MME Form 9
Rev. Nov. 65

UNITED STATES
DEPARTMENT OF THE INTERIOR
Geological Survey

OFFICIAL DOCKET FILE Contract No. _____ Docket No. 6735

Application
- [x] Denied
- [ ] Withdrawn

Contract
- [ ] Terminated - Not Certified
- [ ] Terminated - Certified
- [ ] Cancelled
- [ ] Royalty Agreement

The records contained in this file are marked (x) and arranged in this order:

Folder No. 1:

Left Side

- [ ] Royalty Audits
- [ ] Certification of Discovery
- [ ] Closing Letter
- [ ] Cost Audits
- [ ] Termination Notice or Agreement
- [ ] Recision Notice
- [ ] Assignment of Contract
- [ ] Contract Amendments
- [ ] Contract with all exhibits and annexes
- [ ] Owner's Consent to Lien and Subordination Agreement
- [x] Application and Attachments 6/11/68

Right Side

- [ ] Project Summary (final)
- [ ] Work Completed Analysis (final)
- All other material filed in chronological order including the following reports if checked:
- [ ] Field Team Semiannual Report for Certified Project
- [ ] Final Field Team Report (Tab)
- [ ] Operator's Final Report (Tab)
- [ ] Interim Field Team Reports
- [ ] Operator's monthly reports and all attachments
- [X] On-site Exam. Report (Tab) 10/4/68
- [ ] Settlement Sheets
- [ ] Drill Logs

Additional Folders:

Left Side

Folders No. _____: Reports
- [ ] Analysis of Semiannual Inspection Reports
- [ ] Project Summary (Interim) by MME Engineers

Right Side

- [ ] Field Team Semiannual Report for Certified Project
- [ ] Field Team Interim Reports
- [ ] Operator's Monthly Reports with Transmittal, Narrative and Maps

Folders No. _____: Maps (Use pocket folder or envelope)

Folders No. _____: Settlement Sheets

Folders No. _____: Drill Logs

Folders No. _____: Royalty Material

72195-65

UNITED STATES
DEPARTMENT OF THE INTERIOR

GEOLOGICAL SURVEY
Office of Minerals Exploration
345 Middlefield Road
Menlo Park, California 94025

June 19, 1968

OFFICIAL COPY
O. M. E.
RECEIVED
JUN 24 1968
INITIALS | CODE

Memorandum

To: Chief, Office of Minerals Exploration
Washington, D. C.

From: Field Officer, Region II

Subject: New Application (Copper-Molybdenum)
Allen, Shumate, Weston, & Johnson
English Mt. Mine
Nevada County, California

Enclosed is an application for financial assistance received in the Field Office today. The application appears to be complete and well documented but the project may be overly ambitious for the present known size and grade of the deposit. A modified project of crosscutting to, and drifting on, the Conrad vein alone might be justified and have a much lower cost.

H. K. Stager

Enclosures

MME Form 40
Jan. 65

Budget Bureau No. 42-R1506
Approval expires Dec. 31, 1968

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

OFFICIAL COPY
O. M. E.
RECEIVED
JUN 24 1968
INITIALS CODE

APPLICATION FOR FINANCIAL ASSISTANCE IN MINERALS EXPLORATION

Pursuant to Public Law 85–701 (72 Stat. 700; 30 U.S.C. 641)

NAME OF APPLICANT *(Full legal name and mailing address as they should appear on contract if one is executed.)*

ALLEN, SHUMATE, WESTON & JOHNSON
935 MARIN AVE.
HAYWARD, CALIF. 94541

APPLICANT DO NOT USE THIS BLOCK

DOCKET NUMBER 6735

DATE RECEIVED JUNE 19, 1968

REGION II

DIVISION CODE

BUSINESS ORGANIZATION *(Check one)*

- INDIVIDUAL
- CORPORATION
- PARTNERSHIP ✓
- OTHER *(Specify)*

STATE IN WHICH FIRM IS ORGANIZED CALIF.

LIST CORPORATE OFFICERS OR PARTNERS HERE, IF APPLICABLE

NAME	ADDRESS	TITLE
JACK B. SHUMATE	935 MARIN AVE. HAYWARD, CALIF.	GEN. PARTNER
ALEX A. JOHNSON	15036 GRENDA ST. SAN LEANDRO, CALIF.	GEN. PARTNER
CLAUDE J. ARTERO	2111 CABRILLO CIRCLE LODI, CALIF.	GEN. PARTNER

MINERAL(S) FOR WHICH YOU WISH TO EXPLORE
COPPER AND MOLYBDENUM

ESTIMATED COST OF PROJECT
$80,000.00

PROPERTY NAME: ENGLISH MT. MINE

LOCATION — COUNTY: NEVADA CO. STATE: CALIF.

GENERAL INSTRUCTIONS

Before filling out this application, please read the *OME Regulations for Obtaining Federal Assistance in Financing Explorations for Mineral Reserves* (30 CFR Chap. III). To assure prompt action, your application must provide all applicable material and information specified on the back of this application form. Avoid unnecessary correspondence and delays by submitting complete and accurate information. *Please submit two copies of this application and all accompanying papers* except as otherwise noted. Place your name and address on each sheet. Each item of information, maps, and reports required as a part of this application is described on the back of this form. Identify each attached statement by the item number to which it applies. If an item does not apply to your application, show the item number on your statement and after it write "not applicable." Maps or sketches should be used to supplement narrative descriptions of the property location and boundaries in item 2, existing mine workings and geology in item 3, and the proposed exploration work in item 5. When this information is not too complex, all of it may be shown on one map or sketch. All documents and other attachments submitted as a part of this application, except those in item 3(g) which you mark to be returned, become the property of the Government and will not be returned to the applicant. Send true copies, *not originals*, of leases, contracts, and other documents which are an essential part of your business records. *File this application with the Office of Minerals Exploration, Department of the Interior,* Washington, D. C., 20242, or with the nearest OME Field Office.

CERTIFICATION

The undersigned, whether as an individual, corporate officer, partner, or otherwise, both in his own behalf and acting for the applicant, certifies that the information set forth in this form and accompanying papers is correct and complete, to the best of his knowledge and belief, and that he would not ordinarily undertake the proposed exploration under current conditions and circumstances at his sole expense.

JUNE 11, 1968
DATED

Jack B. Shumate
BY *(Signature)*

GENERAL PARTNER
TITLE

A wilfully false statement or certification to any Department or Agency of the United States Government is a criminal offense. U. S. Code, Title 18, Sec. 1001.

INFORMATION REQUIRED WITH THIS APPLICATION

1. Financial Eligibility:

(a) Submit evidence of efforts made within 90 days preceding the filing of this application to obtain credit from your bank of account and at least one other banking institution or other private source of credit. Such evidence shall include true copies of correspondence which show: (1) date of loan request, (2) amount and terms requested, (3) proposed use of loan funds, and (4) the replies from credit sources. If the loan was offered under terms which you consider unreasonable, state why you consider them so.

(b) List names and addresses of affiliated, parent, or controlling companies or organizations and state extent and nature of their interest.

(c) State how you propose to furnish your share of the cost of the exploration work.

2. Applicant's Rights in Land:

(a) State your interest in the land and mineral rights, whether owner, lessee, purchaser under contract, or other. If you are not the owner, submit one true copy of the lease, contract, or other document (with address of owner) under which you control the property. Describe all liens, mortgages, or other encumbrances on the land and state book and page number and official place where recorded.

(b) State the legal description (section, township, and range; metes and bounds; patent number of claims) of the land upon which you wish to explore and all adjacent land which you own or control. Describe any part of the land or workings which should not be subject to Government royalty and liens. If the land consists of unpatented claims, state book and page number for each recorded location notice, including amended locations, and official place where recorded. State all the names by which you know the property.

(c) For all land or mineral rights encumbered or not owned, submit five copies of Lien and Subordination Agreements on MME Form 52. If the agreements cannot be obtained, state reasons and provide copies of letters of refusal.

3. Physical Description:

(a) Describe in detail and illustrate with maps or sketches all mining or exploration operations which you know have been or are being conducted upon the land. Include existing mine workings and all production facilities.

(b) State your interest, if any, in operations described in (a).

(c) State, if you know, the past and current production, supporting your statement with copies of settlement sheets, mine records, or published data if available.

(d) Describe known ore reserves, giving quantities and grades and sampling methods used. Support your statement with copies of assay certificates and assay maps if available.

(e) Describe by narrative and maps or sketches the geologic features of the property, including ore minerals, geologic formations if known, and type of deposit (vein, bedded, etc.).

(f) State your reasons for expecting to find ore, and if you have sampled the area you propose to explore, show where the samples were taken, describe sampling methods used, and provide copies of assay certificates.

(g) Send with your application at least *two* copies of all geologic or engineering reports, assay maps, or technologic information which you have, indicating whether you require their return.

4. Accessibility of Property:

(a) To aid the OME representative who may examine the property, state name and address of person who will meet him; give directions for reaching the property; and describe accessibility of property and of any mine workings.

(b) Name the shipping and supply points and state the distances to the property.

5. Exploration Work:

(a) Describe fully the proposed exploration work giving individual footages and sizes of openings *for each item of work.* Use narrative, maps, plans, and sections as necessary. Show location of the proposed work as related to geologic features such as veins, ore-bearing beds, contacts of rock formations, etc. Show also the relation of the proposed work to any existing mine workings and to *land boundaries* or to the closest identifiable corner.

(b) If an access road must be built, show the proposed location on the property map and state the length, type and construction methods proposed.

(c) If an OME contract is executed, state how soon thereafter work would be started and finished. State your anticipated average daily or monthly rate of progress for each type of work.

6. Experience:

State your operating experience and background to conduct this exploration work and also that of the person who will supervise the work.

7. Estimate of Costs:

Furnish detailed estimates of the necessary costs *for each item of the work proposed in 5(a)* under the headings listed below with a total for each heading and the estimated total cost of the work. Costs for any work to be performed by an independent contractor should be listed separately under category (a) below. Costs for any work that is not to be performed by an independent contractor should be listed under categories (b) through (g).

(a) Independent contracts. State the total cost of any proposed independent contract for all or any part of the work, and the number of units and the unit cost for each type of work, such as per foot of drilling, per foot of drifting, per hour of bulldozer operations, or per cubic yard of material moved. Cost estimates should be supported by bids from three contractors if possible. (*Note*—If none of the work is to be contracted, write "none" after this item.)

(b) Personal services. The cost of supervision, engineering and geological services, outside consultants, and labor should be itemized by numbers and classes of employees; rates of wages, salaries or fees; and periods of employment. State whether these services are available.

(c) Operating materials and supplies. List items of material and supplies giving quantity and cost of each. Include under this heading power, water, and fuel, and units of equipment and tools costing less than $50 each.

(d) Operating equipment. List items of equipment and tools costing $50 or more per unit. Give specifications and indicate how each item is to be acquired—i.e., rented, purchased or provided by the applicant. If rented or purchased, state the estimated rental or purchase price. If furnished by the applicant, state condition and present fair market value.

(e) Initial rehabilitation and repairs. Describe the type and the cost of *initial* rehabilitation or repair of existing buildings, fixtures, installations (exclusive of mine workings), and movable operating equipment now owned by the applicant which will be used in the exploration work.

(f) New buildings, fixtures, installations. Describe each building, fixed improvement, and installation to be purchased, constructed, or installed for the exploration work, stating specifications and cost including labor, materials, and supervision.

(g) Miscellaneous. Describe the type and estimate the cost of repairs and maintenance of the operating equipment listed in 7(d). Do not repeat initial repairs listed in 7(e). Show also the costs of analytical work, accounting, workmen's compensation and employees' liability insurance, payroll taxes, and other required costs that do not fall within the previous categories. [*Note*—The Government will not contribute to costs incurred before the date of the contract, or to costs of or incident to: (1) acquiring, using, or possessing land and any existing improvements, facilities, buildings, installations, and appurtenances, or the depreciation and depletion thereof; (2) general overhead, corporate management, interest and taxes (other than payroll and sales taxes); (3) insurance (other than employees' liability insurance); and (4) damages to persons or property (other than authorized repair to or replacement of equipment or other property used in the work).]

INT.-DUP. SEC., WASH., D.C

APPLICATION FOR FINANCIAL ASSISTANCE IN MINERALS EXPLORATION

1. FINANCIAL ELEGIBILITY

(a) Letters of correspondence with Bank Of America and Wells Fargo bank attached.

(b) There are no parent or controlling companies affiliated with Allen, Shumate, Weston & Johnson.

(c) We will raise money within the partnership to finance our proportion of the exploration costs.

2. APPLICATS RIGHTS TO LAND

(a) The mineral claims we hold are properly staked and validated mining claims in Tahoe National Forest, At English Mr. Nevada Co., California. They are recorded at the county recorders office in Nevada City, Calif. The volume and page no's. are on the attached copies of the mining claims and current proof of labor.

(b) The land which we wish to explore is in Navada County, Sect. #12 T18N, R12E, M. D. M. and namely in three mining claims, called Jeff Molly #1, Betty Molly #1, and Katy Molly #1. The attached claim & survey maps show these claims in relation to the other adjacent claims and section boundaries. The 10 claims enclosed represents all our holdings in this area.

(c) All land within the 10 aforementioned claims has no leins or encumberances on it.

3. PHYSICAL DESCRIPTION

(a) The conrad vein, (see enclosed map) has a total of eight open pits, from three (3) feet to six (6) feet deep and has been drifted on a distance of about 70 feet. The ore from this adit averaged 2.44% copper with some lesser amounts of molybdenum. The maximum width of the vein in this area is 6'-0, with an average width of about 4'-0. The Scarano vein has a total of six (6) open pits approximately three (3) feet deep, one of which is about 15 feet in length. (All of which assayed about 2 to 3% copper.) Many areas show a high reading with the metal detector, (Fisher M - Scope,) and one zone in particular labeled "Magnetite outcrop" on the accompaning map, reads exceedingly high. The discovery pit (10 feet deep) for the Jeff molly #2 claim is located in this "Magnetite Zone", and is well mineralized with magnetite, molybdenite, and chalcopyrite. Adjacent to the claims just to the east of Jeff molly #2, in sect. #7 T18N, R12E M. D. M. approximately 250' from the boundary of Sect. #12, there are two Quartz veins. One of which has been drifted on a distance of about 45'-0. The veins are 3'-0 to 3'-6 in width and assay 1.45% Mo. These veins strike in the same direction as the Conrad vein. These two Quartz veins are owned by the Southern Pacific Land Co., whose office is in San Francisco. On the North side of English Mountain there are workings for Hard - Rock Gold and Copper that date back to the early 1900's. From which there has been a reported total of $250,000.00 produced in gold. On the South side of Bowman Lake, is a gold mine called the "Yellow Metal Mine"

which operated until it was flooded by the Bowman Reservor.

(b) Our only interest lies in the 10 aforementioned claims, however we did at one time lease the western half of section #7 from the Southern Pacific Land Co.

(c) Only one rail car of ore was shipped from the adit in the Conrad vein. Attached is a copy of the Smelter report from American Smelting and Refining Co. in Tacoma, Wash.

(d) The only known ore reserves are approximately 7,000 tons, assuming a debth of 50' deep, by 200 feet long, by 4'-0 wide on the Conrad vein. The accompanying claim map and the attached assays show locations of assays taken over the claims. The encircled number on the assay corresponds with the encircled number on the claim map.

(e) English Mountain is covered on the top by an Andesitic to Basaltic extrusive from it's peak of about 8250' down to about the 7800' level. Below this extrusive is a metasedimentary rock which outcrops down to about the 6500 foot level. This meta-sediment is cut by a series of north - south trending dark diabase porphry rocks. Below the 6500 foot level is an intrusive grano - diorite that has many east - west trending quartz stringers (veins) almost all of which have varying amounts of molybdenite in them. The quarts veins all dip about 80 degrees to the south, while the east - west veins carrying chalcopyrite, magnetite, pyrrhotite, and molybdenite (heavy sulfides) dips about 82 degrees to the North. Between the two most prominent "Heavy Sulfide" Veins lies a fault that bears N50 degrees E. This fault is quite easily recognized for a distance of about 3/4 of one mile. On the north side of English Mountain a much grater fault intersects English Mt. This fault runs almost true north - south.. The afore - mentioned meta - sediments that overlay the granodiorite are known as the Sailor Canyon (Merten) formation.

(f) It appears that the erosion has cut down and is barely exposing the "Heavy Sulfide" veins in the area. Many geologists have looked at the property and stated that, with all the mineraliztion exposed in the area, it has a good possibility of becoming a producing mine. Many of the samples for assay were grab samples, However assays taken on the Conrad vein were channel samples.

(g) Enclosed are two copies of a report on the property by Mr. Phillip R. Bradley, Jr. chairman of the Calif. State Mining Board, and president of the California State Mining Association. Also enclosed are two copies of our claim assay map and claim map showing location of proposed 1200 foot exploration adit. It is not necessary to return these assays, maps, or reports.

4. ACESSIBILITY OF PROPERTY

(a) I, Jack B. Shumate of 935 Marin Avenue, Hayward, California Phone 783-0206, will meet the OME representative, and show him the property. The property is located on the South Slope of English Mt., about seven miles North of Emigrant Gap as the crow flies. It is accessible by county dirt road from Washington, Calif., A distance of some 20 miles via Bowman Lake. Also it is accessible via the Bowman Lake Road that intersects state highway 20 about 5 miles west of the junction of state highway 20 and national route highway 40. This road is also county dirt road and leads past Fuller Lake enroute to Bowman Lake. The two access roads mentioned, junction on the north - west end of Bowman Lake and proceed around the Lake on the north side. To the Jackson Creek Camp Ground where you turn right toward Faucherie Lake. English Mt. lies due north of Faucherie Lake. One mile west of Faucherie Lake, A bulldoser road leads up to the mine as shown on the Claim - Assay Map.

(b) The shipping points by rail are from Emigrant Gap, Calif. on route 40 (S. P. Railway) A distance of about 20 miles, and Auburn, Calif. also on route 40 (S. P. Railway) A distance of about 40 miles.

Supply points are Grass Valley, Calif. and Nevada City Calif, A distance of about 30 miles.

5. EXPLORATION WORK

(a) We propose to drive (by contract) a 1200 ft. exploration adit 6'-0 wide x 7'-0 high to intersect the Conrad vein approximately 150 feet below the outcrop and continue to the second target (the Scarano vein) and intersect it at a distance about 300 feet below the outcrop. This proposed adit is shown on the claim map enclosed.

(b) The access road has already been built as shown on the enclosed claim map. This road may need some improvement in two spots if other than 4-wheel drive vehicles are to be used on it.

(c) At a rate of 10 feet per day, it would take approximately 4 months to complete the proposed tunnel. If the work was started by July 15, 1968, It should be finished by Oct. 15, 1968 before the snows start in November.

6. EXPERIENCE

Jack B. Shumate, is a graduate Geologist from Marshall University, Huntington, W. Va., And for the past 10 years, has been Instructor of Mineralogy and Geology classes in Adult Education at the Hayward Adult and Technical School at Hayward, Calif. He has also about 20 years experience in mechanical and structural engineering with Corps of Engineers, Noble Co. and currently Del Monte Corp.

Alex A. Johnson, Has a good knowledge of Mineralogy and Geology, and is very adept in the use of explosives. He also has excellent mechanical ability, and the repair of heavy equipment. He is currently employed by Stolte, Inc., He repairs and welds heavy equipment.

Claude J. Artero, who will be head of supervision of the project, is a graduate mining engineer from the University of Calif. at Berkeley. During his college years he worked during the summer as a mucker, miner, and timberman at Grass Valley, Calif. After college he went to South America, where he became the mine superintendent of the Animas Mine at Chorolque, Bolivia. Here he was working for the Cia Arramayo De Minas Co. of Bolivia, where they mined silver, tin, lead, zinc, and copper ores at 500 ton per day. Later he became the district superintendent of the Chorolque Mining District. Later he went to Argentina, where he became general mine and mill superintendent of the Los Condores Mine in the Province of San Luis. Here he mined 600 to 800 tons per day of tungsten, zinc, and copper ores. On returning to the United States, Mr. Artero became chief Engineer of Western Knapp Engineering Co., And was in charge of the designing of the White Pines Copper project in northern Michigan. This included mine development, mill and crushing plant, and copper smelter. He is currently working as a mining and mechanical consulting engineer. Mr. Artero studied under Dr. C. A. Anderson, Former Professor at the University of Calif. At Berkeley, and Former Director of the U. S. Geological Survey. He was also associated with Dr. Ward Smith in Argentina. Dr. Smith is currently with the U. S. Geological Survey.

Phillip R. Bradley, Jr. , chairman of the Calif. State Mining Board is the consultant Mining Engineer for our partnership.

7. ESTIMATE OF COSTS

(a) We intend to contract the project of driving the 1200 foot tunnel to a tunneling contractor in its entirety, other than such supervisory work that is deemed necessary by the partnership, to be done by our own Supervisors, at no cost to the Government nor to the partnership. A cost estimate for driving this tunnel by contractor would be as follows:

Cost of 1200 foot tunnel @ $50.00/foot = ...	$60,000.00
Cost of rail, ties, air and water pipe @ $10.00/foot = . .	$12,000.00
Cost of equipment or tool shed	$ 2,000.00
Powder magazine	500.00
Mobilization & demobilization cost	$ 1,500.00
Timbering at face to 50' in approx..	$ 1,000.00
Repairs to access road	$ 1,000.00
Water tank & Misc. equipment	$ 1,000.00
Assays	$ 1,000.00
TOTAL COST OF TUNNEL	$80,000.00

(b) There will be no cost of supervision, engineering, and geological services, since our own consultants will do this work.

(c) Operating materials & supplies will be furnished by the tunneling contractor, except such surveying devices etc., will be furnished by the partnership.

(d) Operating equipment will be furnished by the tunneling contractor.

(e) There will be no cost of initial rehibilation or repairs necessary on this project.

(f) There will be no new buildings necessary, other than an equipment or tool shed as listed in the Tunnel Cost Estimate.

(g) Since we are contracting this work, there is no necessity for accounting, workmen's compensation, employee's liability insurance, payroll taxes etc. This will be handled by the Contractor, for his employees only.

MINERAL EXPLORATION

DIAMOND DRILLING

APRIL 27, 1968

ALLEN, SHUMATE, WESTON AND JOHNSON

935 MARIN AVE. HAYWARD, CALIF. 94541
~~642 VIA ALAMO - SAN LORENZO, CALIFORNIA~~
~~TELEPHONE BR. 8-2297~~ PHONE - 783-0206

BANK OF AMERICA
P.O. BOX 127
BERKELEY, CALIF. 94712

GENTLEMEN;

WE ARE A CALIF. PARTNERSHIP WHO OWN A GROUP OF TEN MINERAL CLAIMS ON ENGLISH MOUNTAIN, NEVADA CO., CALIF.

ON THESE CLAIMS WE HAVE MANY OUTCROPS OF THE COPPER MINERAL CHALLOPYRITE, AND MOLYBDENUM MINERAL, MOLYBDENITE.

WE HAVE EXPLORED THE SURFACE WITH MANY OPEN PITS, AND HAVE DRIFTED ABOUT 10' ON ONE VEIN.

THE AREA LOOKS VERY PROMISING FOR A POTENTIAL MINE, IF WE HAD MORE CAPITAL TO EXPLORE IT.

WE PROPOSE TO DRIVE A TUNNEL APPROXIMATELY 1200' TO INTERSECT THE VEIN (LINKAD VEIN) AT A DEPTH OF 100 BELOW THE OUTCROP AND THE SCARANO VEIN AT ABOUT 250' BELOW THE OUTCROP.

IF THIS EXPLORATION TUNNEL IS SUCCESSFUL IN EXPOSING MINEABLE ORE, THE PROPERTY COULD BE WORTH SEVERAL MILLION DOLLARS.

WOULD YOU CONSIDER MAKING A $40,000.00 LOAN TO OUR PARTNERSHIP AT A RATE OF 6% INTEREST, SO THAT WE COULD PROCEED WITH THE EXPLORATION OF THIS PROPERTY? BOTH METALS ARE IN GREAT DEMAND AT THIS TIME, AND IF THE EXPLORATION IS SUCCESSFUL, WE WOULD HAVE VERY LITTLE TROUBLE IN EXPLOITING THE PROPERTY.

YOURS SINCERELY,

JACK W. SHUMATE - GEN. PARTNER

Cable Address — BANKAMERICA

Bank of America
NATIONAL TRUST AND SAVINGS ASSOCIATION

WEST BERKELEY BRANCH • 2032 SAN PABLO AVENUE • BERKELEY, CALIFORNIA 94702

April 30, 1968

Mr. Jack Shumate
c/o Allen, Shumate, Weston & Johnson
935 Marin Avenue
Hayward, California 94541

Dear Mr. Shumate:

We are sorry to decline your request for financing to explore your Copper-Molybdenum property located at English Mountain, Nevada County, California.

Our inability to provide the financing is in no way to reflect unfavorably on the program you are contemplating. We hope you will be successful in your venture.

If we can be of any assistance in the future, do not hesitate to call on us.

Very truly yours,

E. B. Rom
Assistant Cashier

EBR/klm

MINERAL EXPLORATION

DIAMOND DRILLING

APRIL 27, 1968

ALLEN, SHUMATE, WESTON AND JOHNSON

935 MARIN AVE, HAYWARD, CALIF. 94541
642 VIA ALAMO - SAN LORENZO, CALIFORNIA
TELEPHONE BR. 8-2297 PHONE - 783-0206

WELLS FARGO BANK
P. O. BOX 244
BERKELEY, CALIF.

GENTLEMEN;

OUR PARTNERSHIP OF ALLEN, SHUMATE, WESTON, & JOHNSON HAVE BEEN WITH YOUR BANK SINCE OCTOBER, 1960. AS YOU KNOW, WE ARE A PARTNERSHIP FORMED FOR THE PURPOSE OF EXPLORING A GROUP OF 10 MINING CLAIMS ON ENGLISH MT., NEVADA CO., CALIF, WHERE WE HAVE GOOD SHOWINGS OF COPPER & MOLYBDENUM ORE.

MY PURPOSE FOR WRITING YOU THIS LETTER IS;

1. WE WISH TO DRIVE AN EXPLORATION TUNNEL APPROXIMATELY 1200' TO EXPOSE TWO OF THE STRONGEST VEINS AT DEPTH.
2. THE COST OF DRIVING THIS TUNNEL IS BEYOND OUR PRESENT MEANS, UNLESS WE CAN GET FINANCIAL ASSISTANCE
3. WE WISH TO APPLY FOR A LOAN OF $40,000.00 FROM YOU AT A 6% PER ANNUM INTEREST.

BOTH COPPER AND MOLYBDENUM ARE IN GREAT DEMAND AT THE PRESENT TIME, AND IF OUR EXPLORATION TUNNEL IS SUCCESSFUL, WE WOULD SURELY BE ABLE TO EXPEDITE THE MINING OF THE ORE.

HOPING TO HEAR FROM YOU SOON, I AM,

YOURS SINCERELY,

JACK B. SHUMATE
GENERAL PARTNER.

Since 1852

WELLS FARGO BANK

BERKELEY MAIN OFFICE
2144 SHATTUCK AVENUE
BERKELEY, CALIFORNIA 94704

May 1, 1968

Mr. Jack B. Shumate, General Partner
Allen, Shumate, Weston & Johnson
935 Marin Avenue
Hayward, California

Dear Mr. Shumate:

We have carefully reviewed your application for a loan to be made in connection with the development of your copper-molybdenum mining property in Nevada County, California.

Our policy at this time does not permit our granting loans for such purposes and we must regretfully inform you that your request has not been approved.

We appreciate you having given us the opportunity to consider your loan request and hope that you will call on us again if you believe we might be of service to you.

Sincerely,

A. J. Landwer, Jr.
Assistant Vice President

AJL/mc

8225

Proof of Labor

State of California

County of NEVADA } ss.

JACK B. SHUMATE, AGENT FOR ALLEN, SHUMATE, WESTON & JOHNSON being duly sworn, says: That[1] TONY MOLLY #4 & 5, STEPHANIE MOLLY #1 & 2, BETTY MOLLY #1 & 2, KATY MOLLY #1 & 2, AND JEFF MOLLY #1 & 2 ARE a[2] CONTIGUOUS GROUP OF QUARTZ mining claims situated in the County of NEVADA State of California; that[3] ALLEN, SHUMATE, WESTON AND JOHNSON the owners of said mining claims; that between the 30th day of SEPT. 1966, and the 1ST day of SEPTEMBER 1967, affiant performed the[4] LABOR and made the[5] IMPROVEMENTS required by law upon said mining claim and such[6] LABOR AND IMPROVEMENTS (MAPPING & MAGNETIC SURVEY) WERE[7] PERFORMED OR MADE by me at the request and at the expense and in behalf of said owners; that the value of said[8] LABOR AND IMPROVEMENTS was AT LEAST ONE THOUSAND dollars ($1,000.00).

Subscribed and sworn to before me this 15TH day of SEPTEMBER 1967

Jack B. Shumate

LEON E. JUNETTE

SEAL

MY COMMISSION EXPIRES AUGUST 30-1971

1. Name of Claim. 2. Placer or quartz. 3. Name of owner or claimant. 4. Labor. 5. Improvements. 6. Labor or Improvements. 7. Performed or made. 8. Labor or Improvements.

Within 30 days after the time limited for performing labor or making improvements, the person in whose behalf such labor was performed, or improvements made, or some one in his behalf, shall make and have recorded by the county recorder an affidavit, which must set forth the value of the labor or improvements, the name of the claim, and the name of the owner or claimant of the claim at whose expense the labor was performed or the improvements made. A certified copy is made prima facie evidence of the facts therein stated. Therefore it is of the greatest importance that every locator shall always have in possession his labor or improvement affidavit or a copy certified by the county recorder. (Public Resources Code, Sec. 2315.)

VOL 430 PAGE 194

VOL. 430 PAGE 195

Proof of Labor

ON

ENGLISH MT. COPPER & MOLYBDENUM Mining Claim in

County of NEVADA

State of California

for year ending SEPT. 30, 1967

Recorded at the Request of

VOL. 430 PAGE 194
OFFICIAL RECORDS
RECORDED AT REQUEST OF
Allen Plummer & Whitney Johnson

SEP 18 1967
35 MIN. PAST 2 O'CLOCK P.M.
NEVADA COUNTY, CALIFORNIA
FEE $ 2.00 per
RECORDER

8225

COMPARED & INDEXED

8225

6145 561

3907 447

Notice of Location of Quartz
Or Other Rock in Place, Claim

Notice is hereby given *that the undersigned citizens of the United States have discovered a vein or lode of quartz, or other rock in place, bearing* Molybdenite & other valuable minerals *and in accordance with the laws of the United States and the laws of the State of California, state:*

First—*That the name of said lode or claim is* Stephanie Molly #2

Second—*That the name s of the locators* are Allen, Shumate, Weston & Johnson, a limited partnership

Third—*That the number of linear feet claimed in length along the course of the vein, each way from the point of discovery is* 150' N82°W & 1350' S82°E

and the width of the claim is three hundred feet on either side thereof as measured from the center line of the vein at the surface, and the general course of the vein or lode, as near as may be, is N82°W

Fourth—*That the said claim was located on the* 10th *day of* July, *1961*

Fifth—*That said claim is situated in* the English Mountain *Mining District, County of* Nevada, *State of California, and that a description of said claim, made by reference to some natural object or permanent monument as will identify the claim located, is as follows, to wit:*

The Stephanie Molly #2 claim is contiguous with the Silvia Molly #2 claim, the Stephanie Molly #1 claim, and the Katy Molly #2 claim.

The north boundary of Stephanie Molly #2 is coincident with the south boundary of Silvia Molly #2 claim. The west boundary of Stephanie Molly #2 claim is coincident with the east boundary of Stephanie Molly #1 claim. The south boundary of Stephanie Molly #2 claim in coincident with the north boundary of Katy Molly #2 claim. The east boundary of Stephanie Molly #2 claim trends N8°E for 600' from the NE corner of Katy Molly #2 to the SE corner of Silvia Molly #2.

The Stephanie Molly #2 claim is situated within T18N, R12E, Section 12, in the NE quarter of the section.

Dated at English Mountain *this* 10th *day of* July, *1961*

ALLEN, SHUMATE, WESTON & JOHNSON

BY ([illegible]
([illegible]
[illegible]
[illegible]

NOTE.—The locator or locators of any lode mining claim shall define the boundaries of such claim so that they may be readily traced, but in no case shall the claim extend more than 1500 feet along the course of the vein or lode, nor more than 300 feet on either side thereof, as measured from the center line of the vein at the surface. (Public Resources Code, Sec. 2302).

The notice must be posted at the point of discovery (Public Resources Code, Sec. 2301).

Within ninety days after the posting of his notice of location upon a lode mining claim, the locator shall record a true copy of the notice, together with a statement of the markings of the boundaries as required in Chapter 4 of the Public Resources Code and of the performance of the required discovery work, in the office of the county recorder of the county in which such claim is situated. (Public Resources Code, Sec. 2313.)

STATEMENT OF MARKINGS OF BOUNDARIES AND PERFORMANCE OF REQUIRED DISCOVERY WORK

The undersigned, locator s *of the lode mining claim described in the within notice of location, state* s *:*

That in accordance with Section 2302 of the Public Resources Code they *defined the boundaries of the claim in manner following:* From the discovery monument on C/L of the claim. 1350' S82E and 150' N82W to the end C/L monuments. Thence 300' N8E & 300' S8W from the end C/L monument to the four corner monuments respectively.

That within sixty days after the location of the lode mining claim described in the within notice, to wit: between the 10 *day of* July, *19* 61, *and the* 24 *day of* Sept. *19* 61 they *erected at each corner of the claim and at the center of each end line, or the nearest accessible points thereto,* Substantial stone monuments at least 18'' high. *as required by Section 2302 of the Public Resources Code;*

That within ninety days after the date of the location of the lode mining claim described in the within notice, to wit: between the 10 *day of* July, *19* 61, *and the* 24 *day of* Sept. *19* 61 they *performed the following discovery work in accordance with the requirements of Section 2304 of the Public Resources Code:* Drilled, blasted & excavated an open adit approx. 6' wide 16' long and 10' deep at the face.

Dated at English Mt. *this* 24 *day of* Sept. *19* 61

T18N R12E
Section 12 M.D.M.

Allen, Shumate, Weston & Johnson
By: Carl B. Shumate

Note.—Within sixty days after the date of location of any lode mining claim hereafter located, the locator or locators shall erect at each corner of the claim and at the center of each end line, or the nearest accessible points thereto, a post not less than four inches in diameter, or a stone monument at least eighteen inches high (Public Resources Code, Sec. 2302).

Within ninety days after the date of location of any lode mining claim hereafter located, the locator or locators thereof shall sink a discovery shaft upon the claim to a depth of at least ten feet from the lowest part of the rim of the shaft at the surface, or shall drive a tunnel, adit, or open cut upon the claim to at least ten feet below the surface (Public Resources Code, Sec. 2304).

