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Arizona Geological Survey
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602-771-1601
http://www.azgs.az.gov
inquiries@azgs.az.gov

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February 7, 1969

Mr. Raymundo J. Chico
103 Woodlawn Road
Baltimore, Md. 21210

Dear Mr. Chico:

Enclosed please find the two Red Rock reports. If your people are going to reenter the mine and explore for ore, these reports would be needed for a very considerable period. I suggest you have them copied, no great task with present reproduction methods, and return the originals. Of course I have no urgent need for the reports, but would like them back within a reasonable time.

Sincerely

Edward Wisser

CYPRUS MINES CORPORATION
523 WEST SIXTH STREET
LOS ANGELES, CALIFORNIA 90014

HENRY T. MUDD
CHAIRMAN OF THE BOARD

January 30, 1969

Dr. Edward H. Wisser
5255 E. Holmes Street
Tucson, Arizona 87511

Dear Dr. Wisser:

Following the suggestion of Mr. Raymundo J. Chico, I am writing to you concerning the Red Rock Mine.

If you have no personal objection to doing so, you have my consent to release to him the report you made on this property for my father.

Sincerely,

RAYMUNDO J. CHICO
ECONOMIC GEOLOGY CONSULTANT
103 WOODLAWN ROAD
BALTIMORE, MARYLAND 21210, USA

TELEPHONE (301) 235-7005

January 17th, 1969

Mr. Henry Mudd
Chairman of the Board
Cyprus Mining Corporation
523 West 6th Street
Los Angeles, California 90014

Dear Mr. Mudd:

Dr. Edward H. Wisser, Consulting Geologist, who performed a consulting assignment for your late father at the Red Rock Mine near Santa Barbara twenty years ago will be willing to let me read his report of that property upon your consent.

Due to the fact that the Red Rock Mine is caved in, and that a corporate client has hired my services, I would greatly appreciate your kindly writing to Dr. Wisser expressing your consent so that I might read his report.

Thank you in advance for your consideration in granting my request.

Sincerely,

Raymundo J. Chico

RJC:bk

cc: Dr. Edward H. Wisser
5255 E. Holmes Street
Tucson, Arizona 85711

1206 PACIFIC MUTUAL BUILDING
LOS ANGELES

September 8, 1942

Mr. Ed Wisser
533 Call Building
San Francisco, California

Dear Ed:

We have taken over the operation of the Red Rock Quicksilver Mine east of Buellton, in Santa Barbara County.

We would like to have you make a study of it just as soon as possible. We of course do not want you to put off making your report on the examinations you have made for us so far and we appreciate that you have some obligations to others. We would like to put in our bid, however, to have you do this job as soon as possible. My guess is that it will take you about a week to do a good job. Please let me know when you think you can make the trip.

Faithfully yours,

L. W. WICKES

LWW:BB

June 16, 1943

Cachuma Mining Co.,
1206 Pacific Mutual Bldg.,
Los Angeles 14, Calif.

Tom Edward Wisser, Dr.,

To professional services, writing office report on Red Rock quicksilver mine, June 1943, 4.5 days @ $25.00	$112.50
White prints, coloring maps, typing, supplies...	10.50
	$122.50

1206 PACIFIC MUTUAL BUILDING
LOS ANGELES
Postal Zone 14.

June 7, 1943.

Mr. Edward H. Wisser
533 Call Building
San Francisco 5, Calif.

Rio Tinto

Dear Ed:

Thank you very much for your letter of June 3. I am today writing Mr. Dudley that the property is nothing in which we would care to become interested at this time.

I spent last weekend at the Red Rock. We are making some nice ore at the head of the 6-9 raise but the eastern branch has broken into the old stopes below No. 5. We should get several hundred tons from the western extension. The values, however, all seem to be within the vein walls and the ore does not make out on the flats.

We are getting some very nice ore in the stopes above the 800. We now have two chinmeys from which considerable tonnage will be obtained, although they will measure in hundreds of tons rather than in thousands. Here again the ore seems to be confined to walls and not making out on the flats.

With kindest regards,

Faithfully yours,

L. W. WICKES

LWW:est

November 19th, 1942

Mr. Harvey S. Mudd,
1206 Pacific Mutual Bldg.,
Los Angeles, Calif.

To Edward Wisser, Dr.,

To professional services, examination of Red Rock mine, Santa Barbara Co.,Calif.,October 21st to 29th,1942,	
9 days @ $45.00	$405.00
Writing report etc., 11 days @ $25.00	275.00
Office assistance	24.00
White prints	6.06
Paper etc	2.50
Postage	1.70
Expense account, submitted herewith	35.18
	~~$841.24~~
	749.44

November 19th, 1942.

Mr. Harvey S. Mudd,
1206 Pacific Mutual Bldg.,
Los Angeles, Calif.

To Edward Wisser, Dr.,

To professional services, examination of Red Rock mine, Santa Barbara Co., Calif., October 21st to 29th, 1942, 9 days @ $45.00	$405.00
Writing report etc., 11 days @ $25.00	275.00
Office assistance	24.00
White prints	6.06
Paper etc	2.50
Postage	1.70
Expense account, submitted herewith	35.18
	$749.44

Ed—
Please check items—
We should have
a corrected bill—
HSM,

EDWARD WISSER
MINING GEOLOGIST
533 CALL BUILDING
SAN FRANCISCO
TELEPHONE GARFIELD 4676

November 19th, 1942

Mr. Harvey S. Mudd,
1206 Pacific Mutual Bldg.,
Los Angeles, Calif.

749.44

To Edward Wisser, Dr.,

To professional services, examination of Red Rock mine, Santa Santa Barbara Co.,Calif.,October 21st to 29th,1942,

9 days @ $45.00	$405.00
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Office assistance	24.00
White prints	6.06
Paper etc	2.50
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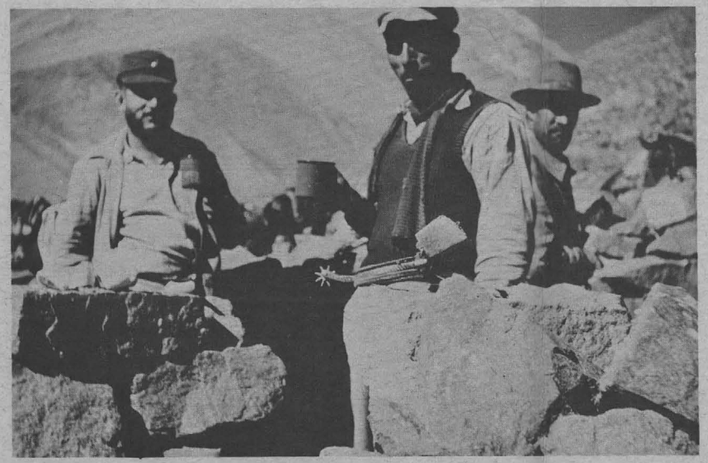
	~~$841.24~~ 749.44

OK
HSM



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INTRODUCTION

RAYMUNDO J. CHICO is an independent Consulting Geologist who operates out of Baltimore, Maryland, with the back up of a small staff.

Mr. Chico's consultancy approach is simple: He goes to the countryside, mountains, deserts, mines, towns, cities, pre-construction sites, libraries, courthouses, corporate headquarters and agencies to work with undivided vigor in his assignments.

The product of his work is also simple: written words, maps, graphs, numerals, dollars and percentage signs — business truth.

He knows how to project screened and unbiased data and analyses for executives, engineers, financiers, investors, managers, contractors, prospectors and public officials.

The broad spectrum of Mr. Chico's capabilities and hints of his Economic Geology pulse are in this brochure.

His talents and research know-how are ready for MINERAL SEARCH, PRE-CONSTRUCTION INVESTIGATIONS and OPERATIONS RESEARCH needs in the USA and overseas, with special interest in Latin America.

SERVICES AND CAPABILITIES

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- ☐ Exploration of raw material sources for engineering construction.
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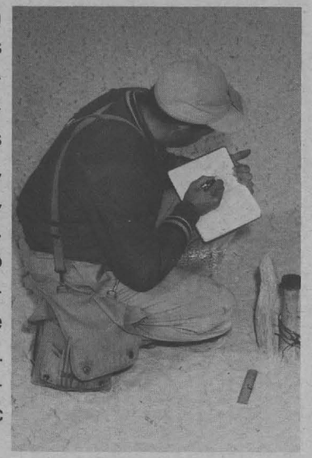
- ☐ Specifications for drilling programs.
- ☐ Terrain analyses and geomorphology.
- ☐ Waterfront geology investigations.
- ☐ Environmental earth science studies.

