keep his workings available for inspection. Thus, if a claimant contends that the values can be found at depth, but the shaft is either caved or cannot safely be entered, the mineral examiner has no obligation to either imperil himself or retimber the shaft. See generally United States v. Hess, 46 IBLA 1, 5 n.1 (1980).i/ However, that rule presupposes that the claimants had access to the claims and could be held responsible for any deterioration which occurred. In the instant case, in contradistinction, the Government held a lease on the land. Thus, it was the Government's obligation not to destroy evidence necessary for the claimant to show his entitlement to a patent. It seems clear that the destruction of the shaft occurred after the Government took possession. This being the case, it was the Government's obligation to restore the caved shaft to its prior condition so that an adequate examination could be made. Failing in that, the Government will not be heard to contest an assertion of a claimant that a discovery existed at depth. Thus, for this reason alone we would reverse the decision of invalidity as it related to the Waterhole No. 2 claim. 8/

Considering all of the relevant and probative evidence of record, we conclude that the evidence clearly establishes that there was no discovery on the Hillside, Barbara, Beehive, Red Rock, Red Top, White Rock, and Arizona lode mining claims. Accordingly, Judge Mesch's determination that these claims were invalid must be affirmed. Insofar as the Waterhole No. 1, Waterhole No. 2, and the Little Gem lode mining claims are concerned, the evidence does not establish that they are invalid, and since the Government failed to establish a prima facie case of invalidity, the contest is properly dismissed as to these three claims. In addition, since it is impossible to find that all of the mining claims are invalid, it follows that the contest must be dismissed as to the Pool millsite claim, as well.

Therefore, pursuant to the authority delegated to the Board of Land Appeals by the Secretary of the Interior, 43 CFR 4.1, the decision appealed from is reversed as to the Waterhole No. 1, the Waterhole No. 2, and the

8/ This case is clearly distinguishable from our recent decision in United States v. Rosenberger, 71 IBLA 195 (1983).j/ As the Board found in that case, the testimony established that claimants had been searching for a deposit of copper thought to exist below the shaft, and there was nothing in the record to indicate that an actual ore body had ever been exposed. Id. at 201. Here, with reference to the discovery of tungsten, claimants directly asserted that a discovery had been made prior to the Governmental actions in obtaining possession of the land. Thus, their inability to prove that a prior discovery existed would be causally linked to the Government's failure to maintain the shaft in the condition which existed upon the Government's taking possession. In Rosenberger, since the evidence failed to support any claim of a prior existing discovery, no such linkage existed.

i) GFS(MIN) 40(1980)
j) GFS(MIN) 76(1983)

Little Gem lode mining claims, reversed as to the Pool millsite claim, but affirmed as to all of the other claims for the reasons stated herein.

James L. Burski
Administrative Judge

I concur:

C. Randall Grant, Jr.
Administrative Judge

ADMINISTRATIVE JUDGE MULLEN CONCURRING WITH RESULTS IN PART AND DISSENTING IN PART:

I have no quarrel with the majority dismissing the contest against the Waterhole No. 1, Waterhole No. 2, and Little Gem lode mining claims and the Pool millsite claim. For the most part, I find no fault with their statement of the law or the conclusions based upon their application of the law cited. I do have a serious problem with their acceptance of an underlying premise which is the foundation for their finding that the remaining claims are invalid.

In order to understand the basis of this premise, one must look at the circumstances surrounding the typical mining claim contest case. In the "normal" case, the claimant has free access to his property, has the ability to develop this property and, therefore, should be more familiar with this property than the contesting Federal agency. This being the case, the Government is required only to come forward with a prima facie case that the claim is invalid because it lacks one or more of the elements critical to the existence of a valid claim, usually an element of discovery. If sufficient evidence is presented to raise a reasonable question regarding the validity of the claim, the contestant has established the "prima facie" case. The claimant then must come forward and demonstrate that the conclusion drawn by the witnesses for the contestant was either wrong or was not supported by sufficient evidence. To hold otherwise would place the contestant in a position of having to prove something when the proof is more logically in the hands of another. The claimant should have the knowledge, experience, and familiarity with the property to be able to come forth with the proof, if the proof is available. This method of presenting and trying a mining claim contest is, in the normal case, the best balance between the respective interests and expertise of the opposing parties.

While Congress and the courts do not require that a claimant possess an expertise or intelligence greater than an ordinary prudent man, the proof of existence of a discovery is a complex matter hinging on the presentation of detailed physical facts. The shift of the burden of proof is justified because the claimant, in the normal case, has the most direct knowledge of these facts through experience gained when exploring for the valuable minerals and finding the discovery. The claimant, in the normal case, knows or should know the location of this discovery, its extent, and the quality of the mineral discovered and has or is in the best position to obtain the documentary and physical evidence necessary to demonstrate these facts. The underlying basis for the burden of the claimant is the comparative availability of material evidence to the respective parties. There is little doubt that, in the normal case, the material evidence is more readily available to the claimant. 1/

1/ This is the second case involving the same appellants that this author has considered. In Eva M. Pool, 74 IBLA 37 (1983),[k] I found that certain claims owned by appellants were invalid. In that case, the contestant conceded that there was sufficient material of sufficient quality to be mined but presented evidence that the market for the mica of a grade found was such that the mineral could not be sold at a profit under present market conditions. With respect to the availability of evidence regarding the existence

k) GFS(MIN) 160(1983)

The basis for the Government's challenge is usually the claimant's failure to have made a discovery within the confines of the claim. The claimant who fails is, in the normal case, the claimant who cannot show the existence of valuable mineral in such quantity and of such quality to warrant the development of a mine. This failure can come about by the lack of evidence, or by a poorly presented case or by the admissions of the claimant that he or she has not yet found sufficient mineralization to warrant the development of a mine.

The determination that the property is not sufficiently mineralized to warrant the development of a mine often comes about when the claimant admits that further exploration is needed prior to development. If a claimant, in the normal case, draws this conclusion, the judge hearing the case should be able to rely on the claimant's judgment. He or she is the party who best knows the property.

Not every case that reaches this Board is a normal case. Special care should be taken to determine if there is something about the case which differs from the norm. If there is an unusual circumstance, the circumstance should be analyzed to identify the party who has caused this set of circumstances to arise and the effect of this action on the ability of the other party to present its case. For example, if a claimant fails or refuses to keep the discovery points open for inspection by the mineral examiner, the claimant cannot challenge the contestant's case on the basis that the mineral examiner did not open those discovery points and sample at the inaccessible faces. The property is under the control of the claimant and if he desires to have samples taken at a specific place, that place should be made available to the mineral examiner. See United States v. Cook, 71 IBLA 268 (1983);[1] United States v. Anderson, 57 IBLA 256 (1981);[m] United States v. Polashek, 57 IBLA 104 (1981).[n] If a party to a contest causes there to be circumstances that hamper or preclude the other party from presenting evidence in support of the case, the lack of evidence should not be used against the party so hampered or precluded. See United States v. Foresyth, 15 IBLA 43 (1974).[o]

Many of the facts in this case have been cited in the majority opinion. In order to emphasize the factors which I believe differentiate this case from the "normal" case, certain of these facts should be restated.

The individual who was the "moving" party with respect to the location and subsequent work on the claims which are subject of this appeal was William A. Pool. Pool was a Spanish American War veteran who settled in southern Arizona. He worked in the Fortuna mine during the period of time that it was in operation and became familiar with the Fortuna ore and mining

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fn. 1 (continued)
of a market for mica the appellants stood on an equal footing with the contestant. In that case, appellants failed to present sufficient evidence that there was a market for the product. The only evidence presented was the unsupported evidence with respect to lower transportation costs. In this case, there is no question regarding the market for precious metals and the contestant presented no evidence with respect to the market for tungsten.

1) GFS(MIN) 77(1983)
m) GFS(MIN) 285(1981)
n) GFS(MIN) 266(1981)
o) GFS(MIN) 27(1974)

conditions. The Fortuna mine, which is located on claims adjacent to appellant's, was one of the largest gold producers in Arizona, but was shut down after the main vein was found to be faulted off and could not be found beyond the fault. Following the closure of the Fortuna mine Pool began prospecting in the area immediately surrounding the patented Fortuna claims.

In about 1940 Pool built a cabin on the Pool millsite and lived at the property during all but the hottest months of the year. He continued to develop these claims until about 1947 when he determined that because of his age it would be best to sell the claims. About this time his son-in-law Emanuel approached Pool and suggested that he, Emanuel, finance the development of a mine. Subsequently, they began developing the Waterhole No. 1 and Waterhole No. 2 claims. As is typical in such operations, they soon needed additional financing and sought out Pool's son and a third party to aid in the development. About this time the "black light" was developed and, using a black light, tungsten ore was found on the claims. The parties began extracting tungsten ore as well as gold ore. The operation was conducted with as little expense as possible and the underground openings were driven on the veins whenever possible. Some gold ore was shipped to Wickenberg, Arizona. The operation continued until 1952. During this time certain of the claims under review were either located or relocated. While Emanuel aided in monumenting these claims, it is clear that Pool remained the guiding force in the operation and made the determination regarding the ground to be located and the position of the claims.

In 1952, the Air Force expanded the Luke gunnery and bombing range to include the lands occupied by the mining claims and millsite. Pool and appellant Emanuel first learned of this action when the area occupied by them was used for gunnery practice while they were still on the claims. Pool and Emanuel contacted the Air Force and were referred to the Army Corp of Engineers. The Army Corps of Engineers then entered into negotiations for the lease of the property. In conjunction with the negotiations an examination and evaluation of the property was conducted by the Army Corps of Engineers. Emanuel aided the Corps representatives in their examination and evaluation. As a result the Army Corps of Engineers entered into a 5-year surface lease of the property in 1953. By this time the third party had withdrawn from the partnership and Emanuel and Pool's son relinquished their interest in the claims to Pool. The lease was therefore only between Pool and the Corps. At the time of the initial negotiations, Pool and Emanuel were advised that the lease would be exclusive and that they would not be allowed to go on or work the claims in any way during the term of the lease. They took the Corps at its word. Pool never returned to the property and Emanuel did not return to the property until 1978. In 1958 the lease was extended for an additional 5-year period. In 1962, the land was withdrawn from mineral entry by an act of Congress. In 1963, and at the end of each 5-year period until 1978 the lease was again extended. In 1969 or 1970 Pool died. In 1972, his son died. The appellants in this case, including Emanuel, are Pool's heirs.

In 1978, the Department of Defense determined that it would be in its best interest to acquire all outside interests in the area of the Luke bombing and gunnery range. In furtherance of this goal, condemnation actions were initiated against the property, naming the heirs of Pool as defendants. The lease was not renewed and no further lease payments were made. At the same time the Army Corps of Engineers made a formal request that a mining claim contest action be brought against appellants by BLM.

In preparation for this contest mineral examiners were sent to examine the claims. These examiners contacted Emanuel and asked him to accompany them during an examination of the claims. In 1978, Emanuel went to the claims with the examiners, thinking that the examination was in conjunction with the condemnation proceedings. When Emanuel arrived at the claims he was confused with respect to the location of the claims and had some difficulty orienting himself on the ground. This was understandable. The claim corners and other monuments had been destroyed during his 25-year absence. The cabin had been burned and other improvements obliterated. The mine openings were caved and were inaccessible.

The examiners asked Emanuel to identify the valuable minerals on the claims and it is apparent that Emanuel did his best to accommodate them. I believe that where he could not identify a location of previous activity, he chose what he thought might be a likely spot. The discussion found in the majority opinion concerning the confusion as to the location of the claims on the ground well illustrates Emanuel's difficulities. Two years after the examination BLM filed a complaint and initiated the contest which is the subject of this appeal.

After the contest complaint was filed, Emanuel sought out and hired a geologist to aid in the defense of the case. This geologist was able to make a terse examination of the claims but was not able to open any of the caved underground openings in order to examine the underground showings, as the only time which the claimants or their representatives were allowed to go on the property was on the weekends and the Army Corps of Engineers advised them that no work to reopen underground openings would be allowed. In effect, the ability to do an in-depth investigation of the property was severely restricted by (1) the limitations placed on access by the military and (2) the economic restrictions placed on the activities by reason of the condemnation proceedings. Faced with a condemnation proceeding no reasonable man would expend time and money on these claims in hope of developing a paying mine, especially in light of the fact that any improvements placed on the property after the commencement of the condemnation action would not be considered when determining the condemnation award.

I find no basis for reliance on the statements of the expert witness regarding the necessity for further exploration. In light of the circumstances in this case, this line of testimony should be given the least weight possible, if any. The expert witness testified with respect to the property as he found it at the time of his inspection. He did not have the benefit of the experience, knowledge or expertise of the person who could have given him the background information reasonably necessary to make this determination. Pool, who had a familiarity with the property sufficient to draw a conclusion regarding the existence of a discovery was dead. If the case had been initiated in a timely manner in the early 1960's he would have been alive and could have aided in the defense of the claims and testified.

