MME Form 52
Jan. 1959

UNITED STATES
DEPARTMENT OF THE INTERIOR
OFFICE OF MINERALS EXPLORATION

FOR GOVERNMENT USE ONLY
Operator
Docket No. OME –
Contract No. 14-23-090 –
Contract Date

LIEN AND SUBORDINATION AGREEMENTS[1]

To the United States of America:

That certain land in the County of Yavapai, State of Arizona,

described as follows:[2] See Annex

hereinafter called the "land", is the subject of a proposed exploration contract, hereinafter called the "Contract", between the United States of America, hereinafter called the "Government" and

Dorman S. O'Leary[3]

hereinafter called the "Operator". In consideration for and as an inducement to the Government executing the Contract, the undersigned:

1. (a) Being the owner of an interest in the land, hereby grants to the Government a lien upon all of his right, title, and interest in the land and upon any production of minerals therefrom to secure the payment to the Government of the royalty on production provided for by the Contract, and agrees if the Operator's interest should be surrendered or terminated at any time prior to the expiration of the rights of the United States under said Contract to pay royalty to the Government according to the terms of said Contract; or

(b) Being the holder of a claim, lien, or encumbrance against the land, hereby subordinates his claim, lien, or encumbrance in or against the land and in any production therefrom to the rights of the Government under the Contract with respect to royalty on production and liens to secure same.[4]

2. Undertakes and agrees that property in which the Government may acquire an interest or equity under the Contract may be dismantled, severed from the land, and removed as may be provided in the Contract; and the Government's interest and equity in such property shall be prior and superior to any adverse right or claim of the undersigned.

3. Represents and undertakes that there is no claim, lien, or encumbrance upon the undersigned's right, title, claim, or interest in or against the land other than the following: (If "none" insert the word "none". Do not leave blank.)

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3/ Insert name exactly as it appears in the Application MME Form 40.

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5. Consents to all amendments (including an agreement of termination) and assignments of the Contract without notice thereof, and undertakes and agrees that this agreement shall extend and apply thereto.

6. Added provisions ____ none ____ (State "None" or "See Annex No.____".)

Dated this ____ day of ____, 19____.

x Jack M Dalton	(Seal)	2589 Garden Hwy Sacramento Calif.	(Street) (City & State)
x Thos. S. Dalton Jr.	(Seal)	3224 Harris St Ave. Oakland, Calif.	(Street) (City & State)
	(Seal)		(Street) (City & State)
	(Seal)		(Street) (City & State)
	(Seal)		(Street) (City & State)
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I, ____ (Name), certify that I am the ____ (Title—Secretary, etc.) of the corporation named herein; that ____ (Name), who signed this agreement was then ____ (Title—Pres., Vice-Pres., etc.) of said corporation; that said agreement was duly signed for and in behalf of said corporation by authority of its governing body, and was within the scope of its corporate powers.

____ (Corporate Seal)

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_____
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The Melinda Jane and Wild Bird Lode mining claims, Designated by the Surveyor General as Lot No. 1246, patent for which is recorded in Book 43 of Deeds, at Pages 12 to 17, in the office of the County Recorder of Yavapai County, Arizona;

The Mammoth Lode mining claim, Designated by the Surveyor General as Lot No. 1200, patent for which is recorded in Book 41 of Deeds, Pages 275 to 279, in the office of the County Recorder of Yavapai County, Arizona;

MME Form 7
(2/63)

OFFICIAL FILE COPY

Date	Surname	Code
5/3/68		120
		120
5/3	Johnson	110
		220
		120M

May 3, 1968

Memorandum

To: The File

From: Edward C. Peterson

Subject: OME-6679 (Copper, Gold and Silver)
Dorman S. O'Leary
Copperopolis Property
Yavapai County, Arizona

Justification for Denial of Application

The Applicant proposes to explore for copper and silver-bearing ore bodies that may occur in and along the Copperopolis shear zone which traverses the subject property by drilling two 1,000-foot diamond drill holes at a total estimated cost of $27,800.

The field examiner suggests that an expanded drilling program be considered, however, the Field Officer recommends that the application be denied. This view is based on the fact the insufficient geologic information is known about the nature and grade of the mineralized material in the target zone to properly evaluate its potential and determine whether exploration is warranted. The lack of geologic information suggests that the property is still in the prospecting stage and is not eligible for OME assistance.

Because of the possibility that favorable exploration targets may exist on the property, I concur with the Field Officer's recommendation to deny the application for assistance without prejudice to the property. If the Applicant should perform additional work on the property and obtain favorable data regarding the character and possible grade of the mineralized material in the exploration target (sulfide-zone), the OME could consider a new application at that time.

Edward C. Peterson

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

ECPeterson/bsl 5/3/68

MME Form 9
Rev. Nov. 65

UNITED STATES
DEPARTMENT OF THE INTERIOR
Geological Survey

OFFICIAL DOCKET FILE

Contract No. _____ Docket No. 6679

Application
- [ ] 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
- [x] Owner's Consent to Lien and Subordination Agreement
- [x] Application and Attachments

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) 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

IN REPLY REFER TO:

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
FEDERAL CENTER, DENVER, COLORADO 80225
Office of Minerals Exploration
Building 53 Room 203

December 29, 1967

OFFICIAL COPY
O. M. E.
RECEIVED
JAN 2 1968
INITIALS | CODE

Memorandum

To: Chief, Office of Minerals Exploration

From: Field Officer, Region III

Subject: Mr. Dorman S. O'Leary (Copper, gold, silver)
Copperopolis Property
Yavapai County, Arizona

Transmitted herewith is the following material pertinent to an application for financial assistance in minerals exploration on the above-stated subject:

1 each booklet containing the application

1 each booklet containing the agreement for sale of patented mining claims and 5 copies of MME Form 52 (Lien and Subordination Agreement)

1 envelope containing assay reports

1 envelope containing one set of maps (1 large claim map, 1 cross section proposed drilling, 1 map Mammoth workings and 2 maps Melinda Jane workings.

One set of the afore-mentioned has been retained for the Region III, Field Office files.

J. William Hasler
mc.

J. William Hasler,
Field Officer, Region III
Office of Minerals Exploration

MME Form 40
Jan. 65

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

Budget Bureau No. 42-R1006
Approval expires Dec. 31, 1968

OME Region III RECEIVED DEC 11 1967 Denver, Colorado

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.)*

Dorman S. O'Leary
P. O. Box 1041
Wickenburg, Arizona 85358

APPLICANT DO NOT USE THIS BLOCK

DOCKET NUMBER: 6679

DATE RECEIVED: 1-2-68

REGION: III

DIVISION CODE:

BUSINESS ORGANIZATION *(Check one)*

- INDIVIDUAL [X]
- CORPORATION [ ]
- PARTNERSHIP [ ]
- OTHER *(Specify)* [ ]

STATE IN WHICH FIRM IS ORGANIZED:

LIST CORPORATE OFFICERS OR PARTNERS HERE, IF APPLICABLE

NAME	ADDRESS	TITLE
Not Applicable		

MINERAL(S) FOR WHICH YOU WISH TO EXPLORE: Copper, gold, Silver

ESTIMATED COST OF PROJECT: $ $27,800

PROPERTY NAME	LOCATION COUNTY	STATE
Copperopolis	Yavapai	Arizona

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 25, D. C., or with the nearest OME Field Office.~~ 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.

December 6, 1967
DATED

Dorman S. O'Leary
BY *(Signature)*

Owner - Individual
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).]

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

P.O. BOX 1041

DORMAN S. O'LEARY
REGISTERED MINING ENGINEER
WICKENBURG, ARIZONA

MU 4-2287

1. Financial Eligibility

(a) I enclose copies of my written requests for a loan of $25,000 for this project, submitted to my bank of account, Valley National Bank of Wickenburg, and one other source of credit, the First National Bank in Phoenix, together with their respective replies, rejecting the requests.

(b) There are no affiliated, parent, or controlling companies associated with me or the project.

(c) My share of the exploration costs will be furnished in the form of supervision, engineering and geological services, and my own personal funds.

P.O. BOX 1041

DORMAN S. O'LEARY
REGISTERED MINING ENGINEER
WICKENBURG, ARIZONA

MU 4-2287

December 15, 1967

Mr. R. D. Hight
Valley National Bank
Wickenburg, Arizona

Dear Mr. Hight:

Please consider this letter an application for a loan of $25,000, proceeds of which are to be used on an exploration diamond drilling program for a mining property of promise which I control.

I would like a term of three years to repay the loan, and expect that funds for repayment will come from sale or operation of the property.

I would appreciate your consideration of this application as soon as possible.

Very truly,

Dorman S. O'Leary

VALLEY NATIONAL BANK

WICKENBURG OFFICE 108 NORTH FRONTIER STREET WICKENBURG, ARIZONA

December 15, 1967

Dorman S. O'Leary
P.O.Box 1041
Wickenburg, Arizona 85358

Dear Mr. O'Leary:

Thanks for your application today requesting a loan of $25,000.00 for the purpose of mine exploration to be repaid over a three year period from production ore sale or sale of the mining property. We are unable to service your application at this time as bank policy does not permit us to extend credit on the speculative basis such as you have indicated unless the payment can be secured from another source of income from the borrower. Of course, you cannot meet this requirement. We also would not be interested in taking mining equipment as security for this type of loan.

I am sorry that we are unable to service your request at this time.

Very truly yours,

R. D. Hight
Manager

RDH:sw

PROTECT YOUR FAMILY — APPOINT THE VALLEY BANK AS YOUR EXECUTOR AND TRUSTEE

P.O. BOX 1041

DORMAN S. O'LEARY
REGISTERED MINING ENGINEER
WICKENBURG, ARIZONA

MU 4-2287

December 15, 1967

1st National Bank of Arizona
411 North Central Avenue
Phoenix, Arizona 85002

Attn: Loan Department

Gentlemen:

I am requesting a $25,000 loan for an exploration program on a promising mining property which I control. The contemplated program consists of diamond drilling, and the proceeds of this loan would be used entirely for this purpose.

I would like three years to repay the loan, and anticipate that funds for repayment would come from successful operation or sale of the property.

Your cooperation will be greatly appreciated.

Very truly,

Dorman S. O'Leary

Dorman S. O'Leary

FIRST NATIONAL BANK OF ARIZONA

WILLIAM A. BRINDLEY, JR.
VICE PRESIDENT

December 18, 1967

Dear Mr. O'Leary:

I have received your written application for a new loan of $25,000 for the purpose of financing an exploration program on mining property which you control. We note that you propose to repay this indebtedness over a three year term and anticipate that the source of funds to effect liquidation of our loan will arise through either successful operations or eventual sale of the property.

This application has now been reviewed in detail and I regret to write that we will be unable to provide you with any financial assistance at this time. The speculative nature of the transaction, inadequacy of collateral to support the borrowing and your present limited financial responsibility is the basis for our decision in this matter.

Thank you again for affording us this opportunity of discussing your financial requirements.

Very truly yours,

William A. Brindley

Mr. Dorman S. O'Leary
P. O. Box 1041
Wickenburg, Arizona

WAB:cp
271-6779

P.O. BOX 1041

DORMAN S. O'LEARY
REGISTERED MINING ENGINEER
WICKENBURG, ARIZONA

MU 4-2287

2. Applicants Rights in the Land

(a) Property consists of three patented mining claims, leased to me, and ten unpatented lode mining claims, located by me. The owners of the three patented claims are:

Jack M. Dalton
2589 Garden Highway
Sacramento, California

Thos. S. Dalton, Jr.
3224 Herriott Avenue
Oakland, California

A copy of the agreement is enclosed. There are no other encumbrances on the land.

(b) Property is located in Sections 33 and 34, T9N, R2W, Yavapai County, Arizona. Legal descriptions are as follows:

Patented Claims:	Mammoth	M. S. 1200
	Melinda Jane	M. S. 1246
	Wild Bird	M. S. 1246
		BOOK/PAGE
Unpatented Claims:	Antietam	198/370
	Bull Run	198/372
	Chancellorsville	198/373
	Gettysburg	198/374
	Antietam No. 3	375/359
	Antietam No. 4	375/360
	Antietam No. 5	375/361
	Mobile No. 1	434/233
	Mobile No. 2	434/234
	Mobile No. 3	434/235

as recorded in Official Records of Yavapai County Recorder, Prescott, Arizona.

The property is generally known as the "Copperopolis" from the name of the old town on the claims.

(c) Five executed copies of Lien and Subordination Agreement, MME form 52, are enclosed.

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DORMAN S. O'LEARY
REGISTERED MINING ENGINEER
WICKENBURG, ARIZONA

MU 4-2287

3. Physical Description

(a) Workings on the Mammoth patented claim consist of 180 feet of drift, about 100 feet of cross cutting, and 200 feet of shaft, the latter now caved and inaccessible. A small amount of stoping was done above the drift. (See sketch of Mammoth workings). This work was all done prior to 1900. In 1947, Magma Copper Co. drilled one 652' diamond drill hole about 350 feet south of the Mammoth workings, with a northerly course. Complete information on this drilling is not available, but I have constructed what information is available in the form of a log, and a copy is enclosed. The hole was apparently of small diameter, core recovery was poor in the fractured ground, and only sludge samples were assayed.

Workings on the Melinda Jane patented claim consist of 670 feet of drift, about 170 feet of raise, 180 feet of winze, and one 357½' diamond drill hole, all done from 1956 to 1958. Assay maps of this underground work and a log of the diamond drill hole are enclosed. Overall recovery in this hole was 67%, but was practically nil in the very soft, oxidized vein which was the target.

(b) My interest in this work was a 17½% working interest in the work done between 1956 and 1958 on the Melinda Jane claim.

(c) Past production is not known. About 2500 tons of material must have been removed from the workings on the Mammoth claim, and part of this was ore. According to the Report of the Governor of Arizona for 1899, the ore from this property averaged $8.00 per ton in gold. No production from the Melinda Jane workings was shipped.

(d) Ore reserves cannot be calculated with available information.

(e) Geologic features of the property are shown in the large map, and described in the enclosed excerpts from USGS Bulletin 782 "Ore Deposits of the Jerome

P.O. BOX 1041

DORMAN S. O'LEARY
REGISTERED MINING ENGINEER
WICKENBURG, ARIZONA

MU 4-2287

(e) (continued)

and Bradshaw Mountains Quadrangle, Arizona", by Waldemar Lindgren, 1926.

(f) Ore of commercial grade can be found in the existing workings, as shown on the enclosed maps, and the appearance of the shear zone, with heavy hematite staining and much alteration and fracturing, combined with the mineralization found in the diamond drill holes, indicates the possibility of a fairly large body of copper gold ore below the deeply oxidized capping. Copper and gold values in the Melinda Jane winze show in increase with depth which may or may not be significant. Mineralization on the north, or footwall side of the shear zone, consist of copper and gold, as shown in the Mammoth workings. The vein in the Melinda Jane workings, which is on the south, or hanging wall of the shear, contains lead, zinc, silver, copper and a little gold, along with appreciable tungsten, and some vanadium and bismuth in places.

(g) With the exception of the assay reports, all enclosed maps and reports may be retained.

ITEM 3(a)

SCALE 1" = 40

DIRECTION North
INCLINATION 45°
STARTED 1947
COMPLETED 1947
DEPTH 652
NOTES BY Magma Copper Co.

