MME Form 9
Rev. Mar. 59

UNITED STATES
DEPARTMENT OF THE INTERIOR
Office of Minerals Exploration

OFFICIAL DOCKET FILE

Contract No. 14-23-2231 Docket No. MME-6548

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- [ ] Withdrawn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
- [x] Closing Letter
- [x] Cost Audits April 1968
- [x] Termination Notice or Agreement 7/17/68
- [ ] Recision Notice
- [ ] Assignment of Contract
- [x] Contract Amendments
- [x] 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)
- [x] Operator's Final Report (Tab) 6/15
- [ ] Interim Field Team Reports
- [x] Operator's monthly reports and all attachments
- [x] On-site Exam. Report (Tab)
- [ ] Settlement Sheets
- [ ] Drill Logs

Additional Folders:

Left Side

Folders No. 2 : Reports
- [ ] Analysis of Semiannual Inspection Reports
- [ ] Project Summary (Interim) by MME Engineers

Right Side

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

Folders No. 3 : Maps (Use pocket folder or envelope)

Folders No. _____ : Settlement Sheets

Folders No. _____ : Drill Logs

Folders No. _____ : Royalty Material

MME Form 7
(2/63)

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SEP 1 0 1968

Big Treasure Mining and Development Co.
125 Sedgefield Court
San Ramon, California 94583

Re: OME-6548 (Silver)
Big Treasure Mining and Development Co.
Little Treasure and Adjust Mines
Pinal County, Arizona
Contract 2231

Gentlemen:

Reference is made to your terminated exploration project under the referenced contract.

We sincerely regret that the work performed did not result in a certification of possible production under the provisions of the contract. In the absence of such certification, the Government retains no claim or lien against the property subject to the contract or any future production therefrom. We are, therefore, closing our books and records on this contract. Your attention, however, is called to the provisions of the contract which require the Operator to keep and preserve certain records for the periods indicated.

We appreciate your interest and participation in the OME exploration program.

Sincerely yours,

Copy to: Messrs. Joe Jameson and Manuel Sosa, c/o Mr. Joseph Jameson, Box 26, Winkelman, Arizona 85292

FRANK E. JOHNSON (gfa)

Frank E. Johnson
Chief, Office of
Minerals Exploration

cc: Director's Reading File
Economic Geology File
OME Docket
Branch of Budget and Finance
OME Reading File
OME Region III
Mr. Smith
130

GLAult/bal 9-10-68

Government's Copy

EXPLORATION CONTRACT
BIG TREASURE MINING AND DEVELOPMENT COMPANY
OME-6548

TERMINATION AGREEMENT

It is agreed this 17th day of July, 1968, between the United States of America, acting through the Department of the Interior, U. S. Geological Survey, hereinafter called the "Government," and Big Treasure Mining and Development Company, hereinafter called the "Operator," parties to that certain Exploration Contract No. 2231 (OME-6548), dated October 12, 1966, as amended, hereinafter called the "Contract," that:

1. Effective December 12, 1967, the Contract and all obligations of the parties thereunder, except as otherwise herein expressly provided, shall be and are hereby terminated.

2. The Government shall contribute only to the allowable costs incurred prior to said effective date.

3. All rights of the Government as provided in the Contract, as amended, respecting certification of possible production, royalties on production and liens to secure the payment thereof, reports (including preservation of the Operator's records), accounts, audits, and the right to recover any overpayment, are hereby preserved.

4. The Operator hereby releases and agrees to save the Government harmless from all claims or demands under or arising out of said Contract except as otherwise provided in this termination agreement.

IN WITNESS WHEREOF, these parties have executed this agreement as of the day and year first above written.

THE UNITED STATES OF AMERICA

By Frank E. Johnson
Chief, Office of Minerals Exploration
U. S. Geological Survey

BIG TREASURE MINING AND DEVELOPMENT COMPANY

By Owen R. Smith

Title Sec.

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Smith
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MME Form 7
(2/63)

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| 7/1/68 | RM Smith | 120 |
| 7/1/68 | Ski Berio | 120 |
| " | Johnson | 110 |
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July 1, 1968

Memorandum

To: The File

From: R. M. Smith, Office of Minerals Exploration

Subject: OME-6548 (Silver )
Big Treasure Mining and Development Company
Little Treasure and Adjust Mines
Pinal County, Arizona
Contract 2231

Justification for Terminating the Contract

All target areas have been explored, but as no significant discovery was made, not all the follow-up work authorized by the contract was performed, and not all the money was spent.

Although the Operator has requested that the contract be terminated, a formal agreement is recommended to further document mutual agreement on the disposition of the unused funds.

RM Smith
R. M. Smith

cc: Director's Reading File
Economic Geology File
OME docket
OME Reading File
Mr. Smith

RMSmith/gla 7-1-68

Docket copy

UNITED STATES DEPARTMENT OF THE INTERIOR

OFFICE OF SURVEY AND REVIEW
AUDIT OPERATIONS
WASHINGTON, D. C.

# Report of Review-Contract 2231
Docket No. OME-6548 (Silver)
Big Treasure Mining and Development Company (Operator)
Little Treasure and Adjust Mines
Pinal County, Arizona

April 1968

We have examined the disbursement records in the Branch of Budget and Finance, Administrative Division, Geological Survey, and reviewed the contract files of the Office of Minerals Exploration (OME) pertaining to the subject minerals exploration contract. The review was performed at Washington, D. C., on March 25, and April 1, 1968.

The work contemplated by this contract, as amended, was to consist of a maximum of 10,000 feet of drilling from the surface and underground to be completed by December 12, 1967. The allowable cost of the work set forth in the contract was $112,000 with the Government's participation, on a 75 percent basis, being limited to $84,000.

The Operator performed 7,344 feet of drilling during the contract period and claimed costs aggregating $72,102.14. The OME Field Officer, Region III, Denver, Colorado, disallowed $870.42, of the claimed costs and approved costs aggregating $71,231.72, as acceptable for Government participation on the 75 percent basis, amounting to $53,423.80. The Operator has been paid $53,223.80, the difference of $200 being withheld pending receipt by the Government of an acceptable final report to be submitted by the Operator in accordance with the provisions of the contract.

We find that the settlement made with the Operator is in accordance with the provisions of the contract.

C. E. Fisher, Auditor

Reviewed by:

W. H. Wilkerson, Jr., Contract and Grant Audit
Audit Operations, Office of Survey and Review

Government's copy

OME Region III
RECEIVED
DEC 15 1967
Denver, Colorado

EXPLORATION CONTRACT
BIG TREASURE MINING AND DEVELOPMENT CO.
OME-6548

AMENDMENT NO. 4

It is agreed this 9th day of November, 1967, between the United States of America, acting through the Department of the Interior, U. S. Geological Survey, hereinafter called the "Government," and Big Treasure Mining and Development Co., hereinafter called the "Operator," that Exploration Contract 2231 (OME-6548), dated October 12, 1966, as amended, is further amended effective March 1, 1967, as follows:

1. The time fixed by Amendment No. 3 to the Contract for completion of the work is extended from 13 to 14 months, or until December 12, 1967.

2. In Exhibit A:

(a) Under the heading Description of the Work, Stage II, the paragraph is revised to read as follows:

The work shall consist of preparing access roads and drill sites as necessary and drilling a maximum of 5,000 feet in approximately seven (7) holes. One vertical hole may be drilled approximately 1,800 feet deep at Site 3 approximately as shown on Figure 1 to explore the Naco limestone for replacement ore bodies near the Dear Creek fault. Other holes may be drilled to further explore mineralized zones indicated by the preceding holes in Stages I and II.

This amendment shall not be construed to change the estimated total cost of the contract, the aggregate amount which the Government may be required to contribute, nor the fixed unit costs of any item of work.

Executed in quadruplicate the day and year first above written.

THE UNITED STATES OF AMERICA

By Frank E. Johnson
Chief, Office of Minerals Exploration
U. S. Geological Survey

BIG TREASURE MINING AND DEVELOPMENT CO.