Notice of Location Quartz Claim

Mining District,
County,
State of California.
Dated *19*

6145

Recorded at Request of
Allen Shumate Weston & Johnson
at 22 min past 10 o'clock A.M
SEP 29 1961
VOL. 38 PAGE 561
MINING CLAIMS
NEVADA COUNTY RECORDS
Thos a Kibler Jr FEE $ 2.80 P.D.
RECORDER

COMPARED & INDEXED

3907

COMPARED & INDEXED

Recorded at Request of
Allen Shumate Weston & Johnson
at 11 min past 7 o'clock P.M
JUL 12 1961
VOL. 38 PAGE 447
MINING CLAIMS
NEVADA COUNTY RECORDS
Thos a Kibler Jr FEE $ 2.80 P.D.
RECORDER

6145 3907

4074

6082

219

Notice of Location of Quartz
Or Other Rock in Place, Claim

Notice is hereby given that the undersigned citizen~~s~~ of the United States have discovered a vein or lode of quartz, or other rock in place, bearing molybdenite & other valuable minerals and in accordance with the laws of the United States and the laws of the State of California, state:

First—That the name of said lode or claim is Jeff Molly #2

Second—That the name~~s~~ of the locator~~s~~ are Allen, Shumate, Weston & Johnson, a limited partnership

Third—That the number of linear feet claimed in length along the course of the vein, each way from the point of discovery is N82°W & S82°E

and the width of the claim is three hundred feet on either side thereof as measured from the center line of the vein at the surface, and the general course of the vein or lode, as near as may be, is N 82° W

Fourth—That the said claim was located on the ____ day of ____, 19__.

Fifth—That said claim is situated in the English Mountain Mining District, County of Nevada, State of California, and that a description of said claim, made by reference to some natural object or permanent monument as will identify the claim located, is as follows, to wit:

The Jeff Molly #2 claim is contiguous with the Betty Molly #2 claim, the Jeff Molly #1 claim, & the Dave Molly #2 claim.

The north boundary of the Jeff Molly #2 claim is coincident with the south boundary of the Betty Molly #2 claim. The west boundary of the Jeff Molly #2 boundary is coincident with the east boundary of the Jeff Molly #1 claim. The south boundary of the Jeff Molly #2 claim is coincident with the north boundary of the Dave Molly #2 claim. The east boundary of the Jeff Molly #2 claim trends N8°E between the NE corner of Dave Molly #2 claim & the SE corner of Betty Molly #2 claim.

The Jeff Molly #2 claim is situated in T18N, R12E, section 12 in the E ½ of the section.

Dated at ____ this ____ day of ____, 19__.

David Allen

Jack B. Shumate

NOTE—The locator or locators of any lode mining claim shall define the boundaries of such claim so that they may be readily traced, but in no case shall the claim extend more than 1500 feet along the course of the vein or lode, nor more than 300 feet on either side thereof, as measured from the center line of the vein at the surface (Public Resources Code, Sec. 2302).

The notice must be posted at the point of discovery (Public Resources Code, Sec. 2301).

Within ninety days after the posting of his notice of location upon a lode mining claim, the locator shall record a true copy of the notice, together with a statement of the markings of the boundaries as required in Chapter 4 of the Public Resources Code and of the performance of the required discovery work, in the office of the county recorder of the county in which such claim is situated. ~~The county recorder shall forward a copy to the State Mineralogist.~~ (Public Resources Code, Sec. 2313.)

98

7289

STATEMENT OF MARKINGS OF BOUNDARIES AND PERFORMANCE OF REQUIRED DISCOVERY WORK

The undersigned, locator of the lode mining claim described in the within notice of location, states:

That in accordance with Section 2302 of the Public Resources Code he defined the boundaries of the claim in manner following: [illegible]

That within sixty days after the location of the lode mining claim described in the within notice, to wit: between the [illegible] *day of* [illegible], *19*[illegible], *and the* [illegible] *day of* [illegible], *19*[illegible], *he erected at each corner of the claim and at the center of each end line, or the nearest accessible points thereto,* [illegible]

as required by Section 2302 of the Public Resources Code;

That within ninety days after the date of the location of the lode mining claim described in the within notice, to wit: between the [illegible] *day of* [illegible], *19*[illegible], *and the* [illegible] *day of* [illegible], *19*[illegible], *he performed the following discovery work in accordance with the requirements of Section 2304 of the Public Resources Code:* [illegible]

Dated at [illegible] *this* [illegible] *day of* [illegible], *19*[illegible].

[illegible]

Note.—Within sixty days after the date of location of any lode mining claim hereafter located, the locator or locators shall erect at each corner of the claim and at the center of each end line, or the nearest accessible points thereto, a post not less than four inches in diameter, or a stone monument at least eighteen inches high (Public Resources Code, Sec. 2302).

Within ninety days after the date of location of any lode mining claim hereafter located, the locator or locators thereof shall sink a discovery shaft upon the claim to a depth of at least ten feet from the lowest part of the rim of the shaft at the surface, or shall drive a tunnel, adit, or open cut upon the claim to at least ten feet below the surface (Public Resources Code, Sec. 2304).

Notice of Location
Quartz Claim

Mining District,
County,
State of California.

Dated ..... *, 19*

4074

Recorded at Request of [illegible]
at [illegible] min past 12 o'clock P.M
AUG 1 - 1960
VOL. 37 PAGE [illegible]
MINING CLAIMS
NEVADA COUNTY RECORDS
[illegible] FEE $ 2.00
RECORDER

JEFF AL #2

6082

Recorded at Request of [illegible]
at [illegible] min past 4 o'clock P.M
OCT 21 1960
VOL. 36 PAGE 214
MINING CLAIMS
NEVADA COUNTY RECORDS
[illegible] FEE $ 2.00
RECORDER

COMPARED & INDEXED

6082 4074

6096 AMENDED Notice of Location of Quartz

243

Or Other Rock in Place, Claim

Notice is hereby given that the undersigned citizens of the United States have discovered a vein or lode of quartz, or other rock in place, bearing gold, silver and other valuable minerals and in accordance with the laws of the United States and the laws of the State of California, state:

First—That the name of said lode or claim is Toni Molly #3

Second—That the names of the locators are Allen, Shumate, Weston and Johnson, a limited partnership

Third—That the number of linear feet claimed in length along the course of the vein, each way from the point of discovery is 1000' to the west ℄ monument and 1000' to the east ℄ monument and the width of the claim is three hundred feet on either side thereof as measured from the center line of the vein at the surface, and the general course of the vein or lode, as near as may be, is N 82° W

Fourth—That the said claim was located on the 25th day of July, 19 60.

Fifth—That said claim is situated in English Mountain Mining District, County of Nevada, State of California, and that a description of said claim, made by reference to some natural object or permanent monument as will identify the claim located, is as follows, to wit:

The Toni Molly #3 claim is contiguous with Toni Molly #2, Molly Molly #1, Toni Molly #4, and Kit Molly #3. The south boundary of Toni Molly #3 is coincident with the north boundary of Toni Molly #2. The north boundary of Toni Molly #3 is coincident with the south boundary of Toni Molly #4. The east boundary of Toni Molly #3 is coincident with the west boundary of Molly Molly #1. The west boundary of Toni Molly #3 is coincident with the east boundary of Kit Molly #3. Toni Molly #3 is situated within T16N, R12E, section 12

Dated at Fairview this 22nd day of October, 1960

Allen, Shumate, Weston and Johnson
A Limited Partnership

by Frederick B. Shumate

NOTE.—The locator or locators of any lode mining claim shall define the boundaries of such claim so that they may be readily traced, but in no case shall the claim extend more than 1500 feet along the course of the vein or lode, nor more than 300 feet on either side thereof, as measured from the center line of the vein at the surface. (Public Resources Code, Sec. 2302).

The notice must be posted at the point of discovery (Public Resources Code, Sec. 2301).

Within ninety days after the posting of his notice of location upon a lode mining claim, the locator shall record a true copy of the notice, together with a statement of the markings of the boundaries as required in Chapter 4 of the Public Resources Code and of the performance of the required discovery work, in the office of the county recorder of the county in which such claim is situated. (Public Resources Code, Sec. 2313.)

244

STATEMENT OF MARKINGS OF BOUNDARIES AND PERFORMANCE OF REQUIRED DISCOVERY WORK

The undersigned, locator I *of the lode mining claim described in the within notice of location, state* I:

That in accordance with Section 2302 of the Public Resources Code I *have defined the boundaries of the claim in manner following:* From the discovery monument on the ℄ of the claim 100' W 52° W and 1400' S 52° E to the end ℄ monuments, thence 200' W 38° S and 600' S 38° W from the end ℄ monuments to the ℄ where there is a discovery.

That within sixty days after the location of the lode mining claim described in the within notice, to wit: between the 25th *day of* July, 1960, *and the* 25 *day of* August, 1960, *they erected at each corner of the claim and at the center of each end line, or the nearest accessible points thereto,* Substantial stone monuments at least 15" high *as required by Section 2302 of the Public Resources Code;*

That within ninety days after the date of the location of the lode mining claim described in the within notice, to wit: between the 25th *day of* July, 1960, *and the* 20th *day of* October, 1960, *they performed the following discovery work in accordance with the requirements of Section 2304 of the Public Resources Code:* Drilled, blasted, and excavated an open adit approximately 6' wide, 221' long, and 10'-0 deep at the face.

Dated at English Mountain *this* 20th *day of* October, 1960.

Allen, Swanke, Weston and Johnson
by David Allen

Note.—Within sixty days after the date of location of any lode mining claim hereafter located, the locator or locators shall erect at each corner of the claim and at the center of each end line, or the nearest accessible points thereto, a post not less than four inches in diameter, or a stone monument at least eighteen inches high (Public Resources Code, Sec. 2302).

Within ninety days after the date of location of any lode mining claim hereafter located, the locator or locators thereof shall sink a discovery shaft upon the claim to a depth of at least ten feet from the lowest part of the rim of the shaft at the surface, or shall drive a tunnel, adit, or open cut upon the claim to at least ten feet below the surface (Public Resources Code, Sec. 2304).

Notice of Location
Quartz Claim

Mining District,
County,
State of California.
Dated, 19

Tony M. #3

6096

Recorded at Request of
Allen, Swanke & Weston & Johnson
at 4½ min past 8 o'clock A M
OCT 24 1960
VOL. 38 PAGE 243 Vol 4
MINING CLAIMS
NEVADA COUNTY RECORDS
Theo. A. Kohler Jr. FEE $ 3.00
RECORDER

COMPARED & INDEXED

6096

Notice of Location of Quartz Or Other Rock in Place, Claim

Notice is hereby given *that the undersigned citizen s of the United States ha. ve discovered a vein or lode of quartz, or other rock in place, bearing* [illegible] *and in accordance with the laws of the United States and the laws of the State of California, state* ____:

First—*That the name of said lode or claim is* Joni Molly #4

Second—*That the name s of the locator* [illegible] Allen, Shumate, Webster & Johnson, [illegible] partnership

Third—*That the number of linear feet claimed in length along the course of the vein, each way from the point of discovery is* 1100' to the east & 400' to the West

and the width of the claim is three hundred feet on either side thereof as measured from the center line of the vein at the surface, and the general course of the vein or lode, as near as may be, is N 80° W

Fourth—*That the said claim was located on the* 25th *day of* July, *19* 60.

Fifth—*That said claim is situated in* English Mountain *Mining District, County of* [illegible], *State of California, and that a description of said claim, made by reference to some natural object or permanent monument as will identify the claim located, is as follows, to wit:*

The Joni Molly #4 claim is contiguous with Joni Molly #3, Katy Molly #1, Joni Molly #5 and Kit Molly #4. The south boundary of Joni Molly #4 is coincident with the ~~Joni Molly~~ north boundary of Joni Molly #3. The north boundary of Joni Molly #4 is coincident with the south boundary of Joni Molly #5. The east boundary of Joni Molly #4 is coincident with the west boundary of Katy Molly #1. The west boundary of Joni Molly #4 is coincident with the east boundary of Kit Molly #4.

Joni Molly #4 is situated within T18S R18E, section 12.

Dated at [illegible] *this* 25th *day of* July *19* 60

Allen, Shumate, Webster & Johnson
David Allen
by { Jim B. Shumate

NOTE.—The locator or locators of any lode mining claim shall define the boundaries of such claim so that they may be readily traced, but in no case shall the claim extend more than 1500 feet along the course of the vein or lode, nor more than 300 feet on either side thereof, as measured from the center line of the vein at the surface (Public Resources Code, Sec. 2302).

The notice must be posted at the point of discovery (Public Resources Code, Sec. 2301).

Within ninety days after the posting of his notice of location upon a lode mining claim, the locator shall record a true copy of the notice together with a statement of the markings of the boundaries as required in Chapter 4 of the Public Resources Code and of the performance of the required discovery work, in the office of the county recorder of the county in which such claim is situated. (Public Resources Code, Sec. 2313.)

STATEMENT OF MARKINGS OF BOUNDARIES AND PERFORMANCE OF REQUIRED DISCOVERY WORK

The undersigned, locator S *of the lode mining claim described in the within notice of location, state* S *:*

That in accordance with Section 2302 of the Public Resources Code he *defined the boundaries of the claim in manner following:* [illegible]

That within sixty days after the location of the lode mining claim described in the within notice, to wit: between the [illegible] *day of* [illegible], *19* [illegible], *and the* [illegible] *day of* [illegible], *19* [illegible], he *erected at each corner of the claim and at the center of each end line, or the nearest accessible points thereto,* [illegible] *as required by Section 2302 of the Public Resources Code;*

That within ninety days after the date of the location of the lode mining claim described in the within notice, to wit: between the [illegible] *day of* [illegible], *19* [illegible], *and the* [illegible] *day of* [illegible], *19* [illegible], he *performed the following discovery work in accordance with the requirements of Section 2304 of the Public Resources Code:* [illegible]

Dated at [illegible] *this* [illegible] *day of* [illegible], *19* [illegible]

[illegible]

Note.—Within sixty days after the date of location of any lode mining claim hereafter located, the locator or locators shall erect at each corner of the claim and at the center of each end line, or the nearest accessible points thereto, a post not less than four inches in diameter, or a stone monument at least eighteen inches high (Public Resources Code, Sec. 2302).

Within ninety days after the date of location of any lode mining claim hereafter located, the locator or locators thereof shall sink a discovery shaft upon the claim to a depth of at least ten feet from the lowest part of the rim of the shaft at the surface, or shall drive a tunnel, adit, or open cut upon the claim to at least ten feet below the surface (Public Resources Code, Sec. 2304).

Notice of Location
Quartz Claim

Mining District,
County,
State of California.
Dated, 19

6088

Recorded at Request of [illegible]
at [illegible] min past 4 o'clock P.M
OCT 21 1960
VOL. 38 PAGE 331 et seq
MINING CLAIMS
NEVADA COUNTY RECORDS
Theo a Keller Jr FEE $ 2.00
RECORDER

4091

Recorded at Request of [illegible]
at [illegible] min past [illegible] o'clock P.M
AUG 1 - 1960
VOL. 37 PAGE 131 et seq
MINING CLAIMS
NEVADA COUNTY RECORDS
Theo a Keller Jr FEE $ 2.00
RECORDER

6088 4091

Notice of Location of Quartz
Or Other Rock in Place, Claim

Notice is hereby given *that the undersigned citizens of the United States have discovered a vein or lode of quartz, or other rock in place, bearing* molybdenite & other valuable minerals *and in accordance with the laws of the United States and the laws of the State of California, state:*

First—*That the name of said lode or claim is* Katy Molly #2

Second—*That the names of the locators* are Allen, Shumate, Weston & Johnson, a limited partnership

Third—*That the number of linear feet claimed in length along the course of the vein, each way from the point of discovery is* 35' N82°W & 1465' S82°E

and the width of the claim is three hundred feet on either side thereof as measured from the center line of the vein at the surface, and the general course of the vein or lode, as near as may be, is N82°W

Fourth—*That the said claim was located on the* 3rd *day of* July, 1961.

Fifth—*That said claim is situated in* the English Mountain *Mining District, County of* Nevada, *State of California, and that a description of said claim, made by reference to some natural object or permanent monument as will identify the claim located, is as follows, to wit:*

The Katy Molly #2 claim is contiguous with the Stephanie Molly #2 claim, the Katy Molly #1 claim, & the Betty Molly #2 claim.

The north boundary of Katy Molly #2 is coincident with the south boundary of Stephanie Molly #2 claim. The west boundary of Katy Molly #2 claim is coincident with the east boundary of Katy Molly #1 claim. The south boundary of Katy Molly #2 is coincident with the north boundary of Betty Molly #2. The east boundary of Katy Molly #2 trends N8°E between the NE corner of Betty Molly #2 & the SE corner of Stephanie Molly #2.

The Katy Molly #2 claim is situated within T18N, R12E, Section 12, being in the east half of the section.

Dated at English Mountain *this* 3rd *day of* July, 1961

Allen, Shumate, Weston & Johnson

BY { Wand C. Allen
Jay B. Shumate
Frank Weston
Alex C. Johnson

NOTE.—The locator or locators of any lode mining claim shall define the boundaries of such claim so that they may be readily traced, but in no case shall the claim extend more than 1500 feet along the course of the vein or lode, nor more than 300 feet on either side thereof, as measured from the center line of the vein at the surface. (Public Resources Code, Sec. 2302).

The notice must be posted at the point of discovery (Public Resources Code, Sec. 2301).

Within ninety days after the posting of his notice of location upon a lode mining claim, the locator shall record a true copy of the notice, together with a statement of the markings of the boundaries as required in Chapter 4 of the Public Resources Code and of the performance of the required discovery work, in the office of the county recorder of the county in which such claim is situated. (Public Resources Code Sec. 2312.)

STATEMENT OF MARKINGS OF BOUNDARIES AND PERFORMANCE OF REQUIRED DISCOVERY WORK

The undersigned, locator s *of the lode mining claim described in the within notice of location, state* s *:*

That in accordance with Section 2302 of the Public Resources Code they *defined the boundaries of the claim in manner following:* From the discovery on the C/L of the claim 1465' S82E & 35' N82W to the end C/L monuments. Thence 300' N8E & 300' S'W from the end C/L to the four conner monuments respectively.

That within sixty days after the location of the lode mining claim described in the within notice, to wit: between the 3 *day of* July, *19* 61, *and the* 24 *day of* Sept., *19* 61, *they erected at each corner of the claim and at the center of each end line, or the nearest accessible points thereto,* substantial stone monuments at lest 18 '' high.

as required by Section 2302 of the Public Resources Code;

That within ninety days after the date of the location of the lode mining claim described in the within notice, to wit: between the 3 *day of* July, *19* 61, *and the* 24 *day of* Sept., *19* 61, *they performed the following discovery work in accordance with the requirements of Section 2304 of the Public Resources Code:* Drilled, blasted, and excavated an open adit approx. 6' wide 12' long and 10' deep at the face.

Dated at English Mt. *this* 24 *day of* Sept., *19* 61

T18N R12E
Section 12 M.D.M.

Allen, Shumate, Weston & Johnson
By: Dave B. Shumate

Note.—Within sixty days after the date of location of any lode mining claim hereafter located, the locator or locators shall erect at each corner of the claim and at the center of each end line, or the nearest accessible points thereto, a post not less than four inches in diameter, or a stone monument at least eighteen inches high (Public Resources Code, Sec. 2302).

Within ninety days after the date of location of any lode mining claim hereafter located, the locator or locators thereof shall sink a discovery shaft upon the claim to a depth of at least ten feet from the lowest part of the rim of the shaft at the surface, or shall drive a tunnel, adit, or open cut upon the claim to at least ten feet below the surface (Public Resources Code, Sec. 2304).

Notice of Location
Quartz Claim

Mining District,
County,
State of California.
Dated ..., *19*...

6142

Recorded at Request of
Allen Shumate Weston Johnson
at 22 min past 10 o'clock AM
SEP 29 1961
VOL 38 PAGE 555
MINING CLAIMS
NEVADA COUNTY RECORDS
Thos a Kelley Jr FEE $ 2.80 Pd
RECORDER

COMPARED & INDEXED

3904

Recorded at Request of
Allen Shumate Weston Johnson
at 42 min past 9 o'clock A.M
JUL 12 1961
VOL 38 PAGE 441
MINING CLAIMS
NEVADA COUNTY RECORDS
Thos a Kelley Jr FEE $ 2.80 pd
RECORDER

6142 3904

6079 4069 243

Notice of Location of Quartz Or Other Rock in Place, Claim

Notice is hereby given that the undersigned citizens of the United States have discovered a vein or lode of quartz, or other rock in place, bearing molybdenite & other valuable minerals and in accordance with the laws of the United States and the laws of the State of California, state:

First—That the name of said lode or claim is Katy Molly #1

Second—That the name(s) of the locators are Allen, Shumate, Weston & Johnson, a limited partnership

Third—That the number of linear feet claimed in length along the course of the vein, each way from the point of discovery is 600' N82°W & 900' S82°E

and the width of the claim is three hundred feet on either side thereof as measured from the center line of the vein at the surface, and the general course of the vein or lode, as near as may be, is N 82° W

Fourth—That the said claim was located on the 25th day of July, 1960

Fifth—That said claim is situated in the English Mountain Mining District, County of Nevada, State of California, and that a description of said claim, made by reference to some natural object or permanent monument as will identify the claim located, is as follows, to wit:

The Katy Molly #1 claim is contiguous with the Stephanie Molly #1 claim, the Toni Molly #4 claim, the Betty Molly #1 claim, & the Katy Molly #2 claim.

The north boundary of the Katy Molly #1 claim is coincident with the south boundary of the Stephanie Molly #1 claim. The south boundary of the Katy Molly #1 claim is coincident with the north boundary of the Betty Molly #1 claim. The west boundary of the Katy Molly #1 claim is coincident with the east boundary of the Toni Molly #4 claim. The east boundary of the Katy Molly #1 claim is coincident with the west boundary of the Katy Molly #2 claim

The Katy Molly #1 claim is situated within T18N, R12E, Section 12, to the east of the center of the section.

Dated at Grass Valley this 25th day of July 1960

Allen, Shumate, Weston & Johnson

David Allen

Jack B. Shumate

NOTE.—The locator or locators of any lode mining claim shall define the boundaries of such claim so that they may be readily traced, but in no case shall the claim extend more than 1500 feet along the course of the vein or lode, nor more than 300 feet on either side thereof, as measured from the center line of the vein at the surface (Public Resources Code, Sec. 2302).

The notice must be posted at the point of discovery (Public Resources Code, Sec. 2301).

Within ninety days after the posting of his notice of location upon a lode mining claim, the locator shall record a true copy of the notice, together with a statement of the markings of the boundaries as required in Chapter 4 of the Public Resources Code and of the performance of the required discovery work, in the office of the county recorder of the county in which such claim is situated. (Public Resources Code, Sec. 2313.)

Cornelius's Form No. 800—NOTICE OF LOCATION—QUARTZ CLAIM—WITH STATEMENT OF MARKINGS AND DISCOVERY WORK.

68

244

STATEMENT OF MARKINGS OF BOUNDARIES AND PERFORMANCE OF REQUIRED DISCOVERY WORK

The undersigned, locator S of the lode mining claim described in the within notice of location, state S:

That in accordance with Section 2302 of the Public Resources Code he defined the boundaries of the claim in manner following:

That within sixty days after the location of the lode mining claim described in the within notice, to wit: between the day of , 19 , and the day of , 19 , he erected at each corner of the claim and at the center of each end line, or the nearest accessible points thereto,

as required by Section 2302 of the Public Resources Code;

That within ninety days after the date of the location of the lode mining claim described in the within notice, to wit: between the day of , 19 , and the day of , 19 , he performed the following discovery work in accordance with the requirements of Section 2304 of the Public Resources Code:

Dated at this day of , 19

Note.—Within sixty days after the date of location of any lode mining claim hereafter located, the locator or locators shall erect at each corner of the claim and at the center of each end line, or the nearest accessible points thereto, a post not less than four inches in diameter, or a stone monument at least eighteen inches high. (Public Resources Code, Sec. 2302).

Within ninety days after the date of location of any lode mining claim hereafter located, the locator or locators thereof shall sink a discovery shaft upon the claim to a depth of at least ten feet from the lowest part of the rim of the shaft at the surface, or shall drive a tunnel, adit, or open cut upon the claim to at least ten feet below the surface (Public Resources Code, Sec. 2304).

Notice of Location
Quartz Claim

Mining District,
County,
State of California.
Dated 19

COMPARED & INDEXED

6079

Recorded at Request of
at min past o'clock M
VOL. 38 OCT 21 1960 PAGE 313 et seq
MINING CLAIMS
NEVADA COUNTY RECORDS
FEE $ 2.80
RECORDER

COMPARED & INDEXED

4069

Recorded at Request of
at 55 min past 11 o'clock A M
VOL. 32 AUG 1 - 1960 PAGE 27 et seq
MINING CLAIMS
NEVADA COUNTY RECORDS
FEE $ 2.80
RECORDER

6079 4069

6091 189

5718 237

Notice of Location of Quartz
Or Other Rock in Place, Claim

Notice is hereby given *that the undersigned citizen s of the United States have discovered a vein or lode of quartz, or other rock in place, bearing* molybdenite & other valuable minerals *and in accordance with the laws of the United States and the laws of the State of California, state:*

First—*That the name of said lode or claim is* Betty Molly #2

Second—*That the name s of the locator s are* Allen, Shumate, Westen & Johnson, a limited partnership

Third—*That the number of linear feet claimed in length along the course of the vein, each way from the point of discovery is* [illegible] N82°W & 1015' S82°E

and the width of the claim is three hundred feet on either side thereof as measured from the center line of the vein at the surface, and the general course of the vein or lode, as near as may be, is N 82° W

Fourth—*That the said claim was located on the* 7th *day of* [illegible], *19*[illegible].

Fifth—*That said claim is situated in* the English Mountain *Mining District, County of* Nevada, *State of California, and that a description of said claim, made by reference to some natural object or permanent monument as will identify the claim located, is as follows, to wit:*

The Betty Molly #2 claim is contiguous with the Katy Molly #2 claim, the Betty Molly #1 claim, & the Jeff Molly #2 claim.

The north boundary of Betty Molly #2 claim is coincident with the south boundary of Katy Molly #2 claim. The west boundary of the Betty Molly #2 claim is coincident with the east boundary of the Betty Molly #1 claim. The south boundary is coincident with the north boundary of Jeff Molly #2 claim. The east boundary of Betty Molly #2 trends in a N8°E direction for 600' between the NE corner of Jeff Molly #2 & the SE corner of Katy Molly #2.

Betty Molly #2 claim is situated in T18N, R12E, Section 12 in the E 1/2 of the section

Dated at [illegible] *this* [illegible] *day of* [illegible], *19*[illegible]

David Allen

Jean B. Shumate

NOTE.—The locator or locators of any lode mining claim shall define the boundaries of such claim so that they may be readily traced, but in no case shall the claim extend more than 1500 feet along the course of the vein or lode, nor more than 300 feet on either side thereof, as measured from the center line of the vein at the surface (Public Resources Code, Sec. 2302).

The notice must be posted at the point of discovery (Public Resources Code, Sec. 2301).

Within ninety days after the posting of his notice of location upon a lode mining claim, the locator shall record a true copy of the notice, together with a statement of the markings of the boundaries as required in Chapter 4 of the Public Resources Code and of the performance of the required discovery work, in the office of the county recorder of the county in which such claim is situated. [illegible] (Public Resources Code, Sec. 2313.)

Condon's Form No. 800—NOTICE OF LOCATION—QUARTZ CLAIM—WITH STATEMENT OF MARKINGS AND DISCOVERY WORK.

STATEMENT OF MARKINGS OF BOUNDARIES AND PERFORMANCE OF REQUIRED DISCOVERY WORK

The undersigned, locator S *of the lode mining claim described in the within notice of location, state* S *:*

That in accordance with Section 2302 of the Public Resources Code he *defined the boundaries of the claim in manner following:* [illegible]

That within sixty days after the location of the lode mining claim described in the within notice, to wit: between the [illegible] *day of* [illegible], *19*[illegible], *and the* [illegible] *day of* [illegible], *19*[illegible], he *erected at each corner of the claim and at the center of each end line, or the nearest accessible points thereto,* [illegible] *as required by Section 2302 of the Public Resources Code;*

That within ninety days after the date of the location of the lode mining claim described in the within notice, to wit: between the [illegible] *day of* [illegible], *19*[illegible], *and the* [illegible] *day of* [illegible], *19*[illegible], he *performed the following discovery work in accordance with the requirements of Section 2304 of the Public Resources Code:* [illegible]

Dated at [illegible] *this* [illegible] *day of* [illegible], *19*[illegible]

[illegible]

Note.—Within sixty days after the date of location of any lode mining claim hereafter located, the locator or locators shall erect at each corner of the claim and at the center of each end line, or the nearest accessible points thereto, a post not less than four inches in diameter, or a stone monument at least eighteen inches high (Public Resources Code, Sec. 2302).

Within ninety days after the date of location of any lode mining claim hereafter located, the locator or locators thereof shall sink a discovery shaft upon the claim to a depth of at least ten feet from the lowest part of the rim of the shaft at the surface, or shall drive a tunnel, adit, or open cut upon the claim to at least ten feet below the surface (Public Resources Code, Sec. 2304).

Notice of Location Quartz Claim

Mining District,

County,

State of California.

Dated ..... *, 19*....

6091

COMPARED & INDEXED

5718

Recorded at Request of
Allen Shumate, Wisser & Johnson
at 23 min past 4 o'clock P.M.
OCT 21 1960
VOL. 38 PAGE 237 Lodge
MINING CLAIMS
NEVADA COUNTY RECORDS
Thos a Kelley Jr FEE $ 3.50
RECORDER

Recorded at Request of
Allen Shumate Wisser & Johnson
at 49 min past 1 o'clock P.M.
OCT - 5 1960
VOL. 38 PAGE 189 Lodge
MINING CLAIMS
NEVADA COUNTY RECORDS
Thos a Kelley Jr FEE $ 3.50
RECORDER

6091 5718

4085 223

6084

Notice of Location of Quartz
Or Other Rock in Place, Claim

Notice is hereby given *that the undersigned citizens of the United States have discovered a vein or lode of quartz, or other rock in place, bearing* molybdenite & other valuable minerals *and in accordance with the laws of the United States and the laws of the State of California, states:*

First—*That the name of said lode or claim is* Betty Molly #1

Second—*That the names of the locators are* Allen, Shumate, Weston & Johnson, a limited partnership

Third—*That the number of linear feet claimed in length along the course of the vein, each way from the point of discovery is* 191' N82°W & 131' S82°E

and the width of the claim is three hundred feet on either side thereof as measured from the center line of the vein at the surface, and the general course of the vein or lode, as near as may be, is N82°W

Fourth—*That the said claim was located on the* 25th *day of* July, 1960

Fifth—*That said claim is situated in the* English Mountain *Mining District, County of* Nevada, *State of California, and that a description of said claim, made by reference to some natural object or permanent monument as will identify the claim located, is as follows, to wit:*

The Betty Molly #1 claim is contiguous with the Katy Molly #1 claim, the Toni Molly #3 claim, the Jeff Molly #1 claim, & the Betty Molly #2 claim

The north boundary of the Betty Molly #1 claim is coincident with the south boundary of the Katy Molly #1 claim. The west boundary of the Betty Molly #1 claim is coincident with the east boundary of the Toni Molly #3 claim. The south boundary of the Betty Molly #1 claim is coincident with the north boundary of the Jeff Molly #1 claim. The east boundary of the Betty Molly #1 claim is coincident with the west boundary of the Betty Molly #2 claim.

The claim is situated within T18N, R12E, Section 12, being in the E. 1/2 of the section.

Dated at [illegible] *this* 25th *day of* July, 19 60

[illegible]

David Allen

Jack B. Shumate

NOTE.—The locator or locators of any lode mining claim shall define the boundaries of such claim so that they may be readily traced, but in no case shall the claim extend more than 1500 feet along the course of the vein or lode, nor more than 300 feet on either side thereof, as measured from the center line of the vein at the surface (Public Resources Code, Sec. 2302).

The notice must be posted at the point of discovery (Public Resources Code, Sec. 2301).

Within ninety days after the posting of his notice of location upon a lode mining claim, the locator shall record a true copy of the notice together with a statement of the markings of the boundaries as required in Chapter 4 of the Public Resources Code and of the performance of the required discovery work, in the office of the county recorder of the county in which such claim is situated. ~~The county recorder shall not record a notice of location without the statement of the boundaries~~ (Public Resources Code, Sec. 2313.)

120
224

STATEMENT OF MARKINGS OF BOUNDARIES AND PERFORMANCE OF REQUIRED DISCOVERY WORK

The undersigned, locator s of the lode mining claim described in the within notice of location, state s:

That in accordance with Section 2302 of the Public Resources Code he defined the boundaries of the claim in manner following: [illegible]

That within sixty days after the location of the lode mining claim described in the within notice, to wit: between the [illegible] day of [illegible], 19[illegible], and the [illegible] day of [illegible], 19[illegible], he erected at each corner of the claim and at the center of each end line, or the nearest accessible points thereto, [illegible]

as required by Section 2302 of the Public Resources Code;

That within ninety days after the date of the location of the lode mining claim described in the within notice, to wit: between the [illegible] day of [illegible], 19[illegible], and the [illegible] day of [illegible], 19[illegible], he performed the following discovery work in accordance with the requirements of Section 2304 of the Public Resources Code: [illegible]

Dated at [illegible] *this* [illegible] *day of* [illegible], 19[illegible]

[illegible]

Note.—Within sixty days after the date of location of any lode mining claim hereafter located, the locator or locators shall erect at each corner of the claim and at the center of each end line, or the nearest accessible points thereto, a post not less than four inches in diameter, or a stone monument at least eighteen inches high (Public Resources Code, Sec. 2302).

Within ninety days after the date of location of any lode mining claim hereafter located, the locator or locators thereof shall sink a discovery shaft upon the claim to a depth of at least ten feet from the lowest part of the rim of the shaft at the surface, or shall drive a tunnel, adit, or open cut upon the claim to at least ten feet below the surface (Public Rerources Code, Sec. 2304).

COMPARED & INDEXED

Notice of Location
Quartz Claim

4385

Mining District,

County,

State of California.

Dated , 19

Recorded at Request of [illegible]
at [illegible] min past [illegible] o'clock [illegible] M
AUG 1 - 1960
VOL. 32 PAGE 112 [illegible]
MINING CLAIMS
NEVADA COUNTY RECORDS
Thos a Kelly Jr FEE $ [illegible]
RECORDER

6084

Recorded at Request of [illegible]
at [illegible] min past [illegible] o'clock [illegible] M
OCT 21 1960
VOL. 38 PAGE 223 [illegible]
MINING CLAIMS
NEVADA COUNTY RECORDS
Thos a Kelly Jr FEE $ [illegible]
RECORDER

COMPARED & [illegible]

6084 4685

6094 Amended

Notice of Location of Quartz
Or Other Rock in Place, Claim

Notice is hereby given *that the undersigned citizens of the United States have discovered a vein or lode of quartz, or other rock in place, bearing* molybdenite and other valuable minerals *and in accordance with the laws of the United States and the laws of the State of California, state:*

First—*That the name of said lode or claim is* Jeff Molly #1

Second—*That the name(s) of the locators are* Allen, Shumate, Weston and Johnson, a limited partnership

Third—*That the number of linear feet claimed in length along the course of the vein, each way from the point of discovery is* 255' S 82° E and 1245' N 82° W

and the width of the claim is three hundred feet on either side thereof as measured from the center line of the vein at the surface, and the general course of the vein or lode, as near as may be, is N 82° W

Fourth—*That the said claim was located on the* 25th *day of* July, 1960

Fifth—*That said claim is situated in* the English Mountain *Mining District, County of* Nevada, *State of California, and that a description of said claim, made by reference to some natural object or permanent monument as will identify the claim located, is as follows, to wit:*

The Jeff Molly #1 claim is contiguous with the Betty Molly #1 claim, the Toni Molly #2 claim, the Dave Molly #1 claim, and the Jeff Molly #2 claim.

The south boundary of Jeff Molly #1 is coincident with the south boundary of Betty Molly #1 claim. The West boundary of Jeff Molly #1 claim is coincident with the east boundary of Toni Molly #2 claim. The South boundary of Jeff Molly #1 claim is coincident with the north boundary of Dave Molly #1 claim. The East boundary of Jeff Molly #1 claim is coincident with the west boundary of Jeff Molly #2 claim.

