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01/04/96

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES FILE DATA

PRIMARY NAME: TOM REED

ALTERNATE NAMES:
ARGO
BALD EAGLE SHAFT
BEN HARRISON
BIG JIM AZTEC
BLACK EAGLE ORE BODY
TIP TOP ORE BODY
BLUE RIDGE GOLD MINES
GREY EAGLE SHAFT
MORNING STAR
OLLA OATMAN SHAFT
PASADENA MINE
RISING SUN
RED CLOUD
HACKS MILL

MOHAVE COUNTY MILS NUMBER: 34B

LOCATION: TOWNSHIP 19 N RANGE 20 W SECTION 23 QUARTER N2
LATITUDE: N 35DEG 01MIN 25SEC LONGITUDE: W 114DEG 22MIN 44SEC
TOPO MAP NAME: OATMAN - 7.5 MIN

CURRENT STATUS: PAST PRODUCER

COMMODITY:
GOLD LODE
SILVER

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CONTINUED ON NEXT PAGE

27 Maps

Tom Reed

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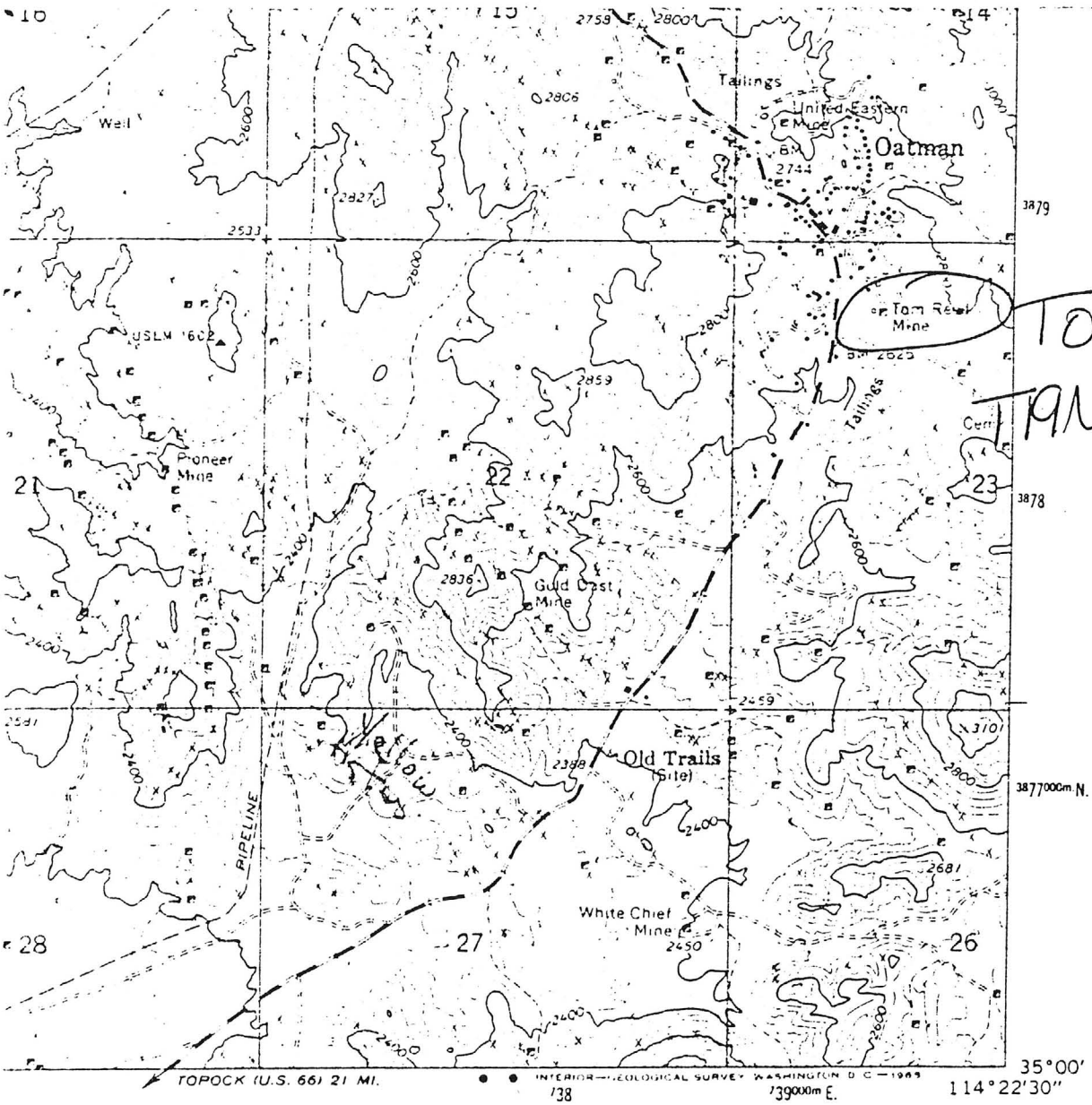

Tom Reed
T9NR20W Sec28
N2

ROAD CLASSIFICATION

Medium-duty ——— Light-duty ═══

Unimproved dirt - - - - - -

ARIZONA

QUADRANGLE LOCATION

51-D

OATMAN, ARIZ.

N3500—W11422.5/7.5

MO

1967

Arizona Department of Mines and Mineral Resources

INFORMATION FROM MINE CARDS IN MUSEUM

ARIZONA

MOHAVE COUNTY

OATMAN AREA

SAN FRANCISCO DISTRICT

TOM REED GROUP

BLACK EAGLE MINE

MM K154 Gold in quartz

MM K154 Gold ore

MILS # 34B

14-ALA's

Tom Reed Gold Mines (file)

Arizona Department of Mines and Mineral Resources

INFORMATION FROM MINE CARDS IN MUSEUM

ARIZONA

MOHAVE COUNTY

MM K164 Gold ore

OATMAN AREA

SAN FRANCISCO DISTRICT

TOM REED GROUP

GMILS #34 B

14 - AKA's

Tom Reed (fild)

TOM REED GOLD MINES

MOHAVE COUNTY
SAN FRANCISCO DIST.

Visited Tom Reed Mine in Oatman to check rumored activity re the tailings. Discussed the situation with Mr. Brandenberg, Resident Agent for the Sawyer Petroleum Co., owners of the property. The reports of a pending deal are unfounded.

2-24-59
TPL

DURAND & COMPANY

INVESTMENT SECURITIES

17 East Pennington St. - P.O. Box 1148

Tucson, Arizona

EUGENE F. DURAND
ROBERT E. HEINEMAN

PHONE: 2582
TELETYPE: TSN 14

July 11, 1945

Mr. A.C. Nebeker,
Field Engineer
State Department of Mineral Resources
304 Home Builders Building
Phoenix, Arizona

Dear Mr. Nebeker:

I have your letter dated July 10, relative to the Tom Reed Gold Mine Company. I wish to thank you very much for the information in this letter and state that we appreciate greatly the trouble to which you were put in obtaining this information.

Yours very truly,

DURAND & COMPANY

By Robert E. Heineman

REH:kk

DEPT. MINERAL RESOURCES
RECEIVED
JUL 12 1945
PHOENIX

D-37 116 140g 14.0 X 12.0 X 8.0 cm K164

MINERAL SPECIMEN FOR DEPARTMENT OF LIBRARY AND ARCHIVES

(Do not write in this space)

Ore _____

Cabinet _____

No. _____

(Wrap each specimen separately, or place it in a substantial bag, by itself, with a number attached, identical with the number on this card.)

Specimen No. 11, collected by Robert E. Morrow. Field Engineer

Name of ore Gold.

Minerals contained _____

Gangue _____

Depth at which taken _____

Approximate mineral content (in terms of average per ton) _____

Name of mine or claim Tom Reed

Group _____

District OATMAN.

Location (distance and direction by highway from what town _____

Owner of property Tom Reed Mines Co.

Operator _____

Mine active or inactive INACTIVE.

If inactive, when operated 1906-1939

Specimen presented by B.N. Perry

Date Aug 15, 1940

Notes (Any general information regarding the history of the property.) Sample is from Black Eagle Shaft. 1275 foot Level. Production of Mine. $20,000,000

If more space is desired for notes, use other side.

G-17

K154

MINERAL SPECIMEN FOR DEPARTMENT OF LIBRARY AND ARCHIVES

Tom Reed G.M.C.

(Do not write in this space)

Ore _____

Cabinet _____

No. _____

(Wrap each specimen separately, or place it in a substantial bag, by itself, with a number attached, identical with the number on this card.)

D.39r.

Specimen No. 30, collected by E. B. Holt.
Field Engineer

Name of ore Gold Quartz

Minerals contained Au

Gangue Quartz

Depth at which taken 600'

Approximate mineral content (in terms of average per ton) $700

Name of mine or claim Black Eagle

Group Tom Reed.

District San Francisco

Location (distance and direction by highway from what town _____

Owner of property Tom Reed G.M. Co.

Operator Tom Reed Gold Mines Co

Mine active or inactive Inactive

If inactive, when operated 1895 (?) to 1929.

Specimen presented by E. B. Holt.

Date Jan. 10, 1940

Notes (Any general information regarding the history of the property.)

If more space is desired for notes, use other side.

This specimen is now in the ADMR Mineral Museum - see K number. K154 1-19-40

Mr. HAMILTON. I understand you have a railroad commission or public service commission in Arizona?

Mr. MAXCY. Yes; I suppose they have. We have never struck them yet.

Mr. HAMILTON. I understand they are in every way endeavoring to assist in the lowering of freight rates.

Mr. MAXCY. Yes. We have been taking that up with the Santa Fe the last few weeks, but I don't know how far we will get with it.

Mr. HAMILTON. What wages are paid at the mine, Mr. Maxcy?

Mr. MAXCY. We are paying about $5.50 for miners—$5.50 to $6; $4.50 to $5 for common labor.

Mr. HAMILTON. Is there any shortage of trained or experienced miners at this time?

Mr. MAXCY. Miners have been rather scarce with us lately.

Mr. HAMILTON. What, as a rule, is the nationality of the miners?

Mr. MAXCY. We have a few Mexicans, but mostly Americans.

Mr. HAMILTON. Does the area in which you are operating give promise of a large development of ore reserves?

Mr. MAXCY. We have a pretty good sized body of ore developed, and some our neighbors want to bring ore to us to be treated, and we have told them would if we could agree on the right basis.

Mr. HAMILTON. How many other properties are being developed in your section?

Mr. MAXCY. Offhand, I would say five or six, but there may be more.

Mr. HAMILTON. Are they all lead-silver properties?

Mr. MAXCY. Most of them are lead-silver properties; maybe one of two copper properties are being developed there also.

Mr. HAMILTON. What, in general, is the size of those operations?

Mr. MAXCY. They are pretty small, I take it, at the present. I am not very familiar with it. There are quite a number of prospects between us and the Bill Williams River.

Mr. HAMILTON. Has the opening up of your property in the last year or two increased the amount of prospecting and development in that area?

Mr. MAXCY. I think it has, but I don't know whether they would have developed if we had not opened up.

Mr. HAMILTON. What percentage of the value of your ore consists of silver—in other words——

Mr. MAXCY (interposing.) Why, I should say about 2 to 3.

Mr. HAMILTON. Were you operating at any time during the—or milling during the operation of the Pittman Act?

Mr. MAXCY. Yes; for a short time.

Mr. HAMILTON. Did you have any difficulties in adjustments at the time the Pittman Act was closed?

Mr. MAXCY. No; they just stopped paying us the amounts; that is the only ficulty.

Mr. HAMILTON. Was any of your silver ore tendered to the smelters that was not received?

Mr. MAXCY. No; we had in the affidavits of all of our cars. Several moved after the Pittman Act stopped. I don't know whether it will amount to anything or not.

Mr. HAMILTON. What is the capacity of your plant, Mr. Maxcy?

Mr. MAXCY. About 150 tons a day—that is, flotation.

Mr. HAMILTON. One hundred and fifty tons of crude ore you mine?

Mr. MAXCY. Yes.

Mr. HAMILTON. What power is used?

Mr. MAXCY. We use the "Y" Fairbanks Morse hot head type of engine.

Mr. HAMILTON. Has there been any reduction of freight rates?

Mr. MAXCY. Yes; $1.20.

Mr. HAMILTON. And when was that in effect?

Mr. MAXCY. It became effective either the latter part of February or the 1st of March.

Mr. HAMILTON. That is upon your concentrates shipped to Midvale?

Mr. MAXCY. Yucca to Midvale; yes, sir.

Mr. HAMILTON. What do you pay for lumber or mine timber?

Mr. MAXCY. Pretty nearly $75 a thousand by the time it reaches us.

Mr. HAMILTON. At the mine?

Mr. MAXCY. Yes. Right in that neighborhood.

Mr. HAMILTON. Is that timber purchased in the Los Angeles district. Mr. Maxcy?

Mr. MAXCY. We generally get it here in Kingman. It comes from Los Angeles.

Mr. HAMILTON. You buy your lumber locally?

Mr. MAXCY. Yes; we buy it in small lots.

Mr. HAMILTON. Have you any other difficulties of any kind, any other obstacles to contend with other than the high cost of materials and labor?

Mr. MAXCY. The high cost of materials, labor, and freight is the principal thing with us. Of course, we have a long truck haul.

Mr. HAMILTON. Is there any opportunity for the development of methods whereby you could improve the extraction of values from the ores? I mean something that would be——

Mr. MAXCY (interposing). Of course, they are working at that all of the time. I don't know just——

Mr. HAMILTON. But nothing that would make a radical change in your operations?

Mr. MAXCY. I don't think so; I don't know of anything just now. We are putting in a chlorination plant to treat some of our ores—a certain class of them. We haven't run on them; we have only the tests that have been made elsewhere.

Mr. HAMILTON. You feel that under the present conditions you can operate at a profit?

Mr. MAXCY. Yes; upon certain grades of ore.

Mr. HAMILTON. Are there any considerable tonnages of ore that you have developed that are not—that it is not possible to treat at a profit to-day?

Mr. MAXCY. Yes; we have quite a body of ore; that is what we are putting in the chlorination process for, to treat that particular ore.