By David H. Kimball

Title President

Long
Smith
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MME Form 7
(2/63)

OFFICIAL FILE COPY

| Date | Surname | Code |
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| 11/14/67 | RM Smith | 120 |
| 11/14/67 | Kesbarno | 120 |
| 11/15 | Johnson | 110 |
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November 14, 1967

To: The File

From: Roscoe M. Smith
Office of Minerals Exploration

Subject: OME-6548 (Silver)
Big Treasure Mining and Development Company
Little Treasure and Adjust Mines
Pinal County, Arizona
Contract 2231

## Justification for Amendment No. 4

The contract (Description of the Work, Stage II) specifies that Drill Hole 3 at Site 3 may be drilled a maximum of 1500 feet deep. The hole was drilled 1857 feet deep and payment was made for the Government's share of the costs of the total footage in accordance with the Operator's voucher for March, 1967.

At its planned depth of 1500 feet the hole had not penetrated the Naco limestone which was inferred to contain replacement ore bodies. Sulfide minerals in the core from the overlying andesite near the bottom of the hole encouraged the Operator to continue drilling. The OME Field Officer authorized additional drilling so long as the total footage allowed by the contract was not exceeded.

The provision in the contract which specified that the 1500-foot depth was a maximum, was overlooked by representatives of both the Operator and the Government. Had it been noted at the proper time an amendment would have been prepared to authorize the additional 357 feet.

Since it was the best judgment of the Field Officer that additional drilling was justified by the geological information then at hand, and since the total drilling does not exceed the total allowed by the contract I recommend an amendment to delete the 1500-foot limit for Hole 3.

R. M. Smith
Roscoe M. Smith

Cc: Director's Reading File
Division File
Economic Geology File
OME Docket
OME Reading File
Mr. Smith

RMSmith/bsl 11/14/67

Government's copy

EXPLORATION CONTRACT
BIG TREASURE MINING AND DEVELOPMENT CO.
OME-6548

AMENDMENT NO. 3

It is agreed this 21st day of August, 1967, between the United States of America, acting through the Department of the Interior, U. S. Geological Survey, hereinafter called the "Government," and Big Treasure Mining and Development Co., hereinafter called the "Operator," that Exploration Contract 2231 (OME-6548), dated October 12, 1966, as amended, is further amended effective August 1, 1967, as follows:

1. The time fixed by Article 1 of the contract for completion of the work is extended from 12 to 13 months, or until November 12, 1967.

2. In Exhibit A:

(a) Under the heading Description of the Work, Stage I, the last paragraph thereof as added by Amendment No. 1, is revised to read as follows:

Holes 7A and 7B shall be drilled from the Adjust Tunnel. The approximate location and maximum inclination of the two holes are shown on Figure 2 entitled, "Generalized Cross Section of Drill Holes 7A and 7B," attached and made part hereof.

(b) Under the heading Estimated Costs of the Work, Stage I, as amended by Amendment No. 2, the following schedule is added:

Fixed Unit Costs[1/], Holes 7A and 7B:

| | |
|---|---|
| 1 Supervisor-geologist-engineer, $3\frac{1}{2}$ months @ $900.00/month | $3,150.00* |
| 1 Outside Consultant, 12 days @ $75.00/day | 900.00* |
| Per diem, 12 days @ $16.00/day | 192.00* |
| 1 Vehicle - 4-wheel drive, $3\frac{1}{2}$ months @ $304.00/month | 1,064.00* |

| | |
|---|---|
| 1 Compressor (rent, installation, operating costs), $3\frac{1}{2}$ months @ $910.00/month | $3,185.00* |
| Air and waterlines (700 feet each), $3\frac{1}{2}$ months @ $286.00/month | 1,001.00* |
| Accounting and office expenses, $3\frac{1}{2}$ months @ $40.00/month | 140.00* |
| Total Fixed Unit Costs | $9,632.00 |

(c) The total Estimated Cost for Stage I is revised as follows:

| | |
|---|---|
| "Total Estimated Costs Stage I" | $65,632.00 |

1/ Includes all costs whatsoever that would otherwise be allowable under Categories (1) through (7).

* Indicates a maximum.

(d) Under the heading Estimated Costs of the Work, Stage II, the schedule and the total are revised to read as follows:

The schedule for Stage I applies except that core drilling in Stage II is reduced from $35,221.00 to $25,589.00 and the Total Estimated Costs of Stage II is reduced from $56,000.00 to $46,368.00.

This amendment shall not be construed to change the estimated total cost of the contract, the aggregate amount which the Government may be required to contribute, nor the amount of any item designated as maximum.

Executed in quadruplicate the day and year first above written.

THE UNITED STATES OF AMERICA

By Frank E. Johnson
Chief, Office of Minerals Exploration
U. S. Geological Survey

BIG TREASURE MINING AND DEVELOPMENT CO.

By David H. Kimball

Title President

Long
Smith
Kirkemo
Johnson
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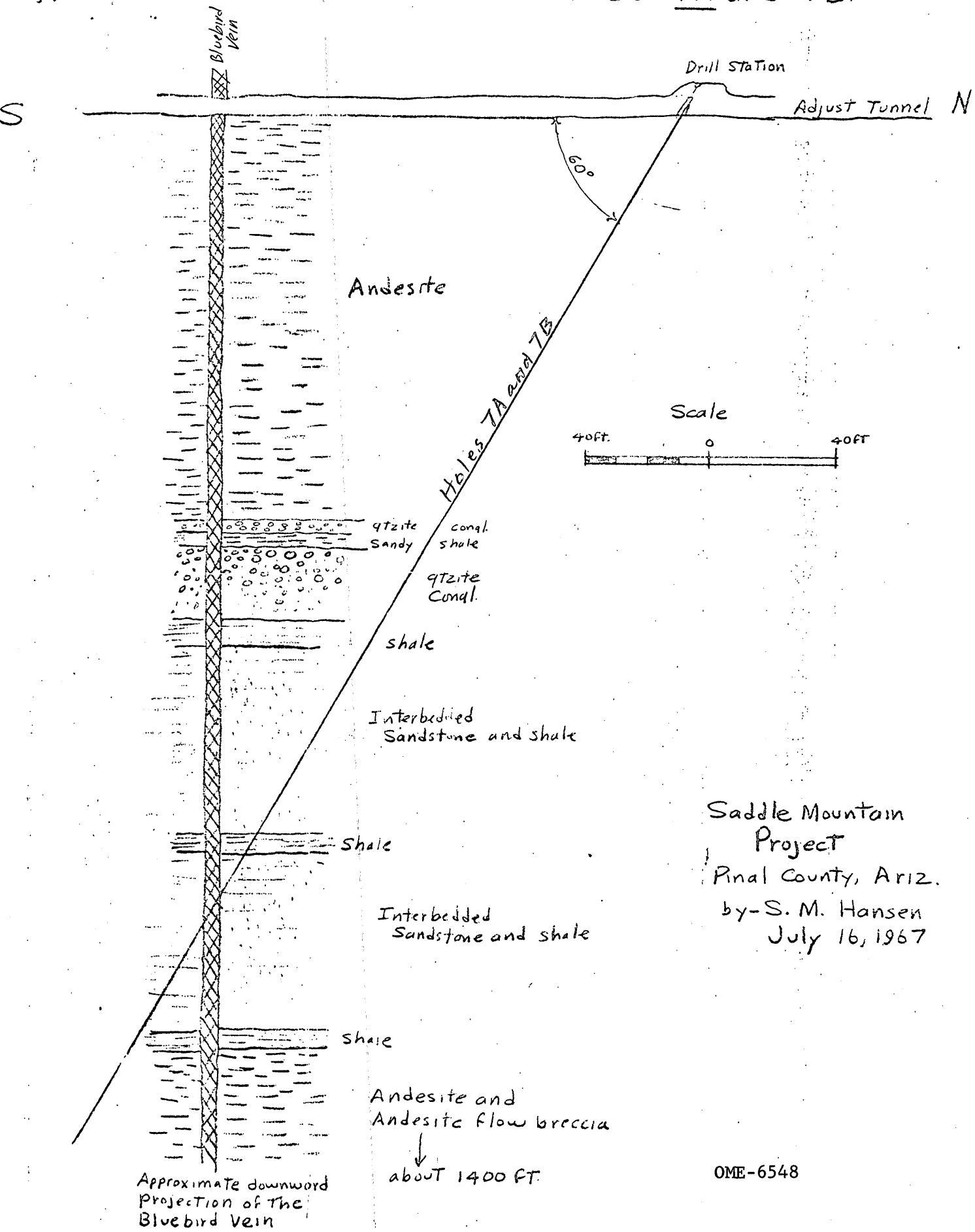
Figure 2

