DMA Form 1

DEFENSE MINERALS ADMINISTRATION
Control Slip

## CONTROLLED DOCUMENT

DMA Docket No. 2218

## DO NOT DETACH THIS SLIP

Action on this document is recorded and controlled in Reports and Records Branch. Any movement of this document between divisions or offices of DMA or movement outside DMA must be reported to the Reports and Records Branch. Actions taken that affect status of the case must also be reported.

This document has been recorded as

EXPLORATION PROJECT

Any action taken to change the type of request for assistance must be promptly reported to the Reports and Records Branch. Use DMA Form 2 for submitting these reports.

Routing Slip

| | | | |
|---|---|---|---|
| To: | PED Rare & Light Metals | Date | 11/16/51 |
| To: | Mr McKnight USGS | Date | 11/28/51 |
| To: | H. F. Keller | Date | 1/10/52 |
| To: | C. H. Johnson | Date | 1-10-52 |
| To: | Opr. Com. | Date | 1-14-52 |
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## CONTROLLED DOCUMENT

FILE COPY
SURNAME:

FE Johnson
Hayes
Hedges
Watts

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION
WASHINGTON 25, D. C.

AIR MAIL

JAN 22 1952

BT

Mr. Oscar A. Giese
Minerals Production & Processing Co.,
55 Montecito Road
Walnut Creek, California

Re: DMA-2218 (Mercury)
Harrison Mine
Yolo County, California

Dear Mr. Giese:

Your subject application for aid for an exploration project in the amount of $55,119.48 has been carefully reviewed.

Our review reveals that geological conditions at the Harrison Mine are unfavorable to the discovery or development of ore deposits that would be of significant importance to the National Defense Program and, consequently, the expenditure of Government funds as proposed is not justified. We regret to advise, therefore, that your application for an Exploration Project is denied.

We appreciate your interest in the National Defense Program and wish to thank you for giving us the opportunity of studying your proposal.

Sincerely yours,

C. O. Mittendorf (fw)
cc 1/22/52

Acting Administrator
Defense Minerals Exploration
Administration

APPROVED:

Member, Bureau of Mines

Member, Geological Survey

FEJohnson/HFKeller/jem/bih - 1/18/52
cc to: Admr's. Reading File
Docket
Messrs. C. H. Johnson - Room 3621
E. T. McKnight - " 4204 GSA Bldg.
Keller
Ellis
Field Team, Region III (2)

700

FILE COPY
SURNAME:

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION
WASHINGTON 25, D. C.

JAN 22 1952

Mr. Oscar A. Giese
Minerals Production & Processing Co.
55 Montecito Road
Walnut Creek, California

Re: DMA-2210 (Mercury)
Harrison Mine
Yolo County, California

Dear Mr. Giese:

Your application for aid for exploration project in the amount of $5,119.48 has been reviewed carefully.

Your application for aid has been denied because it is our belief, that the geological conditions, prevalent at the Harrison Mine are unfavorable to the occurrence of large commercial ore bodies. Our opinion is also substantiated by the past production history of this mine.

We believe that the limited production that might be obtained from the Harrison Mine would not contribute substantially to the defense effort to warrant this loan.

Sincerely yours,

NOT USED

Acting Administrator
Defense Minerals Exploration
Administration

APPROVED:

Member, Bureau of Mines

Member, Geological Survey

UFKeller/jem 1-14-52
cc to: Adm. Reading File
Docket
Messrs. Johnson, C.H. Rm. 3621
McKnight, J.T. Rm. 4204 G.S.
Keller
Ellis
Field Team, Region III (2)

January 14, 1952

Memorandum

To: Mr. H. F. Keller

From: Mr. E. T. McKnight

Subject: Denial letter on Harrison Mine

I would like to see a substitution made in the 2nd line of the 2nd paragraph: For "structure is" substitute "conditions are". I think that the geological structure is very similar to that at the Knoxville mine which has been the big producer in the district. On the other hand, we know that the silica-carbonate rock, with which most of the ore of the district is associated, is very limited at the Harrison mine. The hope of the applicant was that the favorable structural location of the mine would lead to an underground discovery of silica-carbonate rock and associated ore, even though little has been exposed by underground and surface exposures to date. The most informative level in a mine is the "zero level", i. e., the surface. If the surface, which is in the same structural setup as the underground, shows very little silica-carbonate rock, it would appear unprofitable for the Government to engage in expensive underground development a short distance below the surface in the hope that conditions will be different down there.

I think "geological conditions" is broad and general enough to discourage any haggling from the applicant. The geological conditions were unfavorable from the beginning, but the clincher is that extensive underground development has confirmed a geological appraisal that, had it been made in the beginning, would have been unfavorable.

I think the denial could be generalized still further to take into account the past production history of the mine by saying that, in our opinion, the chances for finding a significant tonnage of new quicksilver by the proposed exploration is not great enough to warrant the proposed expenditure of public funds.

Edwin T. McKnight
Edwin T. McKnight
Geologist

Should this the space for approval by Bureau and Geological Survey, in lower left corner of your letter, be omitted from letter to the applicant? ETM.

Minerals Production & Processing Co.
c/o Mr. Oscar A. Giese
55 Montecito Road
Walnut Creek, California

Subject: DMA-2218
Re: Exploration Loan
Harrison Quicksilver Mine

My dear Mr. Giese:

This will acknowledge receipt of your application dated November 1, 1951 for a loan under the Defense Production Act of 1950.

Your application was assigned Docket Number DMA-2218 and referred to the Rare & Light Metals Branch.

Kindly refer to DMA-2218 in any future correspondence relating to your application.

Sincerely yours,

Robert E. Adams

Robert E. Adams, Chief
Reports and Records Unit

2463

IN REPLY REFER TO:

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
WASHINGTON 25, D. C.

January 7, 1952

Memorandum

To: Mr. E. Wm. Ellis

From: Mr. E. T. McKnight

Subject: Geological appraisal of subject docket.

Re: DMA-2218
Minerals Production and Processing Company
Harrison Mine, Yolo County, California
Exploration loan, $55,119.48
Quicksilver

This application requests $55,119, with 3/4 Government participation, to rehabilitate the old underground workings that were last in use in 1919. These workings consist of a main tunnel (January tunnel) that is known to be 360 feet long, plus unmapped drifts on ore, the extent of which is not known. At the end of the project, the property will be in just the same condition that it was when last worked, ready to be examined geologically to see if there are good prospects for a second exploration project designed to discover new ore. At the present time there are not even good hunches as to where new ore might be found. This particular property was picked by the applicant for further attention because it lies between two good producers and he believes that its position in the structural geologic pattern is favorable for a large number of small ore bodies and possibly for larger ore bodies that might be encountered under geologic conditions not apparent at the surface.

Under earlier interpretations, the Production Expansion Division of DMA ruled on several occasions that a straight rehabilitation job was not eligible for exploration assistance under the terms of MO-5. Possibly the present interpretation may be somewhat more liberal, but for this particular application I can see no circumstances that would justify any such liberalization. There is no record, or unrecorded tradition in the camp, of an ore structure that has been incompletely explored. The previous geologic examination showed that the silica-carbonate rock, which contains most of the quicksilver so far produced in the Knoxville district, is in small masses and is too widely distributed at the Harrison property to offer promise of any large scale operation. The published account (California Journal of Mines and Geology, vol. 41, No. 2, p 85, 1945) states that neither the surface nor underground geology suggests that the Harrison mine is capable of yielding ore in commercial quantities, although 263 flasks were produced from the underground workings in 1917, '18 and '19. Later production, 1936-40 inclusive, amounting to 82 flasks, came from a surface open cut, and there was small but unrecorded production in 1942-43.

These production figures indicate the type of yield that could be expected in any future operation. The applicant's hope of finding, through underground prospecting, larger ore bodies than so far discovered in extensive working on this property is founded on very tenuous and equivocal geologic arguments.

I therefore recommend that this application be denied on the basis that the proposed project is only a preliminary and expensive preparation for a possible new project whose chances of finding a significant amount of new ore are not promising enough to warrant the total indicated expenditure of public funds.

Edwin T. McKnight

Edwin T. McKnight
Geologist

Form MF-103
(Revised June 1951)

UNITED STATES DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION

Budget Bureau No. 42-R1035.1.

MF-103 Should Be Filed With General Technical Data Form MF-100

RECEIVED NOV 2 1951 Defense Minerals Administration

# APPLICATION FOR AID FOR AN EXPLORATION PROJECT PURSUANT TO MINERAL ORDER 5, UNDER DEFENSE PRODUCTION ACT OF 1950

*Not To Be Filled in by Applicant*

Docket No. DMA 2218
Metal or Mineral
Date Received 11-7-51
Amount $
Participation (Government %)

Name and address of applicant

Minerals Production & Processing Company,
139 No. Virginia St.,
Reno, Nevada.
Address Correspondence to
Mr. Oscar A. Giese,
55 Montecito Rd., Walnut Creek, Calif.

Date November 1, 1951

If you have already filed MF-100, give date filed _____, type of assistance requested _____,

DMA Docket Number (if available) _____

## INSTRUCTIONS

Read Mineral Order 5, Regulations Governing Government Aid in Defense Projects, before completing this application. Submit four copies each, of the signed application form, General Technical Data Form MF-100, and answers to questions as specified, to Defense Minerals Administration, Department of the Interior, Washington 25, D. C., or to the nearest field executive office thereof, with your name and address on each sheet of the application and all accompanying papers. If you have previously filed MF-100, it is not necessary to file it again. However, you should indicate in space provided above the type of assistance previously applied for (loans, procurement contracts, etc.) and DMA Docket Number, if available. *When a question is inapplicable it should be so stated in the form.* Additional sheets should be attached in answering any questions or in supplying additional information. IF YOU CANNOT ANSWER A QUESTION, SO STATE.

1. (*a*) Give a description of the real property that will be in any way involved in the exploration project, including any existing mine or operating property.

   (*b*) If you are not the owner of the property, submit a copy of the lease, purchase option, or other agreements under which you are authorized to operate the property with each copy of your application.

   (*c*) Give the legal description of the exact parcel, plot, or area upon which the exploration is to be conducted.

   NOTE: (1) If both areas are the same, so state. The only obligation to repay the Government is from the net earnings from any commercial discovery made in the area specified in (*c*) above in which the exploration is to be conducted, and the expenditure of funds which may be charged as costs of the project must be limited to that area or to work necessary to perform the exploration in that area.

   (2) If applicant is not the owner of the property or if there are any liens or encumbrances against the property, copy of agreements of claimants, lienors, encumbrances, and lessors subordinating their interests in the property to the interest of the Government under the Exploration Project Contract will be required for attachment to the Contract.

2. (*a*) What metals or minerals do you expect to find?

   (*b*) Furnish statement of the geologic features of your property, giving type of ore deposit and reasons for expecting to find commercial ore bodies. Illustrate with maps or sketches. If you have a geologic or engineering report, or assay maps showing width and grade, please send them with application, stating whether or not you wish to have them returned.

The information requested in questions 3, 4, 5, 6, 7, 8, and 9 below should be answered specifically and in detail, as this information will be attached to and incorporated as part of the Exploration Project Contract, if such contract is entered into with you by the Government.

ANSWER EACH QUESTION ON SEPARATE SHEETS OF PAPER AND SUBMIT A COPY OF EACH ANSWER FOR EACH COPY OF YOUR APPLICATION.

3. (*a*) Describe fully the proposed work and give the total cost of the project.

   (*b*) State the time required to start the project and to complete it.

4. Submit a map or sketch of the property involved showing a plan (and cross section, if needed) of the present mine workings and the *location of the proposed exploration work* as related to geologic features, such as contacts, veins, ore-bearing beds, etc.

5. Furnish an itemized list of existing facilities, buildings, installations, and fixtures with a statement of the cost of any necessary rehabilitation or repairs to put into useful and operable condition.

6. Furnish a detailed list of additional facilities, buildings, and fixtures to be purchased, installed, or erected by you, with the estimated cost of each item.

7. Furnish a detailed list of operating equipment, separated into items to be—

   (*a*) Rented

   (*b*) Purchased

   (*c*) Furnished by you

   with the rental, purchase price, or depreciation of each item, as the case may be, to be charged as a cost of the project.

8. Furnish an itemized schedule of labor, by numbers and classes (miners, muckers, etc.) and of supervisors by numbers and positions, with the maximum wages or salaries to be paid to each.

9. Furnish a detailed list with estimated cost of each item for materials, supplies, engineering, assaying, accounting, power, water, utilities, and any other items not provided for above.

10. (*a*) How much are you prepared to invest in the proposed project?

    (*b*) Is this amount sufficient to pay your part of the cost of the project, in accordance with the regulations on Government participation (Sec. 9 of MO–5)?

11. State any conditions or circumstances regarding the property not sufficiently brought out by the foregoing questions.

## CERTIFICATION

The undersigned company, and the official executing this certification on its behalf, hereby certify that the information contained in this form and accompanying papers is correct and complete to the best of their knowledge and belief.

**Minerals Production & Processing Co.**
(Name of company)

By Oscar A. Giese
(Signature of authorized official)
**Oscar A. Giese**

**November 1, 1951.**
(Date)

**Secretary**
(Title)

**Title 18, U. S. Code (Crimes), Section 1001, makes it a criminal offense to make a willfully false statement or representation to any department or agency of the United States as to any matter within its jurisdiction.**

U. S. GOVERNMENT PRINTING OFFICE 16—64067-2

Minerals Production &
Processing Company,
Harrison Mine, Yolo Co., Calif.

1. (a) The N.W.¼ of the N.W.¼ of Sec. 36, Township 12 North, Range 5 West, M.D.M. (except for about 8 acres which is included in what is commonly known as the Soda Spring Mine) containing 32 acres more or less.

The East ½ of the N.E.¼ of Section 35, Township 12 North, Range 5 West, M.D.M. containing 80 acres more or less; and a small adjoining parcel of land on which is located a spring of water, and being described as follows:

BEGINNING at the S.E. corner of the N.E.¼ of said Section 35, thence North 500', thence West 200', thence South 500' and thence East 200' to the place of beginning. Containing 2 acres more or less.

(b) A copy of the lease is submitted with each copy of our application.

(c) Exploration will be confined to the Harrison Mine which is a part of the real property described in (a).

2. (a) Mercury

(b) Refer to report by Frederick D. Hanson, E.M.

Refer to map by Paul Averitt & G. Donald Eberlein USGS

No assay maps showing width and grade have been found.

# MINERAL LEASE AND OPTION

THIS AGREEMENT, made the first day of September, 1951, by and between VERNE W. HARRISON, VINCE L. HARRISON, MADGE J. HARRISON, and RUBY A. SNIDER, hereinafter called the parties of the first part, and MINERALS PRODUCTION AND PROCESSING COMPANY, hereinafter called the party of the second part.

WITNESSETH:

THAt whereas, the parties of the first part are the owners and in possession of that certain property, commonly known as the Harrison Mine, hereinafter described, and are willing to lease the same; and

WHEREAS, the party of the second part is willing to lease work and develop the same, upon the terms and conditions hereinafter stated.

NOW, THEREFORE, in consideration of the payment of the royalty hereinafter provided, and of the faithful and timely performance by the party of the second part of the conditions, covenants and agreements hereinafter contained, the parties of the first part do hereby lease and let for mining purposes unto the party of the second part all that certain real property, situate in the County of Yolo, State of California, and particularly described as follows, to wit:

> The N.W. ¼ of the N.W.¼ of Sec. 36, Township 12 North, Range 5 West, M.D.M. (except for about 8 acres which is included in what is commonly known as the Soda Spring Mine) containing 32 acres more or less.

The East ½ of the N.E.¼ of Section 35, Township 12 North, Range 5 West, M.D.M. containing 80 acres more or less; and a small adjoining parcel of land on which is located a spring of water, and being described as follows:

BEGINNING at the S.E. corner of the N.E. ¼ of said Section 35, thence North 500', thence West 200', thence South 500' and thence East 200' to the place of beginning. Containing 2 acres more or less.

for the term commencing September 1, 1951 and ending September 1, 1961, for a period of ten (10) years.

The parties of the first part hereby grant to the party of the second part an option to extend the terms of this lease for an additional period of ten (10) years, to commence at the expiration of the term herein granted, upon the same terms and conditions as herein stated. In the event the party of the second part shall fail to give the parties of the first part a written notice of election to exercise this option for a ten-year extension of this lease within ninety days prior to the expiration hereof, this option shall become null and void.

MINERALS PRODUCTION AND PROCESSING COMPANY, the party of the second part, shall pay to the parties of the first part within five (5) days after receipts or returns are received from the burning, milling or disposition of Mercury or other precious metals obtained from said property, and from each shipment of Mercury or other precious metals, Seven and one-half per cent (7½%) of the gross proceeds obtained from said property as a royalty. The party of the second part shall make any and all royalty payments to the Bank of America, Lower Lake, State of California, and shall send duplicate deposit slips to Verne W.

Harrison, Lower Lake, California, or to any other person that may be designated by the parties of the first part.

It is further mutually covenanted and agreed that when the party of the second part commences mining operations that the party of the second part shall pay to the parties of the first part a minimum royalty of not less than One Hundred Dollars ($100.00) per month, commencing six months after date hereof. Payments to be made on the first day of each month.

And it is further mutually covenanted and agreed as a part of the terms and conditions of this agreement as follows:

1. The party of the second part shall have six (6) months from the date hereof to do such examination and exploratory work as may be desired, free from any and all obligations.

2. The parties of the first part agree that the party of the second part may enter upon said mines or premises and work the same, in a manner necessary to good and economical mining, so as to take out the greatest amount of commercial ore possible, with due regard to the safety, development and preservation of the said premises as a workable mine.

3. Beginning March 1, 1952 the party of the second part shall employ at least five (5) men working twenty-five (25) shifts to the man each calendar month.

4. The party of the second part shall promptly pay all bills incurred for labor or materials, or other purposes in connection with working of said mining property, and shall post and keep posted such notices of non-responsibility as may be furnished to him by the parties of the first part.

5. The party of the second part agrees to insure so as to

protect the parties of the first part against all liability for accident or death under the Workmen's Compensation Act.

6. All work done by the party of the second part shall be performed in a good, minerlike manner, and in accordance with the laws of the State of California, and the lawful orders of the State Mine Inspector, and other duly constituted agencies of said State.

7. The party of the second part shall keep full and accurate account and records of all development work performed upon said property, and all ores and mineral products taken therefrom, and disposed of by the party of the second part, and shall afford the parties of the first part free access to all mine workings as long as this does not interfere in any way with the operation of said property. The parties of the first part shall have the right to be present at any and all cleanups.

8. The party of the second part shall furnish the parties of the first part, at their request, copies of all maps, geological reports, assay certificates and all data, including the results of any diamond drilling upon said property.

9. The parties of the first part agree that all equipment and tools brought to or placed upon said premises by the party of the second part shall not become fixtures; but shall remain the property of the party of the second part; provided that such removal shall be made within thirty (30) days from the abandonment, forfeiture or expiration of this lease, and if not so removed shall become a part of the realty. All buildings and structures on the

surface and timber in place underground shall become a part of the realty.

10. The parties of the first part agree that they will pay all taxes that are now due upon said property, and to pay before delinquency all taxes that hereinafter may be levied upon or assessed against said real property. The party of the second part agrees that he will pay before delinquency all taxes that may hereinafter be levied upon or assessed against any personal property on said premises.

11. The parties of the first part hereby grant to the party of the second part an easement for road purposes over and across their lands so that the party of the second part in conducting operations contemplated by the agreement, shall have a convenient way to travel between the said premises and Knoxville, and between the said premises and Lower Lake, and also an easement for the purpose of conveying water for use in the operation of the plant, mine and for domestic purposes, and the further right to use and occupy said premises for the purposes of storing and maintaining equipment, housing the same, and erecting buildings necessary for the conduct of the business and for the purpose of dumping ore and minerals.

12. The parties of the first part hereby grant to the party of the second part, easements over the real property to lay and maintain pipe lines to convey water; and the party of the second part hereby grants to the parties of the first part the right of grazing stock upon and driving stock over said real property, but without risk or liability to the party of the second part. The party of the second part may fence off land unused by

the parties of the first part to keep livestock away from any dangerous area.

13. In the event ore is not found in paying quantities or in the event ore that is profitable to mine should become exhausted, the party of the second part shall have the right to abandon the property and this lease and option shall be at an end and of no further force or effect.

14. In the event title defects should exist, the parties of the first part agree to cure such defects within a reasonable time and at their own expense.

15. The party of the second part shall have the right to assign this lease and option to others, who shall also be bound thereby. If the party of the second part violates or fails to comply with any of the provisions hereof, then, and in that event, this lease shall terminate, and all rights of the party of the second part hereunder shall cease, and all payments heretofore made hereunder shall be retained by the parties of the first part as full compensation as rental for the use and occupancy of said property, as the consideration for which this agreement is executed and as liquidated damages.

16. The party of the second part agrees to keep the property free and clear of all liens, attachments and encumbrances of any kind, and to that end the parties of the first part may post, file and record the proper notices, giving notice to all persons of the ownership of the parties of the first part, and the protection by him of all liens and claims of all persons.

17. In case of default in any provision herein contained by the party of the second part, the parties of the first part shall notify said party of the second part, in writing, of such default, and should the party of the second part fail or refuse to cure such default within thirty (30) days after the receipt of such notice, then the parties of the first part shall have the right to cancel this agreement by notice in writing.

Such termination shall not relieve the party of the second part from his obligation to pay all sums accrued and payable by the party of the second part to the parties of the first part at the time of such termination; and the party of the second part upon any such termination, shall execute a quit claim deed, quit-claiming to the parties of the first part any interest that the party of the second part may have acquired in the said premises.

18. This lease and option shall bind and inure to the benefit of the heirs, executors, administrators and assigns of all parties hereto.

TIME SHALL BE THE ESSENCE OF THIS AGREEMENT.

IN WITNESS WHEREOF the parties have hereunto set their hands and seals this day and year first above written.

(Sgd.) Verne W. Harrison
VERNE W. HARRISON

(Sgd.) Vince L. Harrison
VINCE L. HARRISON

(Sgd.) Madge J. Harrison
MADGE J. HARRISON

(Sgd.) Ruby A. Snider
RUBY A. SNIDER

Parties of the First Part

MINERALS PRODUCTION AND PROCESSING COMPANY,
A Corporation

(Sgd.)
By Oscar A. Giese
OSCAR A. GIESE, Secretary

Party of the Second Part

# PRELIMINARY REPORT
# HARRISON QUICKSILVER MINE
# KNOXVILLE DISTRICT
# CALIFORNIA

## FOREWORD

The purpose of this examination was to determine if the geologic set-up of the Harrison Property justifies its exploration. Since the underground workings are entirely inaccessible an opinion must be based on observable surface geologic features on the property itself, on its position in the district relative to the more productive mines and the geologic features which localized them, and on available literature.

My conclusions are based on field work at the property and in the district on Sept. 24th and 25th, 1951, and on a study of the maps and reports by Mr. Paul Averitt of the USGS as published in the California Journal of Mines and Geology, Vol. 41, No. 2, April 1945. It is recommended that this publication be available when this report is read.

## CONCLUSIONS

It is my opinion---based on the criteria mentioned above---that the Harrison Property merits a cautious, step-by-step exploration program which would be a legitimate project for a government loan or loans.

## RECOMMENDATIONS

The first step should be the re-opening of the Lower January tunnel. It can then be determined if early production can be expected or if new exploration and development is needed. Since it cannot be foretold in advance if such work is justified, whether it can best be accomplished by diamond drilling or by underground workings, or the footage of such work required and its location, it would seem advisable to restrict the loan application to the funds required for the tunnel re-opening and associated work. The program would be as follows:

1. Rental of bulldozer to repair bad stretches of the present road, and to construct the short segments necessary to allow trucks to reach the portal of the Lower January tunnel and the mill. Possible subsidiary work to secure enough flat ground near the portal for the compressor and necessary shop and storage housing. Prospecting trenches across the ore zones beyond the

limits of underground workings. Replace the old pipe line from the spring to the lower January tunnel.