Mr. HAMILTON. Have you any figures to show whether the tendency of your costs is down or up?

Mr. MAXCY. No; I have not those figures with me. They are running pretty even; they have in the last few months that we have run.

Mr. HAMILTON. That is, you have not noted any material changes in the costs of any of the commodities that you use?

Mr. MAXCY. Most of our commodities are pretty nearly just about the same.

Mr. HAMILTON. Have you any other points that you want to bring out, Mr. Maxcy?

Mr. MAXCY. No, sir; not that I know of.

Mr. HAMILTON. All right. I thank you very much.

Mr. HAMILTON. Mr. Phelps will you come forward, please? Will you give your name and connection for the record?

STATEMENT OF MR. W. B. PHELPS, SUPERINTENDENT TOM REED GOLD MINES CO., OATMAN, ARIZ.

Mr. PHELPS. W. B. Phelps, superintendent of the Tom Reed Gold Mines Co., Oatman, Ariz.

Mr. HAMILTON. Could you give us, Mr. Phelps, a brief outline or history of the operations of the Tom Reed; when they started and——

Mr. MAXCY (interposing). The operations started in rather a small way. It was one of those mines that was built up, and we have produced approximately between twelve and thirteen millions of dollars. I think about one-third to one-fourth would represent profit paid in dividends to the stockholders. We have had a number of mills. The mills were changed, due to improvements mainly. We now have a 300-ton cyanide plant which we are not operating to full capacity. We are treating approximately 150 tons of ore at the present time and we are making a profit.

Mr. HAMILTON. Is the curtailment of your tonnage due to the necessity of treating a higher grade ore than in the past, or is it due to ore reserves?

Mr. PHELPS. No; it is due to a depletion of our ore reserves. I was just talking that over with Mr. Moore before you called me. Our ore either runs good or it is a way below grade, with the exception of a small tonnage. We are approximately at the end of our ore reserves, and we figure we will discontinue our operations about the 1st of June. What we are mining now is the remains of ore bodies—pillars. We are practically just robbing the mine of the pillars at the present time.

I asked Mr. Moore if he could extend the life of his mine to any appreciable extent if we should receive an increase in the price of gold. He will tell you

Taken from Field Hearings - Commission of Gold and Silver Inquiry - U. S. Senate - January 1925

out it. Frankly, I don't believe we could even though we had an increase the price of gold. The conditions that we have been operating under have en such that they have discouraged us toward future development.

More than anything else we feel we operated under a handicap during e high labor costs and things of that kind. As far as we are concerned it has been more of a discouraging effect than anything we have had. Frankly, I will state if we received this excise tax at the present time, we could not continue our operations more than five months. There are but very small quantities of ores that approach our cost of mining and milling. If we got a 25 to 35 per cent increase in the value of ore it might put that ore in the range of making a profit.

Mr. HAMILTON. Are there possibilities of making development of the mine there by depth or laterally?

Mr. PHELPS. Laterally, I think, but not with depth. That is a matter of opinion.

Mr. HAMILTON. Do you feel that had the conditions of operation been normal or comparable to those of 1913 that more development would have been done and an endeavor made to open up new ore bodies?

Mr. PHELPS. Undoubtedly we would have made a great deal larger profit. Another thing, it necessitated us, due to the increase in cost, to increase our to[illegible]ge in our mine, and about 1916 we increased our mill from 150-ton to 3[illegible]ns.

[illegible]. HAMILTON. That was in order to enable you to make a profit?

Mr. PHELPS. Yes, sir. We had to mine a larger quantity of ore of a lower grade; also decrease our costs. Now, for the last year and a half we have been in a position where we could have gotten along nicely with our original milling facilities.

Mr. HAMILTON. Is that due to the fact that costs have been reduced, Mr. Phelps?

Mr. PHELPS. No; that has been due to the quantity of ore. We have not had the ore to put through the mill.

Mr. HAMILTON. And your profits have been likewise reduced in the last year and a half?

Mr. PHELPS. Well, no. That is rather a hard thing to state. Our profits vary, of course, according to the value of the ore. We have a spotty mine; the values have gone up and down in the last six years, which is the period you wish to consider?

Mr. HAMILTON. Yes, thereabouts; six to eight years.

Mr. PHELPS. About the first four years of that six-year period we treated a large quantity of pretty low grade ore; about $8 ore, and treated between 300 and 325 tons a day, and the last two years we have exhausted those ores and we are treating a smaller quantity of higher grade ores, and we have probably—I know in the last six months we have been making a bigger profit than we have ever made—that is, since I have been at the mine. I have been there about six years. Prior to my taking charge, some mill heads ran as high as $35 a ton fo[illegible]eriod of a year or two.

[illegible] HAMILTON. Is the company doing any prospecting or other development in the district?

Mr. PHELPS. Yes; we have taken an option upon a property in the Union Pass district. We are not doing much except to prospect it. Our plan of prodecure now is to build up as much cash reserves as we can. We are not paying any dividends. We are trying to build up a cash reserve so we can look for another mine. They intend to spend that money upon finding and developing another mine.

Mr. HAMILTON. Who is the company that controls the Tom Reed mine?

Mr. PHELPS. The Tom Reed Gold Mines Co. It is a corporation. The stock is held mostly in Pasadena, Calif.

Mr. HAMILTON. It is not controlled by any of the large mining companies?

Mr. PHELPS. No, sir. No; it was a little mine that was found by some poor men and it made most of them rich. Most of the original owners of it are all dead now or are men that fell heir or afterwards bought in on it.

As I understand it, I received a letter from Senator Oddie in regard to your visit here, in which he stated you wanted a lot of comparative costs prior to 1914 and present costs. You know, some years ago we spent considerable money trying to put through the excise tax that Mr. Lawrie headed. We prepared quite a bit of data for that affair, but unfortunately a lot of our operations prior to 1914 were on a smaller tonnage basis, and they were operating rather

carelessly on high-grade ore; the supplies were purchased in a rather haphazard method. Our comparisons right now show some of our costs—that is, cost of supplies prior to 1914 approximately equal the cost at the present time, so we have had a hard time trying to show a gold mine was in a much better stage. We all realize that operating now is a great deal different from what it was in 1914.

Mr. HAMILTON. It is impossible for you to show where costs are less under comparable conditions?

Mr. PHELPS. When first I took charge of the mine—it was in the year of 1916—we had a $5.25 cost; that was mining and milling and depreciation, the entire cost made up by a firm of public accountants. We were milling upon a large ore body and broke our ore very cheaply. Now our costs are around $7 and $7.50. A part of that is due to the increase in the cost of commodities and labor and part of it is due to the fact that we are mining now upon a smaller ore body.

Mr. HAMILTON. What are the wages paid to-day as compared with what they were?

Mr. PHELPS. Oatman has always been a rather highly paid camp. Prior to 1914 we used to pay $4 as a base rate on machine men. We figured a base rate on machine men at that time of $4; 50 cents less for muckers, then accordingly 50 cents for hoist men, etc. You understand it has increased.

Mr. HAMILTON. Yes.

Mr. PHELPS. Now we are paying $5.25 base rate on machine men and deductions according to their vocation.

Mr. HAMILTON. Did you employ the bonus system or contract system in your operations?

Mr. PHELPS. Mostly contract; yes, sir. In fact, we do all the work we can possibly handle under the contract system. We can not always do it upon stopping operations. We have never attempted to work out a bonus system. It has been a straight contract all along.

Mr. HAMILTON. What has been your experience out there with regard to the amount of prospecting that is being done now and what has been done in the past?

Mr. PHELPS. In fact, I don't believe—you are speaking of that district alone?

Mr. HAMILTON. Yes; the prospectors themselves—what is known as a prospector.

Mr. PHELPS. I may be a little bit prejudiced upon that idea. I don't believe there are any prospectors prospecting those hills. We have a lot of claim jumpers and claim locators. The ordinary prospector now calls himself a prospector, but he prospects with an automobile; waits for claims to lapse and then relocates them. As far as the old-time prospector is concerned, we do not have any. They get out there and jump somebody's claims and do just as little work as possible and try to hold it as long as they can. I don't think there is any real prospecting going on at all.

Mr. HAMILTON. What was the period of your boom in the Oatman district?

Mr. PHELPS. 1914 to 1916.

Mr. HAMILTON. Have you any idea of the number of operations that were started?

Mr. PHELPS. I think there must have been 100 or more properties going.

Mr. HAMILTON. And out of that hundred did there develop any considerable production of bullion?

Mr. PHELPS. The boom was started by the finding of the United Eastern mine; you understand that?

Mr. HAMILTON. Yes.

Mr. PHELPS. Well, after the United Eastern was found, the Big Jim was found. The Big Jim, I guess, you can consider as probably the only one that was found due to the boom, although rather recently they have developed a mine called the "Telluride," and they have placed a mill on it. It is a small property called the Oatman United that is now building a mill, but whether you could classify as to which one of those properties were found due to the boom—I believe I would say that the boom caused, probably, the finding of the Big Jim only.

Mr. HAMILTON. What properties are there operating at the present time?

Mr. PHELPS. Most of the producing companies—the United Eastern, the Gold Roads, and the Telluride, and the Tom Reed are producing bullion. There are a number of others developing and the properties are waiting to start their production when they have completed a mill. The Oatman United is one of them. The Gold District is another little property. They put in a mill and use

the amalgam process. They discontinued operations, whether due to the low value of the ore or due to the fact that they did not receive a high percentage of extraction, I am not in a position to say. I understand they are going to remodel their mill and put in some cyanide equipment.

My opinion of it, the reason why the Oatman district is not going ahead very fast, is that they are not making any discoveries of ore. I know as far as the Tom Reed is concerned, I have got some comparisons on that. Even the United Verde mine, in regard to the footage of development and exploration work they do, and during the six years that I have been in charge of the property, we have never performed less than 5,000 feet of development work per year. It has mostly gone over 6,000 feet. Now, that compares very much with the footage the United Verde make, and fairly large copper mines in the large porphyrys, but you know when a mine performs five to six thousand feet of development or exploration work per year for a little 300-ton property, it does not mean a lack of trying to look for ore. We think we have tried to follow a method of seeking ore that is the best we know of; that is, we employ geologists in a consulting capacity, some of the best that we know, and I also use my own judgment, which is later checked up. We have tried to employ the best methods we possibly could. We just have not been successful in finding ore.

Mr. HAMILTON. This property, then, has produced about twelve or thirteen ns of dollars in about 16 years?

r. PHELPS. About 14 years; that is the production. I think they probably operated a year or so before they found any ore. It was only in a more or less development stage.

Mr. HAMILTON. Does your ore carry any silver to amount to anything?

Mr. PHELPS. Very little. We don't make any attempt to keep track of the silver values at all, except in the bullion. About a thirty to forty thousand dollar bullion shipment will run two to three thousand dollars in silver.

Mr. HAMILTON. The price of silver is not material?

Mr. PHELPS. No; it does not affect us at all.

Mr. HAMILTON. In what way do you market your bullion, by shipment to the mint or to the smelters?

Mr. PHELPS. Why, we have varied that. Sometimes we ship to Selby. Most of the time we have been shipping to the mint at San Francisco.

Mr. HAMILTON. It did not make any material difference in the returns received?

Mr. PHELPS. Not very much; about the same.

Mr. HAMILTON. Is there any litigation over claims or property going on at the present time in the district?

Mr. PHELPS. Not at the present time. The United Eastern had an apex suit, but it has all been settled.

Mr. HAMILTON. Generally speaking, after the cloud of battle has passed away, is a fight of that kind worth the money spent upon it?

Mr. PHELPS. I really believe that it was in this case. I don't think if we had otten into this suit a body of ore would have been discovered. It might , that is hard to say. We received a lot of geological information we probably would not have received if we had not gone into a suit of that kind. But absolutely that is not the stand I take at all upon litigation. I think that in litigation, especially apex litigation, both sides lose. It is the lawyers and the experts who come out ahead. What I mean by that, I am not trying to protect the idea of going into a lawsuit.

Mr. HAMILTON. Human nature is usually at fault and not the apexes as a rule. Are there any other obstacles or point which you can bring out, Mr. Phelps?

Mr. PHELPS. We are operating under high-cost conditions in that entire district, regardless of the value, quantities, or sizes of your ore bodies. We are off of the railroad. We have always felt as a gold miner we would like to receive some compensation at least for the gold that has been used in the trades and arts. We realize at the same time that it is rather a touchy ground that we are trying to tread upon, and we have given up all hopes of ever having the Government do anything of that kind. I don't know, personally, whether I wanted the Government to do anything. I can find an ore body of sufficient size and value and work it out and make a profit upon it if they will let me alone. With us it is a matter of finding ore. We spent some money and time on this thing and I have refused to put any more in it. We have been asked to contribute at different times. We won't contribute any more. I think we were simply outgeneraled there in Washington by that jewelers' vigilance committee as they call them. The gold miner never had to organize or anything of that kind to protect himself. He was never troubled with any market condition. I think we were just outgeneraled. I am referring to that last hearing before the Ways and Means Committee.

Mr. HAMILTON. Yes. Well, your point is to be let alone and find an ore body?

Mr. PHELPS. We would like to have a reduction in taxes. We will try our best to find one if let alone.

Mr. HAMILTON. I wanted to ask you about taxation in Arizona upon your property. Could you give a brief statement as to the taxes that mines are subjected to here in Arizona?

Mr. PHELPS. Well, I can not give you any figures at the present time. I could prepare those figures.

Mr. HAMILTON. Could you work out for me from your records a comparative statement showing the increase in the cost of taxation on mining operations, in the past few years?

Mr. PHELPS. Yes, sir; I could do that.

Mr. HAMILTON. I would be very glad to have it if you can work it out, Mr. Phelps.

Mr. PHELPS. Mr. Hamilton, about that also. There have been a few changes made in the method of taxation during the life of the Tom Reed mine, to such an extent that the comparison is very much like our costs. We have always been taxed high until the last year or two. Our taxes have been rather low during that time, but that is due to the method of taxation in the State. We have paid as much as $1 a ton in taxes—I mean in regard to our costs, taxes have represented very close to a dollar a ton for a good many years. Of course you understand the method of taxation in the State—but Mr. Moore can give you that condition a good deal better than I can, because his mine has been a steady producer right along. During that time in the Tom Reed we have had a good many high peaks and low peaks, the difference being due to the high grade and the low grade ores. I will be glad to make up those figures and mail them to you.