During the term of the lease and the extensions thereof the Army Corps of Engineers had maintained exclusive control of the property for a period of more than 25 years. During this period of exclusive control the underground openings had either caved or become so dangerous that access was denied the appellants. Appellants could not rehabilitate the openings in order to facilitate their preparation of a defense, even if they had the means to do so.

As stated before, if a claimant who has control of the property denies access or fails to keep the discovery open for examination by a mineral examiner, there is a presumption that the evidence contained therein, if exposed, would support the mineral examiner's case. While I do not want to go so far as to say that the actions of the Army Corps of Engineers denying unrestricted access to the property and the underground openings in existence at the time that the property was leased were designed to hinder the presentation by the claimants, this conclusion could be drawn. In any event, I believe that the presumption that underground openings would contain evidence detrimental to the party that refuses or fails to maintain these openings should be applied. However, in this case, it should be applied in favor of the appellants and against the contestant. The normal circumstances are reversed.

In summary, I find that the record contains overwhelming evidence that the Army Corps of Engineers has (1) denied access to the property for a period of 25 years; (2) failed to maintain the openings on the leased property or the monumentation of the claims; (3) held the property for a period of at least 15 years beyond the time when there was no doubt that the property would never be returned; (4) framed their actions to acquire the property in such a manner that the ability to take the necessary steps to develop the proof necessary to demonstrate discovery was denied the appellants; and (5) delayed the prosecution of the contest and/or condemnation resulting in the destruction of the presumption based on relative availability of evidence presumed present in a "normal" mining claim contest. As a result of the unilateral action on the part of the Army Corps of Engineers, I find that the burden of establishing, by a preponderance of the evidence, that the claims are invalid should be placed on the contestant. The contestant has not carried the burden of proof that should be imposed in this case and, therefore, the claims should not be declared invalid.

R. W. Mullen
Administrative Judge

10S - 20 Sec 17 Red Rock - millsite

10S - 20W Sec 17 Waterbase

10S 20 Sec 17 - [illegible]

Jim Emanuel

Bagdad Route Bagdad 86321

Phillip Emanuel

13657 [illegible]

[illegible] 85364

Beehive - 10S - 20W Sec 20NE

White Rock " " " "

[illegible] " " " "

PROJECT: Williams Bombing and Gunnery Range - Additional Land

Tract: M- 3F

Owner: Guido E. Cagliari, Jr.

Claims: Christmas Gift, Half Moon, La Fortuna, Arizona and Oregon

PRELIMINARY

TITLE CERTIFICATE

to the

Christmas Gift, Half Moon, La Fortuna, Arizona and Oregon Mining Claims, patented

in the

Fortuna Mining District, Yuma County, Arizona

As patented by the United States of America to La Fortuna Mining Company by patent dated 4 May 1907

(Containing in all 96.108 acres)

I, Walter J. Mackay, being a Title Examiner, employed in the Office of the District Engineer, San Francisco District, Corps of Engineers, U.S. Army, Real Estate Division, hereby certify that:

1. I am an Abstracter and Title Examiner qualified to furnish title evidence for the Corps of Engineers, U.S. Army.

2. That I have no present or intended future interest in the unpatented possessory right mining property described on the Caption hereof, nor am I related to any of the persons or individuals named herein, and that I have no interest in any of the firms or corporations who are claimants herein.

3. That I have carefully examined the Official Records in the Office of the County Recorder of Yuma County, State of ~~Nevada~~ Arizona, and also the Judgment Dockets, Actions Pending Register and Register of Probate Actions in the Office of the Clerk of the ~~District~~ Superior Court of said county, and such records of the United States District Court for the District in which subject property is located, as might affect the title to the unpatented mining claims described on the Caption hereof, subsequent to 4 May 1907, the date of the patent to subject claims.

AND IT IS HEREBY CERTIFIED that the ~~possessory right~~ fee title to said property, as it appears from said records,

IS VESTED IN: [redacted], Jr., under and by virtue of Sheriff's Deed dated ___ January, 1940, recorded 18 January, 1940 in Book 103 Deeds, Page 1, Records of Yuma County, Arizona.

free of encumbrances, taxes, interests, conditions and restrictions on title, EXCEPT AS HEREINAFTER SHOWN, and that a copy or an abstracted brief form of the following pertinent instruments relating to the record title of subject property are hereto attached for the use and benefit of the United States and its Closing Attorney.

1. Patent, Book 24 Deeds, Page 210, Records of Yuma County, Arizona.
2. Agreement, Book 8 Deeds and Agreements, Page 666.
3. Deed, Book 83 Deeds, Page 14.
4. Civil Action No.10367, Superior Court, Yuma County, Arizona.
5. Sheriff's Certificate of Sale, File #[illegible]
6. Articles Incorporation, Book Articles Incorporation, Page 103
7. Sheriff's Deed, Book 103 Deeds, Page 1.
8. Quit Claim Deed, Book 103 Deeds, Page 366.
9. Quit Claim Deed, Book 83 Deeds, Page 368.

SUBJECT TO:

1. State and County Tax of the year 1952, now due and payable but not delinquent.

2. Existing easements for public highways, public utilities, railroads and pipelines.

3. Reservations contained in patent from the United States of America to La Fortuna Mining Company dated 4 May 1907 recorded 26 August 1907 in Book 24 Deeds, Page 218, Records of Yuma County, Arizona.

4. Rights of the parties under Civil No. 1730 - Phoenix, now pending in District Court of the United States in and for the District of Arizona, entitled United States of America vs. J. W. Absher, et al - a condemnation action.

Dated at Yuma, Arizona, this 16th day of September, 1952.

Walter G. Mackay

Walter G. Mackay, Title Examiner,
Corps of Engineers,
Department of the Army.

APPROVED
Roy E. Bennett
Title Examiner
OCT 14 1952

GENERAL LAND OFFICE
No. 46199 MINERAL CERTIFICATE No. 213

THE UNITED STATES OF AMERICA,
TO ALL TO WHOM THESE PRESENTS SHALL COME, GREETING:

Whereas, In pursuance of the provisions of the Revised Statutes of the United States, Chapter Six, Title Thirty-two and legislation supplemental thereto, there have been deposited in the General Land Office of the United States the Plat and Field Notes of survey and the Certificate No. 213, of the Register of the Land Office at Phoenix in the Territory of Arizona accompanied by other evidence whereby it appears that the La Fortuna Mining Company did, on the twenty-seventh day of October, A.D. 1906, duly enter and pay for that certain mining claim or premises, known as the Alta, New Year, Christmas Gift, Half Moon, La Fortuna, Arizona and Oregon lode mining claims designated by the Surveyor-General as Lot No. 2092 embracing a portion of the unsurveyed public domain in the La Fortuna Mining District, in the County of Yuma and Territory of Arizona, in the District of Lands subject to sale at Phoenix and bounded, described and platted as follow, with magnetic variation fourteen degrees and ten minutes east

Beginning for the description of the Alta lode claim at corner No. 1 a schist stone 18 x 8 x 6 inches marked 2092 A 1 with mound of stone, from which U. S. Location Monument No. 2092 bears South 43° 18' East 1029.88 feet distant.

Thence first course, north 16° 58' West 538.7 feet to corner No. 2, a schist stone 20 x 10 x 5 inches marked 2092 A 2 with mound of stone.

Thence second course North 72° 15' East 1369.06 feet to corner No. 3 a schist stone 18 x 10 x 6 inches marked 2092 A 3 with mound of stone.

Thence third course, South 16° 30' East 227.8 feet to a point from which discovery tunnel bears South 83° 19' West 396.6 feet distant, 527.3 feet to corner No. 4 a schist stone 18 x 8 x 5 inches marked 2092 A 4 with mound of stone;

Thence fourth course South 72° 43' West 903.53 feet to corner No. 5 a schist stone 20 x 8 x 8 inches marked 2092 A 5 with mound of stone.

Thence fifth course, South 70° 21' West 506 feet to corner No. 1 the place of beginning.

The survey of the lode claim as above described extending 1374.6 feet in length along said Alta vein or lode.

Beginning for the description of the New Years lode claim at corner No. 1 a pine post 4 feet long, 4 inches square marked 2092 N Y No.1 with mound of stone from which said U. S. Location Monument No. 2092 bears North 67° 31' West 166.72 feet distant.

Thence first course North 20° 07' West 298.16 feet to a point from which discovery shaft bears North 70° 52' East 110 feet distant, 501.26 feet to corner No. 2 a pine post 4 feet long, 4 inches square marked 2092 N Y No.2 with mound of stone.

Thence second course, North 70° 21' East 1405.5 feet to corner No. 3 identical with corner No.5 of said Alta lode claim also marked N Y 5.

Thence third course South 20° 07' East 603 feet to corner No. 4 a pine post 4 feet long, 4 inches square marked 2092 N Y No.4 with mound of stone.

Thence fourth course, South 70° 49' West 1407.7 feet to corner No. 1, the place of beginning; the survey of the lode claim as above described extending 1407.9 feet in length along said New Year vein or lode.

Beginning for the description of the Christmas Gift lode claim at corner No. 1 identical with corners Nos. 5 and 3 of said Alta and New Years lode claims respectively, also marked C.G. 1 from which said U. S. Location Monument No. 2092 bears South 82° 38' West 1439.15 feet distant.

Thence first course, North 72° 48' East 1471.5 feet to corner no. 2, a schist stone 18 x 8 x 5 inches marked 2092 C.G. 2 with mound of stone.

Thence second course South 30° 07' East 810.28 feet to corner No. 3, a pine post 4 feet long, 4 inches square marked 2092 C.G. No. 3 with mound of stone.

Thence third course South 73° 05' West 1473.08 feet to corner No. 4, identical with corner No. 4 of said New Years lode claim, also marked C.G. No.4.

The fourth course, North 30° 07' West 298 feet to a point from which discovery shaft bears North 72° 52' East 481 feet distant, 603 feet to corner No. 1 the place of beginning, the survey of the lode claim as above described extending 1470.9 feet in length along said Christmas Gift vein or lode.

Beginning for the description of the Half Moon lode claim at corner No. 1 identical with corner No. 1 of said New Years lode claim also marked H. M. No. 1

Thence first course North 70° 49' East 1407.7 feet to corner No. 2 identical with corners Nos. 4 of said New Years and Christmas Gift lode claims. Also marked H. M. No. 2

Thence second course, South 30° 07' East 297.75 feet to a point from which discovery shaft bears South 70° 10' West 396 feet distant, 695.5 feet to corner No. 3, a pine post 4 feet long, 4 inches square marked 2092 H. M. No. 3 with mound of stone.

Thence third course, South 70° 46' West 1407.4 feet to corner No. 4 a granite stone 20 x 18 x 8 inches marked 2092 H. M. 4 with mound of stone.

Thence fourth course North 30° 07' West 696.8 feet to corner No. 1, the place of beginning, the survey of the lode claim as above described extending 1417.4 feet in length along said Half Moon vein or lode.

Beginning for the description of the La Fortuna lode claim at corner No. 1 identical with corners No. 2 - 4 - 4 of said Half Moon, New Years and Christmas Gift lode claims respectively, also marked F. No. 1, from which said U. S. Location Monument No. 2092 bears South 75° West 1537.82 feet distant.

Thence first course North 75° 05' East 1473.08 feet to corner No. 2 identical with Corner No. 3 of said Christmas Gift lode claim also marked F No. 2.

Thence second course, South 30° 07' East 807 feet to corner No. 3 a pine post 4 feet long, 4 inches square marked F No.3,

Thence third course South 75° 51' West 1475.75 feet to corner No. 4 identical with corner No. 3 of said Half Moon lode claim also marked F No.4

Thence fourth course North 30° 07' West, 297.75 feet to a point from which discovery cut bears North 73° 27' East 480 feet distant, 585.5 feet to corner No. 1 the place of beginning; the survey of the lode claim as above described extending 1475.3 feet in length along said La Fortuna vein or lode.

Beginning for the description of the Arizona lode claim at corner No.1 identical with corner No. 4 of said Half Moon lode claim, also marked A 1 from which said U. S. Location Monument No. 2092 bears North 33° 08' West 730 feet distant.

Thence first course, North 70° 48' East 1407.4 feet to corner No. 2 identical with corner No. 3 of said Half Moon and corner No. 4 of said La Fortuna lode claims, also marked A No. 2.

Thence second course South 30° 07' East 297.75 feet to a point from which discovery cut bears South 73° 08' West 950 feet distant, 585.5 feet to corner No.3 a pine post 4 feet long, 4 inches square marked 2092 A No. 3 with mound of stones.