# Generalized Cross Section of Drill Holes 7A and 7B.




Saddle Mountain
Project
Pinal County, Ariz.
by-S. M. Hansen
July 16, 1967

OME-6548

MME Form 7
(2/63)

OFFICIAL FILE COPY

| Date | Surname | Code |
|---|---|---|
| 8/9/67 | RM Smith | 120 |
| 8/4/67 | Kirkemo | 120 |
| " | Johnson | 110 |
| | | 120M |
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August 9, 1967

Memorandum

To: The File

From: R. M. Smith, Office of Minerals Exploration

Subject: OME-6548 (Silver)
Big Treasure Mining and Development Company
Little Treasure and Adjust Mines
Pinal County, Arizona
Contract 2231

Justification for Amendment No. 3

The target area for Holes 7A and 7B has been defined more precisely by geologic mapping and stratigraphic correlation during the project. The area can be explored more effectively and with shorter holes by drilling from the Adjust tunnel than from surface site 7 as originally provided by the contract. Accordingly, the Operator requested and the Field Officer recommended an amendment to authorize cost items necessary for drilling from an underground site. The Operator's estimate of these additional costs are based on quotations from local suppliers. All items are necessary to the work and conform to present reasonable costs. Additional time is required to complete these two holes, partly because total time for the project was underestimated by the Operator and partly because procurement and installation of underground drilling equipment was not provided by the contract.

As the proposed underground drilling increases the probability of a discovery, I concur in the recommendation.

R M Smith

R. M. Smith

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

RMSmith/gla 8-9-67

Government's Copy

EXPLORATION CONTRACT
BIG TREASURE MINING AND DEVELOPMENT CO.
OME-6548

AMENDMENT NO. 2

It is agreed this 6th day of March, 1967, between the United States of America, acting through the Department of the Interior, U. S. Geological Survey, hereinafter called the "Government," and Big Treasure Mining and Development Co., hereinafter called the "Operator," that Exploration Contract 2231 (OME-6548), dated October 12, 1966, as amended, is further amended effective the date of the contract as follows:

In Exhibit A, under the heading Estimated Costs of the Work, Stage I, Actual Costs, Category (1) Independent Contracts, the third item is revised to read as follows:

Core drilling, 5,000 feet 35,221.00

| Depth, ft. | NC | NXWL | BXWL |
|---|---|---|---|
| 0 - 500 | $7.60 | $6.90 | $6.40 |
| 500 - 1,000 | | 7.60 | 6.90 |
| 1,000 - 1,500 | | | 7.60 |

This amendment shall not be construed to change the estimated total cost of the contract, the aggregate amount which the Government may be required to contribute, nor the amount of any item designated as maximum.

Executed in quadruplicate the day and year first above written.

THE UNITED STATES OF AMERICA

By Frank E. Johnson
Chief, Office of Minerals Exploration
U. S. Geological Survey

BIG TREASURE MINING AND DEVELOPMENT CO.

By Naim H. Humbach

Title President

Long
Smith
Kirkemo
Johnson
Fälsgaard
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MME Form 7
(2/63)

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| Date | Surname | Code |
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| 2/21/67 | R M Smith | 120 |
| | On leave | 120 |
| 2/21 | Johnson | 110 |
| | | 120M |
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February 21, 1967

Memorandum

To: The File

From: R. M. Smith
Office of Minerals Exploration

Subject: OME-6548 (Silver)
Big Treasure Mining and Development Co.
Little Treasure and Adjust Mines
Pinal County, Arizona
Contract 2231

JUSTIFICATION FOR AMENDMENT NO. 2

After completing the first of the proposed eight drill holes (Hole 5) in which 110 feet of casing was lost, the independent contractor found it necessary in the second hole to reduce from NXWL size to BXWL size at a depth of less than 500 feet in order to avoid a repeated excessive loss of casing. The independent contractor invoiced the Operator for this drilling at $6.40/foot. The Operator has requested that this drilling be approved.

The bid price of $6.40 per foot for BXWL drilling at depths between 0 and 500 feet was omitted from the contract through an oversight by the Government, and should be an allowable cost.

I concur in the Field Officer's recommendation to amend the contract to include the $6.40 price for BX drilling at depths of 0-500 feet.

R M Smith

R. M. Smith

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

RMSmith/gla 2-21-67

Government's copy

EXPLORATION CONTRACT
BIG TREASURE MINING AND DEVELOPMENT COMPANY
OME-6548

AMENDMENT NO. 1

It is agreed this 12th day of January, 1967, between the United States of America, acting through the Department of the Interior, U. S. Geological Survey, hereinafter called the "Government," and Big Treasure Mining and Development Company, hereinafter called the "Operator," that Exploration Contract 2231 (OME-6548), dated October 12, 1966, is amended effective the date of the contract as follows:

In Annex I,

1. Three unpatented lode mining claims are added to the land subject to the terms of the contract:

| Name of Claim | Docket | Page |
|---|---|---|
| Treasure Fraction | 475 | 429 |
| Treasure Extension | 450 | 457 |
| Treasure Extension No. 1 | 450 | 458 |

The Operator is owner of the Treasure Fraction by right of location and is owner of the two remaining claims by Assignment of Lode Mining Claims, dated December 1, 1966, from Spenst M. Hansen and Blanchet W. Hansen, his wife. A copy of the Assignment is contained in the docket of this contract and is made part hereof by reference.

2. The three claims are illustrated on Figure 3 entitled "Big Treasure Mining and Development Company," attached and made part hereof.

In Exhibit A,

1. Under the heading General Provisions, the eighth paragraph is revised to read as follows:

The Government will not contribute to the cost of any hole that is on or within 100 feet of the boundaries of either

the Concord claim or the Trenton claim, or to the cost of a hole closer than 100 feet to the outer boundary of the project area.

2. Under the heading Description of the Work, Stage I, the following paragraph is added after the list of drill holes:

In lieu of drilling holes 7A and 7B from the land surface, two holes may be drilled toward the same targets from the Adit shown on Figure 1 at inclinations modified to compensate for the different elevation. In lieu of bulldozing an access road to drill site 7, rehabilitation by bulldozing of the Adit portal site and access road shall be an allowable cost under this contract.

This amendment shall not be construed to change the estimated total cost of the contract, the aggregate amount which the Government may be required to contribute, the amount of any item designated as maximum, nor the fixed unit cost of any item of work.

Executed in quadruplicate the day and year first above written.

THE UNITED STATES OF AMERICA

By Frank E. Johnson
Chief, Office of Minerals Exploration
U. S. Geological Survey

BIG TREASURE MINING AND DEVELOPMENT CO.