Mr. HAMILTON. I will be glad if you will do so.

Mr. PHELPS. The United Eastern has operated steadily right along, and he can give you those comparisons better than I can, Mr. Hamilton.

Mr. HAMILTON. It was brought out in the hearings in Phoenix that the mining properties in the State of Arizona paid over 50 per cent of the taxes in the State.

Mr. PHELPS. I think it is 52 or 53 per cent, if I remember right. They sent around a little card a short time ago about that; had a circle divided into portions; I believe it was 52 per cent, but I would not be absolutely sure about that.

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

Mr. HHELPS. No, sir; not that I know of.

Mr. HAMILTON. Well, if there is anything further that you think of, we will be glad to take it up later.

Mr. PHELPS. All right. I will have them made up and sent to you, that business about the taxes.

Mr. HAMILTON. Address it to 915 Hobart Building, San Francisco, Calif.

Mr. PHELPS. Yes, sir. The method of taxation in the number of years we have been here has changed, and that is based on the value of your ore produced, you see. Mr. Moore will tell you about that. I think his comparisons would be a good deal better than anything I can give you.

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

STATEMENT OF MR. R. W. MOORE, GENERAL MANAGER UNITED EASTERN MINING CO., OATMAN, ARIZ.

Mr. HAMILTON. You may state your name and your connections for the record, if you will, please, Mr. Moore.

Mr. MOORE. R. W. Moore, general manager of the United Eastern. I knew something of what you wanted some time ago, Mr. Hamilton, but we have been trying to get some information on freight rates for years prior to the time when we started to operate, and to use costs of the other properties in the district prior to 1914, as compared with our present costs. You see, the United Eastern did not start to produce until 1917. Since 1917 the United Eastern has produced something over $14,000,000. That is, the gross value of the ore treated was something over $14,000,000, and the tonnage average is a little over 100,000 tons a year, and if the company was liquidated now it would

"THE PLEA OF THE "TOM REED SHAFT!"

(The Tom Reed is
(A gold mine in
(Oatman Arizona

BY ART. BEAL.

"I'm a shaft that stands
"Over a bowel of earth
"On a hill,and waits for men,
"To come back to work
"And to find the gold
"And to give me life again!"

" 'Though I've waited long,
"My frame is strong,
"The tailing piles are now soft dust;
"And the building covered roofs of tin
"Have slowlby turned to rust!"

"The wind blows in
"On the roofs of tin,
"And they clatter through the night.
"While my feet are planted firm in rock
"And my frame is strong and tight!"

"So blow cold wind!"..."And burn hot sun!"
"All though I'm growing old....
"Come back Ye Men Of Little Faith!"
"COME BACK,...HERE LAY'S THE GOLD!"

Art Beal 1962

TOM REED

MOHAVE COUNTY

NJN WR 8/7/87: It was reported that the company attempting to leach the tails in the Oatman District is called Process Technology. Their address is 2420 W. 1st Street, #58, Tempe, Arizona 85281. A contact person is Tom Dehoff, home number 968-1403. This group has been in the office but relatively secretive about their activities. They have been obtaining water samples in the shafts in the Oatman area. (Project Black Eagle - Tom Reed, file).

NJN WR 9/11/87: Ed Huskinson (card) reported that Process Technology (card) is currently building leach pads and will shortly begin agglomeration and leaching at the Tom Reed (file) Mohave County.

NJN WR 1/22/88: Tom Dehoff (card) and John Lindy with Process Technology (card) Unity Mining (file) are setting up an operation to classify, grind and leach the tailings of the United Eastern (file) and Tom Reed ? (file) Mohave County. They believe they will process about 500,000 tons of tailings. They will classify the tailings with cyclones, the fines will be leached directly with a quick recovery expected. Less than 50% of the material is +200 mesh. This portion will be ground to -320 and leached. Anticipated recovery is .03 or better.

NJN WR 6/10/88: Tom DeHoff (card) visited and reported that Americana and Process Technology are getting closer to establishing production at the Tom Reed, (file) United Eastern (file) Mohave County. Production will entail grinding and agglomeration of the tailings. They expect a 70% recovery which averages about .03 oz/ton Au. Watchman for Americana is Cleon Anderson who may be contacted at 66 Quail Road, Oatman.

HACKS MILL (at Tom Reed Tailings) MOHAVE COUNTY

Visited the Hack Mill under construction on Tom Reed tailings dump. There is high excitement in Oatman in hopes the mill will operate. Some skepticism displayed.
FTJ WR 11-5-65

Oatman Conference

Discussed Hack's mill that was scheduled to start up the same day. A reporter from Needle's paper was on hand but some wrinkles appeared in the mill that would have to be ironed out. Mill a complicated affair. Assay results of a trial run in Nevada showed a 1 oz. concentrate from 1.96 oz. heads. FTJ 11-4-65

Fischer-Watt Mining Co. Inc.

ADMINISTRATIVE OFFICE: 114 TUCKER, SUITE 2
KINGMAN, ARIZONA 86401
PHONE: (602) 753-1622

Dear Mason

Enclosed is a copy of my talk presented at the ACS this August

Perry

Fischer-Watt Mining Co. Inc.

ADMINISTRATIVE OFFICE: 114 TUCKER, SUITE 2
KINGMAN, ARIZONA 86401
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GEOLOGY, ALTERATION AND MINERALIZATION IN THE OATMAN MINING DISTRICT, MOHAVE COUNTY, ARIZONA

Text of Talk Presented by Perry Durning

to the Arizona Geological Society Meeting

August 5, 1980

CONTENTS

I.	Introduction and Acknowledgements	1
II.	Location	1
III.	History of Fischer-Watt Mining Involvement	1
IV.	History and Production	3
V.	Regional Geology and Structure	3
VI.	Local Geology	9
VII.	Mineralization and Alteration	9
VIII.	Exploration Techniques	15
	A) Alteration Mapping and Vein Contouring	15
	B) Fluid Inclusion Studies	21
	C) Geochemistry	22
IX.	Conclusions	22

ILLUSTRATIONS

Figures		Page
Figure 1	Location Map	2
Figure 2	Regional Geology	6
Figure 3a	Geology and Structure of the	7
3b	Oatman District	8
Figure 4	Geology of the Central District	10
Figure 5	Effect of Rock Type on Fracture Pattern	11
Figure 6	Alteration in the Central District	13
Figure 7	Cross Section, United Eastern Orebody	14
Figure 8a,b	Vein Contours, Tom Reed Vein	17, 18
Figure 9	Vein Contours, Kokomo Vein	20

Tables		
Table 1	Individual Mine Production	4
Table 2	Summary of Orebody Characteristics	5

Fischer-Watt Mining Co. Inc.

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I. INTRODUCTION AND ACKNOWLEDGEMENTS

I'd like to thank you for the opportunity to present some of the results of our work at Oatman and share with you some of our successes and disappointments.

I'd also like to thank Fischer-Watt Mining and Canadian Natural Resources for their continuing support of our exploration efforts, and acknowledge the contributions of Larry Buchanan, Gary Clifton, Fred Haynes, Don Muchow and Masters thesis students Bob Smith and Al Morris, all of whom have contributed to our geological understanding of Oatman.

III. LOCATION

The Oatman district is located about 30 miles southwest of Kingman and approximately 100 miles SSE of Las Vegas on old Highway 66. (Figure 1)

III. HISTORY OF FISCHER-WATT MINING INVOLVEMENT

Carl Fischer and Tim Watt as individuals became interested in the Oatman district in 1977. Initial work involved deepening the Ida Shaft on the Tom Reed Jr. Vein. In 1979, Fischer-Watt Mining was organized to evaluate the exploration potential for the entire Oatman district as well as identify other exploration and mine development opportunities throughout the western United States.

During April, 1979, critical land positions were negotiated and geological, geochemical and fluid inclusion studies were initiated.

Drilling was begun in September, 1979, and to date 35 drill holes varying 200 to 1,900 feet have been completed.

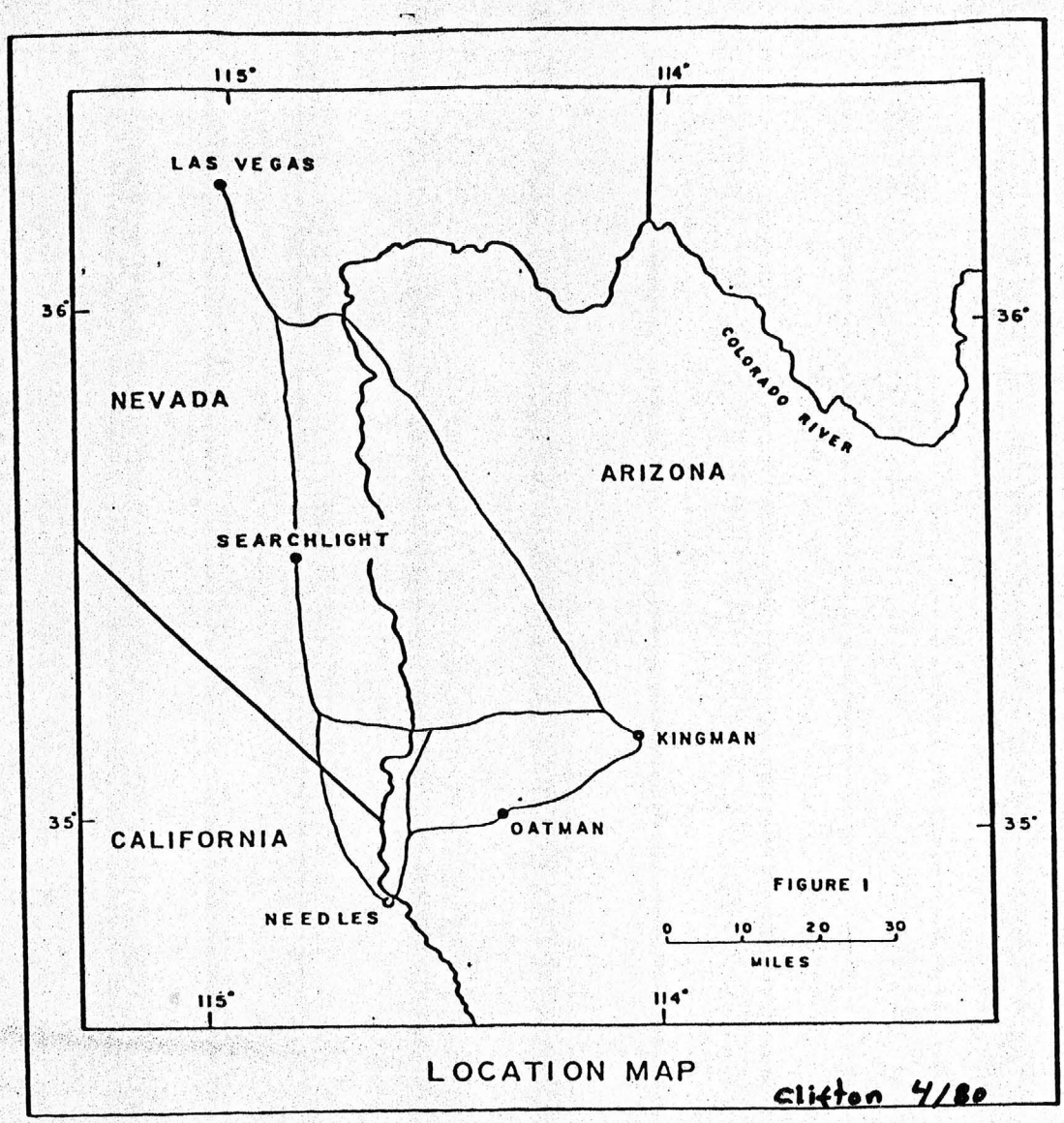
115°
114°
LAS VEGAS
36°
NEVADA
COLORADO RIVER
ARIZONA
SEARCHLIGHT
KINGMAN
35°
CALIFORNIA
OATMAN
NEEDLES
FIGURE 1
0 10 20 30
MILES
115°
114°
LOCATION MAP
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figure I

IV. HISTORY AND PRODUCTION

The original discovery at Oatman was made on the Moss vein in the western part of the district in 1863. However, mine development was discouraged by unfriendly Indians. Mining activities resumed in the 1880's but it was not until the discovery of the Gold Road Vein in 1900 that prospecting activities centered in the central part of the district. In 1901 gold was found on the Tom Reed vein but it was not until 1906 that rich ore in the Tip Top and Ben Harrison ore shoots was discovered. In 1915 and 1916 the Big Jim, Aztec and United Eastern ore bodies were discovered on the Tom Reed vein and the resultant boom swelled the population of Oatman and Gold Road to over 10,000 people. By the mid 1920's Oatman's population had dwindled and most of the mines had turned to leasor operations. Elevation of the gold price from $20. to $35./oz. in 1933 resulted in a revival of the Tom Reed and Gold Road Mining Company properties until they were closed by war board order L-208 in 1942.

The town of Oatman was named after Olive Oatman who was held captive by Indians for several years then found wandering in the desert by a rancher near the present town site.

Total production for the Oatman district between 1897 and 1942 was about 2.2×10^6 ounces Au and $.8 \times 10^6$ ounces Ag. The metal was derived from 3.8×10^6 T of ore with an average grade of 0.59 o/T Au, 0.20 o/T Ag. (Table 1) The majority of this production came from 8 major ore shoots on the Tom Reed and Gold Road vein. (Table 2) All other mines contributed about 10% of total district production.

V. REGIONAL GEOLOGY AND STRUCTURE

Geologic maps covering the Oatman District compiled by Ransome 1923, Lausen 1931, and Thorson 1971, provide excellent regional geologic coverage. Since the meat of my discussion will involve detailed description of the local vein geology I will deal only briefly with the regional geological environment.