Thence third course South 73° 53' West 1413.4 feet to corner No. 4 a pine post 4 feet long, 4 inches square marked 2092 A 4 with mound of stones

Thence fourth course North 30° 07' West 533 feet to corner No. 1 the place of beginning, the survey of the lode claim as above described extending 1413.9 feet in length along said Arizona veing or lode.

Beginning for the description of the Oregon lode claim at corner No. 1, identical with corners Nos. 2 - 3 and 4 of said Arizona, Half Moon and La Fortuna lode claims respectively, from which said U. S. Location Monument No. 2092 bears North 36° 13' West 1718.05 feet distant,

Thence first course North 73° 31' East 1475.75 feet to corner No. 2, identical with corner No. 3 of said La Fortuna lode claim, also marked O No. 1,

Thence second course, South 30° 07' East 296.4 feet to corner No. 3 a schist stone 20 x 8 x 8 inches marked 2092 O 3 with mound of stone.

Thence third course South 73° 53' West 1476 feet to corner No. 4 identical with corner No. 3 of said Arizona lode claim also marked O No. 4,

Thence fourth course, North 30° 07' West 297.75 feet to a point from which discovery cut bears North 73° 27' East 235 feet distant 585.5 feet to corner No. 1 the place of beginning; the survey of the lode claim as above described extending 1476.3 feet in length along said Oregon veing or lode, said lot No. 2092 containing 131 acres and 724/1000 of an acre of land more or less.

NOW KNOW YE, That there is therefore hereby Granted by the United States unto the said La Fortuna Mining Company and to its successors and assigns, the said mining premises hereinbefore described and not expressly excepted from these presents and all that portion of the said Alta, New Years, Christmas Gift, Half Moon, La Fortuna, Arizona and Oregon veins, lodes or ledges and of all other veins, lodes, and ledges, throughout their entire depth, the tops or apexes of which lie inside of the surface boundary lines of said granted premises in said Lot No. 2092 extended downward vertically, although such veins, lodes, or ledges in their downward course may so far depart from a perpendicular as to extend outside the

vertical side lines of said premises; Provided, That the right of possession to such outside parts of said veins, lodes or ledges, shall be confined to such portions thereof as lie between vertical planes drawn downward through the end lines of said Lot No. 2092 as continued in their own direction that such planes will intersect such exterior parts of said veins, lodes, or ledges; And provided further, That nothing herein contained shall authorize the grantee herein to enter upon the surface of a claim owned or possessed by another.

To Have and to Hold said mining premises, together with all the rights, privileges, immunities, and appurtenances of whatsoever nature thereunto belonging unto the said grantee above named and to its successors and assigns forever; subject nevertheless to the above mentioned and to the following conditions and stipulations.

First, That the premises hereby granted with the exception of the surface, as may be entered by the proprietor of any other vein, lode, or ledge, the top or apex of which lies outside of the boundary of said granted premises, should the same in its dip be found to penetrate, intersect, or extend into said premises, for the purpose of extracting and removing the ore from such other vein, lode, or ledge.

Second, That the premises hereby granted shall be held subject to any vested and accrued water rights for mining, agricultural, manufacturing, or other purposes, and rights to ditches and reservoirs used in connection with such water rights as may be recognized and acknowledged by the local laws, customs, and decisions of the courts. And there is reserved from the lands hereby granted, a right of way thereon for ditches or canals constructed by the authority of the United States.

Third, That in the absence of necessary legislation by Congress, the Legislature of Arizona may provide rules for working the mining claim or premises hereby granted, involving easements, drainage, and other necessary means to its complete development.

In Testimony Whereof, I, Theodore Roosevelt, President of the United States of America, have caused these letters to be made Patent, and the Seal of the General Land Office to be hereunto affixed.

Given under my hand, at the City of Washington, the fourth day of May, in the year of our Lord one thousand nine hundred and seven, and of the Independence of the United States the one hundred and thirty-first.

BY THE PRESIDENT: T. Roosevelt

(SEAL) By P. M. McKeen Secretary

Fred Dennett, Acting Recorder of the General Land Office

Recorded Vol. 444, pages 198 to 200 inclusive.

Recorded August 26, 1907 in Book 24 Deeds, Page 216, Records of Yuma County, Arizo

THIS AGREEMENT, made and entered into this 4th day of January, A.D. 1913, by and between the La Fortuna Mining Company, a corporation, organized under and by virtue of the laws of the State of California, and having its principal place of business in the City and County of San Francisco, State of California, the party of the first part, and D. H. Russell, now of the same place, the party of the second part,

WITNESSETH: That the party of the first part, for and in consideration of the sum of One Dollar, ($1.00) and other good and valuable considerations to it in hand paid by the party of the second part, the receipt whereof is hereby acknowledged, and also in consideration of the covenants and agreements of the party of the second part hereinafter contained, agrees to give and grant, and does hereby give and grant unto the said party of the second part, his heirs and assigns, the option right or privilege of purchasing the mining property hereinafter described, upon the following terms and conditions:

First: The purchase price of said mining property is the sum of Twenty-five Thousand ($25,000) Dollars, gold coin of the United States, payable at the option of second party at the First Federal Trust Company, at San Francisco, California, on or before December 31st, 1913.

Second: The party of the second part agrees to enter upon and take possession of said mining property on or before the first day of March, 1913, and thereafter to prospect, work and develop the same in a minerlike fashion, said work to be prosecuted continuously and with due diligence, unless prevented by strikes or other circumstance which he cannot by the ex exercise of due diligence avoid.

Third: Before commencing any work whatsoever upon said property, second party agrees to post or cause to be posted thereon, and also record with the County Recorder of the County in which said property is situate, a notice in accordance with the laws of the State of Arizona, exempting said property and the owners thereof from all liability for labor done and materials furnished, or expenditures made by him or his agents or assigns upon said mining property, or any part thereof.

Fourth: It is also understood and agreed that the party of the second part shall, during the continuance of this option, have the right to install on said property any machinery, mills, hoists, mining equipment, or the like, that to him seems fit, or to rehabilitate any of the buildings or mining equipment now thereon. But in the event he fails to purpose said mining property, or forfeits his rights hereunder, it is understood and agreed that all of such machinery, mills, hoists and the like, whether the same be by him newly installed thereon, or be a rehabilitation of any equipment now thereon, shall be and become the property of first party, and in this regard second party covenants for himself, his heirs and assigns, that he will not remove or cause to be removed from said property any such machinery, mills, hoists and the like, by him so installed, or any part thereof. This covenant does not, however, prevent second party from removing any lease mining equipment, such as lumber, iron, machine drills, tools, mining supplies and the like, which he may have brought upon said property.

In the event the party of the second part elects to mine and extract ores from said property, which right so to do is hereby granted, he agrees to pay to the first party after each and every cleanup, twenty-five per cent of the gross value of all gold or precious minerals by him so extracted; all of said payments to be credited upon the purchase price of said property.

It is also agreed that the first party, its officers or agents shall at all times have the right of entering upon said property to inspect all work done thereon, with full privilege of sampling the property and examining into all accounts relating to the mining and milling of the ores therein.

IT IS UNDERSTOOD that at any time on demand, the party of the first part will execute a good and sufficient deed to said properties with appurtenances, in favor of the second party or any person by him designated, and deposit the same in escrow with the First Federal Trust Company of San Francisco, California, under suitable instructions to said Trust Company, to deliver said deed to the second party or his assigns, upon his exhibiting receipts or giving satisfactory evidence of his having made the payments above provided.

IT IS EXPRESSLY UNDERSTOOD AND AGREED that time is of the essence hereof. In the event second party fails to make the payments at the times and in the manner above described, or in the event he fails to comply with any of his covenants herein contained, then and in that event he shall forfeit all rights hereunder, and the first party shall have the right to take immediate possession of said property, together with all machinery and improvements erected thereon, with the further right of retaining for itself all payments theretofore made, which said payments shall in that event be considered as rent and damage in full for the use and occupancy of said premises.

The property hereinbefore referred to, and on which this option is given, is described as follows, to-wit:

All and singular first party's right, title and interest in and to those certain pieces or parcels of land, situate, lying and being in the County of Yuma, State of Arizona, and more particularly described as follows, to-wit:

All and singular those certain lode mining claims known as the ALTA, NEW YEAR, CHRISTMAS GIFT, HALF MOON, LA FORTUNA, ARIZONA, OREGON, Bachelor and Sunset Lode.

All of said claims, save the Bachelor and Sunset Lode having been patented under Mineral Patent 43198 (Entry #215) to which patent reference is hereby made for a more complete description of said property.

TOGETHER with the tenements, hereditaments and appurtenances thereunto belonging or in anywise appertaining.

Also all machinery, buildings, mining equipment, ditches, pipe lines, flumes, water and water rights appurtenant to, or attached to or heretofore used in connection with said property, or any part thereof, and belonging to said first party.

The above property is intended to include all of the property in the County aforesaid, both real and personal, owned or controlled by the party of the first part.

IN WITNESS WHEREOF, the party of the first part has hereunto set its corporate name and affixed its corporate seal by its Vice President and Secretary thereunto by resolution of the Board of Directors duly authorized, and said second party has hereunto set his hand and seal, xx all on the day and year first above written.

LA FORTUNA MINING COMPANY,

(Corporate Seal)

By J. Dennis Arnold, Vice President.

By A. G. Stevenson, Secretary.

Party of the first part.

R. L. Russell,
Party of the second part.

We, the undersigned, stockholders representing the amount of stock in the La Fortuna Mining Company, as set opposite our respective names, hereby signify in writing our consent and approval of the foregoing agreement of sale of all of the property of the La Fortuna Mining Company, situated in XXXXX Yuma County, State of Arizona.

Names	No. of Shares
Anna J. Lane	120,846
J. Dennis Arnold	30,000
A. J. Ulman) Mrs. A. J. Ulman) By J. Dennis Arnold) Their Atty. in fact)	23,000 2,000
A. G. Stevenson	2,770
TOTAL	178,616

This is to Certify that Anna J. Lane, J. Dennis Arnold, A. J. Ulman, Mrs. A. J. Ulman, by J. Dennis Arnold, their Attorney in Fact, and A. G. Stevenson, holding 178,616 shares of stock, are stockholders in the La Fortuna Mining Company, as of the date of this certificate, and that said stock appears of record in their names upon the books of the Company. Also that the total amount of stock issued and outstanding is two hundred and fifty thousand (250,000) shares of the par value of One Dollar ($1.00)

each, and that the aggregate of the stock set opposite the names above set forth is in excess of two thirds thereof.

IN WITNESS WHEREOF, I have hereunto set my hand, this 4th day of January, 1918.

H. G. Stevenson,
Secretary La Fortuna Mining Company

(Corporate Seal)

For value received we hereby extend the above and foregoing option of purchase for one year additional, that is to say until and including December 31, 1919, and we further hereby acknowledge that the same is in full force and effect according to its tenor.

(Corporate Seal)

LA FORTUNA MINING COMPANY,

By J. S. Markey, President.

By H. G. Stevenson, Secretary.

Acknowledged January 4, 1918 by J. Dennis Arnold, Vice-President and H. G. Stevenson, Secretary of La Fortuna Mining Company, by S. H. Russell before Flora Hall, Notary Public, City and County of San Francisco, California. (Seal)

Acknowledged by Anna J. Lane, J. Dennis Arnold, H. G. Stevenson, J. Dennis Arnold as Attorney in fact of A. J. Ulman and Mrs. A. J. Ulman, on January 4, 1918, before Flora Hall, Notary Public, City and County of San Francisco, California. (Seal)

Acknowledged November 24, 1918 by J. S. Markey, President and H. G. Stevenson, Secretary of La Fortuna Mining Company, before Flora Hall, Notary Public, City and County of San Francisco, California.
(Seal)

Recorded December 6, 1918 in Book 8 Bonds and Agreements, Page 366, Records of Yuma County, Arizona.

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6-26-52
H. G. Mackay.

4636

This Indenture, made this 27th day of February, 1923, between La Fortuna Mining Company, a corporation organized under and by virtue of the Laws of the State of California, party of the first part, and Slan Mining Company, a corporation organized and existing under and by virtue of the Laws of the State of Arizona, party of the second part,

Witnesseth: That the said party of the first part, for and in consideration of the sum of One Dollar($1.00) and other good and valuable consideration, to it in hand paid by the said party of the second part, the receipt whereof is hereby acknowledged, does by these presents, grant, bargain, sell unto the said party of the second part, its successors and assigns forever,

All and singular, first party's right, title and interest in and to those certain pieces or parcels of land, situate, lying and being in the County of Yuma, State of Arizona, and more particularly described as follows, to-wit:

All and singular, those certain lode mining claims known as the M.Z.A., NEW YEAR (and other patented and unpatented mines not covered by this search)

All of said claims, save the "Bachelor" and "Sunset Lode", having been patented under Mineral Patent 40,199 (Entry 213), to which patent reference is hereby made for a more complete description of said property.