Note: expanded coverage on the preceding services and capabilities available upon request.

OPERATIONS AND SUPPORT

Raymundo J. Chico carries out his field and office assignments personally. As a practicing geologist he knows how to cope with tasks necessitating mobility, environment acclimation and foreign conditions. As a consultant in residence, he is able to produce data and analyses for executive decisions - in English and Spanish. He has established close relations with other consultants and specialists in mining, geophysics, geology, construction, law and management. He enjoys access to public and private information centers in the USA and Latin America. His references are disclosed upon specific requests.



BACKGROUND AND EXPERIENCE

RAYMUNDO J. CHICO has been working in Applied Earth Sciences since 1952. Under the Dirección de Fabricaciones Militares of Argentina, he explored for copper orebodies and served the Argentine Corps of Engineers in geology tasks. He was a mining geologist for Cerro de Pasco Corporation in two Peruvian mines, and twice worked in different departments of Cerro Corporation's New York headquarters. For Four Corners Uranium Corporation (mergered with Consolidated Oil & Gas, Inc.), he served as geological engineer at several Rocky Mountains underground and open pit uranium mines; he also carried out uranium exploratory work, drilling supervision, ore reserves valuations and mineral leasing tasks.

From a Missouri Geological Survey assignment he became acquainted with that State's mineral industry, working on iron, lead, zinc, cobalt, copper, barite and tungsten surveys. He was team consultant with the International Basic Economy Corporation (IBEC-Rockefeller) for a San Juan Province sponsored mineral exploration project of the Argentine Andes. In the same country and province he was also geologist for National Lead Company.

As a U.S. Air Force subcontractor, he applied geology and soil mechanics in playas of California, Nevada and Utah. He served for the U.S. Defense Department in a special mineral resources and environmental earth sciences program. For commercial interests he contributed to the geology section of a feasibility study on fertilizers in South America. In the investment field he analyzed for a client a gold-silver stock of an operating company. With computer specialists he prepared off-shore geology data at the National Oceanographic Data Center in Washington, D.C. With oceanographers he sampled underwater sediments in search of sand, gravel, phosphate and manganese nodules. With civil engineers he has shared his knowledge in several flood-control projects of the U.S. Army Corps of Engineers Baltimore District. Most of his recent consultancy, however, has been directed toward uranium exploration programs and mineral negotiations.

Mr. Chico holds academic degrees from Universidad Nacional de Córdoba (Geología/Doct. Ciencias Naturales), University of Missouri School of Mines and Metallurgy (Mining Geology, M.S.) and Harvard University (Mineralogy and Geological Sciences, M.A.). He has gained additional training at the Massachusetts Institute of Technology (Industrial Minerals, Selective Geology and Soil Mechanics) and The John Hopkins University (Chemistry).

He was recipient of fellowships at Córdoba, Missouri and held a scholarship from the Organization of American States at Harvard University. Mr. Chico is a member of the American Institute of Mining Metallurgical and Petroleum Engineers, The Geological Society of America, the Baltimore-Washington Section of the Association of Engineering Geologists and the honorary society of Sigma Xi. He has published in Canada, Czechoslovakia, Germany, Switzerland and the United States of America. He has authored several Economic Geology articles for Reinhold's *Encyclopedia of Earth Sciences Series*. His biography is in WHO'S WHO IN THE EAST (USA), DICTIONARY OF INTERNATIONAL BIOGRAPHY (England) and AMERICAN MEN OF SCIENCE (USA).

FOREGROUND AND PRINCIPLES

The services of Raymundo J. Chico are rooted in the belief that Economic Geology is indispensable for tackling many 20th Century social and economic problems. Pragmatically and speculatively, Economic Geology guides men towards the rational exploitation of natural resources and advises them on conditions and materials encountered on and below the surface of the Earth.

In a free society where land can be bought, claimed, leased, contested, built on, destroyed, polluted, explored, and exploited, Economic Geology has a mission for mankind. This is why a fusion of technical, scientific and ethical integrity is essential.

Economic Geology—when timely applied—produces profit and is allied to prosperity in both developed and developing countries, large and small states and in old and new communities.

Raymundo J. Chico is ready to serve your business and government programs. If you are interested in his capabilities, **Please Write to:**

Raymundo J. Chico,
103 Woodlawn Road
Baltimore, Maryland 21210 USA

or call his office anytime:
Telephone (301) 235-7005

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June 16, 1943

Mr. L.W. Wickes,
1206 Pacific Mutual Bldg.,
Los Angeles, Calif.

Dear Sir:

Pursuant to your request I have revised my analysis of the Red Rock quicksilver mine, Santa Barbara Co., Calif. on the basis of the corrected surveys of the 6 and 7 levels and of developments since my visit of October, 1942. Results of this office study together with recommendations for further exploration are embodied in the accompanying report.

Not having revisited the mine, errors in my present picture of it are unavoidable, and some of the conclusions and recommendations of this report may be modified or rejected by the management on the job.

Yours truly,

Edward Wisser

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ILLUSTRATIONS
(In Pocket)

Long. Vert. Projection, Main Vein, N End of Mine. 1"= 30'

Plan, 5 Level. 1"= 30'

" , N End of 6 Level." "

" , " " " 7 " " "

SUPPLEMENTARY REPORT ON THE RED ROCK MINE
SANTA BARBARA COUNTY, CALIF.

INTRODUCTION.

The structural picture of the north end of the mine brought out in the writer's report of November 18, 1942 has proved wrong owingto serious errors in the surveys on which the geology was based. With the levels falsely placed in relation to one another attempts at fracture correlation naturally resulted only in confusion. After completion of the correct surveys the writer was asked to make a new analysis of the north endof the mine, where the effect of the errors was most marked, and to suggest any prospects thought promising for ore.

STRUCTURE AT NORTH END OF MINE.

Present notions are best shown on the accompanying plans of the 5 and 6 levels. The new discovery that seems to be the key to the puzzle is the identification of the N.W. flat fault at the foot of the shaft near the north end of 5 Level as an important flat which I have named Flat 4. This flat was cut and followed in the crosscut at 265 S on 6 Level.

Flat 4 faults the Main Vein, north side west (reverse movement) on the surface and in the upper levels; but the displacement decreases with depth so that on 6 it is probably little or nothing. The Main Vein on 5 keeps its regional strike, just east of north, as far as exposed to the north; but it flattens with depth,so that its trace on the plane of a level veers radically to the N.E. in the north part of the mine. (See plan of 6 level). The recent crosscut at 150S exposes therefore the Main Vein,and the 7 Level workings north of 300 S are north of the Main Vein.

The SW-A vein on 5 appears to join the Main Vein just south of Flat 4. But SW-A continues downward steeply while the Main Vein flattens,so that the two pull apart in depth; i.e.,their intersection must pitch very flatly N.E.

The Link Vein is a north-south vein connecting, on 5, the Main and SW-A veins just S.W. of their junction. Between 5 and 6 the Link Vein dips east; here it carried the stope shown on the Vertical Projection. Between 6 and 7 the Link vein seems to reverse its dip, dipping west.

These are the essentials of structure brought out by the new analysis.

CHANCES FOR ORE.

The chief ore locus in the Red Rock mine has been the intersections of the various flats with the Main Vein. The Vertical section accompanying this report shows that the Main Vein has been very little explored on levels north of Flat 4,and not at all by raises. The radical N.E. strike of the Main Vein in this area is probably unfavorable for ore,for the vein on this course lies nearly perpendicular to the direction of compression operating at the time of mineralization,as shown in Stress Diagram b, Plan of 6 Level, General Report. However, I never reject cheap prospects at a productive mine from considerations of theory, and shall offer several recommendations for exploration of the Main Vein below Flat 4.

Flat 4 itself carried ore between the 7 and 6 levels,as shown on Plan of 7,stope from crosscut at 350S,and on the Vertical Projection. It has been shown in the General Report, p. 9 that in the upper levels ore makes on flats away from the intersection with the

Main or other veins. The ore body on Flat 4 above 7 started, on 7 level, at the intersection of the Flat with a feeble north-south fracture that may be the East Vein; but the fracture was not seen higher up in the stope, and I think the ore body was along the Flat with little or no aid from the north-south fracture. If so, chances for further ore on Flat 4 above 6 level look pretty good, and a recommendation is made to test this idea.