The Oatman district lies within a thick sequence of 30 to 10 million year old Trachyatic, latitic and rhyolitic volacanic rocks on the southwestern flank of the Black Mountains. (Figure 2) The Oatman district may lie within a large circular caldron-like structure characterized by exceptionally thick sequences of Trachytes and latites and intruded along its margins by late stage epizonal quartz monzonite to rhyolitic stocks and plugs. (Figures 3a, 3b) The circular feature is also the margin for a

Table 1

INDIVIDUAL MINE PRODUCTION

OATMAN MINING DISTRICT, MOHAVE COUNTY, ARIZONA

Mine	Gold $20.67/oz 1897-1933 Tons of Ore	Mined Grade oz/T	Gold $35/oz 1934-1942 Tons of Ore	Mined Grade oz/T	Total Tons of Ore	Average Mined Grade oz/T
Tom Reed	981,090	0.70	205,125	0.32	1,186,215	0.64
United Eastern	687,038	1.12	0	0	687,038	1.12
Gold Road	737,926	0.47	775,895	0.22	1,513,823	0.32
Total Prod.	2,406,054	0.74	981,020	0.24	3,387,076	0.5[illegible]
Other Mines				(est.)	400,000	0.60

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Table 2

SUMMARY OF OREBODY CHARACTERISTICS MINED FROM THE
TOM REED-UNITED EASTERN AND GOLD ROAD VEINS, OATMAN, ARIZONA

Orebody	Symbol Fig. 3 & 14	Tonnage	Grade O/T Au	Maximum Dimensions Length	Width	Height
United Eastern	(UE)	550,000	1.10	450	45	700
Tip Top	(TT)	250,000	±0.70	500	20	1300
Ben Harrison	(BH)	250,000	±0.70	650	20	750
Big Jim Aztec	(BJ) (A)	±500,000	±0.75	1950	35	800
Black Eagle	(B)	±200,000	±0.50	350	10	1000
United American	(UA)	±140,000	±0.50	300	10	1000
United Western	(UW)	40,000	0.30	990	6	300
Gold Road	(GR)	1,500,000	0.32	6,200	22	1300
Telluride	(T) *	20,000	1.0	200	2-3	200
Argo	(AR)	none				
Olla Oatman	(OO)	none				
Red Cloud	(RC)	none				
United Eastern #3	(UE3)	none				
Pasadena	(P)	none				

* Figures are estimates

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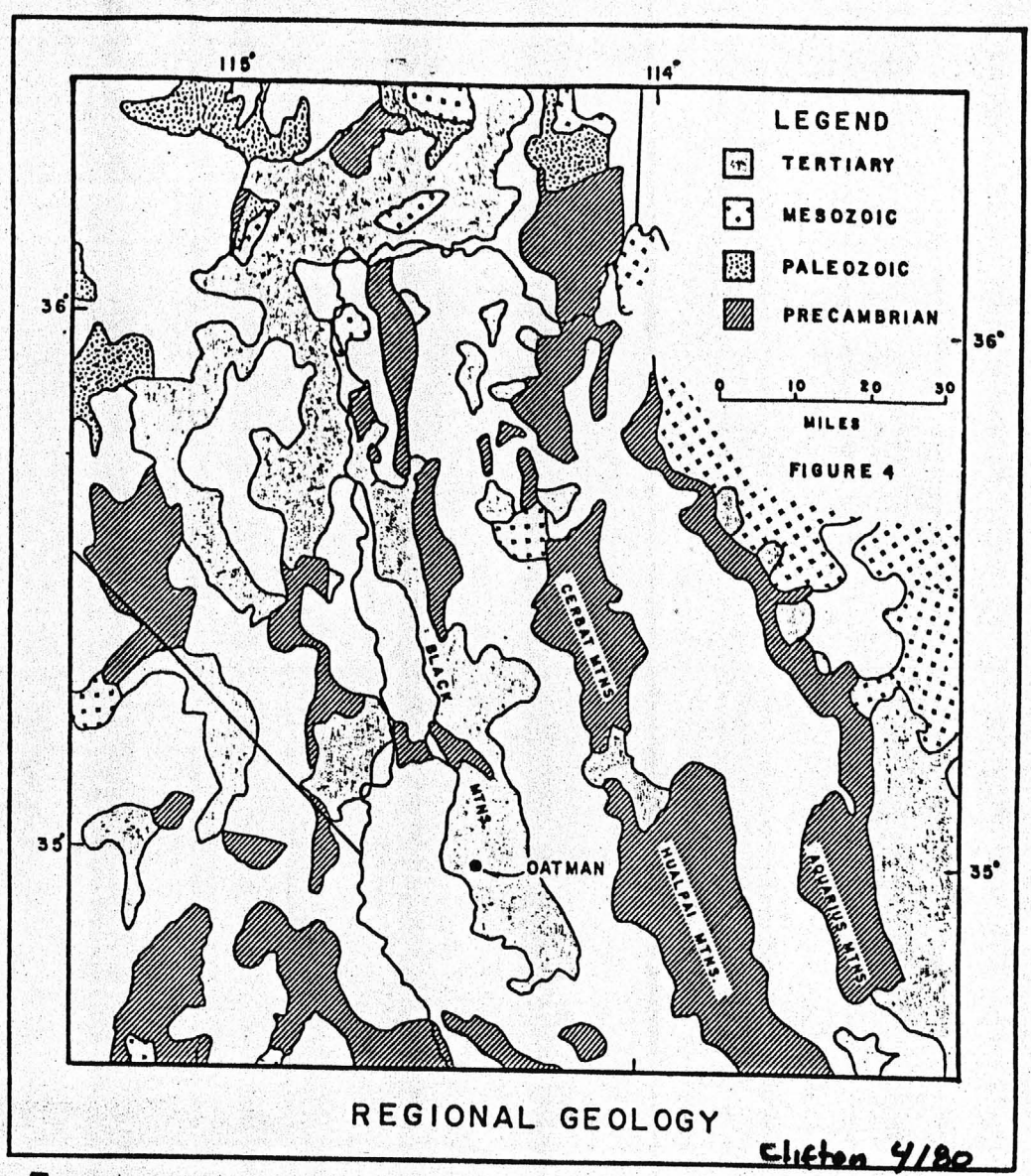

REGIONAL GEOLOGY

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Figure 2

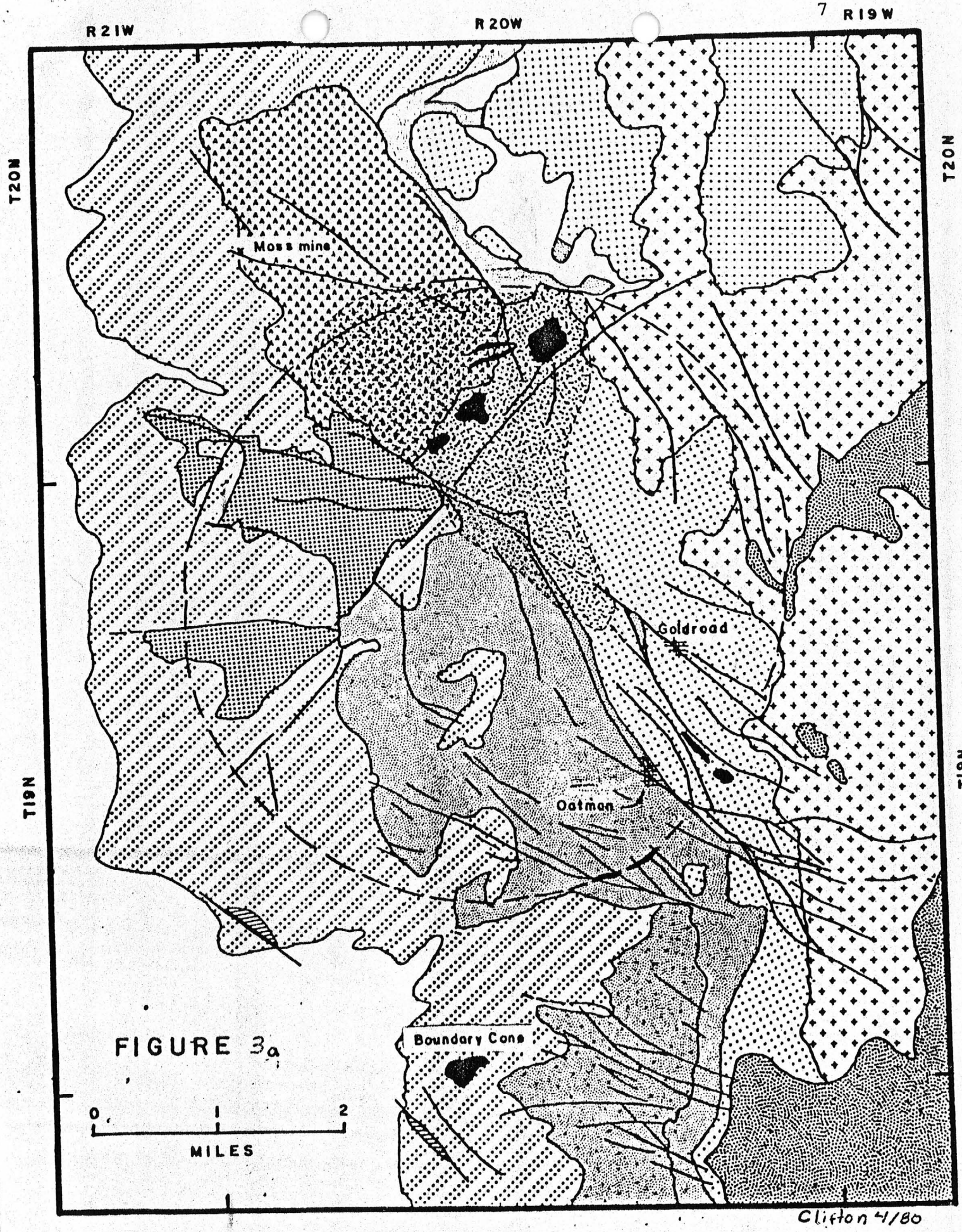
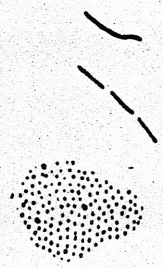


FIGURE 3a

GEOLOGY AND STRUCTURE OF THE OATMAN DISTRICT

FIGURE 36

LEGEND



VEIN

JOINTS OR LINEARS

PHYLLIC/ARGILLIC ALTERATION

QUAT.		ALLUVIUM	
MIDDLE AND UPPER MIOCENE		OLIVINE BASALT	
		RHYOLITE DIKES, PLUGS, FLOWS	
		MOSS PORPHYRY 10.4 ±.5 my	
		LATITE, RHYOLITE (undifferentiated) 19.7 ±.9 my	UPPER VOLCANICS
		GOLD ROAD LATITE 18.2 ±.9 my	MIDDLE VOLCANICS
		OATMAN LATITE	
		ESPERANZA TRACHYTE	
LOWER MIOCENE		TIMES PORPHYRY 22.6 my	LOWER VOLCANICS
EOCENE		ALCYONE FM.	
PRECAM.		GRANITE, GNEISS, SCHIST	

COMPILED FROM:

RANSOME (1923)

LAUSEN (1931)

THORSON (1971)

THIS REPORT

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thick sequence of tuffacous volcanic rocks which thin away from the Oatman district.

The structural pattern is dominated by a set of concentric fractures which define a near perfect 5 mile diameter circular feature identified from landstat imagery and high altitude aerial photography. Cutting the concentric feature is a separate set of fractures which radiate from a common point near the center of the circular feature. The major ore deposits of the central district are located within a wedge of radial fractures which cut the concentric fracture set 3 miles southeast of the center-point.

VI. LOCAL - GEOLOGY

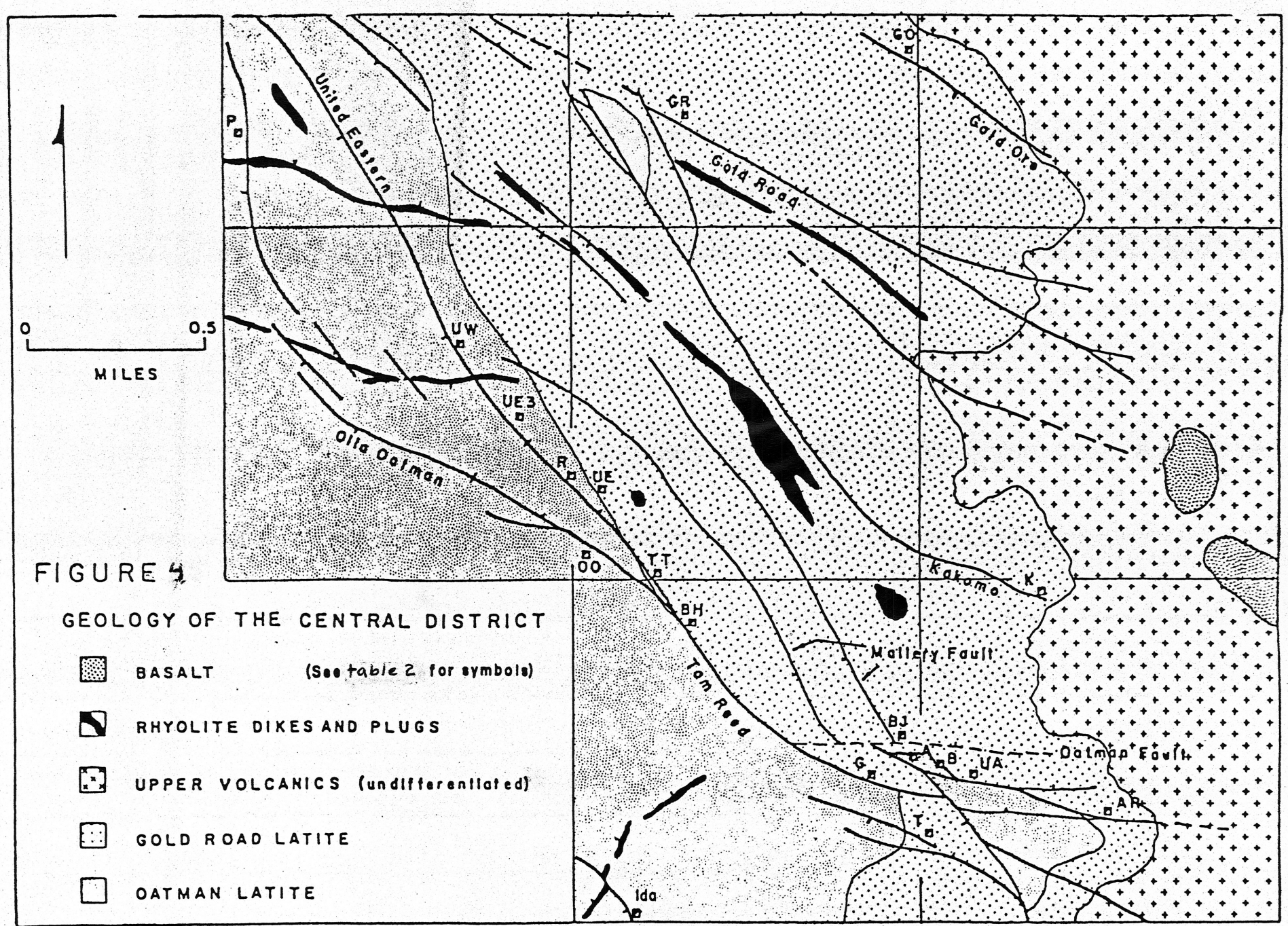
The predominant features of this geology in the vecinity of the Tom Reed and Gold Road veins is a thick sequence of biotite free latite (Oatman latite), biotite rich latite (Gold Road latite) and intrusive biotite rhyolite plugs and dikes (Elephant tooth rhyolite). (Figure 4) Underlying the volcanics near the town of Oatman at a depth of about 2,000 feet is preCambrian Granite as identified in drill holes from the bottom of the United Eastern Mine.