The Jeff Molly #1 claim is situated in the Mining District within the N½ of the section.

Dated at [illegible] *this* 22nd *day of* October, 1960

Allen, Shumate, Weston and Johnson

by { Edward Allen
Jean B. Shumate

NOTE.—The locator or locators of any lode mining claim shall define the boundaries of such claim so that they may be readily traced, but in no case shall the claim extend more than 1500 feet along the course of the vein or lode, nor more than 300 feet on either side thereof, as measured from the center line of the vein at the surface. (Public Resources Code, Sec. 2302).

The notice must be posted at the point of discovery (Public Resources Code, Sec. 2301).

Within ninety days after the posting of his notice of location upon a lode mining claim, the locator shall record a true copy of the notice, together with a statement of the markings of the boundaries as required in Chapter 4 of the Public Resources Code and of the performance of the required discovery work, in the office of the county recorder of the county in which such claim is situated. (Public Resources Code, Sec. 2313.)

239

STATEMENT OF MARKINGS OF BOUNDARIES AND PERFORMANCE OF REQUIRED DISCOVERY WORK

The undersigned, locator S *of the lode mining claim described in the within notice of location, state*.....:

That in accordance with Section 2302 of the Public Resources Code they *defined the boundaries of the claim in manner following:* From the discovery monument on the E. of the claim 255' S 82° E and 1245' N 8° E to the end & monuments, thence 300' N 82° E and 300' S 8° W from the end line monuments to the corner monuments respectively

That within sixty days after the location of the lode mining claim described in the within notice, to wit: between the 25th *day of* July, 1960, *and the* 25th *day of* August, 1960, *they erected at each corner of the claim and at the center of each end line, or the nearest accessible points thereto,* Substantial stone monuments at least 18" high.

as required by Section 2302 of the Public Resources Code;

That within ninety days after the date of the location of the lode mining claim described in the within notice, to wit: between the 25th *day of* July, 1960, *and the* 25th *day of* October, 1960, *they performed the following discovery work in accordance with the requirements of Section 2304 of the Public Resources Code:* Dug, blasted and excavated a 101 deep hole at the discovery site

Dated at Forest Mountain *this* 25th *day of* October, 1960

T. E. W. RIZE
Surveyor 4185 MNM

Allen Shumate, Weston and Johnson
By David Allen

Note.—Within sixty days after the date of location of any lode mining claim hereafter located, the locator or locators shall erect at each corner of the claim and at the center of each end line, or the nearest accessible points thereto, a post not less than four inches in diameter, or a stone monument at least eighteen inches high (Public Resources Code, Sec. 2302).

Within ninety days after the date of location of any lode mining claim hereafter located, the locator or locators thereof shall sink a discovery shaft upon the claim to a depth of at least ten feet from the lowest part of the rim of the shaft at the surface, or shall drive a tunnel, adit, or open cut upon the claim to at least ten feet below the surface (Public Resources Code, Sec. 2304).

Notice of Location
Quartz Claim

.....Mining District,
.....County,
State of California.

Dated.....19.....

6094

Recorded at Request of
Allen Shumate
Weston & Johnson
at 41 min past 8 o'clock A.M.
OCT 24 1960
VOL. 38 of MINING CLAIMS PAGE 239 et seq
NEVADA COUNTY RECORDS
Thos. E. Wilson Jr. FEE $ 1.80 Pd
RECORDER

COMPARED & INDEXED

6094

Notice of Location of Quartz
Or Other Rock in Place, Claim

Notice is hereby given *that the undersigned citizens of the United States have discovered a vein or lode of quartz, or other rock in place, bearing* Molybdenite, Copper, & other valuable minerals *and in accordance with the laws of the United States and the laws of the State of California, states:*

First—*That the name of said lode or claim is* STEPHANIE MOLLY #1

Second—*That the name s of the locator s* are Allen, Shumate, Weston & Johnson, a limited partnership

Third—*That the number of linear feet claimed in length along the course of the vein, each way from the point of discovery is* 1050' N 82°W & 450' S 82°E

and the width of the claim is three hundred feet on either side thereof as measured from the center line of the vein at the surface, and the general course of the vein or lode, as near as may be, is N 82°W

Fourth—*That the said claim was located on the* 1ST *day of* July, *19*62.

Fifth—*That said claim is situated in* the English Mountain *Mining District, County of* Nevada, *State of California, and that a description of said claim, made by reference to some natural object or permanent monument as will identify the claim located, is as follows, to wit:* The Stephanie Molly #1 claim is contiguous with the Stephanie Molly #2, Silvia Molly #1, Toni Molly #5, and Katy Molly #1 claims.

The east boundary of Stephanie Molly #1 is coincident with the west boundary of Stephanie Molly #2. The north boundary of Stephanie Molly #1 is coincident with the south boundary of Silvia Molly #1. The west boundary of Stephanie Molly #1 is coincident with the east boundary of Toni Molly #5. The south boundary of Stephanie Molly #1 is coincident with the north boundary of Katy Molly #1.

Stephanie Molly #1 is situated within T18N, R12E, Section 12, in the NE quarter of the section.

Dated at English Mountain *this* 1ST *day of* July, *19*62

ALLEN, SHUMATE, WESTON & JOHNSON

(BY) [illegible]

NOTE.—The locator or locators of any lode mining claim shall define the boundaries of such claim so that they may be readily traced, but in no case shall the claim extend more than 1500 feet along the course of the vein or lode, nor more than 300 feet on either side thereof, as measured from the center line of the vein at the surface. (Public Resources Code, Sec. 2302).

The notice must be posted at the point of discovery (Public Resources Code, Sec. 2303).

Within ninety days after the posting of his notice of location upon a lode mining claim, the locator shall record a true copy of the notice, together with a statement of the markings of the boundaries as required in Chapter 4 of the Public Resources Code and of the performance of the required discovery work, in the office of the county recorder of the county in which such claim is situated. (Public Resources Code, Sec. 2313.)

STATEMENT OF MARKINGS OF BOUNDARIES AND PERFORMANCE OF REQUIRED DISCOVERY WORK

The undersigned, locator.....of the lode mining claim described in the within notice of location, state.....:

That in accordance with Section 2302 of the Public Resources Code.....he.....defined the boundaries of the claim in manner following:.....

.....

.....

That within sixty days after the location of the lode mining claim described in the within notice, to wit: between the.....day of....., 19....., and the .....day of....., 19..... .....he.....erected at each corner of the claim and at the center of each end line, or the nearest accessible points thereto,.....

.....

as required by Section 2302 of the Public Resources Code;

That within ninety days after the date of the location of the lode mining claim described in the within notice, to wit: between the.....day of....., 19....., and the.....day of....., 19....., ...he.....performed the following discovery work in accordance with the requirements of Section 2304 of the Public Resources Code:.....

.....

.....

Dated at.....this.....day of....., 19.....

.....

.....

Note.—Within sixty days after the date of location of any lode mining claim hereafter located, the locator or locators shall erect at each corner of the claim and at the center of each end line, or the nearest accessible points thereto, a post not less than four inches in diameter, or a stone monument at least eighteen inches high (Public Resources Code, Sec. 2302).

Within ninety days after the date of location of any lode mining claim hereafter located, the locator or locators thereof shall sink a discovery shaft upon the claim to a depth of at least ten feet from the lowest part of the rim of the shaft at the surface, or shall drive a tunnel, adit, or open cut upon the claim to at least ten feet below the surface (Public Resources Code, Sec. 2304).

Notice of Location
Quartz Claim

.....

.....

.....

.....

.....

.....Mining District,

.....County,

State of California.

Dated.....19.....

INSTRUCTIONS FOR USE

Standard Form No. 65
November 1961
General Services Administration
FPMR (41 CFR) 101-11.6

U.S. Government Messenger Envelope

NAME (OR TITLE) OF ADDRESSEE, AGENCY, ORGANIZATIONAL UNIT, ADDRESS, AND ROOM		NAME (OR TITLE) OF ADDRESSEE, AGENCY, ORGANIZATIONAL UNIT, ADDRESS, AND ROOM	
U.S. GEOLOGICAL SURVEY INFORMATION OFFICE	STOP		STOP
U.S. GEOLOGICAL SURVEY INFORMATION OFFICE ROOM [illegible] GSA BUILDING	STOP	[illegible] U.S. GEOLOGICAL SURVEY [illegible] SOUTH EADS STREET ARLINGTON, VIRGINIA	STOP
	STOP		STOP
	STOP	NATHY ISERI RM - 30[illegible]	STOP ✓
[illegible] VA.	STOP	ARLINGTON TOWERS, VA.	STOP
	STOP	[illegible] 26 131	STOP
	STOP		STOP
PROPERTY CONTROL SECTION [illegible] MR. SMITH	STOP	DAVE JONES	STOP
Mike Thompson 12[illegible]	STOP	Mary Ratiff 4242 GSA	STOP
Mike Thompson [illegible]	STOP	Mr. Jennings 4235 - GSA	STOP

Use other side

Use STOP only when messenger service between Government buildings in Washington, D.C., is required or wherever a STOP system is used. Your mail room has STOP information.

65-107

1. Void Previously Used Block
2. Identify Agency of Addressee
3. Write Clearly
4. Send Surplus Envelopes to Supply Room for Reissue

NAME (OR TITLE) OF ADDRESSEE, AGENCY, ORGANIZATIONAL UNIT, ADDRESS, AND ROOM		NAME (OR TITLE) OF ADDRESSEE, AGENCY, ORGANIZATIONAL UNIT, ADDRESS, AND ROOM	
Catherine Carter 445 Taylor Bldg	STOP		STOP
	STOP		STOP
	STOP		STOP
	STOP		STOP
	STOP		STOP
SECRET - EYES ONLY	STOP		STOP
Sally Adkins	STOP		STOP
	STOP		STOP
	STOP		STOP

Use other side first

☆ U. S. GOVERNMENT PRINTING OFFICE:1965—O-781-547

AMERICAN SMELTING AND REFINING COMPANY
TACOMA SMELTER
P. O. BOX 1665
Tacoma 1, Washington

CONTRACT NO. 706

DATE November 3-61
SMELTER LOT NO. 1821
MINE LOT NO.
MATERIAL Gold ore
DATE RECEIVED Oct 6-61
ENTRY
MINE NAME
CAR OR VESSEL 366700

STATEMENT OF SETTLEMENT

NAME OF SHIPPER Allen, Blumenthal, Weston and Johnson
E.22 Via Alamo
San Lorenzo, California

GROSS WEIGHT _____ LBS.
CONTAINERS _____ LBS.
NET WEIGHT 94340 LBS.
MOISTURE 2.48 %
NET DRY WEIGHT 92000 LBS.

METAL QUOTATIONS:	DATES	PRICE	LESS	NET
GOLD		34.9125		
SILVER Hsh	10/5-11	91.375	1.0	[illegible]
LEAD				
COPPER Custom	10/5-11	30.350	9.0	[illegible]
COPPER				

	ASSAY & ANALYSIS		METAL CONTENTS								DEDUCTS	
GOLD		.01	OZS.		OZS. @		%			OZS.		
SILVER		.42	OZS.		OZS. @		% MIN.	OZS.		OZS.		
LEAD		—	%		LBS. LESS		UNITS @	%		LBS.		
COPPER	3.44		%	2245	LBS. LESS	1.0	UNITS @	%	1325	LBS.		362
COPPER			%		LBS. LESS		UNITS @	%		LBS.		
ZINC		1	%	LESS	UNITS		% @		$			
ARSENIC		.15	%	LESS	UNITS		% @					
ANTIMONY		—	%	LESS	UNITS		% @					
NICKEL		—	%	LESS	UNITS		% @					
BISMUTH			%	LESS	UNITS		% @					
TIN			%	LESS	UNITS		% @					
CHLORINE			%	LESS	UNITS		% @					
SILICA	18.2		%	LESS	UNITS		% @					
IRON	28.8		%	LESS	UNITS		% @					
LIME	3.4		%	LESS	UNITS		% @					
SULPHUR	25.1		%	LESS	UNITS		% @					
ALUMINA	5.5		%	LESS	UNITS		% @					

BASE CHARGE 11.00

LEAD PER LB. $ BASE $ @ ¢ FOR EA. ¢

ZINC PER LB. $ BASE $ @ ¢ FOR EA. ¢

METAL VALUE PER TON $ BASE $ @ %

TOTAL PAYMENT PER TON 92000 LBS. @ $ 11.00 506.00

SAMPLING AND ASSAYING
FREIGHT 92200 LBS. @ $ PER ___ TON $ TAXES $
SMELTER LABOR (DISCHARGING) $ SWITCHING $
SACK CHARGE LBS. @ $ PER TON
IN SOLID BOTTOM CAR LBS. @ $ PER TON
UMPIRE CHARGES $; CUSTOMS $; REPRESENTATION $
ADVANCED ON
LESS POUNDAGE SILVER PAYMENT PENDING RECEIPT OF AFFIDAVIT
ROYALTY % OF $

DUE SHIPPER
DUE SMELTER
TOTALS 506.00

BRANCH LABORATORY: 1086 MARTIN AVENUE, SANTA CLARA • CHERRY 8-5262

(1)

ABBOT A. HANKS, INC.

ESTABLISHED 1866

1300 SANSOME STREET • SAN FRANCISCO 11, CALIFORNIA • EXBROOK 7-2464

Engineers
Assayers
Chemists
Metallurgists
Spectrographers
Soils and Foundations
Consulting · Testing · Inspecting

LABORATORY REPORT

Lab. No. C104305

Date August 19, 1959

Submitted by Everett W. Stark
519 California Street
San Francisco, California

Sample Mark 8-7-59
Crosscut Vein Sample
DJW in Stream Bed.

QUALITATIVE SPECTROGRAPHIC ANALYSIS

Metals Found and Estimated Percentage Range

less than .03%	.03% to .30%	.30% to 3%	3% to 30%	30% to 100%
Manganese	Calcium	Aluminum		Silicon
Strontium	Magnesium	Iron		
Vanadium	Sodium	Potassium		
Copper	Titanium	Molybdenum		
Nickel				
Cobalt				
Chromium				
Boron				
Zirconium				

ABBOT A. HANKS, INC.

By Ralph A. Nice
RALPH A. NICE
Spectro-Chemist

CA-108

BRANCH LABORATORY: 1086 MARTIN AVENUE • SANTA CLARA • CHERRY 8-5262

CABLE: HANX

Aug. 19, 1959

ABBOT A. HANKS, INC.

ESTABLISHED 1866

1300 SANSOME STREET • SAN FRANCISCO 11, CALIFORNIA • EXBROOK 7-2464

Engineers
Assayers
Chemists
Metallurgists
Spectrographers
Soils and Foundations
Consulting · Testing · Inspecting

(1) & (2)

Everett W. Stark
519 California Street
San Francisco, California

REPORT OF ASSAY

Deposited by

Sample of ORE

Labty. No.	Mark	GOLD, per ton of 2,000 lbs. Troy Ounces	GOLD, Value at $35.00 oz.	SILVER, per ton of 2,000 lbs. Troy Ounces	SILVER, Value at $	Percentages MOLYBDENUM
C104305 (1)	8-7-59 Cross-cut Vein sample DJW - in stream bed.	Nil		Trace		1.33 %
06 (2)	8-7-59 Cross-cut Deseminated DJW granite sample - stream bed.	Nil		Trace		1.56 %

ABBOT A. HANKS, INC.

By Ralph A. Nice
RALPH A. NICE

bob

BRANCH LABORATORY: 1086 MARTIN AVENUE SANTA CLARA • CHERRY 8-5262

ABBOT A. HANKS, INC.
ESTABLISHED 1866

1300 SANSOME STREET • SAN FRANCISCO 11, CALIFORNIA • EXBROOK 7-2464

Engineers
Assayers
Chemists
Metallurgists
Spectrographers
Soils and Foundations
Consulting · Testing · Inspecting

2

LABORATORY REPORT

Lab. No. C104306

Date August 19, 1959

Submitted by Everett W. Stark
519 California Street
San Francisco, California

Sample Mark
Crosscut Deseminated
DJW - granite sample
stream bed.

QUALITATIVE SPECTROGRAPHIC ANALYSIS

Metals Found and Estimated Percentage Range

Less than .03%	.03% to .30%	.30% to 3%	3% to 30%	30% to 100%
Manganese Strontium Vanadium Copper Nickel Cobalt Chromium Boron Zirconium	Calcium Magnesium Sodium Titanium	Aluminum Iron Potassium Molybdenum		Silicon

Remarks

ABBOT A. HANKS, INC.

By Ralph A. Nice
RALPH A. NICE
Spectro-Chemist

bob CA-108

BRANCH LABORATORY: 1086 MARTIN AVENUE [illegible]NTA CLARA • CHERRY 8-5262
BRANCH OFFICE: 10 DE LUCA PLAC[illegible] SAN RAFAEL • GLENWOOD 4-8650

CABLE: HANX

3 4 5

ABBOT A. HANKS, INC.

ESTABLISHED 1866

1300 SANSOME STREET • SAN FRANCISCO 11, CALIFORNIA • EXBROOK 7-2464

Engineers
Assayers
Chemists
Metallurgists
Spectrographers
Soils and Foundations
Consulting · Testing · Inspecting

August 17,1960

Allan, Shumate, Weston
and Johnson
642 Via Alamo
San Lorenzo, California

REPORT OF ASSAY

Deposited by

Sample of ORE

Labty. No.	Mark	GOLD, per ton of 2,000 lbs. Troy Ounces	GOLD, per ton of 2,000 lbs. Value at $35.00 oz.	SILVER, per ton of 2,000 lbs. Troy Ounces	SILVER, per ton of 2,000 lbs. Value at $	Percentages
						MOLYBDENUM
C110656	Foot Wall	.02	.70			0.01 % 3
57	Hanging Wall					0.02 % 5
58	Vein					1.45 % 4

ABBOT A. HANKS, INC.

By Ralph A. Nice
Ralph A. Nice

nsj

CA-106

BRANCH LABORATORY: 1086 MARTIN AVENUE [illegible]NTA CLARA • CHERRY 8-5262
BRANCH OFFICE: 10 DE LUCA PLACE [illegible]AN RAFAEL • GLENWOOD 4-8650

CABLE: HANX

(3)

ABBOT A. HANKS, INC.

ESTABLISHED 1866

1300 SANSOME STREET • SAN FRANCISCO 11, CALIFORNIA • EXBROOK 7-2464

Engineers
Assayers
Chemists
Metallurgists
Spectrographers
Soils and Foundations
Consulting · Testing · Inspecting

LABORATORY REPORT

Lab. No. C110656 Date August 17, 1960

Submitted by Allan, Shumate, Weston and Johnson Sample Mark Foot Wall

QUALITATIVE SPECTROGRAPHIC ANALYSIS
Metals Found and Estimated Percentage Range

Less than .03%	.03% to .30%	.30% to 3%	3% to 30%	30% to 100%
Vanadium Zirconium Chromium Nickel Cobalt Silver Molybdenum	Titanium Manganese Strontium	Iron Calcium Magnesium Sodium Potassium Copper	Aluminum	Silicon

Remarks

ABBOT A. HANKS, INC.

By Ralph A. Nice
Spectro-Chemist

Ralph A. Nice

nsj

CA-108

BRANCH LABORATORY: 1086 MARTIN AVENUE • S[illegible] CLARA • CHERRY 8-5262
BRANCH OFFICE: 10 DE LUCA PLA[illegible] SAN RAFAEL • GLENWOOD 4-8650

CABLE: HANX

4

ABBOT A. HANKS, INC.

ESTABLISHED 1866

1300 SANSOME STREET • SAN FRANCISCO 11, CALIFORNIA • EXBROOK 7-2464

Engineers
Assayers
Chemists
Metallurgists
Spectrographers
Soils and Foundations
Consulting · Testing · Inspecting

LABORATORY REPORT

Lab. No. C110658

Date August 17, 1960

Submitted by Allan, Shumate, Weston and Johnson

Sample Mark Vein

QUALITATIVE SPECTROGRAPHIC ANALYSIS
Metals Found and Estimated Percentage Range

Less than .03%	.03% to .30%	.30% to 3%	3% to 30%	30% to 100%
Calcium Magnesium Sodium Potassium Copper Manganese Strontium Vanadium Chromium Titanium Nickel	Aluminum	Iron Molybdenum		Silicon

Remarks

ABBOT A. HANKS, INC.

By Ralph A. Nice
Spectro-Chemist
Ralph A. Nice

nsj

CA-108

BRANCH LABORATORY: 1086 MARTIN AVENUE • S[illegible] CLARA • CHERRY 8-5262
BRANCH OFFICE: 10 DE LUCA PLAC[illegible] SAN RAFAEL • GLENWOOD 4-8650

CABLE: HANX

5

ABBOT A. HANKS, INC.

ESTABLISHED 1866

1300 SANSOME STREET • SAN FRANCISCO 11, CALIFORNIA • EXBROOK 7-2464

Engineers
Assayers
Chemists
Metallurgists
Spectrographers
Soils and Foundations
Consulting · Testing · Inspecting

LABORATORY REPORT

Lab. No. C110657 Date August 17, 1960

Submitted by Allan, Shumate, Weston and Johnson Sample Mark Hanging Wall

QUALITATIVE SPECTROGRAPHIC ANALYSIS
Metals Found and Estimated Percentage Range

Less than .03%	.03% to .30%	.30% to 3%	3% to 30%	30% to 100%
Manganese Vanadium Zirconium Chromium Nickel Cobalt Silver Molybdenum	Copper Titanium Strontium	Calcium Magnesium Iron Sodium Potassium	Aluminum	Silicon

Remarks

nsj

ABBOT A. HANKS, INC.

By Ralph A. Nice
Spectro-Chemist

Ralph A. Nice

CA-108

BRANCH LABORATORY: 1086 MARTIN AVENUE • SANTA CLARA • CHERRY 8-5262
BRANCH OFFICE: 10 DE LUCA P[illegible] • SAN RAFAEL • GLENWOOD 4-8650

(6)

ABBOT A. HANKS, INC.

ESTABLISHED 1866

1300 SANSOME STREET • SAN FRANCISCO 11, CALIFORNIA • EXBROOK 7-2464

Engineers
Assayers
Chemists
Metallurgists
Spectrographers
Soils and Foundations
Consulting · Testing · Inspecting

LABORATORY REPORT

Lab. No. C110660 Date August 17, 1960

Submitted by Allan, Shumate, Weston and Johnson Sample Mark Mag 12

QUALITATIVE SPECTROGRAPHIC ANALYSIS
Metals Found and Estimated Percentage Range

Less than .03%	.03% to .30%	.30% to 3%	3% to 30%	30% to 100%
Sodium Potassium Strontium Vanadium Nickel Cobalt Chromium Silver	Magnesium Titanium Copper Molybdenum Manganese	Aluminum Calcium	Silicon	Iron

Remarks

2000
.0003
.6000

12
.6
7.2

2-702

nsj

ABBOT A. HANKS, INC.

By Ralph A. Nice
Spectro-Chemist
Ralph A. Nice

CA-108

BRANCH LABORATORY: 1086 MARTIN AVENUE • SANTA CLARA • CHERRY 8-5262
BRANCH OFFICE: 61 JORDAN STREET • SAN RAFAEL • GLENWOOD 4-8650

CABLE: HANX

(7)

ABBOT A. HANKS, INC.

ESTABLISHED 1866

1300 SANSOME STREET • SAN FRANCISCO 11, CALIFORNIA • EXBROOK 7-2464

Engineers
Assayers
Chemists
Metallurgists
Spectrographers
Soils and Foundations
Consulting · Testing · Inspecting

REPORT OF ASSAY

June 9, 1961

Deposited by Allen, Shumate, Weston & Johnson
642 Via Alamo
San Lorenzo, California

Sample of Ore

Labty. No.	Mark	GOLD, per ton of 2,000 lbs. Troy Ounces	GOLD Value at $35.00 oz.	SILVER, per ton of 2,000 lbs. Troy Ounces	SILVER Value at	Percentages COPPER	Percentages MOLYBDENUM
C115246	3 ft. Channel Cut	.03	$ 1.05	2.17	$ 1.95	12.33	0.01

ABBOT A. HANKS, INC.

By Ralph A. Nice
Ralph A. Nice

lm

CA-106

BRANCH LABORATORY: 1086 MARTIN AVENUE • SANTA CLARA • CHERRY 8-5262
BRANCH OFFICE: 10 DE LUCA PLACE SAN RAFAEL • GLENWOOD 4-8650

CABLE: HANX

ABBOT A. HANKS, INC.
ESTABLISHED 1866
1300 SANSOME STREET • SAN FRANCISCO 11, CALIFORNIA • EXBROOK 7-2464

Engineers
Assayers
Chemists
Metallurgists
Spectrographers
Soils and Foundations
Consulting · Testing · Inspecting

7

LABORATORY REPORT

Lab. No. C115246

Date June 9, 1961

Submitted by Allen, Shumate, Weston & Johnson
642 Via Alamo
San Lorenzo, California

Sample Mark 3 ft. Channel Cut

QUALITATIVE SPECTROGRAPHIC ANALYSIS
Metals Found and Estimated Percentage Range

Less than .03%	.03% to .30%	.30% to 3%	3% to 30%	30% to 100%
Manganese Nickel Cobalt Vanadium Zinc Silver Molybdenum Boron	Aluminum Calcium Magnesium Potassium Titanium	Silicon Sodium	Iron Copper	

Remarks

ABBOT A. HANKS, INC.

By Ralph A. Nice
Spectro-Chemist

lm

CA-108

BRANCH LABORATORY: 1086 MARTIN AVENUE • SANTA CLARA • CHERRY 8-5262
BRANCH OFFICE: 10 DE LUCA PLA. SAN RAFAEL • GLENWOOD 4-8650

CABLE: HANX

ABBOT A. HANKS, INC.
ESTABLISHED 1866
1300 SANSOME STREET • SAN FRANCISCO 11, CALIFORNIA • EXBROOK 7-2464

Engineers
Assayers
Chemists
Metallurgists
Spectrographers
Soils and Foundations
Consulting · Testing · Inspecting

8

LABORATORY REPORT

Lab. No. C111111 Date September 7, 1960

Submitted by Allen, Shumate, Weston & Johnson
642 Via Alamo
San Lorenzo, California

Sample Mark Kit Molly #1

QUALITATIVE SPECTROGRAPHIC ANALYSIS
Metals Found and Estimated Percentage Range

Less than .03%	.03% to .30%	.30% to 3%	3% to 30%	30% to 100%
Copper Vanadium Chromium Zirconium Nickel Boron	Titanium Manganese Molybdenum Strontium	Iron Calcium Magnesium Sodium Potassium	Aluminum	Silicon

Remarks

ABBOT A. HANKS, INC.
By Martin P. Quist
Spectro-Chemist
Martin P. Quist

CA-108 1b

METALLURGICAL LABORATORIES CHEMISTS • ASSAYERS • SPECTROGRAPHERS

1142 HOWARD STREET • SAN FRANCISCO 3, CALIFORNIA • UNDERHILL 3-8575

9

REPORT OF ASSAY

Submitted by Mr. Everett W. Stark
519 California Street
San Francisco, California

Date August 2, 1961

Sample of Ore Allen, Shumate, Weston, Johnson
2 ft. high grade vein

LABORATORY No.	MARK	GOLD, PER TON OF 2,000 LBS. TROY OUNCES	VALUE AT $35.00 OZ.	SILVER, PER TON OF 2,000 LBS. TROY OUNCES	VALUE AT $0.90 OZ.	PERCENTAGES Copper
6722	Allen, Shumate, Weston, Johnson	0.02	0.70	2.86	2.57	20.76

METALLURGICAL LABORATORIES

By [signature]

BRANCH LABORATORY: 1086 MARTIN AVENUE, SANTA CLARA • CHERRY 8-5262
BRANCH OFFICE: 10 DE LUCA PLACE, SAN RAFAEL • GLENWOOD 4-8650

(10)

ABBOT A. HANKS, INC.

ESTABLISHED 1866

1300 SANSOME STREET • SAN FRANCISCO 11, CALIFORNIA • EXBROOK 7-2464

Engineers
Assayers
Chemists
Metallurgists
Spectrographers
Soils and Foundations
Consulting · Testing · Inspecting

LABORATORY REPORT

Lab. No. C109972 Date July 11, 1960

Submitted by Allan, Shumate, Weston & Johnson
642 Via Alamo
San Lorenzo, California

Sample Mark N M # 2

QUALITATIVE SPECTROGRAPHIC ANALYSIS
Metals Found and Estimated Percentage Range

Less than .03%	.03% to .30%	.30% to 3%	3% to 30%	30% to 100%
Zirconium Vanadium Chromium Copper Nickel Cobalt	Titanium Manganese Strontium	Iron Calcium Magnesium Sodium Potassium	Aluminum	Silicon

Remarks
cc: Jack Shumale
Hayward, California

cc: Paul Weber
Berkeley, California

ABBOT A. HANKS, INC.

By Martin P. Quist
Spectro-Chemist

ras CA-108

BRANCH LABORATORY: 1086 MARTIN AVENUE • SANTA CLARA • CHERRY 8-5262
BRANCH OFFICE: 10 DE LUCA PLA SAN RAFAEL • GLENWOOD 4-8650

CABLE: HANX

ABBOT A. HANKS, INC.
ESTABLISHED 1866
1300 SANSOME STREET • SAN FRANCISCO 11, CALIFORNIA • EXBROOK 7-2464

Engineers
Assayers
Chemists
Metallurgists
Spectrographers
Soils and Foundations
Consulting · Testing · Inspecting

(11)

LABORATORY REPORT

Lab. No. C111411 Date September 22, 1960

Submitted by Allen, Shumate, Weston & Johnson
642 Via Alamo
San Lorenzo, California

Sample Mark Toni Molly #2

QUALITATIVE SPECTROGRAPHIC ANALYSIS
Metals Found and Estimated Percentage Range

Less than .03%	.03% to .30%	.30% to 3%	3% to 30%	30% to 100%
Vanadium Chromium Copper Nickel Cobalt Boron	Magnesium Titanium Manganese Strontium Zirconium	Iron Calcium Sodium Potassium	Aluminum	Silicon

Remarks cc: Mr. Jack Shumate, Hayward
Mr. Paul Weber, Berkeley

ABBOT A. HANKS, INC.

By Ralph A. Mie
Spectro-Chemist
Martin P. Quist

CA-108
hms

BRANCH LABORATORY: 1086 MARTIN AVENUE • SANTA CLARA • CHERRY 8-5262
BRANCH OFFICE: 10 DE LUCA PLA SAN [illegible]EL • GLENWOOD 4-8650

CABLE: HANX

(12)

ABBOT A. HANKS, INC.

ESTABLISHED 1866

1300 SANSOME STREET • SAN FRANCISCO 11, CALIFORNIA • EXBROOK 7-2464

Engineers
Assayers
Chemists
Metallurgists
Spectrographers
Soils and Foundations
Consulting · Testing · Inspecting

LABORATORY REPORT

Lab. No. C110361 Date July 28, 1960

Submitted by Allen, Shumate, Weston and Johnson
642 Via Alamo
San Lorenzo, California

Sample Mark Becky Molly # 1

QUALITATIVE SPECTROGRAPHIC ANALYSIS
Metals Found and Estimated Percentage Range

Less than .03%	.03% to .30%	.30% to 3%	3% to 30%	30% to 100%
Manganese Strontium Vanadium Zirconium Boron Copper Chromium Nickel	Titanium	Iron Sodium Potassium Calcium Magnesium	Aluminum	Silicon

Remarks

cc: Jack Shumate
Hayward, California

cc: Paul Weber
Berkeley, California

ABBOT A. HANKS, INC.

By Martin P. Quist
Spectro Chemist

CA-108

ras

BRANCH LABORATORY: 1086 MARTIN AVENUE • SANTA CLARA • CHERRY 8-5262
BRANCH OFFICE: 10 DE LUCA PLAZA • SAN RAFAEL • GLENWOOD 4-8650

CABLE: HANX

(13)

ABBOT A. HANKS, INC.

ESTABLISHED 1866

1300 SANSOME STREET • SAN FRANCISCO 11, CALIFORNIA • EXBROOK 7-2464

Engineers
Assayers
Chemists
Metallurgists
Spectrographers
Soils and Foundations
Consulting · Testing · Inspecting

LABORATORY REPORT

Lab. No. C110362 Date July 28, 1960

Submitted by Allen, Schumate, Weston and Johnson
642 Via Alamo
San Lorenzo, California

Sample Mark Becky Molly # 4

QUALITATIVE SPECTROGRAPHIC ANALYSIS
Metals Found and Estimated Percentage Range

Less than .03%	.03% to .30%	.30% to 3%	3% to 30%	30% to 100%
Copper Manganese Strontium Vanadium Nickel Zirconium Chromium	Titanium	Iron Sodium Potassium Calcium Magnesium	Aluminum	Silicon

Remarks

cc: Jack Shumate
Hayward, California
cc: Paul Weber
Berkeley, California

ras

ABBOT A. HANKS, INC.

By Martin P. Quist
Martin P. Quist, Spectrochemist

CA-108

BRANCH LABORATORY: 1086 MARTIN AVENUE • SANTA CLARA • CHERRY 8-5262
BRANCH OFFICE: 10 DE LUCA PLA SAN RAFAEL • GLENWOOD 4-8650

CABLE: HANX

(14)

ABBOT A. HANKS, INC.

ESTABLISHED 1866

1300 SANSOME STREET • SAN FRANCISCO 11, CALIFORNIA • EXBROOK 7-2464

Engineers
Assayers
Chemists
Metallurgists
Spectrographers
Soils and Foundations
Consulting · Testing · Inspecting

LABORATORY REPORT

Lab. No. C110659 Date August 17, 1960

Submitted by Allan, Shumate, Weston and Johnson Sample Mark Becky 4

QUALITATIVE SPECTROGRAPHIC ANALYSIS
Metals Found and Estimated Percentage Range

Less than .03%	.03% to .30%	.30% to 3%	3% to 30%	30% to 100%
Manganese Zirconium Molybdenum Vanadium Copper Chromium Nickel	Sodium Magnesium Titanium Strontium	Aluminum Iron Calcium Potassium		Silicon

Remarks

nsj

ABBOT A. HANKS, INC.

By Ralph A. Nice
Spectro-Chemist

Ralph A. Nice

CA-103

BRANCH LABORATORY: 1086 MARTIN AVENUE • SANTA CLARA • CHERRY 8-5262
BRANCH OFFICE: 10 DE LUCA PL • SAN RAFAEL • GLENWOOD 4-8650

(17)

ABBOT A. HANKS, INC.

ESTABLISHED 1866

1300 SANSOME STREET • SAN FRANCISCO 11, CALIFORNIA • EXBROOK 7-2464

Engineers
Assayers
Chemists
Metallurgists
Spectrographers
Soils and Foundations
Consulting · Testing · Inspecting

LABORATORY REPORT

Lab. No. C109973 Date July 11, 1960

Submitted by Allan, Shumate, Weston & Johnson
642 Via Alamo
San Lorenzo, California

Sample Mark NM # 3

QUALITATIVE SPECTROGRAPHIC ANALYSIS
Metals Found and Estimated Percentage Range

Less than .03%	.03% to .30%	.30% to 3%	3% to 30%	30% to 100%
Molybdenum Boron Zirconium Vanadium Chromium Nickel Cobalt	Titanium Manganese Strontium Copper	Iron Magnesium Sodium Potassium	Aluminum Calcium	Silicon

Tungsten very hard to obtain below .05%
Gold would show until it gets to about 4 oz/ton
Silver " " " " " " 1 oz/ton

In each group, the elements are listed with largest amounts at the top - Quist estimates that the Moly on NM # 5 was close to .2% - certainly it was over .1%.