By David H. Kimball

Title President

1/18/67

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Appd. Leg. Office
Smith
Shikemo
Johnson

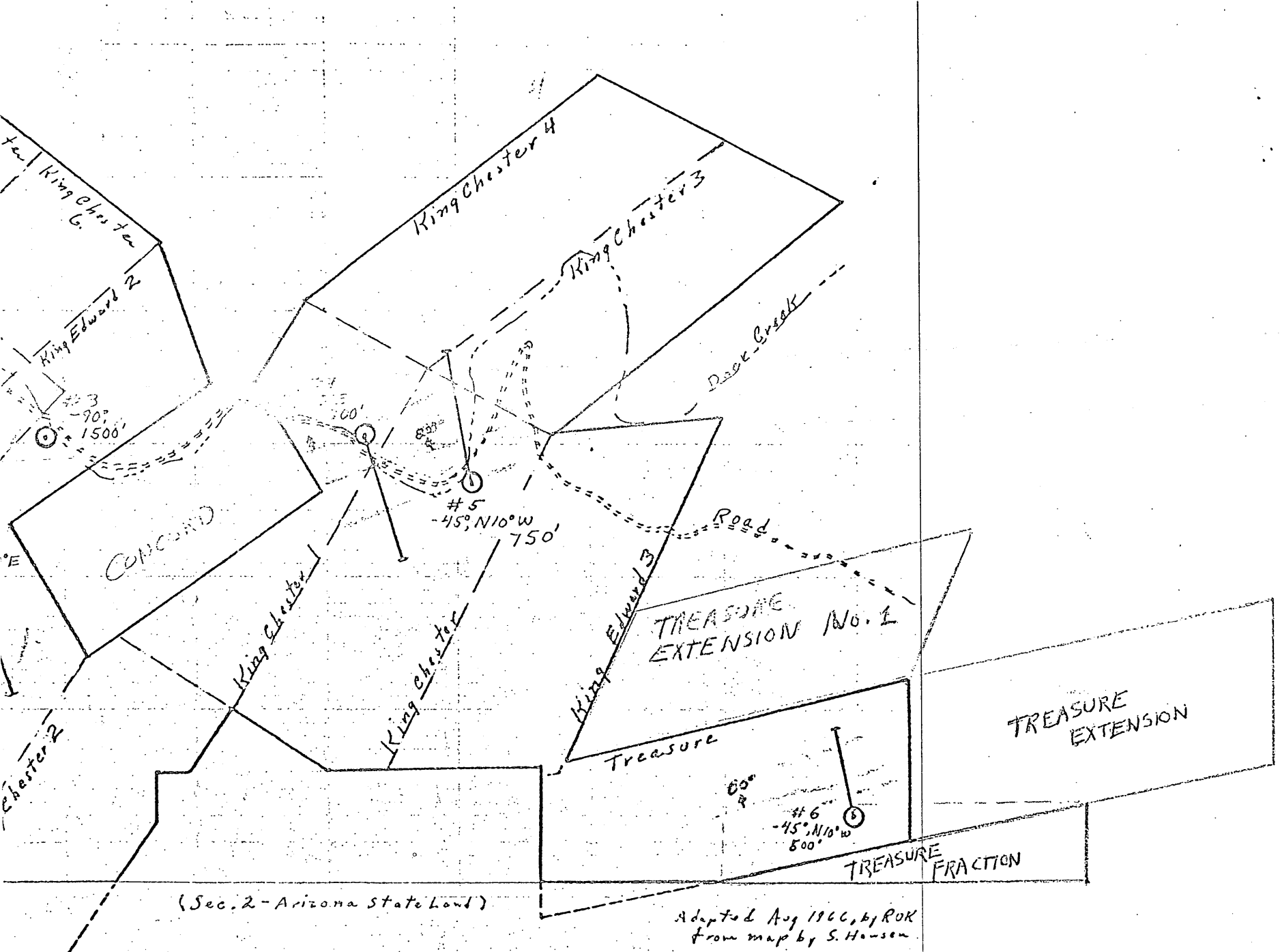


Figure 3. Big Treasure Mining and Development Company

MME Form 7
(2/63)

OFFICIAL FILE COPY

| Date | Surname | Code |
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| 12/19 | R M Smith | 120 |
| 12/20/66 | Kirkberg | 120 |
| " | Johnson | 110 |
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December 19, 1966

Memorandum

To: The File

From: R. M. Smith, Office of Minerals Exploration

Subject: OME-6548 (Silver)
Big Treasure Mining and Development Co.
Little Treasure and Adjust Mines
Pinal County, Arizona
Contract 2231

JUSTIFICATION FOR AMENDMENT NO. 1

The Operator signed the contract in order to commence work as soon as possible after assurance from the Field Officer that changes in specifications and locations of the work can be made by amendment.

By letter dated December 2, 1966, the Operator requested permission to drill proposed Hole2 closer than the specified 200 feet from the boundaries of the Trenton and Concord claims. A plat showing dimensions was submitted revealing that the 200-foot restriction prevents the proper placing of Hole 2, whereas a 100-foot restriction offers no problem. The 200-foot limit was chosen by scaling from the Operator's undimensioned maps, and a 100-foot limit would have been specified if the map had been accurate, since 100 feet is adequate to protect the Government's interest in this instance.

The Operator plans to request permission to drill Holes 7A and 7B from an underground site instead of the surface site specified in the contract, since the surface site cannot be occupied without a prohibitive amount of road construction. The original application proposed underground drilling, the contract specified surface drilling only on advice of the field examiner, and the Field Officer now agrees to underground drilling if the Operator rehabilitates the underground workings at its own expense.

A third request is to drill proposed Hole 3 in Stage I instead of Stage II, and the Field Officer offers no objection. This hole was placed in Stage II upon the recommendation of the field examiner whose reasons are considered to be valid. Approval of this request would be premature because it may never be necessary. If the results of Holes 1 or 2 are favorable, Stage II can be authorized immediately and Hole 3 can be drilled in sequence. If 1 and 2 are not favorable, then the potential of Hole 3 should be reassessed.

Three additional claims are added to the contract area to provide adequate room within the 100-foot boundary limit to drill proposed Hole 6 to greatest advantage.

R M Smith

R. M. Smith

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

RMSmith/gla 12-19-66

Government's copy

MME Form 50
July 1965

UNITED STATES OF AMERICA
DEPARTMENT OF THE INTERIOR
U. S. GEOLOGICAL SURVEY

EXPLORATION CONTRACT
(Long Form)

| Docket No. | Commodity | Contract No. | County | State |
|---|---|---|---|---|
| OME-6548 | Silver | 2231 | Pinal | Arizona |

It is agreed OCT 1 2 1965 (Date), between the United States of America, acting through the Department of the Interior, U. S. Geological Survey, hereinafter called the "Government," and

Big Treasure Mining and Development Co., a California corporation

see corres: San Ramon, Calif. 94583

whose mailing address is 125 Sedgefield Court, Dublin, ~~California 94539~~, hereinafter called the "Operator," as follows:

ARTICLE 1. Authority and scope.--(a) This contract entered into under the authority of Public Law 701, 85th Cong., 2d sess. (72 Stat. 700; 30 U.S.C. § 641 - 646), consists of this form, the attached Annex I (land description), Exhibit A (work and costs), and the maps and documents listed. The work is a search for new or unexplored deposits of the commodity designated above. The Operator shall begin the work on or before December 12, 1966 (Date), and, subject to the provisions of Article 9 and Exhibit A, shall either have completed the work within 12 months from the date of the contract or shall have incurred allowable costs (see Article 6) in a sum not less than the total cost set forth in Exhibit A.

(b) The total allowable cost of the work set forth in Exhibit A is $112,000.00. The Government will contribute ~~50~~ 75 percent of the allowable costs as they are incurred, in a total sum not in excess of $84,000.00 in accordance with the provisions of Articles 3, 4, 5, and 6. "Costs incurred" means costs that have been paid or have become due and payable, or that the Government determines have become obligations.

(c) Interest computation.--Simple interest at the rate of 7¾ percent shall accrue from the dates Federal funds are made available until the period specified for payment of royalty expires, or until the amount of Federal funds contributed is fully repaid with interest.

(d) The Operator shall not transfer or assign this contract or any right or obligation thereunder without the written consent of the Government.

ARTICLE 2. Operator's right in land.--(a) The Operator represents and undertakes that Annex I correctly describes the land which is the subject of this contract and the nature of the Operator's right of property and possession therein (whether as owner, lessee, or otherwise), and that such right, title, or interest is subject only to the following claims, liens, or encumbrances:

See Annex I

(b) The Subordination Agreement of the holder of any claim, lien, or encumbrance listed above and (if the Operator does not hold the legal title) the lien agreement of any holder of the legal title of the land (lessor, seller, optionor, etc.) are attached as follows:

See Annex I

(c) The Operator shall preserve and maintain his right, title, or interest in the land and his right to the possession thereof for the purposes of this contract, and shall devote the land and all existing improvements, facilities, buildings, installations, and appurtenances to the purposes of this contract. The Operator shall neither transfer, convey, nor surrender the land nor any right, title, or interest therein, nor permit nor suffer any claim, lien, or encumbrance thereon, without expressly referring to and providing in the instrument of conveyance, lien, or encumbrance for the preservation of the Government's right to a royalty on production and liens for the payment thereof. Two true copies of such instrument shall be furnished to the Government. If the Government's rights to royalty as provided in Article 7 have been terminated, the provisions of this paragraph (c) shall become inapplicable.