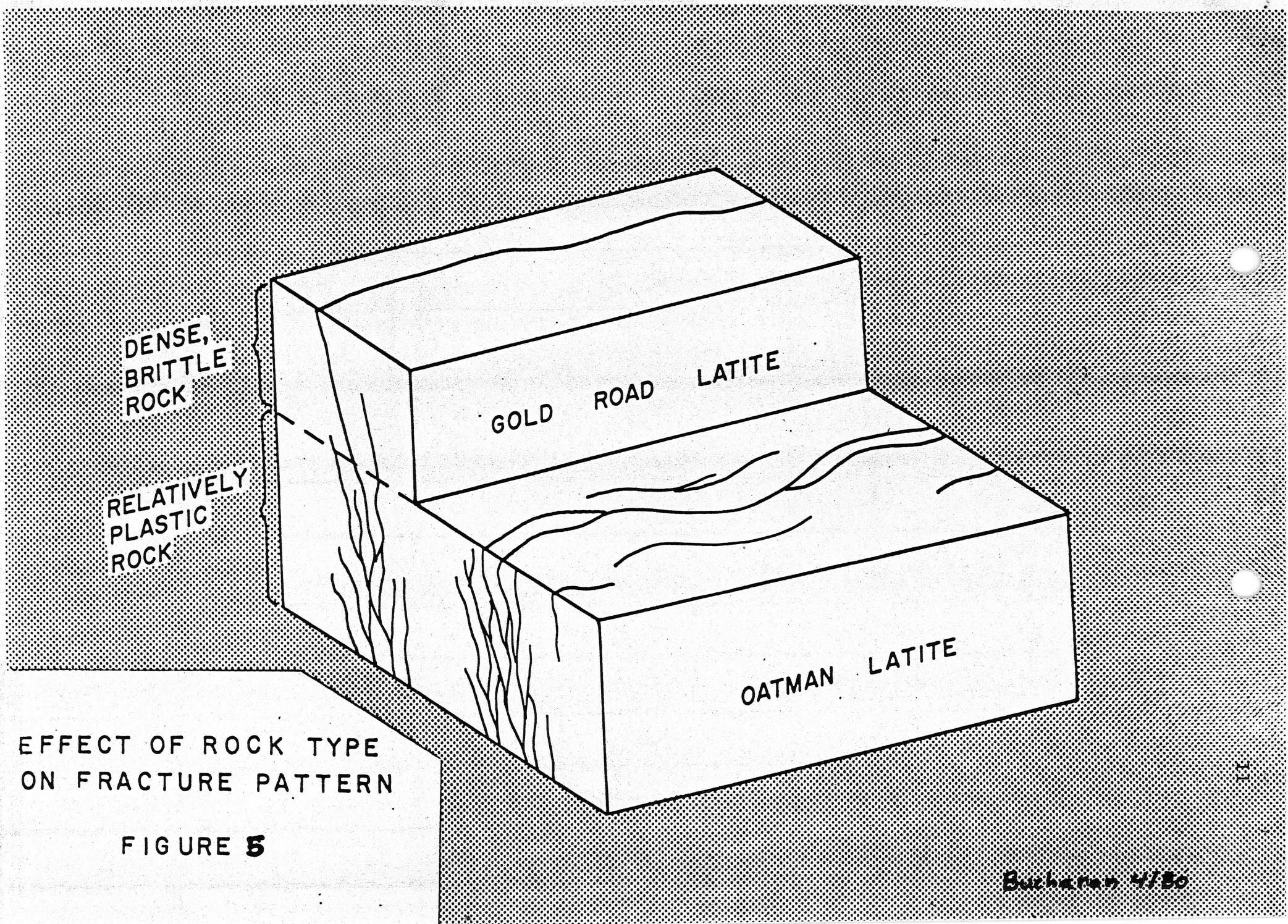
The volcanic units are cut by a series of NW trending fault veins which dip primarily to the north and are the host for the majority of the gold mineralization at Oatman. Oblique slip movement on each of the major faults was probably a few hundred feet and is both pre and post-mineral. The emplacement of the rhyolite dikes was also controlled by pre-mineral NW fault trends and the rhyolites are probably closely related in age to the mineralization. Post-ore faults such as the Mallery and Oatman faults have had a significant impact, in that locally they displace major ore shoots.

Rock types exert a profound influence on the nature of mineralization in the veins. In the Gold Road latite, the mineralization is frequently in long, narrow fissure veins. (Figure 5) In the Oatman latite however, stockwork vein development occurs with quartz and calcite replacing the host Oatman latite over widths of up to 45'. Ore bodies in the Gold Road therefore, have a long strike length and limited vertical range while those in the Oatman exhibit a short strike length and a vertical range 1 to 4 times the strike.

VII. MINERALIZATION AND ALTERATION

The epithermal precious metal veins at Oatman are typical of those found throughout the world in the tertiary volcanic


0
0.5
MILES
United Eastern
Gold Road
Gold Ore
Olta Oatman
Katama
Mallery Fault
Tom Reed
Oatman Fault
Ida
P
GR
GO
UW
UE3
R
UE
OO
TT
BH
BJ
A
B
UA
G
T
AR
K
FIGURE 4
GEOLOGY OF THE CENTRAL DISTRICT
BASALT
(See table 2 for symbols)
RHYOLITE DIKES AND PLUGS
UPPER VOLCANICS (undifferentiated)
GOLD ROAD LATITE
OATMAN LATITE
Clifton 4/80



EFFECT OF ROCK TYPE ON FRACTURE PATTERN

FIGURE 5

Buchanan 4/80

environment. They are quartz-calcite adularia fissure fillings and/or replacement lodes which for the majority of their strike length are barren but which locally form shoots of ore grade mineralization. Mineralization at Oatman consists of free gold and electrum with <¼% sulfides. As with most epithermal districts neither vein material nor mineralization extended to the surface at the time of formation and it was only through the kindness of Nature that erosion exposed the tops of the Gold Road and Tip Top ore shoots. (Figure 6) The ore shoots at Oatman pinch vertically and laterally and decrease in grade and depth. Lausen identified 5 stages of quartz-calcite adularia vein formation and it is only in areas of multiple stage mineralization that significant high grade mineralized ore shoots were formed.

The Gold Road vein to the north is a fissure filling in Gold Road latite more or less continuously mineralized over its explored length of 6,200 feet. Ore shoots are centered at local irregularities along the strike of the vein. Ore grade mineralization cropped out at the surface and led to its early discovery. Enveloping the vein are local zones of phyllic alteration with minor silicification. High in the volcanic pile in exposures believed to be near the paleosurface at the time of formation the vein is expressed as a 2-5' wide zone of phyllic alteration with a 1" thick seam of calcedonic quartz. The Gold Road vein had a total production of about 1.5×10^6 T of ore grading 0.32 o/T Au.

The Tom Reed vein which lies about 1 mile south of the Gold Road vein has a much more subtle expression. Only above the Tip Top and Ben Harrison ore shoots was there significant quartz or silicification. Ore on the Tom Reed vein is entirely in Oatman latite and rather than forming a discrete fissure filling produced stockwork quartz-calcite adularia loads which locally exceeded 45' in width. Ore shoots were localized at flexures along the vein. Unlike the Gold Road vein most of the Tom Reed vein ore shoots had an extremely subtle surface expression and it was only through sinking shafts that buried ore shoots were discovered.

I'll use the surface expression over the great United Eastern ore shoot to illustrate how subtle the surface expression of these ore shoots can be.

The surface expression of the United Eastern ore shoot is a 200' wide zone of phyllic alteration of the Oatman latite which shows moderate chemical destruction of the andesite but no discoloration and no significant quartz or calcite veining. (Figure 7)