2. Re-opening of the 360 foot Lower January tunnel, the main drift on the ore zones, and such connecting workings as seem essential because of geological indications or operating necessities. This work would involve the purchase of a compressor, mucking machine, mine cars, rail, pipe, timber, tools, a truck, etc.

3. Such minor workings and timbering as are needed to adequately expose for examination and sampling any ore showings and promising leads which are exposed in the re-opened workings.

4. Appraisal of the results of the above work to determine if additional exploration and/or development is justified or needed, and if so, whether it can best be done by underground workings, underground diamond drilling, surface diamond drilling, or new openings.

PROPERTY

The Harrison Property is located in the Knoxville Mining District in Yolo and Napa counties, California. It is situated in T.11 N., R.5 W., and consists of the E½ of the NE¼ of Sec.35, the NW¼ of the NW¼ of Sec.36, except for about 8 acres constituting the Soda Springs prospect, and a rectangular parcel of 500' N and S and 200' E and W located in the SE corner of Sec.26. All this is contiguous and totals 117 to 118 acres.

ACCESS

The property lies about 3/4 mile north of the county road between Lower Lake and Monticello at a point about 2½ miles NW of Knoxville and 17½ miles SE of Lower Lake. At present a car can be driven to within a few minutes walk of the workings, but the open pit of the last operation has destroyed a short segment of the road so that from 100 to 200 yards of new road is needed to connect with the road to the portal of the Lower January tunnel. A minor amount of repair is also needed on the intact portions.

OWNERSHIP

The mine is owned and/or controlled by Verne and Vince Harrison of Lower Lake and vicinity. I have not examined the lease or purchase agreement.

FACILITIES

Former operations depended on a spring on the small parcel of land in Sec. 26. The flow of the spring was not determined, but can be presumed to be sufficient for compressor cooling and drilling purposes.

Electric power for furnace and permanent plant can be secured by about 3700 feet of power line.

Equipment on the property includes a 30 ton rotary furnace with accessory condensers, fans, etc. This plant seems to have had little use and to be in good shape.

Other items noted were an air receiver, several D- retorts, one of which is in good shape, and several frame buildings in bad repair near the portal of the Lower January tunnel.

HISTORY

The recorded production of the Harrison Mine through 1943 is given as 345 flasks. Total production is allotted to three periods of activity, as follows:

1. A small unrecorded production prior to 1900.

2. 263 flasks during World War I period of 1917, 1918 and 1919. A concentrating plant was in operation during this period, but the production also includes that from retorted high-grade. Most of the underground work was done during this period.

3. 82 flasks (plus a few unrecorded flasks) in the period 1936 to 1940, inclusive. Most of the ore came from the open pit; it is said that no underground work was done.

DISTRICT GEOLOGY

The following account is taken largely from Mr. Averitt's report or inferred from his maps and descriptions. My own observations are limited to the Harrison Property, to a walk from that property to the county road below the Reed Mine, and to a "circumnavigation" of the district by auto.

The backbone of the district is a large dike-like mass of serpentine from 3/4 to 3-3/4 miles wide which extends across the district in a broad curve convex to the NE. The serpentine includes large and small inclusions of the Franciscan formation, and is encased in sediments of the Knoxville formation of Jurasso-Cretaceous age. Near the north end of the district the serpentine outcrop widens to the NE by about 1½ miles as a series of irregular but more or less connected and parallel bodies. The Reed Mine---the northernmost in the district---is located along the NE contact of the easternmost and largest of these subordinate serpentine masses. At the south end of the Reed the serpentine and the mineralized fault zone which follows its contact terminate along an E-W fault. The mineralized fault zone reappears about 3/4 mile to the west on the Harrison Property, but is here along the NE contact of the westernmost of the subordinate serpentine

bodies and lies about ¼ mile east of the main arcuate mass. The Harrison serpentine tapers out to the SE, but the fault zone continues through the Manhattan property with Franciscan formation on its west side, but is largely covered by Tertiary volcanics consisting of basaltic flows and tuffs and rhyolitic tuffs. Basaltic dikes and necks are also exposed. The fault zone rejoins the serpentine contact about ½ miles above the Knoxville Mine, near which it makes a rather sharp bend to a more NW strike. Except for the cross faulting bounding the upthrust slice in which the Knoxville mine is located the fault zone is continuous from the Knoxville to beyond the Harrison where it is offset eastward to the Reed Mine. Ignoring this offset it may be said that all of the mines of the district except the Red Elephant are located along the fault zone which follows the NE contact of the serpentine mass as a whole.

The area between the serpentine and a line drawn between the Reed and Knoxville Mines forms a roughly triangular shaped sedimentary re-entrant or embayment in which are exposed stratigraphically lower beds of the Knoxville formation than to the north and south. It is also the intersection point of the NNW and WNW striking faults which determined the trend of the ends of the arcuate curve, of the N 40 to 50 W fault zone following the serpentine contact in this area, and of NE trending faults and fractures roughly at right angles to the last mentioned set. Also, on the Manhattan property south of the Harrison is the district center of intrusion and extrusion of Tertiary magma. All of these facts must be genetically related. It may be surmised that the uplift of the serpentine was caused by the intrusion of the Tertiary magma, but that in the complex fault intersection area this magma could work its way through to the surface; its propulsive power was thus lost, and the fault block was not elevated to the same extent as those outside the zone of magmatic "leakage."

The Reed and Knoxville Mines, each just outside of the limits of the embayment and at about equal distances on each side of the volcanic area of intense cross faulting undoubtedly owe their size to their geologic location. Cross faults were far enough spaced so that the horizontal length of the contact fault zone to which the solutions were confined was exceptionally large and the depth interval accessible to mining was far enough above the magmatic source of the solutions so that the zone of rich cinnabar deposition was well developed.

In the intervening Harrison-Manhattan area opposite conditions prevailed, conditions favoring the dispersion of the magma and its mineralizing solutions, and the formation of a large number of relatively small orebodies instead of big continuous bodies. These conditions are: the splitting of the main contact fault zone into at least three strands, the closely spaced cross faulting, the intricately sheared serpentine, and the thick shale horizon between two of these strands. The effect of the closely spaced cross faulting is shown by the fact that both the basalt and the bodies of "silica-carbonate" rock or "opalite" which forms the gangue of the cinnabar deposits occur

at fault intersections as pipe-like bodies, or as relatively short dikes or tabular bodies bounded by cross faults.

The advantage of the big continuous orebody from a development, mining, and cost standpoint is of course undeniable, but this does not mean that an operation based on mining smaller orebodies will not be profitable if these bodies are closely enough spaced, and frequent enough, and if geological guides to their occurrences are developed. No attempt is made here to explain away the vast discrepancy between the past production of the Harrison Property and the Reed and Knoxville Mines, nor the concomitant discrepancy in the size and continuity of the respective bodies of silica-carbonate rock. However, I do not believe that the productive potentiality of the Harrison Mine can be fairly judged by the size and number of exposed orebodies. I would expect development to disclose a large number of more or less similar bodies, many of which would have no observable expression at the present surface, and might in consequence be unusually rich. There would also be the constant possibility of encountering larger orebodies under geologic conditions not apparent at the surface. For instance, there is some reason for expecting the dip of the fault zones to flatten with depth.

The sizeable production of the Manhattan Mine cannot be used as an argument for the Harrison since the bulk of the Manhattan production came from the surface volcanics, and these were eroded from the Harrison Property except for a few residual patches. The mineral content of the extruded magma is lost, but under the dispersive influences mentioned previously it would seem that sufficient must have terminated at depth to make a large total volume of mineralization. Also, until the Harrison workings are re-opened, we do not know the frequency, size, grade or continuity of the orebodies extracted from them, or still exposed.

GEOLOGY AND DEVELOPMENT AT THE HARRISON PROPERTY

Two ore zones have been exposed on the Harrison Property (excluding the Soda Springs prospect) both of which lie along the NE or hanging wall sides of parallel serpentine dikes which probably unite at the north end of the property. The Main, Footwall, or No. 1 ore zone follows the hangingwall of a serpentine body some 600 feet wide. This is the SE tip of the first subordinate serpentine body on the NE side of the main mass. The contact strikes about N 45 W and dips about 65 degrees to the NE. Intense shearing and fracturing extends over a total width of perhaps 250 feet, and embraces both the serpentine and the Knoxville sandstone and shale in its hanging wall. Averitt's map shows five individual bodies of silica-carbonate rock. Mapped lengths average about 30 feet and the average width is perhaps 10 to 15 feet. Forstner's report in 1917 when the underground drifting was in progress states that the vein was from 8 to 15 feet wide.

Two of the five bodies shown by Averitt occur at the surface in the area of the present open pit, and only small vestiges can be seen. Averitt's map shows that the combined width of the two parallel, and probably connected bodies was about 40 feet. This open pit is at the SE end of the developed portion of the ore zone as now exposed. I do not know whether underground workings extended beyond it to the SE. On the north brim of the pit is the collar of the caved vertical shaft of some 125 feet depth which is said to have connected most of the underground workings. The Plant tunnel is about 80 feet to the NW of the shaft, is about 70 feet long, and had at least 80 feet of drift. The portal of the Upper January tunnel is about 50 feet farther NW. This tunnel is at an elevation of 1801 feet, is about 70 feet long, and in 1917 was said to have 150 feet of drift to the NW, and 100 feet to the SE. At the time of Averitt's visit only about 70 feet of tunnel drift was accessible, that part leading to the upper end of the inclined raise from the Lower January tunnel. This latter tunnel was the main opening of the workings. The portal is at an elevation of 1660 feet - 140 feet below the Upper January tunnel. It is 360 feet long and the only working shown on Averitt's map is the inclined raise mentioned above. Forstner's brief report in 1917 stated that the vein was being drifted on from this tunnel, and since the main productive period came in 1919 it can be safely assumed that the ore zone was rather extensively explored on this level and above. Ordinarily it could also be safely assumed that all commercial ore was removed, but it is possible that falling prices stopped the operation before this could be done.

The No. 2 ore zone is roughly parallel to the No. 1, but lies about 300 feet NE of the latter, along or near the hanging-wall of a serpentine dike about 175 feet wide. A body of silica-cerbonate rock about 50 feet long and 10 feet wide (Averitt's map) was exposed in the 70 foot Bat Tunnel which is about 34 feet higher in elevation than the Lower January tunnel, and nearly directly above it. A much smaller body of silica-carbonate rock was exposed in the Lower January tunnel, and some cinnabar is indicated on parallel shearing.

The rock between the two serpentine bodies is indicated as being Knoxville sandstone and shale---mostly high sheared and gougy. The No. 2 serpentine seems to include some Knoxville sandstone, thus suggesting that the serpentine was intrusive into the Knoxville formation. This would not affect the theory that the main mass with its Franciscan inclusions was upthrust into its present position after its emplacement.

The property includes a length of some 1600 or 1700 feet along the strike of the No. 1 and 2 fault zones.

The Soda Springs fault is essentially parallel to the No. 1 and 2 fault zones, and lies about 1000' east of the latter. The

intervening rock seems to consist almost entirely of shale of the Lower Knoxville formation, but the Soda Springs outcrop of silica-carbonate rock in conglomerate of the same formation, and this continues to the east with intercalations of sandstone. Although no signs of mineralization were observed in the shale it is believed possible that it may contain ore at greater depth, and may exercise a damming influence on ore in the No. 2 ore zone.

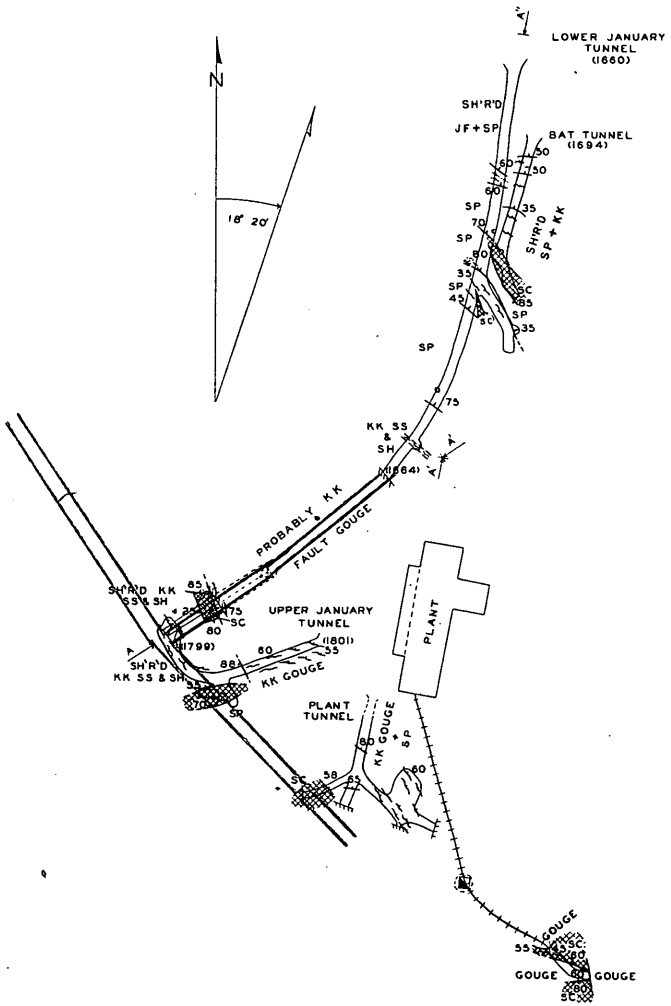
The conspicuous Soda Springs outcrop lies on a 8 acre tract not included in the present agreement, but said to be available later if wanted. The workings, casually visited by the writer--near the top of the outcrop--consist of a tunnel about 125 feet long with its portal at the SE end of the outcrop. Part way in, a tunnel about 5 feet lower in elevation converges with the main tunnel, and the two are connected with a winze-like opening. The floor of the workings then jumps up about 15 feet and emerges into a shaft opening to the surface. The workings mentioned above trend from N 10 E to N 12 W, but are associated at the north end with N 50 W shearing. The core of the mineralization is a dike or vein of the nearly all-black silica-carbonate rock which contains sulfides and cinnabar in small fractures. Silification and cinnabar-iron mineralization has branched out on diverging fissures, and the conglomerate country rock is locally intensely altered to a powdery mass, particularly between converging fractures. The average dip of the main vein is about 80 degrees to the east. It seems possible that this outcrop lies on a short segment of a member of the NNW striking system of faults, a segment caught between several strands of the N 50 W faulting. Production has apparently come from two or three narrow veins. No particular claims are made here about this particular outcrop--it was not even completely inspected, but the fault Zone it occupies may be important at greater depth.

In general it is anticipated that commercial ore will extend to greater depth on the No. 2 ore zone than on the No. 1, and possibly to a greater depth on the Soda Springs zone on the No. 2. Thus the possibilities of the property are not exhausted even if exploration shows that commercial ore in the developed portion of the No. 1 zone bottoms at or near the Lower January tunnel level. The only indication of such an event was that a pile of course rejects from a hand sorting operation, and containing only occasional small veinlets and patches of cinnabar, was of a black and white mottled and streaked character which is believed to be lower grade than the all-black opalite, and to be zonally deeper. However, I understand that miners who worked in the mine have stated that ore continued below the tunnel level.

In conclusion it may be reiterated that my opinion that the exploration if the property may disclose a large number of more or less connected, relatively small orebodies is based on the presence of geological factors favoring the dispersion or splitting of the magma, and its mineralizing solutions into bodies of varying volume whose cinnabar zones will occur at varying depths. Thus ore may occur at depth horizons where the stronger intersections are occupied by noncommercial phases of the mineralization, or even by intrusive bodies. The smaller quantity of mineralization of the smaller branches may be counterbalanced by the greater retention afforded by traps at depth as compared with those near the surface. It must also be mentioned that the property suffers by comparison with its unusually large neighbors. If it were by itself its own present showings would be more impressive.

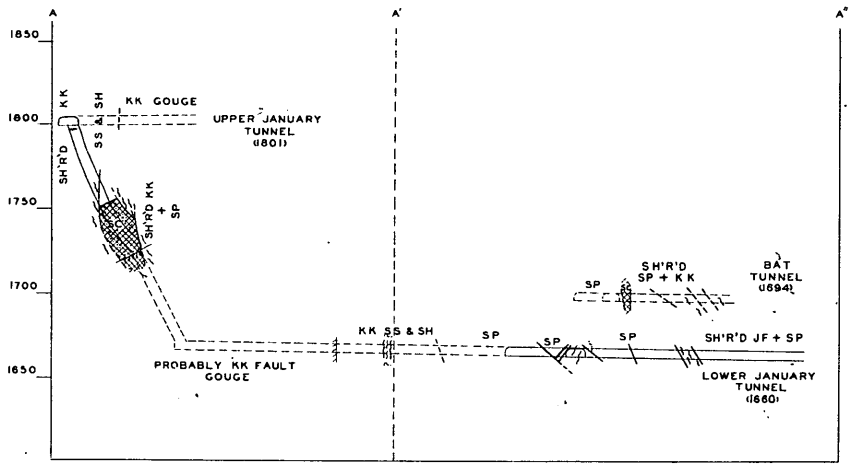
Frederic D. Hanson, E.M.

Nov. 1, 1951
Auburn, Calif.




BASE MAP SUPPLIED BY H. C. SMITH

GEOLOGY & ADDITIONAL WORKINGS BY PAUL AVERITT & G. DONALD EBERLEIN
U.S. GEOLOGICAL SURVEY




# HARRISON MINE

## YOLO COUNTY, CALIFORNIA

25 0 25 50 75 100

SCALE IN FEET

DATUM IS APPROXIMATELY MEAN SEA LEVEL

SEPT. 1943

## EXPLANATION

- SC — SILICA-CARBONATE ROCK
- SP — SERPENTINE
- KK — SH: KNOXVILLE FORMATION SH SHALE; SS: SS SANDSTONE
- JF — FRANCISCAN FORMATION
- CINNABAR MINERALIZATION
- FAULT (DASHED WHERE INFERRED) — 75
- LINEATION OF SHEARS IN FAULT ZONE — 80 50
- GRADATIONAL CONTACT
- HEAD OF INCLINED OPENING
- APPROXIMATE POSITION OF FOOT OF INCLINED OPENING
- APPROXIMATE POSITION OF CAVED SHAFT AT SURFACE
- TRACK
- INACCESSIBLE WORKINGS
- BUILDING
- LINE OF SECTION — A A'

Minerals Production &
Processing Company,
Harrison Mine, Yolo Co.,
Calif.

3. (a) We propose to open the Lower January crosscut tunnel, and all main drifts off this level that are in the ore zones. The Lower January tunnel is 360 feet long; and according to statements of miners who worked on this level, there is approximately 400 feet of drifting on the orebodies. The main drifts off the level are not shown by Averitt on his map as we understand the workings were inaccessible when the map was made. We have, however, sketched on the map the approximate location of the drifts.

As we have no way of determining how much of the mine workings are caved we have based our estimate on the assumption that all workings we explore must be cleaned out and timbered.

The total estimated cost of opening 760 feet of crosscut and main drifts, including the cost of building and repairing roads, purchasing, transporting and installing mine equipment, laying surface pipe lines, erecting buildings, and rehabilitating the property in general, which must be done before the underground work can be started, is $55,119.48.

| | |
|---|---|
| Construction of buildings (See answer to Question 6) | $ 5,233.44 |
| Equipment to be purchased (see answer to Question 7) | 12,801.07 |
| Mine labor and superintendent, etc., 5 months (see answer to Question 8) | 24,674.65 |
| Geologist, part time, 4 months @ $200. mo. | 800.00 |
| Materials and supplies (see answer to Question 9) | 5,265.32 |
| Parts for mine equipment, etc. | 2,505.00 |
| Assaying | 300.00 |
| Hauling equipment and supplies | 1,500.00 |
| Office supplies | 240.00 |
| General expenses | 1,800.00 |
| Total cost of project | $55,119.48 |

(b) The time required to start the project and complete it will be eight months.

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Processing Company,
Harrison Mine, Yolo Co.,
Calif.

4. See Averitt's Map attached

Minerals Production &
Processing Company,
Harrison Mine, Yolo Co.,
Calif.

5. List of installations on Harrison Property. The equipment, however, will not be used under an exploration project.

1 - 6' x 14' oil tank
1 - Wooden frame building (housing plant) partially dismantled
1 - 6" x 9" Risdon Iron Works Blake type crusher
1 - Allis-Chalmers 10 HP motor
1 - Flat pulley on counter shaft - drive pulley for rock crusher
1 - Troughing conveyor feeder - 11' x 16", mounted on channel iron frame, head and tail pulley and 3 rolls. (Belt worn out)
1 - 44' x 2½' Sorocto Rotary Kiln, with fire and feed on upper end. Kiln is driven by a 10 HP Allis-Chalmers motor, with V belt drive to Rober gear reducer, with spear gear to kiln.
1 - American Blower connected to dust cyclone, on lower end of kiln. Discharge of blower is 9' x 14'. Dust cyclone is 10' high by 3½' in dia.
1 - Condenser system, 9 complete units, ¼" plates, mounted on ID frame
1 - 9' x 15" redwood tank
1 - Iron Chimney
1 - Hoeing table
13 - Mercury pots
1 - Power unit, gasoline engine (junk)
1 - Gardner 6 x 6 air compressor (very old)
1 - D-retort

Note: All units in the plant are in good shape, except the power unit & compressor

Other equipment on the property consists of the remains of a Scott furnace, several D-retorts, an air receiver, and several frame buildings that are beyond repair.

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Processing Company,
Harrison Mine, Yolo Co.,
Calif.

6. Buildings to be erected on property:

| | |
|---|---|
| Blacksmith Shop & Timber Framing Shed - 14' x 20', wooden frame and aluminum sheeting, with labor and supervision costs included - | $ 866.58 |
| Compressor Room - 14' x 20', wooden frame and aluminum sheeting, with labor and supervision costs included - | 927.33 |
| Office & Storage Room - 12' x 18' - wooden frame and aluminum sheeting, complete with drafting board, desk, heater, and labor and supervision costs included - | 1,638.60 |
| Change Room - 10' x 12', wooden frame and aluminum sheeting, complete with hot water heater, heater, plumbing, etc., and labor and supervision costs included - | 1,800.93 |
| Total - | $5,233.44 |

Labor cost of erecting the above buildings is figured at 60% of the material cost (building contractor's estimate)

Minerals Production &
Processing Company,
Harrison Mine, Yolo Co.,
Calif.

7. Equipment:

| | |
|---|---|
| (a) Rental of Cat-dozer, with operator, fuel and maintenance (for 30 days) (contract) - | $ 1,182.72 |
| (b) Late model Chevrolet 3600 truck, 1½-2 job, (flatbed) - | 3,347.50 |
| I-R 365 cu.ft. compressor, diesel driven - | 4,120.00 |
| Sullivan Mucking machine - | 2,317.50 |
| 1 - 4' x 10' air receiver - | 257.50 |
| 5 - 1 ton ore cars (end dump) @ $100.00 per car - | 515.00 |
| 5½ Ton 16# rail @ $100.00 per ton - | 566.50 |
| Fish plates (for 16# rail) - | 15.45 |
| Track bolts " " " - | 20.60 |
| 1 - Gardner-Denver D55 jackhammer - | 154.50 |
| 1 - Utility blacksmith forge - | 51.50 |
| 1 - 150# anvil - | 30.90 |
| 1 - Bench vice - | 36.05 |
| 1 - Pipe vice - | 15.45 |
| 1 - Acetylene welding outfit - | 154.50 |
| 1 - Soldering torch - | 15.45 |
| Total - | $12,801.02 |

Minerals Production &
Processing Company,
Harrison Mine, Yolo Co.,
California.