Arsenic at about .1%

Remarks
cc: Jack Shumale
Hayward, California
cc: Paul Weber
Berkeley, California

ABBOT A. HANKS, INC.
By Martin P. Quist
Spectro-Chemist

ras CA-108

BRANCH LABORATORY: 1086 MARTIN AVENUE • SANTA CLARA • CHERRY 8-5262
BRANCH OFFICE: 10 DE LUCA PL. • SAN RAFAEL • GLENWOOD 4-8650

(18)

ABBOT A. HANKS, INC.

ESTABLISHED 1866

1300 SANSOME STREET • SAN FRANCISCO 11, CALIFORNIA • EXBROOK 7-2464

Engineers
Assayers
Chemists
Metallurgists
Spectrographers
Soils and Foundations
Consulting · Testing · Inspecting

LABORATORY REPORT

Lab. No. C110287 Date July 26, 1960

Submitted by Allen, Shumate, Weston and Johnson
642 Via Alamo
San Lorenzo, California

Sample Mark X - 1

QUALITATIVE SPECTROGRAPHIC ANALYSIS
Metals Found and Estimated Percentage Range

Less than .03%	.03% to .30%	.30% to 3%	3% to 30%	30% to 100%
✓✓✓Sodium ✓✓✓Potassium Bismuth ✓✓✓Titanium ✓✓✓Manganese ✓✓✓Nickel ✓✓✓Cobalt ✓✓✓Strontium ✓✓✓Vanadium ✓✓✓Chromium ✓✓✓Boron ✓✓✓Zirconium Silver	✓✓✓Molybdenum ✓✓✓Aluminum ✓✓✓Calcium ✓✓✓Magnesium	✓✓✓Copper SP side vein "Brunkite"	✓✓✓Iron COVELITE ~~(GOODLITE)~~	✓✓✓Silicon

Remarks Copper close to low side of Percentage Range.

ABBOT A. HANKS, INC.
By Martin P. Quist
Spectro-Chemist

ras CA-108

BRANCH LABORATORY: 1086 MARTIN AVENUE • SANTA CLARA • CHERRY 8-5262
BRANCH OFFICE: 10 DE LUCA PL. • SAN RAFAEL • GLENWOOD 4-8650

(19)

ABBOT A. HANKS, INC.

ESTABLISHED 1866

1300 SANSOME STREET • SAN FRANCISCO 11, CALIFORNIA • EXBROOK 7-2464

Engineers
Assayers
Chemists
Metallurgists
Spectrographers
Soils and Foundations
Consulting · Testing · Inspecting

LABORATORY REPORT

Lab. No. C110288 Date July 26, 1960

Submitted by Allen, Shumate, Western and Johnson
642 Via Alamo
San Lorenzo, California

Sample Mark X - 2

QUALITATIVE SPECTROGRAPHIC ANALYSIS
Metals Found and Estimated Percentage Range

Less than .03%	.03% to .30%	.30% to 3%	3% to 30%	30% to 100%
✓✓✓ Vanadium	✓✓✓ Molybdenum	✓✓✓ Aluminum	✓✓✓ Silicon	✓✓✓ Iron
✓✓✓ Nickel	✓✓✓ Magnesium	✓✓✓ Calcium		
✓✓✓ Manganese	✓✓✓ Titanium			
✓✓✓ Sodium	✓✓✓ Copper			
✓✓✓ Potassium				
✓✓✓ Cobalt				
✓✓✓ Strontium				
✓✓✓ Chromium				
✓✓✓ Boron				
✓✓✓ Zirconium				
Silver				

Magnetite hole

Remarks

ABBOT A. HANKS, INC.
By Martin P. Quist
Spectro-Chemist

ras

CA-108

BRANCH LABORATORY: 1086 MARTIN AVENUE • SANTA CLARA • CHERRY 8-5262
BRANCH OFFICE: 10 DE LUCA PLACE • SAN RAFAEL • GLENWOOD 4-8650

(20)

ABBOT A. HANKS, INC.

ESTABLISHED 1866

1300 SANSOME STREET • SAN FRANCISCO 11, CALIFORNIA • EXBROOK 7-2464

Engineers
Assayers
Chemists
Metallurgists
Spectrographers
Soils and Foundations
Consulting · Testing · Inspecting

LABORATORY REPORT

Lab. No. C110289 Date July 26, 1960

Submitted by Allen, Shumate, Weston and Johnson
642 Via Alamo
San Lorenzo, California

Sample Mark X - 3

QUALITATIVE SPECTROGRAPHIC ANALYSIS
Metals Found and Estimated Percentage Range

Less than .03%	.03% to .30%	.30% to 3%	3% to 30%	30% to 100%
✓✓✓ Copper	✓✓✓ Magnesium	✓✓✓ Aluminum	✓✓✓ Silicon	✓✓✓ Iron
✓✓✓ Vanadium	✓✓✓ Manganese		✓✓✓ Calcium	
✓✓✓ Molybdenum				
✓✓✓ Boron				
✓✓✓ Zirconium				
✓✓✓ Sodium				
✓✓✓ Potassium				
✓✓✓ Titanium				
✓✓✓ Nickel				
✓✓✓ Cobalt				
✓✓✓ Strontium				
✓✓✓ Chromium				

Section of pyrite hole

Remarks

ABBOT A. HANKS, INC.

By Martin P. Quist
Martin P. Quist, Spectro-Chemist

ras CA-108

METALLURGICAL LABORATORIES CHEMISTS • ASSAYERS • SPECTROGRAPHERS

1142 HOWARD STREET • SAN FRANCISCO 3, CALIFORNIA • UNDERHILL 3-8575

Phone Gilbert

Date June 21, 1961 JE 7-2557

Submitted by Allen, Shumate, Weston & Johnson
642 Via Alamo
San Lorenzo, California

Sample of Ore #4 (23)

Qualitative Spectrographic Analysis

METALS FOUND AND PERCENTAGE RANGE

LESS THAN 0.01%	.01 TO .10%	.10 TO 1.0%	1.0 TO 10.0%	MAJOR	Lab. No.
Zinc	Potassium	Sodium	Calcium	Silicon	6593
Nickel	Tungsten	Copper	Aluminum	Magnesium	
Cobalt	Titanium		Iron		
Molybdenum	Manganese				
Silver	Lead				
Strontium	Vanadium				
Chromium	Zirconium				

REMARKS:

METALLURGICAL LABORATORIES

By [signature]
SPECTROCHEMIST

METALLURGICAL LABORATORIES CHEMISTS ASSAYERS SPECTROGRAPHERS

1142 HOWARD STREET • SAN FRANCISCO 3, CALIFORNIA • UNDERHILL 3-8575

24

REPORT OF ANALYSIS

Submitted by Allen, Shumate, Weston & Johnson
642 Via Alamo
San Lorenzo, California

Date June 21, 1961

Sample of Ore #3

LABORATORY No.	MARK	PERCENTAGES	
			Copper
6592	Ore #3		5.72
BY PHONE	"	GOLD .05 oz	1.75
	"	SILVER 1.2 oz	1.08

METALLURGICAL LABORATORIES

By Martin P. Ouist

METALLURGICAL LABORATORIES CHEMISTS ASSAYERS SPECTROGRAPHERS

1142 HOWARD STREET • SAN FRANCISCO 3, CALIFORNIA • UNDERHILL 3-8575

24

Submitted by Allen, Shumate, Weston & Johnson
642 Via Alamo
San Lorenzo, California

Date June 21, 1961

Sample of Ore #3

Qualitative Spectrographic Analysis

METALS FOUND AND PERCENTAGE RANGE

LESS THAN 0.01%	.01 TO .10%	.10 TO 1.0%	1.0 TO 10.0%	MAJOR	Lab. No.
Silver	Potassium	Sodium	Copper	Silicon	6592
Nickel	Titanium	Zinc	Calcium	Iron	
Chromium	Manganese	Molybdenum	Magnesium		
	Cobalt		Aluminum		
	Lead				
	Zirconium				
	Vanadium				
	Strontium				

REMARKS:

METALLURGICAL LABORATORIES

By [signature]
SPECTROCHEMIST

METALLURGICAL LABORATORIES CHEMISTS, ASSAYERS & SPECTROGRAPHERS

1142 HOWARD STREET • SAN FRANCISCO 3, CALIFORNIA • UNDERHILL 3-8575

25

Date June 21, 1961

Submitted by Allen, Shumate, Weston & Johnson
642 Via Alamo
San Lorenzo, California

Sample of Ore #1

Qualitative Spectrographic Analysis

METALS FOUND AND PERCENTAGE RANGE

LESS THAN 0.01%	.01 TO .10%	.10 TO 1.0%	1.0 TO 10.0%	MAJOR	Lab. No.
Zinc	Cobalt	Sodium	Calcium	Iron	-6590
Silver	Potassium	Molybdenum	Copper	Silicon	
Chromium	Lead		Aluminum		
	Vanadium		Magnesium		
	Nickel				
	Zirconium				
	Manganese				
	Titanium				

REMARKS:

METALLURGICAL LABORATORIES

By [signature]
SPECTROCHEMIST

METALLURGICAL LABORATORIES CHEMISTS ASSAYERS • SPECTROGRAPHERS

1142 HOWARD STREET • SAN FRANCISCO 3, CALIFORNIA • UNDERHILL 3-8575

26

Date June 21, 1961

Submitted by Allen, Shumate, Weston & Johnson
642 Via Alamo
San Lorenzo, California

Sample of Ore #2

Qualitative Spectrographic Analysis

METALS FOUND AND PERCENTAGE RANGE

LESS THAN 0.01%	.01 TO .10%	.10 TO 1.0%	1.0 TO 10.0%	MAJOR	Lab. No.
Titanium	Calcium	Copper	Iron	Silicon	6591
Manganese	Magnesium	Aluminum			
Nickel	Molybdenum	Sodium			
Cobalt	Potassium				
Zinc	Lead				
Vanadium	Bismuth				
Silver					
Chromium					

REMARKS:

METALLURGICAL LABORATORIES

By [signature]
SPECTROCHEMIST

METALLURGICAL LABORATORIES CHEMISTS ASSAYERS SPECTROGRAPHERS

1142 HOWARD STREET • SAN FRANCISCO 3, CALIFORNIA • UNDERHILL 3-8575

27

Submitted by Allen, Shumate, Weston & Johnson
642 Via Alamo
San Lorenzo, California

Date June 21, 1961

Sample of Ore #5

Qualitative Spectrographic Analysis

METALS FOUND AND PERCENTAGE RANGE

LESS THAN 0.01%	.01 TO .10%	.10 TO 1.0%	1.0 TO 10.0%	MAJOR	Lab. No.
Nickel	Lead	Magnesium	Sodium	Silicon	6594
Chromium	Vanadium	Potassium	Calcium	Aluminum	
Cobalt	Zirconium	Titanium	Iron		
	Manganese	Copper			
	Strontium				

REMARKS:

METALLURGICAL LABORATORIES

By Matt P. Amist
SPECTROCHEMIST

METALLURGICAL LABORATORIES CHEMISTS • ASSAYERS • SPECTROGRAPHERS

1142 HOWARD STREET • SAN FRANCISCO 3, CALIFORNIA • UNDERHILL 3-8575

Submitted by Allen, Shumate, Weston & Johnson
642 Via Alamo
San Lorenzo, California

Date November 8, 1962

(28)

Sample of Conrad Cu Ore

Qualitative Spectrographic Analysis

METALS FOUND AND PERCENTAGE RANGE

LESS THAN 0.01%	.01 TO .10%	.10 TO 1.0%	1.0 TO 10.0%	MAJOR	LAB. NO.
Cobalt	Antimony	Aluminum		Iron	8248-1
Nickel	Zinc	Calcium		Copper	
Vanadium	Strontium	Sodium		Silicon	
Chromium	Titanium	Potassium			
Lead	Manganese				
Molybdenum					
Silver					

REMARKS:

METALLURGICAL LABORATORIES

By [signature]
SPECTROCHEMIST

METALLURGICAL LABORATORIES CHEMISTS • ASSAYERS • SPECTROGRAPHERS

1142 HOWARD STREET • SAN FRANCISCO 3, CALIFORNIA • UNDERHILL 3-8575

Submitted by Allen, Shumate, Weston & Johnson
642 Via Alamo
San Lorenzo, California

Date November 8, 1962

Sample of Conrad Mag-Mo Ore

29

Qualitative Spectrographic Analysis

METALS FOUND AND PERCENTAGE RANGE

LESS THAN 0.01%	.01 TO .10%	.10 TO 1.0%	1.0 TO 10.0%	MAJOR	LAB. No.
Cobalt	Magnesium	Molybdenum	Silicon	Iron	8248-2
Strontium	Sodium	Copper			
Nickel	Potassium	Calcium			
Lead	Titanium				
Chromium	Manganese				
Silver	Vanadium				
	Zinc				

REMARKS:

METALLURGICAL LABORATORIES

By Mark P. Rust Jr.
SPECTROCHEMIST

METALLURGICAL LABORATORIES CHEMISTS • ASSAYERS • SPECTROGRAPHERS

1142 HOWARD STREET • SAN FRANCISCO 3, CALIFORNIA • UNDERHILL 3-8575

REPORT OF ASSAY

Submitted by Allen, Shumate, Weston & Johnson
642 Via Alamo
San Lorenzo, California

Date November 8, 1962

Sample of Ore

LABORATORY No.	MARK	GOLD, PER TON OF 2,000 LBS. TROY OUNCES VALUE AT $35.00 OZ.		SILVER, PER TON OF 2,000 LBS. TROY OUNCES VALUE AT $0.90 OZ.	PERCENTAGES	
8248-1	Conrad Copper Ore	0.03	1.05		28 Copper	12.72
8248-2	Conrad Mag-Mo Ore	0.005	0.17		29 Molybdenum	0.91

METALLURGICAL LABORATORIES

By [signature]

METALLURGICAL LABORATORIES, INC. CHEMISTS • ASSAYERS • SPECTROGRAPHERS

1142 HOWARD STREET • SAN FRANCISCO, CALIFORNIA 94103 • AREA CODE 415 863-8575

30

REPORT OF ANALYSIS

Submitted by Allen-Shumate-Weston & Johnson
935 Marin Avenue
Hayward, California

Date August 22, 1966

P. O. No.

Sample of Core Samples

LABORATORY NUMBER	MARK	PERCENTAGES	
6421	Narrow Vein Cross Cut	Molybdenum	0.027

Ps

METALLURGICAL LABORATORIES, INC.

By Robert A. Atwood

METALLURGICAL LABORATORIES

CHEMISTS • ASSAYERS • SPECTROGRAPHERS

1142 HOWARD STREET • SAN FRANCISCO 3, CALIFORNIA
UNDERHILL 3-8575

31

Date September 2, 1966

Submitted by Allen-Shumate-Weston-Johnson
935 Marin
Hayward, California

Sample of M-Scope high in creek

Qualitative Spectrographic Analysis

METALS FOUND AND PERCENTAGE RANGE

LESS THAN 0.01%	.01 TO .10%	.10 TO 1.0%	1.0 TO 10.0%	MAJOR	LAB NO.
Chromium	Strontium	Magnesium	Aluminum	Silicon	6489-1
Lead	Barium	Potassium	Calcium		
Copper	Titanium		Iron		
Nickel	Manganese		Sodium		
Cobalt	Vanadium				
Silver	Zirconium				

REMARKS:

METALLURGICAL LABORATORIES

By [signature]
SPECTROCHEMIST

DKW RJL

Report by Philip R. Bradley

on

Conrad Vein

On Saturday, July 8th, and Sunday, July 9th, 1961, when I visited the mining property that you hold in eastern Nevada County, California, in R 12 and 13 E, T 18 N, and that lies generally on the southwesterly slopes of Mt. English, I made certain observations and formed certain conclusions; these I report below.

Molybdenum: On Saturday, Messrs. Conrad and Shumate took me over the ground mainly to see a number of the molybdenite showings that led you into your undertaking in the first place. These are of interest but, just as you have said, are hardly for you to attempt to develop with intent of setting up your own operations thereon. In this there would be both too much expense for your situation and too little likelihood of success because of the scale feasible to you. Instead, your policy of doing the work necessary to interesting potential buyers has been the correct one.

I think it may prove that those representatives of mining companies to whom you have already shown the property will not have seen sufficient to attract their further interest; in other words, the present showings need better development before you again offer them for inspection. This development will consist generally of two parts.

One of these is work on one or both of the two quartz veins that run 3 to 6 feet in width, one having been penetrated already by the so-called SP tunnel. You advised me that a face sample here assayed 1.5% Mo. The new work here should consist of drifting on either or both veins, but near the base of the steep hillside in which they are seen rather than so high on the vein as where past work has been done. It should be sufficient for present purposes to drive in on but one of these veins, which one being well left to the judgment of the man in charge in the field, because the choice depends about as much on mechanical or operational feasibility as on geologic strength and promise, actually on the two aspects in combination. To reach these veins at the lower horizon, it may be less costly to drive in from the side at first, at least in the case of the more easterly one, than to drive in on the strike which would involve handling a large amount of slide rock. At this horizon the work would be closer to the road and to access, and discovery of ore would imply the more tonnage and continuity, because of more vein above.

When you are ready to undertake it, this work confined to one heading will require budgeting not less than $4,000. This should provide for between 75 and 100 feet of tunnelling and for assaying samples from the work.

The other part of the new development is that applying to the thin molybdenite-bearing veinlets, usually quartz veinlets, typified by those along Canyon Creek, that occur somewhat bunched into parallel arrangements in various localities. These apparently occupy the E-W striking, steep-dipping members of a set of joints that have been imposed on the country rock quite widely. When sufficiently numerous they may make low-grade orebodies.

The principal expressions of these bunched veinlets were seen in the granite of the lower ground that is covered by your claims and leases; but they may occur as widely, or sufficiently widely to be interesting, in the higher metamorphic remnants, and there be only concealed by detritus and weathering effects. Molybdenite is to be seen here and there in the metamorphics in showings other than the two quartz veins.

There seems a high probability that in the granite all the E-W joints carry molybdenite. While the granite surface is not at all deeply weathered the molybdenite itself seems to have been partly leached out of the upper couple of inches of the veinlets and to be found at a depth of only a few inches in rather greater quantity than on the surface. It does occur somewhat erratically in the veinlets. Specimens from these running 1/2 to 1-1/2 inches wide appear to carry up to 20% MoS.

The apparent improvement in quantity of MoS in only a few inches of depth points up the value of prospecting by shallow trenching. But since the quantity of molybdenum in an area can well depend on intensity of jointing, the procedure is suggested of first seeking out and mapping the areas in which joints occur closely; then after study of results following by such shallow trenching or benching, and sampling, as seems justified.

The mapping that I have in mind is simply the plotting of those areas of promisingly close jointing or veinlet occurrence, using map symbols that indicate outlines of such an area and intensity of jointing within it, intensity being measured in terms dealing with their frequency on the average as one cuts north and south across their strike. At this stage of knowledge I do not think that where these veinlets occur lessfrequently than three feet apart will they make ore and perhaps they must be much closer. Before the mapping begins a pilot trench should be run across one of the most promising areas of close jointing, and sampled, in order to gain some idea of the significance of a certain frequency of jointing in terms of Mo content of the area, and of what minimum frequency should be bothered with in mapping.

Actual figures on quantity of molybdenum depend on results of actual sampling in the localities that are found; this can cost anywhere from a few hundred to a few thousand dollars, depending on what has been found. Mapping is far less expensive, but can substitute to some important degree, at least in the present state of knowledge, for sampling; when sampling seems advisable, mapping in advance will certainly make it more useful and gain more return for the sampling dollar. Mapping could disclose a pattern of occurrence of the more intensely jointed areas that would lead to discovery of others, by projection.

Intensity of jointing where noted was certainly variable and almost certainly large areas exist where it is at least insufficient for promise of low grade bodies. In addition exposure of granite also is variable owing to cover of detritus and in places to vegetation. Mapping, and trenching and sampling if justified, for the bunch-veinlet orebodies can be indicative of promise of the area as a whole only, even if results are good. If good enough, these results can still attract a potential buyer. If poor, they can contribute toward your cutting of expenses, possibly earlier than otherwise, in the direction of these potential low-grade orebodies, if that must be. A pilot trench or two plus mapping on a wide scale may demonstrate almost at the outset that chances for sufficient quantity of bunch-veinlet ore is slim, and thus save you money in the long run. Mapping cannot be expensive, involving primarily only the time of your geologist that you are buying already, and a certain amount ought to be done.

As a whole the joint system seems imposed on an area measured in thousands of yards, and while the bunching of joints required for orebodies is scattered, variable and possibly doubtful at best, nevertheless the impression exists that association of mineralization with such a general and widespread feature as the jointing, suggests that where the jointing does bring in enough mineral to make a possible orebody, mineralization in that locality will remain persistent.

As prospecting is carried on in the molybdenum areas of your property some target figure for the minimum Mo value per ton should be borne in mind, even though there can be considerable latitude in this on the part of various potential buyers. Some of these could think in quite long range terms, and look more for a good prospect for a large tonnage (in reality for large quantities of metal) rather than for some minimum grade that time could drive downwards. Unfortunately this sort of buyer is not so likely to appear at the present time as is the one looking for the immediate, short-range venture. In fact, representatives of three mining companies to whom I have talked recently express this as a present necessity.

The interest of the long-range buyer may be caught by no more than good results in the campaign of mapping, trenching and sampling outlined above.

I expect that to interest the short-range buyer the 3- to 6-foot quartz veins are going to have to prove out at 2% Mo or better, and the veinlet-bunch orebodies at 3/4% minimum. Some minimum area will be necessary in the case of the latter, probably upwards of half an acre.

In working these figures out I take into account the probable cost of operation with both types of orebodies and the daily tonnages feasible for both, in rather round figures owing to present state of knowledge; I also assume as best I can at this stage certain factors that govern the value of Mo actually to be recovered in milling the ore and as if sold at the mill.

You will find yourself from time to time making rough estimates requiring a figure for value of Mo in ore when liquidated. Actual practice might prove this figure as high as 4/5 of the formally quoted market price for contained Mo in high quality concentrate, but I think the practical factor for present estimates must be 4/6, or about 85¢ net per lb. Mo in the ore, as against the current $1.25 quotation. Remember that net sales receipts at point of production are only after costs of delivery to point of actual sale, after brokerage and other like selling costs, and after penalties for impurities, if any; and that they apply only to that Mo in the mill product and not in the ore, mill losses intervening, whereas the Mo we are now called on to evaluate is that Mo present in the ore. The reduction by 1/3 is for expressing value of Mo in the ore in terms of finally realized value. Of course this is before costs of conducting the operation.

Copper: On both days of my visit, your principal copper working, on Jeff Molly No. 1 claim, was so filled with mixed blasted ore and waste that no detailed definition of the vein could be made out, though it is plainly an east-west striking vein of steep dip, occurring in the metamorphics roofing the Sierran granitics that appear not far down the hillside, and in your cut four to five feet in width. Though obscured by blasted material the walls did not seem to be clean-cut. The vein material has the appearance of being a massive mixture of magnetite and iron sulfide, principally pyrrhotite, with lesser quantities of chalcopyrite, and with silica that was not prominent in specimens though shown by their assays to be of relatively high percentage. The proportion of these minerals appears to vary considerably throughout the vein. This appears to fill a fissure the walls of which are somewhat ragged and that show small offshoots of vein material. The vein itself may turn out to be somewhat ragged as to strike and variable as to width when you pursue it under the overburden on the surface or by drifting on it underground.

This showing obviously has the most immediate importance of anything so far uncovered on the property, and your plans to concentrate on it for the time being so as to develop it, as you do so also shipping the best of its ore, are the proper plans for it.

Because of variations in the chalcopyrite content even where metallic minerals (magnetite, pyrrhotite, pyrite, and chalcopyrite) are heaviest, and certainly where ragged penetration of walls by the vein brings wall rock into the blasted material, only by sorting over all the broken rock can ore be gotten together that can be shipped economically.

For your control of such sorting I took the four samples A-D inclusive, on which you received Mr. Quist's assays in the following week; and I left at the property four specimens which were as like the four assayed samples as the eye would permit. The four assays are intended to represent rock of the appearance of the four specimens.

The assays indicate that little rock poorer in appearance than specimen D, 11.2% copper by assay, and none so poor as specimen A, 5.5% copper by assay, should be shipped.

To tabulate the data on these four samples:

B: Low grade: heavy magnetite with streaks of chalcopyrite; not more than 5% chalco, hence about 2% Cu;

assay (Cu) 1.47%

C: Same type material as B, except about 10% chalcopyrite, hence about 3 % Cu;

assay 1.72%

A: Same type material except faces broadly coated with fine disseminated chalcopyrite, though dark in effect; possibly 30% chalcopyrite, hence may contain up to 10% Cu;

assay 5.45%

D: 'High grade': lumps almost fully coated with chalcopyrite, bright in effect, possibly 50% chalco, hence possibly 17% Cu;

assay 11.16%

I had hoped when I took it that "A" was a specimen of ore that could be shipped, and that 'D' would run better than 15% copper and make a good sweetener, but assays were lower than I expected.

Made skeptical by many repetitions of this same experience, I proved still overhopeful; your position as developer would lead you to be much more optimistic than I. The lesson here is that you must be most sanguine and cautious in your sorting. It is a most common failing for miners to overvalue shipping ore; this somewhat in inverse proportion to their experience, at least with the particular property. This results always in some disappointment, usually in some unjustified expense or other, and sometimes even in negative returns.

You can select a few more specimens for guidance as I did, and you can get detailed instructions from Mr. Quist on methods and equipment for fast copper determinations in the field of sufficient accuracy for controlling your sorting and shipping. As to the latter, you must expect that grab samples of broken rock will always run a little higher, from 10 to 20%, than the mass. The reason for this is mainly that grab sampling tends to select fines, in which there is a degree of concentration of metallic minerals because of their brittleness.

You stated to me that 12+% ore would bring you $51 per ton at the Tacoma, Washington smelter of AS&R, at present price of copper. You had not completely determined freight costs but were estimating that about $20 would be required for delivering one ton, from mine to RR by truck and thence by RR to smelter.

Using these facts, and without actual smelter and rail freight schedules, and without taking into account certain variables that will enter, such as the small gold and silver content indicated by various assays to date (which promises to add a dollar or two per ton to the net ore value), and such as silica, iron and sulfur content, and such as size of shipment, moisture or dust content, I estimate the following rough table of per ton net return to be expected from various grades of shipping ore:

Ore Grade, % Cu.	Actual copper content, lbs./ton	Saleable copper content	Smelter Value, per lb., 31¢ - 3¢	Est. smelter charges per ton	Net Value at Smelter	Net return after $20 frt.
7½	150	130	$ 36	$ 13	$ 23	$ 3
10	200	180	50	13	37	17
12½	250	230	64	13	51	31
15	300	280	78	14	64	44
17½	350	330	92	14	78	58
20	400	380	106	15	91	71

The above is probably correct to within about $3 per ton.

Somewhat academic at present, but of interest and of importance in the future, are the figures for net return above when converted into net per pound of copper contained in the ore:

Ore Grade, % Cu.	Per ton ore: Content, lbs. Cu.	Per ton ore: Net $ Return	Per lb. contained Cu. Net Return ¢ per lb. Cu.
7½	150	$ 3	2.0
10	200	17	8.5
12½	250	31	12.4
15	300	44	14.7
17½	350	58	16.6
20	400	71	17.7

There is a rapid gain in rate of improvement at first, as grade increases, followed by a gradual fade in rate that indicates that the most feasible grade is about 15%. Actually, however, for most feasible grade the element of the cost of breaking the ground, per ton ore finally shipped, must be taken into account. If luck is poor and 15% or better ore is scarce, then this element will lower the feasible grade, because it entails breaking more rock per ton actually shipped. Obviously no grade is feasible below 7%.

Of more immediate and practical importance is the indication from the first table above that if your current 'mining' expenses are running about $175* a day, then you must get out 6 tons of 12½% ore, or, more in keeping with probabilities indicated by assays A to D, 10 to 12 tons of 10% ore, daily, to be sure of breaking even.

Milling. The ultimate operation on your copper ore would include milling of run-of-mine ore to upgrade it, making a concentrate economically feasible to ship. California sulfide copper ores concentrated by flotation usually return a 20% or better product. In the long run it might be possible to work out means of treatment of such concentrate on or near the property, producing copper or copper salts at a dollar advantage over shipping to smelter. No technical development is impossible, but means for so treating concentrate on a small scale would involve arts not yet well developed commercially, and probably considerable capital expense, and so cannot be counted on for the near future or in evaluating the present mining opportunity on your property.

A marketable magnetite by-product of milling for a copper concentrate is a more immediate possibility and could indeed affect evaluation of near-future opportunity. Results of concentration tests recommended below plus market data concerning magnetite may show an important addition to the value of your ore.

While it will take concentration tests to verify it, it seems possible that this ore may be concentrated by removal of magnetite and to some extent pyrrhotite magnetically, after only fine crushing and without grinding, plus removal of silica. That the latter may be removed simply is less sure. Silica proportions have been generally high in the samples assayed. Sulfide copper minerals can be separated from siliceous gangue by flotation if fine ground, but here the hope would be to make the separation by gravity (i.e., by table, or jig, or both) without fine grinding, which is expensive both as to equipment and operating costs. If such gravity separation of silica, or a large proportion of it, is possible, then concentration of your ore will require only a relatively simple installation of equipment.

Efficacy of gravity separation of silica will depend on the degree of physical fineness of the silica particles and their degree of interlock with sulfide and magnetite particles. Interlock will also occur between chalcopyrite

---

*Rough estimate of your current daily costs:

Field payroll incl. super, ins., PR taxes, comp.	$ 125
Compressor rent, fuel, lub.	12
Blasting - explosives & misc. supplies	20
Machine drill and drill steel upkeep	13
Misc: travel, communications, etc.	5
Total	$ 175

and pyrrhotite and magnetite. Economic efficiency of separation between the copper and the gangue minerals depends on the degree and nature of such interlock. A preliminary idea of the problem here can be gained by simple laboratory-bench extraction of magnetite and pyrrhotite with a hand magnet from a finely crushed, not ground, sample, dry, followed by removal of silica by panning with water. The material so tested should be as representative as possible. The quantity crushed, the quantity extracted magnetically, the quantity extracted by panning, and the quantity of residue, each, should be dried, weighed in grams, and assayed for copper.

By fine crushed I mean to a size in the range from 6 to 14 mesh. (Crushed to 6 mesh means crushed till all passes through a 6 mesh screen. Considerable will come out much finer. Such test screens are standard trade items. You do not need expensive ones.) The test should be made on the coarser size first, and if unsuccessful repeated on successively finer sizes. Relative success of different sizes may probably be determined by assay of copper concentrate fractions alone. It is to be hoped that crushing to 20 mesh is not required. This would call for multistage crushing in the mill, or for coarse grinding, either of which means stepping into a higher range of mill and milling cost.

The simpler mill hoped for may not produce so high a grade of concentrate as would fine grinding and flotation nor so high a percentage of recovery of the copper minerals from the ore, but still may be more sound economically. The analysis comparing the two would involve cents-per-pound expense of each against the cents-per-pound net smelter return (as in the second table above) from each. The pound divisor is that copper contained in the ore. Cases are known where cost of metallurgical efficiency exceeded return gained from it. In your instance the simpler plant holds promise that its installation and operation can be within your reach.

However, it will require more elaborate concentration tests done by a commercial laboratory, and that may cost a few hundred dollars, before actual milling processes and equipment can be designated, capital costs estimated, and metallurgical efficiency predicted. Such tests should be run only on a truly representative sample not taken until the ore block to be milled has been exposed at least to some depth. The effect of weathering on metallurgy is usually quite pronounced and should be avoided, but from a metallurgical point of view often has considerable downward penetration.

Ore Block. Whether it is you or someone else that conducts the ultimate operation, the mill cannot properly be installed without having in sight ore of sufficient grade to justify the investment. Of course a prime target of your work should be to develop such quantity of ore or to show at least strongest possible promise of its existence.

Assuming the simpler mill flowsheet, and taking into account the various physical factors that will dictate the costs of mining and milling operations and plant, and also probable results of milling -- as these factors may be judged at the present state of your exploration (they include nature of ore and width, extent and attitude of veins) -- it appears possible that a small milling operation

gaited to the ore showings, i.e., handling 40 or 50 tons a day, will pay out all the capital costs connected with putting it into operation and all its operating costs, mine equipment and operation included, if 10,000 tons of 5% or better copper ore can be treated.

This quantity of ore would be available if a block of vein 5 feet wide were developed for a length of 200 feet and a depth of 100 feet; or if two or more blockswere developed that totalled these dimensions, or their equivalent, such as three blocks of 5 foot width vein, averaging 110 feet in length and 60 feet in depth; in short, 100,000 cubic feet. However, vein of a continuing width of less than three feet cannot be counted because of the much higher costs attending mining of this or narrower widths.

Under your current scheme of work, the cost of the workings necessary to completely block out 100,000 cubic feet of ore in a vein averaging 5 feet in width will range from $15 to $20 thousand, less offsets gained from ore shipped; time involved, three to five months dependent upon whether working one or two shifts daily; all of course dependent on mining luck. If a strong persistence and continuity of mineralization is revealed and if development headings can be placed as desired, up to 25% of the length and depth needed to block out ore can be inferred rather than under continuous exposure; work, time, and cost would be lessened thereby.

First priority here should go to development along the vein, going in whichever direction and in whatever manner (i.e., by open cut or drift) your field superintendent finds most practical. He must strike a nice balance in solving the mechanical problems of merely breaking ground in the least expensive way, in attaining best quantity and grade of shipping ore for maximum offset of development cost, and in gaining most feet of development work and gaining most geologic knowledge for least money. These can all conflict at times, as changes occur in the nature of the ground, vein, and ore. Hard and fast rules as to most details of your development have no place; instead you must rely on the day-to-day judgment of your field man, working only under broadest policy, one extending mainly to amount of money available and to rather broad outlines of engineering requirements such as set out here.

My preference at the time of my visit was for a drift run eastward into the hillside, obtaining increasing elevation of surface and decreasing effect of weathering. Some cross-trenching is called for along the course or projected course of the outcrop, particularly if, in drifting underground, a pinch or interruption of the vein is encountered that raises questions about proceeding further in the same direction, or at all; these probably will be answered by the results of such trenching.

Drifting will produce more material per linear foot of advance than will sinking, and will be cheaper per linear foot of advance and per ton of material produced, and preference should be given to it where there is a choice. Nevertheless a certain amount of sinking is necessary on all your copper outcrops.

You must count on sinking on your main showing but if ore occurrence permits it, should first do about 100 feet of development along the vein at your present working horizon. Then you should count on at least 60 feet of sinking, locating your shaft or winze preferably in the heart of the oreshoot. There would be nothing other than mechanical and money problems to stop the drifting while the sinking proceeded, if in good ore. On completion of such sinking, drifting should begin off the bottom of your shaft or winze, the extent of it depending on geologic conditions. To develop the necessary 100,000 cubic feet of ore here entirely will require at least 100 feet of sinking and at least 300 feet of drifting, on at least two horizons, though less if vein width exceeds 5 feet on the average.

This is general program, and you are entitled to abandon work before target distances are reached if the vein goes blank or disappears, or to continue beyond target distances if grade of ore is high and vein strong. Strong vein and mineralization itself justifies inference of downward projection, less strongly requiring actual downward pursuit than does a weak showing. Still, to positively outline orebodies you must open them up down dip as well as along strike on two horizons.