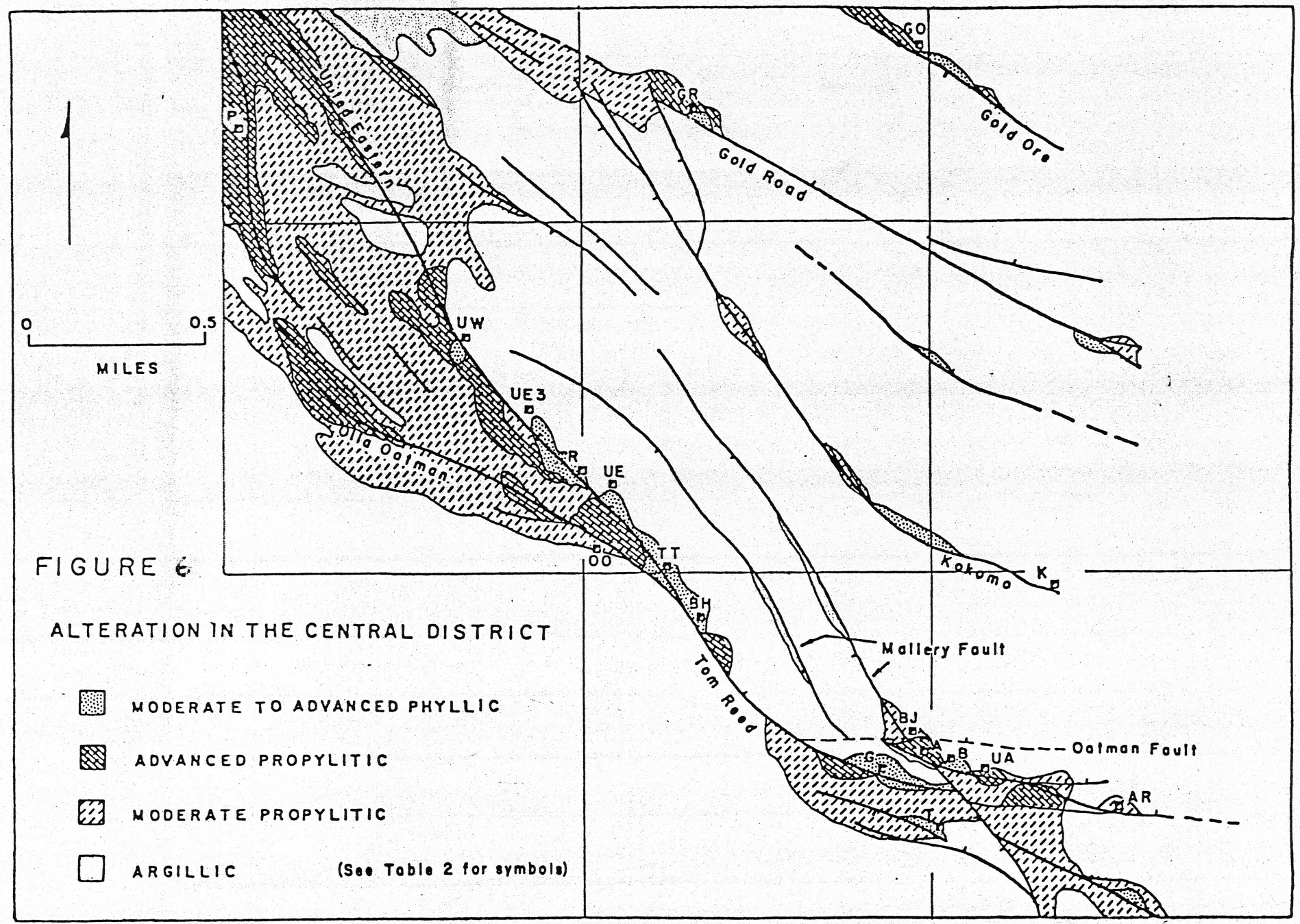


FIGURE 6

ALTERATION IN THE CENTRAL DISTRICT

Clifton 4/80

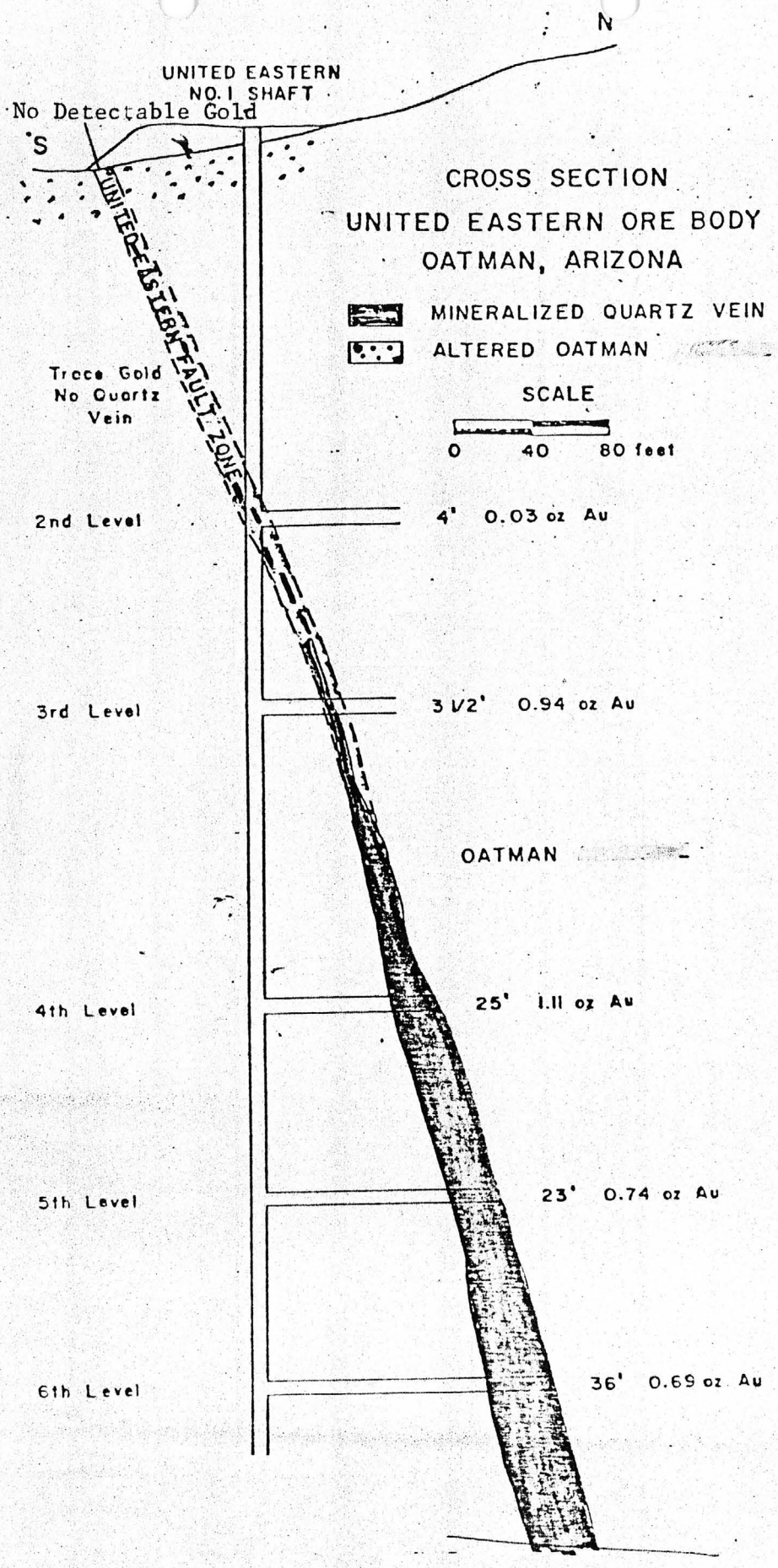

N
UNITED EASTERN
NO. 1 SHAFT
No Detectable Gold
S
UNITED EASTERN FAULT ZONE
CROSS SECTION
UNITED EASTERN ORE BODY
OATMAN, ARIZONA
MINERALIZED QUARTZ VEIN
ALTERED OATMAN
SCALE
0 40 80 feet
Trace Gold
No Quartz
Vein
2nd Level
4' 0.03 oz Au
3rd Level
3 1/2' 0.94 oz Au
OATMAN
4th Level
25' 1.11 oz Au
5th Level
23' 0.74 oz Au
6th Level
36' 0.69 oz Au

Figure 7

The Oatman latite has lost its original textural characteristics and appears to the casual observer to be nothing more than strongly weathered volcanics. A cross section through the United Eastern #1 or discovery shaft shows there is no vein material and no detectable gold at the surface. At 200 feet the shaft cut a 4' wide fault gouge zone containing 4' of 0.03 o/T Au; at 300 feet, 3½' of quartz and calcite returned 0.94 o/T Au and at 450' the vein showed 25' of vein material which graded 1.11 o/T Au. Total production from the United Eastern ore shoot was 550,000 T of 1.11 o/T Au!

It should be noted that in the work by Ransome and Lausen no specific structural control or alteration features were associated with the localization of the ore shoots at Oatman.

VIII. EXPLORATION TECHNIQUES

Fischer-Watt Mining entered the Oatman district believing that with detailed geology, specific structural controls and the high level expression of buried ore shoots could be identified. This information would then be utilized to evaluate the inadequately prospected areas along the major vein structures and areas covered by pre-ore cover, that is, areas where the only expression of a buried ore shoot might be a small area of alteration.

Four principal techniques were utilized at Oatman: detailed alteration mapping; vein contouring; rock chip vein geochemistry; and fluid inclusion analysis. The vein contouring and alteration mapping have largely been completed, however, the geochem and fluid inclusion studies are continuing.

A) Alteration Mapping and Vein Contouring

As mentioned earlier, alteration features at Oatman probably extended to the paleosurface at the time of ore formation and even though no gold mineralization overlies most of the ore shoots characteristic and identifiable alteration halos were found.

Mapping was initiated in the central part of the district to identify specific alteration features over the past productive ore shoots **and then** extend the mapping into lesser prospected areas. (Figure 5)

At Oatman, mapping of phyllic and/or argillic alteration proved most significant. However, on a broad scale propylitic alteration also enveloped the veins although often not directly ore associated. Mapping was done at 1"=100' which was necessary in order to map subtle alteration changes.

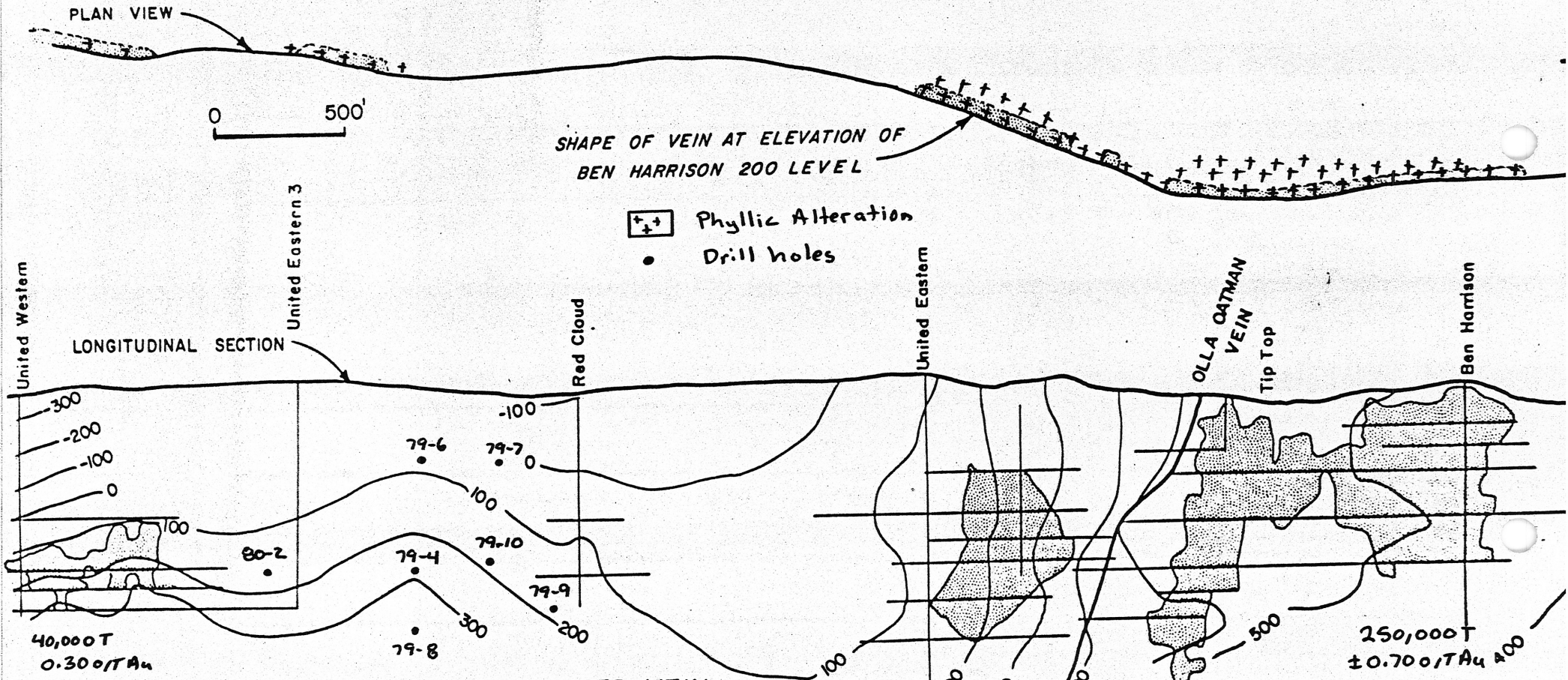
With field mapping it was nearly impossible to distinguish between phyllic and argillic alteration except for their differing distribution patterns. The phyllic alteration (illite and sericite as identified by X-Ray) tends to blossom beyond the specific cracks over the tops of ore shoots and may pervasively alter the wall rocks for up to 100' away from the vein. The argillic alteration is most frequently associated with post-mineral faulting and barren portions of pre-mineral faults, and has a definite footwall and hanging wall. Silicification or quartz or calcite veining is most frequently found within a few tens of feet from the top of ore.

Phyllic alteration is frequently expressed as small valleys less resistant to erosion than the surrounding rock. The rock is often light gray to locally white. Original textures may be totally to locally destroyed and in extreme cases some yellowing from oxidation of pyrite may be present.

For the most part the phyllic alteration over the tops of the oreshoots was so subtle that detailed mapping was absolutely necessary. As will be discussed later the distribution of phyllic alteration frequently corresponds with bends representing dialatant zones along the veins.

This detailed alteration mapping showed that every past productive ore shoot had a distinctive phyllic alteration envelope over it. (Figure 8a, 8b)

In addition to the alteration mapping, very careful attention was given to mapping slight changes in altitude of the vein. This involved not only plotting the information on the field sheets but also marking the position of each exposure on the ground then actually surveying its precise position and orientation so bends due to topographic effects could be removed. This survey data was then plotted on a map and the position of the surface and underground expression of the vein related to the distance from a hypothetical perfect plane. These distances were then contoured and showed irregularities in the vein in both a vertical and horizontal plan which might be related to ore. (Figure 8a, 8b) A horizontal slice through the long section of the Tom Reed vein showed pronounced to subtle concave north bends associated with every known ore shoot. Convex north bends related to pinch zones along the vein. The contouring also identified one inadequately explored area between the United Western and United Eastern ore shoots with a subtle concave north bend and weak phyllic alteration at the surface. This then became one of our principal targets. These subtle bends along an otherwise straight vein structure permitted development, during oblique slip fault



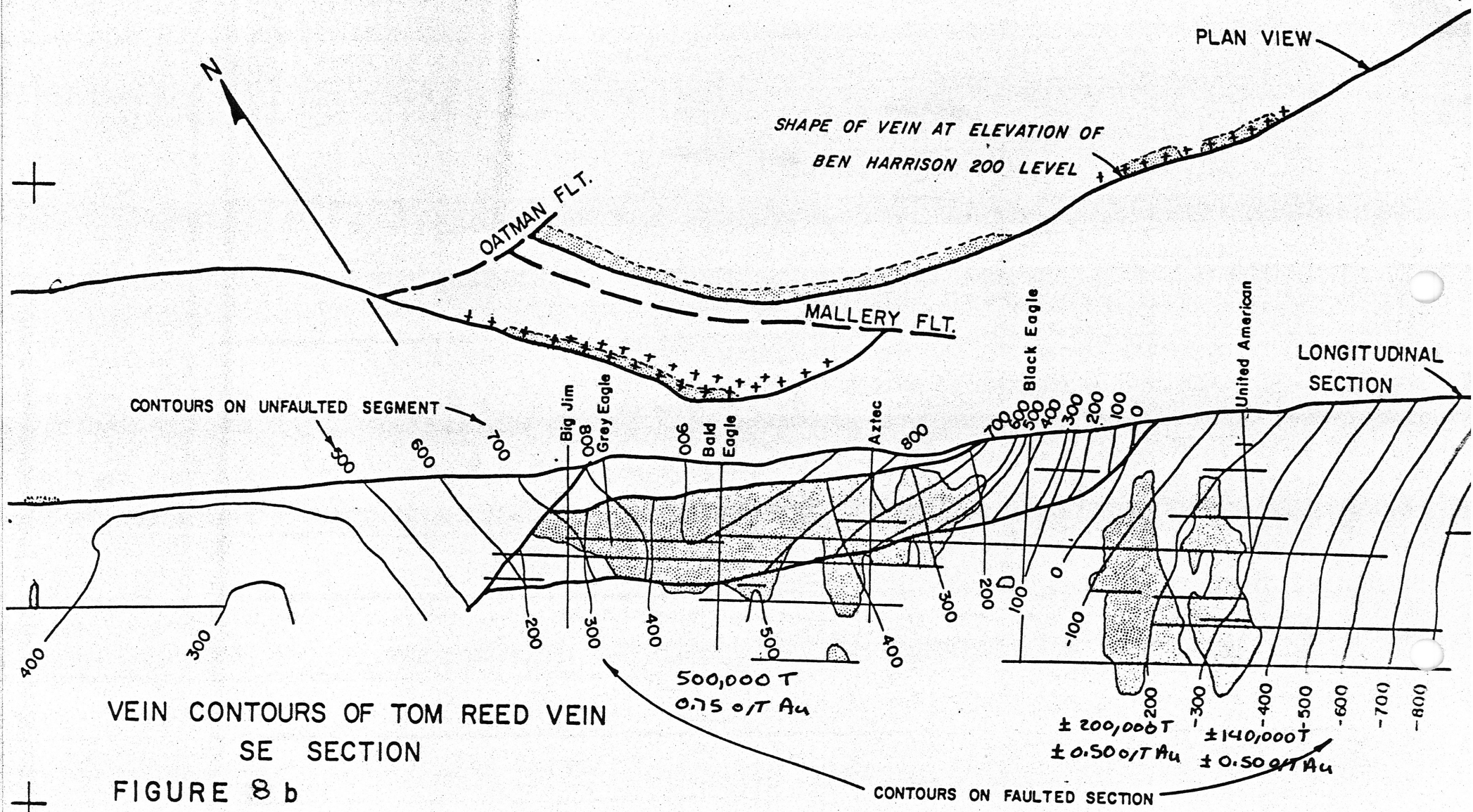
VEIN CONTOURS OF TOM REED VEIN

NW SECTION

FIGURE 8a

DH	Thickness	o/T Au
79-4	30 & 8	0.20 & 0.22
79-6	2	0.05
79-7	3	0.04
79-8	20	0.02
79-9	10	0.04
79-10	3.4	0.16
80-2	3 & 5	0.16 & 0.17

Modified after Clifton 4/80



VEIN CONTOURS OF TOM REED VEIN

SE SECTION

FIGURE 8 b

Modified after Clifton 4/80

movement, of dialatent zones or open areas which permitted ingress of ore forming fluids. Recurrent movement along these faults permitted up to 5 episodes of ore forming solutions.