8.

| Labor and Supervision: | Gross Earnings - per month |
|---|---|
| 1 General Superintendent @ $500.00 per month - | 500.00 |
| 1 Mine Foreman & Master Mechanic @ $400.00 per month - | 400.00 |
| 1 Mine Accountant @ $350.00 per month - | 350.00 |
| 4 Timbermen - rate $1.60 per hour (371.20 per month) - | 1,484.80 |
| 2 Mucking machine operators - rate $1.60 per hour (371.20 per month) - | 742.40 |
| 2 Trammers - rate $1.50 per hour (348.00 per month) - | 696.00 |
| 1 Surface man (timber framer & compressor maintenance) rate $1.50 per hour, (348.00 per month) - | 348.00 |
| | $ 4,521.20 |
| Compensation Insurance - per month (estimated) | 413.73 |
| Total - per month | $ 4,934.93 |

Geologist (part time) $200.00 per month

Minerals Production &
Processing Company,
Harrison Mine, Yolo Co.,
Calif.

9. Materials & Supplies:

| Item | | Cost |
|---|---|---|
| 9312 bd.ft. 6 x 6 timber @ $80.00 - | | $ 767.31 |
| 18000 bd.ft. lagging @ $80.00 - | | 1,483.20 |
| 964 bd.ft.4x6 @ $80.00 (for ties) - | | 79.33 |
| 500 mine wedges @ 4¢ - | | 20.60 |
| 2 kegs. - Nails @ $45.00 - | | 92.70 |
| 2410' - 2" Pipe @ .51¢ per foot - | (new) | 1,265.97 |
| 960' - 1" Pipe @ .24¢ per foot - | " | 299.52 |
| 760' - 8" vent pipe @ .25¢ per foot - | " | 195.70 |
| Misc. 1" & 2" pipe fittings | | 61.80 |
| 1 set - 7/8" hex. jackhammer steel - | (new) | 17.93 |
| 1 - Oiler - | | 7.73 |
| 4 doz. - Jackbits @ .45¢ each - | (new) | 22.25 |
| 200' - 1" Air hose @ .60¢ per ft. - | " | 123.60 |
| 200' - ½" Water hose @ .50¢ per ft. - | " | 103.00 |
| Misc. air & water hose connections - | | 25.75 |
| 100 lbs. - Track spikes (for 16# rail) - | " | 41.20 |
| 1 - Jimcrow - | | 15.45 |
| 2 - 4' Crosscut saws - | (new) | 14.42 |
| 2 - Mine axes - | " | 8.49 |
| 2 - Wrecking bars - | " | 5.30 |
| 1 - Combination square - | " | 1.04 |
| 1 - 100' Steel tape - | " | 10.88 |
| 5 - Scaling bars @ $5.00 each - | | 25.75 |

Minerals Production &
Processing Company,
Harrison Mine, Yolo Co.,
Calif.

9. Materials & Supplies:

| Item | | Cost |
|---|---|---|
| 2 - 14" Stillson wrenches - | (new) | $ 5.92 |
| 3 - 18" " " - | " | 12.58 |
| 3 - 24" " " - | " | 15.91 |
| 1 - Heavy duty pipe cutter - | " | 9.28 |
| 1 doz. - Drifting picks @ $1.35 - | " | 16.69 |
| 1 doz. - Drifting pick handles @ $1.30 | " | 16.07 |
| 1 doz. - Round point shovels @ $3.25 - | " | 40.17 |
| 1 doz. - Round point shovel handles @ $1.45 - | " | 17.92 |
| 3 - 12# Hammers @ $4.95 - | " | 15.30 |
| 3 - 8# Hammers @ $3.95 - | " | 12.21 |
| ½ doz. - Singlejack hammers @ $3.15 - | " | 19.47 |
| 1 doz. - Singlejack handles @ .60¢ - | " | 7.42 |
| 1 doz. - Sledge handles @ $1.25 - | " | 15.45 |
| 1 - Adge - | " | 5.61 |
| **Shop Tools:** | | |
| Misc. blacksmith tools (hammers, tongs, etc.) | | 25.75 |
| 1 - Hacksaw frame - | (new) | 2.01 |
| 6 doz. - Hacksaw blades - | " | 6.23 |
| 6 doz. - Files (various types ) - | " | 54.04 |
| 1 - 29 piece socket set - | " | 27.55 |
| 1 - 6 piece set open end wrenches - | " | 4.83 |
| 1 - 8" Crescent wrench - | " | 1.60 |
| 1 - 12" " " - | " | 2.94 |
| 1 - 15" " " - | " | 4.55 |
| 1 - 18" " " - | " | 7.41 |

Minerals Production &
Processing Company,
Harrison Mine, Yolo Co.,
Calif.

9. Shop Tools, continued

| Item | | Cost |
|---|---|---|
| 1 - Machinist's screwdriver - | (new) | $ .78 |
| 1 - General purpose screwdriver - | " | .93 |
| Carpenter's Tools: | | |
| 1 - Steel square - | (new) | 3.36 |
| 1 - Ratchet bit brace - | " | 6.80 |
| 7 - Wood bits, size 1/8" to 1/2" - | " | 6.90 |
| 2 - Claw hammers - | " | 6.53 |
| 1 - Aluminum level - | " | 9.12 |
| 1 - Crosscut hand saw - | " | 7.73 |
| 1 - Rip Saw - | " | 7.16 |
| 1 - 4 piece chisel set | " | 5.13 |
| 1 - General purpose plane - | " | 10.25 |
| Misc. stock - | | 164.80 |
| Total - | | $5,265.32 |

Other Items:

| | |
|---|---|
| Parts for mine equipment and truck, overhauling mine equipment and truck in outside shops, diesel fuel, gasoline, oils and greases - | 2,505.00 |
| Assaying - At least 100 Mercury determinations @ $3.00 each - | 300.00 |
| Hauling equipment and supplies to mine - | 1,500.00 |
| Office Supplies - | 240.00 |
| General Expense - | 1,800.00 |

Minerals Production &
Processing Company,
Harrison Mine, Yolo Co.,
Calif.

10.
(a) We are prepared to invest twenty-five per cent of $55,119.48, the total cost of the project.

(b) Yes

11. Before deciding upon the Harrison Quicksilver Mine we investigated other quicksilver properties and deposits in California and Nevada; but from information given us by reliable men who formerly worked in the Lower January tunnel of the Harrison, we believe that the property has more chance of becoming a productive mine than the others we examined. These men state that ore exists in the lower drifts of the mine, particularly, in the SE drift in the No. 1 ore zone, and that ore continued below the level.

It is reported that in the past the Harrison Mine was worked intermittently by small companies, and individuals who did not have the necessary capital to develop the mine; and on numerous occasions a drop in the price of mercury shut the mine down.

We are convinced that sufficient capital and efficient management will prove that the known Harrison orebodies contain commercial ore, and that new orebodies will be discovered.

Form MF-103
(Revised June 1951)

UNITED STATES DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION

Budget Bureau No. 42-R1035.1.

MF-103 Should Be Filed With General Technical Data Form MF-100

# APPLICATION FOR AID FOR AN EXPLORATION PROJECT PURSUANT TO MINERAL ORDER 5, UNDER DEFENSE PRODUCTION ACT OF 1950

*Not To Be Filled in by Applicant*

Docket No. dma 2 2 18
Metal or Mineral
Date Received 11-7-51
Amount $
Participation (Government %)

Name and address of applicant

Minerals Production & Processing Company,
139 No. Virginia St.,
Reno, Nevada.
Address Correspondence to
Mr. Oscar A. Giese,
55 Montecito Rd., Walnut Creek, Calif.

Date November 1, 1951

If you have already filed MF-100, give date filed _____, type of assistance requested _____,

DMA Docket Number (if available) _____

## INSTRUCTIONS

Read Mineral Order 5, Regulations Governing Government Aid in Defense Projects, before completing this application. Submit four copies each, of the signed application form, General Technical Data Form MF-100, and answers to questions as specified, to Defense Minerals Administration, Department of the Interior, Washington 25, D. C., or to the nearest field executive office thereof, with your name and address on each sheet of the application and all accompanying papers. If you have previously filed MF-100, it is not necessary to file it again. However, you should indicate in space provided above the type of assistance previously applied for (loans, procurement contracts, etc.) and DMA Docket Number, if available. *When a question is inapplicable it should be so stated in the form.* Additional sheets should be attached in answering any questions or in supplying additional information. IF YOU CANNOT ANSWER A QUESTION, SO STATE.

1. (*a*) Give a description of the real property that will be in any way involved in the exploration project, including any existing mine or operating property.

   (*b*) If you are not the owner of the property, submit a copy of the lease, purchase option, or other agreements under which you are authorized to operate the property with each copy of your application.

   (*c*) Give the legal description of the exact parcel, plot, or area upon which the exploration is to be conducted.

   NOTE: (1) If both areas are the same, so state. The only obligation to repay the Government is from the net earnings from any commercial discovery made in the area specified in (*c*) above in which the exploration is to be conducted, and the expenditure of funds which may be charged as costs of the project must be limited to that area or to work necessary to perform the exploration in that area.

   (2) If applicant is not the owner of the property or if there are any liens or encumbrances against the property, copy of agreements of claimants, lienors, encumbrances, and lessors subordinating their interests in the property to the interest of the Government under the Exploration Project Contract will be required for attachment to the Contract.

2. (*a*) What metals or minerals do you expect to find?

   (*b*) Furnish statement of the geologic features of your property, giving type of ore deposit and reasons for expecting to find commercial ore bodies. Illustrate with maps or sketches. If you have a geologic or engineering report, or assay maps showing width and grade, please send them with application, stating whether or not you wish to have them returned.

The information requested in questions 3, 4, 5, 6, 7, 8, and 9 below should be answered specifically and in detail, as this information will be attached to and incorporated as part of the Exploration Project Contract, if such contract is entered into with you by the Government.

ANSWER EACH QUESTION ON SEPARATE SHEETS OF PAPER AND SUBMIT A COPY OF EACH ANSWER FOR EACH COPY OF YOUR APPLICATION.

3. (*a*) Describe fully the proposed work and give the total cost of the project.

   (*b*) State the time required to start the project and to complete it.

4. Submit a map or sketch of the property involved showing a plan (and cross section, if needed) of the present mine workings and the *location of the proposed exploration work* as related to geologic features, such as contacts, veins, ore-bearing beds, etc.

5. Furnish an itemized list of existing facilities, buildings, installations, and fixtures with a statement of the cost of any necessary rehabilitation or repairs to put into useful and operable condition.

6. Furnish a detailed list of additional facilities, buildings, and fixtures to be purchased, installed, or erected by you, with the estimated cost of each item.

7. Furnish a detailed list of operating equipment, separated into items to be—

   (*a*) Rented

   (*b*) Purchased

   (*c*) Furnished by you

   with the rental, purchase price, or depreciation of each item, as the case may be, to be charged as a cost of the project.

8. Furnish an itemized schedule of labor, by numbers and classes (miners, muckers, etc.) and of supervisors by numbers and positions, with the maximum wages or salaries to be paid to each.

9. Furnish a detailed list with estimated cost of each item for materials, supplies, engineering, assaying, accounting, power, water, utilities, and any other items not provided for above.

10. (*a*) How much are you prepared to invest in the proposed project?

    (*b*) Is this amount sufficient to pay your part of the cost of the project, in accordance with the regulations on Government participation (Sec. 9 of MO–5)?

11. State any conditions or circumstances regarding the property not sufficiently brought out by the foregoing questions.

## CERTIFICATION

The undersigned company, and the official executing this certification on its behalf, hereby certify that the information contained in this form and accompanying papers is correct and complete to the best of their knowledge and belief.

**Minerals Production & Processing Co.**
(Name of company)

By Oscar A. Giese
(Signature of authorized official)
**Oscar A. Giese**

**November 1, 1951.**
(Date)

**Secretary**
(Title)

**Title 18, U. S. Code (Crimes), Section 1001, makes it a criminal offense to make a willfully false statement or representation to any department or agency of the United States as to any matter within its jurisdiction.**

U. S. GOVERNMENT PRINTING OFFICE 16—64067-2

Minerals Production &
Processing Company,
Harrison Mine, Yolo Co., Calif.

1. (a) The N.W.¼ of the N.W.¼ of Sec. 36, Township 12 North, Range 5 West, M.D.M. (except for about 8 acres which is included in what is commonly known as the Soda Spring Mine) containing 32 acres more or less.

   The East ½ of the N.E.¼ of Section 35, Township 12 North, Range 5 West, M.D.M. containing 80 acres more or less; and a small adjoining parcel of land on which is located a spring of water, and being described as follows:

   BEGINNING at the S.E. corner of the N.E.¼ of said Section 35, thence North 500', thence West 200', thence South 500' and thence East 200' to the place of beginning. Containing 2 acres more or less.

   (b) A copy of the lease is submitted with each copy of our application.

   (c) Exploration will be confined to the Harrison Mine which is a part of the real property described in (a).

2. (a) Mercury

   (b) Refer to report by Frederick D. Hanson, E.M.

   Refer to map by Paul Averitt & G. Donald Eberlein USGS

   No assay maps showing width and grade have been found.

# MINERAL LEASE AND OPTION

THIS AGREEMENT, made the first day of September, 1951, by and between VERNE W. HARRISON, VINCE L. HARRISON, MADGE J. HARRISON, and RUBY A. SNIDER, hereinafter called the parties of the first part, and MINERALS PRODUCTION AND PROCESSING COMPANY, hereinafter called the party of the second part.

WITNESSETH:

THAt whereas, the parties of the first part are the owners and in possession of that certain property, commonly known as the Harrison Mine, hereinafter described, and are willing to lease the same; and

WHEREAS, the party of the second part is willing to lease work and develop the same, upon the terms and conditions hereinafter stated.

NOW, THEREFORE, in consideration of the payment of the royalty hereinafter provided, and of the faithful and timely performance by the party of the second part of the conditions, covenants and agreements hereinafter contained, the parties of the first part do hereby lease and let for mining purposes unto the party of the second part all that certain real property, situate in the County of Yolo, State of California, and particularly described as follows, to wit:

> The N.W. ¼ of the N.W.¼ of Sec. 36, Township 12 North, Range 5 West, M.D.M. (except for about 8 acres which is included in what is commonly known as the Soda Spring Mine) containing 32 acres more or less.

The East ½ of the N.E.¼ of Section 35, Township 12 North, Range 5 West, M.D.M. containing 80 acres more or less; and a small adjoining parcel of land on which is located a spring of water, and being described as follows:

BEGINNING at the S.E. corner of the N.E. ¼ of said Section 35, thence North 500', thence West 200', thence South 500' and thence East 200' to the place of beginning. Containing 2 acres more or less.

for the term commencing September 1, 1951 and ending September 1, 1961, for a period of ten (10) years.

The parties of the first part hereby grant to the party of the second part an option to extend the terms of this lease for an additional period of ten (10) years, to commence at the expiration of the term herein granted, upon the same terms and conditions as herein stated. In the event the party of the second part shall fail to give the parties of the first part a written notice of election to exercise this option for a ten-year extension of this lease within ninety days prior to the expiration hereof, this option shall become null and void.

MINERALS PRODUCTION AND PROCESSING COMPANY, the party of the second part, shall pay to the parties of the first part within five (5) days after receipts or returns are received from the burning, milling or disposition of Mercury or other precious metals obtained from said property, and from each shipment of Mercury or other precious metals, Seven and one-half per cent (7½%) of the gross proceeds obtained from said property as a royalty. The party of the second part shall make any and all royalty payments to the Bank of America, Lower Lake, State of California, and shall send duplicate deposit slips to Verne W.

Harrison, Lower Lake, California, or to any other person that may be designated by the parties of the first part.

It is further mutually covenanted and agreed that when the party of the second part commences mining operations that the party of the second part shall pay to the parties of the first part a minimum royalty of not less than One Hundred Dollars ($100.00) per month, commencing six months after date hereof. Payments to be made on the first day of each month.

And it is further mutually covenanted and agreed as a part of the terms and conditions of this agreement as follows:

1. The party of the second part shall have six (6) months from the date hereof to do such examination and exploratory work as may be desired, free from any and all obligations.

2. The parties of the first part agree that the party of the second part may enter upon said mines or premises and work the same, in a manner necessary to good and economical mining, so as to take out the greatest amount of commercial ore possible, with due regard to the safety, development and preservation of the said premises as a workable mine.

3. Beginning March 1, 1952 the party of the second part shall employ at least five (5) men working twenty-five (25) shifts to the man each calendar month.

4. The party of the second part shall promptly pay all bills incurred for labor or materials, or other purposes in connection with working of said mining property, and shall post and keep posted such notices of non-responsibility as may be furnished to him by the parties of the first part.

5. The party of the second part agrees to insure so as to

protect the parties of the first part against all liability for accident or death under the Workmen's Compensation Act.

6. All work done by the party of the second part shall be performed in a good, minerlike manner, and in accordance with the laws of the State of California, and the lawful orders of the State Mine Inspector, and other duly constituted agencies of said State.

7. The party of the second part shall keep full and accurate account and records of all development work performed upon said property, and all ores and mineral products taken therefrom, and disposed of by the party of the second part, and shall afford the parties of the first part free access to all mine workings as long as this does not interfere in any way with the operation of said property. The parties of the first part shall have the right to be present at any and all cleanups.

8. The party of the second part shall furnish the parties of the first part, at their request, copies of all maps, geological reports, assay certificates and all data, including the results of any diamond drilling upon said property.

9. The parties of the first part agree that all equipment and tools brought to or placed upon said premises by the party of the second part shall not become fixtures; but shall remain the property of the party of the second part; provided that such removal shall be made within thirty (30) days from the abandonment, forfeiture or expiration of this lease, and if not so removed shall become a part of the realty. All buildings and structures on the

surface and timber in place underground shall become a part of the realty.

10. The parties of the first part agree that they will pay all taxes that are now due upon said property, and to pay before delinquency all taxes that hereinafter may be levied upon or assessed against said real property. The party of the second part agrees that he will pay before delinquency all taxes that may hereinafter be levied upon or assessed against any personal property on said premises.

11. The parties of the first part hereby grant to the party of the second part an easement for road purposes over and across their lands so that the party of the second part in conducting operations contemplated by the agreement, shall have a convenient way to travel between the said premises and Knoxville, and between the said premises and Lower Lake, and also an easement for the purpose of conveying water for use in the operation of the plant, mine and for domestic purposes, and the further right to use and occupy said premises for the purposes of storing and maintaining equipment, housing the same, and erecting buildings necessary for the conduct of the business and for the purpose of dumping ore and minerals.

12. The parties of the first part hereby grant to the party of the second part, easements over the real property to lay and maintain pipe lines to convey water; and the party of the second part hereby grants to the parties of the first part the right of grazing stock upon and driving stock over said real property, but without risk or liability to the party of the second part. The party of the second part may fence off land unused by

the parties of the first part to keep livestock away from any dangerous area.

13. In the event ore is not found in paying quantities or in the event ore that is profitable to mine should become exhausted, the party of the second part shall have the right to abandon the property and this lease and option shall be at an end and of no further force or effect.

14. In the event title defects should exist, the parties of the first part agree to cure such defects within a reasonable time and at their own expense.

15. The party of the second part shall have the right to assign this lease and option to others, who shall also be bound thereby. If the party of the second part violates or fails to comply with any of the provisions hereof, then, and in that event, this lease shall terminate, and all rights of the party of the second part hereunder shall cease, and all payments heretofore made hereunder shall be retained by the parties of the first part as full compensation as rental for the use and occupancy of said property, as the consideration for which this agreement is executed and as liquidated damages.

16. The party of the second part agrees to keep the property free and clear of all liens, attachments and encumbrances of any kind, and to that end the parties of the first part may post, file and record the proper notices, giving notice to all persons of the ownership of the parties of the first part, and the protection by him of all liens and claims of all persons.

17. In case of default in any provision herein contained by the party of the second part, the parties of the first part shall notify said party of the second part, in writing, of such default, and should the party of the second part fail or refuse to cure such default within thirty (30) days after the receipt of such notice, then the parties of the first part shall have the right to cancel this agreement by notice in writing.

Such termination shall not relieve the party of the second part from his obligation to pay all sums accrued and payable by the party of the second part to the parties of the first part at the time of such termination; and the party of the second part upon any such termination, shall execute a quit claim deed, quit-claiming to the parties of the first part any interest that the party of the second part may have acquired in the said premises.

18. This lease and option shall bind and inure to the benefit of the heirs, executors, administrators and assigns of all parties hereto.

TIME SHALL BE THE ESSENCE OF THIS AGREEMENT.

IN WITNESS WHEREOF the parties have hereunto set their hands and seals this day and year first above written.

(Sgd.) Verne W. Harrison
VERNE W. HARRISON

(Sgd.) Vince L. Harrison
VINCE L. HARRISON

(Sgd.) Madge J. Harrison
MADGE J. HARRISON

(Sgd.) Ruby A. Snider
RUBY A. SNIDER

Parties of the First Part

MINERALS PRODUCTION AND PROCESSING COMPANY,
A Corporation

(Sgd.)
By Oscar A. Giese
OSCAR A. GIESE, Secretary

Party of the Second Part

# PRELIMINARY REPORT
# HARRISON QUICKSILVER MINE
# KNOXVILLE DISTRICT
# CALIFORNIA

## FOREWORD

The purpose of this examination was to determine if the geologic set-up of the Harrison Property justifies its exploration. Since the underground workings are entirely inaccessible an opinion must be based on observable surface geologic features on the property itself, on its position in the district relative to the more productive mines and the geologic features which localized them, and on available literature.

My conclusions are based on field work at the property and in the district on Sept. 24th and 25th, 1951, and on a study of the maps and reports by Mr. Paul Averitt of the USGS as published in the California Journal of Mines and Geology, Vol. 41, No. 2, April 1945. It is recommended that this publication be available when this report is read.

## CONCLUSIONS

It is my opinion---based on the criteria mentioned above---that the Harrison Property merits a cautious, step-by-step exploration program which would be a legitimate project for a government loan or loans.

## RECOMMENDATIONS

The first step should be the re-opening of the Lower January tunnel. It can then be determined if early production can be expected or if new exploration and development is needed. Since it cannot be foretold in advance if such work is justified, whether it can best be accomplished by diamond drilling or by underground workings, or the footage of such work required and its location, it would seem advisable to restrict the loan application to the funds required for the tunnel re-opening and associated work. The program would be as follows:

1. Rental of bulldozer to repair bad stretches of the present road, and to construct the short segments necessary to allow trucks to reach the portal of the Lower January tunnel and the mill. Possible subsidiary work to secure enough flat ground near the portal for the compressor and necessary shop and storage housing. Prospecting trenches across the ore zones beyond the

limits of underground workings. Replace the old pipe line from the spring to the lower January tunnel.

2. Re-opening of the 360 foot Lower January tunnel, the main drift on the ore zones, and such connecting workings as seem essential because of geological indications or operating necessities. This work would involve the purchase of a compressor, mucking machine, mine cars, rail, pipe, timber, tools, a truck, etc.

3. Such minor workings and timbering as are needed to adequately expose for examination and sampling any ore showings and promising leads which are exposed in the re-opened workings.

4. Appraisal of the results of the above work to determine if additional exploration and/or development is justified or needed, and if so, whether it can best be done by underground workings, underground diamond drilling, surface diamond drilling, or new openings.

PROPERTY

The Harrison Property is located in the Knoxville Mining District in Yolo and Napa counties, California. It is situated in T.11 N., R.5 W., and consists of the E½ of the NE¼ of Sec.35, the NW¼ of the NW¼ of Sec.36, except for about 8 acres constituting the Soda Springs prospect, and a rectangular parcel of 500' N and S and 200' E and W located in the SE corner of Sec.26. All this is contiguous and totals 117 to 118 acres.

ACCESS

The property lies about 3/4 mile north of the county road between Lower Lake and Monticello at a point about 2½ miles NW of Knoxville and 17½ miles SE of Lower Lake. At present a car can be driven to within a few minutes walk of the workings, but the open pit of the last operation has destroyed a short segment of the road so that from 100 to 200 yards of new road is needed to connect with the road to the portal of the Lower January tunnel. A minor amount of repair is also needed on the intact portions.

OWNERSHIP

The mine is owned and/or controlled by Verne and Vince Harrison of Lower Lake and vicinity. I have not examined the lease or purchase agreement.