HOLE NO. 1 - MAGMA
PROPERTY Copperopolis
LOCATION 350 feet S. of Mammoth shaft
COLLAR COORD. N. " E. "
COLLAR ELEV. 3000 app.
SHEET 1 OF 2

ROCK AND ALTERATION	LOG	GEOLOGY	% REC.	CORE ASSAYS SECTION	CORE ASSAYS CU.	SLUDGE ASSAYS SECTION	SLUDGE ASSAYS CU.
BRECCIA W/HEMATITE						0-36	.06
36							
SCHIST W/HEMATITE 44						36-41	.18
						41-44	.19
BRECCIA						44-53	.21
60						53-60	.14
GRANITE, ALTERED, LEACHED, IRON STAINED						60-67	.34
						67-75	.16
						75-77	.14
						77-83	.19
						83-97	.08
97							
100 SLTLY STNG PPY 103						97-103	.13
PEGMATITE, IRON STAINED 115							
GRANITE AND PEGMATITE, IRON STAINED			ABOUT 40 %			103/179	.07
GRANITE AND PEG-MATITE - LITTLE IRON STN 180							
PEGMATITE W/MUCH IRON STAINING						179/229	.04
240							
GRANITE, ALTERED LEACHED, MUCH IRON STN 250							
GRANITE AND PEGMATITE SOFT, IRON STAINED [VANADINITE CRYSTAL AT 299']						229/304	.05
300							
PEGMATITE, ALTERED AND LEACHED (BOTTOM OF GOSSAN ?) 325						304/640	.03
SCHIST W/HEMATITE BANDS 350							

HAWLEY & HAWLEY ASSAYERS AND CHEMISTS, INC.
TUCSON, ARIZONA

D. S. O'LEARY
P.O. 1041
WICKENBURG, ARIZ

SCALE

DIRECTION
INCLINATION
STARTED
COMPLETED
DEPTH
NOTES BY

HOLE NO. 1 MAGMA
PROPERTY
LOCATION
COLLAR COORD. N. E.
COLLAR ELEV.
SHEET 2 OF 2

ROCK AND ALTERATION	LOG	GEOLOGY	% REC.	CORE ASSAYS SECTION	CORE ASSAYS CU.				SLUDGE ASSAYS SECTION	SLUDGE ASSAYS CU.			
SCHIST W/HEMATITE BANDS									304/640	.03			
372													
PEGMATITE, NO IRON													
558													
FRESH PEGMATITE 566													
PEGMATITE SOME LEACHING, IRON STAIN													
595													
FRESH GRANITE 597													
PEGMATITE W/ HEMATITE IN SEAMS													
641													640
SCHIST, - DENSE, FINE GR. DARK, W/HEMATITE IN SEAMS 652									640/652	.06			652
T.D													

HAWLEY & HAWLEY ASSAYERS AND CHEMISTS, INC.
TUCSON, ARIZONA

D.S. O'LEARY
P.O. 1041
WICKENBURG, ARIZ

1 FEM 3 (a)

SCALE 1" 1s 40'

DIRECTION North
INCLINATION 45°
STARTED 9/5/57
COMPLETED 10/8/57
DEPTH 357
NOTES BY D. S. O'Leary

HOLE NO. 1-Brooks and O'Leary
PROPERTY Copperopolis
LOCATION
COLLAR COORD. N 10261.8 9271.7
COLLAR ELEV. 3150± (74' below grd lvl at portal)
SHEET 1 OF 1

ROCK AND ALTERATION	LOG	GEOLOGY	% REC.	CORE ASSAYS SECTION	CU.	Au/Ag			SLUDGE ASSAYS SECTION	CU.	Au/Ag	Pb	ZN
GRANITE?			NOT CORED										
210 ALTERED FE STAIN PPY 216			100						216	.08	.005 .2	.4	T
VEIN 222			0						220				
ALTERED FE STAIN PPY 227		SERICITE, QTZ VEINLETS	40						222	0	.01 .3	.15	.75
SERICITE SCHIST W/IRON STAINING QTZ VEINS, SLICKENSIDES			60						227	.05	T/T	.3	T
PEGMATITE 260 264		QTZ VEINLETS-MUSCOVITE	62						268				
SERICITE SCHIST QTZ VEINS, IRON STAINED			35						274		T/T		
279 PPY-FE STAINED 284		QTZ VEINLETS 3" qtz vein at 285	12						279				
SERICITE SCHIST 293				293					284	.08	T/T		
PPY-FE STAINED 300		ALTERED, W/SPECULARITE SLICKENSIDES	42	300	.09	.01			293		.005		
PEGMATITE-FE STAIN 306			24						300	.09	T/T		
PPY-UNALTERED 311			18	311	.05	.005 T			306	.09	T/T		
SCHIST LITTLE FE STAIN 325			53						311	.08	T/.05		
SERICITIC GRANITE OR DIORITE 339		QTZ, FE STAINING (PEGMATITE?)	70	339		Au	Ag						
345		BROWN FE, QTZ MATRIX	100	345	0	0	.039						
SERICITE SCHIST		FE STAIN, QTZ	100	350	0	0	.020						

HAWLEY & HAWLEY ASSAYERS AND CHEMISTS, INC.
TUCSON, ARIZONA

D.S. O'LEARY
P.O. 1041
WICKENBURG, ARIZ

ITEM (e)(g)

the McCabe and Mount Union mines, in the Bigbug district and in the Senator mine, is there some evidence of southward or southwestward pitching shoots. The shoots are generally short, few of them exceeding 200 feet in length.

UNUSUAL TYPES

Among the unusual types of vein formation the Senator-Cash-Storm Cloud veins stand out. Although otherwise conforming to the type here discussed, they contain magnetite, in large part altered to specularite, the plates of which project through the other sulphides. The succession seems to be pyrite (oldest), magnetite, specularite, chalcopyrite, sphalerite, and galena. The specularite is shown in Plate 14, *A*. (See also fig. 7.) It is said that in the Senator mine ore of this type contained much free gold. It is evident that this vein system exhibits two phases of ore deposition. In the older phase pyrite, magnetite, specularite, and chalcopyrite were deposited; in the younger phase pyrite, sphalerite, and galena.

The succession of minerals is well shown in specimens from the Cash mine. The country rock next to the ore, probably a schist, has here been altered to quartz and adularia, the latter in short prismatic crystals. The altered rock also contains calcite, ankerite, chlorite, pyrite, magnetite, and apatite in confused textures. There is some residuary albite and probably also some secondary albite. The structure of the ore is further discussed on pages 121–122.

The copper deposit of the Springfield mine, in the Crown King district, is contained in a mass of granite porphyry allied to the rhyolite porphyry. It contains only a small amount of gold. It is of interest because of its great similarity to the larger deposits at Copper Basin, in the Congress quadrangle. There are small gash veins of quartz and chalcopyrite, and the porphyry has been replaced in the vicinity to a coarse albite aggregate, with some fluorite, exactly as at Copper Basin.

The gold-bearing veins in the Castle Creek district are quartz veins in granite or schist which have suffered deep oxidation. The specularite is distinctly secondary and embedded as platy sheaves and bunches in the chrysocolla (pl. 15, *A*). The primary ore contains much chalcopyrite, but gold is present in fair amounts. There is also, as in the Swallow mine in the adjacent Congress quadrangle, some fluorite and bismuthinite. I am uncertain regarding the origin of these veins. There is no granodiorite and few dikes close by, but the veins suggest by their appearance a comparatively late origin.

D.S. O'LEARY
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WICKENBURG, ARIZ

districts, which lie just outside the quadrangle. The Castle Creek district is difficult to reach; it is best accessible from Wickenburg, the distance being about 18 miles in straight line and in a northwesterly direction. A poor wagon road leads from Wickenburg to the Abe Lincoln mine, and thence trails continue to the Swallow mine and across Castle Creek to Copperopolis. A wagon road is supposed to follow Castle Creek from the Hot Springs up to Briggs.

Castle Creek is a deeply incised stream which after flowing in a southeasterly course for about 25 miles enters Agua Fria River at the extreme south corner of Yavapai County. On Castle Creek a few miles south of the border line of the Bradshaw Mountains quadrangle are the Castle Hot Springs (altitude 1,684 feet), a well-known resort embowered in a grove of date palms and yuccas. The whole region is intensely dissected by a rather mature network of gulches intrenched between abrupt ridges from 1,000 to 1,500 feet high. Travel along the trails is difficult and arduous, and the summer climate is extremely hot. The vegetation is that characteristic of the hot belt and consists mainly of mesquite, cats-claw, sahuaro, and prickly pear.

GEOLOGY

Much of the district is covered by Tertiary volcanic flows, including volcanic agglomerate, andesite, and rhyolite tuff. These materials were poured out on the pre-Cambrian deeply eroded basement and are now dissected by the post-Tertiary erosion. The flows reach up to an altitude of about 3,500 feet, and between Fenton's and Donnelly's to 4,500 feet. North of the flows the southwestern outliers of the Bradshaw Mountains rise abruptly to 4,500 feet, and their brushy ridges connect with the complexes of Silver Mountain, Minnehaha, and Crown King.

The pre-Cambrian consists of a belt of Yavapai schist trending diagonally to the southwest corner of the quadrangle. On both sides of this is normal Bradshaw granite and in places the mixture of schist, diorite, and granite known as the Crooks complex.

The ore deposits are confined to the pre-Cambrian and include a few placers, now exhausted, the best of which were worked in American Gulch north of Briggs's ranch; pre-Cambrian gold quartz veins, represented by the Lehman deposit; gold-copper veins, deeply oxidized, with chrysocolla and specularite and in places carrying gold and silver, exemplified by the Swallow, Whipsaw, Jones, and Copperopolis properties; and lead veins, represented by the long vein that trends westward from Copperopolis.

Regarding the affiliations of the gold-copper veins and the lead veins there is much uncertainty. The only verdict possible is that

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WICKENBURG, ARIZ

they are pre-Tertiary. The copper-bearing veins differ from those seen elsewhere in that the oxidized ore always contains much bright-blue chrysocolla, intergrown with specularite in thin plates.

A supergene origin is ascribed to the specularite because of its very intimate intergrowth with chrysocolla. As shown in Plate 15, *A*, it develops in the copper silicate as minute radiating plates, many of which follow the direction of cracks in the chrysocolla. It is believed that this peculiar variety of oxidized ore owes its origin to the higher temperatures prevalent in this district of low altitude (1,500 to 3,000 feet).

Owing to the situation of the district the production has naturally been small. Some rich ore has been shipped, and some ore has been milled at the Lehman and Whipsaw mills. The total production is probably well below $500,000, gross value.

A little smelting plant was erected many years ago at Briggs to treat Copperopolis ore, but there is no record of production.

Lately 800 acres of nitrate land has been located just north of Briggs on volcanic agglomerate and rhyolite tuff. It is not unlikely that the tuff has yielded traces of nitrate, but the probability that commercial deposits will be developed here is very small.

SWALLOW MINE

The Swallow mine, owned by John Dobler, is at an altitude of 3,225. The place is also known as Buzzard's Roost. It is accessible from the Abe Lincoln mine, 12 miles from Wickenburg, by a road in poor repair leading down Whipsaw Creek and thence north to the head of a small gulch leading down to Castle Creek. The mine is half a mile west of the Bradshaw Mountains quadrangle, in the Congress quadrangle, but it is described here, being in the Castle Creek district. There is a 10-stamp mill on the property.

The country rock is Bradshaw granite with dikes of andesite and granite porphyry. Half a mile southeast of Buzzard's Roost is the south shaft, 225 feet deep. The vein strikes N. 10° W. and dips 70° E. The best ore, which is a copper-stained rusty mass with chrysocolla and brown copper pitch ore, contains 1 to 2 ounces of gold to the ton. The ore averages 3 to 15 feet in width, and much of this has been milled. The ore on the dump carries about 8 per cent of copper and several dollars in gold to the ton.

North of the house and 300 feet above it is a shaft 300 feet deep and presumably on a different vein. Much ore has been stoped to points 150 feet north and 50 feet south of this shaft. The vein strikes N. 33° W. and dips 60° E. Another vein is found 100 feet north of this deposit. Still farther north and above the shaft is a tunnel driven on the same or a parallel vein.

D.S. O'Leary
P.O. 1041
Wickenburg, Ariz

oped by Gus Lehman, who shipped no ore. In 1917 E. C. Champie is said to have shipped four carloads of 20 per cent ore, hauling it to Hot Springs Junction, a distance of 34 miles.

On the trail from Lehman's mill to Copperopolis are several prospects with similar ore. One of them showed 1 foot of chrysocolla ore in a vein along an andesite dike in schist and pegmatite.

COPPEROPOLIS

The locality with the ambitious name Copperopolis is 2 miles northeast of Briggs, at an altitude of 3,200 feet, at the north edge of the Tertiary lava and at the foot of the granite mountain that rises 1,300 feet above the town site. At present there is just one house in the town, and that is deserted. (See pl. 23, *B*.)

The remarkable outcrops at this place long ago attracted attention. At present the five or seven claims are said to be held by R. D. O. Johnson and looked after by Dr. Morrison, of Phoenix.

There are two prominent outcrops at Copperopolis. The upper one is 1,000 feet north of the town and is trenched 100 feet deep by Copperopolis Creek. It is developed by irregular workings and a 200-foot shaft, sunk in 1880 and now caved. The country rock consists of granite and pegmatite, greatly oxidized. The ledge seems to be 100 feet wide with many seams. It strikes N. 60° W. and dips southwest. The ore consists of limonite and bright-blue chrysocolla. Some ore is said to have been shipped to the Briggs smelter and some shipped to outside points. The production was probably small.

Below this outcrop the rock is andesite for 400 feet, to the point where the so-called "great lead vein" crosses. This is a zone perhaps 75 feet wide and whether the country rock is andesite or granite could not be definitely decided. At any rate the ledge matter contains granitic material. An old tunnel opening this lode from creek level is caved, but on the dump is a considerable amount of black oxidized lead ore, probably carbonate and sulphate mixed.

This lead vein crops out also in the low saddle half a mile toward the west, where it strikes about N. 70° W. A little work has been done here, but the openings are caved. The ore shows galena and anglesite with some manganese dioxide in barite gangue. The width is not shown but is probably 8 or 10 feet. The ore is said to assay about 4 ounces of silver to the ton. More work has been done on this vein a mile farther to the west, and it is said to be traceable to Crown Point, in the Congress quadrangle.

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Wickenburg, Ariz.

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WICKENBURG, ARIZONA

MU 4-2287

4. Accessibility of Property

(a) I will be available to meet an OME representative on reasonably short notice, and may be contacted at the address or telephone number noted on this letterhead. The property may be reached most easily by driving to Morristown, about 45 miles northwest of Phoenix on U.S. 67/70; thence driving north east 22 miles on the Castle Hot Springs road to Castle Creek; thence about 6½ miles northwest up Castle Creek, a sand wash with four wheel drive advisable, and thence turning northeast out of Castle Creek two miles to the old town of Copperopolis, which is on the property and is the end of the road. Workings are accessible except for the bottom 50 feet of the winze in the Melinda Jane workings, where the ladders are very bad, and the shaft on the Mammoth claim.

(b) Shipping points would be either Morristown or Kirkland, both on the Santa Fe. Supply points would be Wickenburg and Phoenix.

P.O. BOX 1041

DORMAN S. O'LEARY
REGISTERED MINING ENGINEER
WICKENBURG, ARIZONA

MU 4-2287

5. Exploration Work

(a) Proposed exploration consists of two 1000 feet deep diamond drill holes. Both of these holes will be at an angle of 60° with the horizontal plane, in a northerly direction, with the purpose of intersecting the copper-lead-zinc-silver on the south side of the shear zone, the shear zone itself, shown to be somewhat mineralized in the Magma drill hole, and the copper-gold vein on the north or foot wall of the shear zone. Each hole will consist of an estimated 500 feet of NX wire-line hole, cased with B casing, and 500 feet of BX wire line.

The large core should yield better core recovery in the broken, oxidized material, and the holes should reach sulfides at about 500 feet below the surface. The large map shows the location of the proposed drill holes in relation to the shear zone and property corners, and inferred cross sections of both holes are enclosed.

(b) Short access roads, along with drill sites will be constructed with a bulldozer. These are shown on the large map.

(c) Upon execution of the contract, an estimated 30 days would be required to build the access roads and drill sites and arrange for the diamond drill. Drilling would require about 60 days, or about 1000 feet per month.

P.O. BOX 1041

DORMAN S. O'LEARY
REGISTERED MINING ENGINEER
WICKENBURG, ARIZONA

MU 4-2287

6. Experience

I have been a consulting mining engineer for 13 years, with a B. S. in mining engineering from the University of Kansas, and registered as a professional engineer in Arizona. A great deal of my work has been in central Arizona on projects very similar to the one proposed, and I feel well qualified to supervise and evaluate this project.

P.O. BOX 1041

DORMAN S. O'LEARY
REGISTERED MINING ENGINEER
WICKENBURG, ARIZONA

MU 4-2287

7. Estimate of costs.

(a) Independent contracts

(1) Access roads and drill sites
Bulldozer -- 30 hrs. at 20.00/hr. $ 600.00
(includes moving in and out)

(2) Diamond Drilling
2000 feet at $12.40/ft. 24,800.00
(1000 ft. NXWL, 1000ft. BXWL)
(See enclosed bid from Boyles Bros. Drilling Co.,lowest submitted.)