One reason for sinking on your main showing, aside from the need for obtaining a down-dip dimension for your orebody, is need for a look at the horizon where your fissure passes out of the metamorphics, in which you are now following it, and into the granite below. Relations between the two rocks visible on the surface not far down slope below your present workings make it appear probable (some study of the surface for further information on this point should be made) that the granite basement is within a couple of hundred feet of your outcrop, vertically. It is not likely here that your fissure will die out when it passes down into the granite, but its definition and strength may change, changing the strength of the vein, and certainly the chemical influence of the wall rock on mineralization differed as between the metamorphics and the granite. The effect on the vein as ore will remain unknown until actually seen; it may improve the ore, affect it not at all, or kill it; but in any event a question as to grade and strength of the deeper ore will exist until the vein, where it is in the granite, is opened by mine workings or cored. In your case the former are better because of their many other uses, such as the production of ore as they go, if they have ore to go on.

Other showings. On the other three showings of similar vein material, further up the slope of Mt. English but within your property, in fissures generally parallel to your main showing, twenty feet of exposure along the strike and six feet of sinking, both as minima, are needed. Sinking here is of the higher importance for the time being because of need to get clear of vein affected by weathering. The poorer copper content that these outcrops show may not be representative of unweathered, primary vein, which should be exposed before vital aspects of these veins can be known. If these veins can be shown to average 5% or better copper then at least two of them can add quantity to developed ore just about as fast as can your main working, owing to their width.

In conversation on the first day of my visit I said that the exposure of both copper and molybdenum minerals in the trench located about at the same elevation as your main showing but about a thousand feet east warranted high priority in your prospecting. The second day I revisited this cut, taking a five

foot channel sample, cut southward from the north face on the west side of the trench. This was assayed as sample 'Bradley No.1' and returned but 0.5% copper. This low assay and its off-strike position in reference to the main showing downgrade it in priority on the work schedule. An area here perhaps a hundred feet wide and a few hundred feet long shows widespread occurrence of copper and molybdenum minerals. This may be localized, confined to the margin of the metamorphic cap, the granite being present on the surface within a hundred feet downslope from the trench. Only further trenching and a certain amount of sampling will show actual strength of mineralization. The locality deserves such work, though deferred in favor of all other work in respect to copper outlined here.

Philip R. Bradley.

2801 Oak Knoll
Berkeley, California

July 25, 1961

DIAMOND CORE DRILLING
DIAMOND DRILLING EQUIPMENT
GROUTING
FOUNDATION TESTING
MINING
QUARRYING
SHAFT SINKING
TUNNEL DRIVING
MINE PLANT DESIGN
AND FABRICATION

Boyles Bros. DRILLING COMPANY

CONTRACTORS-ENGINEERS-GEOLOGISTS

Highway 40 at Lincoln Turn-off
2½ Miles West of Auburn, California
P. O. Box 831 Auburn, California 95603 Telex: 37-7490
Phones: Office: (916) 885-6581
Home: Carmichael, Calif.
(916) 944-1697

General Offices and Plant
1624 Pioneer Road P. O. Box 58
SALT LAKE CITY, UTAH 84110
487-7595

BRANCH OFFICES
PHOENIX
RENO
SPOKANE
DENVER
SANTIAGO, CHILE
LIMA, PERU

May 7, 1968

Mr. C. J. Artero
2111 Cabrillo Circle
Lodi, California 95240

Dear Sir:

This will confirm our tentative quotations as given you by our Mr. Fred Hall for exploratory drilling to be done approximately 25 miles east of Washington, California.

1 -	Mobilization and demobilization of equipment to job site	Lump Sum	350.00
2 -	Core Drilling, per linear foot	BX	NX
	0 to 500 feet in depth	8.75	10.00
	500 to 1,000 feet in depth	10.50	-
	1,000 to 1,500 feet in depth	12.50	-
3 -	Reaming and casing, if required, per linear foot		3.50
4 -	Cementing and redrilling cement, per hour Plus cost of cement or any additives.		23.00

We supply cardboard core boxes.

The following to be supplied without cost to Boyles Bros.:

Reasonable access to each drill hole location, suitable for a standard 2 whell drive vehicle. Any dozer work required on access roads, leveling drill stations or to assist in moving drilling equipment between holes.

Very truly yours,

BOYLES BROS. DRILLING COMPANY

Peter Chesler by JG

Peter Chesler, District Manager

PC/jg

cc: Manager Drilling Districts
Boyles Bros., S. L. C.

MINING
CONTRACTING

SHAFTS
TUNNELS

MINE SERVICES COMPANY

FA 3-3957
642 ST. LAWRENCE AVENUE
RENO, NEVADA

GERALD B. HARTLEY, JR., MANAGER

June 7, 1968

Mr. C.J. Itaro
2111 Cabrillo Circle
Lodi, California

Dear Mr. Itaro:

Following up on our two telephone conversations, I am sending to you a preliminary estimate of costs of driving a tunnel on your property near Bowman Lake, California.

The price for driving a 5.5' or 6'X7' high tunnel will be approximately $50 per foot. This will include expendable supplies such as diesel fuel, dynamite, etc.

Permanent supplies such as rail, ties, air and water pipe and ventilation pipe will be in addition and will cost approximately $10 per foot.

Any permanent sheds or mine buildings will be installed at cost plus approximately 20%. A powder magazine will be required and done at the same scale and is estimated to cost approximately $500.

Mobilization and de-mobilization charges will be $750 in and $750 out.

In the event that timbering is required it will be charged for at an agreed upon price.

These figures are necessarily tentative but will be close to final figures.

Very truly yours,

Gerald B. Hartley, Jr.

GBH/c

MME Form 7
(2/63)

OFFICIAL FILE COPY

Date	Surname	Code
10/9/68	E. Peterson	120
	(on leave)	120
"	Johnson	110
10/10	Kilsgaard	
10/11	Clapp	
		220

AIRMAIL

Mr. Jack B. Shumate
935 Marin Avenue
Hayward, California 94541

Re: OME-6735 (Copper and Molybdenum)
Allen, Shumate, Weston, and Johnson
English Mt. Mine
Nevada County, California

Dear Mr. Shumate:

A careful study of your application for financial assistance to explore the subject property and of other information available to us indicates that the probability of disclosing significant ore reserves on the property is not sufficiently promising to justify Government participation in the proposed exploration. Accordingly, we regret to inform you that your application for assistance is denied.

We wish to thank you for your interest in the minerals exploration program and for bringing your property to our attention.

Sincerely yours,

FRANK E. JOHNSON (gla)

Frank E. Johnson
Chief, Office of
Minerals Exploration

cc: Director's Reading File
Economic Geology File
OME Docket
OME Reading File
Region II
130
Mr. Peterson

ECPeterson/bsl 10/9/68

MME Form 7
(2/63)

OFFICIAL FILE COPY

Date	Surname	Code
10/9/68		120
	(on leave)	120
		110
		220
		120M

October 9, 1968

Memorandum

To: The File

From: Edward C. Peterson

Subject: OME-6735 (Copper and Molybdenum)
Allen, Shumate, Weston, and Johnson
English Mt. Mine
Nevada County, California

Justification for Denial of Application

The OME field examiner found no geologic evidence on the property to indicate that further exploration was warranted, and concluded that the probability of discovering any significant ore reserves with the proposed work was too small to justify Government participation therein.

Assay results of samples taken by the examiner of the most favorable material exposed in an adit and prospect pit indicate the property has little economic potential. In addition, much of the proposed work is considered prospecting.

I concur with the Field Officer and recommend that the application for assistance be denied.

Edward C. Peterson

Edward C. Peterson

cc: Director's Reading File
Economic Geology File
OME Docket
OME Reading File
Mr. Peterson

ECPeterson/bsl 10/9/68

MINERAL EXPLORATION DIAMOND DRILLING

7-2-68

ALLEN, SHUMATE, WESTON AND JOHNSON

935 MARIN AVE. HAYWARD, CALIF.
~~642 VIA ALAMO - SAN LORENZO, CALIFORNIA~~
~~TELEPHONE BR. 8-2297~~
PHONE - 783-0206

OFFICIAL COPY
O. M. E.
RECEIVED
JUL 5 1968
INITIALS | CODE
| 130
| 120
| 120
| 120 P

MR. FRANK E. JOHNSON
CHIEF, OFFICE OF MINERALS EXPLORATION
UNITED STATES DEPT. OF THE INTERIOR
U.S. GEOLOGICAL SURVEY
WASHINGTON, D.C.

RE: OME-6735 (COPPER & MOLYBDENUM)
ALLEN, SHUMATE, WESTON & JOHNSON
ENGLISH MT. MINE
NEVADA COUNTY, CALIF.

DEAR MR. JOHNSON:

IN ANSWER TO YOUR LETTER OF JUNE 26, 1968, I HAVE STUDIED THE LETTER CAREFULLY AND AM SENDING GEOLOGIC MAPS AND REPORTS AS FOLLOWS:

GEOLOGY AND MINERAL RESORCES OF T18N, R12 & R13E M.D.M. NEVADA AND SIERRA COUNTIES, CALIF. THIS REPORT WAS WRITTEN PRIOR TO THE COPPER DISCOVERIES IN SECT. 12., AND WAS OBTAINED IN ITS ROUGH FORM FROM THE SOUTHERN PACIFIC LAND CO. HOWEVER IT SHOULD GIVE YOU THE INFORMATION YOU REQUIRE AS TO THE GEOLOGY OF THE ENGLISH MT. AREA.

AREAL ECONOMIC GEOLOGY MAP T18N, R12 & R13E. M.D.M. THIS MAP WAS OBTAINED FROM SOUTHERN PACIFIC LAND COMPANY AND WE WOULD LIKE TO HAVE IT RETURNED, SINCE OTHER COPIES ARE NOT AVAILABLE. HOWEVER THE SAME GEOLOGY IS SHOWN ON THE CHICO SHEET OF THE DIV. OF MINES AND GEOLOGY MAP OF CALIF., BUT AT A MUCH SMALLER SCALE.

CHICO SHEET - GEOLOGIC MAP OF CALIF.

ON THIS SHEET, I HAVE OUTLINED THE ENGLISH MT. AREA IN BLACK. I WOULD HAVE INCLUDED THIS MAP IN THE ORIGINAL APPLICATION, BUT I ASSUMED THAT YOU HAD ALL OF THE GEOLOGY MAPS OF THAT SORT IN YOUR FILES.

REPORT BY R.J.J. LAMPSON ON ENGLISH MT. MINE.

THIS REPORT BY MR. LAMPSON HAS SEVERAL ASSAYS TAKEN ON THE CONRAD VEIN, AND SKETCHES OF THE AREA WHICH SHOULD HELP IN DETERMINING THE AVERAGE COPPER VALUES FOUND ALONG THE CONRAD VEIN. WE WERE IN THE PROCESS OF LEASING THE AREA TO MT. COPPER CO., BUT THEY DECIDED AGAINST IT.

ENGLISH MT. MINE (CALIF. STATE MINERAL BUREAU REPORT)

I INCLUDE THIS REPORT ON THE GOLD MINE (W/COPPER) THAT LIES ON THE NORTH SIDE OF ENGLISH MT. THE FAULT THAT THIS PROPERTY LIES ON MAY PROJECT BENEATH THE VOLCANIC EXTRUSIVES AND INTERSECT THE FAULT ON THE SOUTH SLOPE OF ENGLISH MT. (SEE CHICO SHEET)

THE CONRAD VEIN STRIKES APPROXIMATELY N 82° W AND DIPS 80° TO THE NORTH., WHILE THE SCARANO VEIN STRIKES APPROXIMATELY N 60° W, AND THUS FAR IS SO RAGGED ON THE EDGES THAT WE HAVE BEEN UNABLE TO ESTABLISH A DIP. HOWEVER WE BELIEVE THE DIP WILL BE ABOUT THE SAME AS THE CONRAD VEIN. EACH VEIN HAS A STRIKE LENGTH OF AT LEAST 500 FEET. WE DID NOT REALIZE THAT THE EXTENT OF EXPLORATION TUNNEL AND LENGTH OF DRIFT ON THE TARGET VEINS WOULD BE FINALLY AGREED UPON UNTIL THE AREA WAS VISITED BY YOUR OME DIRECTOR IN THIS AREA. WE FELT THAT HE (MR. STAGER) WOULD INSPECT THE AREA AND MAKE RECOMMENDATIONS AS TO THE BEST PROCEEDURE IN EXPLORING THE AREA.

WE ANTICIPATED DRIFTING ON THE VEINS, ONCE WE HAD TUNNELED TO INTERSECT THEM.

IF WE TUNNELED 400 FEET TO THE CONRAD VEIN, AND THEN DRIFTED 100 FEET IN EACH DIRECTION. THEN MOVED UP NEAR THE SCARANO VEIN, AND TUNNELED 400 FEET TO INTERSECT IT, THEN DRIFTED 100 FEET IN EACH DIRECTION ON IT, THIS WOULD INTERSECT EACH VEIN APPROXIMATELY 150 FEET BENEATH THE SURFACE. OUR ESTIMATE FOR THE COST OF TUNNELING WOULD BE THE SAME AS QUOTED IN THE APPLICATION. THIS WOULD EXPLORE BOTH VEINS AND GIVE US 400 FEET OF DRIFTING.

WE FEEL THAT TUNNELING IN THE AREA WOULD BE THE MOST FEASIBLE WAY OF EXPLORING SINCE THERE ARE SO MANY SMALL VEINS WHICH DIP ALMOST VERTICALLY. THESE VEINS MAY CONVERGE AT DEPTH INTO STRONGER VEINS. SEVERAL VEINS - 8" TO 10" WIDE RUN PARALLEL TO THE CONRAD VEIN AND LIE ONLY ABOUT 3 FEET APART, AND IF THEY CONVERGE AT DEPTH IT MIGHT BE FEASIBLE TO OPEN PIT MINE SOME AREAS. ITS SO EASY TO JUST MISS MINERALIZED ZONES BY DRILLING.

TUNNELING CONTRACTORS ARE FEW AND FAR BETWEEN IN THIS AREA NOW. SO FAR WE HAVE ONLY BEEN ABLE TO LOCATE AND GET BIDS FROM THE ONE IN RENO THAT HAS ALREADY BEEN SUBMITTED. HIS PRICE SEEMS FAIRLY REASONABLE, HOWEVER, WE ARE RUNNING ADS IN THE GRASS VALLEY UNION NEWSPAPER TO TRY AND GET A CHEAPER BID. ANY SUBSEQUENT BIDS FROM THAT AREA WILL BE FORWARDED TO YOU IMMEDIATELY.

IF THERE IS ANY OTHER INFORMATION REQUIRED, PLEASE NOTIFY US.

YOURS SINCERELY,

Jack B. Shumate

JACK B. SHUMATE - GEN. PARTNER

C/C MR. HAROLD K. STAGER

Nevada County Calif

MOUNTAIN COPPER MEMO

Mr. C. W. McClung, Manager	FROM: R. J. J. Lampson
RE: Allen, Schumate, Weston & Johnson	DATE: November 13, 1961

Prospect, Nevada County, California

INTRODUCTION:

On October 10 instructions were received from Mr. McClung to visit the above property. Arrangements were made to meet Mr. Ralph Conrad in Nevada City and proceed with him to the property. We arrived in the area late on the 11th and inspected the property on the 12th and returned the 13th.

LOCATION-NEVADA COUNTY:

The property is reached by taking one of three routes from Nevada City. All three routes have substantial mileage of elementary dirt road. One route runs through Graniteville, one through Washington and one in the vicinity of Emigrant Gap.

The trip from Nevada City via Route 20 and turning north near Emigrant Gap took over 2 hours and was about 50 miles. The trip back via the Washington route took over 1½ hours and was 42 mile long. The Washington route was impassable on the trip to the prospect because of a light rain.

The claims are located in Section 12 and 13 of T 18N R12E and Sections 7 and 18 T 18N R13E, MDM. Sections 12 and 18 were the only legitimate open Sections as Section 7 is railroad (S.P.) and Section 13 is Nevada Irrigation District. A total of 36 claims have been located. All have a portion of the claim area in Section 12, therefore the major portion of Section 12 is staked.

The locators also have a 7½% mining option on the railroad's Section 7, T18N R13E and a prospecting option on the railroad's Section 11 T18N R12E.

The approximate elevation of the main exploration effort is 6800 feet. This is in an area of heavy snows. The property location on the south slope of English Mountain would have the benefit of the sun and earlier melt off.

OWNERSHIP:

The partnership of Allen, Schumate, Weston and Johnson own the 36 claims. Some of the pits on the property are very old and claims were probably located long ago. According to Mr. Conrad, the association lawyer was unable to find any, "Proof of Labor," for any claims in the area. The Sections to the east, west and probably the north section are railroad. The south section is Nevada Irrigation District and the southeast section is U.S. land.

MOUNTAIN COPPER MEMO

Mr. C. W. McClung, Manager	FROM: R. J. J. Lampson Page 2
RE: Allen, Schumate, Weston & Johnson	DATE: November 13, 1961

Prospect, Nevada County, California

DESCRIPTION:

MOLYBDENITE

The original discovery and interest was based on the finding of molybdenite in fractures in the granite along Canyon Creek which runs through SW¼ Sec. 12. The fracture faces in the granite were coated with molybdenite but the fractures were not numerous enough to have ore potential. The numerous closely spaced fractures mentioned in Mr. Bradley's report were south of Canyon Creek and not available due to high water.

The other molybdenite concentration was in quartz dikes in the metamorphics. The heaviest easily visible concentration was in the areas of contact between the quartz dikes and the wall rock. Some molybdenite was shot through the quartz and occasionally a heavy concentration was apparent.

No samples were taken of the molybdenum bearing areas as a representative sample would have to be large to eliminate the taking of an extremely barren or extremely rich sample.

The quartz veins were located about 1,000 feet east of the W¼ Corner of Section 7 and therefore on railroad land. They strike N 60° to 70° E and dip 60° to 70° SE. Two veins are about one foot wide and the largest vein varies from three feet to five feet wide and can be seen in the tunnel for 60 feet along the strike. It can also be seen for 150' down dip on the face of the cliff.

The railroad had a survey made of their Sections and took samples of the adit material. The results follow:

SAMPLE	WIDTH	Au	Ag	Cu	Mo
1B	4'	Tr	0.2	0.315	0.083
2B	5'	Tr	0.2	0.163	0.259

The sampling method is unnamed and the relation of the samples to actual bulk of the vein may or may not be valid.

CONRAD VEIN

The other occurrences of interest on the claims consist mainly of veins of sulfides. These sulfides are of copper, iron and molybdenum.

MOUNTAIN COPPER MEMO

TO: Mr. C. W. McClung, Manager	FROM: R. J. J. Lampson Page 3
RE: Allen, Schumate, Weston & Johnson	DATE: November 13, 1961

Prospect, Nevada County, California

Molybdenite appears quite minor while pyrrhotite is very strong. Chalcopyrite content of the vein varies. Copper varies from 1.15% to 4.74% and stored high grade runs 5.44%.

The sulfide veins bear almost due east and west. The major one discovered so far dips 80° southeast. These veins are parallel to each other and are several hundreds of feet apart. The exposed portions vary from 1' wide to 5' wide. Surface outcrops are few but the veins are located by magnetic means. In all instances the claim location pits had sulfide mineralization in them. They appeared to be low copper-high iron. Samples were only taken on the main vein, from pits on it and from the adit. Also a sample was taken of their high grade in a storage bin. Assay reports and sketches are attached.

Several openings are on the main vein. An adit has been run down strike eastward for about 50 feet. A pit 15 feet long by 5 feet wide is 60 feet west of the portal. Another pit 5 feet wide by 7 feet long is located 150 feet east of the portal.

The vein width is variable. It seems to pinch and swell frequently along strike as well as depthwise.

The extensive low grade mineral exposures in the area and the fair values of the copper assays on this property indicate that the property should be further investigated.

Philip R. Bradley has made a report on the Conrad Vein which details much interesting information on both the copper and the molybdenum occurrences. Investigation was done on July 8th and 9th, 1961.

CONCLUSION:

1. Lease and purchase option with free examination time looks attractive for this property.

2. Contract with geological firm for inspection and evaluation of property.

3. Based on geologists report, plan and execute drilling program to block out ore possibilities.

RJJL:ig

LABORATORY CERTIFICATE

CURTIS & TOMPKINS, LTD.

ESTABLISHED 1878

ANALYTICAL - **CHEMISTS** - CONSULTING

SAMPLERS — INSPECTORS

MEMBERS, OFFICIAL CHEMISTS AND/OR SAMPLERS FOR MANY COMMODITY AND TRADE ORGANIZATIONS

CORPORATE OR STAFF MEMBERSHIP IN PRINCIPAL SCIENTIFIC SOCIETIES

236 FRONT STREET
BETWEEN CALIFORNIA & SACRAMENTO STS.
SAN FRANCISCO 11

CABLE ADDRESS: ANALYST

REFEREE ANALYSES
RESEARCH — INVESTIGATIONS
VITAMIN ASSAYS — BIOCHEMISTRY

SPECIALISTS IN BULK COMMODITIES

Laboratory No. 61k570
Preliminary No. 1057

Reported 10/26/61
Sampled --------
Received 10/18/61

For MOUNTAIN COPPER COMPANY OF CALIFORNIA

Report on 14 samples of Ore

Mark P. O. No. 4496 and as below

Based on Samples which were SUBMITTED to us

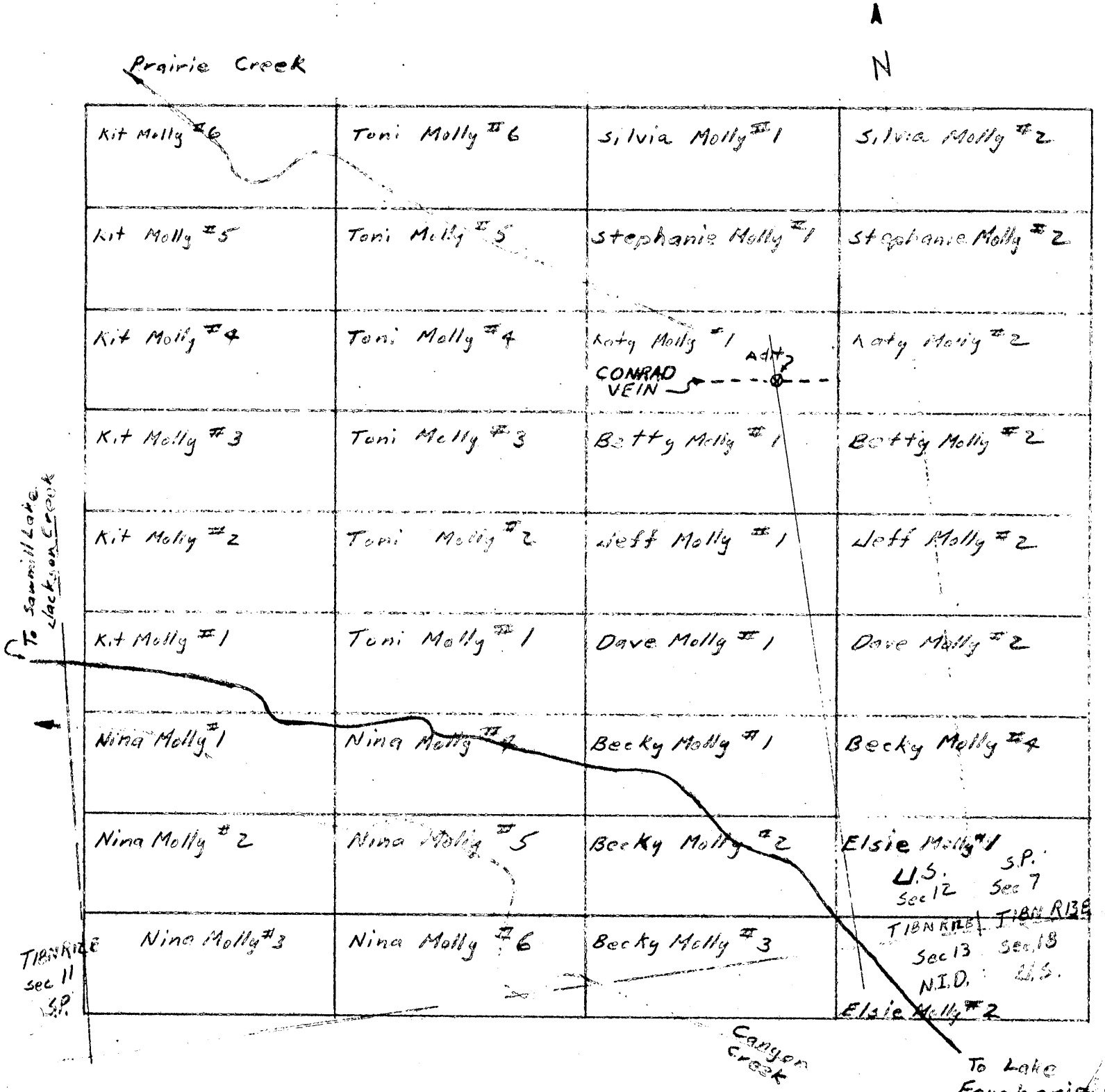
			Copper (Cu), %	Molybdenum (Mo), %
Conrad Vein				
#1	Sample No. 5896	West Pit 1'wide-6'long sampled	2.50	Less than 0.01
#2	Sample No. 5897	East Pit-west side-2'wide x 3'high sampled	3.39	" " 0.01
#3	Sample No. 5898	East Pit-East Side-3'wide cut across vein	1.15	" " 0.01
#4	Sample No. 5899	Grab-Face Round-50' from collar	1.15	" " 0.01
#5	Sample No. 5900	Chip sample Tunnel back-30'long-5'wide	4.74	" " 0.01
#6	Sample No. 5901	Grab-High Grade storage tank	5.44	" " 0.01
Scott Weaver				
	Sample No. 5902	----------	3.20	
	Sample No. 5903	----------	0.77	
	Sample No. 5904	----------	0.58	
Mineral Butte				
	Sample No. 5905	----------	1.66	
	Sample No. 5906	----------	2.24	

McCracken		Lead (Pb), %	Zinc (Zn), %
Sample No. 5907	----------	3.98	17.7
Sample No. 5908	----------	3.83	1.99
Sample No. 5909	----------	2.34	0.28

Curtis & Tompkins Ltd.

ANALYTICAL & ENGINEERING CHEMISTS

B.J.L. DATE 3 Nov 61 SUBJECT Claims Nevada County SHEET NO. ____ OF ____
CHKD. BY ____ DATE ____ Allen - Sampate - etc. JOB NO. ____
Scale: 1" = 200'



LABORATORY CERTIFICATE

CURTIS & TOMPKINS, LTD.

ESTABLISHED 1878

ANALYTICAL - CHEMISTS - CONSULTING

SAMPLERS — INSPECTORS

MEMBERS, OFFICIAL CHEMISTS AND/OR SAMPLERS FOR MANY COMMODITY AND TRADE ORGANIZATIONS

CORPORATE OR STAFF MEMBERSHIP IN PRINCIPAL SCIENTIFIC SOCIETIES

236 FRONT STREET
BETWEEN CALIFORNIA & SACRAMENTO STS.
SAN FRANCISCO 11

CABLE ADDRESS: ANALYST

REFEREE ANALYSES
RESEARCH — INVESTIGATIONS
VITAMIN ASSAYS — BIOCHEMISTRY

SPECIALISTS IN BULK COMMODITIES

Laboratory No. 61k570-A
Preliminary No. 1057

Reported 11/3/61
Sampled -------
Received 10/18/61

For MOUNTAIN COPPER COMPANY OF CALIFORNIA

Report on 9 samples of Ore

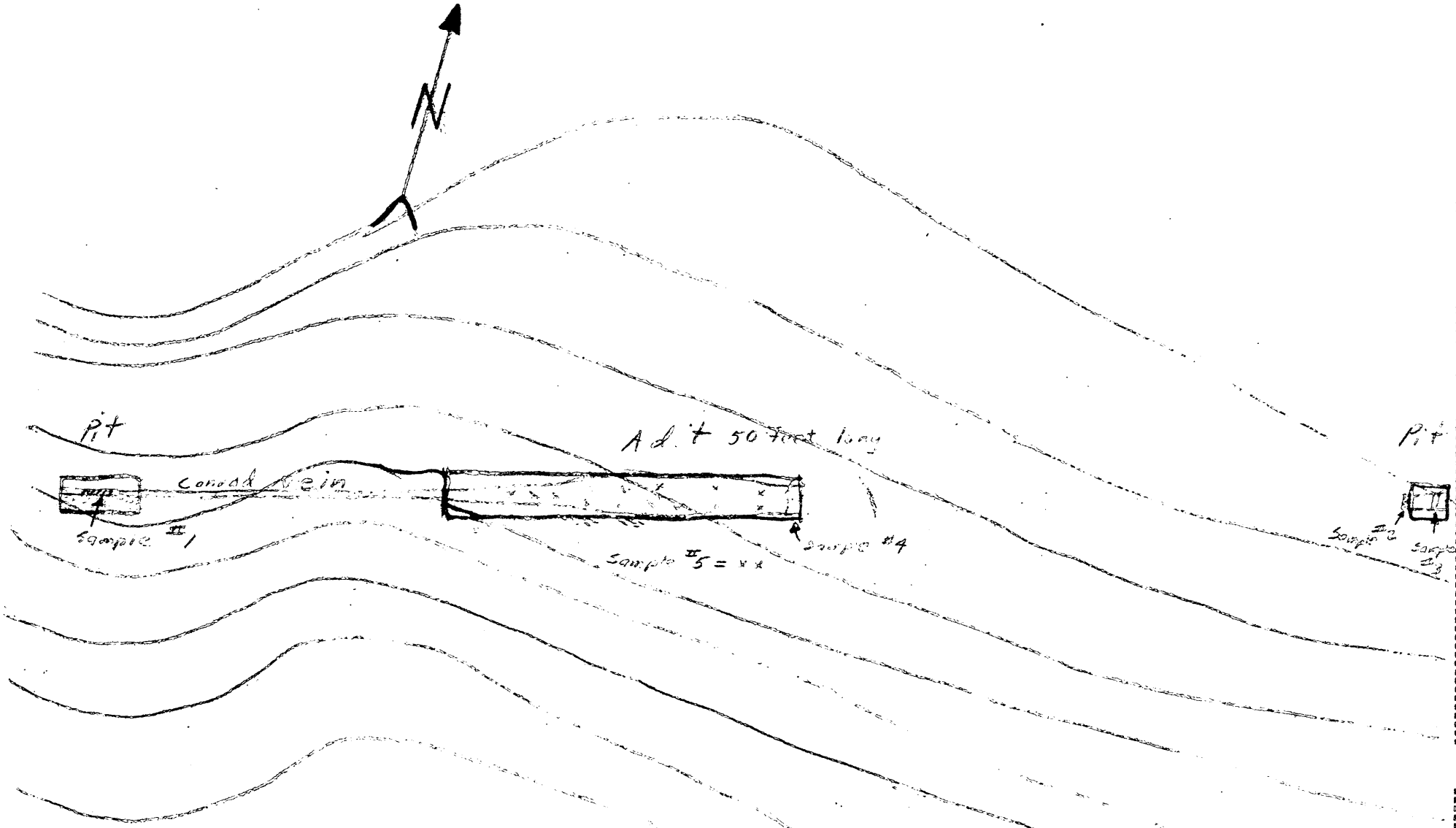
Mark P. O. No. 4496 and as below

Based on Samples which were SUBMITTED to us

	Gold, per ton of 2,000 lbs. Troy Ounces	Silver, per ton of 2,000 lbs. Troy Ounces
Conrad Vein		
Sample No. 5896	Trace	1.00
Sample No. 5897	Nil	2.00
Sample No. 5898	Nil	.80
Sample No. 5899	Trace	.80
Sample No. 5900	Nil	.80
Sample No. 5901	Nil	.50
~~McCracken~~		
~~Sample No. 5907~~	~~Nil~~	~~1.50~~
~~Sample No. 5908~~	~~Trace~~	~~2.08~~
~~Sample No. 5909~~	~~Nil~~	~~11.40~~

Curtis & Tompkins Ltd.

ANALYTICAL & ENGINEERING CHEMISTS



DATE
CHKD. BY DATE
SUBJECT
SHEET NO. OF
JOB NO.

ENGLISH MOUNTAIN MINE - Owner, Jas. Holdsworth, Graniteville
Bonded to H. Schroeder, Nevada City.

Location: English Mountain District
Sec. 6, T. 18 N., R. 13 E., 13 miles
east of Graniteville, Elevation 6200'-6500'.
Bibliography: Cal. State Min. Bur. Rept. XIII,
Page 242

This mine was discovered in 1868 by Holdsworth, but was worked only superficially until 1894 when it was operated by the English Mountain Gold Mining Company. Three years later the 20 stamp mill was destroyed by fire, and the mine was practically idle until 1908 when the present bondee began exploratory work which has been continued during the summer season of each year. There are five claims in the group of which the Marguerite and Helen D. are patented. The property has an area of 105 acres and covers a length of 4500' along the lode. The country rock is a diabase porphyrite and there are two lodes known as the Big vein and the "Gold" Vein, the latter intersecting the former. The "Gold" vein, which is a fissure vein in the diabase, strikes northwest and dips [illegible] southwest. It can be traced on the surface for a distance of 2000', and [illegible] said to average from 4' to 5' in width. The tunnels on this vein are driven a distance of 300' each. No. 2 tunnel, 100 feet below No. 1, developed an ore shoot 150' in length and this ore, which in the oxidized zone yielded from $12 to $32 per ton, was stoped to the surface a distance of 150 feet. An adit about 400' below No. 2 tunnel has been driven a distance of 1200', but so far has failed to reach the ore shoot worked on the upper levels on account of the rake of the shoot. There is also a zone of oxidized material called the Gossan vein, which can be traced for a distance of 4500'. A tunnel has been driven a distance of 300' in this at a depth of 250' below the surface, and another tunnel 75 feet lower has been extended 400' in the oxidized zone.

Crosscuts from the tunnels have shown the walls of the ore-body to be from 25' to 50' apart. The gold content is said to range from 80¢ to $37 per ton. The mine has yielded over $100,000, and although it is the only mine in the vicinity which has produced any considerable amount of gold, from reliable information it appears that the district warrants further exploitation and development.

(Owing to the shortness of the season it was found impossible to visit this mine and district, and the information given was furnished by Mr. Henry Schroeder.)

GEOLOGY AND MINERAL RESOURCES

OF

TOWNSHIP 18 NORTH, RANGES 12 AND 13 EAST

MOUNT DIABLO MERIDIAN

NEVADA AND SIERRA COUNTIES

CALIFORNIA

checked NFB
2-25-60

Geology by:

H.F. Bonham, Jr.
J. W. Cooksley
M. S. Tischler

Report by: H.F. Bonham, Jr.
Date: December, 1959

INTRODUCTION

Township 18 N., Ranges 12 and 13 East, MDM are located in Sierra and Nevada Counties, California approximately five and one-half miles north of Emigrant Gap, a small railpoint on the Southern Pacific Railroad.

CONCLUSIONS

Company Ownership - Twp. 18 N., Rge. 12 E.

Sections 1, 3 (W½ of SW¼), 5 (partial), 7, 11 (S½, NE¼), 13 (W½), 15 (partial), 23, 25, 27 (S½, NE¼), 29 (S½, NW¼, W½ of NE¼), 33 (S½), 35.

Company Ownership - Twp. 18 N., Rge. 13 E.

Sections 1, 5, 7, 9, 11, 13, 15 (all except SE¼ of SE¼), 19, 23 (S½, NE¼ and portions of NW¼), 25 (NE¼, N½ of NW¼), 29, 31 and 33.

Mineral Evaluation - Twp. 18 N., Rge. 12 E.