Vein SW-A produced a good-grade stope above 6, at about 200S; I was told there was ore in the floor on 6. We tried a raise from 7 to 6 to lead us under this ore; but owing to the false surveys, the raise as run came out far in the footwall of SW-A as shown on the plan of 7. A new raise to tap this ore is spotted in the present report.

The Link Vein produced some ore above 6, as shown on Plan of that level and on the Vertical Projection. Provision is made for exploring this vein between 6 and 7.

Finally, the Main Vein may be traced on the surface for at least 500 ft. northeast of the northernmost underground workings. While the outcrop here is not very promising, exposures are poor. Suggestions are made for looking at this vein a little further on the 5 and 7 levels; the 6 Level may be utilized should either the 5 or 7 work bring results.

RECOMMENDATIONS FOR EXPLORATION.

Numbers are carried serially from General Report, with level-number prefix.

5 Level.

5-23. Main Vein. Now that the flat fault near the north end of 5 has been recognized as a structurally important Flat, it seems worth whole to look at the Main Vein above 5 and below this Flat. Recommen-

dation: Continue drift on Main Vein north 50 ft.

6 Level.

6-24. Main Vein and Flat 4.- The Main Vein should be explored above 6 Level and below and just above Flat 4. Flat 4, also, should be explored above 6. Recommendation: At point shown on plan of 6 Level, raise on Main Vein to Flat 4. At the horizon where the Flat is cut, unless ore has already been encountered, drift north on Main Vein possibly 60 ft., and south 50 ft. At the same horizon, drift east and west on Flat 4.

6-25. SW-A Vein.- Flat 4 crosses the Main Vein without doubt, on the surface and on 5. I did not note its crossing on 6, but Conrad Martin shows what is probably Flat 4 on the west side of the Main Vein on 6. Recommendation.-As shown on plan of 6, drive S.W. in footwall of Flat 4 to SW-A vein.

Crosscut 150S.-Main Vein As mentioned above, the Main Vein has been cut in this crosscut since my visit. Presumably it is not worth driving on there; but should the work to the north on 5, and/or the suggested extension of the crosscut at 225 S on 7 find ore, then driving N.E. and possibly S.W. on the Main Vein from 150S crosscut on 6 might be indicated.

6-26. East Vein.- A crosscut in the footwall of Flat 3, driven in place of my drill hole Rec.6-7 designed to find the East Vein north of Flat 3, appears to have found the East Vein. The vein should be examined above 6 and below Flat 3. Recommendation: As shown on 6 Level plan, raise on East vein to Flat 3. At horizon where Flat is cut, drive north and south on Vein, east and west on Flat.

7 Level.

7-27. Main Vein. Time and money were spent hunting for the Main Vein north of 300S coordinate. For 25 ft. more work we can find it in this area. Recommendation.- Extend crosscut at 225 S 25 ft. to cut Main Vein.

7-28. SW-A Vein. The stope on this vein, shown on plan of 6 near 200S coordinate, was above 6 but that level is said to show ore in the floor, beneath the stope. This ore should be tapped from 7. On 7 the SW-A and Link veins are more or less merged directly beneath the ore mentioned; but they should separate not far above 7. Recommendation.- At point shown on 7 plan, raise toward ore on 6. Bearing of raise N40°W, inclination 76°. The raise will probably go up on SW-A vein, but if not that vein should enter the raise shortly. The Link vein may be examined above 7, from this raise, by crosscutting N75°E about 20 ft. at a horizon about 30' above floor of 7.

7-29. SW-A Vein.- The west crosscut at 350S coordinate, apparently run to cut SW-A vein, seems to have just missed its objective. Recommendation.- Extend this crosscut 10 ft.

UNCOMPLETED PROSPECTS.

A number of prospects given in my General Report appear to have not been run. These are listed briefly below, with comments.

5-1, Main Vein. Drop this.

5-2, SW vein, 5-3, Flat 3, 5-4, Flat 2: I still think we should do. Hugh Write tells me that the short drift on Flat 2, near Rec. 5-4, produced 7 flasks; this should encourage finding Flat 2 north of the fault (see plan of 5 with this report).

6-5, Main Vein.- Drop this.

6-6, SW-A Vein. Replaced by 6-25.

6-7. East Vein and Flat 3.- See Rec.6-26.

6-8. East Vein. I lack enthusiasm.

6-9. Main Vein. Done. Found ore.

6-10. West Vein.- A crosscut here went only half far enough.

7-11. Small East Vein above 7.- I assume not done. I am apathetic.

7-12. Main Vein.- Done.

7-13,7-14. West Vein. Not done. 7-14 still seems OK.

7-15. Main Vein.- Chute shown on 7 plan suggests this has been done. If so,has Flat 2 been drifted on to E above 7?

7-16. Junction Main and East Veins above 7.-Not done. Short, and I think worth while.

7-17. SW Vein.- No information. SW vein drifted on on 7 Level.

7-18.- No information. Stope 36,which I figure is on Flat 4, not 3-A as stated in General Report,is shown on new plan of 7. It looks as if Main Vein had been examined under Flat 4 from this stope, as embodied in Rec.7-18. If not, I think it should be if still feasible.

7-19.- Flat 3.- Done.

7-20. Small Flat.-Done.

7-21. Main Vein. Drop this.

HUGH WRIGHT RECOMMENDATIONS.

Several months ago Mr. Hugh Wright and I spent several hours discussing Red Rock. He stresses the importance of the "Dike Vein", shown on the accompanying plan of 5, explaining that it was not the East vein, nor was it entirely along bedding as appeared to me on 5; he said it was a fracture in its own right,and that important ore was mined along it,especially along its intersection with Flat 3. The "Dike Vein" has never been found below 5.

Mr. Wright said also that the East Vein joins the "Dike Vein" on the dip between 5 and 6. He was strongly in favor of exploration of the "Dike Vein" on 6, and if favorable there, on 7. On the accompanying plans and projection Mr. Wright's suggestions are shown in red.

5 Level.- Main Vein. Raise suggested under Flat 3-A, as shown on plan and projection. Possible ore here very small, but might be a good bet on that basis.

5 Level. SW-A Vein.- Short SW drift shows 4 to 5 lb. ore. Test by panning, and if confirmed, drift SW.

5 Level. "Dike Vein".- Most of drift on beds; vein in S.W. wall. Crosscut near 150S coord. suggested as shown. OK. The slip which I have labelled "Dike Vein" looks like a real slip rather than mere bedding. Real slips disappear where the bedding happens to parallel them, but they may carry ore in such places nevertheless.

6 Level.- The "Dike Vein" is shown projected to the 6 level on the accompanying plan. Apparently east crosscut 265S was driven to cut that vein and failed to do so. The vein may lie just beyond the face. However, the N.E. crosscut from Flat 3 seems a more favorable place to hunt for the "Dike Vein". Here the bedding is at right angles to the supposed vein, so the latter should show up strongly; and this crosscut is close to Flat 3, a favorable locus for ore. I believe I should extend this crosscut as shown.