Vein contouring on the Tom Reed vein was essential in establishing structural control for ore at Oatman and provided us with critical data needed to evaluate the structural favorability of less prospected veins.

The Kokomo vein which lies between the Tom Reed and Gold Road vein is a prime example. (Figure 9) Alteration mapping identified several alteration blossoms along the strike and vein contouring identified a major concave north bend in the area of best alteration which was comparable in magnitude to the beds associated with the Ben Harrison - Tip Top - United Eastern or Big Jim-Aztec ore shoots. The vein contouring was done strictly from surface measurements and then projected to a specified data plane. The magnitude of the bend and the intensity of the alteration identified the Kokomo as a major exploration opportunity not unlike the situation which resulted in the discovery of the Bulldog Mountain vein at Creede, Colorado.

I would like to now digress a bit and show some photos of the surface expression of the past-productive ore shoots as related to our observations regarding alteration and structure.

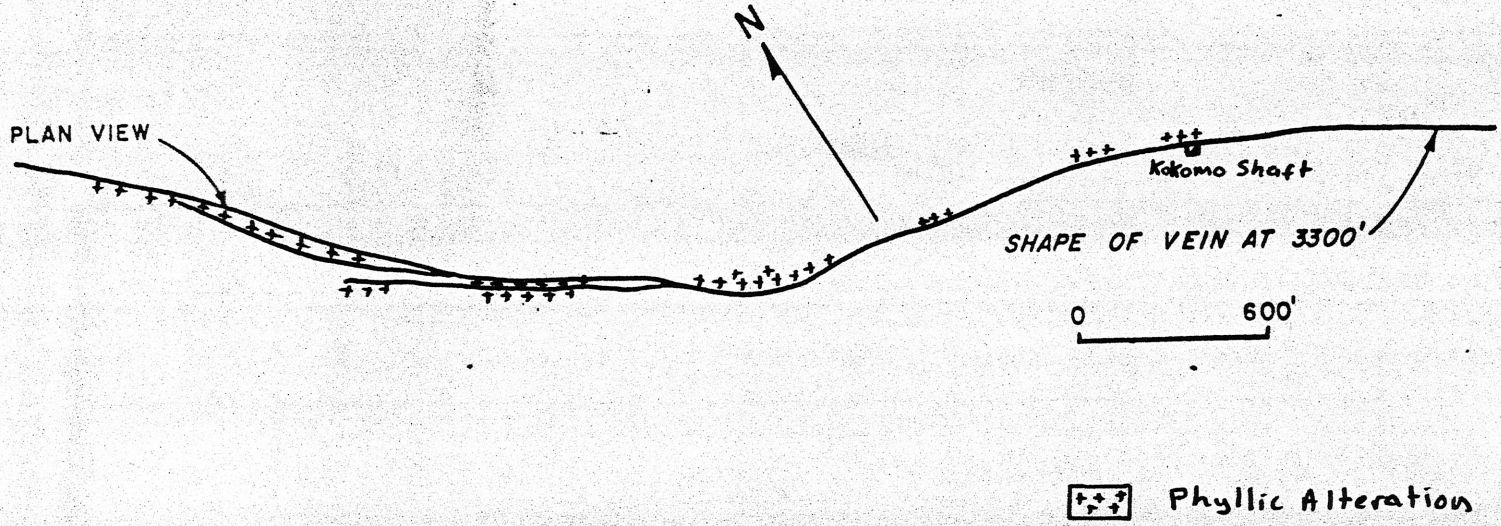
1) The unexplored area between the United Western and United Eastern shaft was drill tested by FWM and showed in our best intercept 30' T.T., 0.20 o/T Au, 500' below the surface. The surface outcrop showed a small area of very weak phyllic alteration, and gave no geochem anomaly.

2) The United Eastern ore shoot, 550,000 T, 1.11 o/T Au as discussed before shows gray phyllically altered Oatman latite 300' above ore.

3) The Tip Top ore shoot, 250,000 T, 0.70 o/T Au shows a massive quartz-calcite ridge with minor gold values at the surface ore is 70' below the outcrop.

4) Ben Harrison ore shoot, 300,000 T, 0.70 o/T Au shows a 10' wide silicified ledge with very minor gold values, 70' above ore.

5) The Gray Eagle-Bald Eagle area is the upper portion of the Big Jim-Aztec ore shoot which yielded 500,000 T, 0.75 o/T Au and shows a 50-100' wide zone of phyllic alteration with very minor quartz-calcite vein material and very minor gold values.



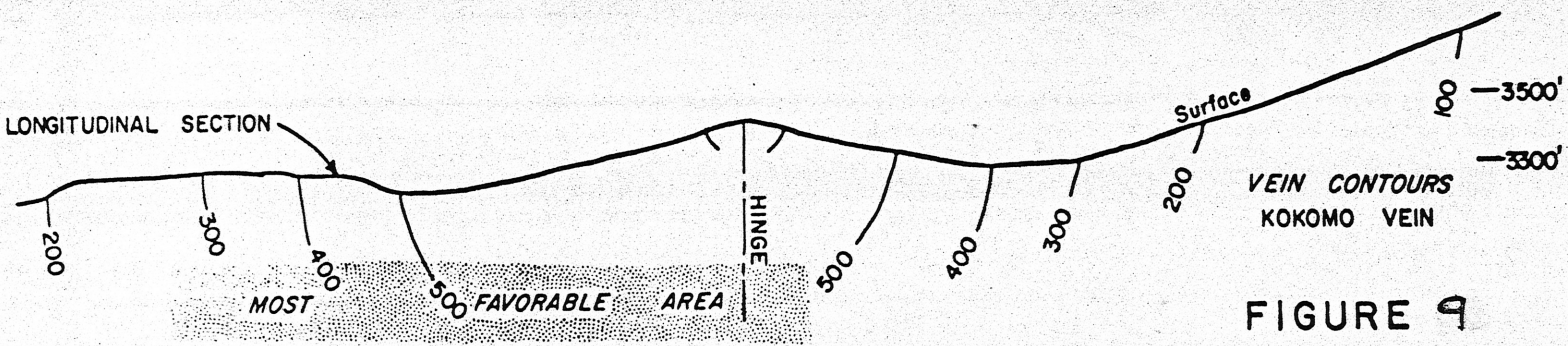


FIGURE 9

Modified after Clifton 4/80

6) The Black Eagle ore shoot, 200,000 T, 0.50 o/T Au shows a 10' wide zone of moderate to strong phyllic alteration and no quartz 300 feet above ore.

7) The United American ore shoot, 140,000 T, 0.50 o/T Au shows a 20' wide zone of phyllic alteration with minor quartz stringers 300' above ore.

8) The Kokomo vein one of our primary exploration targets, shows up to 100' of moderate to strong phyllic alteration.

The purpose of this suite of photos is to illustrate the subtle high level expression of buried epithermal ore shoots and to emphasize that without careful geological mapping and structural interpretation major buried ore shoots could easily be missed.

B) Fluid Inclusion Studies

A fluid inclusion study was initiated at Oatman in hopes of identifying specific hot spots where quartz or calcite vein material is exposed high above the ore shoots. We had also hoped to develop this tool as a reconnaissance technique to be used on virgin prospects by systematically sampling along the vein strike length in hopes of pinpointing local areas of boiling and with the temperature determinations and salinities, then predict the depth to the tops of potential buried ore shoots.

We have at Oatman a petrographic microscope and heating stage purchased from the University of Arizona. Our fluid inclusion results to date have shown that ore deposition occurred in the general temperature range of 220 to 240^{o} and were of low salinities which is typical of epithermal vein systems. Boiling is locally present as identified by explosion textures from the top of the Tip Top ore shoot. To date the concept of utilizing fluid inclusions as a reconnaissance tool has not proven as useful as once anticipated. At Oatman, as in other less prospected areas, definitive fluid inclusion work is hindered for the following reasons:

1) High above the tops of ore shoots vein material is generally lacking.

2) If vein material is present it is often too fine grained for easy temperature and morphology determination and probably does not represent ore stage quartz.

3) Fluid inclusion determinations maybe extremely tedious and time consuming. From the fine grained quartz characteristic of the Oatman ores 3-5 fluid inclusion determinations are a good days production.

4) The thermal gradient which we had hoped to establish for quartz overlying ore shoots at Oatman has not materialized. So using fluid inclusion temperatures and salinities to predict the depth to tops of ore shoots at Oatman has not yet been perfected.

We still feel fluid inclusion determination will prove useful in reconnaissance and in target exploration, and we are continuing our research along these lines in hopes of a significant breakthrough.

C) Geochemistry

At Oatman we have found that gold and silver geochemistry have limited application for the following reasons:

1) Vein material is frequently absent over the tops of ore shoots and altered wall rocks give no anomalous gold or silver values.

2) Gold and silver anomalies are most frequently found at Oatman associated with quartz and calcite not accompanied by phyllic alteration. Drill tests of these anomalies have indicated we are probably looking at the low grade roots of eroded vein systems.

3) Trace element determinations for Cu, Mo, Pb, Zn, As, and Hg have given local anomalies which generally show no relationship to buried ore shoots. However, other elements may be useful.

4) If vein material associated with phyllic alteration is present gold and silver determinations are the best guide to ore. If no vein material is present assessment of ore potential is best based on structure and alteration.

IX. CONCLUSIONS

From our work at Oatman which to date has consisted of detailed mapping, structural interpretation, vein geochemistry, fluid inclusion studies, more than 25,000 feet of drilling and expenditures well in excess of $1. x 10^6, the following conclusions can be drawn.

A) With detailed geological and structural studies specific ore controls were established for gold mineralization at Oatman. It was necessary to utilize all available geological tools at our disposal in order to do this.

B) The surface expression of the buried ore shoots at Oatman is frequently no more than a zone of phyllic alteration with very poorly defined structure.

C) Fluid inclusion studies show much promise for aiding the explorationist in identifying the lateral and vertical position of buried ore shoots but much refining needs to be done with this tool.

D) Geochemistry may have limited application in the exploration of epithermal systems. Unless vein material comes through to the surface the veins are best evaluated by detailed geological mapping supported by geochemistry. The lack of geochemical anomalies should not in itself be discouraging.

E) Drilling vein targets is costly and in the case of gold, drilling results even after large expenditures may be inconclusive. At Oatman, we have drilled numerous holes which grade 0.10 o/T Au or better; a few of our holes have shown better than 0.5 o/T Au. We have not even with the extensive drilling completed to date been able to establish grade continuity between closely spaced holes.

F) Before one enters into an exploration program such as Oatman, they must realize that the ultimate proof of grade and tonnage will probably have to come through underground exploration. The decision to go underground will probably be based on little or no proven ore reserves. At Toyotita, Durango, Mexico, for example, drilling is done primarily to prove structure and not to establish grade. At Bulldog Mountain, Creede, Colorado, Bill Cox drilled 2 core holes but because of very bad drilling conditions and poor core recovery could confirm nothing more than the presence of a mineralized structure. Based on this data, a decision was made to explore the vein underground and resulted in the discovery of the Bulldog Mountain mine. At Oatman, our fate may be the same and if so, I hope our luck will be as good.

G) Luck accompanied by geological insight and utilizing of every tool at one's disposal plays a vital role in the exploration of high grade veins. It is much easier to drill a pinch, above or below an ore shoot than it is to hit the ore shoot. For example, Coastal Mining, at Seven Troughs, Nevada cut a couple of feet pf 4. o/T Au in their first hole; their next 49 holes were disappointing and the project has been abandoned.

On the other hand, Lacana in their first drill hole at Guanajuato, Mexico, hit 35 feet of 17 oz. Ag and 0.20 o/T Au. Subsequent drilling outlined 3.6×10^6 T $\pm$ 9. o/T Ag and now provides the feed for the Las Torres mine and mill complex.

H) There are no sure bets in vein exploration. If the potential for significant targets exists, management must be willing to persist until all reasonable targets are tested.

I) If one is hoping for quick, definitive exploration results you will likely be disappointed.

J) And last but not least, we all dream of finding our pot of gold at the end of the rainbow. (Photo with end of rainbow on Tom Reed vein)

DEPARTMENT OF MINERAL RESOURCES
State of Arizona
MINE OWNER'S REPORT

Date Nov 2, 1965

1. ~~Mine~~: Jack's Mill on Tom Reed mill tailing site
2. Location: Sec..... Twp..... Range..... Nearest Town..... Distance.....
   Direction..... Nearest R.R..... Distance.....
   Road Conditions.....
3. Mining District and County: San Francisco (Tom Reed)
4. Former Name of Mine:.....
5. Owner: Consumers Mineral Recovery & Refining Co.
   Address: Moss Hotel - Oatman
6. Operator: Frank W Hack, Pres (of above Co.)
   Address: % Moss Hotel - Oatman
7. Principal Minerals: Custom mill ~~talk~~ metals
8. Number of Claims: Lode..... Patented..... Unpatented.....
   Placer..... Patented..... Unpatented.....
9. Type of Surrounding Terrain:.....
   PERMANENT ADDRESS P.O. BOX 31, INGLEWOOD, ILL
10. Geology and Mineralization:.....
    F.J.J.
    11-4-65 Operation to begin but adjustments were needed.
    Ore from surrounding area mines.
11. Dimension and Value of Ore Body:.....