(b) Personal Services

Supervision, engineering and geological services -- $600/month 1,200.00

(c) Operating materials and supplies
Core boxes -- 211 ea. at $0.95 200.45

(d) Operating equipment -- none --

(e) Initial rehabilitation and repairs -- none --

(f) New Buildings, fixtures, installations -- none --

(g) Miscellaneous

Assaying, including freight charges for shipping cores 1,000.00

TOTAL $27,800.00

ITEM 7 (a)

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

10801 North 21st Avenue
PHOENIX, ARIZONA 85020
Phones: Office 944-1731
Home 948-2009

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

BRANCH OFFICES
ARIZONA (PHOENIX)
CALIFORNIA (AUBURN)
COLORADO (GOLDEN)
NEVADA (SPARKS)
WASHINGTON (SPOKANE)
CHILE (SANTIAGO)
CABLE: BOYLESBROS
MEXICO, D.F.
PERU (LIMA)
CABLE: BOYLESCOP

November 27, 1967

Mr. D. S. O'Leary
P.O. Box 1041
Wickenburg, Arizona 85350

Dear Mr. O'Leary:

For your drilling on the Copperopolis Property for a minimum of 2000 feet approximately 28 miles N.E. of Wickenburg, Arizona, we submit the following prices.

1.

Drilling	BXWL	NXWL	NC or Collar Pipe
0 to 500 ft.	11.40	12.40	13.60
500 to 1000 ft.	12.40	13.60	

2. The above prices includes everything to do the job. There will be no other charges. Core boxes are to be furnished by you.

Sincerely yours,

J. E. Roberts
District Manager

JER/tk

Item 7(a)

E. J. LONGYEAR COMPANY
308 EAST PIMA STREET
PHOENIX, ARIZONA 85004
PHONE 258-6543
GEN. OFFICE - MINNEAPOLIS, MINN.

November 28, 1967

Mr. D. S. O'Leary
Post Office Box 1041
Wickenburg, Arizona 85358

SUBJECT: PROPOSAL COVERING YOUR PLANNED CORE DRILLING PROGRAM, VICINITY CASTLE HOT SPRINGS, ARIZONA

Gentlemen:

1. In response to your recent request and after examining the area to be drilled, we are pleased to forward our proposal as outlined below.

2. It is our understanding that you wish a price covering all operations to be submitted on a footage basis.

The drilling is expected to consist of approximately 2,000 linear feet of NX and BX size core drilling in angle holes varying in inclination from a minus 45 degrees to a minus 60 degrees.

Water is obtainable from a well near the drilling area.

The formation to be drilled is expected to consist of granite and schist, both fractured and solid.

There are no living facilities in the area. It will be necessary to establish a temporary camp with a trailer house or tent.

It is understood that no work will be required for the preparation of drill access roads or for drill sites. In the event such is required, it is understood that the cost of such work would be invoiceable to you.

3. For the work as outlined above, we will furnish one Longyear drilling machine of suitable design and capacity together with all the required accessory equipment.

We would expect to operate the work on a one shift basis per day, operating six days per week.

4. We will carry public liability insurance covering personal injury and property damage and Workmen's Compensation insurance and also all-risk insurance on the drilling equipment protecting against loss by theft, fire, flood, landslides and other similar hazards. Certificates showing the coverage referred to will be furnished upon request.

5. Based upon conditions which we expect to prevail on this work, we are pleased to quote as follows:

a) Per foot price covering all operations involved in carrying out the program, except as noted above, will be invoiced as follows:

Overburden or diamond core drilling - Angle holes minus 45 degrees to minus 60 degrees -

	NQ WL	BQ WL
0 to 500 feet in depth.....	$16.50/ft.	$16.25/ft.
500 to 1,000 feet in depth.....	$17.50/ft.	$17.25/ft.

6. Cores and/or samples will be turned over to your representative at each drill site.

7. If awarded this work and prior to the mobilizing operations, it is understood and agreed that you will make acceptable financial arrangements with the Longyear Company for payment of invoices covering work performed. Such arrangements can be either in prepayment funds or acceptable information on financial ability that would permit billing on an open account basis.

8. Statements will be submitted promptly at the end of each month covering all invoiceable work performed during the month. Payment will become due promptly upon your receipt of statement.

9. We appreciate the opportunity to submit this proposal to you. If awarded the work, we estimate a minimum of two weeks would be required before mobilizing operations could be effected and the work commenced.

Sincerely,

E. J. LONGYEAR COMPANY

J. R. Miller

Manager, Southwestern Zone
Contract Drilling Division

J.R.Miller:jag

ACCEPTED:

Company_____

By_____

Date_____

2 (a)

AGREEMENT FOR SALE OF PATENTED MINING CLAIMS

Date and Place

March 7, 1960

Wickenburg, Arizona

Parties

Deceased
~~THOMAS S. DALTON, Sr.~~, a widower;
THOMAS S. DALTON, Jr., and,
CATHERINE DALTON, husband and wife;
JACK M. DALTON, and,
PHYLLIS DALTON, husband and wife;
500 Perkins Way
Sacramento 18, California

(herein "SELLER")

and

DORMAN S. O'LEARY
Post Office Box 1041
Wickenburg, Arizona

(herein "BUYER")

AGREEMENT

1. SELLER agrees to sell and convey to BUYER and BUYER agrees to purchase, for the sum of $30,000.00, the three (3) patented mining claims located in the Castle Creek Mining District, Yavapai County, Arizona, particularly described as follows:

The Melinda Jane and Wild Bird Lode mining claims, Designated by the Surveyor General as Lot No. 1246, patent for which is recorded in Book 63 of Deeds, at Pages 12 to 17, in the office of the County Recorder of Yavapai County, Arizona;

The Mammoth Lode mining claim, Designated by the Surveyor General as Lot No. 1200, patent for which is recorded in Book 41 of Deeds, Pages 275 to 279, in the office of the County Recorder of Yavapai County, Arizona;

Together with tenements, heriditaments and appurtenances and rights and privileges thereunto belonging or in anywise appertaining;

Together with the personal property situate upon said mining claims. Subject to all General and Special Taxes incurred thereon subsequent to January 1, 1960.

2. Seller warrants that there are presently no encumbrances of any kind or description upon said mining claims or any of them and that he has not sold or assigned said properties, or any part thereof, to any third person, firm, or corporation and agrees to defend and save harmless Buyer in the event of any claims, demands or litigation by third parties concerning an interest in, or the title to, said three mining claims.

Seller shall not encumber said mining claims or any of them or interest therein without consent of Buyer in writing first had and obtained.

3. Buyer shall pay Seller said sum of $30,000.00 (without interest) as follows:

(a) A royalty of five (5%) percent on all net smelter returns, as defined herein, upon and for all minerals, ores, metals or values, of any and every kind and character, mined, extracted or taken from the above described mining claims, or any part thereof, which royalty (s) shall be applied to reduce and be credited to said sum of $30,000.00, which royalty (s) shall continue until said sum of $30,000.00 shall have been paid.

(b) In the event that said royalty (s) received in any one calendar month following the date of this Agreement shall aggregate a sum less than $225.00, Buyer shall pay to Seller such further sum as shall be necessary (when added to the actual royalty (s) received in said month, if any) to equal the sum of $225.00; said payment shall be made on or before the expiration of ten (10) days immediately following the first day of the next succeeding calendar month; For example, if royalty (s) received in the month of March, 1960, should aggregate $100.00 Buyer

shall on or before April 10, 1960, pay Seller the sum of $125.00.

All payments so made shall be applied to reduce and be credited to said sum of $30,000.00 and shall continue until said sum of $30,000.00 shall have been paid.

(c) Buyer shall have the right at any time during the life of this Agreement, and provided that he shall not then be in default hereunder, to pay in cash the balance of said sum of $30,000.00 then due or any part thereof, and said cash payment (s) shall be applied to reduce and be credited to said sum of $30,000.00.

By "net smelter returns", as used herein, is meant the amount paid by any purchaser from the sale of concentrates, ores, metals, or values shipped, taken or produced from said mining claims, less all smelter charges, marketing and shipping costs.

4. Buyer, during the life of this Agreement, shall pay all taxes, assessments and charges of every kind incurred after January 1, 1960, that may be charged or imposed upon said mining claims, or any interest therein, at least ten (10) days before these various charges become

delinquent.

5. Buyer, from and after the date Buyer takes possession and during the life of this Agreement, shall keep said mining claims and any interest(s) therein free of all encumbrances, except such as are incurred, if any, under Paragraph 2 hereof.

6. Buyer shall conduct all operations upon said mining claims in a workmanlike and minerlike manner, and in conformity with the Laws of the State of Arizona applicable thereto and shall from and after the date of this Agreement have exclusive possession, exploration and development rights in and to said mining claims.

7. Seller shall, at request of Buyer, forthwith execute and deliver to Buyer a good and sufficient warranty deed executed by Sellers, conveying good and marketable title to said three (3) mining claims to Buyer, showing as paid any tax imposed upon said deed(s).

It is understood that a condition of the conveyance to Buyer provided for in this Paragraph 7 shall be that Buyer shall pay or have paid or cause to pay or caused to have been paid to Seller lawful money of the United States in an amount equal to the purchase price of $30,000.00 as provided in Paragraph 3 hereof.

8. Full compliance by Buyer with all the terms

of this Agreement shall be a condition precedent to Buyer's right to a conveyance hereunder. Should Buyer fail to comply with any of the terms hereof, then the unpaid balance, including interest thereon, shall become due and payable at the option of Seller, sixty (60) days after said failure to comply. In such event, Seller, at Seller's option, may 60 days after said failure to comply, cancel and forfeit all of Buyer's rights under this Agreement and all Buyer's interest in said mining claims either by:

(a) service upon Buyer of a written declaration of default, forfeiture and cancellation; or

(b) by depositing in the United States mail, postage prepaid, such written declaration addressed to Buyer either at the post office address Buyer shall have caused to be filed with Seller, or if no such address be so filed, then addressed to Buyer at his address first above given.

(c) by recording such written declaration in the office of the Recorder of Yavapai County.

Such written declaration when served, mailed or recorded shall be conclusive proof in favor of subsequent purchasers or encumbrancers in good faith and for a valuable consideration of such default, forfeiture and cancellation. Upon such declaration of default, forfeiture and cancellation by Seller according to any of the methods above provided, all rights, estates and interest hereby created

or then existing in favor of Buyer, or anyone claiming under Buyer, shall cease and become null and void; and the right of possession and all equitable and legal interests and estates in said mining claims, with all sums of money theretofore paid by Buyer, shall revert to, vest in and become the sole property of Seller in fee; and the money paid shall be forfeited to and retained by, and become the sole property of Seller, as rental for said mining claims and as consideration for the execution of this Agreement.

In the event of such default, forfeiture and cancellation by Seller, Buyer shall, at request of Seller, forthwith execute a Quitclaim Deed in favor of Seller divesting Buyer of all interest(s) in or to said mining claims.

Upon such declaration of default, forfeiture and cancellation of this Agreement, Buyer shall nevertheless have the right to enter upon said mining claims and within sixty (60) days thereafter remove all improvements, equipment, machinery or buildings placed thereon by Buyer, but such right of removal shall not extend to timbers, rails, ties, ladders, sets, or other permanent structures installed below the surface except that Buyer may remove any headframes provided such removal does not damage said property.

9. Waiver by Seller of any failure of Buyer to comply with any of the terms hereof shall not be construed

as a waiver of any subsequent failure by Buyer to comply with the same or other terms; no delay or omission of Seller in exercising any right under this Agreement shall be construed as a waiver of such right; no acceptance by Seller of any payments made in a manner or at a time other than as herein provided shall be construed as a variation of the terms of this Agreement.

10. Should either Seller or Buyer be compelled to undertake or to defend an action at law from any cause arising from this Agreement, the losing party shall pay all costs in connection therewith, including reasonable attorney's fees of the prevailing party.

11. No sale, transfer or assignment of any right or interest herein by Buyer shall be valid or binding upon Seller for any purpose without Seller's written consent thereto having been first obtained.

12. Buyer assumes all hazards of damage to or destruction of any improvements now on said land or hereafter to be placed thereon, and of the taking of said premises or any part thereof for public use.

13. This Agreement shall be governed by the laws of the State of Arizona, both as to interpretation and performance.

14. All payments to be made hereunder shall be

made by depositing in the United States mail, postage prepaid, such payments addressed to Seller either at the post office address Seller shall have caused to be filed with Buyer, or if no such address be so filed, then addressed to Jack M. Dalton, 500 Perkins Way, Sacramento 18, California. Each such payment shall be deemed made on the hour and date indicated by the Postmark thereon when so deposited.

18. Buyer shall forthwith record the original "No-Lien Notice" in the Office of the Yavapai County Recorder. Copies thereof shall be posted and maintained by Buyer during the life of this Agreement at the collar of all shafts, tunnels, and entrances to the mine and to all boarding houses and offices upon said property.

19. This Agreement shall apply to and be binding upon the respective successors in interest of Buyer and Seller.

IN WITNESS WHEREOF, we have hereunto set our hands on the day and year first above written.

(signed) Thomas S. Dslton
Thomas S. Dalton, Sr.

(signed) Thomas S. Dalton, Jr.
Thomas S. Dalton, Jr.

Dorman S. O'Leary
Dorman S. O'Leary
"Buyer"

(signed) Catherine Dalton
Catherine Dalton

(signed) Jack M. Dalton
Jack M. Dalton

(signed) Phyllis Dalton
Phyllis Dalton

"Seller"

STATE OF CALIFORNIA

COUNTY OF

On this _____ day of _____, 1960, before me, the undersigned, a Notary Public in and for said County and State, personally appeared THOMAS S. DALTON, SR., a widower, and acknowledged that he executed the above Agreement as one of the Sellers for the purposes therein contained.

WITNESS my hand and official seal.

_____
Notary Public in and for said
County and State.

STATE OF CALIFORNIA

COUNTY OF

On this _____ day of _____, 1960, before me, the undersigned, a Notary Public in and for said County and State, personally appeared THOMAS S. DALTON, JR., and CATHERINE DALTON, husband and wife, and acknowledged that they executed the above Agreement as one of the Sellers for the purposes therein contained.

WITNESS my hand and official seal.

_____
Notary Public in and for said
County and State.

STATE OF CALIFORNIA

COUNTY OF

On this _____ day of _____, 1960, before me, the undersigned, a Notary Public in and for said County and State, personally appeared JACK M. DALTON and PHYLLIS DALTON, husband and wife, and acknowledged that they executed the above Agreement as one of the Sellers for the purposes therein contained.

WITNESS my hand and official seal.

_____
Notary Public in and for said
County and State

STATE OF ARIZONA

COUNTY OF

On this _____ day of _____, 1960, before me, the undersigned, a Notary Public in and for said County and State, personally appeared DORMAN S. O'LEARY, and acknowledged that he executed the above Agreement as the Buyer for the purposes therein contained.

WITNESS my hand and official seal.

_____
Notary Public in and for said
County and State.

1 set of maps

1 large claim map
1 cross section proposed drill
1 map Mammoth workings
2 maps Melinda Jane workings

MME Form 7
(2/63)

OFFICIAL FILE COPY

Date	Surname	Code
5/3/68	[illegible]	120
5/3/68	[illegible]	120
"	Johnson	110
5/7	[illegible]	
5/7	Lemmon	
5/[illegible]	James	
		220
		120M

AIRMAIL

MAY 8 - 1968

Mr. Dorman S. O'Leary
P. O. Box 1041
Wickenburg, Arizona 85358

Re: OME-6679 (Copper, Gold and Silver)
Dorman S. O'Leary
Copperopolis Property
Yavapai County, Arizona

Dear Mr. O'Leary:

Careful study of your application for financial assistance in exploring the subject property and of other information available to us indicates that not enough geologic information is known of the exploration target to support the proposed project and justify Government participation in the work. Accordingly, we must inform you that your application for assistance is denied.

We regret the necessity for this action which, however, is taken without prejudice to the property. Should you perform additional work on the property and obtain favorable data regarding the nature and possible grade of the mineralized material in the target you wish to test, we shall be pleased to consider a new application at that time.

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

The numerous assay reports submitted with the application are being returned to you as requested.

Sincerely yours,

FRANK E. JOHNSON

Frank E. Johnson
Chief, Office of
Minerals Exploration

Enclosures
cc: Director's Reading File
Division File
Economic Geology File
OME File - OME Reading File - Mr. Peterson - R-III - 130

ECPeterson/bsl 5/3/68

IN REPLY REFER TO:

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
FEDERAL CENTER, DENVER, COLORADO 80225

Office of Minerals Exploration
Building 53 Room 203

OFFICIAL COPY
O. M. E.
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April 25, 1968

Memorandum

To: Chief, Office of Minerals Exploration

From: Field Officer, Region III

Subject: OME-6679 (Copper, Gold, Silver)
Dorman S. O'Leary
Copperopolis Property
Yavapai County, Arizona

Transmitted herewith is a Report of Examination on the subject property by Jacques F. Robertson, U. S. Geological Survey.

Mr. Robertson recommends a limited diamond drilling program to explore for copper, gold, and silver in the Copperopolis shear zone, by completing 4 diamond drill holes 1,000 feet in depth to explore the area proposed by the applicant and also along the Melinda Jane claim.