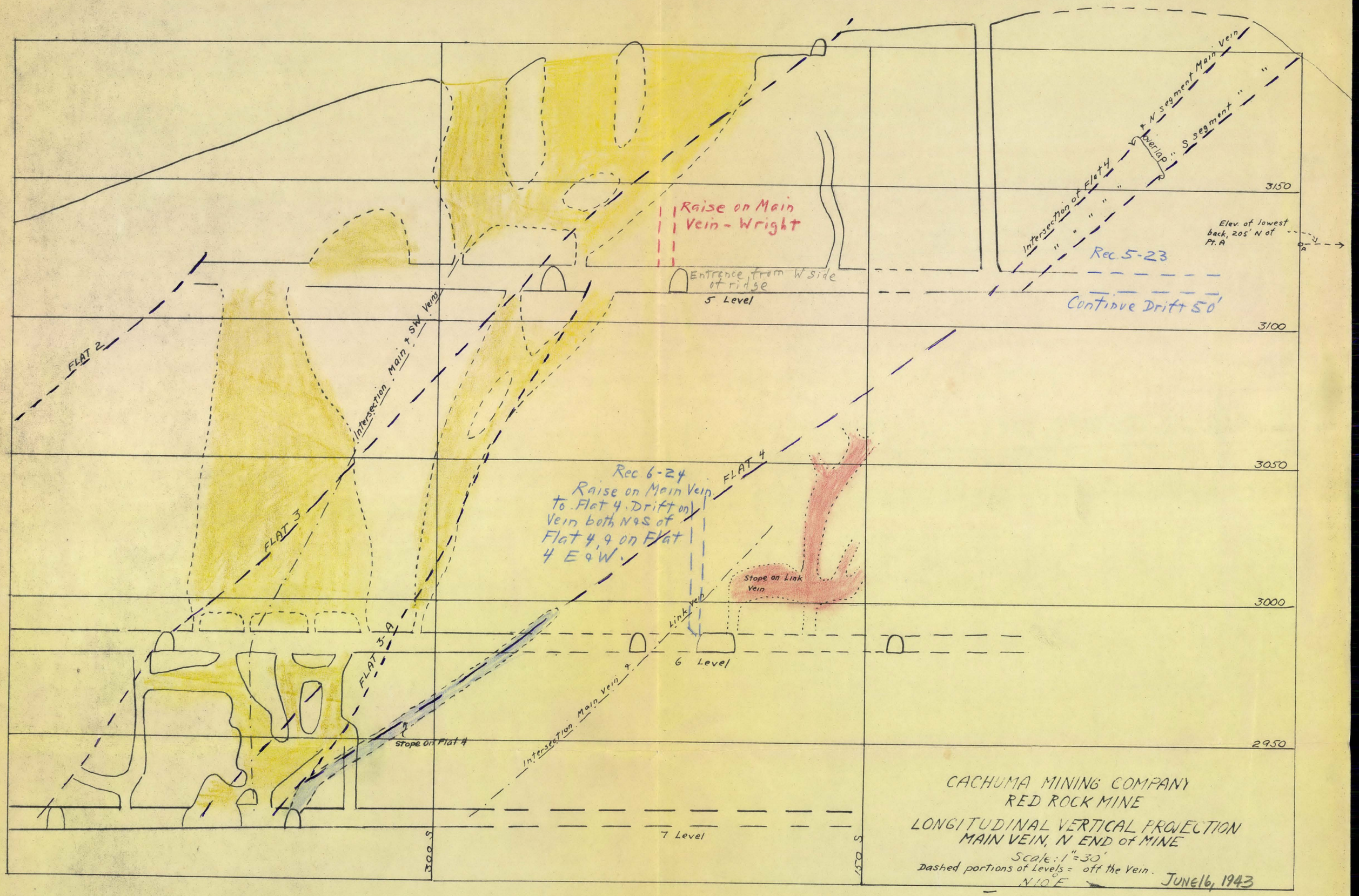
6 Level.- Main Vein.- Wright suggests a raise under a flat near 450S. I think this country has been covered from raise of Rec.6-9, 35 ft. to the south. Mr. Wright says that above 6 level ore remains above Flat 1, near the Main Vein. See Projection of General Report.

GENERAL NOTE.

To decide whether any of the prospects mentioned in this report should be run, one must have contact with the pulse of the mine, ~~and~~ profit being made, labor situation etc. I have no such contact. In general, I should say that fairly expensive prospects, such as those on the Main Vein to the north, might be worth doing because there is plenty of space for enough ore to change the whole picture; that where such space is lacking, only cheap prospects are justified except where driving to tap known ore.

San Francisco 5, Calif.
June 16th, 1943.

Edward Wisser
Mining Geologist



Raise on Main Vein - Wright
Entrance from W side of ridge
5 Level
Rec. 5-23
Continue Drift 50'
Intersection of Flat 4 & N segment Main Vein
" " " " " overlap " S segment " "
Elev. of lowest back, 205' N of Pt. A
3150
3100
3050
3000
2950
FLAT 2
FLAT 3
FLAT 3-A
FLAT 4
Intersection Main & SW Veins
Rec 6-24
Raise on Main Vein to Flat 4. Drift on Vein both N & S of Flat 4, & on Flat 4 E & W.
Stope on Link Vein
Link Vein
6 Level
Intersection Main Vein &
Stope on Flat 4
7 Level
300 S
150 S
CACHUMA MINING COMPANY
RED ROCK MINE
LONGITUDINAL VERTICAL PROJECTION
MAIN VEIN, N END of MINE
Scale: 1" = 30'
Dashed portions of Levels = off the Vein.
N 10° E
JUNE 16, 1943

Vert. Projection

RAYMUNDO J. CHICO
ECONOMIC GEOLOGY CONSULTANT
103 WOODLAWN ROAD
BALTIMORE, MARYLAND 21210, USA

TELEPHONE (301) 235-7005

March 31, 1969

Mr. Henry T. Mudd
Chairman of the Board
Cyprus Mines Corporation
523 West Sixth Street
Los Angeles, California 90014

Dr. Edward Wisser
5255 East Holmes Street
Tucson, Arizona 85711

Gentlemen:

This is a two-fold thank you letter: Firstly, to acknowledge Mr. Mudd for his authorization given to Dr. Wisser on January 20, 1969; and secondly, to thank Dr. Wisser for his 1942/1943 reports on the Red Rock Mine, near Santa Barbara, California.

After having read these reports, I am hereby returning them to Dr. Wisser via registered mail (return receipt requested accompanied by a $1.87 postal refund check).

Most sincerely yours,

Raymundo J. Chico

3 Enclosures: as stated

rjc/bb

EDWARD WISSER
MINING GEOLOGIST
533 CALL BUILDING
SAN FRANCISCO

TELEPHONE GARFIELD 4676

November 18th, 1942

Mr. Harvey S. Mudd
1206 Pacific Mutual Building
Los Angeles, California

Dear Sir,

Pursuant to your request I have examined the Red Rock Quicksilver Mine, Santa Barbara County, California, and submit herewith a report covering the results of that examination.

Yours very truly,

Edward Wisser

Edward Wisser.

SUMMARY STATEMENT

The Red Rock Quicksilver Mine, about 40 miles by road north of Santa Barbara, has produced about 2000 flasks of quicksilver. The country rock at the mine is shale. The ore shoots are small, scattered and low-grade, and are mainly located along the intersections of north-south, steep fractures with northeast, flat fractures.

The mine is small and without prospects of developing into a lucrative enterprise. It seems possible, however, that some of the capital invested might be returned during the ensuing year, and 22 recommendations for exploration, most of them short and cheap, are given with this end in view.

The mine lies not far east of the Cachuma fault, a major fault between Franciscan Serpentine on the southwest and Cretaceous Shale on the northeast. Since this fault formed at about the time of the quicksilver mineralization, and since serpentine-sediment contacts are loci for much quicksilver ore in California, investigation of this fault is recommended.

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ILLUSTRATIONS
(In Pocket)

Claim Map. Scale 1"-500'

Geologic Plan 5 Level. Scale 1"-30'

" " 6 " " " "

" " 7 " " " "

" " 8 " " " "

Vertical Longitudinal Projection Main Vein. Scale 1"-30'

REPORT ON THE RED ROCK MINE

SANTA BARBARA COUNTY

CALIFORNIA

INTRODUCTION

The following report is based on a stay of eight days at the property, October 21st to 29th, 1942. Complete cooperation was extended by Messrs. Lyttleton Price and C.L.Gruenig, superintendent and assistant superintendent respectively. After my return to Berkeley W.G.Donaldson, former half owner, offered a number of valuable suggestions for exploration.

LOCATION. TOPOGRAPHY. HOLDINGS. PLANT.

The Red Rock Quicksilver Mine lies in Santa Barbara County, chiefly in Sec. 2, T.7 N., R.29 W., San Bernardino Meridian. The mine lies about 43 miles by road almost due north of Santa Barbara via the San Marcos Pass and about 20 miles by road northeast of Solvang. Buellton, which is 2 miles from Solvang is the nearest town on highway 101.

The principal workings lie within a steep ridge trending north-south and forming the east slope of a small stream flowing south which eventually reaches the Santa Inez River. The accompanying claim map shows the claims comprising the property.