ARTICLE 3. Performance of the work.--(a) Operator's responsibility.--The work shall be performed diligently, efficiently, in a workmanlike manner in accordance with good mining standards, and in compliance with State laws governing health, safety, and liability insurance covering employment. The Operator shall provide suitable and adequate equipment, facilities, materials, supplies, and labor to complete the work as specified in Article 1(a).

(b) Independent contracts.--To the extent that the allowable costs are estimated in Exhibit A with express reference to performance by independent contractors on a unit-price basis (such as per foot of drilling, per foot of drifting, per hour of bulldozer operations), the work may be so performed (see Article 6(a), Category (1)). Any such independent contract shall refer to some specific and identifiable part of the work, and shall be subject to all of the pertinent terms and conditions of this exploration contract; but the Government shall not be considered a party thereto, and its rights under this contract, including the right to terminate its contributions, shall not be affected thereby. Regardless of the provisions of any such independent contract, the Government will participate in payments to the independent contractor only as to work performed in accordance with the provisions of this exploration contract, and only to the extent that the Government deems the unit prices for the work under the independent contract to be reasonable.

(c) Government may inspect.--The Operator shall consult with and inform the Government on all phases of the work as it progresses. The Government may enter at all reasonable times to inspect the work under the contract and production operations during the period that royalty is payable to the Government. The Operator shall provide the Government with all reasonable means of access for such inspections.

ARTICLE 4. Contribution by the Government.-- The Government will make its contribution on the basis of the monthly vouchers referred to in Article 5(b), but all payments by the Government are provisional only, subject to audit. Until the account between the Operator and the Government is finally audited and settled and the Operator's final report has been received, the Government may withhold such sums as are necessary to protect its interests. The Government may make payments for the account of the Operator directly to independent contractors and suppliers rather than to the Operator.

ARTICLE 5. Reports, accounts, audits.--(a) Operator's records.--The Operator shall keep suitable records and accounts of the work performed and of any production in which the Government may have an interest; and shall preserve those with respect to work performed for at least three years after final payment by the Government, and those with respect to production for at least three years after any obligation to pay royalties to the Government has terminated. The Government may inspect and audit said records and accounts at any time, either by itself or by a certified public accountant. The Comptroller General of the United States or his representative, until the expiration of said three-year periods, shall have access to and the right to examine all pertinent books, documents, papers, and records of the Operator. If work under this contract is carried on in conjunction with any other operations, or if labor, supervision, services, materials, supplies, equipment, facilities, or other requirements for carrying on the work are also used in connection with other operations, the costs shall be segregated and accounted for on a basis and by methods and accounts that are satisfactory to and approved by the Government.

(b) Monthly reports.--The Operator shall provide the Government with four copies of monthly reports in three sections as follows:

(1) Operator's Monthly Voucher claiming costs for work performed;

(2) Operator's Progress Report showing the number of units of the various types of work performed; and

(3) a narrative report of the work performed during the reporting period, including adequate engineering-geological maps or sketches, drill hole logs and locations, and assay reports on samples taken concurrently with advance in mineralized ground.

(Forms for reporting under (1) and (2) above will be provided by the Government; however, the original of the Operator's Monthly Voucher shall be supported by documentary evidence, such as certified copies or transcripts of payrolls and invoices, for all costs claimed under Article 6 (a) (1).)

(c) Final report.--Upon completion of the work or termination of the Government's obligation to contribute to costs, the Operator shall furnish the Government with three copies of a final report (in addition to the final monthly report). This final report shall include a geological and engineering evaluation of the results of the work performed under the contract with an estimate of the ore reserves resulting from such work, complete assay data, adequate geological and engineering maps or sketches, and a summary of the work performed and the related costs.

(d) Report of sales.--The Operator shall provide the Government with suitable accounting and documentary evidence covering all production to which the Government's royalty relates, such as two copies of smelter or concentrator settlement sheets and certified accounts of production and sale or other disposition of production.

(e) Compliance with requirements.--If the Government determines that any of the Operator's reports, records, or accounts are insufficient or incomplete, or if the Operator fails to make them, the Government may procure the preparation or completion of the same with suitable attachments as an expense of the work to which the Operator shall contribute. The Government may withhold approval and payment of any vouchers relating to insufficient or incomplete reports, records, or accounts.

ARTICLE 6. Costs.--(a) Allowable costs.--The allowable costs of the work to which the Government will contribute are limited to:

(1) the necessary, reasonable, and direct actual costs that are estimated in Exhibit A by categories as specified in this article; and

(2) fixed costs for units of work to be performed (per foot, per hour, etc.) agreed upon in lieu of actual costs and set forth in Exhibit A.

The Government will not contribute to costs under any category or subcategory omitted from the estimate of costs in Exhibit A. Any excess over any estimate which is indicated as the maximum of any category, subcategory, or item, either as to requirement or related cost; any excess over a fixed unit cost; and any excess over the total allowable cost of the work are not allowable. The Operator shall incur such excesses for his own account without contribution by the Government, but the Operator is not obligated to incur more than his agreed percentage of the total allowable cost of the work.

Any category or subcategory or element thereof not designated as a maximum in this article, or in Exhibit A may be exceeded, provided that the total allowable cost of the work, which is a maximum, is not exceeded.

CATEGORY (1)--INDEPENDENT CONTRACTS.--(See Article 3(b)). The total of this category and the average unit cost estimated for each type of work to be performed under an independent contract are maximums.

CATEGORY (2)--PERSONAL SERVICES.

Subcategory (a)--Supervision and Technical Services--All elements of this subcategory (number of supervisors, technicians, outside consultants, periods of employment, rates of pay, and total) are maximums.

Subcategory (b)--Labor.

CATEGORY (3)--OPERATING MATERIALS AND SUPPLIES.--Includes such items as drill bits and steel, explosives, fuel, pipe, power, timber, rail, and small tools costing less than $50 each.

CATEGORY (4)--OPERATING EQUIPMENT.

Subcategory (a)--Rental.--The number of each rented item [6 mine cars, 1 truck], the rate of rental [$100 per month, $5 per hour], and the total of this subcategory are maximums.

Subcategory (b)--Purchases.--The total of this subcategory is a maximum.

Subcategory (c)--Depreciation.--All elements of this subcategory (time periods, rate of depreciation, and subcategory total) are maximums.

CATEGORY (5)--INITIAL REHABILITATION AND REPAIRS.--Costs of items listed under this category include all requirements, such as labor, materials and supplies, and supervision at a rate not higher than provided for in Category (2), and shall not be duplicated under any other category. The total of this category is a maximum.

Subcategory (a)--Initial rehabilitation and repairs of existing buildings, fixtures, and installations (exclusive of mine workings).--The total of this subcategory is a maximum.

Subcategory (b)--Initial rehabilitation and repairs of operating equipment.--The total of this subcategory is a maximum.

CATEGORY (6)--NEW BUILDINGS, FIXTURES, AND INSTALLATIONS (EXCLUSIVE OF MINE WORKINGS).--Costs of items listed under this category include all requirements, such as labor, materials and supplies, and supervision at a rate not higher than provided for in Category (2), and shall not be duplicated under any other category. The total of this category is a maximum.

CATEGORY (7)--MISCELLANEOUS.--Includes requirements and costs that do not fall within any of the first six categories, such as repairs other than initial and maintenance of operating equipment, analytical work, prints and other reproductions, accounting, Operator's share of payroll taxes, liability insurance covering employment, travel, and communications.