It is the opinion of the Field Officer that there may be chances of finding a significant discovery of copper, gold and silver at depth along the Copperopolis shear zone, however, because so little is known about nature of the ore below the zone of oxidation, it is advisable to request that the applicant drill at least two holes to ascertain the nature and possible grade of the mineralized material, in that ~~zone~~ sulfide. Should this work prove favorable the applicant could then reapply to OME for further consideration.
At this time Hasler considers the proposal as premature.

It is recommended that the application be denied without prejudice and that the applicant be requested to supply additional data obtained by drilling, to support any proposed exploration at depth on the Copperopolis shear zone.

J. William Hasler

J. William Hasler,
Field Officer, Region III
Office of Minerals Exploration

UNITED STATES

DEPARTMENT OF THE INTERIOR

STEWART L. UDALL, SECRETARY

U. S. GEOLOGICAL SURVEY

OFFICE OF MINERALS EXPLORATION

REPORT OF EXAMINATION

REGION III

OME-6679

DORMAN S. O'LEARY (COPPER-GOLD-SILVER)

COPPEROPOLIS PROPERTY

YAVAPAI COUNTY, ARIZONA

By

JACQUES F. ROBERTSON

April 1968

Report of Exam.

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Geology of the Copperopolis deposit---------- 6

Analysis of assay data---------- 9

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Conclusions and recommendations---------- 26

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Summary

On the basis of examination and appraisal of the Copperopolis property, Yavapai County, Arizona, it is recommended that the federal government participate in a limited drilling exploration for copper and silver in the Copperopolis shear zone if the applicant is interested in an enlarged proposal. The shear zone is 50 to 200 feet thick and several miles long, and shows pervasive copper, lead, and zinc mineralization in highly oxidized portions above 220 feet of depth. Primary and possibly enriched sulfide ore minerals are inferred 200 to 450 feet below the surface from the mineral content and assay values obtained from the underground workings on the Melinda Jane claim. Gold values are accessory and submarginal, and do not presently warrant government participation in exploration for that metal.

It is suggested that the drilling program proposed by the applicant for 2 diamond drill holes, each 1,000 feet deep, to explore beneath the Mammoth claim is too modest, and as a minimum should include two additional drill holes, each 1,000 feet deep, to explore also the mineralized shear zone beneath the Melinda Jane claim. Drilling only 2 holes would restrict the chances of finding ore, and severely limit the evaluation of mineralized intercepts. The applicant should be asked to reconsider his proposal in light of this recommendation. Sites for the additional drill holes as well as any future exploration, would require the acquisition of claims adjoining the Copperopolis property on the south, or the written consent of property owners for such drilling. The applicant should be asked to review the drilling costs and resubmit a

detailed breakdown of costs for drilling 4 holes, including casing, cementing, and reaming, as well as the estimates for preparing additional access roads and drill sites, supervision, materials, and assays of drill core. The additional 2 holes would roughly double the estimated costs of $27,800 for the original proposal, assuming the fixed-unit costs presented are valid.

Introduction

Mr. Dorman S. O'Leary, operator of the Copperopolis property, Yavapai County, Arizona applied on December 6, 1967 for Government assistance to explore for copper, gold, and silver. The application was referred to the field, and the property was examined by Jacques F. Robertson, USGS geologist for OME Region III, in company with the applicant on February 21, 1968.

Property description

The Copperopolis property is located in sections 33 and 34, T. 9 N., R. 2 W., in the SW corner of the Bradshaw Mountains 30-minute quadrangle, Yavapai County, Arizona. It lies near the south end of the Bradshaw Mountains at an altitude of 3,700 feet and is on a line midway between Phoenix and Prescott, and 17 airline miles NE of Wickenburg. The property is reached most easily by driving to Morristown 45 miles northwest of Phoenix on U. S. Highway 67/70, thence northeast 22 miles on the unimproved but maintained Castle Hot Springs road to Castle Creek, thence 6-1/2 miles northwest up Castle Creek, a sandwash with 4-wheel drive advisable, and then 2 miles northeast out of Castle Creek to the old townsite of Copperopolis. The trip occupies about 2 hours

to traverse the 30 miles from Morristown. Another route connects the property directly to Wickenburg over 30 miles of tortuous dirt and gravel road. Some work is being done currently to improve the road conditions near the property. Shipping points would be either Morristown or Kirkland, both on the Acheson Topeka and Santa Fe Railroad. Supply points would be Wickenburg and Phoenix.

The Copperopolis property consists of 3 patented claims leased by the applicant and 10 unpatented claims filed solely in the name of the applicant. The 3 patented claims are owned jointly by Jack M. Dalton (and his wife) and Thomas S. Dalton, Jr. (and his wife). Two other claims shown on the map of the property are situated nearby to the north of the patented claims, but are not included in the application. All the claims listed below are recorded in Official Records of the Yavapai County Recorder, Prescott, Arizona and would be subject to Government royalty and liens:

Patented Claims		Book	Page
Mammoth	M.S. 1200	41	275-279
Melinda Jane	M.S. 1246	43	12-17
Wild Bird	M.S. 1246	43	12-17
Unpatented Claims			
Antietam		198	370
Bull Run		198	372
Chancellorsville		198	373
Gettysburg		198	374
Antietam No. 3		375	359
Antietam No. 4		375	360
Antietam No. 5		375	361
Mobile No. 1		434	233
Mobile No. 2		434	234
Mobile No. 3		434	235

Lien and subordination agreements were signed by the owners of the 3 patented claims, copies of which accompany the application. There are no other liens or encumbrances on the above listed claims.

Principal workings are on the Mammoth, Melinda Jane, and Chancellorsville claims but shallow pits and shafts are scattered over the rest of the property. Jeep roads extend across 8 of the claims and to the main workings. The Mammoth claim is developed by 180 feet of drift and 100 feet of crosscut, both accessible but relatively shallow, and by a separate shaft now caved and inacessible but reported to have been 200 feet deep. Minor stoping has been done above the drift. All this work was done prior to 1900.

Workings on the Melinda Jane claim were all done from 1956 to 1958 by the owners and the applicant and consist of 670 feet of drift, 170 feet of raise, and 180 feet of winze. They are accessible except for the bottom 50 feet of the winze where the ladders are in bad condition. The main drift is timbered and has track, but is nearly closed by a large muck pile near the portal. The winze from the drift and the raise to the surface are timbered in part, but have no hoisting apparatus. No permanent buildings or structures are located presently on the property except an old cabin in a state of disrepair. A well located on the property, used to water stock, furnishes adequate water for mining or drilling operations.

History and production

Copperopolis was briefly described by Lindgren in USGS Bulletin 782, Ore deposits of the Jerome and Bradshaw Mountains Quadrangles, Arizona, published in 1926 (See excerpt included with application).

Apparently the deposit was discovered in the early 1880's, and was worked for the oxidized copper and gold. Little was done, however, for 50 years prior to 1947. Wilson D. Michell, a consulting geologist, examined the property in mid-1946 and wrote a fairly comprehensive geologic report (a copy furnished by Mr. O'Leary is included in the docket). On the basis of his recommendations Magma Copper Company in 1947 drilled a 652-foot diamond drill hole from a site 350 feet south of the Mammoth workings, on a northerly course, at an inclination of -45°. Mr. O'Leary reports that the logs were not available to him, but a company representative told him that core recovery was less than 40 percent, and sludge only was recovered in the sheared mineralized ground with uniformly poor assays. Apparently Magma Copper Co. did not pursue any further exploration. In late 1957, during the period of underground exploration of the Melinda Jane claim, the owners in cooperation with Mr. O'Leary put down a diamond drill hole 357 feet deep on a northerly bearing at -45° angle in the gully west of the Melinda Jane workings on the Antietam claim. "Overall recovery in this hole was 67 percent, but was practically nil in the very soft oxidized vein which was the target" says O'Leary and copper, gold, and silver values were extremely poor. Assay data from these holes are included in the application.

Production from the Copperopolis property is not known, but must have been small. According to Lindgren (1926, p. 186) "Some ore is said to have been shipped to the Briggs smelter and some shipped to outside points". Mr. O'Leary suggests in his application that "About 2500 tons

of material must have been removed from the workings on the Mammoth claim, and part of this was ore. According to the Report of the Governor of Arizona for 1899, the ore from this property averaged $8.00 per ton in gold." No production has been realized from the Melinda Jane workings.

General geology

A copy of the unpublished 1946 report by Wilson D. Michell on the Copperopolis property (then known as the Amity Group of claims) accompanies the OME docket. He describes the general geology and structure on the property and in the surrounding area so well that the reader is referred to pages 5 to 9 of that report. I will confine myself to observations about the mineral deposit that contribute additional or more detailed information.

Geology of the Copperopolis deposit

The Copperopolis claims are located on a leached mineralized shear and breccia zone that strikes generally N. 80° W. at right angles to the regional structure and extends for 7,500 feet within the limits of the property. It can be traced westward from the property endline for a considerable distance. Michell states that it has a total observed length of 11,500 feet, but it terminates abruptly a short distance east of the property (and Antietam No. 3 claim) in massive granite. This shear structure is impressively developed on the Mammoth claim where it attains a thickness of 200 feet, tapering unevenly to east and west to about 50 feet thick. The dip is steep to south, ranging from 80° S. on the Mammoth Claim to 60° S. in the Melinda Jane workings. Cursory

examination of surface exposure indicate that the shear zone is slightly sinuous and that segments of it splinter off and horsetail into the country rock. It must represent some fairly large fault along which premineral movement has taken place, but the aggregate amount and direction were not discernible in the area examined. The applicant informed me that he has seen striations on slippage planes that indicated some of the movement was nearly horizontal and left lateral.

The sheared and brecciated granitic rock and minor schist in the uncommonly thick Copperopolis shear zone are thoroughly altered, and pervaded and stained by hydrated iron oxides. The iron oxide minerals are intensely concentrated at the surface along with quartz gangue to form a dark reddish grey to brown, porous, cellular gossan capping, mostimpressively developed on the Mammoth claim. The field term "limonite" would seem to best describe the iron oxide mineral assemblage that forms incrustations, coatings, and cavity fillings throughout the zone, though fine grained hematite crystals are widely recognized. Other minerals observed include sooty manganese dioxide in profuse coatings, the oxidized copper minerals malachite and chrysacolla in abundant streaks, spots, and thin fracture fillings, and the oxidized lead minerals anglesite and cerussite in sparsely scattered spots. The secondary copper sulfide, chalcocite, was seen in a few places, as well as the complex supergene vanadium minerals vanadinite and decloisite. Primary lead sulfide, galena, occurs in small isolated nodules and pods insulated from further oxidation by shells of anglesite and cerussite. Such occurrences were revealed in the drift of the Melinda Jane claim, near the hanging wall

of the shear zone. Though not recognized during the field examination, some oxidized minerals of zinc must be present, as the assays abundantly report zinc. No primary copper sulfide minerals were seen anywhere on the property; they would seem to have been present originally, however, to judge by the secondary minerals present. It appears, in any case, that the shear zone served as the locus of deposition of primary sulfide minerals, which were thoroughly leached, and altered subsequently by groundwater and weathering agencies.

Only the upper part of the oxidized zone is exposed to view at present on the Copperopolis property. Topographic relief along the mineralized shear zone amounts to nearly 200 feet. The Melinda Jane main drift tests the oxidized zone from 5 to 6 feet below the surface at its portal to between 60 and 75 feet below the surface at its face. The winze in the Melinda Jane workings penetrates the oxidized zone to a depth of 160 feet below the drift, for a total depth of at least 220 feet below the collar of the shaft, which is situated on a saddle of a ridge. The bottom of the winze is estimated to be at a level approximately 100 feet below the valley bottom at an altitude of 3,060 feet. The 200-foot deep Mammoth shaft, now caved, would have penetrated possibly 100 feet deeper than the Melinda Jane winze as its collar is closer to the valley bottom than the Melinda Jane shaft, but what was encountered at its bottom is not known. Indications are that the hole drilled by the Magma Copper Company in 1947 (see Drill Hole Cross Sections accompanying the application) encountered hematite bands and stains in seams more than 450 feet below the surface. The oxidized zone as judged from studies of deposits in the region (Lindgren, 1926, p. 49), range from 100 to more

than 400 feet thick depending on the characteristics of the water table in each locality. On the Copperopolis property it appears that the oxidized zone is considerably more than 200 feet deep and may extend to at least 450 feet below the surface.

Analysis of assay data

Assay data presented by the applicant are separated into two general categories, representing samples of mineralized ground from (1) surface outcrops and shallow (near-surface) workings and (2) the Melinda Jane underground workings. Though both types are from the oxidized zone, those from the surface are related more to a gossan capping where gold and the relatively insoluble mineral residues of copper and lead are inclined to be more concentrated in contrast to silver and oxidized zinc which are depleted by leaching, and it is therefore useful to separate them for comparison and evaluation from those taken from widely separated points on the claims and cannot be correlated directly with the assay values found in the Melinda Jane workings.

Assays of samples taken from surface outcrops and shallow workings are shown in Table 1. Seven of the 13 samples were taken from the Mammoth claim, 4 from the Antietam claim west of the Melinda Jane workings, and 1 each from the end claims of Bull Run to west and Antietam No. 3 to east. Gold and copper values on the Mammoth claim, considered by themselves average 0.043 oz./ton Au and 1.78% copper, though gold ranges from 0 to 0.115 oz/ton and copper runs as high as 4.22%. The average of all surface samples at Copperopolis run 0.028

Table 1. Assays of samples from surface outcrops and shallow workings

Claim & Sample No.	Length of channel (ft.)	Au oz./ton	Ag oz./ton	Cu %	Pb %	
Bull Run						
OK 6-1-1	3	Tr	0.4	0.70	1.80	
Antietam						
OK-5-2-1	7	0.005	0.4	0.90	0.60	
OK-5-1-2	6	0.02	0.1	----	Tr.	From same trench
OK-5-1-1	6	0.01	0.2	0.33	Tr.	
OK-5-1-3	8	0.01	0.4	1.05	0.90	
Mammoth						
M-10-1	15.5	0.115		0.83		
M-10-2	9	0.0		0.11	From Mammoth drift	
M-1-2	7	0.03	0.4	200		
M-1-1	4	0.04	0.5	2.20		
M-3-1	4	0.01	Tr	2.50	Outcrop	
M-4-1	7	0.01	0.3	0.60	Shaft outcrop	
M-2-1	6	0.10	0.8	4.22	Outcrop	
Antietam No. 3						
OK-11-1-1	3	0.01	0.6		0.70	
Average		.028	0.4	1.2		

oz/ton gold and just about 1.2% copper. Silver appears to average about 0.4 oz./ton over-all, with no significantly higher or lower values in any of the claims. Lead values are spotty and low in 3 of the claims but no assays for lead are reported from the Mammoth claim. Zinc apparently was not analyzed from surface samples.

Assayed samples from the underground workings of the Melinda Jane claim give some ideas about the tenor of ore that may be expected below the outcrop but still within the oxidized zone. The workings follow closely the hanging wall of the Copperopolis shear zone, which is intensely oxidized and permeated with reddish brown iron oxides. The reader is referred to the map of the Melinda Jane drift and the profile of the winze accompanying the application, whereon are posted the assays to be discussed in this section. For the purposes of this report, the assays from muck samples are disregarded for they generally agree with the channel samples.

For 200 feet along the drift from the portal the following high, low and weighted average assays were obtained from 14 samples:

Interval: 0 - 200 ft.	Ag (oz.)	Pb%	Zn%	Cu%	Channel Length	Length of drift (ft.)
High	1.0	12.30	3.00	0.48		
Low	0.0	0.30	0.30	0.00		
Wt'd average	0.42	1.94	1.62	0.19	4.06	200

No gold assays were run from this interval. The individual assay of 12.30 percent lead is more than 3 times higher than the next highest assay of 3.80 percent lead; if this high value is eliminated from

consideration the weighted average for lead is still 1.15 percent. If that portion of the drift between 112 and 200 feet from the portal only is considered, the values for 6 samples run as follows:

Interval:

112 - 200	Ag (oz.)	Pb%	Zn%	Cu%	Channel Length (ft.)	Length of drift (ft.)
High	1.00	3.80	2.88	0.48		
Low	.40	.65	.97	0.10		
Wt'd Average	.72	2.10	1.80	0.24	3.5	88

Though the spread between low and high values is not as great as when considering the whole interval, the weighted averages are revised only slightly upward.

Two samples, somewhat isolated in a 6-foot interval of the drift 262 to 268 feet from the portal, carried the following average values:

	Ag (oz./ton)	Pb%	Zn%	Cu%	Channel Length (ft.)
Average	5.85	1.2	.35	.18	6

Silver is high relative to lead and zinc, compared to those samples between the portal and 200 feet.