Sections 1, 3, 5, 7, 11, 13, 15, 23, 25, 27, 29, 33, 35 . . . Nonmineral. Small amounts of placer gold occur in the gravels of Mosney and Alder Creeks in Section 33. These placers are not of present commercial value.

Mineral Evaluation

Twp. 18 N., Rge. 13 E.

Sections 1, 5, 9, 11, 13, 15, 19, 23, 25, 29 . . . Nonmineral.

Section 31 . . . Potential mineral vein quartz float found which contains minor amounts of copper, scheelite, silver and gold

Potential Mineral

Section 33 . . . Numerous quartz-tourmaline veins containing pyrite and minor amounts of copper, silver and gold crop out in Section 33. The veins are not of present

economic value because of their low precious metal and copper content and their remote location in an area of extremely severe winters.

Section 7 . . . Potential mineral. Quartz veins containing molybdenite (MoS_2) and copper crop out in the NW¼ SW¼ of the Section. The low average metal content (.2% Mo and .3% Cu) of the veins and their remote location in an area of severe winters precludes any profitable development of these veins under present economic conditions.

TOPOGRAPHY AND ACCESSIBILITY

The topography, road system, trails and accessibility are shown on the geologic map, No. R-1213-18 which covers this area. The regional setting may be ascertained by inspecting the U.S. Geological Survey topographic sheets of the Emigrant Gap and Donner Lake Quadrangles published in 1951 and 1955 respectively. Since virtually the entire area of the two townships is located above an elevation of 5000 feet, near the crest of the Sierra Nevada, heavy winter snowfalls render the area inaccessible to any form of transportation other than snowcats, skis or snowshoes for approximately 6 months of the year, usually from December through May. Snow depths exceeding 20 feet on level ground are not uncommon in this general area during the winter months.

MINERAL RESOURCES EXAMINED

Metallic Deposits

(Lode)

Copper, Gold, Silver

Meadow Lake District. Quartz-tourmaline veins containing abundant sulfides, predominantly pyrite, are characteristic of this dis-

trict. Within Twp. 18 N., Rge. 13 E., veins of this type crop out in Sections 21, 22, 26, 27, 28, 32 and 33. This zone of quartz-tourmaline veins also extends south into Twp. 17 N., Rge. 13 E.

The district was discovered in 1865 by H. H. Hartley who found high-grade samples (up to $60,000/ton) of gold ore in Section 28 at the south end of Meadow Lake. These samples consisted of highly oxidized vein material containing free gold. A wild "gold rush" ensued and a town (Meadow Lake) of over 5000 people was built within a few months. Little high-grade gold ore was discovered during the resulting period of intensive prospecting and it was soon found that the free milling gold ore of the oxidized zone was extremely shallow and gave way within a few feet to primary sulphide ore not amenable to treatment by the primitive milling practices of that time. As a consequence, the boom soon subsided and only a few people, including the original discoverer, Hartley, remained in the area. (The above information is condensed from Visker, 1958, p. 104).

Activity in the district, subsequent to the original boom, has consisted of desultory, small scale mining operations, largely unprofitable, plus several exploration programs which attempted to develop a large tonnage of low-grade copper-gold ore. None of the exploration programs proved successful.

The potential of the Meadow Lake district has been a subject of debate, almost since its initial discovery. Lindgren (1900, p. 8) stated that the veins of this district were fissure veins containing quartz, tourmaline, pyrite, arsenopyrite and sphalerite and a moderate amounts of gold. He stated that free gold occurred only in the "decomposed" (oxidized) portions of the veins and that the veins

frequently had ill defined walls. Lindgren also noted that the mining attempts in the area had proven largely unsuccessful, because of the low grade of the ore, the severe climate, and the remote location of the area.

Raymond (1902) challenged the validity of the existing unfavorable reports on the district and concluded that well defined and important vein systems containing extractable gold values of economic worth were present in the Meadow Lake area.

A. L. Wisker, a San Francisco mining engineer who currently (1959) owns the Meadow Lake Mine, has been the chief proponent in recent years of the theory that the Meadow Lake District contains a large tonnage of low-grade copper-gold ore which would be profitably extracted by modern milling and metallurgical practices. Wisker has presented his theories in two articles, one written for the California Journal of Mines and Geology (Wisker, 1936, p. 182-204) and a recent article for the Engineering and Mining Journal (Wisker, 1958, p. 104-105). The interested reader is referred to these articles for a detailed exposition of Mr. Wisker's theories.

Wisker (1958, p. 104) states that an appreciable tonnage of gold-copper ore in the $12 to $25 range is present in the district, that 20 veins in one well known group have an average ore width of 5½ feet and that the geological conditions in the area are similar to that of the Empire Star mine in Grass Valley. Wisker (1958, p. 104) also lists a spectroscopic analysis of the vein material and presents a number of assays. Finally he suggests that a 20 square mile area encompassing the district should be surveyed geophysically. Wisker's 1936 article is essentially a repetition of the above information.

Logan (1941, p. 426) states that in 1939 the Marsman Company of California put down 7 diamond drill holes in the Excelsior mine area (Sec. 26) of the Meadow Lake district. Logan (1941, p. 426) quotes G. H. Newman, a geologist for the company, as stating "Of the seven holes drilled, 4 were negative in results, 1 was encouraging and 2 mildly so. The results of drilling do not substantiate the original representation of the Meadow Lake ore bodies as being large well-defined veins of great strength and resistance with possibilities of producing large quantities of medium- to low grade ore..."

The results of the present investigation by the writer, J. W. Cockfield and H. S. Tischler also indicate that there is little real chance of developing a profitable mining operation in the Meadow Lake district.

The veins of the Meadow Lake district consist of quartz and tourmaline containing variable amounts of pyrite and chalcopyrite with minor amounts of gold and silver. The veins occur in two main systems, one trending N. 70W. to E-W. and the other trending W. 20-45W.. Vein dips range from vertical to steeply SE.. NE. trending veins are rare. The veins pinch and swell abruptly. Veins, locally 20 feet or more in width, pinch down to thin stringers a few inches in width, within distances of 20 feet or less. Frequently, the vein walls are not well defined and the vein stringers outward into barren wall rock. The veins occur in granodiorite, diorite and in metavolcanics of the Sailor Canyon formation. Oxidation of the vein material is superficial, usually extending less than 5 feet below the present surface.

The veins, in general, are not persistent along strike and only a few veins could be traced for as much as 2000 feet along strike. The presence of tourmaline in the veins indicates that they were formed at high temperatures (300°-500° C. ?) and can probably be classified as hypothermal veins. Veins of this class often extend to depths of 5000 feet or more. However, the lack of great lateral persistence in these veins suggests that they may be equally limited in vertical extent.

Mines and Prospects, Section 27

Anderson Mine. The Anderson mine, located in the SE¼ SE¼ Section 27, consists of shallow open cuts and a shaft, now partially filled with water, located on two parallel quartz-tourmaline veins, the thickness of which was not determined, which trend N. 60 W. and dip 80° SE.. The total extent of underground workings is unknown but probably small. The vein material, besides quartz and tourmaline, contains pyrite, chalcopyrite and presumably some gold and silver. The mine has been idle for a number of years.

Excelsior Mine. The Excelsior mine is located in the SW¼ of NW¼ and the NW¼ of SW¼ of Section 27 and consists of a large open stope and numerous shallow cuts on a group of parallel veins trending approximately N. 40W. and dipping 60° to 80° SW.. The veins are quartz-tourmaline veins containing variable amounts of pyrite and chalcopyrite. The veins pinch and swell rapidly along strike and reach a maximum observed width of 10 feet. The mine has been idle for a number of years. A grab sample from an ore pile taken from one of the veins was assayed. The sample represented a sulphide rich phase of the vein. Assay results were as follows:

Sample No. R-27-18-13-1 Co	Au oz/ton	Ag oz/ton	Cu%
	0.070	0.15	0.05

Meadow Lake Mine. The Meadow Lake Mine is located in the NE¼ SW¼ of Section 27. The mine workings are located, with one exception, on veins of the same group that extend through the Excelsior mine. Two shafts, now filled with water, are located on an E-W. trending vein which dips 45° S. . Shallow open cuts explore the NW. trending veins. The veins are the typical quartz-tourmaline sulphide veins of the Meadow Lake district. A grab sample from an ore pile, located adjacent to the E-W. vein, gave the following assay:

Sample No. R-27-18-13-2 Co	Au oz/ton	Ag oz/ton
	0.620	3.2

The sample was from the oxidized portion of the vein and contained quartz, tourmaline and abundant "limonite". The sample is interesting in that it was the only sample, out of a total of 9 samples taken in the Meadow Lake district, which showed potentially commercial amounts of gold and silver. The Meadow Lake mine is owned by A. L. Wisker.

Other prospects in Section 27. There are many other large and small quartz-tourmaline-sulfide veins in Section 27. Virtually all have been prospected by shallow pits and cuts. Their mineralogy is essentially identical to the veins discussed above. None of these prospects is currently being worked or show evidence of any recent activity.

Prospects in Section 33.

Numerous quartz-tourmaline-pyrite veins crop out in the W½ of Section 33. Very few of these veins could be traced for more than a few hundred feet. The strongest and most persistent veins crop

out on the north slope of Old Man Mountain adjacent to Phoenix Lake. These veins are located in Section 33 and in Section 4 of Twp. 17 N., Rge. 13 E. They have been more intensively prospected than the remainder of the veins in Section 33 and a small mining operation was attempted in this locality 50 or more years ago.

The veins adjacent to Phoenix Lake are typical quartz-tourmaline veins of the Meadow Lake district. They contain pyrite and minor amounts of chalcopyrite. Sulfides, principally pyrite, locally constitute up to 50% of the vein material, although the average sulfide content of the veins does not materially exceed 10% of the vein matter.

The remnants of a small stamp mill and several small buildings were found on the east shore of Phoenix Lake. Several NSOW. trending veins crop out on the east shore of the lake and extend up a north trending spur of Old Man Mountain. Five distinct veins were mapped, the largest vein reaches a maximum width of 10 feet, however, it has an average width of 5 feet or less. The veins are essentially parallel and trend NSOW. and dip from 85° to the SW. to vertically. The veins are explored by long open cuts and one short adit.

A representative sample of sulphide rich vein material was taken for assay. Results were as follows:

Sample No.	Au oz/ton	Ag oz/ton	Cu %
R-33-18-33-13	trace	0.3	0.012

This sample taken in conjunction with similar assay results from samples of other veins in Section 33 strongly indicate that the copper-gold-silver mineralization in Section 33 is too low grade to be of economic value.

Numerous other veins, similar in all respects to those described above, crop out in the W½ of Section 33. Six additional samples (see geologic map for sample location) of sulfide rich vein material were taken from quartz-tourmaline veins in Section 33. Results were as follows:

Sample No.	Au. oz/ton	Ag. oz/ton	Cu %
33-18-13-2B	0.030	0.2	0.012
" -3B	0.010	0.2	0.050
" -4B	0.010	0.1	0.025
" -5B	trace	0.3	0.012
" -6B	0.010	0.2	0.025
" -1?	0.010	0.2	0.025

Yellow Metal Mine

The Yellow Metal Mine is located in the NW¼ NW¼ Section 9, Twp. 18 N., Rge. 12 E., on the south shore of Bowman Lake. At this locality a dark, gray-green lamprophyre dike intrudes migmatitic, porphyritic granite. The dike and immediately adjacent granite have been mildly, hydrothermally altered and mineralized with disseminated sulfides, chiefly pyrite. The dike trends approximately N10E and dips at a low to moderate angle southeastward.

According to MacBoyle (1918, p. 258) "The deposit is a brown porphyry dike or mineralized stockwork shot full of quartz stringers and kidneys, the whole mass carrying free gold and 3% of pyrite and galena." MacBoyle (1918, p. 258) also states that a mill test run on 3 tons quartered down to 350 pounds, plated $6.80 in free gold and showed $4 in sulphides.

The mineralized rock from the Yellow Metal mine seen by the writer consisted of pyritized lamprophyre dike rock and porphyritic granite containing disseminated pyrite and minor amounts of galena and sphalerite. The dike rock has been chloritized and the feldspar

of the porphyritic granite has been partially sericitized.

The deposit was explored by a short crosscut adit and a series of open cuts. A small mill and an old bunkhouse remain on the property. The mine has been idle for a number of years and it seems doubtful that much, if any, gold was ever produced.

Section 5 Prospect

A quartz vein, containing sporadically disseminated sul des, crops out in the SE¼ NW¼ and the SW¼ NE¼ Section 5, Twp. 18 N., Rge. 12 E. The prospect is claimed by a Mr. C. P. Dancer or Danser, P. O. Box 2733, Reno, Nevada. A cabin and a portion of the quartz vein, appear to be located on land belonging to the So. Pac. Land Co.

The quartz vein was emplaced in a sheared zone in porphyritic granite. The vein trends N. 70-80 E. and has a vertical dip. It ranges from 3 to 4 feet in width and could be traced for approximately 400 feet along strike. The vein quartz contains disseminated pyrite and minor amounts of galena and chalcopyrite. Sulfides constitute approximately 1% of the vein material.

The prospect has been explored by shallow open cuts and a vertical shaft, about 50 feet deep. The porphyritic granite immediately adjacent to the vein has been intensely sheared and sericitized.

A composite grab sample of vein material taken from the shaft dump was assayed. The result was as follows:

Sample No.	Au. oz/ton	Ag. oz/ton
R-5-18-12-1B	0.110	0.2

The assay results, while not conclusive, are not encouraging. It seems doubtful that a paying mine could be developed from this prospect. There is no indication that any gold has been produced from the property. The prospect is currently idle, although the

cabin shows signs of recent occupancy.

Molybdenite-Copper

Section 7 prospects. Several quartz veins, lenses and stringers containing molybdenite, crop out in the NW¼ SW¼ of Section 7, Twp. 18 N., Rge. 13 E. The veins and lenses crop out in granodiorite and in metavolcanic and metasedimentary rocks of the Sailor Canyon (Wilton) formation, adjacent to a northwest trending fault. The quartz masses occupy two fracture systems, a NW. system, essentially parallel to the NW. trending fault and undoubtedly associated with this fault and a NE. to E trending system, nearly at right angles to the fault. The NE trending quartz veins are the thickest and most persistent.

Three main NE. trending veins were found in the course of the field work. The northernmost vein of this group averages 3 feet in width, strikes N. 60-70 E. and dips 60° SE. The vein material consists predominantly of quartz, with sporadic dissemination of pyrite, molybdenite, chalcopyrite, scheelite, powellite and epidote. Locally, molybdenite and epidote occur as veinlets up to one-half inch thick along fractures in the vein quartz. The distribution of the molybdenite in the vein is quite irregular, segments of the vein nearly barren of molybdenite alternate with zones in which molybdenite constitutes up to 5% of the vein material.

The central vein in the group averages 4 feet in thickness, strikes N60E to E-W and dips 40° to the south. The vein consists largely of quartz with disseminated molybdenite and chalcopyrite, pyrite and minor amounts of scheelite and powellite are locally present. The molybdenite content of this vein is less variable than that of the northernmost vein. Virtually all of the quartz

contains some molybdenite. The sulfides occur in the quartz as thin veinlets along fractures, subparallel to the vein walls, and impart a banded appearance to the vein. The veinlets are discontinuous and are commonly less than one-quarter inch in thickness. Since the vein quartz frequently breaks along the fracture planes coated with sulfides, a false impression of the amount of molybdenite present in the vein ~~is~~ may be readily gained.

The central vein has been explored by a short adit approximately 40 feet long. Two chip samples were taken in the adit across the width of the vein. Assay results are as follow:

Sample No.	Sample width	Au. oz/ton	Ag oz/ton	Cu%	Mo%
R-7-18-13-1B	4'	trace	0.2	0.315	0.083
R-7-18-13-2B	5'	trace	0.2	0.163	0.259

The assay results indicate that the vein could not be mined and milled directly due to the low average grade of the mineralization. Hand sorting of the vein material would, however, probably produce a satisfactory mill feed.

The southernmost vein in this group strikes approximately N30E, dips steeply SE. and is about one foot wide. Its mineralogy is similar to the veins described above.

The NW. trending veins, lenses and stringers occur as en-echelon fracture fillings in meta-volcanic rocks. A typical quartz vein or lense is 20 to 30 feet in length and 6 to 18 inches in width. The quartz contains irregularly disseminated molybdenite, chalcopyrite and pyrite. This vein system is not as important as the NE trending veins because of the lenticular nature and narrow widths of the veins within the group.

At present, the molybdenite bearing veins are too low-grade and too small to constitute a commercial source of molybdenum. It is

certain, however, that when the current sources of molybdenum, such as the deposit at Climax Colorado, are exhausted, alternate sources will have to be developed. It is possible that under such circumstances the molybdenite-bearing veins described above will assume economic importance.

Scheelite-Copper-Gold

Section 31, Twp. 18 N., Rge. 13 E. One of the few instances of tungsten mineralization noted within the project area, occurs in the NW¼ NW¼ Section 31, Twp. 18 N., Rge. 13 E. At this locality, quartz float containing minor amounts of scheelite, copper and gold was found. The quartz float occurs in an area of gabbroic rocks and presumably was derived from a vein emplaced in gabbro. The vein was not found in outcrop. A sample of the float was assayed with the following result:

Sample No.	Au. oz/ton	Ag. oz/ton	Cu %	WO_3 %
R-31-18-13-1B	0.020	0.2	0.252	0.026

The assay result is not encouraging and since the quartz float occurs on a slope with a heavy mantle of talus and brush, no further attempt to locate the source of the float was made.

Metallic Deposits

(placer)

Little placer gold has been mined in Twp. 18 N., Rge. 12 & 13 E. The area is located east of and at a higher average elevation than the main outcrop area of Mesozoic gold-bearing veins and Tertiary auriferous gravels. Consequently, the stream gravels in the area are either barren or contain only minor amounts of locally derived placer gold. One exception to this general statement is noted. The Recent and Pleistocene stream gravels in Fall Creek were fairly

productive (Lindgren, 1900, p. 10). Presumably the gold content of the Fall Creek placers was derived from the erosion of auriferous quartz stringers and veinlets on Grouse Ridge.

No auriferous quartz veins of any real consequence are known to crop out in the drainage area of Fall Creek. No accurate estimate of the value of placer gold produced within Twp. 18 N., Rges. 12 and 13 E. is available, but the total production cannot have been large.

Nonmetallic Deposits

Limestone

Crystalline limestone, locally converted to skarn near intrusive contacts, is present in both the Blue Canyon and Sailor Canyon formations. The largest limestone bodies occur in the Blue Canyon formation. In general, the limestone occurs in small lenses.

Fall Creek Mt.

A large, lenticular body of limestone extends from the north side of Fall Creek Mt. to the saddle between Bowan and Red Mts. The limestone body is about one-half mile wide at its southern end and narrows progressively to the north. Within the main limestone body, are interbeds of limy slate occur. The limestone varies from fine to coarsely crystalline and from dark gray to white. It appears to be relatively pure limestone; however, it was not sampled because the major portion of the body is located on land belonging to the Pacific Gas and Electric Co.

None of the limestone has been quarried.

There are other limestone lenses cropping out within the map area. However, none of these lenses approaches the Fall Creek Mt. deposit in size. Due to the location of these limestone lenses in

an area of relatively poor accessibility and severe climate, it seems doubtful that they will be of commercial interest for many years to come.

Construction Materials

Abundant sources of construction materials are available throughout the map area. Quaternary stream gravels and glacial moraines are one abundant source; another one the talus cones which mantle many of the steeper slopes within the area. Plutonic and metavolcanic rocks were used as aggregate and rip rap in the construction of Fordyce Dam and plutonic and metasedimentary rocks were used as aggregate in the construction of Bowman Dam.

The abundance of similar material elsewhere in the Sierra Nevada precludes the use of aggregate materials from Twp. 18 N., Rges. 12 and 13 E. on other than a strictly local basis.

MINERAL RESOURCES COMPILED

Metallic Deposits

Copper-Gold

English Mountain Mine, NW¼ Sec. 6, Twp. 18 N., Rge. 13 E. (MacBoyle, 1920, p. 85)

Ownership. Henry Schroeder (1920) Nevada City.

Past Production. $100,000 prior to 1897.

Extent of workings. 1000 feet drifts and crosscuts including one 500 feet and one 300 feet drift.

Geology. Copper bearing gossan in "diabase " (metavolcanic rocks of the Sailor Canyon formation). Gossan reported to be 50 feet wide and 1000 feet in length. Alongside the gossan a broken footwall of "diabase" reportedly carries stringers of chalcopyrite and widely varying

amounts of gold.

Note The property was examined prior to 1920 by the U. S. Smelting and Refining Co. and the International Smelting and Refining Co. according to MacBoyle.

Orno Grande Group, Sec. 27, Twp. 18 N., Rge. 13 E. (MacBoyle, 1920, p. 88

Ownership. J. P. Clark, F. J. Cook, Cisco (1920)

Extent of workings. 3 shafts, one 32 feet vertical shaft, one 125 feet 3-compartment vertical shaft and one 2-compartment 105 feet deep vertical shaft. Also 200 feet of open cuts and a 30 foot adit.

Geology. 20 parallel veins, cropping out over a total length of 4500 feet. Main vein strikes N85°W and dips 72°SW, wallrock is "porphyry" (probably meta-volcanic rocks of the Sailor Canyon fm.) The veins contain chalcopyrite, barite, malachite, pyrite and quartz. Reported ore value, 5% copper, $7 gold and 3 oz. of silver. Oxidation extends from 1 to 10 feet beneath the present surface.

Turner Group, Sec. 16, Twp. 18 N., Rge. 13 E. (MacBoyle 1920, p. 91)

Ownership. W. M. Turner, Webber Lake, Sierra County (1920)

Extent of workings. Surface cuts, and an 18 feet deep shaft.

Geology. Vein 16 feet in width, strikes northwesterly and dips south. The wallrock is reported as "porphyry" (probably quartz diorite in this location). The vein supposedly contains chalcopyrite and pyrite and assays, gold $9, silver 5 oz., and copper 4%.

Nonmetallic Deposits

No descriptions in available literature.

GENERAL GEOLOGIC SETTING

The rocks present in Twp. 18 N., Rges. 12 and 13 E. may be divided into three major groups; a basement complex consisting of Paleozoic and Mesozoic metasedimentary and metavolcanic rocks intruded by Mesozoic granitic rocks, which is unconformably overlain by Tertiary volcanic rocks, both of which are unconformably overlain by Quaternary surficial deposits.

Paleozoic Rocks

Blue Canyon Formation

General statement. The Blue Canyon formation was first named and described by Lindgren (1900, p. 192) who considered it as part of the Calaveras group of probable Carboniferous age. Lindgren (1900, p. 4) also states that the relative ages of the subdivision of the Calaveras group have not been established and that it might contain Paleozoic rocks older than Carboniferous. Since the Blue Canyon formation is not known to occur in depositional contact with any of the other subdivisions of the Calaveras group, its actual relationship with the Calaveras group is uncertain.

Distribution. The Blue Canyon formation crops out in a northerly trending belt averaging one mile in width which extends from the eastern end of Bowman Lake southward through Red Hill, Fall Creek Mt., and the head of Fall Creek.

Lithology. The Blue Canyon formation in Twp. 18 N., Rge. 12 E. is composed of quartz graywacke sandstone, limestone, and subordinate amounts of calcareous slate, slate and chert. Thermal metamorphism of these rocks near intrusive contacts has resulted in the formation of quartzite, schist and hornfels from graywacke sandstone and slate.

The Blue Canyon formation has undergone regional metamorphism and contact metamorphism. In general, the rocks of the Blue Canyon formation belong to the green-schist facies. The hornfels and quartz-mica schist produced by contact metamorphism of graywacke and slate belong to the amphibolite facies.

Stress during regional metamorphism was sufficiently strong to develop overturned-isoclinal folds in the rocks of the Blue Canyon formation and to cause development of schistosity. The schistosity planes are usually parallel to the bedding planes.

Foliation and bedding in the Blue Canyon formation in this area strikes N.-5 to N.30W. and dips range from vertical to 70° NE.

The quartz graywacke is a light to dark gray-green, poorly sorted rock which consists predominantly of fine to coarse grains of subrounded to well-rounded quartz with occasional feldspar(?) grains in a matrix of chlorite and sericite. The chlorite and sericite of the groundmass were probably derived from an originally silty and clayey matrix by low-grade metamorphism. The quartz graywacke weathers red-brown and varies from massive to thin-bedded; massive beds predominate. The proportion of sand grains to matrix is quite variable. All gradations ranging from nearly pure quartzite to slate occur.

The limestone is usually a dark gray weathering, finely crystalline rock, cut by numerous fractures containing coarsely crystalline calcite. Locally, zones of pure, white, coarsely crystalline calcite occur. No recognizable fossils were found in the limestone.

The slate and calcareous slate are dark gray to black rocks which possess a well-developed slaty cleavage. They usually weather to a

light buff or brownish color. The fine-grained nature of these rocks prevented the field determination of their mineralogy.

The Blue Canyon formation (as revised in this paper) in Twp. 18 N., Rge. 12 E. reaches a measured thickness of approximately 15,000 feet. Since these rocks have been isoclinally folded, the actual thickness of the strata must be reduced by a factor of at least 2 and more probably 4.

Relation to other rocks. The Blue Canyon formation in this area is apparently, in part, overlain with angular unconformity by the Sailor Canyon (Milton) formation. The contact between the Blue Canyon and Sailor Canyon (Milton) formations in the area from Island Lake to Sawmill Lake may be a fault. This is suggested by a change in trend of the contact between Fenner and Sawmill Lakes with an apparent progressive omission of beds in the Sailor Canyon formation in a northerly direction along the contact. North of Sawmill Lake, dikes of granite porphyry and diabase have been intruded along the contact between the two formations.

The contact between the Blue Canyon formation and the Sailor Canyon formation in the Folsom Canyon area may be either a fault or an unconformity. If the contact is an unconformity, then it has been overturned with the result that rocks of the Blue Canyon formation are overlying rocks of the Sailor Canyon (Milton) formation.

Granite intrudes the Blue Canyon formation in Fall Creek. The intrusive contact is exposed in the creek just east of the Bowman Lake road.

Age. According to Lindgren (1900, p. 2) poorly preserved fossils occurring in limestone at Peckman Valley (two miles north of

the area) ~~[illegible]~~ and at the junction of Big Granite Creek and the North Fork of the American River (12 miles southeast of the area), indicate nothing more definite than a Paleozoic age for the Blue Canyon formation. However, among the fossils listed by Lindgren is Lithostrotion and according to Shimer and Schrock (1944, p. 89) the Lithostrotion of early American paleontologists is a Mississippian index fossil. Whether or not the Lithostrotion referred to by Lindgren was correctly identified is, of course, unknown to the writer. It seems plausible, however, in the absence of more definite fossil evidence, to assign the Blue Canyon formation an age of Mississippian (?).

Economic potential. There has been no production of metallic or non-metallic commodities from rocks of the Blue Canyon formation in Twp. 18 N., Rge. 12 E. to date. The large limestone body ~~with~~ north of Fall Creek Mt. constitutes the main potential economic resource within the Blue Canyon formation in this area.

Mesozoic Rocks

Sailor Canyon (Milton) Formation

Distribution and definition. Lindgren (1900, p. 2) proposed the name Sailor Canyon formation for meta-sedimentary rocks of upper Triassic and Jurassic age which are well exposed at Sailor Canyon along the North Fork of the American River. From Sailor Canyon, these rocks extend northward in unbroken outcrop to Signal Peak in Twp. 17 N., Rge. 13 E. North of Signal Peak, plutonic intrusive rocks disrupt the continuity of the Sailor Canyon (Milton) formation, but intermittent outcrops of lithologically similar rocks in a belt over 10 miles wide extend through Twp. 18 N., Rges. 12 and 13 E. and into Twp. 19 N., Rges. 12 and 13 E.

Turner (1897) proposed the name Milton formation for rocks, lithologically similar to the Sailor Canyon formation, which crop out in the area around Milton on the Middle Fork of the Yuba River. A mile south of Milton, these rocks are covered by volcanic rocks of the Mehrten formation. Rocks mapped by Lindgren (1900) as part of the Sailor Canyon formation crop out two miles further to the south beneath the Capping Mehrten formation. Clark (1930, p. 20) concluded that the two formations were the same and that the same Milton formation should be retained on the basis of priority. The writer agrees with Clark's first conclusion, but since the name Sailor Canyon has continued to be used for these rocks in published geologic literature up to the present, it seems best in order to avoid confusion, to call these rocks in this report Sailor Canyon (Milton) formation.

Lithology. Clark (1930, p. 17-23) divided the Sailor Canyon (Milton) formation into four members, a lower andesite breccia, a chert member, a thick sequence of epiclastic sediments and tuffs, and an upper andesite flow and breccia member. During the course of the present investigation it was found that Clark's general stratigraphic sequence is correct, but that the lower members of the formation are not readily separable at all localities. This is the case because the lithologic units or members as mapped by Clark do not have sharp contacts but rather exhibit varying degrees of interbedding, one with the other.

The general stratigraphic sequence in the Sailor Canyon (Milton) formation in Twp. 18 N., Rges. 12 and 13 E. as delineated during the present investigation is as follows: (1) a basal member consisting of andesite flows, breccias and tuffs, interbedded with chert, lime-

stone and hornfels; (2) a middle member consisting of hornfels, sandstone, chert and andesitic tuff; (3) an upper member consisting of andesite flows, breccias and tuffs. The upper member was the only one completely differentiated on the geologic map.

The metavolcanic rocks of the basal unit are dark grey to gray-green, fine to coarse-grained rocks consisting largely of plagioclase and hornblende (uralite). Flows, tuff breccia and tuffs of andesitic composition ~~are~~ constitute the metavolcanic rock types present. Massive tuff-breccia is the dominant rock type. Breccia fragments in the tuff are relic, subrounded to angular fragments, ranging from an inch or less in diameter, up to two or three feet. Most of the fragments are less than a foot in diameter. They occur in a tuff matrix. Both the tuff and the breccia fragments are lithologically similar and are composed essentially of hornblende and plagioclase. The relic fragments show up prominently on weathered surfaces, but are often indistinct on fresh surfaces. The tuff breccia grades into tuff, with a decrease in coarse fragmental material.

The andesitic flows are massive, gray-green rocks which commonly exhibit amygdaloidal tops. Scoriaceous zones are not infrequent. Local introduction of pyrite is common within the metavolcanic flow rocks on Bowman Mt. and surficial oxidation of this pyrite has resulted in an overall reddish-brown coloration in the weathered surfaces of these rocks. The meta-andesite flows are composed of hornblende and plagioclase with minor amounts of epidote, chlorite and augite.

Well stratified tuffs are associated with the flows and tuff-breccia. The tuffs range from very fine grained to coarse-grained and appear to have been deposited in shallow, quiet water. Locally,

the tuffs contain rounded chert grains and pebbles, undoubtedly derived from erosion of the cherts in the Calaveras group.

Interbedded with the metavolcanic rocks are lenses and beds of white to gray blue chert and gray to grayish-blue marbelized limestone. The cherts are usually massive and bedding is indistinct, although, locally, layered chert occurs. Clark (1930, p. 104) states that the chert is a radiolarian chert metamorphosed to impure quartzite. If true, the chert is of primary origin.

The limestone which occurs in the Sailor Canyon (Milton) formation in the Bowman Mt. area, is a finely crystalline, gray rock cut by numerous joints and fractures filled with coarsely crystalline calcite. Limestone cropping out adjacent to the granite in Sec. 9 Twp. 18 N., Rge. 12 E. has been converted to a quartz-epidote-garnet tactite.

The metasedimentary rocks of the middle unit of the Sailor Canyon (Milton) formation consist predominantly of hornfels with interbeds of sandstone, chert and, rarely, limestone.

The limestone, metamorphosed to calc-silicate hornfels by the effects of an adjacent granite pluton, crops out in the Sailor Canyon (Milton) formation on the south shore of Fordyce Lake. The calc-silicate hornfels is composed of porphyroblasts of garnet in a coarsely crystalline matrix of calcite and wollastonite. Similar calc-silicate hornfels crops out in section 1, Twp. 18 N., Rge. 12 E. on the west side of English Mt.

The hornfels, derived from shales, sandy shales and tuffaceous shales by thermal metamorphism, is a dark brown to black, fine-grained rock with a blocky fracture. According to Clark (1930, p. 112-114), the hornfels consist of biotite-quartz rock, orthoclase-biotite-

quartz rock and plagioclase-biotite-quartz rock. Original bedding in the hornfels is commonly preserved as fine color banding.

Quartzite beds, probably meta-cherts, occur interbedded with the hornfels and consist almost entirely of fine- to medium-grained quartz. The sandstone beds are composed of a dark gray rock consisting of quartz, plagioclase and biotite.

The metasedimentary rocks of the middle unit grade upward into finely stratified andesitic meta-tuffs similar in all respects to those already described.

The upper unit consisting of meta-andesite tuff, tuff-breccia and flows is similar in lithology to the meta-volcanic rocks of the basal unit already described. The chief difference between the two metavolcanic units in the Sailor Canyon (Milton) formation is the greater thickness of the upper unit. It reaches an estimated thickness of between 4000 and 5000 feet at English Mt., while the thickness of the basal unit is less than one-half as much, including interbedded metasedimentary rocks.

Detailed petrographic descriptions of the Sailor Canyon (Milton) rocks in Twp. 18 N., Rges. 12 and 13 E. are given by Clark (1930, p. 94-149) and the interested reader is referred to his report for further information.

<u>Relationship to other rocks.</u> As originally mapped by Lindgren (1900), all of the metasedimentary and metavolcanic rocks in Twp. 18 N., Rge. 12 E. west of Sawmill and Shotgun lakes were included in the Blue Canyon formation. Clark (1930, fig. 4), in his study of the Sailor Canyon (Milton) formation, followed Lindgren in this respect. Lindgren (1900, p. 2) stated however, that the line of demarcation between the Blue Canyon and Sailor Canyon (Milton)

formations in the Bowman Lake area was uncertain. He stated that it was located between the limestone zone in the Blue Canyon formation and the "quartz porphyry" dike at the east end of Bowman Lake.

During the course of the present investigation, it was found that some of the rocks mapped by Lindgren as part of the Blue Canyon formation should, in all likelihood, be assigned to the Sailor Canyon (Milton) formation. These rocks include the belt of rocks on Bowman Mt. between the main limestone zone in the Blue Canyon formation and the granite on the west; the belt of metamorphic rocks extending from Round and Island lakes south to Grouse Ridge and the metamorphic rocks between Shotgun and Penney Lakes. These rocks, consisting of interstratified metavolcanic rocks, both flow and pyroclastic rocks and chert, hornfels, limestone and sandstone, are lithologically more similar to the rocks of the Sailor Canyon (Milton) formation as described by Clark (1930) than to rocks of the Blue Canyon Formation.

The rocks in question also exhibit a degree and type of metamorphism which is essentially identical to that present in rocks of the Sailor Canyon (Milton) formation, but which differs from that present in the Blue Canyon formation. In general, the disputed rocks show a higher degree of thermal (contact) metamorphism, but a distinctly lower degree of dynamic metamorphism than the rocks of the Blue Canyon formation.

For the above reasons, the metamorphic rocks on Bowman Mt., Grouse Ridge and between Penney and Shotgun Lake, were included in the Sailor Canyon (Milton) formations in this report and on the geologic map.

The Sailor Canyon (Milton) formation, in part, unconformably

overlies the Blue Canyon formation and, in part, is in fault contact with the Blue Canyon formation. The Sailor Canyon formation is extensively intruded by granitic rocks in Twp. 18 N., Rges. 12 and 13 E. It is unconformably overlain by volcanic rocks of the Valley Springs and Mehrten formations and by Pleistocene glacial moraine.