Power. - Compressed air for mining is furnished by a 320 cu. ft. free air per minute Sullivan 2-stage compressor driven by Caterpillar Diesel, and a 120 cu. ft. Ingersoll-Rand single-stage compressor driven by a Waukesha gasoline engine.

Power for the furnace plant is furnished by a Caterpillar 36 horsepower Diesel direct connected to a 30 KVA generator.

Plant. - The coarse and fine ore bins each hold 35 tons. The crusher is a 10" x 14" Blake, crushing to 1/2". The furnace is a 3' x 48' Gould rotary fed by a standard plunger feeder, with a standard Gould burner using ordinary fuel oil. The Sirroco is between the condensers and the furnace. There are 8 pairs of 16" x 25' cast iron condensers which discharge into a redwood tank and up a wooden stack. Fuel oil storage capacity is 16,000 gallons for fuel oil, 6500 for Diesel oil, 1000 for gasoline.

Ore Handling. - The bins at 6,7 and 8 levels hold 30 tons each. They are equipped with 1/2" grizzlies and a waste chute for sorting. Fifty percent of the material dumped on the bin passes the grizzly; of the oversize, about 25% is sorted out for waste.

Transportation. - Ore is hauled to the plant on contract with a 3 1/2 ton dump truck at a price of 30 cents per ton. Distance varies from a half-mile (6 and 7 Tunnels) to a few hundred yards (8 Tunnel).

The company has a GMC half-ton pickup, a one-ton Chevrolet stake body truck and a Buick Coupe.

Camp. - There is an adequate machine shop at the portal of No.6 Tunnel. Living quarters, boarding house and office are located in the stream valley below the furnace plant and they are well built.

TERMS UNDER WHICH PROPERTY IS HELD.

The Cachuma Mining Co., present operator, paid W.G. Donaldson $25,000 for a half interest in the patented and unpatented mining claims with the accompanying mining rights, and a half interest in all personal property, improvements, etc. The other half of the property is owned by Red Canyon Mining Co., controlled by Hugh

Wright and C.E.McDowell. The deal between Cachuma Mining Co. and Red Canyon Co. is in the form of a Lease and Agreement. Cachuma furnishes from September 1st, 1942 on, all working capital. Cachuma is to be reimbursed for all advances for operating, and for one-half of any capital expenditures made for improvements. After building up a working fund of $20,000 any additional profits are to be split 50/50 with Red Canyon. Cachuma may step out at any time but they thereby lose any advances made for operating which have not been returned from operating profit; they would, however, have a claim for any capital expenditure made which could be returned to them by sale of any of the property for which the capital expenditure was made. If Cachuma should abandon work, Red Canyon has the right to take over on the same basis as that under which Cachuma is now operating.

HISTORY. PRODUCTION.

Nothing is known of the early history of the mine. It is mentioned in the 1918 report of the State Minerologist on quicksilver resources. According to report a Herreshoff furnace formerly operated outside the portal of No.6 Tunnel. Mr. Hugh Wright built some retorts at this same locality. When Donaldson started operations in August, 1941 he produced 39 flasks from these retorts in that and the following month. The present rotary furnace treated 12,018 tons between October 1st, 1941 and September 1st, 1942. From this tonnage 640 flasks were produced with an over-all average of 4.05 pounds quicksilver per ton. The report on the mine by George Schilling dated August 5, 1942 quotes Hugh Wright as estimating a total production of the property at 30,000 tons. If we assume the average grade to have been 5 lbs. per ton the

total production would be about 2000 flasks.

GENERAL GEOLOGY.

The Red Rock Mine lies in an area of strongly folded thin-bedded shale with some sandstone, of middle Cretaceous age. The beds are intensely folded along northwest axes; at the mine their dip is steeply northeast. The deformation which produced this folding is very late, presumably middle Pleistocene and affected the entire region of the Santa Inez Mountains. West of the stream which flows south through camp is a prominent belt of serpentine striking northwest. The northeast boundary of this belt coincides with the Gachuma fault striking northwest and dipping northeast. This is a reverse fault, presumable the result of the same compressive forces that caused the folding of the sediments northeast of the fault (see R.N.Nelson: Geology of the Hydrographic Basin of the Upper Santa Inez River, California. Univ. Calif. Pub. Bull. Dep't. Geol. Sci., vol. 15, No.10, 327-326, May, 1925.)

The Cretaceous sediments exposed at the mine are mainly thin-laminated dark shale, quite sandy in places, with thin intercalated beds of shaly sandstone. In spite of the thinness of the shale beds they tend to break massive rather than slaty; this is probably due to welding during the strong compression that produced the folding. Nevertheless, the shale as a whole is not a hard competent rock.

FRACTURING. ORE DEPOSITS.

The known orebodies lie mainly along a series of rather weak but persistent fractures or minor faults striking roughly north-south and dipping principally to the east. These fractures distinctly cut across the shale bedding in most places; where, however the bedding swings parallel to the fracturing, the latter

seems to follow beds and cannot be distinguished from them.

The principal north-south fracture is known as the Main Vein (see level plans). This fracture strikes a little east of north and dips east from about 80° to less than 60°.

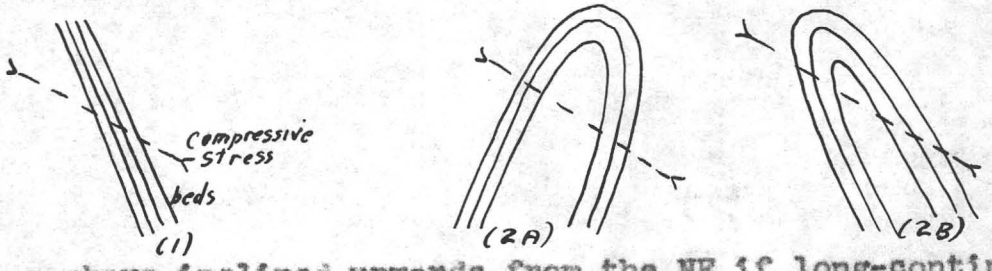
As shown best on the plan of level 5, the Main Vein has two southwest branches, the SW and SW-A vein. These branches join to form a single vein to the southwest. At the north end of the 5,6 and 7 levels the Main Vein has supposedly been lost. The explanation for this is suggested on the plan of 7 level. Near coordinate 150 S shale beds instead of striking NW and dipping steeply NE, are folded into a sort of dome and the Main Vein fracture, where it crosses this dome appears to lose its identity and split, one split following the beds on the south flank of the dome. Further, it would seem that late fault movements have prolonged Vein SW-A northeast past its junction with the Main Vein, which has been faulted by this extended Vein SW-A.

Parallel to the Main Vein and about 40' west of it lies the West Vein exposed on 7 level only. This seems to be a weak fracture of little importance.

A more important parallel fracture is the East Vein shown on the plan of 6 level. This dips west toward the Main Vein and is thought to join that vein just above the 7 level. If so the so-called East Vein explored on the 7 level is not the East Vein of the 6 level, for it lies 30' south of the Main Vein, farther south than does the East Vein on 6 level.

A second, and entirely distinct set of fractures comprises the so-called "Flats". These strike northeast and dip very flatly SE. They are shown on the longitudinal vertical projection of the Main Vein, and on the level plans by structural contours and a light blue color. The major flats occur almost exclusively in

the hanging wall of the Main Vein, seldom or never crossing that vein into the footwall; the origin of the Flats seems connected with that of the Main Vein. Referring to the Stress Diagrams on the plan of 6 level, Diagram a suggests that the N-S fractures of the Main Vein set, and the NE fractures of the Flat set represent conjugate shear planes formed by compressive stress acting in a NE direction and inclined down to the NE. The force that folds beds as intensely as the Red Rock beds are folded is compression acting roughly normal to the beds. The direction of compression postulated above is perpendicular to the strike of the Red Rock beds, but not perpendicular to the dip; see Sketch 1:

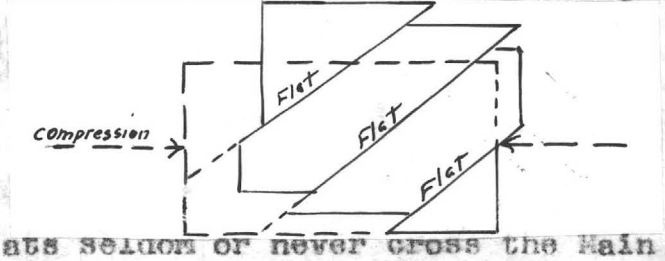


However, a shove inclined upwards from the NE if long-continued would overturn the beds toward the SW, since the shove is directed toward the surface where resistance is zero. The Red Rock beds are thought to be overturned to the SW, by the same compressive force that produced the N-S fractures and the Flats, (Sketches 2A, 2B).