The interval in the drift between 310 and 430 feet in from the portal was channel sampled at least every 10 feet by the applicant. The assays of 13 samples gave the following values:

Interval:

310 - 430	Ag (oz./ton)	Pb%	Zn%	Cu%	Channel Length	Length of drift (ft.)
High	6.60	10.80	8.75	1.55		
Low	0.50	0.50	.75	0.00		
Wt'd Average	2.70	5.1	3.4	0.41	2.9	120

Again no assays were run for gold. All the weighted average values for lead, zinc, and copper in this interval are about double those calculated in the previously discussed intervals. The applicant suggested that this part of the mineralized shear-zone is potentially mineable, if the grade of ore minerals can be sustained above and below the drift level.

Assay values from the 26 channel samples taken in the rest of the drift to the face, 440 to 590 feet from the portal, run as follows:

Interval: 440 - 590	Ag (oz./ton)	Pb%	Zn%	Cu%	Channel Length	Length of drift (ft.)
High	4.6	3.2	5.1	0.25		
Low	0.6	0.4	0.35	0.05		
Wt'd Average	1.38	1.15	2.18	0.14	4.2	150

Although the assays derived from the 55 samples taken in the drift sustain fair to good values in lead and zinc, they carried almost entirely submarginal ore values in copper. An exception is a concentration of copper in a 23-foot interval between 327 and 350 feet from the portal that averages 1.10% copper.

Channel samples were taken at every 5 feet in the 410 winze below the Melinda Jane main drift, and were assayed for gold, silver, lead, zinc and copper. (The assay results are posted on the illustration showing the cross-section of the winze furnished by the applicant.) Inspection of the assays show a marked drop in lead and zinc values and a simultaneous increase in copper values at about 100 feet down and a further marked increase in copper from 150 feet to the bottom at 185 feet. The assays, divided and grouped into these intervals may be summarized thus:

Interval 0 - 95

19 samples:	Au oz./ton	Ag oz./ton	Pb%	Zn%	Cu%	Channel Length (ft.)
High	T02	2.8	13.1	9.1	0.46	
Low	Tr	0.7	1.2	0.7	0.05	
Wt'd Average	Tr	1.33	5.62	5.35	0.25 (16 samples)	3.6

Interval 100 - 145

10 samples:						
High	0.01	0.79	1.02	1.3	1.88	
Low	Tr	0.29	0.40	0.0	0.50	
Wt'd Average	0.006 ±	0.55	0.69	0.45	0.88	3.0

Interval 150 - 185

8 samples:						
High	0.02	0.80	0.50	0.75	2.97	
Low	0.005	0.24	0.21	0.10	0.71	
Wt'd Average	0.015	0.59	0.34	0.51	1.77	2.9

Silver values in the drift are spotty, ranging as high as 6.60 oz./ton, but averaging no more than 2.70 oz./ton in the interval 310 to 430 feet (length of 120 feet). Silver seems to be associated with lead and zinc. The relationship, expressed as the ratio of ounces of silver to precent lead, is very roughly 1 to 1 or less for low values of lead, but drops off markedly as lead values exceed 3 or 4 percent. Gold was not tested for in the drift, suggesting that the applicant is aware that it occurs in little more than trace amounts. This view is supported by the gold assays obtained from the winze.

The 410 winze explores at depth the relatively high lead-zinc-silver zone outlined in the Melinda Jane drift. The assays from samples in the winze indicate the downward continuation of an oreshoot below the drift for 95 feet where it seems to come to an end. The lead-zinc-silver values within that interval, however, are closely comparable to those in the drift. Copper is submarginal and gold occurs only in trace amounts. From 95 feet to the bottom of the winze lead and silver tail off sharply to around 0.5 percent and silver drops to 0.5 oz. per ton. Copper content, however, increases to an average of 0.88 percent in the interval from 100 to 145 feet and doubles its average value to 1.77 percent in the 35-foot interval from 150 feet to the bottom of the winze. Though the gold assays are low, they roughly double in value to correspond with the increase in copper assays. The nature of the copper mineralization that accounts for the increased values toward the bottom of the winze was not learned during the examination of the Melinda Jane workings except that it consists of secondary minerals, according to the applicant.

Review of proposed exploration

Mr. O'Leary has proposed exploration of the Copperopolis shear zone by two 1,000 foot deep diamond drill holes. They would be collared sufficiently south of the shear zone (as shown on the surface map of the property) and so oriented and inclined as to pass entirely through the thick shear zone, at a depth that would penetrate primary and possibly enriched mineral zones below the oxidized zone. Both holes would be inclined at minus 60° from the horizontal, and would bear north or nearly so. Hole Number 1 would be placed to explore beneath the gossan cap on

the Mammoth claim and hole number 2 would explore the shear zone approximately 600 feet to west. Both holes would be collared in granitic rock in the hanging wall of the shear zone; hole number 1 would encounter the shear zone at 275 feet, and hole number 2, at 480 feet. It is contemplated that each hole would consist of approximately 500 feet of NX size wireline drilling, cased with B casing, and 500 feet of BX size wireline hole. The drill sites are well situated with respect to terrain and roads, with a minimum of bulldozer leveling necessary. Except that the collar to proposed Hole No. 1 is located just off the applicant's claim, the proposed drilling sites and drill hole orientations are well designed for obtaining maximum possible information about the mineralized shear zone at depth, within a limited span of its strike length. The site of drill hole No. 1 could be moved slightly to fall within the claim boundaries without materially changing the attitude and direction of the hole.

The applicant has submitted an estimate of costs for the proposed exploration on a fixed unit cost basis, based on a bid submitted by Boyles Bros. Drilling Company. The bid prices "Includes everything to do the job" on the following drill schedule:

(Drilling (ft.))	BXWL	NXWL	NC or Collar Pipe
0 to 500	$11.40	$12.40	$13.60
500 to 1,000	12.40	13.60	

The total cost of diamond drilling 2,000 feet per the above figures would be $24,800.00. The applicant would assume responsibility for preparing access roads and drill sites, estimated 30 hours of contract

bulldozer work at $20.00 per hour for a total of $600.00, including moving the bulldozer into and out of the property. The applicant would also provide engineering and geological supervision for the estimated 2 months of drilling at $600.00 per month, or $1,200.00. He would also provide core boxes at $200.00 and arrange for assaying, estimated at $1,000. The total cost estimated by the applicant is $27,800. Inasmuch as there are no living accomodations at the Copperopolis property and roads are long and difficult, the drilling contractor's crew would have to camp near the drill sites. The E. J. Longyear Company's unit-cost bid per foot of drilling is considerably higher, by $4 to $5, than the Boyles Bros. Drilling Co. bid.

Apart from the merits of an exploration program, the specifications and costs of the proposed drilling should be reviewed. Although the applicant anticipates that casing will be required for 50 percent of the drilling, no separate figures are presented by the drilling contractors for the costs of casing holes, removing casing, and the contigency costs for lost casing. If casing is to be provided under the unit costs estimated by the bidder, it should be so stated in the application. In the same manner, the costs of cementing and reaming drill holes should be detailed, or clearly stated if included in the bidder's unit costs. Such considerations may be the reason for the large disparity in unit costs bid between the 2 drilling contractors. Boyles Bros. Drilling Company has been involved in drilling in the area, several miles east of Copperopolis; their lower bid may reflect more experience with the logistics involved. If the estimated drilling costs should include casing, cementing, reaming, etc., the total costs of the program as

presented in the application seem reasonable. The applicant appears to have the requisite training and experience to supervise the program.

Ore possibilities and speculations

The aspects of primary mineral deposits at depth and of a possible enriched zone on the Copperopolis property can only be surmised from an inspection of the metallic values in the oxidized zone and then drawing some general inferences from the known physico-chemical relationships and by making some comparisons with other deposits in the district.

The character of the oxidized zone suggests, in the first place, that the primary metallic minerals at depth probably include the iron, copper, lead, and zinc sulfides pyrite, chalcopyrite, galena, and sphalerite. The great amount of iron oxide minerals, including goethite and hematite, that permeate the whole oxidized zone and form concentrated gossan caps makes it almost inescapable that pyrite was the main source of the iron. This is reinforced by the sparse occurrences of the lead sulfide, galena in the residual pods or nodules, and by the sample assays of zinc, indicating that the primary ore minerals were sulfides. Chalcopyrite and chalcocite or covellite, it is suggested, has been almost completely dissolved out by the oxidation of pyrite and chalcopyrite that yields soluble copper sulfates, except a small excess of copper precipitated as the carbonate malachite, the silicate chrysocolla, and minor residual chalcocite. The presence of moderate to large amounts of the copper minerals available for solution as sulfate would encourage the rather abundant precipitation of the iron oxide minerals, as is evident in the Copperopolis shear zone. The fair amount of hematite in the

gossan in comparison to goethite and jarosite might imply, as Tunell (1928, p. 74-75) has suggested, that the pyrite to chalcocite ratio in the original sulfide ore is low, possibly indicating a fair to good grade of primary copper ore at depth.

Before considering further the mineral possibilities, it would be well to point out a fallacious notion that the applicant holds. The applicant suggests, under Item 5(a) of the application, on his surface map, and in discussions, that the hanging wall side of the shear zone is characterized by copper-lead-zinc-silver values whereas the footwall side is restricted to copper and gold. This impression is biased due to the greater development of the hanging wall side of the shear zone by the Melinda Jane workings, which gives a larger sample of mineralized ground coupled with an abundance of sample assays, in contrast to the shallow Mammoth workings on the footwall side with its assay samples of accumulated residual copper minerals. Besides, no assay data in lead and zinc are provided from samples taken from the Mammoth workings. Not enough is known about the shear zone at depth to suggest the preferred localization of particular metals on the hanging wall or footwall sides of the shear zone. It is just as possible that copper, lead, and zinc with accompanying gold and silver values are distributed unevenly throughout the shear zone.

No clear cut information seems to be available at the Copperopolis property to determine whether or not an enriched sulfide zone should be encountered at depth. Certainly the region has been subjected to prolonged and intense weathering, as exemplified by the deep oxidized condition of the Copperopolis deposit. The water table is apparently deep though highly variable, and to judge by the climatic history of the Southwest has probably fluctuated greatly in past geologic times. These factors would not seem to provide the long continued stable environment necessary to form a significantly enriched sulfide zone. Lindgren observes (1926, p. 49), from his study of the mines in the region, "* * * with irregular water level and scant supply, it is not surprising that the limit between oxidized and primary ore may be indefinite. Residual sulphides may be found close to the surface, and in places oxidation reaches below the water level and gradually fades out * * * In most places there is no chalcocite zone proper or only a thin layer of enriched material." The increased values in copper at the bottom of the Melinda Jane winze may or may not mark the approach to an enriched sulfide zone. They may be due solely to an oxidized remnant of a copper-rich streak.

Appraisal of the assay data permit limited generalities about the economic mineral potential at the Copperopolis property. Samples assayed for gold record low to submarginal values and do not suggest appreciably higher values at depth. Although some gold may have been leached out under oxidizing conditions, the major proportion probably remained behind as free gold, when the sulfide minerals such as chalcopyrite and pyrite became altered and were dissolved out.

The slightly higher gold values in the gossan capping probably reflect residual accumulation caused by weathering at the surface. Gold, however, is a partner to copper, as it increases slightly with higher values of that metal. There is relatively little chance of developing significantly more gold in the uncertain zone of sulfide enrichment or in the deeper zone of primary sulfide minerals. There is no present justification for government participation in the search for gold on the Copperopolis property, though gold would contribute a small share to the value of any ore reserves discovered.

Silver values in the oxidized zone are generally rather low and do not justify support for exploration or mining of that commodity strictly by itself. Probably a fair amount of silver has been leached out of the oxidized zone, and may have been carried down and redeposited at and below the water table where it contributes to some enrichment. It is possible that silver in the enriched zone, if there is one, would run generally 2 or 3 times more than in the oxidized zone, but still this would be quite modest, ranging from less than 5 to 10 oz. per ton, with higher values in rare scattered concentrations. Silver is a persistent companion to lead, as shown by the assays, and this should continue at depth. A curious phenomenon among the samples assayed is the apparent decline in the ratio of silver to lead above a few percent of lead. This suggests that silver probably occurs only in modest amounts in the primary sulfide zone at depth.

Lead and zinc occur in fair amounts in the Melinda Jane workings, where an ore shoot is indicated having a strike length of at least 120 feet and a dip length of about the same (95 feet in the winze

plus a 25-foot projection upward from the floor of the drift). Its thickness in the shear zone from the hanging wall has not been explored adequately, but my guess is that it reaches at least 10 feet and may exceed 20 feet at drift level. This lens contains a minimum of 17,000 tons of indicated ore averaging at least 5% lead, between 3.5 and 5.5% zinc, and 1.3 to 2.7 oz./ton silver. Some zinc undoubtedly has been leached out of this oxidized ore, so that it is fair to state that primary ores at depth should run higher in zinc. Lead values should be roughly comparable at depth to those encountered in the oxidized zone. The bottoming of lead-zinc-silver ore in the winze illustrates the vagaries of complex sulfide deposits. Similar ore lenses, however, should be found along and across strike of the shear zone as well as at depth, with intervening sub-economic to barren ground to be expected. Although good copper values and good lead-zinc-silver values seem to be mutally exclusive in the oxidized zone, there is no reason to expect that this holds true in the zone of primary sulfide minerals. Unfortunately, exploration for lead and zinc is not eligible for government participation, and the evidence available in the oxidized zone suggest that the Copperopolis property would be dependent to some degree on its lead-zinc deposits.

Copper, though everywhere present in the oxidized zone, is quite erratic in distribution and in value. The fair to good copper assays returned from surface samples in gossan may reflect to a certain extent the surface accumulation of insoluble copper mineral residues, and is not a fair representation of copper values

that may be expected below 20 feet of depth. The great amount of iron oxide in the oxidized zone suggests that much copper has been leached out.

Copper in the oxidized lead-zinc-silver lens of the Melinda Jane workings generally ranges from 0.41 to 0.25 percent except for the 23-foot interval of 1.10% copper. In other stretches of the Melinda Jane drift copper values are lower, ranging from 0.14 to 0.24 percent, but other metal values are lower also. Appreciable amounts of oxidized copper, however, may have been leached out and redeposited elsewhere. As the lead-zinc-silver values bottom out in the 410 winze of the Melinda Jane workings, 100 feet below the drift, copper values increase markedly to an average of 0.88 percent in the interval between 100 and 145 feet below the drift and average 1.77 percent between 150 and 185 feet. These values strongly suggest a copper ore body, the dimensions of which are unknown. The nature of the mineralization, whether enriched or not, accounting for the higher copper assays could not be adequately appraised because the lower part of the winze is not presently accessible; the copper minerals are all secondary, however, according to Mr. O'Leary. The low copper values associated with the lead-zinc-silver ore lens may be due to copper being more readily dissolved in the presence of other sulfides in the oxidized zone. Below the lead-zinc lens where sulfide minerals were probably sparse, it is speculated copper may have redeposited to form a secondarily enriched zone. High copper values may be concentrated in an enriched

zone, though more than likely secondary copper minerals have been dispersed through a considerable vertical range, contributing somewhat to the primary sulfide zone at depth. The values for copper in primary ore are pure conjecture, but might attain 1 percent or more.

Government participation in exploration for copper has some merit in the lower parts of the oxidized zone and below, on the basis of the assays from the samples in the lower 85 feet of the Melinda Jane winze. In the upper parts of the oxidized zone copper values would tend to be erratic with small pockets of ore grade oxide material sparsely scattered through generally poor to barren leached ground; exploration for copper in the upper oxidized zone could not be supported.