FACILITIES

Former operations depended on a spring on the small parcel of land in Sec. 26. The flow of the spring was not determined, but can be presumed to be sufficient for compressor cooling and drilling purposes.

Electric power for furnace and permanent plant can be secured by about 3700 feet of power line.

Equipment on the property includes a 30 ton rotary furnace with accessory condensers, fans, etc. This plant seems to have had little use and to be in good shape.

Other items noted were an air receiver, several D- retorts, one of which is in good shape, and several frame buildings in bad repair near the portal of the Lower January tunnel.

HISTORY

The recorded production of the Harrison Mine through 1943 is given as 345 flasks. Total production is allotted to three periods of activity, as follows:

1. A small unrecorded production prior to 1900.

2. 263 flasks during World War I period of 1917, 1918 and 1919. A concentrating plant was in operation during this period, but the production also includes that from retorted high-grade. Most of the underground work was done during this period.

3. 82 flasks (plus a few unrecorded flasks) in the period 1936 to 1940, inclusive. Most of the ore came from the open pit; it is said that no underground work was done.

DISTRICT GEOLOGY

The following account is taken largely from Mr. Averitt's report or inferred from his maps and descriptions. My own observations are limited to the Harrison Property, to a walk from that property to the county road below the Reed Mine, and to a "circumnavigation" of the district by auto.

The backbone of the district is a large dike-like mass of serpentine from 3/4 to 3-3/4 miles wide which extends across the district in a broad curve convex to the NE. The serpentine includes large and small inclusions of the Franciscan formation, and is encased in sediments of the Knoxville formation of Jurasso-Cretaceous age. Near the north end of the district the serpentine outcrop widens to the NE by about 1½ miles as a series of irregular but more or less connected and parallel bodies. The Reed Mine---the northernmost in the district---is located along the NE contact of the easternmost and largest of these subordinate serpentine masses. At the south end of the Reed the serpentine and the mineralized fault zone which follows its contact terminate along an E-W fault. The mineralized fault zone reappears about 3/4 mile to the west on the Harrison Property, but is here along the NE contact of the westernmost of the subordinate serpentine

bodies and lies about ¼ mile east of the main arcuate mass. The Harrison serpentine tapers out to the SE, but the fault zone continues through the Manhattan property with Franciscan formation on its west side, but is largely covered by Tertiary volcanics consisting of basaltic flows and tuffs and rhyolitic tuffs. Basaltic dikes and necks are also exposed. The fault zone rejoins the serpentine contact about ½ miles above the Knoxville Mine, near which it makes a rather sharp bend to a more NW strike. Except for the cross faulting bounding the upthrust slice in which the Knoxville mine is located the fault zone is continuous from the Knoxville to beyond the Harrison where it is offset eastward to the Reed Mine. Ignoring this offset it may be said that all of the mines of the district except the Red Elephant are located along the fault zone which follows the NE contact of the serpentine mass as a whole.

The area between the serpentine and a line drawn between the Reed and Knoxville Mines forms a roughly triangular shaped sedimentary re-entrant or embayment in which are exposed stratigraphically lower beds of the Knoxville formation than to the north and south. It is also the intersection point of the NNW and WNW striking faults which determined the trend of the ends of the arcuate curve, of the N 40 to 50 W fault zone following the serpentine contact in this area, and of NE trending faults and fractures roughly at right angles to the last mentioned set. Also, on the Manhattan property south of the Harrison is the district center of intrusion and extrusion of Tertiary magma. All of these facts must be genetically related. It may be surmised that the uplift of the serpentine was caused by the intrusion of the Tertiary magma, but that in the complex fault intersection area this magma could work its way through to the surface; its propulsive power was thus lost, and the fault block was not elevated to the same extent as those outside the zone of magmatic "leakage."

The Reed and Knoxville Mines, each just outside of the limits of the embayment and at about equal distances on each side of the volcanic area of intense cross faulting undoubtedly owe their size to their geologic location. Cross faults were far enough spaced so that the horizontal length of the contact fault zone to which the solutions were confined was exceptionally large and the depth interval accessible to mining was far enough above the magmatic source of the solutions so that the zone of rich cinnabar deposition was well developed.

In the intervening Harrison-Manhattan area opposite conditions prevailed, conditions favoring the dispersion of the magma and its mineralizing solutions, and the formation of a large number of relatively small orebodies instead of big continuous bodies. These conditions are: the splitting of the main contact fault zone into at least three strands, the closely spaced cross faulting, the intricately sheared serpentine, and the thick shale horizon between two of these strands. The effect of the closely spaced cross faulting is shown by the fact that both the basalt and the bodies of "silica-carbonate" rock or "opalite" which forms the gangue of the cinnabar deposits occur

at fault intersections as pipe-like bodies, or as relatively short dikes or tabular bodies bounded by cross faults.

The advantage of the big continuous orebody from a development, mining, and cost standpoint is of course undeniable, but this does not mean that an operation based on mining smaller orebodies will not be profitable if these bodies are closely enough spaced, and frequent enough, and if geological guides to their occurrences are developed. No attempt is made here to explain away the vast discrepancy between the past production of the Harrison Property and the Reed and Knoxville Mines, nor the concomitant discrepancy in the size and continuity of the respective bodies of silica-carbonate rock. However, I do not believe that the productive potentiality of the Harrison Mine can be fairly judged by the size and number of exposed orebodies. I would expect development to disclose a large number of more or less similar bodies, many of which would have no observable expression at the present surface, and might in consequence be unusually rich. There would also be the constant possibility of encountering larger orebodies under geologic conditions not apparent at the surface. For instance, there is some reason for expecting the dip of the fault zones to flatten with depth.

The sizeable production of the Manhattan Mine cannot be used as an argument for the Harrison since the bulk of the Manhattan production came from the surface volcanics, and these were eroded from the Harrison Property except for a few residual patches. The mineral content of the extruded magma is lost, but under the dispersive influences mentioned previously it would seem that sufficient must have terminated at depth to make a large total volume of mineralization. Also, until the Harrison workings are re-opened, we do not know the frequency, size, grade or continuity of the orebodies extracted from them, or still exposed.

GEOLOGY AND DEVELOPMENT AT THE HARRISON PROPERTY

Two ore zones have been exposed on the Harrison Property (excluding the Soda Springs prospect) both of which lie along the NE or hanging wall sides of parallel serpentine dikes which probably unite at the north end of the property. The Main, Footwall, or No. 1 ore zone follows the hangingwall of a serpentine body some 600 feet wide. This is the SE tip of the first subordinate serpentine body on the NE side of the main mass. The contact strikes about N 45 W and dips about 65 degrees to the NE. Intense shearing and fracturing extends over a total width of perhaps 250 feet, and embraces both the serpentine and the Knoxville sandstone and shale in its hanging wall. Averitt's map shows five individual bodies of silica-carbonate rock. Mapped lengths average about 30 feet and the average width is perhaps 10 to 15 feet. Forstner's report in 1917 when the underground drifting was in progress states that the vein was from 8 to 15 feet wide.

Two of the five bodies shown by Averitt occur at the surface in the area of the present open pit, and only small vestiges can be seen. Averitt's map shows that the combined width of the two parallel, and probably connected bodies was about 40 feet. This open pit is at the SE end of the developed portion of the ore zone as now exposed. I do not know whether underground workings extended beyond it to the SE. On the north brim of the pit is the collar of the caved vertical shaft of some 125 feet depth which is said to have connected most of the underground workings. The Plant tunnel is about 80 feet to the NW of the shaft, is about 70 feet long, and had at least 80 feet of drift. The portal of the Upper January tunnel is about 50 feet farther NW. This tunnel is at an elevation of 1801 feet, is about 70 feet long, and in 1917 was said to have 150 feet of drift to the NW, and 100 feet to the SE. At the time of Averitt's visit only about 70 feet of tunnel drift was accessible, that part leading to the upper end of the inclined raise from the Lower January tunnel. This latter tunnel was the main opening of the workings. The portal is at an elevation of 1660 feet - 140 feet below the Upper January tunnel. It is 360 feet long and the only working shown on Averitt's map is the inclined raise mentioned above. Forstner's brief report in 1917 stated that the vein was being drifted on from this tunnel, and since the main productive period came in 1919 it can be safely assumed that the ore zone was rather extensively explored on this level and above. Ordinarily it could also be safely assumed that all commercial ore was removed, but it is possible that falling prices stopped the operation before this could be done.

The No. 2 ore zone is roughly parallel to the No. 1, but lies about 300 feet NE of the latter, along or near the hanging-wall of a serpentine dike about 175 feet wide. A body of silica-carbonate rock about 50 feet long and 10 feet wide (Averitt's map) was exposed in the 70 foot Bat Tunnel which is about 34 feet higher in elevation than the Lower January tunnel, and nearly directly above it. A much smaller body of silica-carbonate rock was exposed in the Lower January tunnel, and some cinnabar is indicated on parallel shearing.

The rock between the two serpentine bodies is indicated as being Knoxville sandstone and shale---mostly high sheared and gougy. The No. 2 serpentine seems to include some Knoxville sandstone, thus suggesting that the serpentine was intrusive into the Knoxville formation. This would not affect the theory that the main mass with its Franciscan inclusions was upthrust into its present position after its emplacement.

The property includes a length of some 1600 or 1700 feet along the strike of the No. 1 and 2 fault zones.

The Soda Springs fault is essentially parallel to the No. 1 and 2 fault zones, and lies about 1000' east of the latter. The

intervening rock seems to consist almost entirely of shale of the Lower Knoxville formation, but the Soda Springs outcrop of silica-carbonate rock in conglomerate of the same formation, and this continues to the east with intercalations of sandstone. Although no signs of mineralization were observed in the shale it is believed possible that it may contain ore at greater depth, and may exercise a damming influence on ore in the No. 2 ore zone.

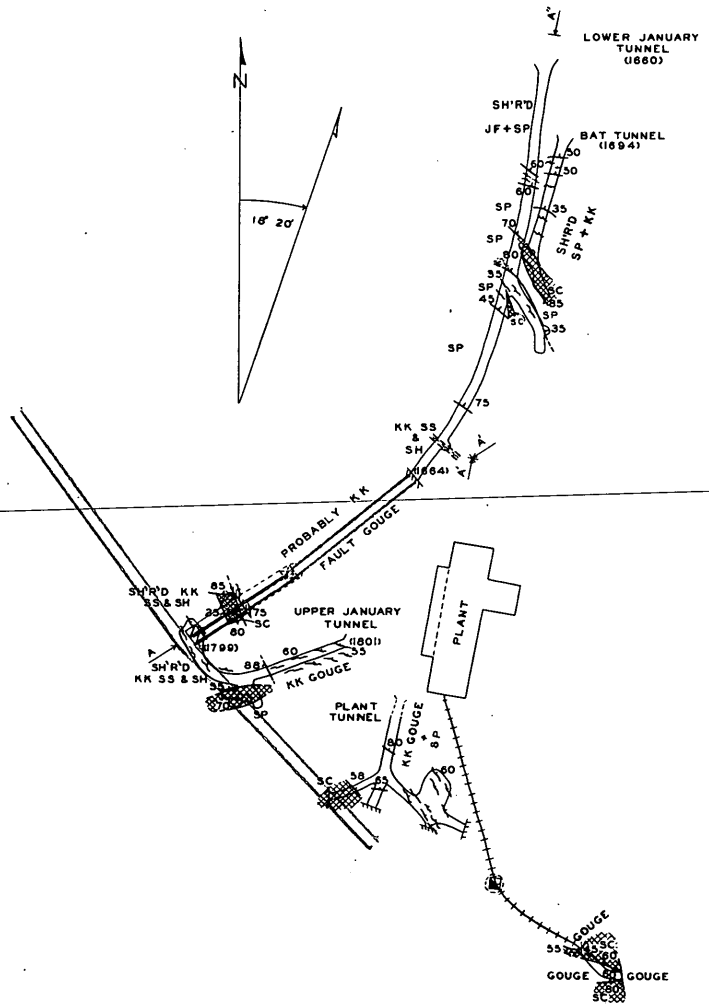
The conspicuous Soda Springs outcrop lies on a 8 acre tract not included in the present agreement, but said to be available later if wanted. The workings, casually visited by the writer---near the top of the outcrop---consist of a tunnel about 125 feet long with its portal at the SE end of the outcrop. Part way in, a tunnel about 5 feet lower in elevation converges with the main tunnel, and the two are connected with a winze-like opening. The floor of the workings then jumps up about 15 feet and emerges into a shaft opening to the surface. The workings mentioned above trend from N 10 E to N 12 W, but are associated at the north end with N 50 W shearing. The core of the mineralization is a dike or vein of the nearly all-black silica-carbonate rock which contains sulfides and cinnabar in small fractures. Silification and cinnabar-iron mineralization has branched out on diverging fissures, and the conglomerate country rock is locally intensely altered to a powdery mass, particularly between converging fractures. The average dip of the main vein is about 80 degrees to the east. It seems possible that this outcrop lies on a short segment of a member of the NNW striking system of faults, a segment caught between several strands of the N 50 W faulting. Production has apparently come from two or three narrow veins. No particular claims are made here about this particular outcrop---it was not even completely inspected, but the fault Zone it occupies may be important at greater depth.

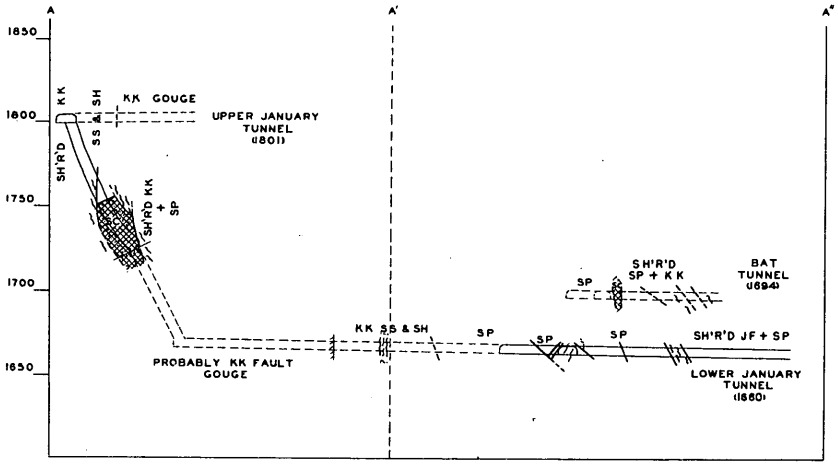
In general it is anticipated that commercial ore will extend to greater depth on the No. 2 ore zone than on the No. 1, and possibly to a greater depth on the Soda Springs zone on the No. 2. Thus the possibilities of the property are not exhausted even if exploration shows that commercial ore in the developed portion of the No. 1 zone bottoms at or near the Lower January tunnel level. The only indication of such an event was that a pile of course rejects from a hand sorting operation, and containing only occasional small veinlets and patches of cinnabar, was of a black and white mottled and streaked character which is believed to be lower grade than the all-black opalite, and to be zonally deeper. However, I understand that miners who worked in the mine have stated that ore continued below the tunnel level.

In conclusion it may be reiterated that my opinion that the exploration if the property may disclose a large number of more or less connected, relatively small orebodies is based on the presence of geological factors favoring the dispersion or splitting of the magma, and its mineralizing solutions into bodies of varying volume whose cinnabar zones will occur at varying depths. Thus ore may occur at depth horizons where the stronger intersections are occupied by noncommercial phases of the mineralization, or even by intrusive bodies. The smaller quantity of mineralization of the smaller branches may be counterbalanced by the greater retention afforded by traps at depth as compared with those near the surface. It must also be mentioned that the property suffers by comparison with its unusually large neighbors. If it were by itself its own present showings would be more impressive.

Frederic D. Hanson, E.M.

Nov. 1, 1951
Auburn, Calif.




# HARRISON MINE

## YOLO COUNTY, CALIFORNIA

25 0 25 50 75 100

SCALE IN FEET

DATUM IS APPROXIMATELY MEAN SEA LEVEL

SEPT. 1943

## EXPLANATION

- SC — SILICA-CARBONATE ROCK
- SP — SERPENTINE
- KK — SH: KNOXVILLE FORMATION SH SHALE; SS: SS SANDSTONE
- JF — FRANCISCAN FORMATION
- CINNABAR MINERALIZATION
- 75 — FAULT (DASHED WHERE INFERRED)
- 80 50 — LINEATION OF SHEARS IN FAULT ZONE
- GRADATIONAL CONTACT
- HEAD OF INCLINED OPENING
- APPROXIMATE POSITION OF FOOT OF INCLINED OPENING
- APPROXIMATE POSITION OF CAVED SHAFT AT SURFACE
- TRACK
- INACCESSIBLE WORKINGS
- BUILDING
- A A' — LINE OF SECTION

BASE MAP SUPPLIED BY H. C. SMITH

GEOLOGY & ADDITIONAL WORKINGS BY PAUL AVERITT & G. DONALD EBERLEIN
U.S. GEOLOGICAL SURVEY

Minerals Production &
Processing Company,
Harrison Mine, Yolo Co.,
Calif.

3. (a) We propose to open the Lower January crosscut tunnel, and all main drifts off this level that are in the ore zones. The Lower January tunnel is 360 feet long; and according to statements of miners who worked on this level, there is approximately 400 feet of drifting on the orebodies. The main drifts off the level are not shown by Averitt on his map as we understand the workings were inaccessible when the map was made. We have, however, sketched on the map the approximate location of the drifts.

As we have no way of determining how much of the mine workings are caved we have based our estimate on the assumption that all workings we explore must be cleaned out and timbered.

The total estimated cost of opening 760 feet of crosscut and main drifts, including the cost of building and repairing roads, purchasing, transporting and installing mine equipment, laying surface pipe lines, erecting buildings, and rehabilitating the property in general, which must be done before the underground work can be started, is $55,119.48.

| | |
|---|---|
| Construction of buildings (See answer to Question 6) | $ 5,233.44 |
| Equipment to be purchased (see answer to Question 7) | 12,801.02 |
| Mine labor and superintendent, etc., 5 months (see answer to Question 8) | 24,674.65 |
| Geologist, part time, 4 months @ $200. mo. | 800.00 |
| Materials and supplies (see answer to Question 9) | 5,265.32 |
| Parts for mine equipment, etc. | 2,505.00 |
| Assaying | 300.00 |
| Hauling equipment and supplies | 1,500.00 |
| Office supplies | 240.00 |
| General expenses | 1,800.00 |
| Total cost of project | $55,119.48 |

(b) The time required to start the project and complete it will be eight months.

Minerals Production &
Processing Company,
Harrison Mine, Yolo Co.,
Calif.

4. See Averitt's Map attached

Minerals Production &
Processing Company,
Harrison Mine, Yolo Co.,
Calif.

5. List of installations on Harrison Property. The equipment, however, will not be used under an exploration project.

1 - 6' x 14' oil tank
1 - Wooden frame building (housing plant) partially dismantled
1 - 6" x 9" Risdon Iron Works Blake type crusher
1 - Allis-Chalmers 10 HP motor
1 - Flat pulley on counter shaft - drive pulley for rock crusher
1 - Troughing conveyor feeder - 11' x 16", mounted on channel iron frame, head and tail pulley and 3 rolls. (Belt worn out)
1 - 44' x 2½' Sorocto Rotary Kiln, with fire and feed on upper end. Kiln is driven by a 10 HP Allis-Chalmers motor, with V belt drive to Rober gear reducer, with spear gear to kiln.
1 - American Blower connected to dust cyclone, on lower end of kiln. Discharge of blower is 9' x 14'. Dust cyclone is 10' high by 3½' in dia.
1 - Condenser system, 9 complete units, ¼" plates, mounted on ID frame
1 - 9' x 15" redwood tank
1 - Iron Chimney
1 - Hoeing table
13 - Mercury pots
1 - Power unit, gasoline engine (junk)
1 - Gardner 6 x 6 air compressor (very old)
1 - D-retort

Note: All units in the plant are in good shape, except the power unit & compressor

Other equipment on the property consists of the remains of a Scott furnace, several D-retorts, an air receiver, and several frame buildings that are beyond repair.

Minerals Production &
Processing Company,
Harrison Mine, Yolo Co.,
Calif.

6. Buildings to be erected on property:

| | |
|---|---|
| Blacksmith Shop & Timber Framing Shed - 14' x 20', wooden frame and aluminum sheeting, with labor and supervision costs included - | $ 866.58 |
| Compressor Room - 14' x 20', wooden frame and aluminum sheeting, with labor and supervision costs included - | 927.33 |
| Office & Storage Room - 12' x 18' - wooden frame and aluminum sheeting, complete with drafting board, desk, heater, and labor and supervision costs included - | 1,638.60 |
| Change Room - 10' x 12', wooden frame and aluminum sheeting, complete with hot water heater, heater, plumbing, etc., and labor and supervision costs included - | 1,800.93 |
| Total - | $5,233.44 |

Labor cost of erecting the above buildings is figured at 60% of the material cost (building contractor's estimate)

Minerals Production &
Processing Company,
Harrison Mine, Yolo Co.,
Calif.

7. Equipment:

| | |
|---|---|
| (a) Rental of Cat-dozer, with operator, fuel and maintenance (for 30 days) (contract) - | $ 1,182.72 |
| (b) Late model Chevrolet 3600 truck, 1½-2 job, (flatbed) - | 3,347.50 |
| I-R 365 cu.ft. compressor, diesel driven - | 4,120.00 |
| Sullivan Mucking machine - | 2,317.50 |
| 1 - 4' x 10' air receiver - | 257.50 |
| 5 - 1 ton ore cars (end dump) @ $100.00 per car - | 515.00 |
| 5½ Ton 16# rail @ $100.00 per ton - | 566.50 |
| Fish plates (for 16# rail) - | 15.45 |
| Track bolts " " " - | 20.60 |
| 1 - Gardner-Denver D55 jackhammer - | 154.50 |
| 1 - Utility blacksmith forge - | 51.50 |
| 1 - 150# anvil - | 30.90 |
| 1 - Bench vice - | 36.05 |
| 1 - Pipe vice - | 15.45 |
| 1 - Acetylene welding outfit - | 154.50 |
| 1 - Soldering torch - | 15.45 |
| Total - | $12,801.02 |

Minerals Production &
Processing Company,
Harrison Mine, Yolo Co.,
California.

8.

| Labor and Supervision: | Gross Earnings per month |
|---|---|
| 1 General Superintendent @ $500.00 per month - | 500.00 |
| 1 Mine Foreman & Master Mechanic @ $400.00 per month - | 400.00 |
| 1 Mine Accountant @ $350.00 per month - | 350.00 |
| 4 Timbermen - rate $1.60 per hour (371.20 per month) - | 1,484.80 |
| 2 Mucking machine operators - rate $1.60 per hour (371.20 per month) - | 742.40 |
| 2 Trammers - rate $1.50 per hour (348.00 per month) - | 696.00 |
| 1 Surface man (timber framer & compressor maintenance) rate $1.50 per hour, (348.00 per month) - | 348.00 |
| | $ 4,521.20 |
| Compensation Insurance - per month (estimated) | 413.73 |
| Total - per month | $ 4,934.93 |

Geologist (part time) $200.00 per month

Minerals Production &
Processing Company,
Harrison Mine, Yolo Co.,
Calif.

9. Materials & Supplies:

| Item | | Cost |
|---|---|---|
| 9312 bd.ft. 6 x 6 timber @ $80.00 - | | $ 767.31 |
| 18000 bd.ft. lagging @ $80.00 - | | 1,483.20 |
| 964 bd.ft.4x6 @ $80.00 (for ties) - | | 79.33 |
| 500 mine wedges @ 4¢ - | | 20.60 |
| 2 kegs. - Nails @ $45.00 - | | 92.70 |
| 2410' - 2" Pipe @ .51¢ per foot - | (new) | 1,265.97 |
| 960' - 1" Pipe @ .24¢ per foot - | " | 299.52 |
| 760' - 8" vent pipe @ .25¢ per foot - | " | 195.70 |
| Misc. 1" & 2" pipe fittings | | 61.80 |
| 1 set - 7/8" hex. jackhammer steel - | (new) | 17.93 |
| 1 - Oiler - | | 7.73 |
| 4 doz. - Jackbits @ .45¢ each - | (new) | 22.25 |
| 200' - 1" Air hose @ .60¢ per ft. - | " | 123.60 |
| 200' - ½" Water hose @ .50¢ per ft. - | " | 103.00 |
| Misc. air & water hose connections - | | 25.75 |
| 100 lbs. - Track spikes (for 16# rail) - | " | 41.20 |
| 1 - Jimcrow - | | 15.45 |
| 2 - 4' Crosscut saws - | (new) | 14.42 |
| 2 - Mine axes - | " | 8.49 |
| 2 - Wrecking bars - | " | 5.30 |
| 1 - Combination square - | " | 1.04 |
| 1 - 100' Steel tape - | " | 10.88 |
| 5 - Scaling bars @ $5.00 each - | | 25.75 |

Minerals Production &
Processing Company,
Harrison Mine, Yolo Co.,
Calif.