After the Flats were formed the direction of compressive stress seems to have swung around to the NW, and acted nearly in a horizontal plane. (Stress Diagram b). This new stress acted on both the Main Vein and the Flat fracture sets as described below; but it set up also minor shear planes roughly parallel to the Cachuma fault, which strikes from E-W to N50°W and dips north. Examples of such minor shear planes are: E-W fracture at portal of 8 level; similar fractures near the new raise at north end of

6 level; E-W fracture drifted on to the east near the north end of 7 level.

In response to this second period of stress the hanging wall of the Main Vein moved up and to the north as shown by striations on the plane of the vein and by drag of the shale beds. The hanging wall did not however move as a unit. It is divided into blocks by the various flats (see longitudinal vertical projection). Each block between the flats moved upward and to the north more or less as a unit being bounded on the west by the Main Vein and above and below by flats. Thus, at a given intersection between the Main Vein and a flat, the corner so formed in the hanging wall of the vein and of the flat moved upward along the line of intersection of the vein and of the flat. The striations on both the Main Vein and on the flat parallel this line. The accompanying sketch shows how simple compression has effected this dislocation of the blocks on the hanging wall of the Main Vein.



While the flats seldom or never cross the Main Vein they do cross the East Vein as is shown on the plan of 6 level.

Ore Localization.

The Red Rock ores carry practically no gangue and consist almost entirely of cinnabar. Their localization was dependent upon openings in the rock, i.e. brecciation. That the cinnabar was, however, able to deposit in extremely minute openings is shown by the presence of ore in tight cemented fault breccia. Brecciated

ground is not, however, enough in itself to produce an orebody; it must be connected by a permeable channel with the source below. Plainly the shattered intersections of the Main Vein and the Flats formed the principal channels and these intersections are the principal loci for ore. The time of quicksilver mineralization however, is so late that the then surface was not far above the surface of today. All types of fractures on approaching the surface tend to open because rock pressure upon them approaches zero. Toward the surface, therefore, the Red Rock orebodies restrict themselves less closely to the Main Vein-Flat intersections; they make out along the Main Vein away from Flats and form on Flats away from the Main Vein. This is shown on the vertical longitudinal projection and on the plans of 5 and 6 level.

Acute angle junctions of veins frequently localize ore. The junction of the SW and SW-A veins seems to have localized the principal ore on the SW vein (see plans of 6 and 7 levels).

Finally, the NW late shear planes mentioned on pages 6 and 7 may have localized the small orebodies on the Main Vein and the SW-A Vein near the north end of 6 level.

POSSIBILITIES FOR THE RED ROCK MINE.

In all California quicksilver mines known to the writer the major ore bearing structure is a contact between dissimilar rock formations. Thus at New Almaden the orebodies lie along the contact between chert and sandstone on the one hand and serpentine on the other; at the Aetna, between basalt and sandstone or between basalt and serpentine; at the Cloverdale between chert and sandstone. The Red Rock has no such contact; all the ore lies in soft shale. Like other similar occurrences the Red Rock orebodies in shale

are small and decidedly low grade. Like nearly all quicksilver mines in whatever rock the orebodies were larger and probably of better grade toward the surface, and they show a tendency to constrict with depth. A considerable proportion of the ore mined above the 6 level came from Flat 3 away from its intersection with the Main or other veins. On 7 and 8 levels the flats appear to be much tighter and are probably out as a source of ore at those horizons.

The vertical longitudinal projection shows the petering out, between the 6 and 7 levels of the major ore bodies on the Main Vein near its intersection with Flat 3. On the other hand, the ore bodies on the Main Vein associated with Flat 1 were as important between 7 and 6 levels as above 6 level. The Main Vein, however, beneath these ore bodies, on 7 level is extremely weak and it is barren; therefore the ore associated with Flat 1 recently found on 8 level must be part of a separate ore body which will not reach 7 level going up. Whether or not this Flat 1 group of ore bodies is growing weaker with depth cannot yet be said; but the poor showing of the Flat 3 group of ore bodies between 7 and 6 levels suggests that only the Flat 1 group will produce on 8 level, unless the small ore body in the floor of 8 at the junction with the SW vein develops with depth.

The chances for the Red Rock mine must be viewed, not only from the standpoint of geology, but from that of the deal under which the property is operated as well. However, the amount of net operating profit to be swallowed by taxes will not be considered in this report nor the effect of this on return of investment, and no suggestion whether or not the mine be dropped and the in-

vestment written off will be offered. In order that such a decision may be reached, however, some analysis of the possible ability of the Red Rock mine to make money is offered.

Possible Returns from the Mine. - It is assumed in the following analysis that adequate labor is finally secured.

Two questions must be answered: first, what monthly tonnage and grade are needed to pay back enough capital to make continued operation attractive, and second, what chances are there for securing this tonnage and grade?

Obviously the furnace should be worked to full capacity; 40 tons per day, 1200 tons per month, say 14,000 tons per year.

The average grade of ore furnaced between October 1st, 1941 and September 1st, 1942 was 4.05 lbs. This was l wered by the disastrously low-grade for August, 1942, 2.96 lbs., and for the low grade at the start, 1.29 lbs. In this calculation, 5 lbs. per ton is set as the assumed average grade for future ore because it is within the range of possibility, and because a grade much lower would sour the operation per se.

At 40 tons per day, averaging 5 lbs. per ton, 200 lbs. Hg are produced, ignoring furnace losses. Gross value of this is $500 per day. Guessing over-all costs at $7.50 per ton gives total costs per day $300 and operating profit $200 per day, $6000 per month or $72,000 per year, leaving $36,000 for the Cachuma Mining Co. This seems the best that can be expected.

Assuming that such a return is satisfactory, what are the chances for the mine to produce it? The Flat 1 group of ore bodies produced about 5000 tons between 7 and 6 levels, with a pitch-length of about 140'. The pitch-length from 8 to 7 is about 200'

but the ore so-far exposed is lower in grade than that above. Selective mining and sorting will so cut down the tonnage that at best it will probably not exceed 5000 tons. No other ore can be postulated for 8 level, though the small rich ore body on 7 level at the junction of the Main Vein with the SW vein may develop going down.

Of the prospects laid out for higher levels, few offer chances for real tonnage. (See under Recommendations). The principal chances appear to be those connected with Flat 2 (Nos. 6-Ø and 7-15). There is room, at least, here for say 5000 tons above 7 level. There is plenty of virgin ground on the Main Vein north of the present mine, but the outcrop is not promising and no tonnage may be estimated here. All the other prospects together might produce 5000 tons. This gives 15,000 tons that might be put in sight, or about a year's run. Naturally if the Flats north of Flat 1 produce ore on 8 level, this estimate could be exceeded. But I think chances poor for finding ore associated with Flat 2, and I think we shall be lucky to run the plant a year at capacity.

If it is decided to go ahead, obviously the thing to be avoided is to keep barely breaking even or going into the red. To avoid this, the prospects given below should be run as quickly as possible, in order that payable ore be available at all times for the furnace. The loan of a long-hole drill would greatly speed up this exploration; while I have recommended a total of only 245 feet long-hole drill exploration, the management will without doubt find many additional places in which to use the drill. I have seen such a drill work very successfully at the Abbott Quicksilver Mine, Lake Co., California. The cuttings are carefully saved and

panned in lots from every 5 or 10 ft. of the hole.

Unless the labor situation is greatly improved, I see no use in continuing to operate, for monthly deficits are inevitable; but if labor is secured, I urge the running of the following recommendations with all possible despatch, in order to bring about a decision as soon as possible on continuing operations or closing down.

The writer has probably not exhausted exploration possibilities in this complicated little mine; but it is hoped that the large-scale maps furnished will aid the management in laying out further prospects.

RECOMMENDATIONS FOR EXPLORATION.

The prospects are numbered serially throughout the mine; but the number of the level on or above which the work is to be done is added as a prefix.

5 Level.

Refer to Plans, 5 and 6 Levels, and Vertical Longitudinal Projection, Main Vein.