Together with the tenements, hereditaments and appurtenances thereunto belonging or in any wise appertaining.

Also all machinery, buildings, mining equipment, ditches, pipe lines, flumes, water and water rights, appurtenant to, or attached to, or heretofore used in connection with said property, or any part thereof, and belonging to said first party.

The above conveyance is intended to include all of the property in the County aforesaid both real and personal, owned by or controlled by the party of the first part.

This deed is executed pursuant to that certain bond or option, and renewals thereof, given by grantor herein to one O. H. Russell, and by the said Russell duly assigned to grantee herein, said bond or option being dated January 4th, 1918, and having been recorded in the Recorder's office of Yuma County, State of Arizona, on the 8th day of December, 1918, in Book No. 8, Records of B & A, at Page 566, to which records reference is hereby made.

To have and to hold, all and singular, the property and premises above described, together with the appurtenances, unto the said party of the second part, and unto its successors and assigns forever.

In Witness Thereof, the said party of the first part has hereunto set its corporate name and affixed its corporate seal by its President and Secretary, thereunto by resolution of the Board of Directors duly authorized at a meeting of said Board of La Fortuna Mining Company, duly and regularly called, at which all of the Directors were present and voting the day and year first above written.

LA FORTUNA MINING COMPANY

(SEAL)
$5.00 U.S.I.R.S. Cancelled.

by F. S. Markey, President

A. J. Stevenson, Secretary.

Acknowledged on February 27, 1923 by F. S. Markey and A. J. Stevenson, President and Secretary respectively of La Fortuna Mining Company, before Flora Hall, Notary Public, City and County of San Francisco, California. (SEAL)

We, the undersigned, stockholders in La Fortuna Mining Company, representing the amount of stock set opposite our respective names, hereby signify in writing our consent and approval of the foregoing conveyance to the Alen Mining Company of Arizona of all of the property of La Fortuna Mining Company, situate in Yuma County, State of Arizona.

Names	No. of Shares
A. M. Monahone Jr.	300
Ila Lane Allen	1,000
Anna J. Lane	120,460
Theophilus Allen	3,000
L. L. Lane	1,000
F. S. Markey	10
E. S. McCurdy	10
Thos. E. White	10
A. J. Stevenson	2,750
A. J. Stevenson, Trustee	300
Ellen M. Wright	10
Clara M. Stevenson	2,125

Names	No. of Shares - Continued
B. Bernhard	3,350
Mrs. H. S. Robinson	1,000
T. M. Lane	1,000
J. Dennis Arnold	50,000
By Valerie Harrison Arnold, Executrix of his Will	
Mrs. J. Dennis Arnold	1,000
Walter C. Hank	1,000
Mrs. M. E. Shepman	1,000
Edw'd J. McCutchen	6,126
Chas. Tulloch	600
	175,116

Acknowledged on April 12, 1923 by Ila Lane Allen, Anna G. Lane, Theophilus Allen, L. L. Lane, F. S. Markey, E. S. McCurdy, Thos. A. White, H. O. Stevenson, Ellen M. Wright, Clara M. Stevenson, B. Bernhard, Mrs. H. S. Robinson, T. M. Lane, Mrs. J. Dennis Arnold, Walter C. Hank, Mrs. M. E. Shepman and Edw'd J. McCutchen, and Chas. Tulloch, before Flora Hall, Notary Public, City and County of San Francisco, California.
(SEAL) Commission expires April 13, 1926.

Acknowledged on April 12, 1923 by R. M. Monsbone and H. O. Stevenson, trustees, before Flora Hall, Notary Public, City and County of San Francisco, California.
(SEAL) Commission expires April 13, 1926.

Acknowledged on April 12, 1923 by Valerie Harrison Arnold, Executrix of the Will of J. Dennis Arnold, deceased, before Flora Hall, Notary Public, City and County of San Francisco, California
(SEAL) Commission expires April 13, 1926.

THIS IS TO CERTIFY that R. M. Monsbone, Jr., Ila Lane Allen, Anna G. Lane, Theophilus Allen, L. L. Lane, F. S. Markey, E. S. McCurdy, Thos. A. White, H. O. Stevenson, H. O. Stevenson, Trustee, Ellen M. Wright, Clara M. Stevenson, B. Bernhard, Mrs. H. S. Robinson, T. M. Lane, Valerie Harrison Arnold, Executrix of the Will of J. Dennis Arnold, Walter C. Hank,

Mrs. M. A. Chapman, Edw. J. McCutchan and Chas. Tulloch, holding 175,115 shares of stock, are stockholders in the La Fortuna Mining Company, as of the date of this certificate, and that said stock appears of record in their names upon the books of the Company. Also, that the total amount of stock issued and outstanding is two hundred and fifty thousand (250,000) shares of the par value of One Dollar($1.00) each, and that the aggregate of the stock set opposite the names above set forth is in excess of two-thirds thereof.

In Witness Thereof, I have hereunto set my hand this 18th day of April, 1923.

(SEAL) H. J. Stevenson, Secretary, La Fortuna Mining Company.

Recorded November 16, 1924 in Book 43 Deeds, Page 14, Records of Yuma County, Arizona.

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3-24-82
S. J. Keeley

IN THE SUPERIOR COURT OF THE STATE OF ARIZONA, IN AND FOR THE COUNTY OF YUMA.

Guido E. Caglieri, Plaintiff	)	Civil Action
vs.	)	File No. 10557.
Elam Mining Company, a corporation, Defendant.	)	Sheriff's Certificate of Sale on Foreclosure

I, J. A. Beard, Sheriff of the County of Yuma, State of Arizona, do hereby certify that under and by virtue of an order of sale issued out of the Superior Court of Yuma County, State of Arizona, in the action of Guido E. Caglieri, Plaintiff, against Elam Mining Company, a corporation, Defendant, duly attested the 30th day of April, 1945, on a judgment rendered in said action in favor of said Plaintiff, on the 18th day of January, 1943, and to me, as such Sheriff, duly directed and delivered, whereby I was commanded to seize and sell the property hereinafter described, along with other property, according to law, and to apply the proceeds of such sale towards the satisfaction of the judgment in said action, amounting to the sum of Five Thousand and no/00 ($5000.00) Dollars and plaintiff's costs taxed at Thirty-Six and 40/100 Dollars ($36.40), I duly levied on, and on the 29th day of May, 1945, at 10 o'clock A. M., at the Court House door in the City of Yuma, in said County of Yuma, I duly sold at public auction, according to law, and after due and legal notice, to Guido E. Caglieri, the plaintiff in said action, who made the highest and best bid therefor at such sale, for the sum of Five Thousand Seventy Five and 03/100 Dollars, lawful money of the United States, which was the whole sum paid by said Guido E. Caglieri, a portion of the real estate described in said Order of Sale, lying and being in said County of Yuma, State of Arizona, and described as follows, to-wit:

> All those certain patented mining claims situated in the La Fortuna Mining District, in Yuma County, State of Arizona, entitled and designated as: CHRISTMAS GIFT, HALF MOON, LA FORTUNA, ARIZONA and OREGON, designated, together with other mining claims, by the United States Surveyor-General as Lot No. 2092 and patented, together with other mining claims, to La Fortuna Mining Company under United States Patent No. 45139, dated May 4, 1907, and recorded in the office of the County Recorder of Yuma County, Arizona, on August 26, 1907, in Book 24 of Deeds, at Page 216, to which Patent reference is hereby made for a more complete and specific description thereof, together with the tenements, hereditaments and appurtenances thereunto belonging or in any wise appertaining.

and I do hereby further certify that the said property was sold in one lot or parcel, and that the said sum of Five Thousand and Seventy Five and 03/100 Dollars was the highest bid made, and the whole price paid therefor, and that the same is subject to redemption in six months, pursuant to the Statute in such case made and provided.

Given under my hand this 29th day of May, 1945.

J. A. BEARD, Sheriff,

By F.B. Watson, Deputy Sheriff.

Filed May 29,1945,Records of Yuma County,Arizona. File #2578.
8-25-52 W.G.Mackay.

CERTIFIED COPY ARTICLES OF INCORPORATION

Incorporators: J. M. Russell, Peter T. Robertson, Lula A. Robertson.

Name of Corporation: ELAN MINING COMPANY

Principal Place of Business: City of Yuma, Arizona, with branch office at City and County of San Francisco, California.

General Nature of Business: ******* buying, selling, owning and leasing mineral lands and other real estate *******

Capital Stock: $100,000.00, 100,000 shares $1.00 each.

Term: 25 years, with privilege of renewal as provided by law.

Highest Indebtedness: $50,000.00

Private property of stockholders exempt.

Certified to December 20, 1918 by C. A. Jones, Chairman, Arizona Corporation Commission, Attest: Margaret Aepli, Acting Secretary. (Corporate Seal)

Recorded December 23, 1918 in Book 4 Articles of Incorporation, Page 192, Records of Yuma County, Arizona.

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AMENDMENT TO ARTICLES OF INCORPORATION

Article III

Capital Stock $500,000.00, 500,00 shares $1.00 each.

Article VI

Highest amount of indebtedness $350,000.00.

Recorded January 17, 1925 in Book 5 Articles Incorporation, Page 1, Records of Yuma County, Arizona.

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8-26-52 W. G. Mackey.

NOW THIS INDENTURE WITNESSETH: That the party of the first part, the said Sheriff, in order to carry into effect the sale so made by him as aforesaid, in pursuance of said judgment and decree, and in conformity to the statute in such cases made and provided, and also in consideration of the premises and of the sum of Five Thousand Seventy-five and 03/100 Dollars ($5,075.03), so bid and paid by said purchaser, the said party of the second part, the receipt whereof is hereby acknowledged, has granted, bargained, sold and conveyed, and by these presents does grant, bargain, sell and convey unto the said party of the second part and unto his heirs and assigns forever, all of the certain lots, pieces or parcels of land lying and being in the said County of Yuma, State of Arizona, and more particularly described as follows, to-wit:

All those certain patented mining claims situated in the La Fortuna Mining District, in Yuma County, State of Arizona, entitled and designated as:
CHRISTMAS GIFT, HALF MOON, LA FORTUNA, ARIZONA AND OREGON, designated, together with other mining claims, by the United States Surveyor-General as Lot No. 2092 and patented, together with other mining claims, to La Fortuna Mining Company under United States Patent No. 45196, dated May 4, 1907, and recorded in the office of the County Recorder of Yuma County, Arizona, on August 28, 1907, in Book 24 of Deeds, at Page 218, to which Patent reference is hereby made for a more complete and specific description thereof, together with the tenements, hereditaments and appurtenances whatsoever to the same belonging or in any wise appertaining.

TO HAVE AND TO HOLD all and singular the said premises conveyed or intended to be conveyed, together with the appurtenances thereunto belonging, unto the said party of the second part, his heirs, executors, administrators and assigns forever.

IN WITNESS WHEREOF the said party of the first part to these presents has hereunto set his hand and seal the day and year first above written.

J. A. Beard
Sheriff of the County of Yuma, State of Arizona.

Acknowledged by J. A. Beard, Sheriff of Yuma County, State of Arizona on January 16, 1946 before R. E. Lee Jr., Notary Public, Yuma County, Arizona. (SEAL) Commission expires Dec 21, 1946.

Recorded on January 16, 1946 in Book 103 Deeds, Page 1, Records of Yuma County, Arizona.

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6-23-52
M. G. Mackey

2740 QUIT CLAIM DEED

Guido E. Caglieri, a single man, also known as Guido E. Caglieri Jr., the first party, does hereby realse, release and quit claim unto Herbert Levison, a single man, the second party, all that real property situated in the La Fortuna Mining District County of Yuma State of Arizona described as follows:

All those certain patented mining claims situated in the La Fortuna Mining District, in Yuma County, State of Arizona, entitled and designated as: CHRISTMAS GIFT, HALF MOON, LA FORTUNA, ARIZONA and OREGON, designated together with other mining claims, by the United States Survey General as Lot No. 2092 and patented, together with other mining claims, to La Fortuna Mining Company under United States patent No. 46199, dated May 4, 1907 and recorded in the Office of the County Recorder of Yuma County, Arizona, on August 26, 1907 in Book 24 of Deeds, at page 216, to which Patent reference is hereby made for a more complete and specific description thereof, together with the tenements, hereditaments and appurtenances whatsoever to the same belonging or in any wise appertaining, acquired by virtue of a deed made, executed and delivered to said Guido E. Caglieri, a single man, also known as Guido E. Caglieri Jr., by J. A. Beard, Sheriff of the County of Yuma, State of Arizona, which said deed is recorded in Volume No. 103 of Deeds, page 1, recorded in the office of the County Recorder, County of Yuma, State of Arizona, on January 16, 1946.