Indications are that the Copperopolis property, although having no primary sulfide minerals except scattered nodular remnants of galena in the oxidized zone, is essentially a complex sulphide base metal deposit at depth. Although the characteristics of the primary deposit have been deduced in part from the assay data and relationships in the oxidized zone, judgement is aided also by a review of known sulfide deposits in the district, such as the Iron King mine, 32 miles NNE of the Copperopolis property, which operated over a span of 60 years. Creasey described the Iron King mine in detail (1952, p. 24-56). Principal sulfide minerals include sphalerite, galena, chalcopyrite, pyrite, tennantite, and arsenopyrite, with gold and silver accompanying the sulfides, down to 1,140 feet below the surface. They occur in a system of steep-dipping en echelon veins localized along a shear zone, and are generally fine grained, massive,

and banded--caused by differences in relative amounts of sphalerite and pyrite. Pyrite is the dominant sulfide mineral, as much as 75 percent of the veins in places. Sphalerite is abundant, locally replacing pyrite in importance. Galena generally is less abundant than sphalerite though uniformly distributed. Gold consistently exceeds silver in dollar value by twice, which does not match the known relationships in the Copperopolis deposit. The production figures from the Iron King mine from 1906 to 1947 probably give a fair idea of the relative abundance of the ore minerals: 18,500 tons of lead, 57,500 tons of zinc, 2,000 tons of copper, 3,765,000 ounces of silver, and 119,500 ounces of gold from approximately 926,800 tons of ore. The average grade of all ore mined on the 400 and lower levels through 1947 was $7 per ton in gold and silver, 2.17 percent lead, and 6.80 percent zinc. Grade of copper is not reported in Creasey's paper; recent estimates by Mr. Robert Raabe, Mining Engineer formerly with the Bureau of Mines, place it at around 0.4 percent (Personal communication).

In the above statistics it is interesting to note the relatively small production of copper compared to lead and zinc at the Iron King mine and the more than 3-fold tonnage of zinc compared to lead. By comparison, lead assays at the Copperopolis property generally exceed the amount of zinc, at least in the oxidized zone. At depth the ratio probably changes in favor of zinc. Overall copper value at Copperopolis may compare closely with that at the Iron King mine. Raabe says (Personal communication) that not one metal produced from the Iron King Mine could by itself sustain the mine nor for that matter any 2;

collectively, however, they contributed enough values for successful mining operations. The Copperopolis property as well certainly would have to rely on all the metals combined for successful production. Incidentally, it should be noted that the Iron King mine ranked 12th in the United States, in the production of silver in 1964 (1964, Minerals Yearbook, p. 956), though it dropped to 19th in 1966 (1966, Minerals Yearbook, p. 353; this rank was achieved in spite of the fact that it produced ore that averaged no more than 4 oz. per ton silver as late as 1947.

Conclusions and recommendations

There are two aspects to consider in determining whether or not the government should participate in exploration for copper, gold, and silver on the Copperopolis property. One is the probability of finding sufficient reserves of ore to justify the exploration costs, and the other is the minimum size of the exploration program necessary to satisfy the first requirement. In order to render a fair opinion, several features of the deposit have been examined critically and a few interpretations developed. Some conclusions are inferred from indirect evidence, such as comparing the production and mineralogy from another known sulfide mine in the district, because the highly oxidized condition of the Copperopolis property inhibits direct assessment. The main observations and interpretations are summarized below:

1. The Copperopolis shear zone extends over the length of the property, some 7,500 feet, and has been traced along the strike

for over 11,500 feet. It ranges in thickness from no less than 50 feet to over 200 feet. It can be reliably predicted that such a prominent shear zone will persist with comparable thicknesses to considerable depth, measured in thousands of feet.

2. All parts of the shear and breccia zone appear to be mineralized, to judge by the pervasive limonite and hematite encrustations and staining, as well as the widely scattered streaks of secondary copper minerals and the concentrations of secondary lead and zinc minerals. Mainly the areas bordering the foot and hanging wall of the shear zone have been explored by shallow workings and surface diggings. Iron and manganese oxide minerals are particularly concentrated in an impressive gossan cap containing minor residual chalcocite and other oxidized copper minerals in the middle Copperopolis claims of Mammoth, Melinda Jane, and Gettysburg. This suggests that the shear structure is perhaps more strongly mineralized in the central part of the Copperopolis property; strong mineralization should extend downward in the shear zone for several thousand feet.

3. The oxidized zone appears to extend at least 220 feet below the surface and may exceed 450 feet of depth. An enriched sulfide zone below the oxidized zone is likely to be poorly defined under the long continued arid conditions with deep though variable water tables, that have prevailed in the region. Mines within the district characteristically have no chalcocite zone proper, or only a thin layer of enriched material between oxidized and primary ore.

4. The mineral assemblage in the oxidized zone indicates complex sulfide deposits at depth of lead, zinc, silver, copper and gold, in order of relative abundance. They probably occur in descreet bodies or ore shoots of mixed sulfide minerals scattered through the shear zone with intervening ground having submarginal values, as illustrated in the Melinda Jane workings.

5. Gold occurs only in accessory amounts on the Copperopolis property, averaging 0.028 ounces per ton from all assays taken from surface and near surface samples, and 0.015 ounces per ton from samples in the lower 35 feet of the Melinda Jane winze. Government participation in exploration for gold would not appear to be justified at present, although gold accompanies copper, increasing in value proportionaly with increases of that metal. It is not likely that gold values will increase significantly in the primary mineral zone at depth.

6. Silver is a persistent companion to lead, though it rarely exceeds a few ounces per ton in assays taken in the oxidized zone. In the lead-zinc-silver ore streak in the Melinda Jane drift it averaged 2.70 ounces per ton. Although some silver may have been leached out of the oxidized zone and redeposited to form enriched concentrations at depth in the Copperopolis shear zone, it probably occurs only in modest amounts in primary sulfide ores. The relatively low values to be expected do not justify government support for exploration of silver by itself. Exploration may be justified, however, when the total mineral values are considered, and if exploration for copper is deemed valid.

7. Oxodized copper showing are widespread at the surface and underground in the Copperopolis shear zone. Accumulated residual oxidized copper minerals are believed to account for the relatively high values of 2 to 4 percent copper in the Mammoth claim, and probably could not be sustained at more than shallow depth. Copper is generally submarginal in the oxidized lead-zinc-silver lens in the Melinda Jane workings, but increases markedly in value below this lens in the interval between 100 and 185 feet down the winze, ranging from 0.88 to 1.77 percent. Such values should encourage some exploration at depth, and on that basis it is recommended that the government participate in a limited exploration program for that metal. Values for copper in primary ore might conceivably run as high as 1 percent or more.

8. On the basis of numerous assays of oxidized mineral from the underground workings of the Melinda Jane claim, and from comparisons with values in the well-known sulfide deposits of the Iron King Mine in the district, the Copperopolis property would appear to be principally a lead-zinc-silver deposit, with possibly fair to rich bodies of copper scattered throughout. A lens in the oxidized zone of the Melinda Jane workings contains approximately 17,000 tons of indicated ore averaging 5 percent lead, between 3.5 and 5.5 percent zinc, and around 2 oz./ton silver. Copper averages 0.41 percent and undoubtedly has been leached out of this oxidized ore; primary and enriched ores at depth should run higher in zinc and copper. The same is probably true about silver. Production from the Iron King mine up to 1947 was based on primary sulfide ores

that averaged 2.17 percent lead, 6.80 percent zinc, and 4 oz./tons silver. Values are closely comparable between the two mines when allowances are made for the differences between oxidized and primary ore. It is fairly evident that the Copperopolis property would depend, for successful operation, on mining all the base metals copper, lead, and zinc, as well as the accompanying gold and silver, as was the case with the Iron King mine.

A limited exploration program for silver and copper at the Copperopolis property is indicated by the information developed. The program proposed by the applicant to drill 2 holes from the surface to explore for primary and secondarily enriched ore in the Copperopolis shear zone at depth below the Mammoth claim is well conceived, but is too modest. It is recommended that the applicant's proposal be considered, but expanded to include, as a minimum, 2 more such deep holes from the surface to explore below the Melinda Jane workings, on the basis of the encouraging assays of copper and silver. Presumably, this expanded program should roughly double the exploration costs presented by the applicant, if the drilling costs as proposed are adequate. The applicant has indicated interest in such an enlarged exploration program, provided he has the option of cancelling it is poor results are obtained in the first 2 holes. Drilling only 2 holes severaly restricts the chances for finding mineralization of ore grade; 4 holes are barely adequate to explore the Copperopolis shear zone at depth, and not sufficient really to tell much about the extent of the ore mineralization if such is encountered.

The locations of the 2 additional holes depend to some extent on the limitations of the terrain, whether drill sites can be leveled and roads cut to reach them. It is recommended, however, that they be located west of drill hole No. 2. The collar of diamond drill hole No. 3 would be most ideally located N. 80° W. 1,000 feet from drill hole No. 2 and roughly 550 feet south of the surface trace of the Copperopolis shear zone. It would bear N. 20° E. and would be designed to intersect the shear zone 100 feet below the bottom of the Melinda Jane winze and thereafter penetrate through the shear zone as much as possible in one thousand feet of drilling. The exact drill site, and corresponding bearing and inclination of the hole must be determined by the applicant, as no detailed topographic map of the property is available. It is known that the suggested drill site is located on a prominent ridge.

The location of drill hole No. 4 would depend on the results obtained from drill holes Nos. 2 and 3. If these 2 holes intersect good mineralized ground hole No. 4 would best serve by exploring the Copperopolis shear zone between them. The collar of hole No. 4 might be located approximately N. 70° W. 500 feet from hole No. 2 and 400 feet south of the shear zone. It would bear N. 20° E., and its inclination would be designed to intersect the shear zone 350 to 450 feet below the surface. Again the details depend on the collar location and topography. Poor results in drill hole No. 2 should not rule out the possibility of finding good mineralization by drilling hole No. 4 at the suggested location. An alternate possibility, however, might be to locate it 400 to 500 feet west of drill hole No. 3.

Because of the impressive thickness and southerly dip of the Copperopolis shear zone, effective deep drilling requires that the drill holes be collared several hundred feet to south of the outcrop or apex of the shear zone. This places the 2 additional holes outside of the present claim boundaries. It is clear that the proposed exploration as well as any further exploration that might evolve from a drilling program would need more operational space to the south. It is suggested, therefore, that the applicant take up a number of claims adjoining the present Copperopolis claims on the south sufficient for drilling sites, or in lieu of this obtain the written consent of any claim holders on the south to drill from their property or properties.

It is suggested that the applicant be asked to reconsider the exploration program as presented in order to allow at least 4 deep diamond drill holes as outlined above. He should be asked to review the drill cost figures, and resubmit a detailed breakdown of costs for 4 holes, including casing, cementing, and reaming, and estimates of the additional costs for providing access roads and leveling for the 2 extra drill sites, as well as for further supervision, materials, and assays.

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U. S. Bureau Mines, 1967, Metals, in Minerals Yearbook, 1966, v. I-II: Wash., D. C. U. S. Gov. Printing Off., 1352 p.

Office of Minerals Exploration
Building 53 Room 203

April 25, 1968

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Mr. Dorman S. O'Leary
P. O. Box 1041
Wickenburg, Arizona 85358

Subject: OME-6679 (Copper-Gold-Silver)
Dorman S. O'Leary
Copperopolis Property
Yavapai County, Arizona

Dear Mr. O'Leary:

This letter is in reply to your request dated April 22, 1968 concerning the subject application. Mr. Robertson's report of examination is being transmitted to Washington, D. C. today. You should hear from them within a couple of weeks I should judge.

Sincerely yours,

J. William Hasler

J. William Hasler,
Field Officer, Region III
Office of Minerals Exploration

cc: Chief, OME
OME chron
OME-6679
Mr. Hasler
Mr. Robertson

P. O. BOX 1041

DORMAN S. O'LEARY
REGISTERED MINING ENGINEER
WICKENBURG, ARIZONA
85358

684-2287

OME Region III
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Denver, Colorado

April 22, 1968

Mr. J. William Hasler, Field Officer, Region III
Office of Minerals Exploration
Room 203, Building 53
Denver Federal Center
Denver, Colorado

Ref. OME-6679

Dear Mr. Hasler:

I would appreciate some information on the status of my application. Mr. Robertson, of your office, made his examination 60 days ago, and seemed to think a decision on the matter would be reached within 30 days of his visit.

Very truly,

D. S. O'Leary

D. S. O'Leary

Office of Minerals Exploration
Building 53 Room 203

February 27, 1968

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Mr. Dorman S. O'Leary
P. O. Box 1041
Wickenburg, Arizona 85358

Subject: OME-6679 (Copper-Gold-Silver)
Dorman S. O'Leary
Copperopolis Property
Yavapai County, Arizona

Dear Mr. O'Leary:

Transmitted herewith is your original "Report on the Amity Group of Claims, Castle Creek Mining District, Yavapai County, Arizona by Wilson D. Michell, Superior, Arizona, dated July 1, 1946." Thank you for the use of this report for reproduction.

Sincerely yours,

J. William Hasler
mc

J. William Hasler,
Field Officer, Region III
Office of Minerals Exploration

Enclosure

cc: Chief, OME
OME chron
OME-6679
Mr. Hasler

REPORT ON THE AMITY GROUP OF CLAIMS
COPPEROPOLIS
(COPPER-GOLD-LEAD VEINS)
CASTLE CREEK MINING DISTRICT, YAVAPAI
COUNTY, ARIZONA, by WILSON D. MITCHELL
Superior, Arizona, July 1, 1946.

INTRODUCTION

Location and Accessibility

The Amity Group of sixteen mining claims, three of which are patented, is located around the common intersection of Secs. 27, 28, 33, and 34, in T. 9 N., R. 2 W., Gila and Salt River B. 1. & M., in the Castle Creek Mining District of Yavapai County, Arizona. The claims include the old camp of Copperopolis, and are about 1-1/2 miles northeast of the site of Briggs, former location of a small smelter operated in the early 1890's. The area is within the U.S.G.S. topographic map of the Bradshaw Mountains quadrangle.

The property at present is accessible by road from Morristown, located on U. S. Highway 70. The total distance from Morristown is 31-1/2 miles, which includes 22 miles on the Castle Hot Springs graded highway, 7 miles of difficult road in the bed of Castle Creek, and 2-1/2 miles of steep dirt road crossing a ridge from Castle Creek at Briggs to the property in the canyon of Copperpolis Creek. In dry weather most passenger cars and ordinary trucks cannot approach closer than about 7 miles from the property, altho a four-wheel drive army reconnaissance car such as that used by the present owners is able to negotiate the road without undue difficulty. The entire trip to the main highway at Morristown consumes, at best, 2-1/2 hours.

The property at Copperopolis has always been difficult of access since the time of discovery in the early 1880's. Very little work, consisting only of the production by leasers of small amounts of oxidized copper-gold ore mined at the surface has been done in the vicinity of Copperopolis for the past 50 years.

The question of a usable all-weather road to the Amity group will be considered later in this report.

TOPOGRAPHY AND CLIMATE

The country in the vicinity of the Amity group is not of extreme relief, but is rugged and highly dissected by steep-walled washes. The camp is located in the canyon of Copperopolis Creek, a tributary of Castle Creek which it joins at Briggs. The elevation at Copperopolis camp is 3200 feet. The hills rise steeply northward about one mile to the peak of Lohman Hill, a prominent landmark at an elevation of approximately 4450 feet.

The climate is typical of southern Arizona at moderate elevations, being very much the same as at Superior, so that surface drilling or other operations could be carried on thruout the year. Access is easier under existing road conditions during the winter and summer rainy seasons than it is in the dry periods, but flash floods are a menace during the summer rains.

Most of the hill slopes are covered with mesquite, catsclaw, various kinds of cactus, and greasewood. Rattlesnakes are numerous.

EXAMINATION

The writer examined the property from June 11 to 14, 1946. The examination was facilitated by the guidance and courtesy of two of the owners, Thomas S. Dalton, Sr., and Jack M. Dalton.

A report made for Amity Exploration, Inc., by J. S. Coupal, mining engineer of Phoenix, in December, 1945, was of assistance in the present work.

Ownership

The thirteen unpatented claims of the Amity Group, which are properly monumented and recorded and to which title is clear, were located by the present owners in 1945. The three patented claims were bought from the former owners, who acquired tax title by purchase from the State of Arizona. The entire group is now owned by Amity Exploration, Inc., an Arizona corporation, Thomas S. Dalton, Sr., President, Box 85, Morristown, Arizona. A one-fourth interest in the corporation is held by each of Thomas S. Dalton, Sr., his sons Jack M. Dalton and Thomas S. Dalton, Jr., and Edward C. White.

Mr. Dalton, Sr., is a practical mining man who has been engaged in mining work in the Western States for 45 years, and his sons have been associated with him in these activities for a considerable period.

Amity Group and Duco Boy Group.

Amity Exploration, Inc., has obtained a 90-day option from June 12, 1946, on the ten patented claims of the Duco Boy Group, the center of which is one mile west of the central portion of the Amity Group. Since, in my opinion, the Duco Boy claims contain part of the extension of the main shear zone of the Amity Group, I believe that consideration should be given to the Duco Boy in conjunction with the Amity. However, because different ownership and option conditions are involved in the two properties, the Duco Boy is reported upon separately.

Attention is called to the fact that the maps accompanying these two reports have been made at the same scale and caused to overlap, so that they can be studied together.