(b) Nonallowable costs.--In addition to the limitations imposed by paragraph (a) of this Article 6 the Government will not contribute to the following costs:

(1) Costs of the land, such as rental, depreciation, depletion, or other costs of acquiring, owning, or holding possession;

(2) Indirect costs, such as general overhead, corporate management, interest, taxes (other than payroll and sales taxes), insurance (other than liability insurance covering employment), damages to persons, damages to property (other than necessary repairs or replacements of equipment or other property used in the work);

(3) Previous work performed or costs incurred before the date of this contract; and

(4) Deferred payments.--Any costs incurred by the Operator under any rental-purchase agreement, installment-purchase agreement, or any agreement for the purchase of goods under the provisions of which payment of the full purchase price is deferred more than 90 days from the delivery of the goods, unless the purchase agreement is approved by the Government in writing.

(c) Reductions in costs.--The Operator shall account for and give the Government credit for any incidental benefits, credits, or money received in the ordinary course of business in prosecuting the work (as by salvage or sale of materials or equipment, furnishing of room or board, furnishing of power or services to third persons, rebates or discounts on purchases, etc.), in the same ratio in which the Government contributes to costs; and such amounts shall be treated as a reduction in costs incurred so that they are available for use within the limit of the original total cost. The provision does not apply to receipts from production which are subject to the Government's royalty under the provisions of Article 7.

ARTICLE 7. Repayment by Operator.--(a) Certification.--If the Government considers that mineral or metal production from the land covered by the contract may be possible as a result of the exploration work, it shall so certify in writing to the Operator at any time not later than six months after a sufficient final report and final accounting (see Article 5) have been furnished.

(b) Royalty on production.--The Operator, whether or not the producer (for example, if the Operator either transfers or does not retains his interest in the land), shall pay to the Government a royalty on all minerals and metals mined or produced from the land as follows:

(1) irrespective of any certification of possible production--from the date of the contract until the lapse of the time within which the government may issue such certification or until the total net amount contributed by the Government is fully repaid with interest, whichever occurs first; or

(2) if the Government issues a certification of possible production--for a period of ten years from the date of the contract, or until the total net amount contributed by the Government is fully repaid with interest, whichever occurs first.

(c) Payment of royalty.--(1) The Government's royalty shall be five percent of the gross proceeds (including any bonuses, premiums, allowances, or other benefits) from the production sold, in the form sold (ore, concentrate, metal or equivalent), at the point of delivery (the f.o.b. point); except, that charges of the buyer arising in the regular course of business and shown as deductions on the buyer's settlement sheets (such as treatment processes performed by the buyer, sampling and assaying to determine the value of the production sold, and freight payable by the buyer to a carrier (not the Operator or producer)), shall be allowed as deductions in arriving at the "gross proceeds" as that term is used herein. No costs of the Operator or Producer are deductible in arriving at the "gross proceeds" as that term is here used.

The term "treatment processes" means those processes (such as milling, concentrating, smelting, refining, or equivalent, but excluding fabricating or manufacturing) applied to the crude ore or other production after it is extracted from the ground to put it into a commercially marketable form.

(2) The Government's royalty shall be computed and paid currently upon each lot sold, held, or used in integrated operations, as the case may be.

(d) Unsold production.--If any production (ore, concentrate, metal, or equivalent), after the lapse of six months from the date the ore was extracted from the ground, remains neither sold nor used in integrated manufacturing or fabricating operations (for instance, if it is stockpiled), the Government, at its option, as long as it so remains, may require the computation and payment of its royalty on the value of such production in the form (ore, concentrate, metal, or equivalent) it is in when the Government elects to require computation and payment. If any production is used in integrated manufacturing or fabricating operations before the Government makes its election, the Government's royalty on such production shall be computed on the value thereof in the form in which and at the time it is so used. "Value" as here used means what is or would be gross income from mining operations for percentage depletion purposes in Federal income tax determination or the market value, whichever is greater.

(e) Lien for payment.--To secure the payment of royalty (see Article 7(b)), the Operator hereby grants to the Government a lien upon his interest in the land and upon any production of minerals and metals therefrom until the royalty claim is extinguished by lapse of time or is fully paid.

(f) Notice to purchasers.--The Operator or producer shall give notice of the Government's claim for royalty to any purchaser of the production, and shall authorize and direct such purchaser to pay the royalty directly to the Government and to furnish the Government with copies of the settlement sheets. If the records of any production and sales or other disposition of production, whether the production is by the Operator or by others, are not made available to the Government, the amount of the royalty may be estimated by the Government, and this estimate shall be final and binding upon the Operator or producer.

(g) No obligation to produce.--Nothing in this contract shall be construed as imposing any obligation on the Operator or the Operator's successor in interest to engage in any production operations.

(h) Government not obligated to buy.--Nothing in this contract shall be construed as imposing any obligation on the Government to purchase any minerals and metals mined or produced from the land.

ARTICLE 8. Interests in purchased property.--(a) Title and ownership.--All costs under this contract shall be incurred by the Operator in the Operator's own name and for the Operator's own account; but any property acquired to the cost of which the Government contributes shall belong to the Operator and the Government jointly in proportion to their respective contributions although title thereto shall be taken in the name of the Operator.

(b) Preservation of property.--Until the final disposal of any property in which the Government has an interest, the Operator shall preserve and protect same for the best interest of the Government, and any reasonable and necessary cost thereof will be treated as an allowable cost of the exploration. After the completion of the work, termination of the Government's obligation to contribute, or when such property is not being used for the work, the Operator shall not use it elsewhere without the written consent of the Government and without paying a reasonable rental to be fixed by the Government for its proportionate interest.

(c) Disposal of property.--Upon the completion of the work, termination of the Government's obligation to contribute to costs, or when the property is no longer needed for the work, the Operator shall promptly dispose of salable or salvageable property in which the Government has an interest for the joint account of the Government and the Operator, either by return to the vendor, sale to others, purchase by the Operator, or sale or transfer to the Government at a price at least as high as could be obtained from others, unless the Government in writing waives its interest in any such property. Without advance approval of the sales price by the Government, the Operator shall not sell at any price any item of property that cost more than $500, and shall not sell at less than 25 percent of the purchase price any item of property that cost $500 or less. The Government, in lieu of approving the sales price for any such item, may itself purchase the item at the best price which the Operator is able to obtain or offers. Property remaining upon any termination of the work shall be considered in groups or categories (such as drill steel, explosives, pipe, or rail), and if the original cost of the remaining unexpended portion of any such group or category is less than $50, the Government waives its interest therein. If necessary to accomplish the disposal of any item, the Operator shall dismantle and sever it from the land, the cost thereof to be treated as a cost of the exploration.

(d) Default of the Operator re disposal.--If within 90 days after the completion of the work, termination of the Government's obligation to contribute to costs, or after the property is no longer needed for the work, the Operator has failed to sell or otherwise liquidate or dispose of any property in which the Government has an interest, the Government, at any time prior to final settlement under the contract, may:

(1) in writing extend the time within which the Operator must dispose of or liquidate the property;

(2) by written notice to the Operator, place upon such property what it determines to be a fair valuation thereof, not in excess of the cost less 1.66 percent per month from the date such property was purchased under this contract to the termination of said 90-day period; and such property shall thereupon be considered and accounted for as having been purchased by the Operator at the valuation so fixed by the Government; and

(3) enter and take possession of such property wherever it may be found, and remove and dispose of it for the joint account of the parties.

ARTICLE 9. Termination of the Government's obligations.--(a) If the Government determines that operations at any time have failed to achieve anticipated results and further work is not justified, the Government may give the Operator written notice thereof, and thereupon:

(1) the Government shall be free of all obligation to contribute to costs not then incurred other than such as may be allowable under the provisions of the contract as necessary and incidental to final accounting and reporting; and

(2) the Operator shall be free of all obligation to prosecute the work other than such as may be necessary and incidental to final accounting and reporting.

(b) If the Government determines that the Operator is in default under the terms of the contract, the Government may give the Operator written notice of such default with a specification of reasonable time within which the default must be cured; and if the Operator fails to cure such default as required, thereupon:

(1) the Government shall be relieved of all obligation to contribute to costs not incurred when the notice was given, other than such as may be allowable by the provisions of the contract as necessary and incidental to final accounting and reporting; and

(2) the Operator shall be free of all obligation to prosecute the work other than such as may be necessary and incidental to final accounting and reporting.