Age. According to Clark (1930, p. 48-53), fossils found in the Sailor Canyon (Milton) formation range in age from Upper Triassic (200 feet from base of formation) to Middle Jurassic (middle portion of formation). The age of the upper (meta-volcanic) member of the Sailor Canyon (Milton) formation may be Middle and/or Upper Jurassic.

Gabbro-Diorite

Distribution. A body of gabbro-diorite, approximately three square miles in area, forms the elongate east-northeast trending ridge known as the Black Buttes in Twp. 18 N., Rges. 12 and 13 E.

Lithology. The gabbro-diorite is a dark gray to gray-green, medium to coarse-grained rock composed predominantly of plagioclase, pyroxene and uralite (hornblende). As mapped, the gabbro-diorite pluton contains undifferentiated areas of pyroxenite and basic metavolcanic rocks. The gabbro-diorite body exhibits gradational contacts with diorite and quartz-diorite. The gradation from gabbro-diorite to diorite and quartz diorite occurs as a result of a gradual decrease in the amount of mafic minerals present coupled with a change in the mafic minerals from hornblende and pyroxene to hornblende and minor biotite, accompanied by and in part due to, the introduction of quartz-feldspathic material along joints and fracture surfaces. Sharp contacts between the various plutonic rock types were not observed. All gradations from pyroxenite, and gabbro to diorite and

quartz diorite can be seen.

Relations to other rocks. The gabbro-diorite body intruded sedimentary and volcanic rocks of the Sailor Canyon (Milton) formation. Subsequently it was intruded by granodioritic magma. The zone of diorite and quartz diorite which commonly separate the gabbro-diorite from granodiorite is regarded by the writer as a zone of contaminated rock produced by the reaction between the granodiorite magma and the gabbro-diorite. The diorite and quartz diorite are probably the result of both assimilation and metasomatic replacement of gabbro-diorite by the granodiorite.

Age. The gabbro-diorite intrudes rocks of the Sailor Canyon (Milton) formation, which ranges from Upper Triassic to at least Middle Jurassic in age. It is intruded by late Cretaceous granodiorite. Gabbro and ultrabasic intrusive rocks in the foothill belt of the Sierra Nevada are almost certainly of late Jurassic age since they intrude upper Jurassic rocks (Mariposa formation) and are themselves intruded by late Jurassic granodiorites. If the gabbro-diorite in this area is contemporaneous with the basic and ultrabasic intrusives in the Sierran foothills, as seems likely, then it is also late Jurassic in age.

Diorite and Quartz Diorite

Distribution. Diorite and quartz diorite crop out in irregularly shaped bodies in the area around Sanford and Loney Lakes, in the Baltimore and Beyers Lake area, in the French Lake area and adjacent to Fordyce Lake.

Lithology. The diorite is a light to dark gray, fine to medium grained rock consisting predominantly of hornblende and plagioclase with varying amounts, 5% or less, of quartz pyroxene and potassic

feldspar. With an increase in quartz it grades into quartz diorite, with an increase in mafic content and the disappearance of quartz it grades into gabbro-diorite. The quartz diorite is a light grey, fine to medium-grained rock consisting of hornblende, plagioclase and quartz with minor amounts, 5% or less, of biotite and potassic feldspar. It grades into diorite, with a diminution of quartz and into granodiorite, with an increase in the amount of potassic feldspar present.

These rocks should probably be regarded as contaminated rocks formed by the reaction between a granodioritic magma and the gabbro-diorite pluton described above.

Relation to other rocks. Diorite and quartz-diorite exhibit gradational relationships with each other and with both gabbro-diorite and granodiorite. Diorite and quartz diorite intrude rocks of the Sailor Canyon (Milton) formation within the map area. The diorite and quartz diorite are unconformably overlain by rocks of the Mehrten formation and by Pleistone glacial deposits.

Age. The diorite and quartz-diorite are considered by the writer to be essentially contemporaneous in age with the granodiorite plutons. Curtiss, et al. (1958, p. 12-13) state that the granitic intrusives in the Sierra Nevada east of the Mother Lode fault zone are late Cretaceous in age.

Economic potential. No known metallic deposits of economic importance occur in these rocks. They are suitable as local sources of aggregate.

Granodiorite

Distribution. An irregularly shaped granodiorite pluton crops out in the eastern one-half of Twp. 18 N., Rge. 12 E and in the

western one-half of Twp. 18 N., Rge. 13 E.

Lithology. The granodiorite is a medium-grained, light grey rock composed of plagioclase, potassic feldspar, quartz, hornblende and biotite. Hornblende is the dominant mafic mineral in the granodiorite, it forms 20 to 25% of the granodiorite, quartz forms about 20% and feldspar forms 50 to 60% of the granodiorite. The granodiorite has gradational contacts with diorite and quartz diorite bodies, which from their distribution pattern, tend to form border zones between the granodiorite pluton and areas of basic to intermediate igneous wall rocks. This distributional pattern of the diorite and quartz-diorite strongly suggests that these rocks were formed as a result of reaction between the granodiorite magma and the basic to intermediate igneous wall rocks.

Relation to other rocks. The granodiorite intrudes rocks of the Sailor Canyon formation, it has gradational contacts with diorite and quartz diorite. The granodiorite is unconformably overlain by volcanic rocks of the Valley Springs and Mehrten formations and by Pleistocene glacial deposits. Migmatite zones, formed by the intimate injection of granitic magma along fractures and bedding planes, ~~which are common~~ frequently occur along contacts between the granodiorite and the metavolcanic and metasedimentary rocks of the Sailor Canyon (Kilton) formation.

Age. According to Curtiss, et al. (1958, p. 12-13), the granitic rocks east of the Mother Lode fault zone are late Cretaceous in age. The age assignment is based upon radioactive dating using the potassium-argon method. Larsen, et al (1958, p. 52-53) using the lead-alpha method on granitic rocks in the Sierra Nevada, also concluded that these rocks were late Cretaceous in age.

Economic potential. The granodiorite is the ~~best~~ host rock for many of the veins in the Meadow Lake district. These veins are not considered by the writer to be of current economic importance. The granodiorite would make a good local source of aggregate.

Canyon Creek Porphyritic Granite

Distribution. The Canyon Creek granite crops out in the west one-half of Twp. 18 N., Rge. 13 E. It is well exposed along Canyon Creek southwest of Bowman Lake.

Lithology. The porphyritic granite is a light gray, white, or gray-green rock composed of quartz, potassic and sodic feldspars, hornblende, calcic plagioclase and minor biotite. Large, rounded quartz crystals, up to 7 mm in diameter, compose from 10% to 50% of the rock. The quartz phenocrysts are set in an aphanitic to medium-grained groundmass of quartz, feldspar and hornblende crystals. Usually the calcic plagioclase and hornblende occur as small corroded clots or crystal aggregates, embayed and partially digested by quartz and sodic-potassic feldspar. Intermediate to basic inclusions are numerous. The inclusions increase in number as the contact between the granite and the Sailor Canyon formation is approached. Near the contact, the inclusions form approximately 50% of the rock by volume. The inclusions consist of hornblende, plagioclase and varying amounts of quartz and calcic-potassic feldspar depending upon their degrees of assimilation. Quartz phenocrysts, of the type occurring in the granite, are present in most of the inclusions.

The writer believes that the inclusions are xenoliths and represent partially assimilated metavolcanic rocks of the Sailor Canyon (Milton) formation. The clots of hornblende and calcic plagioclase, common in the porphyritic granite, are more completely

digested xenoliths. All stages in the assimilation of the xenoliths can be seen in the porphyritic granite.

The original magma, which formed the porphyritic granite, was evidently extremely rich in SiO_2, Na, K and Al and impoverished in Fe, Mg and Ca since chilled border phases of the granite are leucocratic rocks with a mafic content of less than 5%. Also, it is evident from a thorough megascopic examination of the porphyritic granite, that the majority of the contained mafic minerals occur in clots or crystal aggregates and represent partially assimilated xenoliths rather than integral constituents of the original granitic magma.

Relation to other rocks. The Canyon Creek porphyritic granite intrudes rocks of the Sailor Canyon (Milton) and Blue Canyon formations. It is unconformably overlain by volcanic rocks of the Mehrten formation and Pleistocene glacial deposits. The granite porphyry dike at the east end of Bowman Lake is believed by the writer to be an offshoot of the porphyritic granite because of the marked similarity in lithology between the two rocks.

Age. Lindgren (1900, p. 4) thought that the Canyon Creek porphyritic granite might be substantially older than the other granitic plutons in this portion of the Sierra. He based this hypothesis in part upon a tentative correlation between diabase dikes in the granite and the "diabase" (meta-volcanic rocks) of English Mt. (Sailor Canyon formation). Diabase diking in the granite was not observed during the present investigation and even if diking of this nature does occur, the fact that the porphyritic granite intrudes Sailor Canyon rocks, makes any correlation between such dikes and the meta-volcanic sequence of English Mt. high unlikely.

The Canyon Creek porphyritic granite does not come into contact at the present surface with any of the other granitic plutons in the area. Consequently its age relative to the other plutonic rocks of the area is unknown. Since it intrudes the Upper Triassic to Middle Jurassic, Sailer Canyon (Milton) formation, it must be at least as young as Middle Jurassic. In all probability it is the same age as as the other granitic plutons in the Sierra Nevada, which lies east of the Mother Lode fault zone, that is, late Cretaceous.

Porphyritic Granite

Distribution. Porphyritic granite, a phase of the main granodiorite pluton in the area, crops out on the southeast side of Fordyce Lake.

Lithology. The porphyritic granite is a light gray, medium to coarse grained rock consisting of phenocrysts of potassic feldspar in a groundmass of quartz, potassic feldspar, plagioclase, biotite, and hornblende. The mafic minerals compose between 5 and 10% of the rock, quartz approximately 20% and feldspar the remainder. The biotite and potassic feldspar have subhedral to euhedral crystal faces. The quartz and plagioclase usually are present as anhedral grains.

To the south and southeast, beyond the limits of Twp. 18 N., Rge. 13 E. the granite grades into granodiorite by a gradual decrease in potassic feldspar.

Relations to other rocks. The porphyritic granite intrudes metasedimentary and metavolcanic rocks of the Sailer Canyon (Milton) formation. Outside the map area, it grades into granodiorite.

Age. The porphyritic granite is of approximately the same age as the granodiorite plutons in this portion of the Sierra Nevada.

which are considered by Curtiss, et al. (1958, p. 12-13) to be late Cretaceous in age.

Economic potential. The porphyritic granite contains no known economic mineral deposits.

Dike Rocks

Distribution. Dikes are not abundant in the plutonic and metamorphic rocks of the map area except in migmatite zones along plutonic contacts where their number and complexity makes their representation on the geologic map impractical. Only prominent dikes not directly connected with the contact zones of the plutonic intrusives are shown on the geologic map.

Lithology. The most common dike rock outside the plutonic contact zones is diabase. A thick diabase dike crops out on the east side of Duncan Lake. Along its eastern edge the dike cuts rocks of the Salkey Canyon formation, and on the west it _____ is in contact with a granite porphyry dike. The relative ages of the two dikes were not apparent as no cross cutting or other age diagnostic features were found.

Diabase dikes also intrude diorite and diorite gabbro on Black Butte near Loney Lake. The diabase is a fine-grained, dark gray-green rock consisting of plagioclase and pyroxene. The texture is subophitic.

Relation to other rocks. The dikes intrude both metamorphic and plutonic rocks. They are unconformably overlain by Pleistocene glacial deposits.

Age. The dike rocks, except the diabase dikes, are spatially and genetically related to the plutonic rocks and are of the same age, late Cretaceous. Diabase dikes intrude both plutonic and metamorphic

rocks. It is not certain that the diabase dikes are all of the same age. These dikes which intrude the plutonic rocks are younger than the plutonic rocks and must therefore be at least as young as late Cretaceous. The diabase dike that intrudes the basal portion of the Sailer Canyon formation may be as old as Middle Jurassic.

Economic potential. Essentially nil.

Tertiary Rocks

Valley Springs Formation

Distribution. The Valley Springs formation crops out in the E½ of Twp. 18 N., Rge. 13 E. Two main outcrop areas are present; (1) the headwaters of the Middle Yuba River, east of English Mountain, (2) one-half mile north of Fordyce Lake on the south slope of Meadow Lake Hill.

Lithology. The Valley Springs formation consists of white to buff, rhyolitic tuff and welded tuff. The tuffs are predominantly crystal-lapilli tuffs, locally grading into crystal tuffs. The tuffs are composed of pumiceous lapilli, sanidine, quartz, and biotite in an aphanitic groundmass.

Locally intercalated with the crystal-lapilli tuffs are gray to buff welded tuffs consisting of streaked-out pumiceous lapilli and sanidine, quartz, and biotite crystals in a glassy groundmass. None of the tuffs in the map area were waterlain.

Relation to other rocks. The Valley Springs formation unconformably overlies rocks of the Sailer Canyon formation. It is overlain with local unconformity by the Mehrten formation. Quaternary alluvial and glacial deposits unconformably overlie the Valley Springs formation.

Age and correlation. Anderson (1957, p. 27-28) states that the

Valley Springs formation contains a flora of Clarendonian (Mio-Pliocene) age. The rhyolite tuffs which are locally present at the base of the Mehrten formation, are assigned to the Valley Springs formation on the basis of similar lithology and stratigraphic position. The rhyolite tuff and associated fluviatile material at the base of the Mehrten formation in the Sierra Nevada is defined by Axelrod (1957, p. 28) as composing the Valley Springs formation.

Economic potential. Ground water aquifer, local source of dimension stone, tends to form unstable slopes, particularly where artificial cuts are made through water saturated zones in the tuffs. Landsliding is a potential danger in such circumstances, because the tuff alters readily to clay in water saturated zones and the resultant clay has low plasticity and coherence.

Mehrten Formation

Distribution. The Mehrten formation crops out over an area of about 10 square miles in the north-central and northeast portions of Twp. 18 N., Rge. 13 E. The Mehrten formation also crops out along the western border of Twp. 18 N., Rge. 12 E.

Lithology. The Mehrten formation, within the map area, consists of volcanic mudflow deposits (laharz), tuff breccia, flow breccia, and fluviatile volcanic gravels, all composed largely of fragmental hornblende andesite.

The andesitic mudflow deposits consist of pebbles, boulders and cobbles, dominantly of hornblende andesite in a fine-grained tuffaceous matrix. The andesite fragments range from angular to sub-rounded. The hornblende andesite is a gray to brown rock containing phenocrysts of hornblende, plagioclase and more rarely, pyroxene in a fine-grained groundmass. The mudflow deposits show a

crude stratification when viewed from a distance, which is not detectable upon close examination.

The tuff-breccia consists of angular to sub-angular fragments of hornblende andesite in a matrix of tuff.

The flow breccia is a brown to reddish-brown rock consisting of angular fragments of hornblende andesite in a matrix of andesite. The breccia fragments are frequently scoriaceous.

The gravels consist of sub-rounded to rounded pebbles, cobbles and boulders of hornblende andesite, plutonic and metamorphic rocks in a sandy to clayey matrix. Hornblende andesite clasts predominate. The gravels represent fluviatile and flood-plain deposits.

Relation to other rocks. The Mehrten formation lies with major unconformity upon Cretaceous and older rocks within the map area. It lies with local unconformity on rhyolite tuff of the Valley Springs formation. It is unconformably overlain by Pleistocene gravel deposits.

Age. The Mehrten formation according to Axelrod (1957, p. 25) is Mio-Pliocene in age. The age is based upon both fossil faunas and floras.

Economic potential. The rocks of the Mehrten formation have relatively high porosity and permeability. They therefore form excellent aquifers. Springs frequently occur at the base of the Mehrten formation where it overlies Cretaceous or older rocks. This is due to the much lower porosity and permeability of the older rocks in general, as compared with the rocks of the Mehrten formation.

Plio-Pleistocene Basalt

Distribution. An isolated outcrop of basalt is present in Sections 20 and 21, Twp. 18 N., Rge. 12 E. immediately west of Fall Creek Mt.

Lithology. The basalt is a black fine-grained rock containing occasional phenocrysts of olivine vesicular and scoriaceous phases were noted.

Relation to other rocks. The basalt is entirely surrounded and unconformably overlain by Pleistocene glacial deposits, no base was seen. Presumably, the basalt at this locality is lying unconformably upon pre-Tertiary rocks. The source of the basalt flow is unknown; similar basalt flows ascribed to local centers of eruption are described by Lindgren (1900, p.6-7) in the Colfax folio.

Age. Lindgren (1900, p.6-7) considered the basalt to be of Pleistocene age. However, the available evidence in the map area simply indicates that the basalt is pre-glaciation and post-Cretaceous. Evidence found elsewhere in this portion of the Sierra Nevada indicates that the basalt is younger than the Nehrten formation. Thus the basalt may be Pliocene or early Pleistocene in age.

Quaternary Rocks

Pleistocene Glacial Deposits

Distribution. Virtually, the entire map area was glaciated during the Pleistocene. As a result, glacial deposits are widespread. Only the thicker accumulations of glacial material are shown on the geologic map. The most extensive accumulation of glacial deposits in the area is present in the western portion of Twp. 18 N., Rge. 12 E. where over 50% of the area is covered by glacial moraine.

Lithology. The dominant type of glacial deposit present in Twp. 18 N., Rges. 12 & 13 E. is glacial moraine. Subordinate areas of fluvio-glacial outwash also occur. The glacial moraine consists of angular to subrounded pebbles, cobbles and boulders of volcanic, metamorphic and plutonic rocks in a sandy to clayey matrix. Sorting is

very poor and the deposits lack stratification.

Relation to other rocks. The glacial deposits unconformably overlie the older rocks of the area.

Age. There is no doubt that the glacial deposits are of Pleistocene age.

Economic potential. Local source of aggregate, ground-water aquifer.

Lake Deposits

Distribution. Small meadows resulting from the silting up of cirque and morainal lakes are common in glaciated areas. Several of the larger meadow areas, so formed, have been differentiated on the geologic map.

Lithology. The lake deposits consist of fine sands, silts and clays.

Relation to other rocks. The lake deposits unconformably overlie glacial deposits and the Tertiary and pre-Tertiary rocks.

Age. The lake deposits are Recent in age.

Economic potential. The lake deposits form a rich, well watered soil, ideal for the growth of grasses. Consequently, they form meadow areas ideal for livestock grazing.

Stream Gravels

Distribution. Although stream gravels are present in all of the streams of the area, only the thickest and most persistent accumulations have been shown on the geologic map. The principal areas of stream gravels in Twp. 18 N., Rge. 12 and 13 E. are, (1) the Middle Yuba River, (2) Fall Creek and, (3) Canyon Creek.

Lithology. The stream deposits consist of subangular to well-rounded pebbles, cobbles and boulders derived from the pre-existing

rocks of the area. Since a diversity of lithologies is present in these pre-existing rocks, a similar diversity of rocks is present in the stream gravels. The gravels contain abundant interstitial sand, but little clay or silt due to the high gradients of the streams in which the gravels occur.

Relation to other rocks. The stream gravels unconformably overlie Pleistocene and older rocks.

Age. The stream gravels are predominantly of Recent age, although local areas of stream gravel of probable Pleistocene age occur.

Economic potential. The stream gravels contain small amounts of placer gold in the Fall Creek area.

STRUCTURAL FEATURES

Folds

The rocks of the Blue Canyon formation have undergone at least two and possibly three major orogenic periods. The Sailor Canyon (Hilton) formation has been involved in at least one and possibly two periods of deformation.

The earliest orogeny occurred in the Permian or early Triassic, prior to the deposition of the Sailor Canyon formation. The Blue Canyon formation was tilted and folded. Subsequently the Sailor Canyon (Hilton) formation was deposited with angular unconformity upon an erosion surface cut on the Blue Canyon formation. Both formations were then subjected to at least one period of intense deformation. Chandra (1953, p. 92) and Curtiss et al. (1958, p. 9) have compiled evidence indicating that there were two separate orogenies in the Sierra Nevada during the Mesozoic. From their radioactive age determinations Curtiss, et al. (1958, p. 9) have concluded that one orogeny (Nevadan) occurred in the Upper Jurassic, and the second (Santa Lucian)

in the late Cretaceous.

Within the map area, numerous drag folds occur in the Blue Canyon formation. The drag folds axes plunge steeply to the east and strike N 70-80 E. The rocks of the Blue Canyon formation strike north to NW and dip, in general, 70 to 80 NE. Vertical dips also occur. Major folds were not discriminated in the Blue Canyon formation due to the lack of adequate marker beds, faulting, lack of adequate exposure due to the cover of younger rocks overlying the Blue Canyon formation and intrusion of plutonic rocks into the formation.

Clark (1930, p.) states that a major syncline is present in the Sailor Canyon (Milton) formation. The axis of the syncline according to Clark, passes through the map area. Attitudes measured in the Sailor Canyon (Milton) formation by the writer tend to corroborate Clark's conclusion. The axis of the syncline would extend through English Mountain and Fordyce Lake. The general trend of the axis is NW, no measurable plunge was noted. The syncline has been intruded by plutonic rocks, consequently only isolated portions of the original structure are present within the map area.

The identification by the writer of the meta-volcanic and meta-sedimentary rocks in Bowman Mt. as part of the Sailor Canyon (Milton) formation means that these rocks, which apparently underlie rocks of the Blue Canyon formation, were either folded or faulted into their present position. Conclusive evidence as to which occurred was not obtained during the reconnaissance mapping. If the rocks were folded into their present position, then the fold is an overturned anticlinal fold, whose limbs dip steeply east and whose axis would trend northerly through Red Mt.

Rocks of the Sailor Canyon formation on Grouse Ridge have been highly deformed. Isoclinal folds, locally overturned, have been mapped in the Sailor Canyon (Milton) formation in the area. The fold axes trend N 10-30 E and plunge shallowly to the NE. Some of the folds are overturned to the east. Since this area of intense deformation in the Sailor Canyon formation is adjacent to an intrusive contact with quartz diorite, it is possible that the folding is due to the emplacement of the intrusive rocks.

Faults

No major faults were mapped in Twp. 18 N., Rges. 12 and 13 E. Many small faults, many of them occupied by quartz veins, occur in the plutonic rocks. In the Meadow Lake district these faults trend from E-W to NE. A NE trending fault extending from Phoenix Lake to the Anderson Mine area was also mapped in the Meadow Lake district.

The contact between the Sailor Canyon formation and granodiorite on the southwest side of English Mt. is a fault. The fault trends NW. Subsidiary fracture associated with the fault have been mineralized and contain quartz veins with disseminated sulfides.

The contact between the Hime Canyon formation and the Sailor Canyon formation east of Culbertson Lake is probably a fault. The contact is discordant to the bedding in both formations and Sailor Canyon strata are apparently progressively omitted along the contact.

Intrusive dikes have been emplaced along the contact east of Bowman Lake, ~~[illegible]~~ again indicating that the contact is a fault.

FIELD WORK

A total of 21 man days was spent in the field in Twp. 18 N., Rges. 12 and 13 E.

Geophysics

Hand specimens of all rocks taken from Twp. 18 N., Rge. 12 and 13 E. were analyzed for anomalous radiation and fluorescence. Scheelite was noted in vein-quartz samples from Section 31, Twp. 18 N., Rge. 13 E.

RECOMMENDATIONS

The occurrence of molybdenum-copper-tungsten mineralization in quartz veins in Section 7, Twp. 18 N., Rge. 13 E. and of copper-tungsten in quartz vein float in Section 31 of the same township is interesting and merits future investigation, particularly if the present adverse conditions affecting tungsten mining in this country change for the better.

The writer has made it clear in his discussion of the Meadow Lake district that he feels the district has little future potential.

The pre-Tertiary rocks of the area are, in general, suitable for aggregate use. Their remote location, however, renders their use for any purpose, other than local construction, unlikely.

REFERENCES CITED

Axelrod, D. I., 1957, Late Tertiary floras and the Sierra Nevada uplift: Geol. Soc. America Bull., vol. 68, pp. 19-46.

Chandra, D. K., 1953, Geology of the Colfax and Forest Hill quadrangles: Ph.D. thesis, Univ. Calif. Dept. Geology, Berkeley 143 p.

Clark, S. G., 1930, The Milton formation of the Sierra Nevada of Californi Ph.D. thesis, Univ. Calif. Dept. Geology, Berkeley, 208 p.

Curtis, G. H., et al, 1958, Age determination of some granitic rocks in California by the potassium-argon method: California Div. Mines Special Report 54, p. 3-16.

Larsen, E. S., et al., 1958, Lead alpha ages of the Mesozoic batholiths of Western North America: U. S. Geological Survey Bull. 1070-B.

Lindgren, W., 1900, U. S. Geol. Survey Atlas, Colfax Folio (No. 66) 10p.

Logan, C. A., 1941, Mineral resources of Nevada County: California Jour. Mines and Geology, vol. 37, no. 3, p. 374-469.

MacBoyle, E., 1920 Mines and Mineral resources of Nevada County, California: California Min. Bur. Rept. 16, 270 p.

Raymond, G. W., 1902, Mining and Scientific Press

Shaver, H. W. and Shrock, R.R., 1944, Index fossils of North America: John Wiley and Sons, Inc., New York, 721 p.

Turner, 1892, U.S. Geol. Survey Atlas, Downieville folio (no. 37) 8 p.

Wisker, A. L., 1936, Gold-bearing veins of Meadow Lake district, Nevada County: California Jour. Mines and Geology, vol. 32.

_____., 1958, Can modern metallurgical methods revitalize the Meadow Lake area?: Engineering and Mining Journal vol. 159, no. 5, p. 104-105.

UNITED STATES
DEPARTMENT OF THE INTERIOR

GEOLOGICAL SURVEY
Office of Minerals Exploration
345 Middlefield Road
Menlo Park, California 94025

October 4, 1968

OFFICIAL COPY
O. M. E.
RECEIVED
OCT 8 1968

INITIALS	CODE
	30
	120
	110
	120

Memorandum

To: Chief, Office of Minerals Exploration
Washington, D. C.

From: Field Office
Region II

Subject: OME-6735 (Copper-Molybdenum)
Allen, Shumate, Weston, and Johnson
English Mt. Mine
Nevada County, California

Enclosed is an Application Report on the subject property recommending that the application be denied on the basis that the geologic probability of discovering minable ore bodies as a result of the proposed work is too small to justify Government participation.

H. K. Stager

Enclosure

UNITED STATES

DEPARTMENT OF THE INTERIOR

STEWART L. UDALL, SECRETARY

GEOLOGICAL SURVEY

OFFICE OF MINERALS EXPLORATION

REPORT OF EXAMINATION

REGION II

On-Site Exam Report

APPLICATION REPORT

OME-6735 (Copper-Molybdenum)
Allen, Shumate, Weston, and Johnson
English Mt. Mine
Nevada County, California

By

H. K. Stager
Field Officer
OME, Region II

October 4, 1968

CONTENTS

	Page
INTRODUCTION	1
SUMMARY	1
RECOMMENDATIONS	2
LOCATION, ACCESSIBILITY, AND LOCAL FACILITIES	2
PROPERTY	3
History and Production	3
Ownership	3
Financial Eligibility	4
Development	4
GEOLOGY	4
Geologic Setting	4
Ore Deposits	5
Sampling	6
Ore Reserves	6
EXPLORATION	7
Applicants' Proposal	7

ILLUSTRATIONS

Figure 1. Index map showing location of English Mt. Mine.

INTRODUCTION

The partnership of Allen, Shumate, Weston, and Johnson, 935 Marin Avenue, Hayward, California 94541, applied to the Office of Minerals Exploration for Government assistance in an exploration project, Docket OME-6735, to explore for copper and molybdenum at the English Mt. Mine, Nevada County, California. The applicants infer the presence of minable bodies of copper and molybdenum on the property and wish to explore for these ore bodies by driving a crosscut adit and drifting on one or more veins.

A field examination was requested by the Office of Minerals Exploration and was made by H. K. Stager, Field Officer, on August 30, 1968, accompanied by Mr. Jack B. Shumate, Mr. Alex A. Johnson, and Mr. Claude J. Artero, general partners. The applicants' maps, reports, and assay data were examined and compared with surface and underground exposures in the mine area. Four samples were taken during the examination and the results of the assays are given in the following report.

SUMMARY

The English Mt. Mine property contains several outcrops of copper- and molybdenum-bearing material in metamorphosed sedimentary and volcanic rocks along and near a contact with granitic rocks. About 46 tons of ore, containing 2.44 percent copper, has been produced from a short adit on the Conrad vein. The applicants proposed to explore the deposit by driving a crosscut adit 1,200 feet in length, to intersect the two major veins, at a total estimated cost of $80,000. The program is largely prospecting in nature and the size and grade of the ore-bearing structures do not justify a project of the extent and cost contemplated.

RECOMMENDATIONS

It is recommended that the application be denied on the basis that the proposed project lacks suitable targets, is largely prospecting in nature, and that the geologic probability of discovering minable ore deposits as a result of the proposed work is too small to justify Government participation.

LOCATION, ACCESSIBILITY, AND LOCAL FACILITIES

The English Mt. Mine property is in sec. 12, T. 18 N., R. 12 E., MDM, Nevada County, California (Fig. 1), on the southwest side of English Mountain at an altitude of about 6,400 feet.

To reach the property, that is about 30 miles northeast of Grass Valley (the closest major town), drive east on Highway 20 about 20 miles to the Washington-Graniteville Road, turn left (north) and drive about 20 miles to the Jackson Creek Campground at the northeast end of Bowman Lake, turn right (south) and drive about 3 miles on the Faucherie Lake Road. The property lies on the north side of the road about one mile northwest of Faucherie Lake. A steep access road leads up the side of English Mountain to the center of the property. A 4-wheel drive vehicle is necessary to reach the property and the drive from Grass Valley requires about two hours. The property is not accessible during the winter months because of deep snow cover.

All necessary services, supplies, equipment, and labor are available in the Grass Valley-Nevada City area. Ample water is available on the property. The closest shipping point is on the Southern Pacific Railroad at Emigrant Gap, California (20 miles). Assay services are available in San Francisco, California (160 miles), at a cost of about $5 per sample for gold and silver,

$2 for copper, and $5 for molybdenum. The closest copper smelter is in Tacoma, Washington (about 700 miles).

PROPERTY

History and Production

Mining in the district has been limited to a small gold operation, discovered in 1868 and worked intermittently for about 50 years, several small copper prospects and a small, low grade, molybdenite deposit. The applicants became interested in the area about 1960 and located a number of lode claims on the outcrops of chalcopyrite- and molybdenite-bearing material. The only recorded production is a shipment to the A. S. & R. Company smelter at Tacoma, Washington, in October 1961. This shipment totaled 46 tons of ore that assayed 2.44 percent copper. The ore did not yield enough copper ($362) to pay the treatment charges ($506) and the Operators received a bill from the smelter for $144.

Ownership

The property consists of 10 unpatented lode mining claims, as follows:

Name	Book	Page
Stephanie Molly #1	--	--
Stephanie Molly #2	38	447
Jeff Molly #1	38	239
Jeff Molly #2	38	97
Toni Molly #3	38	243
Toni Molly #4	38	131
Katy Molly #1	38	87
Katy Molly #2	38	441
Betty Molly #1	38	119
Betty Molly #2	38	189

These claims were located, and are presently held, by the applicants. They are recorded at the Nevada County Recorder's Office in Nevada City, California.

Financial Eligibility

The applicants furnished copies of letters to two banks requesting loans for the proposed work and also copies of letters from the banks denying the loans. The applicants proposed to furnish their share of the exploration costs in cash.

Development

The property is developed by about 15 shallow prospect pits and a drift adit about 70 feet in length. Most of the pits are sloughed in and not accessible for study or sampling. The adit is open but is in poor condition. Except for a small steel ore bin, of about 20 ton capacity, there are no surface facilities.

GEOLOGY

Geologic Setting

The English Mt. Mine property is in an area of high relief and, although parts of the claim area are covered by glacial moraine, slope wash, and dense vegetation, outcrops are abundant.

The oldest rocks exposed on the property are metasedimentary and metavolcanic rocks of the Sailor Canyon (Milton) Formation of Triassic-Jurassic age. The metasedimentary rocks consist chiefly of hornfels with interbeds of sandstone, chert, and, rarely, limestone. Bedding strikes north and dips moderately to steeply east. The metavolcanic rocks are largely flows of andesite and beds of andesite tuff. These metamorphic rocks are underlain

at a shallow depth and intruded by granodiorite of Cretaceous age and diabase dikes of Cretaceous or younger age. Several faults, that strike east-west to northwest and dip steeply south, cut the metamorphic rocks. These faults commonly contain veins of massive sulfides that locally are copper- and molybdenum-bearing. Two of these veins, known as the Conrad and Scarano veins, are the principal targets of the applicants' proposed exploration program.

Ore Deposits

The only production from the property consisted of a single shipment of about 46 tons of ore that assayed 2.44 percent copper, 0.01 ounce of gold, and 0.42 ounce of silver per ton. The molybdenum content is not known. This ore was mined from the short adit on the Jeff Molly #1 Claim and occurred in a massive sulfide zone in the Conrad vein that strikes about N. 82° W. and dips about 85° S. The vein pinches and swells, from 1 to 5 feet in thickness, along the strike and downdip. Where exposed in the open pits and adit it appears to average about 3 feet in thickness. The ore minerals are chalcopyrite and molybdenite in a massive gangue of pyrrhotite with minor amounts of quartz, calcite, epidote, and pyrite. The vein walls are poorly defined and the sulfides commonly extend out into the hornfels wall rock. The copper content ranges from less than 1 percent to about 6 percent but probably averages about 1 percent. The molybdenum content is extremely erratic but probably averages about 0.01 percent.

The Scarano vein is about 800 feet north of and nearly parallel to the Conrad vein. It is poorly exposed and the prospect pits along the trace of the vein are sloughed in and do not expose mineralized material in place.

Oxidized material on the dumps indicates that the ore is similar to that in the Conrad vein.

Sampling

Four samples were taken of the most favorable material exposed in the adit and nearby prospect pit on the Conrad vein. These samples were assayed and yielded the following results:

Sample No.	Ounces per ton Gold	Silver	Percent Copper	Molybdenum	Description
EM-1	Trace	Trace	0.93	0.033	Chip sample across face of adit (4').
EM-2	0.01	Trace	1.03	0.093	Chip sample 30' back from face of adit (4').
EM-3	0.01	0.20	0.95	0.020	Chip sample 10' from portal of adit (2').
EM-4	0.01	0.40	2.69	0.017	Chip sample across vein in pit face west of adit portal (4').

Ore Reserves

The applicants estimate the indicated reserves to be about 7,000 tons of ore in a block 200 feet in length, 4 feet in width, and extending downdip 50 feet on the Conrad vein in the area of the drift adit and prospect pit from which the small production has come. The grade of these reserves is not given but, from the results of the assays of the samples taken during the examination, it appears the average grade would be about 1 percent copper, 0.04 percent molybdenum, 0.01 ounce of gold, and 0.1 ounce of silver per ton.

This is less than the grade of the ore shipped to the smelter (2.44 percent copper) but that ore was upgraded by sorting and not representative of the average grade of the mineralized material.

Because of the isolated location of the property, the short working season, and distance to a copper smelter, ore of less than about 5 percent copper content could not be mined economically. It is not apparent that there is any minable quantity of this grade of ore available on the property.

EXPLORATION

Applicants' Proposal

The applicants proposed to explore the property by driving a crosscut adit 1,200 feet in length to intersect the Conrad vein about 150 feet below the outcrop and the Scarano vein about 300 feet below the outcrop. They estimated the project would require about 4 months to complete and cost about $80,000.