9. Materials & Supplies:

| Item | | Cost |
|---|---|---|
| 2 - 14" Stillson wrenches - | (new) | $ 5.92 |
| 3 - 18" " " - | " | 12.58 |
| 3 - 24" " " - | " | 15.91 |
| 1 - Heavy duty pipe cutter - | " | 9.28 |
| 1 doz. - Drifting picks @ $1.35 - | " | 16.69 |
| 1 doz. - Drifting pick handles @ $1.30 | " | 16.07 |
| 1 doz. - Round point shovels @ $3.25 - | " | 40.17 |
| 1 doz. - Round point shovel handles @ $1.45 - | " | 17.92 |
| 3 - 12# Hammers @ $4.95 - | " | 15.30 |
| 3 - 8# Hammers @ $3.95 - | " | 12.21 |
| ½ doz. - Singlejack hammers @ $3.15 - | " | 19.47 |
| 1 doz. - Singlejack handles @ .60¢ - | " | 7.42 |
| 1 doz. - Sledge handles @ $1.25 - | " | 15.45 |
| 1 - Adge - | " | 5.61 |
| **Shop Tools:** | | |
| Misc. blacksmith tools (hammers, tongs, etc.) | | 25.75 |
| 1 - Hacksaw frame - | (new) | 2.01 |
| 6 doz. - Hacksaw blades - | " | 6.23 |
| 6 doz. - Files (various types ) - | " | 54.04 |
| 1 - 29 piece socket set - | " | 27.55 |
| 1 - 6 piece set open end wrenches - | " | 4.83 |
| 1 - 8" Crescent wrench - | " | 1.60 |
| 1 - 12" " " - | " | 2.94 |
| 1 - 15" " " - | " | 4.55 |
| 1 - 18" " " - | " | 7.41 |

Minerals Production &
Processing Company,
Harrison Mine, Yolo Co.,
Calif.

9. Shop Tools, continued

| Item | | Cost |
|---|---|---|
| 1 - Machinist's screwdriver - | (new) | $ .78 |
| 1 - General purpose screwdriver - | " | .93 |
| Carpenter's Tools: | | |
| 1 - Steel square - | (new) | 3.36 |
| 1 - Ratchet bit brace - | " | 6.80 |
| 7 - Wood bits, size 1/8" to 1/2" - | " | 6.90 |
| 2 - Claw hammers - | " | 6.53 |
| 1 - Aluminum level - | " | 9.12 |
| 1 - Crosscut hand saw - | " | 7.73 |
| 1 - Rip Saw - | " | 7.16 |
| 1 - 4 piece chisel set | " | 5.13 |
| 1 - General purpose plane - | " | 10.25 |
| Misc. stock - | | 164.80 |
| Total - | | $5,265.32 |

Other Items:

| | |
|---|---|
| Parts for mine equipment and truck, overhauling mine equipment and truck in outside shops, diesel fuel, gasoline, oils and greases - | 2,505.00 |
| Assaying - At least 100 Mercury determinations @ $3.00 each - | 300.00 |
| Hauling equipment and supplies to mine - | 1,500.00 |
| Office Supplies - | 240.00 |
| General Expense - | 1,800.00 |

Minerals Production &
Processing Company,
Harrison Mine, Yolo Co.,
Calif.

10.
(a) We are prepared to invest twenty-five per cent of $55,119.48, the total cost of the project.

(b) Yes

11. Before deciding upon the Harrison Quicksilver Mine we investigated other quicksilver properties and deposits in California and Nevada; but from information given us by reliable men who formerly worked in the Lower January tunnel of the Harrison, we believe that the property has more chance of becoming a productive mine than the others we examined. These men state that ore exists in the lower drifts of the mine, particularly, in the SE drift in the No. 1 ore zone, and that ore continued below the level.

It is reported that in the past the Harrison Mine was worked intermittently by small companies, and individuals who did not have the necessary capital to develop the mine; and on numerous occasions a drop in the price of mercury shut the mine down.

We are convinced that sufficient capital and efficient management will prove that the known Harrison orebodies contain commercial ore, and that new orebodies will be discovered.

Form MF-103
(Revised June 1951)

UNITED STATES DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION

Budget Bureau No. 42-R1035.1.

MF-103 Should Be Filed With General Technical Data Form MF-100

RECEIVED NOV 7 1951 Defense Minerals Administration

# APPLICATION FOR AID FOR AN EXPLORATION PROJECT PURSUANT TO MINERAL ORDER 5, UNDER DEFENSE PRODUCTION ACT OF 1950

*Not To Be Filled in by Applicant*

Docket No. dma 2218
Metal or Mineral
Date Received 11-7-51
Amount $
Participation (Government %)

Name and address of applicant

Minerals Production & Processing Company,
139 No. Virginia St.,
Reno, Nevada.
Address Correspondence to
Mr. Oscar A. Giese,
55 Montecito Rd., Walnut Creek, Calif.

Date November 1, 1951

If you have already filed MF-100, give date filed ....., type of assistance requested .....,

DMA Docket Number (if available) .....

## INSTRUCTIONS

Read Mineral Order 5, Regulations Governing Government Aid in Defense Projects, before completing this application. Submit four copies each, of the signed application form, General Technical Data Form MF-100, and answers to questions as specified, to Defense Minerals Administration, Department of the Interior, Washington 25, D. C., or to the nearest field executive office thereof, with your name and address on each sheet of the application and all accompanying papers. If you have previously filed MF-100, it is not necessary to file it again. However, you should indicate in space provided above the type of assistance previously applied for (loans, procurement contracts, etc.) and DMA Docket Number, if available. *When a question is inapplicable it should be so stated in the form.* Additional sheets should be attached in answering any questions or in supplying additional information. IF YOU CANNOT ANSWER A QUESTION, SO STATE.

1. (*a*) Give a description of the real property that will be in any way involved in the exploration project, including any existing mine or operating property.

   (*b*) If you are not the owner of the property, submit a copy of the lease, purchase option, or other agreements under which you are authorized to operate the property with each copy of your application.

   (*c*) Give the legal description of the exact parcel, plot, or area upon which the exploration is to be conducted.

   NOTE: (1) If both areas are the same, so state. The only obligation to repay the Government is from the net earnings from any commercial discovery made in the area specified in (*c*) above in which the exploration is to be conducted, and the expenditure of funds which may be charged as costs of the project must be limited to that area or to work necessary to perform the exploration in that area.

   (2) If applicant is not the owner of the property or if there are any liens or encumbrances against the property, copy of agreements of claimants, lienors, encumbrances, and lessors subordinating their interests in the property to the interest of the Government under the Exploration Project Contract will be required for attachment to the Contract.

2. (*a*) What metals or minerals do you expect to find?

   (*b*) Furnish statement of the geologic features of your property, giving type of ore deposit and reasons for expecting to find commercial ore bodies. Illustrate with maps or sketches. If you have a geologic or engineering report, or assay maps showing width and grade, please send them with application, stating whether or not you wish to have them returned.

The information requested in questions 3, 4, 5, 6, 7, 8, and 9 below should be answered specifically and in detail, as this information will be attached to and incorporated as part of the Exploration Project Contract, if such contract is entered into with you by the Government.

ANSWER EACH QUESTION ON SEPARATE SHEETS OF PAPER AND SUBMIT A COPY OF EACH ANSWER FOR EACH COPY OF YOUR APPLICATION.

3. (*a*) Describe fully the proposed work and give the total cost of the project.

   (*b*) State the time required to start the project and to complete it.

4. Submit a map or sketch of the property involved showing a plan (and cross section, if needed) of the present mine workings and the *location of the proposed exploration work* as related to geologic features, such as contacts, veins, ore-bearing beds, etc.

5. Furnish an itemized list of existing facilities, buildings, installations, and fixtures with a statement of the cost of any necessary rehabilitation or repairs to put into useful and operable condition.

6. Furnish a detailed list of additional facilities, buildings, and fixtures to be purchased, installed, or erected by you, with the estimated cost of each item.

7. Furnish a detailed list of operating equipment, separated into items to be—

   (*a*) Rented

   (*b*) Purchased

   (*c*) Furnished by you

   with the rental, purchase price, or depreciation of each item, as the case may be, to be charged as a cost of the project.

8. Furnish an itemized schedule of labor, by numbers and classes (miners, muckers, etc.) and of supervisors by numbers and positions, with the maximum wages or salaries to be paid to each.

9. Furnish a detailed list with estimated cost of each item for materials, supplies, engineering, assaying, accounting, power, water, utilities, and any other items not provided for above.

10. (*a*) How much are you prepared to invest in the proposed project?

    (*b*) Is this amount sufficient to pay your part of the cost of the project, in accordance with the regulations on Government participation (Sec. 9 of MO-5)?

11. State any conditions or circumstances regarding the property not sufficiently brought out by the foregoing questions.

## CERTIFICATION

The undersigned company, and the official executing this certification on its behalf, hereby certify that the information contained in this form and accompanying papers is correct and complete to the best of their knowledge and belief.

**Minerals Production & Processing Co.**
(Name of company)

By Oscar A. Giese
(Signature of authorized official)
**Oscar A. Giese**

**November 1, 1951.**
(Date)

**Secretary**
(Title)

**Title 18, U. S. Code (Crimes), Section 1001, makes it a criminal offense to make a willfully false statement or representation to any department or agency of the United States as to any matter within its jurisdiction.**

U. S. GOVERNMENT PRINTING OFFICE 16—64067-2

Minerals Production &
Processing Company,
Harrison Mine, Yolo Co., Calif.

1. (a) The N.W.¼ of the N.W.¼ of Sec. 36, Township 12 North, Range 5 West, M.D.M. (except for about 8 acres which is included in what is commonly known as the Soda Spring Mine) containing 32 acres more or less.

The East ½ of the N.E.¼ of Section 35, Township 12 North, Range 5 West, M.D.M. containing 80 acres more or less; and a small adjoining parcel of land on which is located a spring of water, and being described as follows:

BEGINNING at the S.E. corner of the N.E.¼ of said Section 35, thence North 500', thence West 200', thence South 500' and thence East 200' to the place of beginning. Containing 2 acres more or less.

(b) A copy of the lease is submitted with each copy of our application.

(c) Exploration will be confined to the Harrison Mine which is a part of the real property described in (a).

2. (a) Mercury

(b) Refer to report by Frederick D. Hanson, E.M.

Refer to map by Paul Averitt & G. Donald Eberlein USGS

No assay maps showing width and grade have been found.

# MINERAL LEASE AND OPTION

THIS AGREEMENT, made the first day of September, 1951, by and between VERNE W. HARRISON, VINCE L. HARRISON, MADGE J. HARRISON, and RUBY A. SNIDER, hereinafter called the parties of the first part, and MINERALS PRODUCTION AND PROCESSING COMPANY, hereinafter called the party of the second part.

WITNESSETH:

THAt whereas, the parties of the first part are the owners and in possession of that certain property, commonly known as the Harrison Mine, hereinafter described, and are willing to lease the same; and

WHEREAS, the party of the second part is willing to lease work and develop the same, upon the terms and conditions hereinafter stated.

NOW, THEREFORE, in consideration of the payment of the royalty hereinafter provided, and of the faithful and timely performance by the party of the second part of the conditions, covenants and agreements hereinafter contained, the parties of the first part do hereby lease and let for mining purposes unto the party of the second part all that certain real property, situate in the County of Yolo, State of California, and particularly described as follows, to wit:

> The N.W. ¼ of the N.W. ¼ of Sec. 36, Township 12 North, Range 5 West, M.D.M. (except for about 8 acres which is included in what is commonly known as the Soda Spring Mine) containing 32 acres more or less.

The East ½ of the N.E.¼ of Section 35, Township 12 North, Range 5 West, M.D.M. containing 80 acres more or less; and a small adjoining parcel of land on which is located a spring of water, and being described as follows:

BEGINNING at the S.E. corner of the N.E. ¼ of said Section 35, thence North 500', thence West 200', thence South 500' and thence East 200' to the place of beginning. Containing 2 acres more or less.

for the term commencing September 1, 1951 and ending September 1, 1961, for a period of ten (10) years.

The parties of the first part hereby grant to the party of the second part an option to extend the terms of this lease for an additional period of ten (10) years, to commence at the expiration of the term herein granted, upon the same terms and conditions as herein stated. In the event the party of the second part shall fail to give the parties of the first part a written notice of election to exercise this option for a ten-year extension of this lease within ninety days prior to the expiration hereof, this option shall become null and void.

MINERALS PRODUCTION AND PROCESSING COMPANY, the party of the second part, shall pay to the parties of the first part within five (5) days after receipts or returns are received from the burning, milling or disposition of Mercury or other precious metals obtained from said property, and from each shipment of Mercury or other precious metals, Seven and one-half per cent (7½%) of the gross proceeds obtained from said property as a royalty. The party of the second part shall make any and all royalty payments to the Bank of America, Lower Lake, State of California, and shall send duplicate deposit slips to Verne W.

Harrison, Lower Lake, California, or to any other person that may be designated by the parties of the first part.

It is further mutually covenanted and agreed that when the party of the second part commences mining operations that the party of the second part shall pay to the parties of the first part a minimum royalty of not less than One Hundred Dollars ($100.00) per month, commencing six months after date hereof. Payments to be made on the first day of each month.

And it is further mutually covenanted and agreed as a part of the terms and conditions of this agreement as follows:

1. The party of the second part shall have six (6) months from the date hereof to do such examination and exploratory work as may be desired, free from any and all obligations.

2. The parties of the first part agree that the party of the second part may enter upon said mines or premises and work the same, in a manner necessary to good and economical mining, so as to take out the greatest amount of commercial ore possible, with due regard to the safety, development and preservation of the said premises as a workable mine.

3. Beginning March 1, 1952 the party of the second part shall employ at least five (5) men working twenty-five (25) shifts to the man each calendar month.

4. The party of the second part shall promptly pay all bills incurred for labor or materials, or other purposes in connection with working of said mining property, and shall post and keep posted such notices of non-responsibility as may be furnished to him by the parties of the first part.

5. The party of the second part agrees to insure so as to

protect the parties of the first part against all liability for accident or death under the Workmen's Compensation Act.

6. All work done by the party of the second part shall be performed in a good, minerlike manner, and in accordance with the laws of the State of California, and the lawful orders of the State Mine Inspector, and other duly constituted agencies of said State.

7. The party of the second part shall keep full and accurate account and records of all development work performed upon said property, and all ores and mineral products taken therefrom, and disposed of by the party of the second part, and shall afford the parties of the first part free access to all mine workings as long as this does not interfere in any way with the operation of said property. The parties of the first part shall have the right to be present at any and all cleanups.

8. The party of the second part shall furnish the parties of the first part, at their request, copies of all maps, geological reports, assay certificates and all data, including the results of any diamond drilling upon said property.

9. The parties of the first part agree that all equipment and tools brought to or placed upon said premises by the party of the second part shall not become fixtures; but shall remain the property of the party of the second part; provided that such removal shall be made within thirty (30) days from the abandonment, forfeiture or expiration of this lease, and if not so removed shall become a part of the realty. All buildings and structures on the

surface and timber in place underground shall become a part of the realty.

10. The parties of the first part agree that they will pay all taxes that are now due upon said property, and to pay before delinquency all taxes that hereinafter may be levied upon or assessed against said real property. The party of the second part agrees that he will pay before delinquency all taxes that may hereinafter be levied upon or assessed against any personal property on said premises.

11. The parties of the first part hereby grant to the party of the second part an easement for road purposes over and across their lands so that the party of the second part in conducting operations contemplated by the agreement, shall have a convenient way to travel between the said premises and Knoxville, and between the said premises and Lower Lake, and also an easement for the purpose of conveying water for use in the operation of the plant, mine and for domestic purposes, and the further right to use and occupy said premises for the purposes of storing and maintaining equipment, housing the same, and erecting buildings necessary for the conduct of the business and for the purpose of dumping ore and minerals.

12. The parties of the first part hereby grant to the party of the second part, easements over the real property to lay and maintain pipe lines to convey water; and the party of the second part hereby grants to the parties of the first part the right of grazing stock upon and driving stock over said real property, but without risk or liability to the party of the second part. The party of the second part may fence off land unused by

the parties of the first part to keep livestock away from any dangerous area.

13. In the event ore is not found in paying quantities or in the event ore that is profitable to mine should become exhausted, the party of the second part shall have the right to abandon the property and this lease and option shall be at an end and of no further force or effect.

14. In the event title defects should exist, the parties of the first part agree to cure such defects within a reasonable time and at their own expense.

15. The party of the second part shall have the right to assign this lease and option to others, who shall also be bound thereby. If the party of the second part violates or fails to comply with any of the provisions hereof, then, and in that event, this lease shall terminate, and all rights of the party of the second part hereunder shall cease, and all payments heretofore made hereunder shall be retained by the parties of the first part as full compensation as rental for the use and occupancy of said property, as the consideration for which this agreement is executed and as liquidated damages.

16. The party of the second part agrees to keep the property free and clear of all liens, attachments and encumbrances of any kind, and to that end the parties of the first part may post, file and record the proper notices, giving notice to all persons of the ownership of the parties of the first part, and the protection by him of all liens and claims of all persons.

17. In case of default in any provision herein contained by the party of the second part, the parties of the first part shall notify said party of the second part, in writing, of such default, and should the party of the second part fail or refuse to cure such default within thirty (30) days after the receipt of such notice, then the parties of the first part shall have the right to cancel this agreement by notice in writing.

Such termination shall not relieve the party of the second part from his obligation to pay all sums accrued and payable by the party of the second part to the parties of the first part at the time of such termination; and the party of the second part upon any such termination, shall execute a quit claim deed, quit-claiming to the parties of the first part any interest that the party of the second part may have acquired in the said premises.

18. This lease and option shall bind and inure to the benefit of the heirs, executors, administrators and assigns of all parties hereto.

TIME SHALL BE THE ESSENCE OF THIS AGREEMENT.

IN WITNESS WHEREOF the parties have hereunto set their hands and seals this day and year first above written.

(Sgd.) Verne W. Harrison
VERNE W. HARRISON

(Sgd.) Vince L. Harrison
VINCE L. HARRISON

(Sgd.) Madge J. Harrison
MADGE J. HARRISON

(Sgd.) Ruby A. Snider
RUBY A. SNIDER

Parties of the First Part

MINERALS PRODUCTION AND PROCESSING COMPANY,
A Corporation

(Sgd.)
By Oscar A. Giese
OSCAR A. GIESE, Secretary

Party of the Second Part

PRELIMINARY REPORT
HARRISON QUICKSILVER MINE
KNOXVILLE DISTRICT
CALIFORNIA

FOREWORD

The purpose of this examination was to determine if the geologic set-up of the Harrison Property justifies its exploration. Since the underground workings are entirely inaccessible an opinion must be based on observable surface geologic features on the property itself, on its position in the district relative to the more productive mines and the geologic features which localized them, and on available literature.

My conclusions are based on field work at the property and in the district on Sept. 24th and 25th, 1951, and on a study of the maps and reports by Mr. Paul Averitt of the USGS as published in the California Journal of Mines and Geology, Vol. 41, No. 2, April 1945. It is recommended that this publication be available when this report is read.

CONCLUSIONS

It is my opinion---based on the criteria mentioned above---that the Harrison Property merits a cautious, step-by-step exploration program which would be a legitimate project for a government loan or loans.

RECOMMENDATIONS

The first step should be the re-opening of the Lower January tunnel. It can then be determined if early production can be expected or if new exploration and development is needed. Since it cannot be foretold in advance if such work is justified, whether it can best be accomplished by diamond drilling or by underground workings, or the footage of such work required and its location, it would seem advisable to restrict the loan application to the funds required for the tunnel re-opening and associated work. The program would be as follows:

1. Rental of bulldozer to repair bad stretches of the present road, and to construct the short segments necessary to allow trucks to reach the portal of the Lower January tunnel and the mill. Possible subsidiary work to secure enough flat ground near the portal for the compressor and necessary shop and storage housing. Prospecting trenches across the ore zones beyond the

limits of underground workings. Replace the old pipe line from the spring to the lower January tunnel.

2. Re-opening of the 360 foot Lower January tunnel, the main drift on the ore zones, and such connecting workings as seem essential because of geological indications or operating necessities. This work would involve the purchase of a compressor, mucking machine, mine cars, rail, pipe, timber, tools, a truck, etc.

3. Such minor workings and timbering as are needed to adequately expose for examination and sampling any ore showings and promising leads which are exposed in the re-opened workings.

4. Appraisal of the results of the above work to determine if additional exploration and/or development is justified or needed, and if so, whether it can best be done by underground workings, underground diamond drilling, surface diamond drilling, or new openings.

PROPERTY

The Harrison Property is located in the Knoxville Mining District in Yolo and Napa counties, California. It is situated in T.11 N., R.5 W., and consists of the E½ of the NE¼ of Sec.35, the NW¼ of the NW¼ of Sec.36, except for about 8 acres constituting the Soda Springs prospect, and a rectangular parcel of 500' N and S and 200' E and W located in the SE corner of Sec.26. All this is contiguous and totals 117 to 118 acres.

ACCESS

The property lies about 3/4 mile north of the county road between Lower Lake and Monticello at a point about 2½ miles NW of Knoxville and 17½ miles SE of Lower Lake. At present a car can be driven to within a few minutes walk of the workings, but the open pit of the last operation has destroyed a short segment of the road so that from 100 to 200 yards of new road is needed to connect with the road to the portal of the Lower January tunnel. A minor amount of repair is also needed on the intact portions.

OWNERSHIP

The mine is owned and/or controlled by Verne and Vince Harrison of Lower Lake and vicinity. I have not examined the lease or purchase agreement.

FACILITIES

Former operations depended on a spring on the small parcel of land in Sec. 26. The flow of the spring was not determined, but can be presumed to be sufficient for compressor cooling and drilling purposes.

Electric power for furnace and permanent plant can be secured by about 3700 feet of power line.

Equipment on the property includes a 30 ton rotary furnace with accessory condensers, fans, etc. This plant seems to have had little use and to be in good shape.

Other items noted were an air receiver, several D- retorts, one of which is in good shape, and several frame buildings in bad repair near the portal of the Lower January tunnel.

HISTORY

The recorded production of the Harrison Mine through 1943 is given as 345 flasks. Total production is allotted to three periods of activity, as follows:

1. A small unrecorded production prior to 1900.

2. 263 flasks during World War I period of 1917, 1918 and 1919. A concentrating plant was in operation during this period, but the production also includes that from retorted high-grade. Most of the underground work was done during this period.

3. 82 flasks (plus a few unrecorded flasks) in the period 1936 to 1940, inclusive. Most of the ore came from the open pit; it is said that no underground work was done.

DISTRICT GEOLOGY

The following account is taken largely from Mr. Averitt's report or inferred from his maps and descriptions. My own observations are limited to the Harrison Property, to a walk from that property to the county road below the Reed Mine, and to a "circumnavigation" of the district by auto.