The Government may also avail itself of any other remedy the law may provide for breach of contract, including the right to rescind the contract and to demand repayment of all moneys contributed by the Government under the contract.

(c) The giving of any notice by the Government under the provisions of this Article 9 shall not affect the Government's rights as provided for in the contract with respect to royalty and liens to secure the payment thereof, and such rights shall be fully preserved.

(d) The determinations of the Government are subject to appeal under Article 13.

ARTICLE 10. Notices to be given by the Government may be delivered to the Operator, or may be sent by certified mail addressed to the Operator at his mailing address stated in this contract. If mailed, notices are deemed to have been delivered five days after the date of mailing.

ARTICLE 11. Officials not to benefit.--No member of or delegate to Congress or resident commissioner shall be admitted to any share or part of this contract or to any benefit that may arise therefrom; but this provision shall not be construed to extend to this contract if made with a corporation for its general benefit.

ARTICLE 12. Nondiscrimination in Employment. The provisions respecting nondiscrimination in employment which are required by section 301 of Executive Order 10925, dated March 6, 1961 as amended and supplemented are attached hereto as Exhibit B and are hereby incorporated in and made a part of this contract.

ARTICLE 13. Disputes.--Any dispute arising under this contract which is not disposed of by agreement shall be decided by the Director, U. S. Geological Survey, who shall reduce his decision to writing and mail or otherwise furnish a copy thereof to the Operator. The decision of the Director, U. S. Geological Survey, shall be final and conclusive unless, within 30 days from the date of receipt of such copy, the Operator mails or otherwise furnishes to the Director, U. S. Geological Survey, a written appeal addressed to the Secretary of the Interior. The decision of the Secretary or his duly authorized representative for the determination of such appeals shall be final and conclusive unless determined by a court of competent jurisdiction to have been fraudulent, or capricious, or arbitrary, or so grossly erroneous as necessarily to imply bad faith, or not supported by substantial evidence.

The term "Director, U. S. Geological Survey," as used herein includes his duly authorized representative.

ARTICLE 14. Work Hours Act of 1962 - Overtime Compensation.--This contract, to the extent that it is of a character specified in the Work Hours Act of 1962 (Public Law 87-581, 76 Stat. 357-360) and is not covered by the Walsh-Healey Public Contracts Act (41 U.S.C. 35-45), is subject to the following provisions and to all other provisions and exceptions of said Work Hours Act of 1962.

(a) Overtime requirements.--No Operator or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any laborer or mechanic to be employed on such work in excess of eight hours in any calendar day or in excess of forty hours in any workweek unless such laborer or mechanic receives compensation at a rate of not less than one and one-half times his basic rate of pay for all hours worked in excess of eight hours in any such calendar day or in excess of forty hours in any such workweek, as the case may be.

(b) Violations; liability for unpaid wages; liquidated damages.--In the event of any violation of the clause set forth in subparagraph (a) of this paragraph, the Operator and any subcontractor responsible therefor shall be liable to any affected employee for his unpaid wages. In addition, such Operator and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for

liquidated damages. Such liquidated damages shall be computed, with respect to each individual laborer or mechanic employed in violation of the clause set forth in subparagraph (a) of this paragraph, in the sum of $10 for each calendar day on which such employee was required or permitted to work in excess of eight hours or in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in subparagraph (a) of this paragraph.

(c) Withholding for unpaid wages and liquidated damages.--The U. S. Geological Survey may withhold or cause to be withheld, from any moneys payable on account of work performed by the Operator or subcontractor, such sums as may administratively be determined to be necessary to satisfy any liabilities of such Operator or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in subparagraph (b) of this paragraph.

ARTICLE 15. Copeland (Anti-Kickback) Act--Nonrebate of wages.--The regulations of the Secretary of Labor applicable to contractors and subcontractors (29 CFR, Part 3), made pursuant to the Copeland Act, as amended (40 U. S. C. 276c) and to aid in the enforcement of the Anti-Kickback Act (18 U. S. C. 874) are made a part of this contract by reference. The Operator will comply with these regulations and any amendments or modifications thereof and will be responsible for the submission of affidavits required of independent contractors thereunder. The foregoing shall apply except as the Secretary of Labor may specifically provide for reasonable limitations, variations, tolerances, and exemptions.

ARTICLE 16. Changes and added provision.--

Executed in quintuplicate the day and year first above written.

THE UNITED STATES OF AMERICA

BIG TREASURE MINING AND DEVELOPMENT CO.
(Operator)

By David H. Kimball

Title President

By Silas W. Baker
Acting Director, U. S. Geological Survey

Long
App. Sol. Off.
Smith
Kikamo
Johnson
Kilszak
Lucas

I, Owen R. Smith, certify that I am the
(Name)

secretary of the corporation named as Operator herein; that David H. Kimball, who signed this contract on behalf of the Operator, was then
(Name)

President of said corporation; that said contract was duly signed for
(Title)

and in behalf of said corporation by authority of its governing body, and is within the scope of its corporate powers.

Owen R. Smith

[ CORPORATE SEAL ]

EXPLORATION CONTRACT
BIG TREASURE MINING AND DEVELOPMENT CO.
OME-6548

ANNEX I

The land, including all rights pertaining thereto, referred to in Article 2 of the contract consists of twenty-three (23) unpatented lode mining claims and two (2) patented claims in secs. 34 and 35, T. 4 S., R. 16 E., and secs. 2 and 3, T. 5 S., R. 16 E., G&SRB&M, Saddle Mountain mining district, Pinal County, Arizona. It is shown on Figure 1 entitled, "Claim Map of Big Treasure Mining and Development Company, Pinal County, Arizona, showing proposed exploration," attached and made part hereof.

The unpatented claims are recorded in the County Clerk's office at Florence, Arizona, as follows:

| Name of Claim | Docket | Page |
|---|---|---|
| Treasure | 447 | 109 |
| Silver Lead | 103 | 319 |
| Silver Lead #2 | " | 320 |
| Maybe Hopeful | " | 321 |
| Silver King | " | 322 |
| Mountain Top | " | 323 |
| King Henry The First | 425 | 462 |
| " " " Second | " | 463 |
| " " " Third | " | 464 |
| " " " Fourth | " | 465 |
| " " " Fifth | " | 466 |
| King Edward The First | 426 | 123 |
| " " " Second | " | 124 |
| " " " Third | " | 125 |
| King Chester | " | 273 |
| King Chester No. 1 | 428 | 412 |

| Name of Claim | Docket | Page |
|---|---|---|
| King Chester No. 2 | 428 | 413 |
| " " " 3 | " | 414 |
| " " " 4 | " | 415 |
| " " " 5 | " | 416 |
| " " " 6 | " | 417 |
| " " " 7 | " | 418 |
| " " " 8 | " | 419 |

The patented claims are as follows:

| Name of Claim | Patent No. |
|---|---|
| Concord | 2179 |
| Trenton | 2180 |

The Operator is the owner of the Treasure unpatented claim under the terms of an Assignment of Mining Lease and Claim dated August 30, 1966, from Spenst M. Hansen and Blanchet W. Hansen, his wife. Spenst M. Hansen was the locator and original owner of the claim.

The Operator is in possession of the remaining unpatented claims listed above under the terms of an Assignment of Mining Leases and Claims dated April 22, 1966, from Chester L. Whitelock and Blanche D. Whitelock, his wife. C. L. Whitelock leased the Silver Lead, Silver Lead #2, Maybe Hopeful, Silver King, and Mountain Top claims from the owners, Joseph Jameson and Manuel Sosa, under terms of a Mining Lease dated May 19, 1965. The remaining unpatented claims were located by C. L. Whitelock.

The Operator is in possession of the two patented claims under the terms of the above-mentioned Assignment of Mining Leases and Claims dated April 22, 1966, from Chester L. Whitelock and Blanche D. Whitelock, his wife. Chester L. Whitelock leased the claims from Lee Acton and Margaret M. Acton, his wife, on April 29, 1965.

Copies of the two assignments are contained in the docket of this contract and are made part hereof by reference.