CONCLUSIONS AND RECOMMENDATIONS

1. Wide shear zones cross-cutting the regional rock structure are occupied at the surface by prominent leached iron gossans which contain narrow oxidized copper-gold bodies of good value. The strongest shear zone can be followed for perhaps as much as 11,500 feet, of which

5,400 feet is Amity ground. The shear zones are in a complex of Pre-Cambrian intrusives with schist inclusions.

2. Development is insignificant because of inaccessibility of the deposit, and the property is purely a prospect.

3. There is a good possibility that the leached gossan represents the top of sizable bodies of copper-gold ore, with some erratically distributed lead values, and the oxidized copper showings may be residual from the leaching of the larger bodies.

4. Diamond drilling is recommended to explore first the parts of the major shear zone beneath the most extensive area of iron gossan (on the Mammoth claim) in order to get information eventually on the grade, size, and distribution of possible sulphide ore bodies. Conditions should be good for diamond drilling.

5. An all-weather road will have to be constructed by means of about 2 miles of bulldozer work, making the distance to Wickenburg some 18 miles.

6. Consideration should be given to exploration of the Duco Boy Group one mile west and containing the probable extension of the major Amity shear zone. Additional ground may be located to cover this shear zone between the two properties.

7. Water supply can readily be developed on the property for drilling and mining purposes.

MINE WORKINGS AND EQUIPMENT

As shown on the map accompanying this report, shallow pits, cuts, shafts, and short tunnels constitute the only mining development on the Amity Group. The Mammoth shaft, reportedly 200 feet deep, is the most extensive working on the property. The purpose of the mine openings was solely for the removal of small amounts of oxidized shipping ore

found at the surface in narrow bands within the major leached gossan zones. The samples recorded on the accompanying map represent such stringers of oxidized ore.

A cabin capable of accommodating six men is located at the old camp of Copperopolis. This cabin is now in use by the owners, and is in fair condition. Recently the owners have build a substantial and well-equipped small assay office some 250 yards north of the cabin. The assay office, where running water is available pumped in from the nearby well, serves also as sleeping quarters for two men and as a general office. It is equipped with a shower bath. Lighting, cooking, and assay equipment in the camp use Coleman type gasoline burners.

The owners have a saddle horse at the property, and the reconnaissance car which is used to travel to Morristown.

GENERAL GEOLOGY

Rock Types and Distribution

The Amity property lies within a northeast-trending belt of complexly related intrusives of various types containing inclusions of pre-Cambrian Yavapai schist. This belt, about five miles wide at Copperopolis, is a screen between two great masses of Bradshaw granite.(1) The mixture of schist and intrusive rocks, all considered pre-Cambrian, has been lumped together by Lindgren(2) under the term "Crooks complex". On the Amity and Duco Boy properties the igneous intrusives predominate greatly in areal extent over the schist, which is present only as inclusions of relatively small size.

The eroded pre-Cambrian complex has been overlapped south of Copperopolis by Tertiary volcanic flows, including agglomerates, andesite, and rhyolite tuff. These volcanics, which are post-ore in age, touch the extreme southern part of the Amity property (see accompanying map).

(1) N. H. Darton et al, "Geologic Map of State of Arizona", (1924).
(2) Lindgren, W.-"Ore Deposits of the Jerome and Bradshaw Mountains Quadrangles, Arizona" (U.S.G.S. Bull. 782, pp 183-4, (1922).

No attempt has been made to prepare an areal geologic map of the rock types in the Amity Group, because the distribution is extremely complex and extensive metamorphism has made identification difficult. Notes have been placed on the accompanying map, however, to indicate the larger areas of different rocks where they were encountered in the present examination.

The igneous rocks, which are believed to represent phases or differentiates of the Bradshaw granite magma, include normal granite, diorite, andesite, and dikes of coarse tourmaline-bearing granite pegmatite. In addition to these rocks are dikes of rhyolite, porphyry, and basalt, which are probably younger than the Bradshaw intrusives.

The Yavapai schist is represented by inclusions of dark-colored quartz-mica schist and bodies of black gneiss. There appear to be two principal belts of schist: A westerly one crossing the American and Amity No. 10 claims, and an easterly one in parts of Amity No. 2 and Amity No. 3 claims.

The Tertiary volcanics in the southern parts of Amity and Amity No. 11 claims consist of gray andesite flows and tuff, and rhyolite agglomerate.

Geologic Structure

The prevailing rock structure of the "Crooks complex" on Amity ground is NNE. The structure is indicated by the strike of schistosity, the elongation of schist inclusions within the intrusive bodies, and the trend of bands of different igneous rock types. Insufficient data were secured to permit a generality as to the dip of schistosity or intrusive contacts. The interpretation by Jaggar and Palache[1] that vertical close folding of the schist in the NNE regional trend guided the igneous intrusive bodies, seems to provide a good explanation for the structure and rock distribution as we see them today.

Crossing the prevailing northeast structure at nearby right-angles

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(1) Jaggar and Palache, "Bradshaw Mountains, Arizona", (U.S.G.S. Folio 122, p. 9, 1905).

(average strike N 60° W) are numerous, wide, and in places prominent, steeply dipping iron gossan zones carrying copper, gold, lead, and silver mineralization. Some of the mineralized zones are associated with rhyolite porphyry dikes.

MINERAL DEPOSITS

Vein Structure

The strongest gossan zones, as has been stated, cut at right angles across the prevailing regional structure. The most important of these zones is prominently developed on the Mammoth claim. As the accompanying map shows, it can be followed on Amity property continuously from Amity No. 1 claim thru Amity No. 10, a distance of 5,400 feet. I believe, also, that the same leached gossan continues westward into the Duco Boy property; and, in fact, on our return from the Duco Boy to Copperopolis we encountered showings between the two properties which are presumably on this same structure. If this is the case, the total length of this leached gossan is about 11,500 feet. The iron gossan seems to terminate eastward rather abruptly in massive granite on Amity No. 1 claim.

The Mammoth gossan zone dips steeply south. It reaches a maximum width of 200 feet at the Mammoth shaft. Along the footwall of the leached gossan is a vein of oxidized copper minerals 5 feet to 6 feet wide on which some tunnelling has been done from creek level (see map). The wall rock is granite and granite pegmatite.

Data concerning other gossan zones are recorded on the accompanying map, and no further description is necessary here. The gossans lie in well-defined shear zones which show evidence of movement, and mineralization has been confined to the channelways which the shear zones provided.

As shown on the map, another set of leached mineralized gossans follow the NNE regional structure. These are less numerous and less strong than the WNW shear zones. The most prominent of the NNE zones

is an "open fissure" on Amity No. 6 and Amity No. 5, so called because erosion has removed most of the central part of the fissure to a depth of 50 feet where the zone crosses a low ridge on Amity No. 6 (see map). There is little evidence of copper mineralization on this fissure.

Vein Mineralogy

No workings have penetrated thru the oxidized and leached zone of the deposits. Exposures of the shear zones contain quartz, silicified and altered country rock, and much porous cellular brown and red limonite and hematite. Within the wide leached zones in places are narrow bands of oxidized copper minerals, which I believe are residual and have escaped the general leaching. This oxidized copper ore, some of which has been shipped, consists of chrysocolla and malachite with hematite and limonite in quartz gangue, and carried gold values with some silver.

In some cases on the same shear zones with the copper mineralization are lead deposits which contain oxidized lead minerals (probably cerussite and anglesite), residual galena, and vanadinite in a gangue of quartz associated with limonite and hematite.

In the opinion of the writer the lead mineralization represents a minor, and probably somewhat later, phase of the copper ore deposition, and the same channelways were utilized. If such is the case, lead values are probably erratic in distribution on the shear zones, except possibly in certain veins (such as the one just south of Copperopolis camp - see map) which happen to have been occupied solely by the lead-bearing mineral assemblage.

Leached Gossan and its Significance

A careful search was made for limonite "boxwork" which might indicate what, if any, copper minerals had been removed from the leached gossan. Some box work derived probably from chalcopyrite was found at widely distributed places on the property, and a little chalcocite boxwork was seen. The great abundance of iron suggests the presence originally of much pyrite, and many examples of pyrite boxwork were found.

The floods of pyrite-derived limonite (and hematite) would be expected to obscure much evidence of copper sulphide leaching.

My interpretation of the gossan is that sulphide ores containing copper minerals and also a great deal of pyrite were subjected to strong oxidizing conditions, with leaching and transportation of copper values favored by acid and ferric sulphate derived from the decomposition of pyrite. The oxidized copper ores remaining in the leached zone are not continuous or extensive. They seem to me to be possibly residual portions of larger copper bodies, and have survived the strong leaching perhaps because of chemical reaction with inclusions of altered granite or with local occurrences of calcareous gangue minerals. Under such strong leaching conditions, if these small bodies were the only concentrations of copper sulphide in the shear zones, I would not expect them to have survived.

It is not possible to say whether the ores of which samples are recorded on the map represent oxidation of a secondary enriched zone or of primary sulphides, but the values are sufficient to arouse interest under either possibility. The latter case would be more favorable for good sulphide ore at depth. Some chalcocite boxwork is present in the leached gossan, but I would expect evidence of much more chalcocite if the surface exposures represent oxidation of a secondary chalcocite zone.

ORE POSSIBILITIES

The Amity deposit is an essentially undeveloped prospect. The previous discussion has attempted to give reasons for believing that possibilities are good for large copper-gold orebodies beneath the spectacular iron gossan in the shear zones, but no statement more definite than that seems warranted at present.

There is no assurance that the narrow bands of oxidized copper ore now showing are remnants of originally larger bodies which have been mostly leached out, but for reasons previously discussed, I believe that this may be so.

The surface samples, altho covering only narrow widths, are fairly attractive in themselves. It cannot be determined for certain what they indicate as to the grade of primary and secondary sulphide orebodies at depth. A straight unweighted average of the samples on the main, or Mammoth, shear zone for 5,400 feet on Amity property is as follows:

7.12% Cu
0.55 oz. Ag
0.[illegible] oz. Au

As indicated on the map, there are also some erratically distributed but fairly high lead values, with the best lead-bearing vein showing on Amity and Amity No. 11 claims near the old camp.

No workings in the district have gone deep enough to give us an indication of the possible depth of oxidation on the Amity deposits. Lindgren[1] suggests an oxidized zone in that general area of 100 to 400 feet deep, but this is based on work at other types of deposits at some distance from Copperopolis.

RECOMMENDED EXPLORATION

Road Building

If any work is done on the Amity Group, a road will have to be built to the property to avoid the long and difficult present trip in Castle Creek wash. One suggested route north from the property was made by Mr. Coupal. By this route the distance to U. S. Highway 89 at Kirkland Junction would be some 30 miles, and about 3 miles of road would have to be built from Copperopolis to the end of the old road to Lohman's Mill.

A better road connection has been suggested by Mr. Dalton southwest to Wickenburg, a distance of some 18 miles. About 2 miles of road would have to be built from the Melinda Jane claim to the Abe Lincoln Mine, from which fairly good roads lead to Wickenburg. Grades

(1) Lindgren, W., op. cit. p. 40.

on the road to be built would not be excessive, and a bulldozer could do the work.

DIAMOND DRILLING

It is recommended that exploratory diamond drilling be done on the Amity ground, giving attention first to the strongest part of the Mammoth shear zone near the Mammoth Shaft. No attempt is made in this preliminary report to lay out specific proposed holes. The essential thing will be to determine the character and grade of sulphide material if found.

The topography is suitable for diamond drill exploration of the shear zones. The first holes would probably not have to exceed 700 feet in length. Wall rock on the eastern part of the Mammoth shear zone, where the first drilling would be done is coarse granite, and should drill fairly well.

Location or Purchase of Other Ground

The American and Britton claims do not have any immediate interest, and the showings on the American, particularly, are not very good. If the Britton claim can be cheaply secured, it might be worth purchasing, but it does not cover any of the main shear zone.

Consideration should be given to exploration on the Duce Boy property, on what is presumably the extension of the major shear zone on the Amity Group. If so, and perhaps in any case, intervening ground on the main shear zone between the properties might well be secured. Some or all of it is probably open to location.

WATER SUPPLY

A 7-foot well has been sunk in the bed of Copperopolis Creek on Amity No. 8 claim. Water from this is pumped to a 750-gallon tank

and used for the assay office and domestic purposes. Water was standing in this well even after the long period of drought this year. There are also two springs along the creek near the old camp.

Ample water for drilling and mining should be available if deeper wells are sunk in Copperopolis Creek, which has a fairly large drainage area to the north.

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AIRMAIL

Memorandum

JAN 8 1968

To: Field Officer, Region III

From: Chief, Office of Minerals Exploration

Subject: OME-6679 (Copper, Gold and Silver)
Dorman S. O'Leary
Copperopolis Property
Yavapai County, Arizona

The subject application is referred to you for further consideration, a field examination if warranted, and recommendations.

The assay data submitted does not support the request for assistance to explore for copper, gold, and silver. Rather, the information suggests that the Copperopolis property is chiefly a lead-zinc deposit.

The application is well prepared, and we have no specific questions on the geology or other preliminary considerations. Although we question whether the proposed work of diamond drilling two holes constitutes an adequate exploration project. We note that the drilling costs appear to be high and should be more detailed.

FRANK E. JOHNSON (gfa)

Frank E. Johnson

cc: Director's Reading File
Division File
Economic Geology File
OME File
OME Reading File
Mr. Peterson
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ECPeterson/bsl 1/8/68

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JAN 8 1968

AIRMAIL

Mr. Dorman S. O'Leary
P. O. Box 1041
Wickenburg, Arizona 85358

Re: OME-6679 (Copper, Gold and Silver)
Dorman S. O'Leary
Copperopolis Property
Yavapai County, Arizona

Dear Mr. O'Leary:

Your application for exploration assistance has been reviewed in our Washington Office and referred to Mr. J. William Hasler, Field Officer, Region III, Office of Minerals Exploration, Room 203, Building 53, Denver Federal Center, Denver, Colorado 80225.

Mr. Hasler will notify you if additional information concerning the application is needed, and possibly to make arrangements for a field examination.

Sincerely yours,

FRANK E. JOHNSON (gla)

Frank E. Johnson
Chief, Office of
Minerals Exploration

cc: Director's Reading File
Division File
Economic Geology File
OME File
OME Reading File
Mr. Peterson
R-III

ECPeterson/bsl 1/8/68

January 2, 1968

Mr. Dorman S. O'Leary
P. O. Box 1041
Wickenburg, Arizona 85358

Subject: OME-6679

Dear Mr. O'Leary:

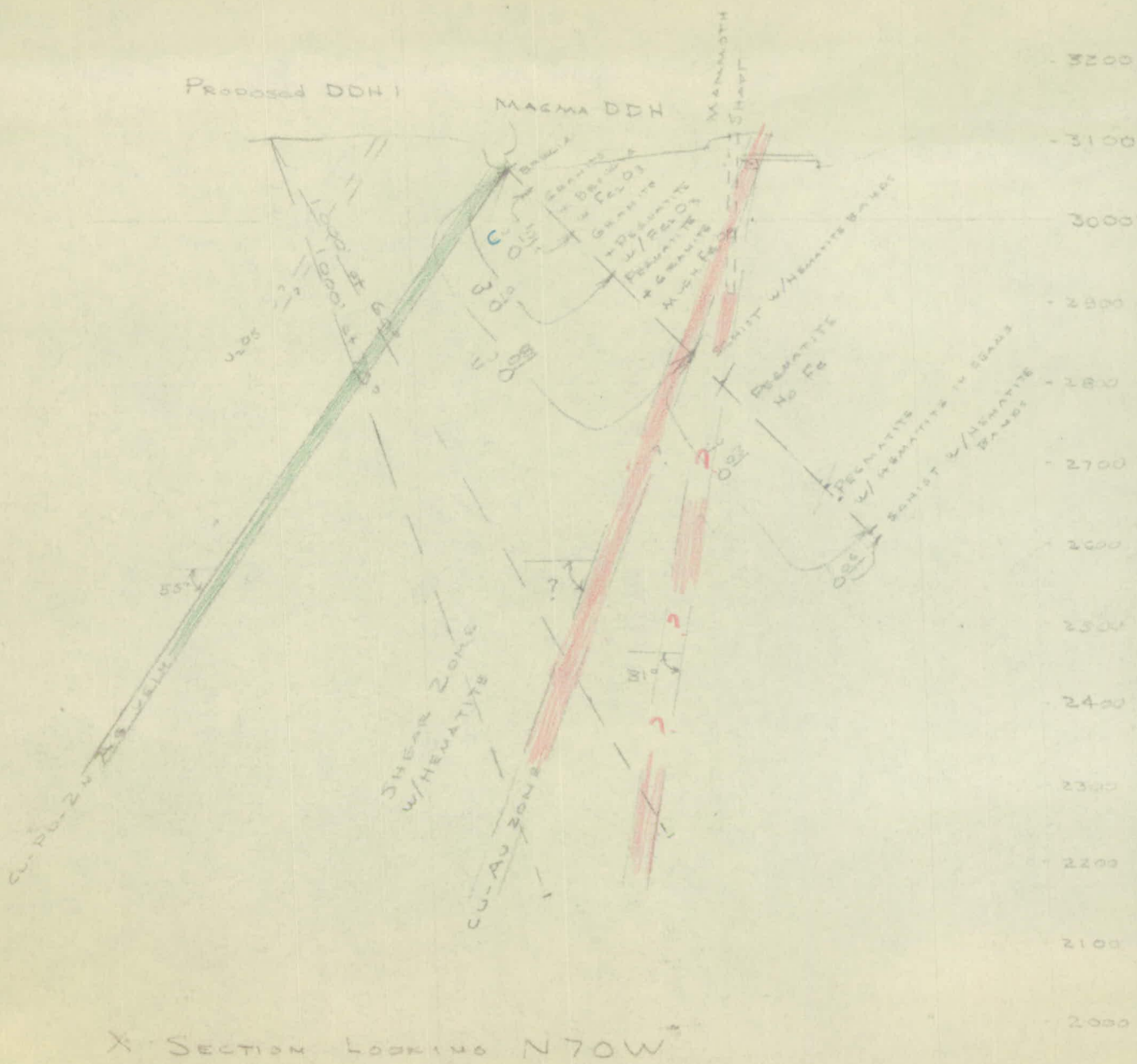
Your application for exploration assistance, dated December 6, 1967, submitted to our Denver, Colorado, office, has been assigned Docket No. OME-6679.