The backbone of the district is a large dike-like mass of serpentine from 3/4 to 3-3/4 miles wide which extends across the district in a broad curve convex to the NE. The serpentine includes large and small inclusions of the Franciscan formation, and is encased in sediments of the Knoxville formation of Jurasso-Cretaceous age. Near the north end of the district the serpentine outcrop widens to the NE by about 1½ miles as a series of irregular but more or less connected and parallel bodies. The Reed Mine---the northernmost in the district---is located along the NE contact of the easternmost and largest of these subordinate serpentine masses. At the south end of the Reed the serpentine and the mineralized fault zone which follows its contact terminate along an E-W fault. The mineralized fault zone reappears about 3/4 mile to the west on the Harrison Property, but is here along the NE contact of the westernmost of the subordinate serpentine

bodies and lies about ¼ mile east of the main arcuate mass. The Harrison serpentine tapers out to the SE, but the fault zone continues through the Manhattan property with Franciscan formation on its west side, but is largely covered by Tertiary volcanics consisting of basaltic flows and tuffs and rhyolitic tuffs. Basaltic dikes and necks are also exposed. The fault zone rejoins the serpentine contact about ½ miles above the Knoxville Mine, near which it makes a rather sharp bend to a more NW strike. Except for the cross faulting bounding the upthrust slice in which the Knoxville mine is located the fault zone is continuous from the Knoxville to beyond the Harrison where it is offset eastward to the Reed Mine. Ignoring this offset it may be said that all of the mines of the district except the Red Elephant are located along the fault zone which follows the NE contact of the serpentine mass as a whole.

The area between the serpentine and a line drawn between the Reed and Knoxville Mines forms a roughly triangular shaped sedimentary re-entrant or embayment in which are exposed stratigraphically lower beds of the Knoxville formation than to the north and south. It is also the intersection point of the NNW and WNW striking faults which determined the trend of the ends of the arcuate curve, of the N 40 to 50 W fault zone following the serpentine contact in this area, and of NE trending faults and fractures roughly at right angles to the last mentioned set. Also, on the Manhattan property south of the Harrison is the district center of intrusion and extrusion of Tertiary magma. All of these facts must be genetically related. It may be surmised that the uplift of the serpentine was caused by the intrusion of the Tertiary magma, but that in the complex fault intersection area this magma could work its way through to the surface; its propulsive power was thus lost, and the fault block was not elevated to the same extent as those outside the zone of magmatic "leakage."

The Reed and Knoxville Mines, each just outside of the limits of the embayment and at about equal distances on each side of the volcanic area of intense cross faulting undoubtedly owe their size to their geologic location. Cross faults were far enough spaced so that the horizontal length of the contact fault zone to which the solutions were confined was exceptionally large and the depth interval accessible to mining was far enough above the magmatic source of the solutions so that the zone of rich cinnabar deposition was well developed.

In the intervening Harrison-Manhattan area opposite conditions prevailed, conditions favoring the dispersion of the magma and its mineralizing solutions, and the formation of a large number of relatively small orebodies instead of big continuous bodies. These conditions are: the splitting of the main contact fault zone into at least three strands, the closely spaced cross faulting, the intricately sheared serpentine, and the thick shale horizon between two of these strands. The effect of the closely spaced cross faulting is shown by the fact that both the basalt and the bodies of "silica-carbonate" rock or "opalite" which forms the gangue of the cinnabar deposits occur

at fault intersections as pipe-like bodies, or as relatively short dikes or tabular bodies bounded by cross faults.

The advantage of the big continuous orebody from a development, mining, and cost standpoint is of course undeniable, but this does not mean that an operation based on mining smaller orebodies will not be profitable if these bodies are closely enough spaced, and frequent enough, and if geological guides to their occurrences are developed. No attempt is made here to explain away the vast discrepancy between the past production of the Harrison Property and the Reed and Knoxville Mines, nor the concomitant discrepancy in the size and continuity of the respective bodies of silica-carbonate rock. However, I do not believe that the productive potentiality of the Harrison Mine can be fairly judged by the size and number of exposed orebodies. I would expect development to disclose a large number of more or less similar bodies, many of which would have no observable expression at the present surface, and might in consequence be unusually rich. There would also be the constant possibility of encountering larger orebodies under geologic conditions not apparent at the surface. For instance, there is some reason for expecting the dip of the fault zones to flatten with depth.

The sizeable production of the Manhattan Mine cannot be used as an argument for the Harrison since the bulk of the Manhattan production came from the surface volcanics, and these were eroded from the Harrison Property except for a few residual patches. The mineral content of the extruded magma is lost, but under the dispersive influences mentioned previously it would seem that sufficient must have terminated at depth to make a large total volume of mineralization. Also, until the Harrison workings are re-opened, we do not know the frequency, size, grade or continuity of the orebodies extracted from them, or still exposed.

GEOLOGY AND DEVELOPMENT AT THE HARRISON PROPERTY

Two ore zones have been exposed on the Harrison Property (excluding the Soda Springs prospect) both of which lie along the NE or hanging wall sides of parallel serpentine dikes which probably unite at the north end of the property. The Main, Footwall, or No. 1 ore zone follows the hangingwall of a serpentine body some 600 feet wide. This is the SE tip of the first subordinate serpentine body on the NE side of the main mass. The contact strikes about N 45 W and dips about 65 degrees to the NE. Intense shearing and fracturing extends over a total width of perhaps 250 feet, and embraces both the serpentine and the Knoxville sandstone and shale in its hanging wall. Averitt's map shows five individual bodies of silica-carbonate rock. Mapped lengths average about 30 feet and the average width is perhaps 10 to 15 feet. Forstner's report in 1917 when the underground drifting was in progress states that the vein was from 8 to 15 feet wide.

Two of the five bodies shown by Averitt occur at the surface in the area of the present open pit, and only small vestiges can be seen. Averitt's map shows that the combined width of the two parallel, and probably connected bodies was about 40 feet. This open pit is at the SE end of the developed portion of the ore zone as now exposed. I do not know whether underground workings extended beyond it to the SE. On the north brim of the pit is the collar of the caved vertical shaft of some 125 feet depth which is said to have connected most of the underground workings. The Plant tunnel is about 80 feet to the NW of the shaft, is about 70 feet long, and had at least 80 feet of drift. The portal of the Upper January tunnel is about 50 feet farther NW. This tunnel is at an elevation of 1801 feet, is about 70 feet long, and in 1917 was said to have 150 feet of drift to the NW, and 100 feet to the SE. At the time of Averitt's visit only about 70 feet of tunnel drift was accessible, that part leading to the upper end of the inclined raise from the Lower January tunnel. This latter tunnel was the main opening of the workings. The portal is at an elevation of 1660 feet - 140 feet below the Upper January tunnel. It is 360 feet long and the only working shown on Averitt's map is the inclined raise mentioned above. Forstner's brief report in 1917 stated that the vein was being drifted on from this tunnel, and since the main productive period came in 1919 it can be safely assumed that the ore zone was rather extensively explored on this level and above. Ordinarily it could also be safely assumed that all commercial ore was removed, but it is possible that falling prices stopped the operation before this could be done.

The No. 2 ore zone is roughly parallel to the No. 1, but lies about 300 feet NE of the latter, along or near the hanging-wall of a serpentine dike about 175 feet wide. A body of silica-carbonate rock about 50 feet long and 10 feet wide (Averitt's map) was exposed in the 70 foot Bat Tunnel which is about 34 feet higher in elevation than the Lower January tunnel, and nearly directly above it. A much smaller body of silica-carbonate rock was exposed in the Lower January tunnel, and some cinnabar is indicated on parallel shearing.

The rock between the two serpentine bodies is indicated as being Knoxville sandstone and shale---mostly high sheared and gougy. The No. 2 serpentine seems to include some Knoxville sandstone, thus suggesting that the serpentine was intrusive into the Knoxville formation. This would not affect the theory that the main mass with its Franciscan inclusions was upthrust into its present position after its emplacement.

The property includes a length of some 1600 or 1700 feet along the strike of the No. 1 and 2 fault zones.

The Soda Springs fault is essentially parallel to the No. 1 and 2 fault zones, and lies about 1000' east of the latter. The

intervening rock seems to consist almost entirely of shale of the Lower Knoxville formation, but the Soda Springs outcrop of silica-carbonate rock in conglomerate of the same formation, and this continues to the east with intercalations of sandstone. Although no signs of mineralization were observed in the shale it is believed possible that it may contain ore at greater depth, and may exercise a damming influence on ore in the No. 2 ore zone.

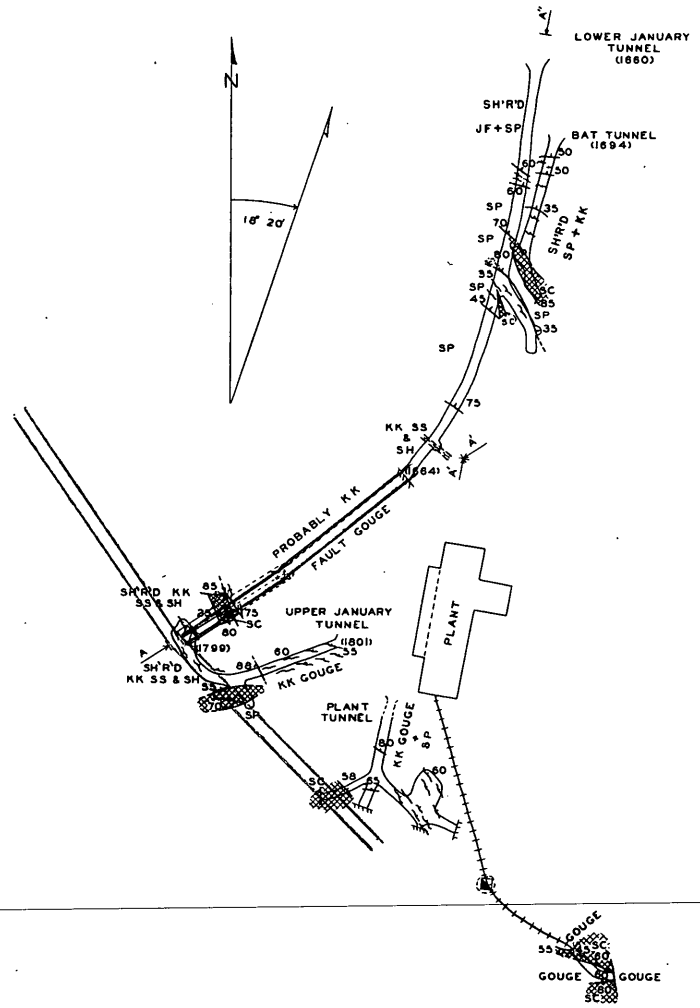
The conspicuous Soda Springs outcrop lies on a 8 acre tract not included in the present agreement, but said to be available later if wanted. The workings, casually visited by the writer---near the top of the outcrop---consist of a tunnel about 125 feet long with its portal at the SE end of the outcrop. Part way in, a tunnel about 5 feet lower in elevation converges with the main tunnel, and the two are connected with a winze-like opening. The floor of the workings then jumps up about 15 feet and emerges into a shaft opening to the surface. The workings mentioned above trend from N 10 E to N 12 W, but are associated at the north end with N 50 W shearing. The core of the mineralization is a dike or vein of the nearly all-black silica-carbonate rock which contains sulfides and cinnabar in small fractures. Silification and cinnabar-iron mineralization has branched out on diverging fissures, and the conglomerate country rock is locally intensely altered to a powdery mass, particularly between converging fractures. The average dip of the main vein is about 80 degrees to the east. It seems possible that this outcrop lies on a short segment of a member of the NNW striking system of faults, a segment caught between several strands of the N 50 W faulting. Production has apparently come from two or three narrow veins. No particular claims are made here about this particular outcrop---it was not even completely inspected, but the fault Zone it occupies may be important at greater depth.

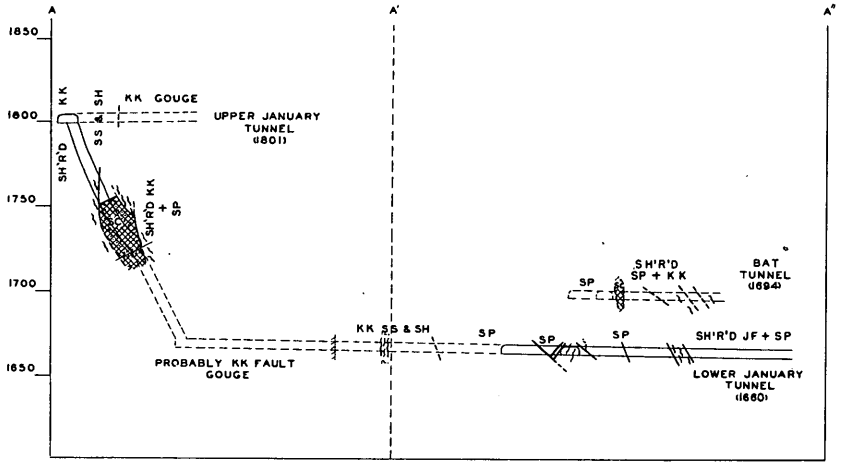
In general it is anticipated that commercial ore will extend to greater depth on the No. 2 ore zone than on the No. 1, and possibly to a greater depth on the Soda Springs zone on the No. 2. Thus the possibilities of the property are not exhausted even if exploration shows that commercial ore in the developed portion of the No. 1 zone bottoms at or near the Lower January tunnel level. The only indication of such an event was that a pile of course rejects from a hand sorting operation, and containing only occasional small veinlets and patches of cinnabar, was of a black and white mottled and streaked character which is believed to be lower grade than the all-black opalite, and to be zonally deeper. However, I understand that miners who worked in the mine have stated that ore continued below the tunnel level.

In conclusion it may be reiterated that my opinion that the exploration if the property may disclose a large number of more or less connected, relatively small orebodies is based on the presence of geological factors favoring the dispersion or splitting of the magma, and its mineralizing solutions into bodies of varying volume whose cinnabar zones will occur at varying depths. Thus ore may occur at depth horizons where the stronger intersections are occupied by noncommercial phases of the mineralization, or even by intrusive bodies. The smaller quantity of mineralization of the smaller branches may be counterbalanced by the greater retention afforded by traps at depth as compared with those near the surface. It must also be mentioned that the property suffers by comparison with its unusually large neighbors. If it were by itself its own present showings would be more impressive.

Frederic D. Hanson, E.M.

Nov. 1, 1951
Auburn, Calif.




# HARRISON MINE

## YOLO COUNTY, CALIFORNIA

25 0 25 50 75 100

SCALE IN FEET

DATUM IS APPROXIMATELY MEAN SEA LEVEL

SEPT. 1943

## EXPLANATION

- SC — SILICA-CARBONATE ROCK
- SP — SERPENTINE
- KK — KNOXVILLE FORMATION
  - SH — SH SHALE
  - SS — SS SANDSTONE
- JF — FRANCISCAN FORMATION
- CINNABAR MINERALIZATION
- FAULT (DASHED WHERE INFERRED)
- 75 — LINEATION OF SHEARS IN FAULT ZONE
- 60 50
- GRADATIONAL CONTACT
- HEAD OF INCLINED OPENING
- APPROXIMATE POSITION OF FOOT OF INCLINED OPENING
- APPROXIMATE POSITION OF CAVED SHAFT AT SURFACE
- TRACK
- INACCESSIBLE WORKINGS
- BUILDING
- A A' A" — LINE OF SECTION

BASE MAP SUPPLIED BY H. C. SMITH

GEOLOGY & ADDITIONAL WORKINGS BY PAUL AVERITT & G. DONALD EBERLEIN
U.S. GEOLOGICAL SURVEY

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3. (a) We propose to open the Lower January crosscut tunnel, and all main drifts off this level that are in the ore zones. The Lower January tunnel is 360 feet long; and according to statements of miners who worked on this level, there is approximately 400 feet of drifting on the orebodies. The main drifts off the level are not shown by Averitt on his map as we understand the workings were inaccessible when the map was made. We have, however, sketched on the map the approximate location of the drifts.

As we have no way of determining how much of the mine workings are caved we have based our estimate on the assumption that all workings we explore must be cleaned out and timbered.

The total estimated cost of opening 760 feet of crosscut and main drifts, including the cost of building and repairing roads, purchasing, transporting and installing mine equipment, laying surface pipe lines, erecting buildings, and rehabilitating the property in general, which must be done before the underground work can be started, is $55,119.48.

| | |
|---|---|
| Construction of buildings (See answer to Question 6) | $ 5,233.44 |
| Equipment to be purchased (see answer to Question 7) | 12,801.02 |
| Mine labor and superintendent, etc., 5 months (see answer to Question 8) | 24,674.65 |
| Geologist, part time, 4 months @ $200. mo. | 800.00 |
| Materials and supplies (see answer to Question 9) | 5,265.32 |
| Parts for mine equipment, etc. | 2,505.00 |
| Assaying | 300.00 |
| Hauling equipment and supplies | 1,500.00 |
| Office supplies | 240.00 |
| General expenses | 1,800.00 |
| Total cost of project | $55,119.48 |

(b) The time required to start the project and complete it will be eight months.

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4. See Averitt's Map attached

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5. List of installations on Harrison Property. The equipment, however, will not be used under an exploration project.

1 - 6' x 14' oil tank
1 - Wooden frame building (housing plant) partially dismantled
1 - 6" x 9" Risdon Iron Works Blake type crusher
1 - Allis-Chalmers 10 HP motor
1 - Flat pulley on counter shaft - drive pulley for rock crusher
1 - Troughing conveyor feeder - 11' x 16", mounted on channel iron frame, head and tail pulley and 3 rolls. (Belt worn out)
1 - 44' x 2½' Sorocto Rotary Kiln, with fire and feed on upper end. Kiln is driven by a 10 HP Allis-Chalmers motor, with V belt drive to Rober gear reducer, with spear gear to kiln.
1 - American Blower connected to dust cyclone, on lower end of kiln. Discharge of blower is 9' x 14'. Dust cyclone is 10' high by 3½' in dia.
1 - Condenser system, 9 complete units, ¼" plates, mounted on ID frame
1 - 9' x 15" redwood tank
1 - Iron Chimney
1 - Hoeing table
13 - Mercury pots
1 - Power unit, gasoline engine (junk)
1 - Gardner 6 x 6 air compressor (very old)
1 - D-retort

Note: All units in the plant are in good shape, except the power unit & compressor

Other equipment on the property consists of the remains of a Scott furnace, several D-retorts, an air receiver, and several frame buildings that are beyond repair.

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6. Buildings to be erected on property:

| | |
|---|---|
| Blacksmith Shop & Timber Framing Shed - 14' x 20', wooden frame and aluminum sheeting, with labor and supervision costs included - | $ 866.58 |
| Compressor Room - 14' x 20', wooden frame and aluminum sheeting, with labor and supervision costs included - | 927.33 |
| Office & Storage Room - 12' x 18' - wooden frame and aluminum sheeting, complete with drafting board, desk, heater, and labor and supervision costs included - | 1,638.60 |
| Change Room - 10' x 12', wooden frame and aluminum sheeting, complete with hot water heater, heater, plumbing, etc., and labor and supervision costs included - | 1,800.93 |
| Total - | $5,233.44 |

Labor cost of erecting the above buildings is figured at 60% of the material cost (building contractor's estimate)

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7. Equipment:

| | |
|---|---|
| (a) Rental of Cat-dozer, with operator, fuel and maintenance (for 30 days) (contract) - | $ 1,182.72 |
| (b) Late model Chevrolet 3600 truck, 1½-2 job, (flatbed) - | 3,347.50 |
| I-R 365 cu.ft. compressor, diesel driven - | 4,120.00 |
| Sullivan Mucking machine - | 2,317.50 |
| 1 - 4' x 10' air receiver - | 257.50 |
| 5 - 1 ton ore cars (end dump) @ $100.00 per car - | 515.00 |
| 5½ Ton 16# rail @ $100.00 per ton - | 566.50 |
| Fish plates (for 16# rail) - | 15.45 |
| Track bolts " " " - | 20.60 |
| 1 - Gardner-Denver D55 jackhammer - | 154.50 |
| 1 - Utility blacksmith forge - | 51.50 |
| 1 - 150# anvil - | 30.90 |
| 1 - Bench vice - | 36.05 |
| 1 - Pipe vice - | 15.45 |
| 1 - Acetylene welding outfit - | 154.50 |
| 1 - Soldering torch - | 15.45 |
| Total - | $12,801.02 |

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8.

| Labor and Supervision: | Gross Earnings per month |
|---|---|
| 1 General Superintendent @ $500.00 per month - | 500.00 |
| 1 Mine Foreman & Master Mechanic @ $400.00 per month - | 400.00 |
| 1 Mine Accountant @ $350.00 per month - | 350.00 |
| 4 Timbermen - rate $1.60 per hour (371.20 per month) - | 1,484.80 |
| 2 Mucking machine operators - rate $1.60 per hour (371.20 per month) - | 742.40 |
| 2 Trammers - rate $1.50 per hour (348.00 per month) - | 696.00 |
| 1 Surface man (timber framer & compressor maintenance) rate $1.50 per hour, (348.00 per month) - | 348.00 |
| | $ 4,521.20 |
| Compensation Insurance - per month (estimated) | 413.73 |
| Total - per month | $ 4,934.93 |

Geologist (part time) $200.00 per month

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9. Materials & Supplies:

| Item | | Cost |
|---|---|---|
| 9312 bd.ft. 6 x 6 timber @ $80.00 - | | $ 767.31 |
| 18000 bd.ft. lagging @ $80.00 - | | 1,483.20 |
| 964 bd.ft.4x6 @ $80.00 (for ties) - | | 79.33 |
| 500 mine wedges @ 4¢ - | | 20.60 |
| 2 kegs. - Nails @ $45.00 - | | 92.70 |
| 2410' - 2" Pipe @ .51¢ per foot - | (new) | 1,265.97 |
| 960' - 1" Pipe @ .24¢ per foot - | " | 299.52 |
| 760' - 8" vent pipe @ .25¢ per foot - | " | 195.70 |
| Misc. 1" & 2" pipe fittings | | 61.80 |
| 1 set - 7/8" hex. jackhammer steel - | (new) | 17.93 |
| 1 - Oiler - | | 7.73 |
| 4 doz. - Jackbits @ .45¢ each - | (new) | 22.25 |
| 200' - 1" Air hose @ .60¢ per ft. - | " | 123.60 |
| 200' - ½" Water hose @ .50¢ per ft. - | " | 103.00 |
| Misc. air & water hose connections - | | 25.75 |
| 100 lbs. - Track spikes (for 16# rail) - | " | 41.20 |
| 1 - Jimcrow - | | 15.45 |
| 2 - 4' Crosscut saws - | (new) | 14.42 |
| 2 - Nine axes - | " | 8.49 |
| 2 - Wrecking bars - | " | 5.30 |
| 1 - Combination square - | " | 1.04 |
| 1 - 100' Steel tape - | " | 10.88 |
| 5 - Scaling bars @ $5.00 each - | | 25.75 |

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9. Materials & Supplies:

| Item | | Cost |
|---|---|---|
| 2 - 14" Stillson wrenches - | (new) | $ 5.92 |
| 3 - 18" " " - | " | 12.58 |
| 3 - 24" " " - | " | 15.91 |
| 1 - Heavy duty pipe cutter - | " | 9.28 |
| 1 doz. - Drifting picks @ $1.35 - | " | 16.69 |
| 1 doz. - Drifting pick handles @ $1.30 | " | 16.07 |
| 1 doz. - Round point shovels @ $3.25 - | " | 40.17 |
| 1 doz. - Round point shovel handles @ $1.45 - | " | 17.92 |
| 3 - 12# Hammers @ $4.95 - | " | 15.30 |
| 3 - 8# Hammers @ $3.95 - | " | 12.21 |
| ½ doz. - Singlejack hammers @ $3.15 - | " | 19.47 |
| 1 doz. - Singlejack handles @ .60¢ - | " | 7.42 |
| 1 doz. - Sledge handles @ $1.25 - | " | 15.45 |
| 1 - Adge - | " | 5.61 |
| **Shop Tools:** | | |
| Misc. blacksmith tools (hammers, tongs, etc.) | | 25.75 |
| 1 - Hacksaw frame - | (new) | 2.01 |
| 6 doz. - Hacksaw blades - | " | 6.23 |
| 6 doz. - Files (various types ) - | " | 54.04 |
| 1 - 29 piece socket set - | " | 27.55 |
| 1 - 6 piece set open end wrenches - | " | 4.83 |
| 1 - 8" Crescent wrench - | " | 1.60 |
| 1 - 12" " " - | " | 2.94 |
| 1 - 15" " " - | " | 4.55 |
| 1 - 18" " " - | " | 7.41 |

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9. Shop Tools, continued

| Item | | Cost |
|---|---|---|
| 1 - Machinist's screwdriver - | (new) | $ .78 |
| 1 - General purpose screwdriver - | " | .93 |
| Carpenter's Tools: | | |
| 1 - Steel square - | (new) | 3.36 |
| 1 - Ratchet bit brace - | " | 6.80 |
| 7 - Wood bits, size 1/8" to 1/2" - | " | 6.90 |
| 2 - Claw hammers - | " | 6.53 |
| 1 - Aluminum level - | " | 9.12 |
| 1 - Crosscut hand saw - | " | 7.73 |
| 1 - Rip Saw - | " | 7.16 |
| 1 - 4 piece chisel set | " | 5.13 |
| 1 - General purpose plane | " | 10.25 |
| Misc. stock - | | 164.80 |
| Total - | | $5,265.32 |

Other Items:

| | |
|---|---|
| Parts for mine equipment and truck, overhauling mine equipment and truck in outside shops, diesel fuel, gasoline, oils and greases - | 2,505.00 |
| Assaying - At least 100 Mercury determinations @ $3.00 each | 300.00 |
| Hauling equipment and supplies to mine - | 1,500.00 |
| Office Supplies - | 240.00 |
| General Expense - | 1,800.00 |

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Calif.