5-1. Main Vein. Donaldson suggests there may be other fractures parallel to the Main Vein east of the segment followed at the extreme north end of 5 level. Recommendation 5-1: From point at N end of 5 level shown on plan, drill N78°E about 45'.

5-2. SW Vein. Ore on this vein seems localized by the intersection of the SW with the SW-a vein; according to Donaldson the ore above 6 level had a flat pitch up to the north; this line of pitch should be examined on the 5 level. The SW fracture zone drifted on from the Main Vein on 5 level, ~~ere~~ is probably not the real SW vein, which lies SE of that drift, as shown on plan

of level 5. Recommendation: From point shown on plan, 5 level, crosscut S20°E about 25'. If true SW vein is cut, drift SW on it toward intersection with SW-A.

5-3. Flat 3. An ore body was stoped on Flat 3, about 40' east of the intersection of that Flat with the Main Vein, and extending from 6 to 5 level. (See plan of 5, or for complete sketch of stope, plan of 6). According to Donaldson, narrow ore exists on Flat 3 above 5 level, presumable up the pitch of the ore below. Recommendation: Explore Flat 3 above the stope. One method might be to cut a bench into the footwall of the open stope at which the stub drift on 5 level from the Main Vein drift ends; the bench should be wide enough to carry track; the waste can be thrown into the open stope. From this bench one or more raises may be put up on the best showings; if Flat 3 looks encouraging on the NE side of the stope, continue drift on Flat 3 NE. An ore body was mined about 75' NE of the stope just mentioned, and there may be a third small ore body between the two.

5-4. Flat 2. Flat 2 looks as strong as Flats 1 and 3, but where exposed it has produced no ore, except, as shown on plan of 5 level and on longitudinal projection, Main Vein, it may be related to the ore body that tops at the south end of the 5 level drift on the Main Vein. Flat 2 was followed in the short tunnel just south of the East portal, 5 level, but was lost at a small bedding fault. Recommendation: From present west face of small tunnel, drive west until clear of fault zone, then crosscut north a few feet, and if Flat 2 is not picked up, south. Drive west on Flat 2 a possible maximum of 75'.

6 Level.

See Plan of 6 Level, and Vertical Longitudinal Projection, Main Vein.

6-5. Main Vein. Judging by 5 level, the Main Vein just north of SW-A vein-fault offers little promise on 6 level. But it should lie close to the present north end of that level and should be examined there. Recommendation: From present extreme north face, 6 level, crosscut N24°W about 30' to examine north segment, Main Vein. If the drill hole of Rec. 5-1 picks up anything of promise east of the Main Vein on 5 level, such a showing would be examined by cross cutting or drilling east from drift on north segment, Main Vein, when this has been run a few rounds on 6 level.

6-6. SW-A Vein. The SW-A vein on 6 level, near its junction with the SW Vein, is strong and carries a thin but persistent streak of cinnabar, although nothing stopeable. Near the north end of 6 level, however, this vein carried a good ore body. There is a slim chance for another ore body between this one and the north end of the drift on SW-A Vein from the Sw Vein. Recommendation: From point in Main Vein drift,, 6 level, shown on plan, drill N70°W maximum of 40'.

6-7. East Vein. The East Vein seems to end going north on Flat 3 (see plan, 6 level). But on 7 level a N-S vein corresponding in position to the East Vein made ore under Flat 3-A. It seems worth while to try to pick up this supposed East Vein on 6 level north of Flat 3-A. Recommendation: From point shown on 6 level plan, drill west 40'.

6-8. East Vein. The vein called the East Vein on 7 level is probably not the East Vein of 6 level, but lies about 20' east of that vein near the south face of the drift on the East Vein, 6

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level. Recommendation: From present south face of drift on East Vein, 6 level, cross cut east about 25'. (Donaldson). This proposed work may lie too close to the surface to make it worth while.

6-9. Main Vein. Flat 2 does not appear on 6 level, but does on 5 and 7. Where it should show up on 6, the Main Vein also disappears, apparently losing itself in the bedding. At this particular locality chances for ore are poor; but the anomolous attitude of the bedding is probably quite local; somewhere above 6 level normal conditions are restored. (Compare similar conditions on 7 level, where neither the Main Vein nor Flat 1 appears on the level, immediately below the good stopes associated with Flat 1). The Main Vein should be examined near its junction with Flat 2 above 6 level. Recommendation: At point shown on plan of 6 level and longitudinal projection Main Vein, raise on vein to Flat 2. At the point selected on 6 level, the Main Vein may be recognized and followed upward.

If ore is found by this raise, or in drifts from it, along the junction of the Main Vein and Flat 2, it might be worth while to drift south at this intermediate level on the Main Vein to Flat 1-A, as suggested on the longitudinal projection, Main Vein.

6-10. West Vein. Exposed only on 7 level, this vein has been feeble; it was drifted on for some distance near the south end of the level, and apparently cut farther north, in a west crosscut near 600S coordinate. It seems to dip west in that crosscut, in which case it would join the Main Vein on the dip before reaching 6 level; but its dip in general seems to be east, and it may lie west of the Main Vein on 6 level.

The level plan shows a southwest vein on the surface at 680S

and 95E coordinates; the vein shows cinnabar. It might be the West Vein, but is more likely a southwest branch of the Main Vein. Recommendation: From the big "saloon" on 6 level, drill west 40'.

7 Level.

See Plan, 7 Level, and Longitudinal Projection, Main Vein.

7-11. Small East Vein. No. 10 shaft connects with the Main Vein drift on 7 level near its south end. In the cut north of the shaft collar is a N-S, west-dipping vein showing cinnabar. This vein should join the Main Vein on the dip about at 7 level, but there is no sign of it there nor of the Main Vein itself at this particular place, but Shaft 10 is said to have followed the small east vein for some distance below the collar. This vein might be worth following from the shaft north. Recommendation: If study of the small vein in Shaft 10 shows the vein definitely leaving the shaft in the shaft footwall or hanging wall, crosscut east or west, whichever is called for, at a point say 20' below where the vein leaves the shaft, to pick up the vein. Drive north on vein. If the vein simply dies out in the shaft going down, drive north on it where it still exists, if enough backs are indicated to make this worth while.

7-12. Main Vein. Donaldson suggests that Flat 1 is composite, and the slips shown at the daylight turn in tunnel 7 may not represent the whole Flat, if they represent any of it. The Main Vein should be explored farther south, through this zone of Flats. Recommendation: Drive south on Main Vein as shown on plan. The slip indicated may not be the Main Vein, so some cross cutting may be needed.

7-13. West Vein. Flat 1 may persist west of the Main Vein.

At any rate, the west Vein perhaps deserves another look south of where explored on 7 level. Recommendation: Cross cut west as shown on plan, in order to determine which of the two slips, dipping 68°E and 77° respectively is the West Vein. Drive south on whichever looks the better.

7-14. West Vein. The Flat drifted on between the West and Main Veins is strong. There might be an ore body along the intersection of this Flat and the West Vein. Recommendation: After Rec. 7-13 has shown which of the two slips is the West Vein, raise on this vein near the point shown.

7-15. Main Vein, East Veins, West Vein. Designed primarily to explore the Main Vein under Flat 2, this prospect corresponds to 6-9. (See longitudinal projection). It offers a chance, also, to explore both the East vein of level 6 and the "East" Vein of level 7 under Flat 2; also the so-called West vein exposed in the cross cut near coordinate 600S, 7 level. Recommendation: At point shown on plan, 7 level, and on longitudinal projection, raise on Main Vein to Flat 2. Drift east just under Flat from top of raise to explore both "East" veins, that of the 6 and that of the 7 levels, which, if distinct veins should both appear at this horizon. If Flat 2 exists west of the Main Vein, drive west just under this Flat, at same horizon, to West vein cut in cross cut below.

7-16. East and Main Veins. The East Vein had ore in the 6 level drift floor. The downward extension of this should be tapped below 6 level. Recommendation: At point shown on 7 level plan and longitudinal projection, raise on Main Vein. The junction of the East and Main Veins should lie just above 7 level;

if found where suggested on projection, drift north on East Vein and raise at suitable point to get under ore on 6 level. If East Vein not found, continue raise on Main Vein to about 30' above floor of 7 level, and cross cut east to pick up East Vein. There may be some ore on the Main Vein here also, below the Flat shown on projection.