The proposal was poorly planned; was primarily designed to prospect the area between the two veins; did not allow for any exploration along the strike or dip of the veins; and could not be accomplished in the time or for the costs estimated. The proposed adit site would require that the portal and several hundred feet of the crosscut would be driven in unconsolidated glacial moraine that would be extremely difficult to penetrate with an adit and would require extensive timber to hold.

The property should first be prospected by a small diamond drilling project, to determine the probable thickness, length, and grade of the mineralized zones, and then explored by drift adits along the major vein, or

veins. If the applicants undertake such a prospecting program at their own expense, and the results are favorable, it may then be possible to justify Government participation in an exploration project to test the most favorable vein.

UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

OME-6735
(Copper-Molybdenum)

Figure 1.--MAP OF CALIFORNIA AND NEVADA

MME Form 7
(2/63)

OFFICIAL FILE COPY

Date	Surname	Code
7/10/68	Peterson	120
7/10/68	Kirkbemo	120
		110
7/10	Cal	220
		120M

JUL 10 1968

AIRMAIL

Memorandum

To: Field Officer, Region II

From: Chief, Office of Minerals Exploration

Subject: OME-6735 (Copper and Molybdenum)
Allen, Shumate, Weston, and Johnson
English Mt. Mine
Nevada County, California

The subject application is referred to you for further consideration, a field examination if warranted, and recommendations.

A review of the material furnished by the Applicant suggests that some exploration of the Conrad vein may be warranted, however, no supporting evidence has been presented to justify the proposed testing of the Scarano vein. It appears that the area north of the Conrad vein is still in the prospecting stage.

Although the Applicant proposes a program of crosscutting and drifting, it seems that a limited amount of drilling from surface sites would provide satisfactory results at considerable less cost.

If a contract is proposed, additional bids for the work to be performed are required.

We are enclosing the Areal Economic Geology map furnished by the Applicant. Please note that he has requested its return. You indicated that you have the other material recently submitted by the Applicant.

FRANK E. JOHNSON

Frank E. Johnson

Enclosure

cc: Director's Reading File
Economic Geology File
OME Docket
OME Reading File
130
Mr. Peterson

ECPeterson/bsl 7/10/68

MME Form 7
(2/63)

OFFICIAL FILE COPY

Date	Surname	Code
7/10/68	Peterson	120
7/10/68	Kirkham	120
		110
		220
		120M

JUL 10 1968

AIRMAIL

Mr. Jack B. Shumate
935 Marin Ave.
Hayward, California 94541

Re: OME-6735 (Copper and Molybdenum)
Allen, Shumate, Weston, and Johnson
English Mt. Mine
Nevada County, California

Dear Mr. Shumate:

This will acknowledge your letter July 2 enclosing additional information in support of the subject application for financial assistance.

We are now referring the application for further consideration to Mr. Harold K. Stager, Field Officer, Region II, U. S. Geological Survey, Building 2, 345 Middlefied Road, Manlo Park, California 94025.

Mr. Stager will notify you if additional information concerning the application is needed, and possibly to make arrangements for an on-site examination of the property.

Sincerely yours,

FRANK E. JOHNSON

Frank E. Johnson
Chief, Office of
Minerals Exploration

cc: Director's Reading File
Economic Geology File
OME Docket
OME Reading File
130
R-II
Mr. Peterson

ECPeterson/bsl 7/10/68

MME Form 7
(2/63)

OFFICIAL FILE COPY

Date	Surname	Code
6/26/68	Peterson	120
6/26/68	Kirkham	120
		110
		220
		120M

JUN 26 1968

AIRMAIL

Mr. Jack B. Shumate
935 Marin Ave.
Hayward, California 94541

Re: OME-6735 (Copper and Molybdenum)
Allen, Shumate, Weston, and Johnson
English Mt. Mine
Nevada County, California

Dear Mr. Shumate:

Our review of your application for exploration assistance indicates that much of the geological data required to justify the proposed work has not been furnished. We suggest that you obtain additional sample and assay data to reasonably establish that the Conrad and Scarano veins are strong and well mineralized structures of appreciable size. Such favorable information would enhance the probability that significant ore reserves may be discovered by the proposed work.

In addition, any geologic information that you may have concerning the project area should be also furnished. This data may include geologic maps, projections or sections, and a description of the structures, formations, and mineral occurrences of the area. The strike, dip, width, and known length of the target veins should be submitted.

We note that no provisions have been included in your proposal for the exploration of the target veins. The proposal of driving a 1200-foot crosscut without subsequent testing of the mineralized structures encountered by the workings is considered development and is not eligible for OME assistance. The work plan and cost estimate should be revised to include sufficient drifting and/or underground drilling to adequately explore the mineralized areas.

Please comment on the feasibility of other, less costly, exploration such as diamond drilling from surface sites in lieu of the proposed work. It seems that several well planned holes would explore the targets at considerable less cost and time. Perhaps the initial work should be limited to the exploration of the Conrad vein which appears to be the more favorable of the two targets.

As you have indicated the proposed work will be contracted, cost estimates should be supported by bids from three independent contractors if possible.

We shall be pleased to continue the processing of your application upon receipt of the requested information; however, nothing in this letter should be considered as a commitment by the Government to grant an exploration contract.

Sincerely yours,

FRANK E. JOHNSON

Frank E. Johnson
Chief, Office of
Minerals Exploration

cc: Director's Reading File
Economic Geology File
OME Docket
OME Reading File
Region II
Mr. Peterson

ECPeterson/bsl 6/26/68

June 24, 1968

Mr. Jack B. Shumate
935 Marin Ave.
Hayward, California 94541

Subject: OME-6735

Dear Mr. Shumate:

Your application for exploration assistance, dtated June 11, 1968, submitted to our office at Menlo Park, California, has been assigned Docket No. OME-6735.

Please identify all future correspondence relating to your application by this docket number.

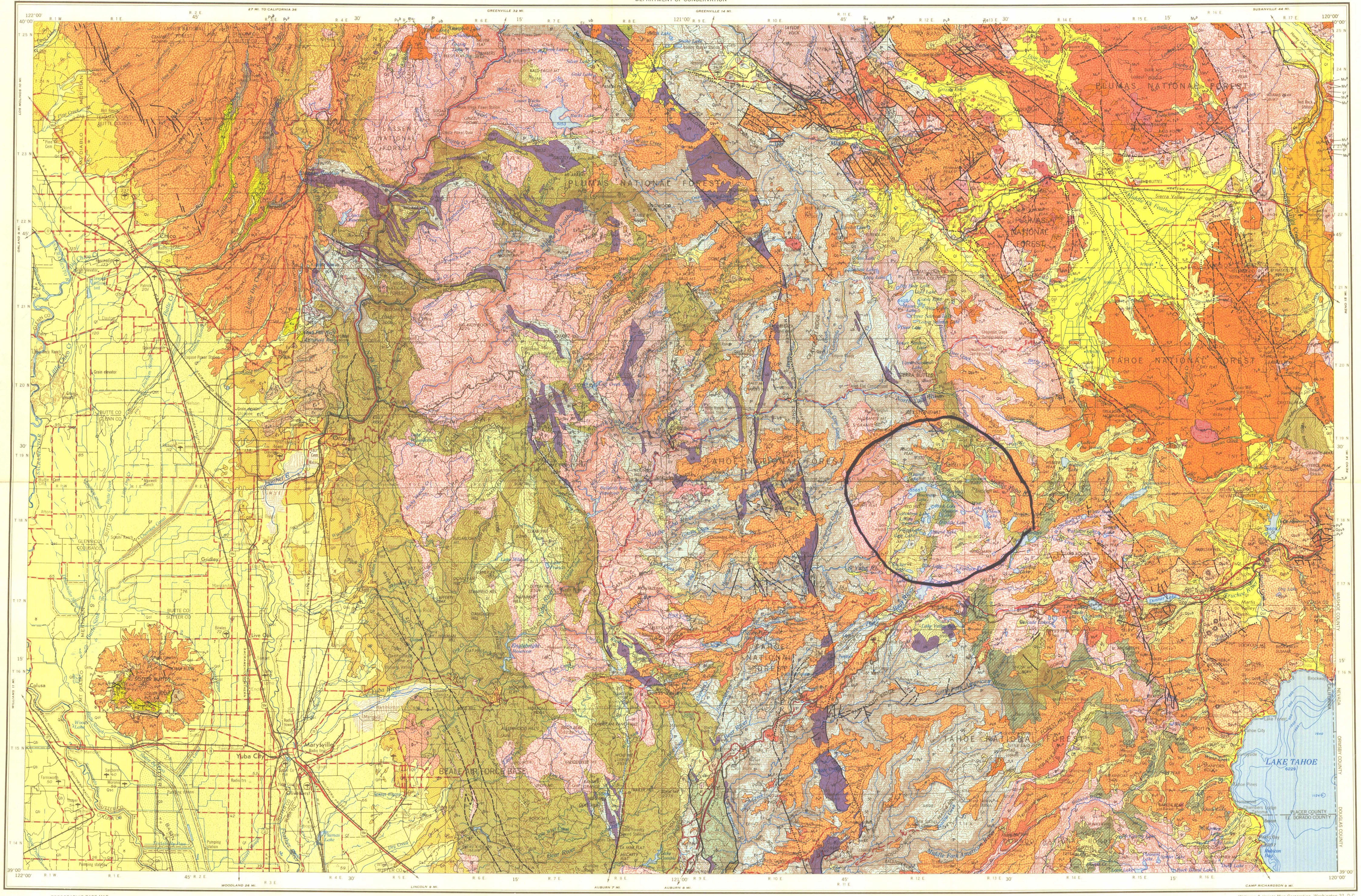
Sincerely yours,

Frank E. Johnson
Chief, Office of
Minerals Exploration

cc: to Region II

DIVISION OF MINES AND GEOLOGY
IAN CAMPBELL, CHIEF
GORDON B. OAKESHOTT, DEPUTY CHIEF

STATE OF CALIFORNIA
THE RESOURCES AGENCY
DEPARTMENT OF CONSERVATION



TOPOGRAPHIC BASE MAP

Prepared by the Army Map Service (KCSX), Corps of Engineers, U. S. Army, Washington, D. C. Compiled in 1957 from United States Quadrangles, 1:24,000, 1:25,000, 1:48,000, 1:50,000, 1:62,500, U. S. Geological Survey and AMS, 1937-57. Planimetric detail revised by photo-planimetric methods. Horizontal and vertical control by USGS, USC&GS, USFS, USBR, U. S. Army and CE, and Fairchild Aerial Surveys. Map field checked, 1958.

Land net prepared by U. S. Geological Survey

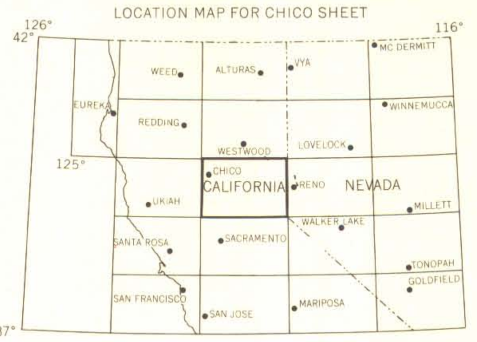
Depth contours in Lake Tahoe in feet — compiled from soundings shown on U. S. Coast and Geodetic Survey Chart 5001

Contact
(Dashed where approximately located, gradational or inferred)

Fault
(Dashed where approximately located; dotted where concealed)

Thrust fault
(Barbs on upper plate; dashed where approximately located, dotted where concealed)

LOCATION MAP FOR CHICO SHEET



Scale 1:250,000

5 0 5 10 15 20 Statute Miles

5 0 5 10 15 20 25 30 Kilometers

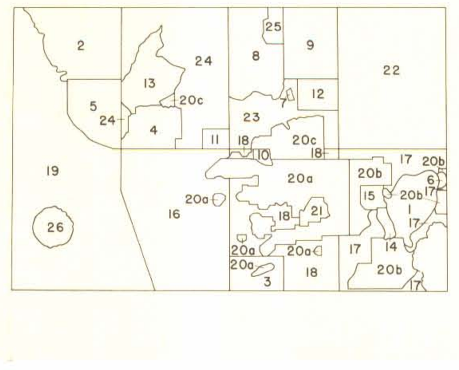
CONTOUR INTERVAL 200 FEET
WITH SUPPLEMENTARY CONTOURS AT 100 FOOT INTERVALS

GEOLOGIC MAP OF CALIFORNIA

OLAF P. JENKINS EDITION

CHICO SHEET

COMPILATION BY JOHN L. BURNETT AND CHARLES W. JENNINGS 1962



INDEX TO GEOLOGIC MAPPING
(COMPLETE INDEX ON EXPLANATORY DATA SHEET)

1. Birkeland, P. W., unpublished.
2. Burnett, J. L., unpublished. Saul, L., unpublished. Taff, J. A., Hanna, G. D., and Cross, C. M., 1940. Cook, R. E., unpublished.
3. Chandra, D. K., unpublished.
4. Compton, R. R., 1955.
5. Creely, R. S., unpublished.
6. Daley, A. C. and Poole, D. M., unpublished.
7. Durrell, C. and Proctor, P. D., 1948.
8. Durrell, C., unpublished. Turner, H. W., 1897.
9. Durrell, C., unpublished.
10. Ferguson, H. G. and Gannett, R. W., 1932.
11. Goodwin, J. G., unpublished.
12. Ford, R. S., unpublished.
13. Hietanen, A., 1951.
14. Hudson, F. S., 1948.
15. Hudson, F. S., 1951.
16. Lindgren, W. and Turner, H. W., 1895.
17. Lindgren, W., 1897.
18. Lindgren, W., 1900.
19. Olmsted, F. H. and Davis, C. H., 1961.
20a. Southern Pacific Company, Land Department, unpublished.
20b. Southern Pacific Company, Land Department, unpublished.
20c. Southern Pacific Company, Land Department, unpublished.
21. Stanford Geological Survey, unpublished.
22. Stinson, M. C., unpublished.
23. Turner, H. W., 1897.
24. Turner, H. W., 1898.
25. Wilhelms, D. E., unpublished.
26. Williams, H., 1929. Johnson, H. R., 1943. Garrison, L. E., 1961.

Williams & Heintz Map Corporation, Washington 27, D.C.

EXPLANATION

SEDIMENTARY AND METASEDIMENTARY ROCKS — IGNEOUS AND META-IGNEOUS ROCKS

CENOZOIC

QUATERNARY

Recent

- Qs — Dune sand
- Qal — Alluvium
- Qsc — Stream channel deposits (GREAT VALLEY)
- Qf — Fan deposits (GREAT VALLEY)
- Qb — Basin deposits (GREAT VALLEY)
- Qrv — Recent volcanic: Qrv[r] —rhyolite; Qrv[a] —andesite; Qrv[b] —basalt; Qrv[p] —pyroclastic rocks
- Qst — Salt deposits
- Ql — Quaternary lake deposits
- Qg — Glacial deposits
- Qt — Quaternary nonmarine terrace deposits

Pleistocene

- Qm — Pleistocene marine and marine terrace deposits
- Qpv — Pleistocene volcanic: Qpv[r] —rhyolite; Qpv[a] —andesite; Qpv[b] —basalt; Qpv[p] —pyroclastic rocks
- Qc — Pleistocene nonmarine
- QP — Plio-Pleistocene nonmarine
- Quaternary and/or Pliocene cinder cones

TERTIARY

Pliocene

- Pc — Undivided Pliocene nonmarine
- Puc — Upper Pliocene nonmarine
- Pu — Upper Pliocene marine
- Pv — Pliocene volcanic: Pv[r] —rhyolite; Pv[a] —andesite; Pv[b] —basalt; Pv[p] —pyroclastic rocks
- Pmlc — Middle and/or lower Pliocene nonmarine
- Pml — Middle and/or lower Pliocene marine

Miocene

- Mc — Undivided Miocene nonmarine
- Muc — Upper Miocene nonmarine
- Mu — Upper Miocene marine
- Mv — Miocene volcanic: Mv[r] —rhyolite; Mv[a] —andesite; Mv[b] —basalt; Mv[p] —pyroclastic rocks
- Mmc — Middle Miocene nonmarine
- Mm — Middle Miocene marine
- Ml — Lower Miocene marine

Oligocene

- Φc — Oligocene nonmarine
- Φv — Oligocene volcanic: Φv[r]—rhyolite; Φv[a] —andesite; Φv[b] —basalt; Φv[p]—pyroclastic rocks
- Φ — Oligocene marine

Eocene

- Ec — Eocene nonmarine
- Ev — Eocene volcanic: Ev[r] —rhyolite; Ev[a] —andesite; Ev[b] —basalt; Ev[p] —pyroclastic rocks
- E — Eocene marine

Paleocene

- Epc — Paleocene nonmarine
- Ep — Paleocene marine

Undivided

- QTc — Cenozoic nonmarine
- QTv — Cenozoic volcanic: QTv[r]—rhyolite; QTv[a]—andesite; QTv[b] —basalt; QTv[p] —pyroclastic rocks
- Tc — Tertiary nonmarine
- Ti — Tertiary intrusive (hypabyssal) rocks: Ti[r]—rhyolite; Ti[a] —andesite; Ti[b] —basalt
- Tl — Tertiary lake deposits
- Tv — Tertiary volcanic: Tv[r] —rhyolite; Tv[a] —andesite; Tv[b] —basalt; Tv[p] —pyroclastic rocks
- Tm — Tertiary marine

MESOZOIC

CRETACEOUS

- K — Undivided Cretaceous marine
- Ku — Upper Cretaceous marine
- Kl — Lower Cretaceous marine
- KJf — Franciscan formation
- KJfv — Franciscan volcanic and metavolcanic rocks
- gr — Mesozoic granitic rocks

JURASSIC

- Jk — Knoxville formation
- bi — Mesozoic basic intrusive rocks
- Ju — Upper Jurassic marine
- ub — Mesozoic ultrabasic intrusive rocks
- Jml — Middle and/or Lower Jurassic marine
- JRv — Jura-Trias metavolcanic rocks

TRIASSIC

- R — Triassic marine

UNDIVIDED

- m, ls — Pre-Cretaceous metamorphic rocks (ls = limestone or dolomite)
- mv — Pre-Cretaceous metavolcanic rocks
- ms — Pre-Cretaceous metasedimentary rocks
- gr-m — Pre-Cenozoic granitic and metamorphic rocks
- P, ls — Paleozoic marine (ls = limestone or dolomite
- Pv — Paleozoic metavolcanic rocks

PALEOZOIC

PERMIAN

- P — Permian marine
- Pmv — Permian metavolcanic rocks

CARBONIFEROUS

- C — Undivided Carboniferous marine
- Cv — Carboniferous metavolcanic rocks
- CP — Pennsylvanian marine
- CM — Mississippian marine

DEVONIAN

- D — Devonian marine
- Dv — Devonian metavolcanic rocks
- Dv? — Devonian and pre-Devonian and Devonian metavolcanic rocks

SILURIAN

- S — Silurian marine
- pSs — Pre-Silurian metasedimentary rocks
- pS — Pre-Silurian metamorphic rocks
- pSv — Pre-Silurian metavolcanic rocks

ORDOVICIAN

- O — Ordovician marine

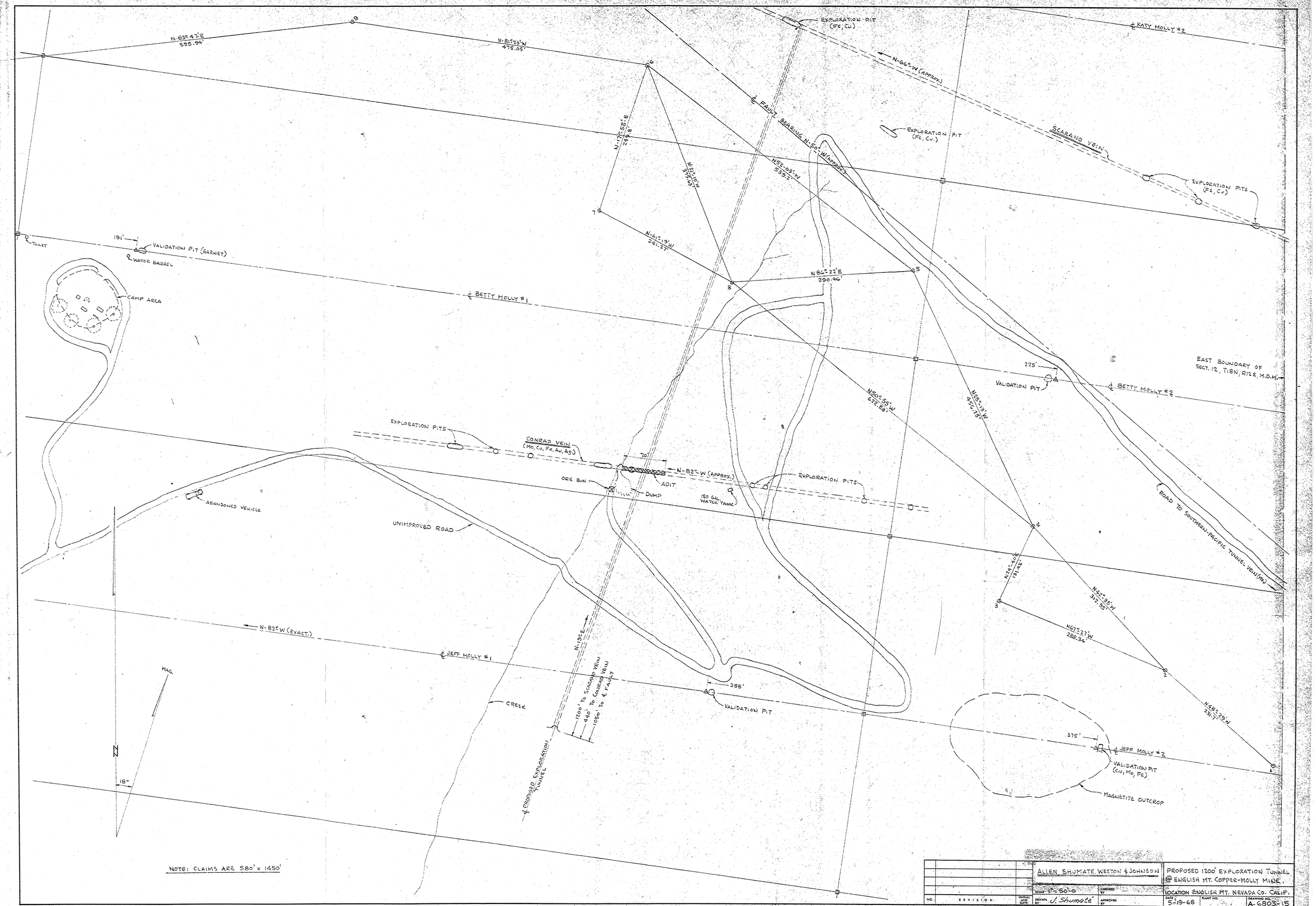
CAMBRIAN

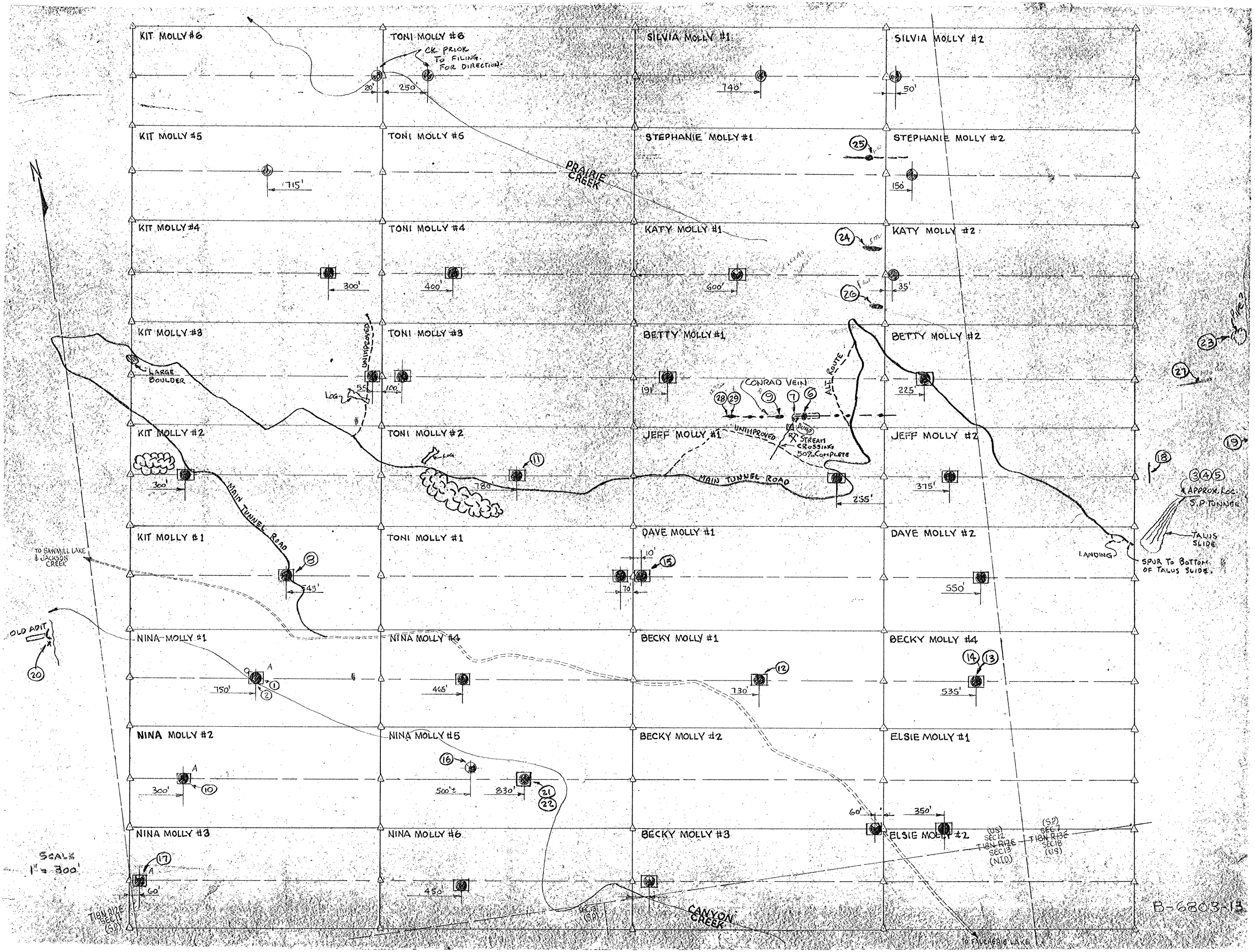
- Є — Cambrian marine
- Є? — Cambrian – Precambrian marine

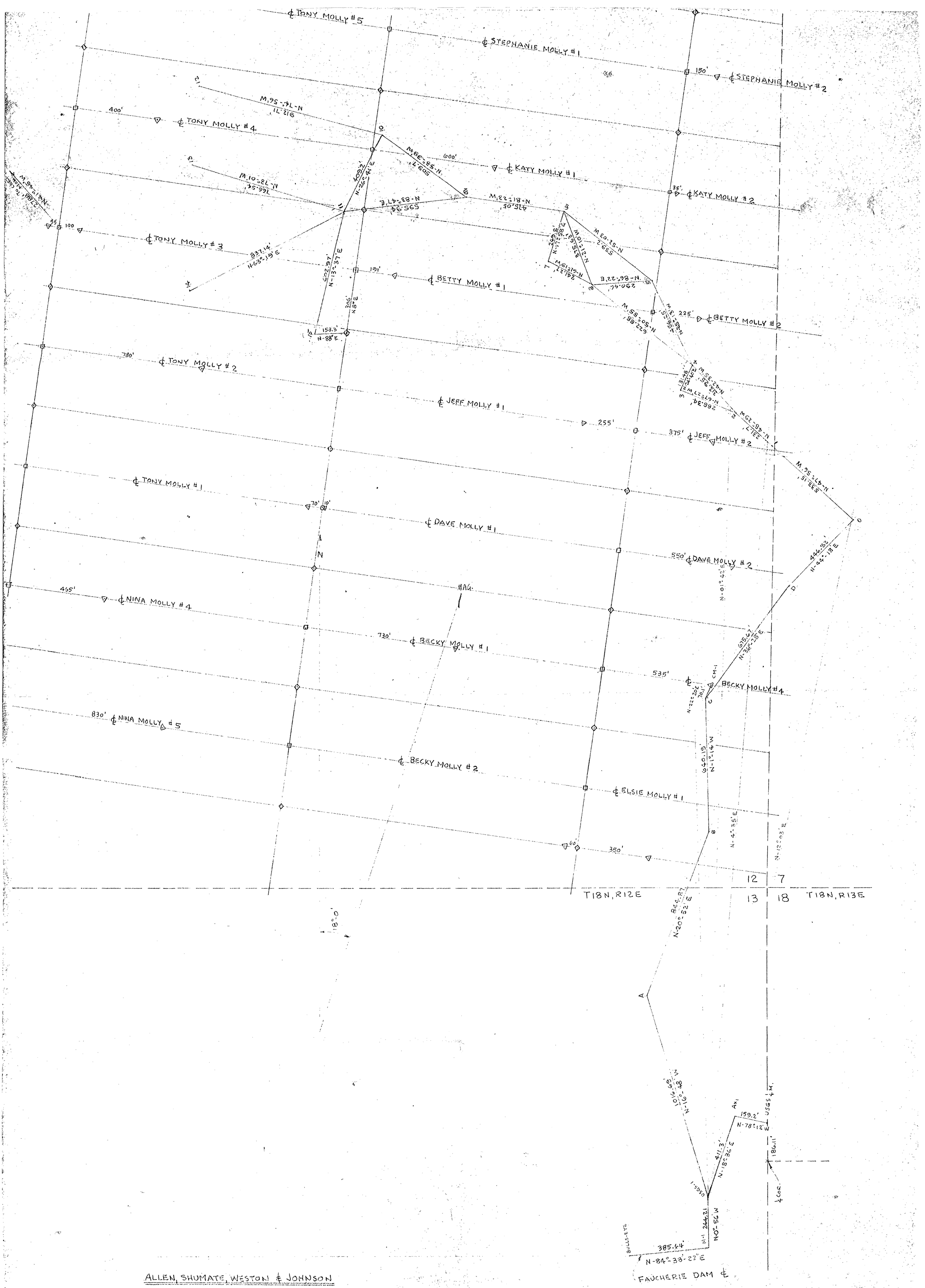
PRECAMBRIAN

- pЄ — Undivided Precambrian metamorphic rocks (pЄg = gneiss, pЄs = schist)
- pЄgr — Undivided Precambrian granitic rocks
- lpЄ — Later Precambrian sedimentary and metamorphic rocks
- epЄ — Earlier Precambrian metamorphic rocks

HEAVY BORDER ON BOXES INDICATES UNITS THAT APPEAR ON THIS SHEET


N-63° 47' E
595.94'
N-81° 23' W
475.05'
N-77° 58' E
249.8'
N-71° 16' W
375.67'
N-61° 19' W
241.27'
N 84° 22' E
290.46'
N 52° 03' W
593.2'
N 50° 55' W
622.68'
N 25° 13' W
452.25'
N 42° 35' W
312.95'
N 67° 27' W
288.34'
N 28° 29' W
231.7'
N 24° 40' E
191.48'
EXPLORATION PIT (FE, CU)
EXPLORATION PIT (FE, CU.)
EXPLORATION PITS (FE, CU)
℄ KATY MOLLY #2
N-66° W (APPROX)
℄ FAULT BEARING N-50° W (APPROX)
SCARANO VEIN
TOILET
191'
VALIDATION PIT (GARNET)
℄ WATER BARREL
CAMP AREA
℄ BETTY MOLLY #1
225'
VALIDATION PIT
℄ BETTY MOLLY #2
EAST BOUNDARY OF SECT. 12, T18N, R12E, M.D.M.
EXPLORATION PITS
CONRAD VEIN (Mo, Cu, Fe, Au, Ag)
70'
N-82° W (APPROX.)
ORE BIN
ADIT
DUMP
150 GAL. WATER TANK
EXPLORATION PITS
ABANDONED VEHICLE
UNIMPROVED ROAD
ROAD TO SOUTHERN-PACIFIC TUNNEL VEIN (Mo)
N-82° W (EXACT.)
℄ JEFF MOLLY #1
MAG.
N
18°
N-19° E
1200' TO SCARANO VEIN
440' TO CONRAD VEIN
1050' TO ℄ FAULT
℄ PROPOSED EXPLORATION TUNNEL
CREEK
255'
VALIDATION PIT
375'
℄ JEFF MOLLY #2
VALIDATION PIT (CU, Mo, FE)
MAGNETITE OUTCROP
NOTE: CLAIMS ARE 580' x 1450'
ALLEN SHUMATE WESTON & JOHNSON
PROPOSED 1200' EXPLORATION TUNNEL @ ENGLISH MT. COPPER-MOLLY MINE.
SCALE 1" = 50'-0
CHECKED BY
LOCATION ENGLISH MT. NEVADA CO. CALIF.
NO.
REVISION
INITIAL AND DATE
DRAWN BY J. Shumate
APPROVED BY
DATE 5-19-68
PLANT NO.
DRAWING NO. A-6803-15


KIT MOLLY #6
TONI MOLLY #6
CK PRIOR TO FILING FOR DIRECTION
SILVIA MOLLY #1
SILVIA MOLLY #2
20'
250'
740'
50'
KIT MOLLY #5
TONI MOLLY #5
STEPHANIE MOLLY #1
STEPHANIE MOLLY #2
PRAIRIE CREEK
715'
150
KIT MOLLY #4
TONI MOLLY #4
KATY MOLLY #1
KATY MOLLY #2
300'
400'
600'
35'
KIT MOLLY #3
TONI MOLLY #3
BETTY MOLLY #1
BETTY MOLLY #2
LARGE BOULDER
UNIMPROVED
LOG
55
100
191'
CONRAD VEIN
ALT. ROUTE
225'
KIT MOLLY #2
TONI MOLLY #2
JEFF MOLLY #1
JEFF MOLLY #2
UNIMPROVED
STREAM CROSSING 50% COMPLETE
MAIN TUNNEL ROAD
300'
780
255'
375'
MAIN TUNNEL ROAD
APPROX. LOC. S.P. TUNNEL
TALUS SLIDE
LANDING
SPUR TO BOTTOM OF TALUS SLIDE.
KIT MOLLY #1
TONI MOLLY #1
DAVE MOLLY #1
DAVE MOLLY #2
TO SAWMILL LAKE & JACKSON CREEK
545'
10'
70'
550'
OLD ADIT
NINA MOLLY #1
NINA MOLLY #4
BECKY MOLLY #1
BECKY MOLLY #4
750'
465'
730'
535'
NINA MOLLY #2
NINA MOLLY #5
BECKY MOLLY #2
ELSIE MOLLY #1
300'
500'±
830'
60'
350'
NINA MOLLY #3
NINA MOLLY #6
BECKY MOLLY #3
ELSIE MOLLY #2
(US) SEC 12 T18N R12E
SEC 13 (NID)
(SP) SEC 7 T18N R13E
SEC 18 (US)
SCALE 1" = 300'
60'
450'
T18N R12E SEC 17 (SP)
SEC 18 (SP)
CANYON CREEK
TO FALCHERIE LAKE
B-6803-13



ALLEN, SHUMATE, WESTON & JOHNSON

SURVEY OF

COPPER, MOLYBDENUM MINE

@ ENGLISH MT. NEVADA CO. CALIF.

T18N, R12E - SECTION #12 M.D.M.

SCALE: 1" = 200'

SURVEY BY: C. J. ARTERO DRAWN BY: J. SHUMATE

DWG. B-6803-14