10.

(a) We are prepared to invest twenty-five per cent of $55,119.48, the total cost of the project.

(b) Yes

11. Before deciding upon the Harrison Quicksilver Mine we investigated other quicksilver properties and deposits in California and Nevada; but from information given us by reliable men who formerly worked in the Lower January tunnel of the Harrison, we believe that the property has more chance of becoming a productive mine than the others we examined. These men state that ore exists in the lower drifts of the mine, particularly, in the SE drift in the No. 1 ore zone, and that ore continued below the level.

It is reported that in the past the Harrison Mine was worked intermittently by small companies, and individuals who did not have the necessary capital to develop the mine; and on numerous occasions a drop in the price of mercury shut the mine down.

We are convinced that sufficient capital and efficient management will prove that the known Harrison orebodies contain commercial ore, and that new orebodies will be discovered.

Form MF-103
(Revised June 1951)

UNITED STATES DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION

Budget Bureau No. 42-R1035.1.

MF-103 Should Be Filed With General Technical Data Form MF-100

RECEIVED NOV 7 1951 Defense Minerals Administration

# APPLICATION FOR AID FOR AN EXPLORATION PROJECT PURSUANT TO MINERAL ORDER 5, UNDER DEFENSE PRODUCTION ACT OF 1950

*Not To Be Filled in by Applicant*

Docket No. dma 2218
Metal or Mineral
Date Received 11-7-51
Amount $
Participation (Government %)

Name and address of applicant

Minerals Production & Processing Company,
13 No. Virginia St.,
Reno, Nevada.
Address Correspondence to
Mr. Oscar A. Giese,
55 Montecito Rd., Walnut Creek, Calif.

Date November 1, 1951

If you have already filed MF-100, give date filed ....., type of assistance requested .....,

DMA Docket Number (if available) .....

## INSTRUCTIONS

Read Mineral Order 5, Regulations Governing Government Aid in Defense Projects, before completing this application. Submit four copies each, of the signed application form, General Technical Data Form MF-100, and answers to questions as specified, to Defense Minerals Administration, Department of the Interior, Washington 25, D. C., or to the nearest field executive office thereof, with your name and address on each sheet of the application and all accompanying papers. If you have previously filed MF-100, it is not necessary to file it again. However, you should indicate in space provided above the type of assistance previously applied for (loans, procurement contracts, etc.) and DMA Docket Number, if available. *When a question is inapplicable it should be so stated in the form.* Additional sheets should be attached in answering any questions or in supplying additional information. IF YOU CANNOT ANSWER A QUESTION, SO STATE.

1. (*a*) Give a description of the real property that will be in any way involved in the exploration project, including any existing mine or operating property.

   (*b*) If you are not the owner of the property, submit a copy of the lease, purchase option, or other agreements under which you are authorized to operate the property with each copy of your application.

   (*c*) Give the legal description of the exact parcel, plot, or area upon which the exploration is to be conducted.

   NOTE: (1) If both areas are the same, so state. The only obligation to repay the Government is from the net earnings from any commercial discovery made in the area specified in (*c*) above in which the exploration is to be conducted, and the expenditure of funds which may be charged as costs of the project must be limited to that area or to work necessary to perform the exploration in that area.

   (2) If applicant is not the owner of the property or if there are any liens or encumbrances against the property, copy of agreements of claimants, lienors, encumbrances, and lessors subordinating their interests in the property to the interest of the Government under the Exploration Project Contract will be required for attachment to the Contract.

2. (*a*) What metals or minerals do you expect to find?

   (*b*) Furnish statement of the geologic features of your property, giving type of ore deposit and reasons for expecting to find commercial ore bodies. Illustrate with maps or sketches. If you have a geologic or engineering report, or assay maps showing width and grade, please send them with application, stating whether or not you wish to have them returned.

The information requested in questions 3, 4, 5, 6, 7, 8, and 9 below should be answered specifically and in detail, as this information will be attached to and incorporated as part of the Exploration Project Contract, if such contract is entered into with you by the Government.

ANSWER EACH QUESTION ON SEPARATE SHEETS OF PAPER AND SUBMIT A COPY OF EACH ANSWER FOR EACH COPY OF YOUR APPLICATION.

3. (*a*) Describe fully the proposed work and give the total cost of the project.

   (*b*) State the time required to start the project and to complete it.

4. Submit a map or sketch of the property involved showing a plan (and cross section, if needed) of the present mine workings and the *location of the proposed exploration work* as related to geologic features, such as contacts, veins, ore-bearing beds, etc.

5. Furnish an itemized list of existing facilities, buildings, installations, and fixtures with a statement of the cost of any necessary rehabilitation or repairs to put into useful and operable condition.

6. Furnish a detailed list of additional facilities, buildings, and fixtures to be purchased, installed, or erected by you, with the estimated cost of each item.

7. Furnish a detailed list of operating equipment, separated into items to be—

   (*a*) Rented

   (*b*) Purchased

   (*c*) Furnished by you

   with the rental, purchase price, or depreciation of each item, as the case may be, to be charged as a cost of the project.

8. Furnish an itemized schedule of labor, by numbers and classes (miners, muckers, etc.) and of supervisors by numbers and positions, with the maximum wages or salaries to be paid to each.

9. Furnish a detailed list with estimated cost of each item for materials, supplies, engineering, assaying, accounting, power, water, utilities, and any other items not provided for above.

10. (*a*) How much are you prepared to invest in the proposed project?

    (*b*) Is this amount sufficient to pay your part of the cost of the project, in accordance with the regulations on Government participation (Sec. 9 of MO–5)?

11. State any conditions or circumstances regarding the property not sufficiently brought out by the foregoing questions.

## CERTIFICATION

The undersigned company, and the official executing this certification on its behalf, hereby certify that the information contained in this form and accompanying papers is correct and complete to the best of their knowledge and belief.

Minerals Production & Processing Co.
(Name of company)

By Oscar A. Giese
(Signature of authorized official)
Oscar A. Giese

November 1, 1951.
(Date)

Secretary
(Title)

**Title 18, U. S. Code (Crimes), Section 1001, makes it a criminal offense to make a willfully false statement or representation to any department or agency of the United States as to any matter within its jurisdiction.**

U. S. GOVERNMENT PRINTING OFFICE 16—64067-2

Minerals Production &
Processing Company,
Harrison Mine, Yolo Co., Calif.

1. (a) The N.W.¼ of the N.W.¼ of Sec. 36, Township 12 North, Range 5 West, M.D.M. (except for about 8 acres which is included in what is commonly known as the Soda Spring Mine) containing 32 acres more or less.

   The East ½ of the N.E.¼ of Section 35, Township 12 North, Range 5 West, M.D.M. containing 80 acres more or less; and a small adjoining parcel of land on which is located a spring of water, and being described as follows:

   BEGINNING at the S.E. corner of the N.E.¼ of said Section 35, thence North 500', thence West 200', thence South 500' and thence East 200' to the place of beginning. Containing 2 acres more or less.

   (b) A copy of the lease is submitted with each copy of our application.

   (c) Exploration will be confined to the Harrison Mine which is a part of the real property described in (a).

2. (a) Mercury

   (b) Refer to report by Frederick D. Hanson, E.M.

   Refer to map by Paul Averitt & G. Donald Eberlein USGS

   No assay maps showing width and grade have been found.

# MINERAL LEASE AND OPTION

THIS AGREEMENT, made the first day of September, 1951, by and between VERNE W. HARRISON, VINCE L. HARRISON, MADGE J. HARRISON, and RUBY A. SNIDER, hereinafter called the parties of the first part, and MINERALS PRODUCTION AND PROCESSING COMPANY, hereinafter called the party of the second part.

WITNESSETH:

THAt whereas, the parties of the first part are the owners and in possession of that certain property, commonly known as the Harrison Mine, hereinafter described, and are willing to lease the same; and

WHEREAS, the party of the second part is willing to lease work and develop the same, upon the terms and conditions hereinafter stated.

NOW, THEREFORE, in consideration of the payment of the royalty hereinafter provided, and of the faithful and timely performance by the party of the second part of the conditions, covenants and agreements hereinafter contained, the parties of the first part do hereby lease and let for mining purposes unto the party of the second part all that certain real property, situate in the County of Yolo, State of California, and particularly described as follows, to wit:

> The N.W. ¼ of the N.W.¼ of Sec. 36, Township 12 North, Range 5 West, M.D.M. (except for about 8 acres which is included in what is commonly known as the Soda Spring Mine) containing 32 acres more or less.

The East ½ of the N.E.¼ of Section 35, Township 12 North, Range 5 West, M.D.M. containing 80 acres more or less; and a small adjoining parcel of land on which is located a spring of water, and being described as follows:

BEGINNING at the S.E. corner of the N.E. ¼ of said Section 35, thence North 500', thence West 200', thence South 500' and thence East 200' to the place of beginning. Containing 2 acres more or less.

for the term commencing September 1, 1951 and ending September 1, 1961, for a period of ten (10) years.

The parties of the first part hereby grant to the party of the second part an option to extend the terms of this lease for an additional period of ten (10) years, to commence at the expiration of the term herein granted, upon the same terms and conditions as herein stated. In the event the party of the second part shall fail to give the parties of the first part a written notice of election to exercise this option for a ten-year extension of this lease within ninety days prior to the expiration hereof, this option shall become null and void.

MINERALS PRODUCTION AND PROCESSING COMPANY, the party of the second part, shall pay to the parties of the first part within five (5) days after receipts or returns are received from the burning, milling or disposition of Mercury or other precious metals obtained from said property, and from each shipment of Mercury or other precious metals, Seven and one-half per cent (7½%) of the gross proceeds obtained from said property as a royalty. The party of the second part shall make any and all royalty payments to the Bank of America, Lower Lake, State of California, and shall send duplicate deposit slips to Verne W.

Harrison, Lower Lake, California, or to any other person that may be designated by the parties of the first part.

It is further mutually covenanted and agreed that when the party of the second part commences mining operations that the party of the second part shall pay to the parties of the first part a minimum royalty of not less than One Hundred Dollars ($100.00) per month, commencing six months after date hereof. Payments to be made on the first day of each month.

And it is further mutually covenanted and agreed as a part of the terms and conditions of this agreement as follows:

1. The party of the second part shall have six (6) months from the date hereof to do such examination and exploratory work as may be desired, free from any and all obligations.

2. The parties of the first part agree that the party of the second part may enter upon said mines or premises and work the same, in a manner necessary to good and economical mining, so as to take out the greatest amount of commercial ore possible, with due regard to the safety, development and preservation of the said premises as a workable mine.

3. Beginning March 1, 1952 the party of the second part shall employ at least five (5) men working twenty-five (25) shifts to the man each calendar month.

4. The party of the second part shall promptly pay all bills incurred for labor or materials, or other purposes in connection with working of said mining property, and shall post and keep posted such notices of non-responsibility as may be furnished to him by the parties of the first part.

5. The party of the second part agrees to insure so as to

protect the parties of the first part against all liability for accident or death under the Workmen's Compensation Act.

6. All work done by the party of the second part shall be performed in a good, minerlike manner, and in accordance with the laws of the State of California, and the lawful orders of the State Mine Inspector, and other duly constituted agencies of said State.

7. The party of the second part shall keep full and accurate account and records of all development work performed upon said property, and all ores and mineral products taken therefrom, and disposed of by the party of the second part, and shall afford the parties of the first part free access to all mine workings as long as this does not interfere in any way with the operation of said property. The parties of the first part shall have the right to be present at any and all cleanups.

8. The party of the second part shall furnish the parties of the first part, at their request, copies of all maps, geological reports, assay certificates and all data, including the results of any diamond drilling upon said property.

9. The parties of the first part agree that all equipment and tools brought to or placed upon said premises by the party of the second part shall not become fixtures; but shall remain the property of the party of the second part; provided that such removal shall be made within thirty (30) days from the abandonment, forfeiture or expiration of this lease, and if not so removed shall become a part of the realty. All buildings and structures on the

surface and timber in place underground shall become a part of the realty.

10. The parties of the first part agree that they will pay all taxes that are now due upon said property, and to pay before delinquency all taxes that hereinafter may be levied upon or assessed against said real property. The party of the second part agrees that he will pay before delinquency all taxes that may hereinafter be levied upon or assessed against any personal property on said premises.

11. The parties of the first part hereby grant to the party of the second part an easement for road purposes over and across their lands so that the party of the second part in conducting operations contemplated by the agreement, shall have a convenient way to travel between the said premises and Knoxville, and between the said premises and Lower Lake, and also an easement for the purpose of conveying water for use in the operation of the plant, mine and for domestic purposes, and the further right to use and occupy said premises for the purposes of storing and maintaining equipment, housing the same, and erecting buildings necessary for the conduct of the business and for the purpose of dumping ore and minerals.

12. The parties of the first part hereby grant to the party of the second part, easements over the real property to lay and maintain pipe lines to convey water; and the party of the second part hereby grants to the parties of the first part the right of grazing stock upon and driving stock over said real property, but without risk or liability to the party of the second part. The party of the second part may fence off land unused by

the parties of the first part to keep livestock away from any dangerous area.

13. In the event ore is not found in paying quantities or in the event ore that is profitable to mine should become exhausted, the party of the second part shall have the right to abandon the property and this lease and option shall be at an end and of no further force or effect.

14. In the event title defects should exist, the parties of the first part agree to cure such defects within a reasonable time and at their own expense.

15. The party of the second part shall have the right to assign this lease and option to others, who shall also be bound thereby. If the party of the second part violates or fails to comply with any of the provisions hereof, then, and in that event, this lease shall terminate, and all rights of the party of the second part hereunder shall cease, and all payments heretofore made hereunder shall be retained by the parties of the first part as full compensation as rental for the use and occupancy of said property, as the consideration for which this agreement is executed and as liquidated damages.

16. The party of the second part agrees to keep the property free and clear of all liens, attachments and encumbrances of any kind, and to that end the parties of the first part may post, file and record the proper notices, giving notice to all persons of the ownership of the parties of the first part, and the protection by him of all liens and claims of all persons.

17. In case of default in any provision herein contained by the party of the second part, the parties of the first part shall notify said party of the second part, in writing, of such default, and should the party of the second part fail or refuse to cure such default within thirty (30) days after the receipt of such notice, then the parties of the first part shall have the right to cancel this agreement by notice in writing.

Such termination shall not relieve the party of the second part from his obligation to pay all sums accrued and payable by the party of the second part to the parties of the first part at the time of such termination; and the party of the second part upon any such termination, shall execute a quit claim deed, quit-claiming to the parties of the first part any interest that the party of the second part may have acquired in the said premises.

18. This lease and option shall bind and inure to the benefit of the heirs, executors, administrators and assigns of all parties hereto.

TIME SHALL BE THE ESSENCE OF THIS AGREEMENT.

IN WITNESS WHEREOF the parties have hereunto set their hands and seals this day and year first above written.

(Sgd.) Verne W. Harrison
VERNE W. HARRISON

(Sgd.) Vince L. Harrison
VINCE L. HARRISON

(Sgd.) Madge J. Harrison
MADGE J. HARRISON

(Sgd.) Ruby A. Snider
RUBY A. SNIDER

Parties of the First Part

MINERALS PRODUCTION AND PROCESSING COMPANY,
A Corporation

(Sgd.)
By Oscar A. Giese
OSCAR A. GIESE, Secretary

Party of the Second Part

PRELIMINARY REPORT
HARRISON QUICKSILVER MINE
KNOXVILLE DISTRICT
CALIFORNIA

FOREWORD

The purpose of this examination was to determine if the geologic set-up of the Harrison Property justifies its exploration. Since the underground workings are entirely inaccessible an opinion must be based on observable surface geologic features on the property itself, on its position in the district relative to the more productive mines and the geologic features which localized them, and on available literature.

My conclusions are based on field work at the property and in the district on Sept. 24th and 25th, 1951, and on a study of the maps and reports by Mr. Paul Averitt of the USGS as published in the California Journal of Mines and Geology, Vol. 41, No. 2, April 1945. It is recommended that this publication be available when this report is read.

CONCLUSIONS

It is my opinion---based on the criteria mentioned above---that the Harrison Property merits a cautious, step-by-step exploration program which would be a legitimate project for a government loan or loans.

RECOMMENDATIONS

The first step should be the re-opening of the Lower January tunnel. It can then be determined if early production can be expected or if new exploration and development is needed. Since it cannot be foretold in advance if such work is justified, whether it can best be accomplished by diamond drilling or by underground workings, or the footage of such work required and its location, it would seem advisable to restrict the loan application to the funds required for the tunnel re-opening and associated work. The program would be as follows:

1. Rental of bulldozer to repair bad stretches of the present road, and to construct the short segments necessary to allow trucks to reach the portal of the Lower January tunnel and the mill. Possible subsidiary work to secure enough flat ground near the portal for the compressor and necessary shop and storage housing. Prospecting trenches across the ore zones beyond the

limits of underground workings. Replace the old pipe line from the spring to the lower January tunnel.

2. Re-opening of the 360 foot Lower January tunnel, the main drift on the ore zones, and such connecting workings as seem essential because of geological indications or operating necessities. This work would involve the purchase of a compressor, mucking machine, mine cars, rail, pipe, timber, tools, a truck, etc.

3. Such minor workings and timbering as are needed to adequately expose for examination and sampling any ore showings and promising leads which are exposed in the re-opened workings.

4. Appraisal of the results of the above work to determine if additional exploration and/or development is justified or needed, and if so, whether it can best be done by underground workings, underground diamond drilling, surface diamond drilling, or new openings.

PROPERTY

The Harrison Property is located in the Knoxville Mining District in Yolo and Napa counties, California. It is situated in T.11 N., R.5 W., and consists of the E½ of the NE¼ of Sec.35, the NW¼ of the NW¼ of Sec.36, except for about 8 acres constituting the Soda Springs prospect, and a rectangular parcel of 500' N and S and 200' E and W located in the SE corner of Sec.26. All this is contiguous and totals 117 to 118 acres.

ACCESS

The property lies about 3/4 mile north of the county road between Lower Lake and Monticello at a point about 2½ miles NW of Knoxville and 17½ miles SE of Lower Lake. At present a car can be driven to within a few minutes walk of the workings, but the open pit of the last operation has destroyed a short segment of the road so that from 100 to 200 yards of new road is needed to connect with the road to the portal of the Lower January tunnel. A minor amount of repair is also needed on the intact portions.

OWNERSHIP

The mine is owned and/or controlled by Verne and Vince Harrison of Lower Lake and vicinity. I have not examined the lease or purchase agreement.

FACILITIES

Former operations depended on a spring on the small parcel of land in Sec. 26. The flow of the spring was not determined, but can be presumed to be sufficient for compressor cooling and drilling purposes.

Electric power for furnace and permanent plant can be secured by about 3700 feet of power line.

Equipment on the property includes a 30 ton rotary furnace with accessory condensers, fans, etc. This plant seems to have had little use and to be in good shape.

Other items noted were an air receiver, several D- retorts, one of which is in good shape, and several frame buildings in bad repair near the portal of the Lower January tunnel.

HISTORY

The recorded production of the Harrison Mine through 1943 is given as 345 flasks. Total production is allotted to three periods of activity, as follows:

1. A small unrecorded production prior to 1900.

2. 263 flasks during World War I period of 1917, 1918 and 1919. A concentrating plant was in operation during this period, but the production also includes that from retorted high-grade. Most of the underground work was done during this period.

3. 82 flasks (plus a few unrecorded flasks) in the period 1936 to 1940, inclusive. Most of the ore came from the open pit; it is said that no underground work was done.

DISTRICT GEOLOGY

The following account is taken largely from Mr. Averitt's report or inferred from his maps and descriptions. My own observations are limited to the Harrison Property, to a walk from that property to the county road below the Reed Mine, and to a "circumnavigation" of the district by auto.

The backbone of the district is a large dike-like mass of serpentine from 3/4 to 3-3/4 miles wide which extends across the district in a broad curve convex to the NE. The serpentine includes large and small inclusions of the Franciscan formation, and is encased in sediments of the Knoxville formation of Jurasso-Cretaceous age. Near the north end of the district the serpentine outcrop widens to the NE by about 1½ miles as a series of irregular but more or less connected and parallel bodies. The Reed Mine---the northernmost in the district---is located along the NE contact of the easternmost and largest of these subordinate serpentine masses. At the south end of the Reed the serpentine and the mineralized fault zone which follows its contact terminate along an E-W fault. The mineralized fault zone reappears about 3/4 mile to the west on the Harrison Property, but is here along the NE contact of the westernmost of the subordinate serpentine

bodies and lies about ¼ mile east of the main arcuate mass. The Harrison serpentine tapers out to the SE, but the fault zone continues through the Manhattan property with Franciscan formation on its west side, but is largely covered by Tertiary volcanics consisting of basaltic flows and tuffs and rhyolitic tuffs. Basaltic dikes and necks are also exposed. The fault zone rejoins the serpentine contact about ½ miles above the Knoxville Mine, near which it makes a rather sharp bend to a more NW strike. Except for the cross faulting bounding the upthrust slice in which the Knoxville mine is located the fault zone is continuous from the Knoxville to beyond the Harrison where it is offset eastward to the Reed Mine. Ignoring this offset it may be said that all of the mines of the district except the Red Elephant are located along the fault zone which follows the NE contact of the serpentine mass as a whole.

The area between the serpentine and a line drawn between the Reed and Knoxville Mines forms a roughly triangular shaped sedimentary re-entrant or embayment in which are exposed stratigraphically lower beds of the Knoxville formation than to the north and south. It is also the intersection point of the NNW and WNW striking faults which determined the trend of the ends of the arcuate curve, of the N 40 to 50 W fault zone following the serpentine contact in this area, and of NE trending faults and fractures roughly at right angles to the last mentioned set. Also, on the Manhattan property south of the Harrison is the district center of intrusion and extrusion of Tertiary magma. All of these facts must be genetically related. It may be surmised that the uplift of the serpentine was caused by the intrusion of the Tertiary magma, but that in the complex fault intersection area this magma could work its way through to the surface; its propulsive power was thus lost, and the fault block was not elevated to the same extent as those outside the zone of magmatic "leakage."

The Reed and Knoxville Mines, each just outside of the limits of the embayment and at about equal distances on each side of the volcanic area of intense cross faulting undoubtedly owe their size to their geologic location. Cross faults were far enough spaced so that the horizontal length of the contact fault zone to which the solutions were confined was exceptionally large and the depth interval accessible to mining was far enough above the magmatic source of the solutions so that the zone of rich cinnabar deposition was well developed.