In Witness Whereof, the said first party has executed this conveyance this 1 day of May, 1946.

Guido E. Caglieri

Acknowledged May 1, 1946 by Guido E. Caglieri, a single man, also known as Guido E. Caglieri Jr., before Louis Wiener, Notary Public, City and County of San Francisco, California.
(Seal) Commission expires Aug. 19, 1947.

(Certificate by H.A.van der Zee, Clerk, City and County of San Francisco, California, that Louis Wiener was, at the time of taking the acknowledgment to annexed instrument, a Notary Public in and for said City and County of San Francisco)

Recorded May 6, 1946 in Book 103 Deeds, Page 346, Records of Yuma County, Arizona.

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6-30-52
E. O. Mackay.

2741

QUIT CLAIM DEED

Herbert Levison, a single man, the first party, does hereby remise, release and Quit Claim unto Guido E. Caglieri, Jr., a single man, the second party, all that real property situated in the La Fortuna Mining District County of Yuma State of Arizona described as follows:

All those certain patented mining claims situated in the La Fortuna Mining District, in Yuma County, State of Arizona, entitled and designated as: CHRISTMAS GIFT, HALF MOON, LA FORTUNA, ARIZONA AND OREGON, designated, together with other mining claims, by the United States Surveyor General as Lot No. 2092 and patented, together with other mining claims, to La Fortuna Mining Company under United States Patent No. 45199, dated May 4, 1907 and recorded in the Office of the County Recorder of Yuma County, Arizona, on August 26, 1907, in Book 24 of Deeds at page 216, to which Patent reference is hereby made for a more complete and specific description thereof, together with all the tenements, hereditaments and appurtenances whatsoever to the same belonging or in any wise appertaining.

In Witness Whereof, the said first party has executed this conveyance this 2nd day of May, 1946.

Herbert Levison

Acknowledged May 2, 1946 by Herbert Levison, a single man, before Louis Wiener, Notary Public, City and County of San Francisco, California. (Seal) Commission expires Aug. 13, 1947.

(Certificate of H. A. van Der Zee, Clerk, City and County of San Francisco, California, that Louis Wiener was, at the time of taking the acknowledgment to annexed instrument, a Notary Public in and for said City and County of San Francisco)

Recorded May 6, 1946 in Book 103 Deeds, Page 348, Records of Yuma County, Arizona.

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8-30-52
W. G. Mackay

IN THE SUPERIOR COURT OF THE STATE OF ARIZONA
IN AND FOR THE COUNTY OF YUMA

Guido B. Caglieri, Jr., Plaintiff	)	Civil Action
vs.	)	File No. 10557
Elan Mining Company,	)	
a corporation, Defendant	)	

October 28, 1942 Filed Complaint

Recites that defendant on or about May 1, 1941 made and executed its promissory note payable to plaintiff. dated San Francisco, California, May 1, 1941 for $15,060.72 payable one day after date, signed ELAN MINING COMPANY
By Guido B.Caglieri,President
(Corporate Seal) By J. Shand, Secretary

That defendant has not paid said note, nor any part thereof; that plaintiff hereby expressly reduces his claim against defendant to the sum of $5000.00 and remits to the defendant all of said debt in excess thereof.

Wherefore plaintiff prays judgment against defendant in the sum of $5000.00 and for his costs herein expended.

John B. Wisely, Jr.
Attorney for Plaintiff
22 Second Street
Yuma, Arizona

October 28, 1942 Filed Affidavit on Attachment.

October 28, 1942 Filed Bond for Attachment in the sum of $5000.00. United States Fidelity and Guaranty Company, a corporation.

October 30, 1942 Filed Writ of Attachment

November 7, 1942 Filed Summons. Return, served Dorthy Palmer,Assist. Secy. in office of Corporation Commission,State of Arizona.

November 25, 1942 Filed Affidavit of John B. Wisely, Jr.

That he is now, and at all times herein mentioned was, the attorney of record for plaintiff; that said action was commenced by filing complaint on October 28, 1942, and that thereafter summons was duly issued; that defendant, Elan Mining Company, a corporation, was personally served with summons and complaint in the County of Maricopa, State of Arizona on November 4, 1942 as more fully appears by the return of service heretofore filed herein; that the time for said defendant to appear, answer, plead, or otherwise defend in said action has expired; that neither this affiant nor said plaintiff has been served with any answer or other pleading by or on behalf of defendant; that he has examined the records and files of this action and has been informed and believes, that no such answer or pleading has been filed by defendant, or by any other person on behalf of defendant, and that defendant has not appeared,answered,pleaded,or otherwise defended herein. JOHN B. WISELY, JR.

Subscribed and sworn to November 25, 1942, before James B. Rolle, Jr., Notary Public, Yuma County, Arizona (Seal) Commission Expires Nov. 14, 1945.

November 25, 1942 Default Entered

January 18, 1942 Filed Judgment. Recites:

This action came on regularly this day to be heard, the plaintiff appearing by his attorney, John B. Wisely, Jr. and it appearing to the satisfaction of the court that the above named defendant was duly and personally served with summons and complaint herein in the State of Arizona and that a writ of attachment was, on October 28, 1942, duly and regularly issued against the property of defendant, directed and delivered to T. H. Newman, Sheriff of said County of Yuma, Arizona, which writ of attachment was thereafter on said date duly levied upon the following described property, being the property of said defendant:

All of those certain patented mining claims situated in La Fortuna Mining District in Yuma County, State of Arizona, designated as:
ALICE; BAILEY XX; BARNEY XX; FAMOUS XX; WASHINGTON
in accordance with the survey number 3952; and held by said defendant under United States Patent number 057436, dated March 31, 1926, and recorded on April 12, 1926, in the office of County Recorder of Yuma County, State of Arizona, in book 59 of Deeds at page 195, to which reference is hereby made for more specific description; and

All of those certain patented mining claims situated and being in the La Fortuna Mining District in Yuma County, State of Arizona, described as
ALTA; NEW YEAR; CHRISTMAS GIFT; HALF MOON; LA FORTUNA; ARIZONA; OREGON
designated by the Surveyor-General as Lot No. 2092, held by defendant under United States Patent No. 45199 to the La Fortuna Mining Company, dated May 4, 1907, and recorded in the office of the County Recorder of Yuma County, State of Arizona, on August 26, 1907, in book 24 of Deeds at page 216; and which said claims were thereafter conveyed by La Fortuna Mining Company to the said defendant by deed dated February 27, 1923, and recorded in the office of the County Recorder of Yuma County, State of Arizona, on December 16, 1924, in book 56 of Deeds at page 14, to which said Patent reference is hereby made for more specific description.

All of which said mining claims embrace a portion of approximately Sections 17, 20 and 21, Township 10 South, Range 20 West, Gila and Salt River Meridian.

together with the tenements, hereditaments and appurtenances whatsoever to the same belonging or in anywise appertaining.

And it further appearing that said defendant has failed to appear, answer, plead, or otherwise defend in said action and that time for answering allowed by law has expired and that default of defendant has been duly entered, the court proceeded to hear the evidence offered by plaintiff in support of his complaint, and same having been introduced and considered, court finds that all of the allegations of plaintiff's complaint are true and that plaintiff is entitled to judgment as prayed for, by reason of said attachment, has a lien upon the property described above for the full amount of this judgment, including costs and accruingcosts, and that said lien be foreclosed and said property be sold under special execution in the manner provided by law in order to satisfy said judgment;

IT IS THEREFORE HEREBY ORDERED, ADJUDGED AND DECREED that plaintiff, Guido E. Caglieri, do have and recover of and from defendant, Elan Mining Company, a corporation, the sm of $5,000 and his costs herein expended, taxed at $36.40, and that plaintiff, by reason of said attachment, has a lien upon the property above described for the full amount of this judgment, including costs and accruing costs, from said date of levy, and that said lien be foreclosed and that special execution be issued and the property of defendant heretofore attached by plaintiff, or so much thereof as may be necessary, be sold under said special execution in the manner provided by law in order to satisfy plaintiff's said judgment and that any party to this action may be a purchaser at such sale.

Dated this 18 day of January, 1943.

HENRY C. KELLY
Superior Court Judge

April 30, 1945 filed Notice of Sheriff's Sale of Real Property and Publisher's Affidavit of Publication with printed copy of Notice attached.

April 30, 1945 Filed Execution and Order of Sale.

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8-25-52
W. G. Mackay

PRELIMINARY COPY

OF A PORTION OF A REPORT ON THE GEOLOGY OF THE FORTUNA MINE

BY

C. F. Tolman,
H.F. Lynn,
D. Rebstock.

TABLE OF CONTENTS

SUMMARY

Introduction -- The scope of this report is limited to the solution of the fault problem.

Location ------ Twenty-eight miles southeast of Yuma, Arizona, in the Gila Mountains.

Climate ------- Typical torrid, arid climate of the southwestern United States.

Claims -------- Twelve claims, 600 by 1500 feet.

Ownership ------Elan Mining Company, with a total capitalization of 500,000 shares of $1.00 per value.

Present condition of Property: Completely abandoned. No material of value on the property.

Topography ---- Typical desert topography. Rugged country, ranging from 764 feet above sea level at collar of shaft to 2770 on highest peak.

Geology ------- A dense, granular, quartz replacement lens along the bedding of sedimentary pre-Cambrian schists which are intruded by porphyritic lenses and sills and by pegmatite dikes. All are displaced by three sets of faults of distinctly separate generations. The ore body terminates against a post mineral fault of the latest generation.

The Fault Problem: The range of possible movement along the Queen fault varies from 560 feet to 630 feet total displacement, with a vertical component of 150 feet to 330 feet and a horizontal component of 535 50 550 feet.

Development---- 20 levels, 14,300 feet of lateral development, only 5300 feet of which was in, or in the immediate vicinity of the ore.

Proposed Development: 300 feet drifting and 1600 feet of diamond drilling.

CONCLUSIONS

1. The Fortuna Mine is a meretorious property as it has produced gold to the value of $2,883,000.00 and issued $1,075,000.00 in dividends.

2. The orebody is a replacement lens of quartz in pre-Cambrian schists with no evidence of decreasing value with depth. On the contrary, the vein was widest and the ore highest grade at the fault of intersection.

3. The main ore shoot was cut off and displaced by a post-mineral fault.

4. The problem of faulting has been solved by using the certain sedimentary horizons and the pegmatite dikes as criteria.

5. The fault is a normal fault of fairly large horizontal displacement and with a total displacement of between 580 and 630 feet.

6. The subsurface apex of the faulted segment of the ore body lies above the 5 level on the foot-wall side of the Queen fault.

7. Prospecting can best be done from the 5 level by drifting to intersect the faulted segment of the Arch-duke fault and diamond drilling to prospect the ore body.

8. No more than 300 feet of drifting and 1600 feet of diamond drilling is necessary to prospect the area indicated by the geologic data.

9. It is estimated that $25,000.00 should cover all costs of the development necessary to prove the existence of the faulted segment of the ore body.

10. In view of the geological data obtained on the surface and not contradicted by any of the mine workings, the theory that the Queen fault is a reverse fault is untenable.

TOTAL COST OF DEVELOPING LA FORTUNA MINE
TO A PRODUCING BASIS TO THE 8 LEVEL

The following is an itemized account of bringing the Fortuna Mine to a producing basis down to and including the 8 level.

1. FIXED COSTS:

1. Additional Repair on shaft			$5,000.00
2. Raise new shaft 600 ft. at $30. per ft.			18,000.00
3. Pipe line, 700 ft. head pump, 2 miles of 6" pipe, 200 ft. well			18,000.00
4. Mill and Cyanide plant (75 ton mill)			75,000.00
5. Equipment			
Drills: 2 drifters	$700.00		
3 jackhammers	845.00		
5 stopers	1,000.00	$2,545.00	
Steel 2000' @ $30. ft		1,200.00	
Drill sharpener		1,032.00	
Furnace		285.00	
Supplies		1,000.00	6,062.00
6. Housing			
Bunk house, 30 rooms @ $300/room		9,000.00	
Apt. house, 10 three room apts. @ $500/room		15,000.00	
Store		2,000.00	
Machine Shop		3,000.00	
Cook House		5,000.00	
Assay office and retort room		5,000.00	39,000.00
7. Hoist			
2000' 4000# @ 400'/min.		2,500.00	
2000' of 1/2" cable at 30¢/ft.		600.00	3,100.00
8. Compressor			
480 cu. ft./min.		2,590.00	
100 H.P. engine or motor		3,000.00	5,590.00
9. Contingencies			10,000.00
10. Pockets and stations			
4 levels at $1,000.00 a level			4,000.00
Total Fixed Charges			183,752.00

(continued on next page)

COSTS OF PRELIMINARY DEVELOPMENT
To Explore the Faulted Segment
of La Fortuna Ore Body.