7-17. SW Vein. According to Donaldson, the ore on the SW vein had a very flat rake down to the SW, whereas No.4 stope went up the dip. Recommendation: From a point in No.4 stope-raise in ore, drive an intermediate level between 7 and 6 levels SW on the vein. If this shows ore to the SW, extension of the 7 level drift SW would be indicated. (Donaldson).

7-18. Main Vein at Flat 2. If it is thought that Raise 37 on Main Vein has not explored that vein at Flat 3-A sufficiently, a drift might be run along that flat from No.36 stope, at intersection of Flat 3-A and so-called East Vein above 7 level. Recommendation: From some point in No. 36 stope, possibly where Flat 3-A looks best toward the west, drive west just under Flat to Main Vein.

7-19. Flat 3. The underhand stope on Flat 3, near the East Vein on 6 level, bottomed in ore, though narrow, according to Donaldson. Raise 33 on 7 level, up only a few feet, is said by Donaldson to be in the hanging wall of Flat 3. Recommendation: From the top of Raise 33 cross cut north a few feet to pick up Flat 3. Raise on Flat 3, heading for bottom of underhand stope below 6 level.

7-20. Small Flat. The small Flat on 7 level, leaving the Main Vein at 390S coordinate, shows good cinnabar paint near the

face. Recommendation: Take a few more rounds out of this east drift. If no ore is found, select best point in drift and raise on Flat.

7-21. Main Vein. If the dominant south pitch of ore bodies on the Main Vein continues past the north end of the present mine, then such a south-pitching ore shoot would be found first on the lowest level. The Claim Map shows that the Red Rock Main Vein-zone persists at least 600' north of the north end of the mine. The course changes to decidedly northeast, and I doubt if this stretch has much promise; but a final look should be taken at the Main Vein going north on 7 level. Recommendation: From the north end of 7 level, continue drift on branch of Main Vein to SW-A vein, then cross cut N40°W to north segment of Main Vein.

There may be several members of the vein-zone here, and drilling or crosscutting east and west may be indicated.

8 Level.

See Plan of 8 Level and Longitudinal Projection.

8-22. East and West Veins. At the time I left the mine there was still some question as to whether the vein being drifted on north was the Main Vein. I take it that it is or I should have heard. Numerous branches leave the Main Vein on 8 level. They should be examined not too far away from Flat 1. Recommendation: At point shown on plan, drill east and west, each hole being 40' long.

Note. It is about 600' between the north end of the Flat 1 ore shoot on 8 level to where the Flat 3 ore shoots would be expected. (See projection, Main Vein). Unless Recs. 6-9 and 7-15 find ore associated with Flat 2, it seems doubtful whether this

600' of drifting should be done. An alternative would be to sink from 6 on the high grade small shoot at the junction of the Main and SW Veins.

Summary of Exploration Footage. -

Level	Drifts & Crosscuts	Raises	Drill Holes.
5	185'?	50'?	45'
6	55	50	120
7	410	210	
8			80
Total	650	310	245

This looks like a moderate sized program. 574' of development footage was done in March,1942, and 509' in April. Naturally if some of these prospects find ore the footage will expand, but the whole program could be done in two or three months with a full crew.

CACHUMA FAULT

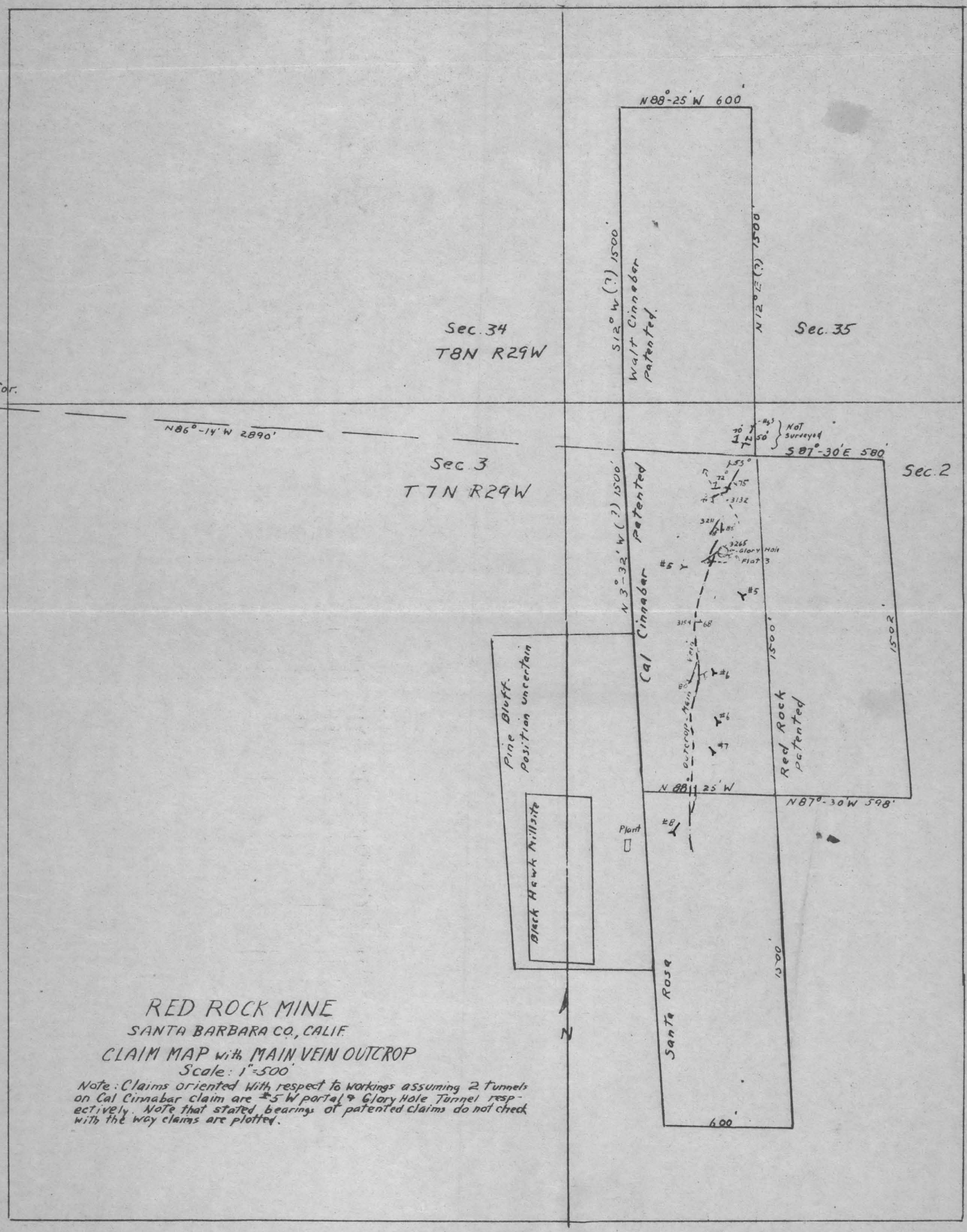
The Cachuma fault is a major fault of the region, and formed at about the time of the quicksilver mineralization. A reverse fault, it separates a great belt of Franciscan serpentine, on the Southwest, from the Cretaceous Shales containing the Red Rock Mine, on the Northeast. Its scarp stands up prominently on the slope west of camp.

Serpentine -sediment contacts localize the ore in many of the great quicksilver mines of California (e.g. New Almaden, New Idria). The Cachuma fault lies outside company gound but I understand claims covering some of it are locally owned (Los Olivos) and might be cheaply aquired. While chances for ore on the Cachuma fault look poor, considering the intensive prospecting of the old timers, it would be highly vexatious to spend money at Red Rock while the real mine of the area lay across the creek.

I suggest thorough prospecting, including panning, along the NE contact of the serpentine belt across the crreek from the Red Rock Camp.

San Francisco, California.
November 18th, 1942.

Edward Wisser
Mining Geologist.



RED ROCK MINE

SANTA BARBARA CO., CALIF.

CLAIM MAP with MAIN VEIN OUTCROP

Scale: 1"=500'

Note: Claims oriented with respect to workings assuming 2 tunnels on Cal Cinnabar claim are #5 W portal & Glory Hole Tunnel respectively. Note that stated bearings of patented claims do not check with the way claims are plotted.

CLAIM MAP
1" = 500'