Please identify all future correspondence relating to your application by this docket number.

Sincerely yours,

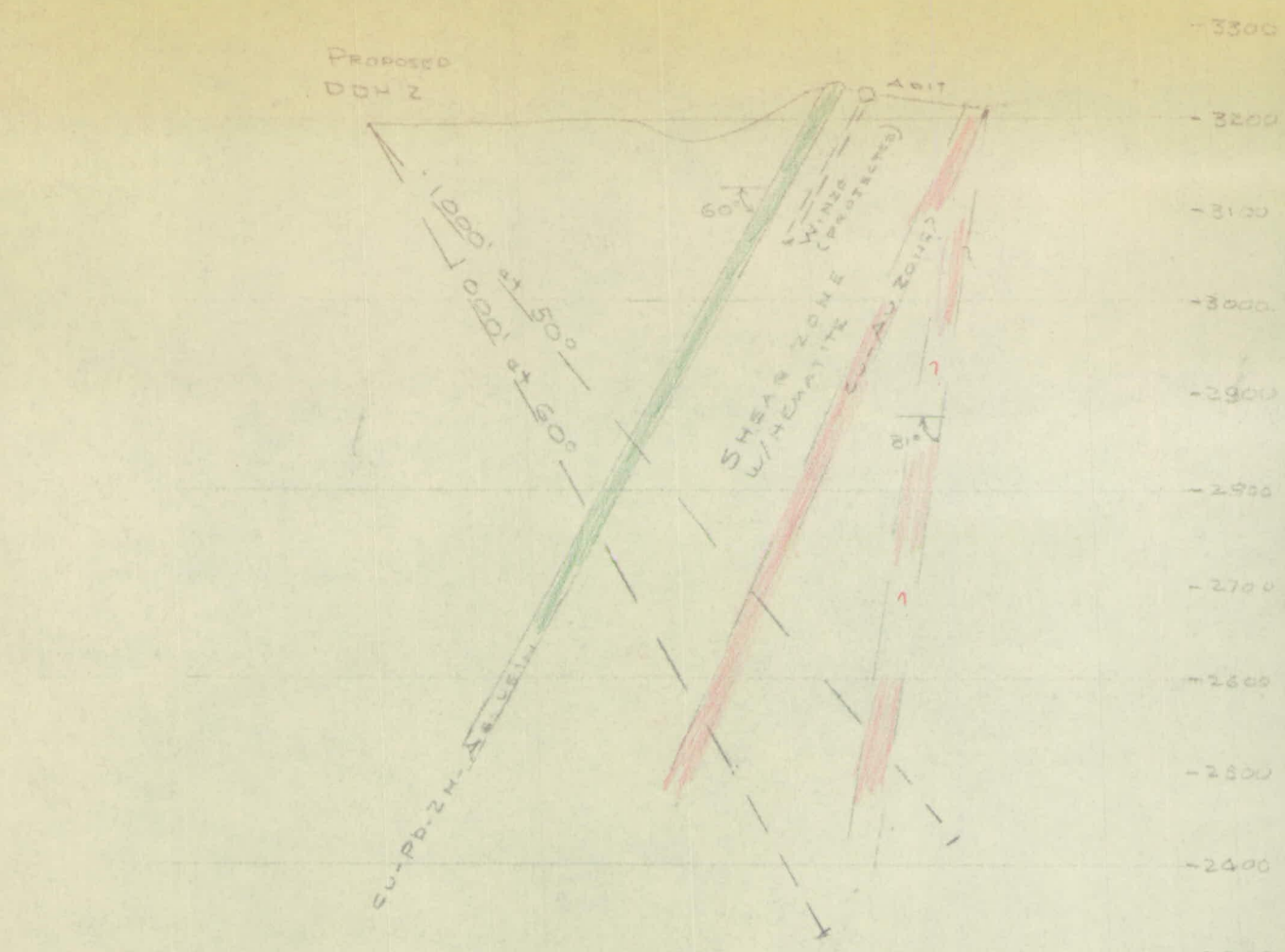
Frank E. Johnson
Chief, Office of
Minerals Exploration

cc: OME Region III



X SECTION LOOKING N70W
AT PROPOSED DDH 1

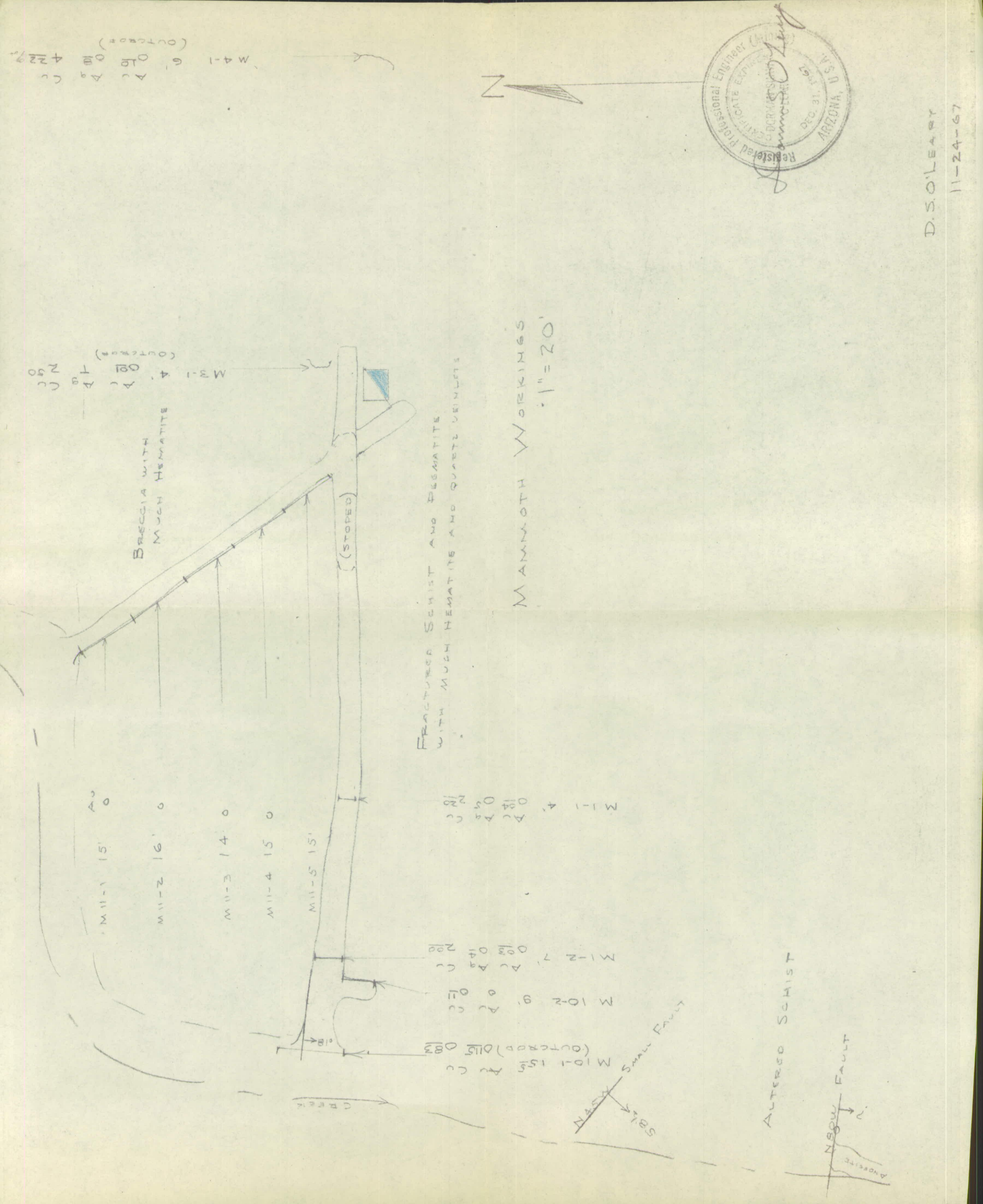
1" = 200'

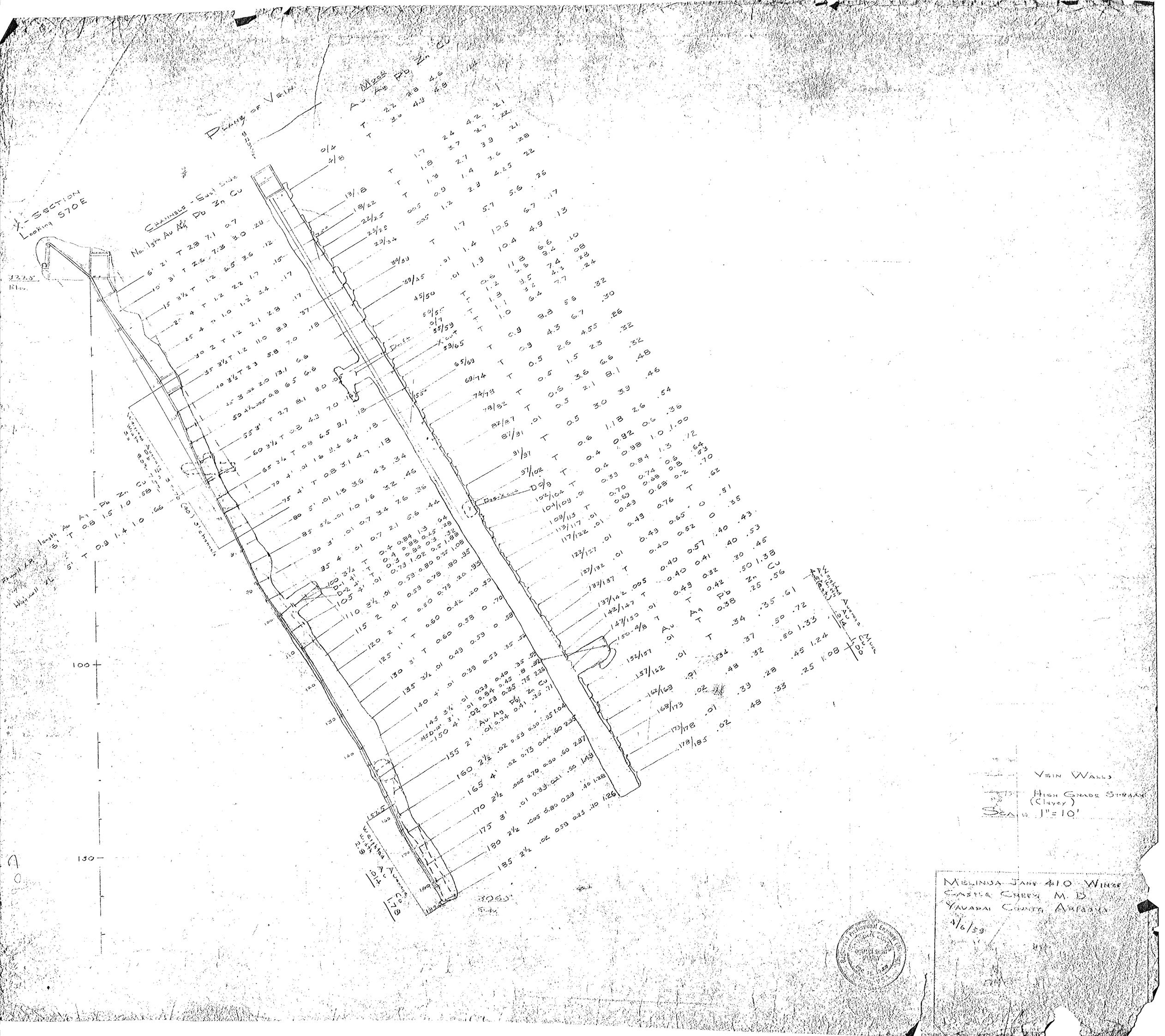


X-SECTION LOOKING N85W
AT PROPOSED DDH2

1" = 200'

D.S.O.L. 12-1-67


M4-1 6' Au Ag Cu
Qtz Pb Zn 422
(OUTCROP)
N
Registered Professional Engineer (Mining)
CERTIFICATE EXPIRES DECEMBER 31
ARIZONA, U.S.A.
D.S.O'LEARY
11-24-67
M3-1 4' Au Ag Cu
Qtz Pb Zn
(OUTCROP)
BRECCIA WITH
MUCH HEMATITE
(STOPED)
FRACTURED SHIST AND PEGMATITE
WITH MUCH HEMATITE AND QUARTZ VEINLETS
MAMMOTH WORKINGS
1" = 20'
M1-1 4' Au Ag Cu
Qtz Pb Zn
M1-2 7' Au Ag Cu
Qtz Pb Zn
M10-2 9' Au Cu
Qtz
M10-1 15' Au Cu
(OUTCROP) Qtz Pb
81°
CREEK
M11-1 15'
M11-2 16'
M11-3 14'
M11-4 15'
M11-5 15'
N45W
SMALL FAULT
S81°
ALTERED SCHIST
N80W
FAULT
ANDESITE


X-SECTION
Looking S70E
Plane of Vein
Channels - East Side
Vein Walls
High Grade Stream (Clayey)
Scale 1"=10'
Melinda Jane 410 Winze
Castle Cherry M.D.
Yavapai County Arizona
4/6/59

Underground Workings
Melinda Jane Claim M.S 1246
D.S. O'Leary
Scale 1" = 20'
Registered Professional Engineer (Mining) Dorsey Shaw O'Leary Certificate No. ... Arizona U.S.A.
Muck
385 X cut
410 Winze
Cross Fracture (mineralized)
Au Ag Pb Zn Cu .01 3.0 33.6 7.8 .10 - Grab of high grade

Copperopolis Prospect
Castle Creek M. D
Sections 33 and 34 T9N R2W
Yavapai County Arizona
Scale 1" = 200'
T9N R2W
28 27
33 34
Copperopolis Creek
Britton
M.S. 1929
(Not in contract)
American
M.S. 1199
(Not in contract)
Wild Bird
Pat. M.S. 1246
(Dalton)
Mammoth
Pat. M.S. 1200
(Dalton)
Melinda Jane
Pat. M.S. 1246
(Dalton)
Shear Zone
Cu-Au?
Gettysburg
198/374
(O'Leary)
Chancellorsville
198/373
(O'Leary)
Antietam No. 3
375/359
(O'Leary)
Antietam No. 4
375/360
(O'Leary)
Antietam No. 5
375/361
(O'Leary)
Antietam
198/370
(O'Leary)
Bull Run
198/372
(O'Leary)
Mobile No
434/233
(O'Leary)
Mobile No. 2
434/234
(O'Leary)
Mobile No 3
434/235
(O'Leary)
Road
To Wickenburg 30 miles
Brooks and O'Leary
DDH1 - 1957
USLM No. 1 CCD
N 88° 25' W
1450
S 80° 47' E
1450
N 80 W
1500
N 83° W
1450
S 83° E
1450
N 83 W
1050
S 85 W
1400
S 80 E
1370