Please give as complete information as possible and attach copies of engineer's reports, shipment returns, maps, etc. if you wish to have them available in this Department's files for inspection by prospective leasors or buyers.

(over)

12. Ore "Blocked Out" or "In Sight":

Ore Probable:

13. Mine Workings—Amount and Condition:

	No.	Feet	Condition
Shafts			
Raises			
Tunnels			
Crosscuts			
Stopes			

14. Water Supply:

15. Brief History:

16. Remarks:

17. If Property for Sale, List Approximate Price and Terms:

18. Signature:

Do Not Reproduce

TOM REED GOLD MINES

MOHAVE COUNTY
OATMAN DIST.

Thurs. Jan. 10, 1963 - Visited White Chief mine in Oatman. No activity. Visited Tom Reed mine. 8 men working, installing transformers and repairing shaft to install pumps for mill water in the future. Joe Brandenburg in charge.
Visited Americano Investment Co. office, interviewed L. M. Wiscombe and visited several of the properties with him, that the company has acquired.
E. G. WILLIAMS - Weekly Report Jan. 11, 1963.

OATMAN, ARIZ. Americana Investments plans a 1000-ton multi-purpose cyanide mill to process mill tailings and gold-silver ores.

Taken from E. & M.J. January 1963, p 81

The Americana Investments, Inc., Leland M. Wiscombe, president, has started mill construction at its holdings near Oatman, Arizona. This is the concern which recently acquired the TOM REED GOLD properties and accumulated tailings from the SAWYER PETROLEUM COMPANY, Los Angeles, California. The tailings lease to Americana was subject to an agreement to install a 1,000-ton-per-day capacity mill and to begin immediate processing of these tailings. More than half of the needed equipment is already at the mill site, and completion of the plant is scheduled for February. W. J. Nault of Salt Lake City, Utah, co-designer of the mill, is acting as consulting metallurgist and mill technician.

TAKEN FROM MINING WORLD, February, 1963, p 31

The Americana Investments Inc., Leland M. Wiscombe, president, now have their mill building completed, also assay lab. Two steel ore bins, one 600 tons, one 400 tons com pleted. Two ball mills installed. One bank of flotation cells installed. The crusher is on the mill site and foundation was being poured for it. The conveyor from the tailings to the mill bin was completed. Two 500 g.p.m. pumps are installed on the 475 level of the Tom Reed shaft and the pipe line is completed to the mill. All the transformers are installed for power. Nearly all the equipment that is needed is at the mill site. They hope to be milling tailings by the first of April.

MEMO - E.G. WILLIAMS - 3-15-63

Tom Reed (f

K 11/11 04

ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY

EVAN MECHAM, GOVERNOR

NOTICE OF INTENT TO (ISSUE) (A) GROUNDWATER QUALITY PROTECTION PERMIT(S)

Pursuant to Arizona Compilation of Rules and Regulations, Title 9, Chapter 20, Article 2 the Director of the Arizona Department of Environmental Quality intends to (issue) (a) Groundwater Quality Protection Permit(s) to the following applicant(s), subject to certain special and general conditions.

Public Notice No. 68-87AZGW
Process Technologies/Unity Mining Inc.
Black Eagle Project
2420 W. First Street, Suite #58
Tempe, Arizona 85281
Groundwater Quality Protection Permit G-0032-08

The permittee shall be authorized to operate a nondischarge hydrometallurgical precious metal recovery facility utilizing the cyanide heap leaching method. The facility is located approximately one mile southeast of Oatman, Arizona (T19N,R20W,Sec 23 and 24). The Groundwater Quality Protection Permit shall regulate the containment of cyanide leach solution to be used in the operation of the heap leach facility. The heap pad and ponds (pregnant and barren) shall be constructed with a synthetic liner over a prepaired surface to form an impermeable boundary between leach solution and soil surface. Ponds shall be tested with fresh water for leakage before cyanide may be added to the system. The pad and ponds shall have a leak detection and collection system underneath the liner to be monitored for the presence of liner leakage. The facility shall monitor leach solution daily in the form of a water balance record and monitor the leak detection collection system weekly for liner leakage. The facility shall be protected from runoff associated with a 100-year, 24-hour stormwater event and shall fence the site to provide restricted access. Groundwater at the site is at a depth of approximately 700 feet below land surface.

The permit (application)(Notice of Disposal) is available for public review Monday through Friday, 8:00 a.m to 5:00 p.m. at Arizona Department of Environmental Quality, Water Permits Unit, 2005 North Central Avenue, Phoenix, Arizona 85004.

Persons may submit comments or request a public hearing on the proposed action, in writing, to ADEQ at the above address within thirty (30) days from the date of this notice. Public hearing request must include the reason for such request.

stoped for 5,000 feet along strike. Past production from the Gold Road Mine is 1,500,000 tons grading 0.32 o/T Au. The mine closed in 1942 by war board order #L-208, with reported reserves of ± 250,000 tons of 0.25 o/T Au remaining in the mine.

20.9 Gold Road townsite - once a thriving community of 2,000 to 3,000 people. The three hundred ton per day Gold Road Mill was located across a small ridge to the north. Massive stockwork veined outcrop to left is relatively barren silica cap over the Sharp ore body on the Gold Road Vein (200,000 - 300,000 tons grading 0.50 o/T Au).

21.4 To the south a road cut exposes the post mineral Mallery fault zone. Two miles to the southeast the Mallery fault displaced the top of the Big Jim-Aztec ore shoot on the Tom Reed Vein by more then 400 feet. The Big Jim-Aztec ore shoot, footwall to the Mallery fault, was buried below barren Oatman latite and was discovered by accident. The Big Jim-Aztec orebodies produced ± 500,000 tons grading 0.75 o/T Au.

22.5 United Western Mine adjacent to road produced 40,000 T grading 0.30 o/T Au prior to closure in 1940. Drilling in this area by Fischer-Watt Mining shows an open ended reserve of + 200,000 T grading 0.20 o/T Au. The only surface expression of the United Western mineralization is a weak zone of illitic alteration. At the surface, there is no detectable gold or silver and no definative trace element anomaly.

23.1 To the north lies 750,000 tons of mill tailings from the United Eastern Mill. Mill ore came from the United Eastern and Big Jim ore shoots. Ore was ground to 80% - 200 mesh and processed through a modern Cyanide Mill. About 97% of the gold was recovered (Mill tailings grade ± 0.03 o/T Au).

23.3 Stop 2 - Turn to right to old schoolhouse - view of Oatman - once a thriving community of 8,000 to 10,000 people. Oatman now has a population of 90 to 100 permanent residents. Cliff forming rock unit to north is Gold Road latite (18.2 ± .9 my). White intrusive rock unit is the Elephants Tooth rhyolite (19.6 ± .9 my). Slope forming unit is the Oatman latite which is host for most of the major ore shoots at Oatman. The mine shaft to the north is the United Eastern #2 shaft from which was produced 550,000 T grading 1.10 o/T Au. The only surface expression of the United Eastern ore shoot (300 feet below the present surface) is a zone of strong illitic alteration with no geochem signature. To the south east along the Tom Reed Vein - the bold silicified outcrop in back of the fire station is the top of the Tip Top ore shoot (250,000 T ± 0.70 o/T Au). Erratic anomalous gold and silver values are obtained in outcrop. The top of the ore shoot is about 75 feet below the surface. East-southeast from the Tip Top at the cement foundations for the Tom Reed Mill on the small hill east of town is the Ben Harrison ore

Visited Joe Brandenburg who said Placer Mines Inc. are about to start leaching Tom Reed Tails. Kenneth Myers is president, Harbor City, California, A. Young is resident manager, Richard Harless is secretary. FTJ WR 3/8/68

Interviewed Joe Brandenburg - he said Young and Peterson who were attempting to work Tom Reed Tailings were behind in royalties and their equipment had been seized. FTJ WR 7/12/68

Visitors (1) J.J. Strutzel regarding Tom Reed Mine. Byron Jackson being sued for destruction of Tom Reed Shaft and Strutzel was searching files for information. Trial was to be in Kingman on Monday, Nov. 29. FTJ WR 11/24/71

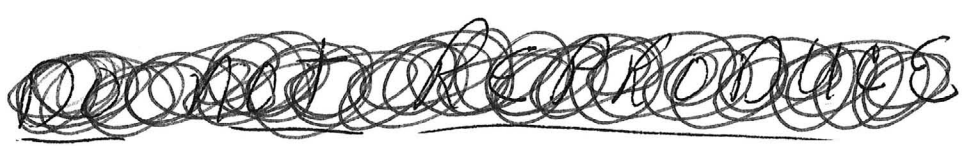
Paul Reed called regarding the owner of the Tom Reed mine in Oatman. He was told that the Sawyer Petroleum Company of Los Angeles was the owner and Mr. Vandenberg was the manager or caretaker. Suggested that he talk to Lloyd Moss or Jim McCarthy of Oatman and if he was interested in milling the tailings that he also look at the United Eastern mine next door. GWI WR 9/17/73

GW/WR 1/13/78 - Mr. O.J. Harwood said they have leases on the Tom Reed & the United Eastern tailings therefore, wanted information about them which was given. 2/23/78 a.p.

NJN WR 4/15/83: It was reported that either a company or a person with the name Sawyer is planning to rework the tailings of the Tom Reed Gold Mine, Mohave County, soon.

Office Visit JHJ 3/7/84 Robert A. Brant, Vice President, Royal American Exploration Corporation, Suite 1025, 1801 Avenue of the Stars, Los Angeles, California 90067, Ph: (213) 277-1280 visited and stated that his company owns what he calls the "Oatman Tailings in cluding Tom Reed and United Eastern". He has a figure of 1½ million and 800,000 tons respectively. They are going after certain tonnage that runs .07 Cimetta Engineering of Tucson has done lots of work for them.

At one time considerable tonnage was processed with stamp mills. This is the part with higher gold content. The tails will be slurried, run through cyclones to separate slimes (-270 mesh) grind balance to -325, then on to agitation leach with carbon-in-pulp. Plant will be located about Tom Reid dump. United Eastern tails will be slurried then pumped to plant site and entered into circuit. Anticipate 15 men. No date set for start-up as yet. At this time they believe they have plenty of water in the mines. They will require only 93,000 gallons per day for make-up water. A 24 hour leach is planned.



TOM REED GOLD MINES [redacted] MOHAVE COUNTY
OATMAN DIST.

At Oatman visited Tom Reed office, mine and mill. Except for a few bugs the mill section for tailings was ready to go. The section for mined ore has quite some work to be done.

E.G.WILLIAMS - Weekly Report - 5-10-63

VISITED AMERICANA office and mill, they are resampling the tailings. All other work has stopped.
E. G. Williams, Weekly Report July 17, 1963

Visited Tom Reed office and interviewed Joe Brandenburg, he is taking care of Americana Investment Co. affairs. He doesn't know for sure what the company is going to do, but thinks they are going to try and reorganize.

E. G. Williams - Weekly Report Sept. 17, 1963

STATE MINE INSPECTOR

MAR 29 1984

TOM REED GOLD MINE IF,

Office of State Mine Inspector

705 West Wing, Capitol Building
Phoenix, Arizona 85007
602-255-5971

NOTICE TO ARIZONA STATE MINE INSPECTOR

In compliance with Arizona Revised Statute Section 27-303, we are submitting this written notice to the Arizona State Mine Inspector, 705 West Wing, Capitol Building, Phoenix, Arizona 85007 of our intent to ~~___~~ start or ____ stop a mining operation.

COMPANY NAME Royal American Petroleum Corporation

CHIEF OFFICER E.W. Sawyer, Chairman

COMPANY ADDRESS 1801 Avenue of the Stars

COMPANY TELEPHONE NUMBER (213) 277-1284

MINE OR PLANT NAME Oatman Tailings Mine

MINE OR PLANT LOCATION (including county and nearest town, as well as directions for locating by vehicle)

Approximately one-half mile south of the town of Oatman, Arizona

(Mohave County)

TYPE OF OPERATION reprocess tailings PRINCIPAL PRODUCT Gold

STARTING DATE June 1, 1984 CLOSING DATE

DURATION OF OPERATION Seven years plus

PERSON SENDING THIS NOTICE Robert Brant

TITLE OF PERSON SENDING THIS NOTICE Vice President

DATE NOTICE SENT TO STATE MINE INSPECTOR March 27, 1984

PLEASE NOTE: Any operation found operating, without having sent this notice to the Arizona State Mine Inspector, will be charged with a petty offense.

12/83

TC REED GOLD MINE CO.

DAILY MILL ASSAY REPORT

March, 21st, 26
OATMAN, ARIZ., ... 192

Sample No.	DESCRIPTION		AU. Ozs. Per Ton	AU. Value Per Ton	REMARKS
1	Press Tails	7-3			
2	" "	3-11 Shifts 24hr,	.001	.02	
3	" "	11-7			
4	" Special				
5	" Average				
6	Head Sol.	7-3	.176	3.61	
7	" "	3-11 Shifts	.184	3.80	
8	" "	11-7	.186	3.84	
9	Average 24hr, Sample		.180	3.72	
10	Dorr Overflow	No. 1			
11	" "	No. 8			
12	" "	No. 9			
13	" "	No. 10	.006	.12	
14	" "	No. 11			
15	Dorr Underflow	No. 1			
16	" "	No. 8			
17	" "	No. 9			
18	" "	No. 10			
19	" "	No. 11			
20	Agitator Sol.	No. 4	.66	13.64	
21	" Pulp	No. 4	.04	.80	
22	Dorr Washed	No. 1			
23	" "	No. 8			
24	" "	No. 9			
25	" "	No. 10			
26	" "	No. 11			
27	Dorr Unwashed	No. 10			
28	" "	No. 11			
29	+200 Mesh				
30	—200 "				
31	Tailings Scrapings				
32	Slag Pour	No. 1 Lot			
33	" "	No. 2			
34	Shipping Slag				
35	Con. Tails, No. 1				
36	" " No. 2				
37	" " No. 3				

ARIZONA DEPT. OF MINES & MINERAL RESOURCES
STATE OFFICE BUILDING
416 W. CONGRESS, ROOM 161
TUCSON, ARIZONA 85701

..... Assayer