The costs of exploration for the Fortuna ore body will amount to approximately $25,000.00, itemized as follows:

Repair Old Shaft		$3,000.00
Drifting 300 ft. @ $24.00 per ft.		7,200.00
Drilling 1600 ft @ 5.50 " "		8,800.00
Equipment:		
Drill repair	$300.00	
Hose, pipe, etc.	100.00	
Blacksmith Shop	300.00	
Drill steel, 1000 ft. @ 30¢ per foot.	300.00	
Cable, 1500 ft @ 12¢ perft	180.00	1,180.00
Hoist equipment 2000 pound capacity, 450 ft. per min., 1500 ft. depth		485.00
Compressor--rent for 4 months 310 cu. ft. per min.		1,600.00
Contingencies		2,735.00
Total		$25,000.00

TOTAL COST OF DEVELOPING LA FORTUNA MINE
TO A PRODUCING BASIS TO THE 8 LEVEL

1. FIXED COSTS (itemized on preceding page)	$183,752.00	
II. *CROSSCUTS TO STRIKE VEIN 6-7-8 levels		
500' @ $20.00 per ft.	10,000.00	
Total Fixed and Variable Costs		$193,752.00
III. PRELIMINARY EXPLORATION COSTS		25,000.00

*Note: The cost of cross-cutting will vary with the location of the shaft; drifting in ore will pay costs.

CHAPTER I

INTRODUCTION

Since the scope of this report is limited to the solution of the fault problem in connection with the termination of the main ore body in the La Fortuna Mine, only the principal features connected with the history and production will be included herein. This is not a complete geological report. For further details the reader is referred to the reports by O. H. Hershey, written over a period of several years.

Location

The property is situated in the County of Yuma, State of Arizona, about 26 miles southeast of the town of Yuma at the base of the Gila Range. There is a paved highway from Yuma to within eight miles of the property. From this point a country road, dirt, but in fair condition, is extended to the property. From this point on the road is unimproved but passable. The nearest railroad station is Blaisdell, approximately 13 miles by unimproved road from the mine. The mine is accessible at all times of the year.

Climate

The climate of the region is extremely hot in summer.

but cool, with pleasant working conditions, in winter. While it is possible to work in the district during the summer months, it has been the practice of the operators to discontinue all work during the hottest months, due to the inefficiency of the labor at that time.

Because of the arid condition of this region, the supply of water is a grave problem. Formerly water was pumped from the Gila River bottom, 13 miles distant, through a four inch pipe line to a 100,000 gallon reservoir. The pumping plant and pipe line have since been dismantled. During the latest development at the mine water was sotred in the lower workings and pumped to the surface as needed. It is probable that a water supply could be obtained by drilling in the flats about two miles southwest of the mine. Should the property be brought to a producing stage, this matter could be attended to.

Claims.

The property consists of 12 claims, as follows: Oregon, Alta, Christmas Gift, La Fortuna, New Year, Half Moon, Arizona, Alice, Bailey, Barney, Famous, Washington. Each is a full sized claim 600 feet by 1500 feet, all patented and taxes paid.

Ownership.

This mine and the claims are owned by the Elan Mining Company. The total capitalization is 500,000 shares of $1.00

par value, of which 249,000 shares are outstanding, owned by a small group of investors.

Production.

The La Fortuna mine has produced $2,883.075.35 from 180,780 tons of ore, an average value of $15.94 per ton. This tonnage probably includes production from the Christmas Gift vein and Suicide Shaft. The following table illustrates the profit in the operations:

Original cost of mine	$155,700.00
Cost of Plant	200,000.00
Bonus dividend to C.D.Lane	75,000.00
Regular dividends	1,075,000.00
Costs	1,377,375.35
	$2,883,075.35

Taken from the dividend account, and now included in the cost, is an item of approximately $400,000.00 used in the futile development of the mine below the 10 level.

Present condition of the property

Due to the inactivity of the property and lack of a watchman, all buildings have been dismantled. The mill has been stripped of all valuable parts and the boilers, hoists and other equipment are not usable. The shaft is caved and inaccessible beyond the fourth level. The property, therefore, should

be considered as a new property with all buildings, shafts and hoists to be supplied and constructed. Some drills, and steel, and other mining equipment are stored in Yuma.

Topography

The topography of the region is that typical of the desert southwest country, consisting of jagged peaks and steep sided ridges flattening off into the playa flats formed by the desert wash. A United States Geological Survey Bench Mark, elevation 744 feet above sea level, is located approximately 250 feet west of the collar of the shaft. The mountains back of the mine range up to 2770 feet above sea level.

The valleys and ridges are controlled principally by the faults, on which there are a number in this region. Slight modification of this topographic control is due to the differential weathering of beds. The direction of the main range is northwest-southeast.

CHAPTER II

GEOLOGY

In a preliminary report of this nature a detailed description of the geology, except where directly applicable to the fault problem involved, is not fitting.

The Fortuna vein outcrops in the center of a belt of pre-Cambrian hornblendic, biotitic, garnitiferous schists which form a belt approximately 2 miles wide and which strikes about North 60° East, dipping toward the south. Stratigraphically above and below this belt are located highly acidic, apparently, granitic gneisses. Numerous dikes and sills of porphyritic rocks, of a composition between that of diorite and diabase, and extremely basic sills intrude the schists.

Numerous pegmatite dikes, striking from north and south to northeast and southwest and dipping from vertical to parallel to the bedding, cut the schists. These dikes vary considerably in their composition along their strike and dip.

The vein parallels the bedding both in strike and dip, occurring as a lens cut by numerous faults of several ages.

Stratigraphy

The belt of hornblendic schist lying between the granitoid gneisses has an approximate total thickness of 3800 feet. The repitition of these obscure horizons, due to faulting,

makes the total thickness very difficult to determine. There is no folding.

The strike of the beds varies from North 30° East Thru the East and West to North 75° West. Strikes varying from about North 70° East are local due to the drag along faults. The schistosity is approximately parallel to the bedding, dips southerly in direction, and varies from 30 to 90 degrees. This variance is due principally to its relation to the faults. An average dip would be approximately 50 degrees toward the south.

The lowest member of the hornblende schist mapped is that shown on the northwest corner of the area north of the Queen fault. Approximately 380 feet thick, it consists of thin-bedded hornblende schist with some epidote, weathering dark. Toward the top of this formation is a phase that outcrops in gravestone-like blocks.

Next, stratigraphically, is a thinbedded biotite, garnetiferous schist intruded locally by a porphyritic sill now consisting chiefly of feldspar and hornblende. This horizon is definitely lenticular, ranging from 30 feet to 80 feet in thickness. The garnet horizon widens adjacent to the instrusive and may be an old contact metamorphic feature. At the top of this horizon a thin bed of conglomerate was recognized, definitely establishing the sedimentary character of the formation in this hornblende schist belt.

The next ± 430 feet is composed of varying forms of thin-

bedded hornblende schist with no outstanding characteristics readily identifiable in the field. Toward the top of the formation, two lenticular biotitic garnetiferous schists occur, each of which is not over 5 feet in thickness.

The next formation, best exposed on the northwest slope of the hill immediately north and west of the Russell house, consists of lenticular sills of porphyritic rock intruded by thin-bedded hornblende schist. This formation can be used only locally as a marker bed in computing fault block movements. It is intrusive and lenticular; that it may occur in other horizons is entirely possible.

Immediately above the horizon is a dense, hard, dark, hornblendic schist, poorly bedded, weathering almost black, locally exhibiting white spots that resemble those spots of the prophyritic rock described above. Under the microscope, however, these spots appear to be residual calcite. This formation is probably a highly metamorphosed limestone, locally intruded by porphyritic sills. Approximately 50 feet above the base of this formation occurs a small series of silicious beds accompanied by one garnetiferous horizon not more than 5 feet wide. This bed, in conjunction with its relation to the porphyritic intrusion below it, is used in computing the displacement of both the Emporer and Queen faults. The total thickness of this bed is approximately 350 feet.

Immediately above this metamorphic limestone occurs

a series of biotitic siliceous garnetiferous beds approximately 750 feet in thickness. This zone, called "the lower garnet series," is exposed throughout the area mapped and forms one of the best horizons for determining the general displacement of the Queen fault. Its best exposure occurs north and west of the mine shaft along the Christmas Gift vein ridge. At the base of the formation it is found to be a rapidly alternating series of hornblende, thin-bedded schist and silicious garnetiferous biotitic beds. Toward the top of the series, we find that the garnetiferous and hornblende beds are displaced by lenticular porphyritic sills, diminishing in quantity toward the east along the strike. On the "Mill Hill" it is probable that the upper portion of this series has been completely removed by the intrusion of this porphyritic rock exposed in that area. The vein designated by Hershey as bed #16, lying immediately above the Fortuna vein, is a biotitic garnet bed intruded by basis sills and belongs to the lower garnet series. The total thickness of this formation is about 750 feet. The base of this formation is exposed to the south and west of the Queen fault and affords data for the determination of the faulting in that region.

Above this horizon is a dark, thin-bedded, hornblende schist, represented in places by a pale-green, thin-bedded zone of schist with needle-like crystals of hornblende and possibly of tremolite, best exposed on the "Mill Hill." This horizon

may be traced northward throughout the area and forms in some instances an excellent key member to determine the displacement of numerous faults to the north of the Queen fault. In conjunction with a garnetiferous bed, described immediately below, it forms a basis of the determination of the total displacement along the Queen fault. Its maximum thickness is determined to be approximately 250 feet.

Immediately above this zone lies a thin-bedded silicious hornblendic schist varying in character throughout but without sufficient differences in characteristics to be readily subdivided in mapping. Thirty feet above the base of this formation, a 10 foot bed of biotitic, silicious, garnetiferous schist is found, traceable throughout the area to the northeast and outcropping in one instance wouth of the Queen fault. As mentioned above, this, in conjunction with the bed immediately below it stratigraphically, forms the best criterion for the determination of the Queen fault displacement. Within this horizon occurs a zone of epidote-bearing beds, lenticular in habit, formed by contact alteration. These beds outcrop on both hanging and foot walls of the Queen fault and can be used to check the fault displacement. Two sills of basic material, now principally hornblendic due to metamorphic action, occur in this horizon. These sills are lenticular in habit and are not traceable throughout the area. The best exposure of this horizon occurs both to the northeast and southwest and immediately adjacent to the Queen fault along the "Mill Hill" and the flat to the southwest.

Stratigraphically above this series occurs the "Upper garnet zone" of approximately 420 feet in thickness. The lowest member of this horizon is a massive bed of silicious garnetiferous schist varying greatly in thickness and ranging up to 120 feet in thickness toward the south. The upper member of this formation consists of interbedded hornblende and biotitic garnetiferous silicious schist.

The next 200-feet consists of thin-bedded hornblendic schist varying in composition and appearance from a bluish green to deep sea green in color on the weathered surface. There is nothing characteristic about this zone.

Stratigraphically above this horizon lies an extensive highly silicious granitoid gneiss. The thickness of this horizon has not been determined, but is known to be over 2000 feet. At the base of this so-called upper formation is a very basic sill. The contact between the upper formation and the one immediately below it is very definite and forms an excellent plane for the determination of fault movements. Unfortunately, however, this contact is covered by detrital material at its intersection with the Queen Fault.

Traversing these schists are found numerous pagmatite dikes varying somewhat in composition and containing garnets, black biotite, moxcovite, and insome instances tourmaline. These dikes are found in pre-existing fissures and along the

bedding of the schist . Those which are most characteristic and persistent fill fissures--those parallel to the bedding are not regular. The general strike is approximately North 30° East and the usual dip is practically vertical. They are continuous, but have been broken up into small segments by intricate faulting. These dikes offer excellent data for the solution of the fault problems and especially that of the Queen fault. Since these dikes are used as data for the determining of the displacement of the Queen fault, a brief description of those used follows.

Toward the southeast portion of the surface map, accompanying this report, in the Queen Valley is shown a large plug of pegmatite, labelled #1 on the horizontal projection. This plug is characterized by the lack of quartz and the presence of small garnets. It is extremely wide in relation to length, ranging up to 150 feet in width. Five hundred feet northwest of this plug occurs a similar one to the south of the Queen Valley. Immediately southeast of the latter are exposed small segments of the same material in the Queen Valley. These are dragged blocks along the fault line. There can be no doubt that these two large blocks, above mentioned, are portions of the same dike and that the horizontal separation of these two certically dipping plugs is 500 feet.