In the intervening Harrison-Manhattan area opposite conditions prevailed, conditions favoring the dispersion of the magma and its mineralizing solutions, and the formation of a large number of relatively small orebodies instead of big continuous bodies. These conditions are: the splitting of the main contact fault zone into at least three strands, the closely spaced cross faulting, the intricately sheared serpentine, and the thick shale horizon between two of these strands. The effect of the closely spaced cross faulting is shown by the fact that both the basalt and the bodies of "silica-carbonate" rock or "opalite" which forms the gangue of the cinnabar deposits occur

at fault intersections as pipe-like bodies, or as relatively short dikes or tabular bodies bounded by cross faults.

The advantage of the big continuous orebody from a development, mining, and cost standpoint is of course undeniable, but this does not mean that an operation based on mining smaller orebodies will not be profitable if these bodies are closely enough spaced, and frequent enough, and if geological guides to their occurrences are developed. No attempt is made here to explain away the vast discrepancy between the past production of the Harrison Property and the Reed and Knoxville Mines, nor the concomitant discrepancy in the size and continuity of the respective bodies of silica-carbonate rock. However, I do not believe that the productive potentiality of the Harrison Mine can be fairly judged by the size and number of exposed orebodies. I would expect development to disclose a large number of more or less similar bodies, many of which would have no observable expression at the present surface, and might in consequence be unusually rich. There would also be the constant possibility of encountering larger orebodies under geologic conditions not apparent at the surface. For instance, there is some reason for expecting the dip of the fault zones to flatten with depth.

The sizeable production of the Manhattan Mine cannot be used as an argument for the Harrison since the bulk of the Manhattan production came from the surface volcanics, and these were eroded from the Harrison Property except for a few residual patches. The mineral content of the extruded magma is lost, but under the dispersive influences mentioned previously it would seem that sufficient must have terminated at depth to make a large total volume of mineralization. Also, until the Harrison workings are re-opened, we do not know the frequency, size, grade or continuity of the orebodies extracted from them, or still exposed.

GEOLOGY AND DEVELOPMENT AT THE HARRISON PROPERTY

Two ore zones have been exposed on the Harrison Property (excluding the Soda Springs prospect) both of which lie along the NE or hanging wall sides of parallel serpentine dikes which probably unite at the north end of the property. The Main, Footwall, or No. 1 ore zone follows the hangingwall of a serpentine body some 600 feet wide. This is the SE tip of the first subordinate serpentine body on the NE side of the main mass. The contact strikes about N 45 W and dips about 65 degrees to the NE. Intense shearing and fracturing extends over a total width of perhaps 250 feet, and embraces both the serpentine and the Knoxville sandstone and shale in its hanging wall. Averitt's map shows five individual bodies of silica-carbonate rock. Mapped lengths average about 30 feet and the average width is perhaps 10 to 15 feet. Forstner's report in 1917 when the underground drifting was in progress states that the vein was from 8 to 15 feet wide.

Two of the five bodies shown by Averitt occur at the surface in the area of the present open pit, and only small vestiges can be seen. Averitt's map shows that the combined width of the two parallel, and probably connected bodies was about 40 feet. This open pit is at the SE end of the developed portion of the ore zone as now exposed. I do not know whether underground workings extended beyond it to the SE. On the north brim of the pit is the collar of the caved vertical shaft of some 125 feet depth which is said to have connected most of the underground workings. The Plant tunnel is about 80 feet to the NW of the shaft, is about 70 feet long, and had at least 80 feet of drift. The portal of the Upper January tunnel is about 50 feet farther NW. This tunnel is at an elevation of 1801 feet, is about 70 feet long, and in 1917 was said to have 150 feet of drift to the NW, and 100 feet to the SE. At the time of Averitt's visit only about 70 feet of tunnel drift was accessible, that part leading to the upper end of the inclined raise from the Lower January tunnel. This latter tunnel was the main opening of the workings. The portal is at an elevation of 1660 feet - 140 feet below the Upper January tunnel. It is 360 feet long and the only working shown on Averitt's map is the inclined raise mentioned above. Forstner's brief report in 1917 stated that the vein was being drifted on from this tunnel, and since the main productive period came in 1919 it can be safely assumed that the ore zone was rather extensively explored on this level and above. Ordinarily it could also be safely assumed that all commercial ore was removed, but it is possible that falling prices stopped the operation before this could be done.

The No. 2 ore zone is roughly parallel to the No. 1, but lies about 300 feet NE of the latter, along or near the hanging-wall of a serpentine dike about 175 feet wide. A body of silica-carbonate rock about 50 feet long and 10 feet wide (Averitt's map) was exposed in the 70 foot Bat Tunnel which is about 34 feet higher in elevation than the Lower January tunnel, and nearly directly above it. A much smaller body of silica-carbonate rock was exposed in the Lower January tunnel, and some cinnabar is indicated on parallel shearing.

The rock between the two serpentine bodies is indicated as being Knoxville sandstone and shale---mostly high sheared and gougy. The No. 2 serpentine seems to include some Knoxville sandstone, thus suggesting that the serpentine was intrusive into the Knoxville formation. This would not affect the theory that the main mass with its Franciscan inclusions was upthrust into its present position after its emplacement.

The property includes a length of some 1600 or 1700 feet along the strike of the No. 1 and 2 fault zones.

The Soda Springs fault is essentially parallel to the No. 1 and 2 fault zones, and lies about 1000' east of the latter. The

intervening rock seems to consist almost entirely of shale of the Lower Knoxville formation, but the Soda Springs outcrop of silica-carbonate rock in conglomerate of the same formation, and this continues to the east with intercalations of sandstone. Although no signs of mineralization were observed in the shale it is believed possible that it may contain ore at greater depth, and may exercise a damming influence on ore in the No. 2 ore zone.

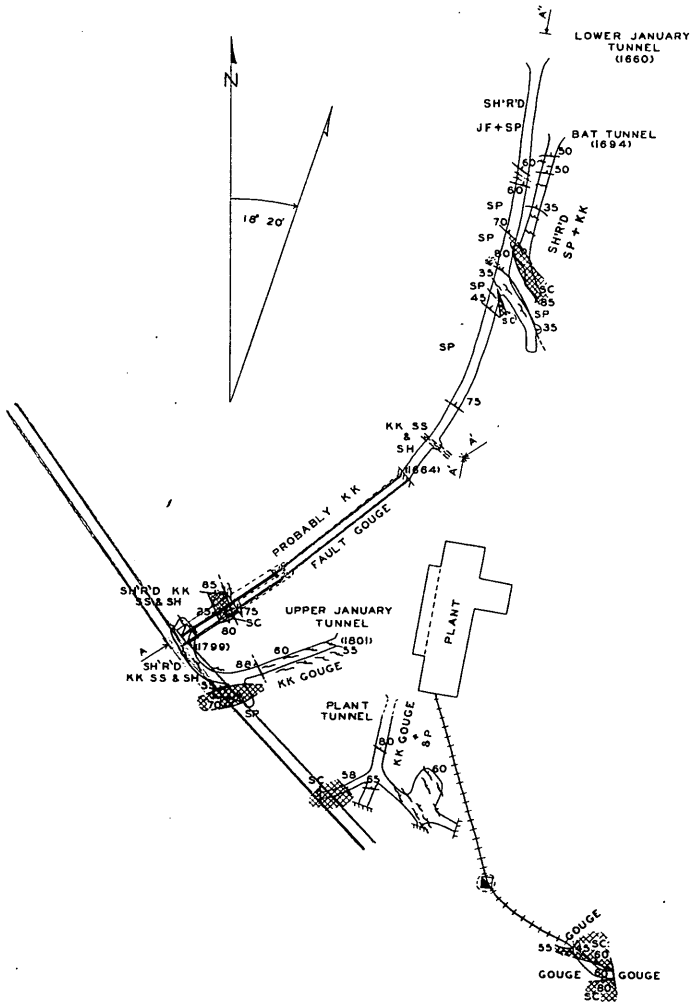
The conspicuous Soda Springs outcrop lies on a 8 acre tract not included in the present agreement, but said to be available later if wanted. The workings, casually visited by the writer---near the top of the outcrop---consist of a tunnel about 125 feet long with its portal at the SE end of the outcrop. Part way in, a tunnel about 5 feet lower in elevation converges with the main tunnel, and the two are connected with a winze-like opening. The floor of the workings then jumps up about 15 feet and emerges into a shaft opening to the surface. The workings mentioned above trend from N 10 E to N 12 W, but are associated at the north end with N 50 W shearing. The core of the mineralization is a dike or vein of the nearly all-black silica-carbonate rock which contains sulfides and cinnabar in small fractures. Silification and cinnabar-iron mineralization has branched out on diverging fissures, and the conglomerate country rock is locally intensely altered to a powdery mass, particularly between converging fractures. The average dip of the main vein is about 80 degrees to the east. It seems possible that this outcrop lies on a short segment of a member of the NNW striking system of faults, a segment caught between several strands of the N 50 W faulting. Production has apparently come from two or three narrow veins. No particular claims are made here about this particular outcrop---it was not even completely inspected, but the fault Zone it occupies may be important at greater depth.

In general it is anticipated that commercial ore will extend to greater depth on the No. 2 ore zone than on the No. 1, and possibly to a greater depth on the Soda Springs zone on the No. 2. Thus the possibilities of the property are not exhausted even if exploration shows that commercial ore in the developed portion of the No. 1 zone bottoms at or near the Lower January tunnel level. The only indication of such an event was that a pile of course rejects from a hand sorting operation, and containing only occasional small veinlets and patches of cinnabar, was of a black and white mottled and streaked character which is believed to be lower grade than the all-black opalite, and to be zonally deeper. However, I understand that miners who worked in the mine have stated that ore continued below the tunnel level.

In conclusion it may be reiterated that my opinion that the exploration if the property may disclose a large number of more or less connected, relatively small orebodies is based on the presence of geological factors favoring the dispersion or splitting of the magma, and its mineralizing solutions into bodies of varying volume whose cinnabar zones will occur at varying depths. Thus ore may occur at depth horizons where the stronger intersections are occupied by noncommercial phases of the mineralization, or even by intrusive bodies. The smaller quantity of mineralization of the smaller branches may be counterbalanced by the greater retention afforded by traps at depth as compared with those near the surface. It must also be mentioned that the property suffers by comparison with its unusually large neighbors. If it were by itself its own present showings would be more impressive.

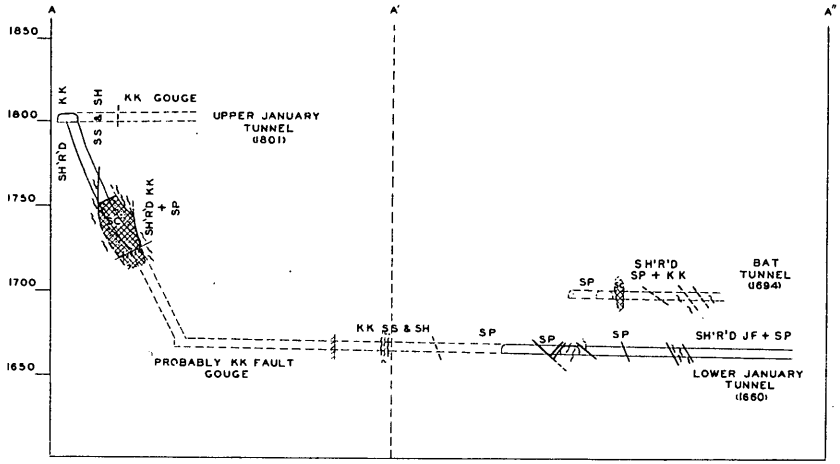
Frederic D. Hanson, E.M.

Nov. 1, 1951
Auburn, Calif.




BASE MAP SUPPLIED BY H. C. SMITH

GEOLOGY & ADDITIONAL WORKINGS BY PAUL AVERITT & G. DONALD EBERLEIN
U.S. GEOLOGICAL SURVEY




# HARRISON MINE

## YOLO COUNTY, CALIFORNIA

25 0 25 50 75 100

SCALE IN FEET

DATUM IS APPROXIMATELY MEAN SEA LEVEL

SEPT. 1943

## EXPLANATION

- SC — SILICA-CARBONATE ROCK
- SP — SERPENTINE
- KK — SH: KNOXVILLE FORMATION SH SHALE; SS: SS SANDSTONE
- JF — FRANCISCAN FORMATION
- CINNABAR MINERALIZATION
- FAULT (DASHED WHERE INFERRED)
- 60 50 — LINEATION OF SHEARS IN FAULT ZONE
- GRADATIONAL CONTACT
- HEAD OF INCLINED OPENING
- APPROXIMATE POSITION OF FOOT OF INCLINED OPENING
- APPROXIMATE POSITION OF CAVED SHAFT AT SURFACE
- TRACK
- INACCESSIBLE WORKINGS
- BUILDING
- A A' — LINE OF SECTION

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3. (a) We propose to open the Lower January crosscut tunnel, and all main drifts off this level that are in the ore zones. The Lower January tunnel is 360 feet long; and according to statements of miners who worked on this level, there is approximately 400 feet of drifting on the orebodies. The main drifts off the level are not shown by Averitt on his map as we understand the workings were inaccessible when the map was made. We have, however, sketched on the map the approximate location of the drifts.

As we have no way of determining how much of the mine workings are caved we have based our estimate on the assumption that all workings we explore must be cleaned out and timbered.

The total estimated cost of opening 760 feet of crosscut and main drifts, including the cost of building and repairing roads, purchasing, transporting and installing mine equipment, laying surface pipe lines, erecting buildings, and rehabilitating the property in general, which must be done before the underground work can be started, is $55,119.48.

| | |
|---|---|
| Construction of buildings (See answer to Question 6) | $ 5,233.44 |
| Equipment to be purchased (see answer to Question 7) | 12,801.02 |
| Mine labor and superintendent, etc., 5 months (see answer to Question 8) | 24,674.65 |
| Geologist, part time, 4 months @ $200. mo. | 800.00 |
| Materials and supplies (see answer to Question 9) | 5,265.32 |
| Parts for mine equipment, etc. | 2,505.00 |
| Assaying | 300.00 |
| Hauling equipment and supplies | 1,500.00 |
| Office supplies | 240.00 |
| General expenses | 1,800.00 |
| Total cost of project | $55,119.48 |

(b) The time required to start the project and complete it will be eight months.

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4. See Averitt's Map attached

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5. List of installations on Harrison Property. The equipment, however, will not be used under an exploration project.

1 - 6' x 14' oil tank
1 - Wooden frame building (housing plant) partially dismantled
1 - 6" x 9" Risdon Iron Works Blake type crusher
1 - Allis-Chalmers 10 HP motor
1 - Flat pulley on counter shaft - drive pulley for rock crusher
1 - Troughing conveyor feeder - 11' x 16", mounted on channel iron frame, head and tail pulley and 3 rolls. (Belt worn out)
1 - 44' x 2½' Sorocto Rotary Kiln, with fire and feed on upper end. Kiln is driven by a 10 HP Allis-Chalmers motor, with V belt drive to Rober gear reducer, with spear gear to kiln.
1 - American Blower connected to dust cyclone, on lower end of kiln. Discharge of blower is 9' x 14'. Dust cyclone is 10' high by 3½' in dia.
1 - Condenser system, 9 complete units, ¼" plates, mounted on ID frame
1 - 9' x 15" redwood tank
1 - Iron Chimney
1 - Hoeing table
13 - Mercury pots
1 - Power unit, gasoline engine (junk)
1 - Gardner 6 x 6 air compressor (very old)
1 - D-retort

Note: All units in the plant are in good shape, except the power unit & compressor

Other equipment on the property consists of the remains of a Scott furnace, several D-retorts, an air receiver, and several frame buildings that are beyond repair.

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6. Buildings to be erected on property:

| | |
|---|---|
| Blacksmith Shop & Timber Framing Shed - 14' x 20', wooden frame and aluminum sheeting, with labor and supervision costs included - | $ 866.58 |
| Compressor Room - 14' x 20', wooden frame and aluminum sheeting, with labor and supervision costs included - | 927.33 |
| Office & Storage Room - 12' x 18' - wooden frame and aluminum sheeting, complete with drafting board, desk, heater, and labor and supervision costs included - | 1,638.60 |
| Change Room - 10' x 12', wooden frame and aluminum sheeting, complete with hot water heater, heater, plumbing, etc., and labor and supervision costs included - | 1,800.93 |
| Total - | $5,233.44 |

Labor cost of erecting the above buildings is figured at 60% of the material cost (building contractor's estimate)

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7. Equipment:

| | |
|---|---|
| (a) Rental of Cat-dozer, with operator, fuel and maintenance (for 30 days) (contract) - | $ 1,182.72 |
| (b) Late model Chevrolet 3600 truck, 1½-2 job, (flatbed) - | 3,347.50 |
| I-R 365 cu.ft. compressor, diesel driven - | 4,120.00 |
| Sullivan Mucking machine - | 2,317.50 |
| 1 - 4' x 10' air receiver - | 257.50 |
| 5 - 1 ton ore cars (end dump) @ $100.00 per car - | 515.00 |
| 5½ Ton 16# rail @ $100.00 per ton - | 566.50 |
| Fish plates (for 16# rail) - | 15.45 |
| Track bolts " " " - | 20.60 |
| 1 - Gardner-Denver D55 jackhammer - | 154.50 |
| 1 - Utility blacksmith forge - | 51.50 |
| 1 - 150# anvil - | 30.90 |
| 1 - Bench vice - | 36.05 |
| 1 - Pipe vice - | 15.45 |
| 1 - Acetylene welding outfit - | 154.50 |
| 1 - Soldering torch - | 15.45 |
| Total - | $12,801.02 |

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8.

| Labor and Supervision: | Gross Earnings per month |
|---|---|
| 1 General Superintendent @ $500.00 per month - | 500.00 |
| 1 Mine Foreman & Master Mechanic @ $400.00 per month - | 400.00 |
| 1 Mine Accountant @ $350.00 per month - | 350.00 |
| 4 Timbermen - rate $1.60 per hour (371.20 per month) - | 1,484.80 |
| 2 Mucking machine operators - rate $1.60 per hour (371.20 per month) - | 742.40 |
| 2 Trammers - rate $1.50 per hour (348.00 per month) - | 696.00 |
| 1 Surface man (timber framer & compressor maintenance) rate $1.50 per hour, (348.00 per month) - | 348.00 |
| | $ 4,521.20 |
| Compensation Insurance - per month (estimated) | 413.73 |
| Total - per month | $ 4,934.93 |

Geologist (part time) $200.00 per month

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9. Materials & Supplies:

| Item | | Cost |
|---|---|---|
| 9312 bd.ft. 6 x 6 timber @ $80.00 - | | $ 767.31 |
| 18000 bd.ft. lagging @ $80.00 - | | 1,483.20 |
| 964 bd.ft.4x6 @ $80.00 (for ties) - | | 79.33 |
| 500 mine wedges @ 4¢ - | | 20.60 |
| 2 kegs. - Nails @ $45.00 - | | 92.70 |
| 2410' - 2" Pipe @ .51¢ per foot - | (new) | 1,265.97 |
| 960' - 1" Pipe @ .24¢ per foot - | " | 299.52 |
| 760' - 8" vent pipe @ .25¢ per foot - | " | 195.70 |
| Misc. 1" & 2" pipe fittings | | 61.80 |
| 1 set - 7/8" hex. jackhammer steel - | (new) | 17.93 |
| 1 - Oiler - | | 7.73 |
| 4 doz. - Jackbits @ .45¢ each - | (new) | 22.25 |
| 200' - 1" Air hose @ .60¢ per ft. - | " | 123.60 |
| 200' - ½" Water hose @ .50¢ per ft. - | " | 103.00 |
| Misc. air & water hose connections - | | 25.75 |
| 100 lbs. - Track spikes (for 16# rail) - | " | 41.20 |
| 1 - Jimcrow - | | 15.45 |
| 2 - 4' Crosscut saws - | (new) | 14.42 |
| 2 - Mine axes - | " | 8.49 |
| 2 - Wrecking bars - | " | 5.30 |
| 1 - Combination square - | " | 1.04 |
| 1 - 100' Steel tape - | " | 10.88 |
| 5 - Scaling bars @ $5.00 each - | | 25.75 |

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9. Materials & Supplies:

| Item | | Cost |
|---|---|---|
| 2 - 14" Stillson wrenches - | (new) | $ 5.92 |
| 3 - 18" " " - | " | 12.58 |
| 3 - 24" " " - | " | 15.91 |
| 1 - Heavy duty pipe cutter - | " | 9.28 |
| 1 doz. - Drifting picks @ $1.35 - | " | 16.69 |
| 1 doz. - Drifting pick handles @ $1.30 | " | 16.07 |
| 1 doz. - Round point shovels @ $3.25 - | " | 40.17 |
| 1 doz. - Round point shovel handles @ $1.45 - | " | 17.92 |
| 3 - 12# Hammers @ $4.95 - | " | 15.30 |
| 3 - 8# Hammers @ $3.95 - | " | 12.21 |
| ½ doz. - Singlejack hammers @ $3.15 - | " | 19.47 |
| 1 doz. - Singlejack handles @ .60¢ - | " | 7.42 |
| 1 doz. - Sledge handles @ $1.25 - | " | 15.45 |
| 1 - Adge - | " | 5.61 |
| **Shop Tools:** | | |
| Misc. blacksmith tools (hammers, tongs, etc.) | | 25.75 |
| 1 - Hacksaw frame - | (new) | 2.01 |
| 6 doz. - Hacksaw blades - | " | 6.23 |
| 6 doz. - Files (various types ) - | " | 54.04 |
| 1 - 29 piece socket set - | " | 27.55 |
| 1 - 6 piece set open end wrenches - | " | 4.83 |
| 1 - 8" Crescent wrench - | " | 1.60 |
| 1 - 12" " " - | " | 2.94 |
| 1 - 15" " " - | " | 4.55 |
| 1 - 18" " " - | " | 7.41 |

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9. Shop Tools, continued

| Item | | Cost |
|---|---|---|
| 1 - Machinist's screwdriver - | (new) | $ .78 |
| 1 - General purpose screwdriver - | " | .93 |
| Carpenter's Tools: | | |
| 1 - Steel square - | (new) | 3.36 |
| 1 - Ratchet bit brace - | " | 6.80 |
| 7 - Wood bits, size 1/8" to 1/2" - | " | 6.90 |
| 2 - Claw hammers - | " | 6.53 |
| 1 - Aluminum level - | " | 9.12 |
| 1 - Crosscut hand saw - | " | 7.73 |
| 1 - Rip Saw - | " | 7.16 |
| 1 - 4 piece chisel set | " | 5.13 |
| 1 - General purpose plane - | " | 10.25 |
| Misc. stock - | | 164.80 |
| Total - | | $5,265.32 |

Other Items:

| | |
|---|---|
| Parts for mine equipment and truck, overhauling mine equipment and truck in outside shops, diesel fuel, gasoline, oils and greases - | 2,505.00 |
| Assaying - At least 100 Mercury determinations @ $3.00 each - | 300.00 |
| Hauling equipment and supplies to mine - | 1,500.00 |
| Office Supplies - | 240.00 |
| General Expense - | 1,800.00 |

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10.
(a) We are prepared to invest twenty-five per cent of $55,119.48, the total cost of the project.

(b) Yes

11. Before deciding upon the Harrison Quicksilver Mine we investigated other quicksilver properties and deposits in California and Nevada; but from information given us by reliable men who formerly worked in the Lower January tunnel of the Harrison, we believe that the property has more chance of becoming a productive mine than the others we examined. These men state that ore exists in the lower drifts of the mine, particularly, in the SE drift in the No. 1 ore zone, and that ore continued below the level.

It is reported that in the past the Harrison Mine was worked intermittently by small companies, and individuals who did not have the necessary capital to develop the mine; and on numerous occasions a drop in the price of mercury shut the mine down.

We are convinced that sufficient capital and efficient management will prove that the known Harrison orebodies contain commercial ore, and that new orebodies will be discovered.