At the southeast end of the hill upon which the Mill is situated a large pegmatite dike occurs which is traceable to the north to the extreme edge of the map. While the most prom-

inent feature is the presence of black biotite in this dike, the most characteristic feature is the presence of a granular quartz. It has a graphic texture and is accompanied by small garnet crystals. The dike strikes approximately North 30° East and dips about vertically. It occupies a fracture upon which there has been some movement. In one instance it shows at least 90 feet separation of the base of the upper garnet series. The composition of this dike varies along both strike and dip. Black biotite is a variable constituent, but granular quartz, graphically intergrown with the feldspar, is characteristic and occurs the length of the dike. The width of this dike varies from a few feet to 100 feet in thickness. This is designated as #11 dike on the horizontal projection.

Approximately 200 feet northwest of this dike a small pegmatite dike occurs outcropping north of the Queen fault on the "Mill Hill". This dike is traceable North but its position is obscured by the faulting. This dike is designated as #111 on the horizontal projection.

South of the Queen fault, approximately due south of the shaft, a pegmatite dike occurs, ranging up to 8 feet in width, occupying a structure striking North 30° East and exhibiting the characteristic granular quartz graphically intergrown with the feldspar. There can be no doubt that this is the continuation of the larger dike described above. As contributary evidence, approximately 200 feet west of this and parallel

to it occurs another small dike resembling that small dike described above. The horizontal separation indicated by the correlation of these dikes is approximately ≈ 500 feet.

North of the shaft collar are to be found two dikes parallel to one another, striking approximately North 45° East and dipping 45 to 60 degrees to the northwest. These dikes occupy fractures along which movement has taken place. They form excellent data for the determination of fault movements north of the Queen fault.

Faulting

The general faulting of the region is expressed strongly on the topographic maps of the area. Valleys and ridges are controlled by the major faulting. A glance at the United States Geological Survey topographic map of the Fortuna Quadrangle shows that the general faulting strikes from North 60° to North 30° West. The dip of these structures is found to be usually toward the north at an angle varying from 30 to 80 degrees but generally around 65 degrees.

There are three distinct periods of faulting. The first strikes approximately North 45° to North 50° East and antedates the introduction of the pegmatite dikes. North of the Fortuna Mine shaft collar two of these faults occur, paralleling each other and dipping 45 to 65 degrees toward the northwest. The displacements along these faults are minor,

probably not over 100 feet along the dip in a normal direction. The faults are now occupied in places by the pegmatite dikes.

A second series of faults, striking almost due north and dipping easterly at an angle from 65 to 85 degrees, are also normal in character. The most southerly exposure of the westerly, north striking fault, the Archduke, occurs immediately south of the mill and south of the Queen fault. In the center of the area, as mapped, the fault consists of a small broken zone not more than 3 feet wide, locally occupied by a granular quartz vein with some calcite. The hanging wall of the fault plane shows bending in a normal direction. The separation of the beds on the south side of the Queen fault along the Archduke is difficult to determine due to the presence of numerous faults parallel to the Queen fault cutting the Archduke fault into small segments. North of the Queen fault along the "Mill Hill," in the saddle, approximately half way between the ends of the hill, a small broken zone is situated. By projection from the under ground workings, the Archduke fault, which, by repute, is occupied underground by a quartz vein, would occur at this point. Trenching in the saddle immediately north of this position has exposed a fault striking approximately north which is cut off by a northwest striking fault. On the side of the hill immediately east of this saddle can be traced a broken zone with the beds dragged in a similar manner to that portion of the Archduke fault south of the Queen fault. This broken zone passes

into the wash of the stream curving northeasterly from the collar of the Fortuna shaft. On the same ridge, 350 feet to the northeast, is exposed a fault line striking approximately due north and dipping 75 degrees to the east. It is occupied locally by quartz and calcite and shows drag along the hanging wall side. This can be traced northward until it passes into the wash of the same stream as described above. To the north of the point where the fault zone disappears under the wash on the opposite side of the stream, there is an outcrop of granular quartz. Due north from this position, on the saddle of the ridge approximately in the center of the area as mapped toward the north border, a strong fault zone occurs. Though no quartz and calcite are present beyond the ridge, the beds exhibit a bending similar to that described above.

It is probable that these segments represent the same fault. Where determinable the fault shows a horizontal displacement of about 200 feet, and underground a total displacement of about 260 feet. This fault cuts and displaces the pegmatite dikes and the faults striking North 50° East described above.

Paralleling this fault and approximately 1200 feet to the east, south of the Queen fault, occurs another fault striking approximately north and dipping easterly at an angle of 65 degrees. At a saddle immediately south of the southeasterly end of the "Mill Hill" is exposed a fault zone approximately 5 feet wide and consisting of blue gouge and dragged schist dipping 65

degrees. Tracing this plane to the south at the small hill adjacent to the King fault is found a fault plane with the same strike and dip, separating a dark basic sill 60 feet along its strike. This probably represents the horizontal separation along this fault, the Empress. North of the saddle first mentioned and to the Queen fault, the Empress fault is obscured due to detrital matter on the slopes of the ridge. It is probable, however, that an obscure fault separating the base of the "upper garnet series" 60 feet immediately south of the Queen fault at the end of the "Mill Hill" represents the Empress fault in this position. At a point approximately 425 feet southeast of the large pegmatite dike at the end of the "Mill Hill" on the north side of the stream occupying the Queen fault valley, occurs an outcrop of a fault striking northerly and dipping easterly at an angle of 45 degrees. This fault zone consists of a breccia about 4 feet wide. Trenching in the saddle immediately north of this point exposed a broken zone 4 to 5 feet wide dipping 60 to 90 degrees to the east. If this be the fault segment of the Empress fault, it must pass into the wash to the immediate north.

North of the Princess fault about 300 feet west of the large pegmatite dike a small fault plane is exposed. Projecting this plane to the north, we pass through several saddles and encounter a fault plane cutting the large pegmatite dike on the southeast slope of the ridge on the northern edge of the map. This fault

plane is traceable to the valley to the north and definitely effects several beds as illustrated on the surface map. The separation of the beds along the fault line at the northern extremity is approximately 200 feet. It is probable that these segments of a fault plane represent the same one and we may consider those as described as the Empressfault. In view of the fact that only two fault planes striking north are found north and south of the Queen fault, we may feel that they are identifiable.

It is probable that, because of subsequent movement along later faults, the movements along the various segments of both the Archduke and Empress vary and that a movement of one block cannot be compared to the movement along its complimentary segment in another block.

The third and most important series of faults are those of which the Queen fault is a member, and, economically, in relation to the Fortuna Mine, is the most important. These faults strike northwest and dip to the northeast.

At the southwest corner of the area mapped is shown a large breccia zone accompanied by definite fault planes. This has been termed the King fault and is a strong structure traceable for miles in a southwesterly direction. Its topographical expression is usually a saddle in the ridges or valleys. The bedding of the schist is dragged until it is parallel to the strike of the fault. The block of schist to the north of the King fault has evidently been moved toward the east in relation

to that block to the south of the fault. The amount of movement has not been determined nor is it known whether it be "reverse" or "normal" in direction.

To the North of the King fault occur several parallel and "sympathetic" faults, evidently due to sympathetic action and readjustment during and after the extensive fault movement along the King fault. The direction and amount of movement along these minor faults can be determined accurately by computation with the use of the base of the "Upper garnet series," which outcrops to the northwest of the "big flat" upon which the mill tailings are situated, and the lagmatite dike labelled #11. Of these, in our present discussion, only one must be taken into consideration. This is the so-called "Jester fault" exposed on the 800 level in the new workings south of the Queen fault. This fault, according to surface data, has a westerly shift on the footwall of the fault plane and is normal in direction.

Economically the most important fault in the district is the Queen fault which cuts off the ore of the Fortuna Mine just below the 1100 level. The actual intersection between the ore and the fault plane occurs between the 5 and 6 levels; finally passing out at the easterly edge of the ore-shoot previously displaced by the Archduke fault on the 1100 level. A more detailed discussion of the relation will follow in a later section.

The Queen fault runs from the northwest corner of the

area as mapped along the broad flat valley in a southeasterly direction passing the "Mill Hill" turning slightly more to the south at the end of the hill and is traceable beyond the southeast boundary of the area as shown on the accompanying map. The most northerly outcrop of the broken zone representing the Queen fault occurs north and west of the mill at the "Russell House," Here it shows a large broken zone with local discontinuous gouges, some breccia accompanying them and the bedding on the hanging wall dragged parallel to the strike of the fault. Apparently the fault movement at this point, as shown by the drag of the bedding, has been such that the hanging wall block has moved in a southeasterly direction.

Across the flat to the southeast from this exposure and southwest of the mill, the schists are broken and clearly disturbed though no fault plane can be seen. Almost beneath the stamp battery at the foundation of the mill can be seen an exposure of breccia zone, although no distinct planes can be seen. Tracing the broken zone toward a southeasterly direction, the old road-cuts along the "Mill Hill" expose a broken zone with schist on the hanging wall dragged parallel to the fault line. Along the road cut due south from the saddle along the "Mill Hill" we find a fault plane striking North 30° West and dipping 60 degrees to the northeast. This latter is probably one strand of the Queen fault passing to the south of the large block of pegmatite #11 that is found on the side of the "Mill

Hill." Trenching the northeast edge of this block shows that it is cut off by a fault plane striking northwesterly and dipping 43 to 55 degrees to the northeast. Thus we may consider this large block of pegmatite as lying in the Queen fault zone and representing merely a dragged portion of the dike of which its complements can be found to the northeast and southwest of the Queen fault. Approximately 100 feet south of the exposure last mentioned, in the road-cut, are several fault planes with accompanying breccia zones. These are probably foot-wall portions of the large Queen fault shear zone. These planes strike North 60° west and dip 60 to 78 degrees toward the northeast. These fault planes are represented on the 800 level by the so-called "Sisty" fault which is the foot-wall gouge of the Queen fault shear zone. The 500 level exhibits 75 feet of shear in the main Queen fault. Fragments of pegmatite dike #11 are found throughout these foot-wall shears. Trenchings in the saddle further south along the Queen fault valley, at the southeast end of the "Mill Hill," has revealed a strong breccia and a fault plane at the southwest end of the hanging-wall segment of the pegmatite dike #11. This fault plane strikes North 75° West and dips 60 degrees toward the north. From here, in a southeasterly direction, the fault zone is covered by a fair thickness of detrital material, consequently there are no exposures of the Queen fault zone. Between the two large segments of a pegmatite plug, at the southeast corner of

the map, are found several blocks of pegmatite similar in character to these aforementioned segments. These are dragged blocks in the Queen fault zone.

This large structure, tracable on the surface by its effect upon the topography, b y several exposures of breccia and gouge lines, is represented underground by a large broken zone on the 500 level, by a distinct fault plane on the 800 level, and, by repute, by distinct fault planes from thence to the deep workings of the mine, The solution and amount of movement of this fault will be discussed under a separate heading.

Northeast of the "Mill Hill" occurs a valley parallel to the Queen but swinging toward the north in a northwesterly direction. Southeast of the "Mill Hill" this valley is joined by the Queen Valley and extends to the southeasterly edge of the map. At the north end of the valley we find that the lowest garnet bed described is cut off and does not reappear on the northeast side of the valley. At the saddle to the northwest of the Fortuna Mine along the valley below the reservoir, we find a large shear zone at least four feet wide and dragging the beds parallel to it. From this saddle toward the southeast, outcrop several fault planes striking north 30° west dipping from 50 to 60 degrees. In a tunnel south of the reservoir, approximately half way between the reservoir and the Christmas Gift outcrop, a fault plane is found striking north 50° w est and dipping 75 degrees to the north, Immediately

south of this exposure on the east slope of the stream a prominent fault plane is seen striking North 30° west and dipping 60 degrees to the east. A trench, dug in the small saddle northeast of the round hill immediately north and west of the Fortuna shaft, exposed a large breccia zone with a distince fault gouge on the foot-wall striking North 30° west and dipping 63 degrees to the northeast. About 100 feet north 60° east of this exposure, in a cut in the side of the hill below the Christmas Gift bein outcrop, a fault plane occurs striking north 30° west and dipping 49 degrees to the east. For the next 2,000 feet the line of this fault is covered by debris in the valley controlled by it. There are no exposures, but on the second level of the Fortuna mine at a distance of 50 and 125 feet northwest of the shaft, are exposed two fault planes, the Count and Countess faults, so-called. These faults definitely displace any ore underground and that amount along the Count fault has been determined; a horizontal separation of approzimately 100 feet. The displacement along the more northerly or Countess fault has not been determined. By projecting these faults, found on the second level, to the surface, they will be seen to be the continuation of the fault zone immediately above described. No further exposures of these faults are obtained until we find their intersection with the large pegmatite dike #11 north of the Queen fault. Here we find that the pegmatite dikes have been shifted silghtly to

The east on the hanging-wall side. Thence to the south, this fault line is observed. Whether it joins these faults to the north or the Queen to the south is a matter of conjecture.

The last fault to be discussed in detail is the Princess fault striking almost due east and west. Its most westerly exposure is on the south slope of the small round hill immediately north and west of the Fortuna Mine shaft collar. Here it has a south dip of 86 degrees and consists of a 3 foot broken zone with distinct hanging and footwall planes. The strike is North 77° West. At a distance of approximately 200 feet at the base of the hill characterized by the two west dipping pegmatite dikes, is found a broken zone with bedding dragged until it strikes almost due east and west. The dips of the broken zones vary from 86 degrees northerly to 75 degrees southerly. If this zone is projected westerly it encounters that exposure immediately above described. Due east from this point, in a saddle of the next ridge, numerous fault planes are exposed by trenching, striking east and west and dipping to the north 62 degrees. By trenching, it is found that these planes are cut by the fault gouges striking North 60° West. At the saddle in the ridge most easterly mapped south of the highest peak in the northwest corner, are found definite gouges striking east and west and dipping almost vertically. This broken zone has been termed the Princess fault. While this has been considered a single fault, it probably consists of several segments formed contemporaneously

wit and activated by the same stresses as those which formed the Queen fault system. The movements along the Princess fault are variable, depending upon the blocks between the northwest striking fault in which each segment occurs.

There are numerous other faults to the northwest from the Queen which, although important as far as their displacement of the formation is concerned, do not concern us in relation to the Fortuna Mine.

Ore and Ore Bodies

The ore of the Fortuna Mine consists of a dense, slightly granular quartz, often copper stained and with a variable gold content. The gold occurs in a free state with no accessory minerals in the ore body as mined. It is probable, as indicated by the presence of copper staining, that chalcopyrite occurs below the zone of oxidation in minor quantities.

Under the microscope there is no evidence of strain phenomena in the anhedral quartz crystals, indicating no recrystallization or other effects of dynamic metamorphism. The introduction of the quartz is, therefore, subsequent to the metamorphism of the schists and, consequently, would be unaffected by pre-metamorphic faulting. The ore body varies in width from a thin knife blade like vein to 20 feet in maximum width.

The ore shoot occurs as a lenticular replacement in pre-Cambrian schist and outcrops west of the main Fortuna shaft in two lenses, the "west shoot" and the "east shoot;" These two pipes were followed down separately and retained their entity until the 5 level where they joined, though one section 150 feet in length was too small and lean to mine. On the 2 level and probably to the 4 level the eastern edge of the ore body is cut and displaced by the Count fault. From the 4 level to slightly below the 8 level the ore is continuous, reaching a maximum length of 500 feet below the 5 level. Slightly below the 5 level the western edge of the ore body rakes into and is cut off by the Queen fault. Between the 5 and 6 levels the eastern edge of the ore body is cut by the Archduke fault and is displaced approximately 260 feet on this fault and is picked up again on the 9 level. That portion of the ore remaining on the foot-wall of the Archduke is rapidly cut off by the north dipping Queen fault until it is completely truncated at a point approximately 70 feet below the 8 level. The portion on the hanging-wall of the Archduke fault was mined to the 11 level where, again, due to its rake, it is cut and displaced by the Queen fault. The ore is a continous body from the surface until it is cut off by the Queen fault. It has an average width of approximately 3-1/2 feet and a maximum length along the strike of almost 500 feet. The ore body dips with the schistosity and rakes slightly more easterly than the dip. The value of

the quartz runs from nil to, reputedly, $40.00 to $50.00 a ton. The vein is reported to be widest and richest at the point of cut off.

The Christmas Gift vein and the vein on the Half Moon claim would afford excellent zones for development, provided that the main Fortuna vein is developed to a producing stage.

The Fault Problem

It is demonstrated that the Fortuna vein was cut off and displaced by the northwest striking, northeast dipping Queen fault. It is also known that the ore body has been displaced by the Archduke fault. This displaced portion on the hanging-wall of the Archduke fault on the hanging wall side of the Queen fault has been developed and mined. The Archduke fault is cut and displaced by the Queen fault. The future of the Fortuna Mine depends upon the solution of the Queen fault movement and the recovery and development of that ore south of the Queen fault. Since certain of the horizons of the schists have been definitely proven to be sedimentary and, therefore continous, the identification of these sedimentary beds on opposite sides of the Queen fault afford excellent date for the computation of the fault movement, in conjunction with the separation shown by the pegmatite dikes. In this solution of the fault problem, care has been taken to

avoid all possible confusion due to the junction and cumulative displacement of various branch faults. Thus two separate horizons, identified on both sides of the Queen, have been used.

Immediately West of the "Mill Hill" is a large hill, chiefly composed of highly metamorphosed limestone. This metamorphic limestone is the only limestone horizon in the whole stratigraphic sequence.

Fifty feet abofe the base of this formation is a garnet bed accompanied by several silicious, biotitic beds that can be traced to the hanging-wall of the Queen fault. At the base of this formation are numerous lenses of porphyritic intrusives. To the southwest of the Queen fault valley there occurs a low ridge composed chiefly of this same metamorphosed limestone. At the southeast end of the ridge we find the base of the "lower garnet series". At the northeast end of the ridge we find the same garnet bed underlain by porphyritic intrusive that we have on the hanging-wall of the Queen fault. The thickness of the metamorphosed limestoen on one side agrees with the thickness on the other. There can be no doubt as to the identification of these two garnet beds, on opposite sides of the Queen fault, as the same bed. The horizontal separation along the Queen fault of this bed is 200 feet.

On the top of the "Mill Hill" an outcrop of garnetiferous, biotitic, silicious schist occurs, interbedded with

a silicious, hornblendic, thin-bedded schist. At the base of the thin-bedded schist occurs a pale green hornblendic schists, easily identifiable in the field. Below this horizon, and sometimes interbedded with it, is a large mass of porphyritic intrusive. While the porphyry is probably lenticular and cannot be used as criterion for fault displacement, certainly the garnet bed is sedimentary and can be so used. Its relation to the porphyritic bed is merely contributary evidence and confirms the identification. South of the mill on the foot-wall of the Queen fault is found a garnet bed similar to that described. Stratigraphically below this bed occurs the same sequence as that described above as that on the hanging-wall of the Queen fault. The horizontal separation of this bed on the Queen fault. The horizontal separation of this bed on the Queen fault is 20 feet. The bed strikes eas-west and dips 42 to 43 degrees southeast. This agrees fairly closely with that separation illustrated above. There is very little doubt concerning the identification of this horizon. The variance with that horizontal separation given above may be due to several causes.

The separation of the pegmatite dikes along the Queen fault has been discussed above in a previous section. Briefly reviewing, the pegmatite plug labelled #1 on the southeast section of the map has been separated 500 feet along the strike of the Queen fault. This separation is corroborated by the displacement as shown on the #11 pegmatite dike,

the identification of which is enhanced by the presence of a small dike labelled #111. There can be no doubt of a 500 foot horizontal separation of vertically dipping structures along the Queen fault. The solution of the problem of the Queen fault displacement is readily obtained, therefore, by the use of this data. It is found, as illustrated in the accompanyint geometrical solutions, that the range of possible movement varies from 580 feet total displacement to 630 geet total displacement, with a vertical displacement of 150 ~~ft~~ to 300 feet and a horizontal displacement of 535 to 550 feet. This the faulted portion of the ore lying between the foot-wall of the Archduke fault and the foot-wall of the Queen fault will be found with a subsurface apex south of the Queen fault and slightly above the 5 level in elevation. The ore lying on the 5 level will be south of the Queen fault and slightly northwest of the most westerly drift in the 5 level workings south of the Queen fault. This is illustrated by the accompanyingsketch. The ore will proceed downward until it strickes the faulted section of the Archduke fault where it will be again displaced similar to that displacement on the hanging-wall side of the Queen fault. This displacement is known and no difficulty should be encountered in developing this segment of ore. To the south, the rake of the ore carries is to the Jester fault which displaces the ore body westerly on its foot-wall side. No difficulty should be encountered in developing this ore.

CHAPTER III

DEVELOPMENT

During the operation of the mine, and before the ore was lost by faulting, eight levels were developed with a total of 5300 feet of development work distributed as follows:

#1	level	200	feet
2	"	800	"
3	"	150	"
4	"	1440	"
5	"	540	"
6	"	380	"
7	"	600	"
8	"	1190	"

These workings fairly well define the position of the ore body. Little work was done away from the vein.

Included in the last item is some work done subsequent to the loss of the ore by later owners of the property. Subsequent to the discovery that the ore was lost below the 8 level, additional development work was done. In this work the faulted segment of the ore body on the hanging-wall of the Archduke fault and foot-wall of the Queen fault was developed. That portion of the ore lying on the foot-wall of the Queen fault, due to the fact that the Queen was considered a reverse fault, was explored downward by winzing and lateral development along the Queen fault. The total amount of drifting for this portion of the ore amounted to 5530 feet and is distributed as follows:

#9	level	660 feet
10	"	1400 "
11	"	180 "
12	"	1170 "
13	"	780 "
14	"	520 "
15	"	360 "
16	"	260 "

This latter development was accomplished, including the cost of winzing, for a cost of approximately $400,000.00. The mine was developed by two shafts. These were called the discovery shafts. These were abandoned for a later shaft termed the "Hill Top" shaft, sunk diagonally across the dip of the vein. When it was found that the ore was raking almost at right angles to the shaft, this "Hill Top" shaft was abandoned and the present main shaft raised from the 4 level. This shaft was sunk to the 10 level where a winze was put down to the 20 level but no lateral development work done lower than the 16 level.

At the resumption of development work subsequent to 1918, all development work was done on the 5 and 8 levels in search of the faulted portion of the ore in the position conceived at that time. This work amounted to 4,000 feet, as follows:

#5	level	850 feet
8	"	3150 "

Some few small bodies of gold bearing quartz were developed on the 8 level.

In conjunction with this development work, 22 diamond

drill holes were drilled. The total cost of this work was approximately $300,000.00. The total development work in the mine has consisted of over 14,830 feet of horizontal development.

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F.O.82

SHERIFF'S DEED

THIS INDENTURE, Made this _____ day of January, 1946, between J. A. BEARD, Sheriff of the County of Yuma, State of Arizona, the party of the first part, and GUIDO E. CAGLIERI, party of the second part,

WITNESSETH:

WHEREAS, in and by a certain judgment and decree made and entered by the Superior Court of the State of Arizona in and for the County of Yuma, on the 16th day of January, 1943, in a certain action then pending in said court wherein said Guido E. Caglieri was plaintiff and the Elen Mining Company, a corporation, was the defendant, it was, among other things, ordered, adjudged and decreed, that all and singular, the attached premises specifically described in said judgment and decree, be sold under special execution in the manner provided by law; and

WHEREAS, in accordance with said judgment and decree, execution and order of sale, was, on the 30th day of April, 1945, issued and delivered to the said Sheriff of the County of Yuma, State of Arizona, commanding him to seize the premises described in said judgment and decree and sell the same under execution and apply the proceeds of said ___ towards the satisfaction of said judgment and make return thereon within ninety (90) days; and

WHEREAS, pursuant to said execution and order of sale to him directed and delivered, the said Sheriff of the County of Yuma, State of Arizona, levied on the premises mentioned in said judgment and decree and agreeably to said judgment and the provisions of law, and did, at the hour of 10 o'clock A. M. on the 29th day of May, 1945, after due public notice had been given as required by the laws of this State and the course and practice of said Court, sell said premises at public auction at the front door of the Court House in the City of Yuma, Yuma County, State of Arizona, at which sale a portion of the premises mentioned in said judgment and decree and hereinafter described, was fairly struck off to the said Guido E. Caglieri, the said party of the second part, for the sum of Five Thousand Seventy-five and 05/100 Dollars ($5,075.05), he being the highest bidder and that being the highest sum bid for the same, and

WHEREAS, the said party of the second part thereupon paid to the said Sheriff the said sum _ money so bid by him; and

Whereas, the said Sheriff thereupon made and issued the usual certificate of the said sale in duplicate in due form of law and delivered one thereof to the said purchaser and caused the other to be filed in the office of the County Recorder of said Yuma County; and

WHEREAS, more than six (6) months have elapsed since the date of said sale and no redemption has been made for the premises so sold as aforesaid, by or on behalf of said judgment debtor, Elen Mining Company, a corporation, or by or on behalf of any other person, and no notice of intention to redeem having been given by any lien holder, creditor or other person entitled to redeem as provided by law.