A Lien and Subordination Agreements executed February 25, 1966, by Joe Jameson and Manuel Sosa is attached and made part hereof.

A Lien and Subordination Agreements covering the two patented claims is waived.

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 – | 2231 |
| Contract Date | OCT 12 1966 |

LIEN AND SUBORDINATION AGREEMENTS[1]

To the United States of America:

That certain land in the County of PINAL, State of ARIZONA,

described as follows:[2] Lode mining claims lying in the Saddle Mountain Mining District. The names of the claims are as follows: SILVER LEAD; SILVER LEAD NO. 2; MAYBE HOPEFUL; SILVER KING; MOUNTAIN TOP. All these claims are recorded at Florence, Pinal County, Arizona.

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

BIG TREASURE MINING AND DEVELOPMENT COMPANY[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.)

NONE

1/ Production from the land is not required, and in the absence of production there is no obligation to pay royalty to the Government.

2/ Either (a) insert the legal description of the land, or (b) strike out the words "as follows" and insert "in a lease /or contract, deed, or other document/ dated_____, and recorded in Book_____, Page____, official records of said county". If (b) is used, the book and page of recordation must be inserted above. If the space provided is insufficient, use an Annex and refer to the Annex in the space.

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

4/ Subparagraph 1(a) does not apply to the holder of a claim, lien, or encumbrance.

4. Undertakes and agrees (a) neither to commit any act nor assert any claim in conflict with the provisions of this Agreement; and (b) to give advance notice of the Government's rights under this agreement to any subsequent transferee, mortgagee, encumbrancer, or lessee of any of the undersigned's right, title, claim, or interest in or against the land or any production therefrom, furnishing the Government with two true copies of such notice; and

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 25 day of February, 1966

Jal Jamison (Seal) _____ (Street) (City & State)

Manuel Sova (Seal) _____ (Street) (City & State)

_____ (Seal) _____ (Street) (City & State)

_____ (Seal) _____ (Street) (City & State)

_____ (Seal) _____ (Street) (City & State)

_____ (Seal) _____ (Street) (City & State)

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)

INT.-DUP. SEC., WASH., D.C. 21103

EXPLORATION CONTRACT
BIG TREASURE MINING AND DEVELOPMENT CO.
OME-6548

## EXHIBIT A

The purpose of the project is to explore by drilling from sites to be prepared on the land surface for silver-bearing ore bodies in and along the Little Treasure, Bluebird, and other quartz-barite-calcite veins which traverse andesitic volcanic rocks interstratified with sandstone and conglomerate of Cretaceous age. Additional deep drilling to explore for silver-lead replacement deposits near the Deer Creek fault in Naco limestone of Pennsylvanian age depends upon the results of drilling the veins.

## General Provisions

A bulldozer no smaller than a D-7 Caterpillar shall be used for road repair and preparation of drill sites.

All drill holes shall be completed not less than BX wireline size, and shall be cased as necessary. The Government will not contribute to the cost of casing left in a hole at the Operator's request.

Facilities shall be provided for recovering drill sludge, and such sludge shall be retained when drilling in significantly mineralized rock.

All drill core shall be stored in boxes identified as to hole number with markers in the core sections indicating the depths represented. Significantly mineralized core shall be split and one split assayed for gold and silver and for lead, zinc, or copper as warranted. Whenever core recovery is less than 50 percent, a split of the corresponding retained sludge shall be assayed separately. The remaining core shall be stored in proper sequence with the unsampled core, and the remaining sludge shall be stored in suitable containers properly identified as to hole number and depth. Stored samples shall be made available for Government inspection and possible use, and may be disposed of by the Operator with prior Government approval.

True copies of assay certificates of all samples shall be submitted with the Operator's monthly report.

All drill holes shall be logged and copies of the logs showing the locations of all samples taken and the geological formations and structures traversed by the drill holes shall be furnished monthly to the Government.

The Operator shall provide such supervision, labor, and technical services as may be required to perform the work in a satisfactory manner.

The Government will not contribute to the cost of any hole that is on or within 200 feet of the boundaries of either the Concord claim or the Trenton claim, or to the cost of a hole closer than 200 feet to the outer boundary of the project area.

The location, direction, and extent of each work item shall be subject to Government approval.

The work shall be divided into two stages. The Operator shall complete all of Stage I and as much of Stage II as is authorized in advance by the Government and confirmed in writing. Approval of Stage II shall depend upon favorable results having been obtained in Stage I.

## Description of the Work

### Stage I

The work shall consist of bulldozing and blasting access roads to six (6) drill sites, leveling the drill sites, and drilling a maximum of 5,000 feet in a maximum of seven (7) inclined drill holes at the approximate locations shown on Figure 1. The approximate bearings, inclinations, and depths of the seven holes are as follows:

| Hole | Bearing | Inclination | Depth, feet |
|---|---|---|---|
| 1 | S 45 E | -60° | 700 |
| 2 | S 20 E | -45° | 600 |
| 3 | (See Stage II) | | |
| 4 | S 15 E | -45° | 700 |
| 5 | N 10 W | -45° | 750 |
| 6 | N 10 W | -45° | 500 |
| 7A | South | -45° | 750 |
| 7B | S 30 W | -45° | 1,000 |

### Stage II

The work shall consist of preparing access roads and drill sites as necessary and drilling a maximum of 5,000 feet in approximately seven (7) holes. One vertical hole may be drilled a maximum of 1,500 feet deep at Site 3 approximately as shown on Figure 1 to explore the Naco limestone for replacement ore bodies near the Deer Creek fault. Other holes may be drilled to further explore mineralized zones

indicated by the preceding holes in Stages I and II.

## Estimated Costs of the Work

### Stage I

**Actual Costs**

Category (1) Independent Contracts

| | |
|---|---|
| Mobilization and demobilization, one bulldozer | $100.00 |
| Bulldozing roads and drill sites, 60 hours @ $20.00/hour | 1,200.00 |
| Core drilling, 5,000 feet | 35,221.00 |

| Depth, ft. | NC | NXWL | BXWL |
|---|---|---|---|
| 0-500 | $7.60 | $6.90 | 6.40 AM. |
| 500-1,000 | | 7.60 | $6.90 |
| 1,000-1,500 | | | 7.60 |

| | |
|---|---|
| Casing lost in hole, 500 feet @ $4.00/foot | 2,000.00 |
| Reaming and installing casing, 1,000 feet @ $3.40/foot | 3,400.00 |
| Cementing and redrilling, 200 hours @ $12.50/hour | 2,500.00 |
| Additives, 200 sacks, @ $7.50/sack | 1,500.00 |
| Water truck rent, 4 months @ $190.00/month | 760.00 |
| Water truck mileage, 2,000 miles @ $0.12/mile | 240.00 |
| | $46,921.00 |

Category (2) Personal Services

None except:

Subcategory (a) Supervision and Technical Services

| | | |
|---|---|---|
| 1 Supervisor-geologist-engineer | | |
| 4 months @ $900.00/month | $3,600.00 | |
| 1 Outside consultant | | |
| 8 days @ $75.00/day | 600.00 | |
| Subcategory (b) Labor | | |
| 1 Miner (surface) | | |
| 5 days @ $24.00/day | 120.00 | |
| 1 Laborer | | |
| 5 days @ $20.00/day | 100.00 | |
| | | $4,420.00 |

Category (3) Operating Materials and Supplies

None except:

| | | |
|---|---|---|
| Explosives including detonators | $ 110.00 | |
| Core boxes (cardboard) | | |
| 500 @ $1.00/box | 500.00 | |
| | | $ 610.00 |

Category (4) Operating Equipment

None except:

Subcategory (2) Rental

| | | |
|---|---|---|
| Air compressor, drill, drill steel, | | |
| 5 days @ $80.00/day | $ 400.00 | |
| Vehicle (4-wheel drive) | | |
| 4 months @ $160.00/month | 640.00 | |
| | | $ 1,040.00 |

Category (7), Miscellaneous

None except:

| | | |
|---|---|---|
| Payroll taxes and insurance @ 15% | $ 573.00 | |
| Assays for gold and silver, | | |
| 500 assays @ $3.00/assay | 1,500.00 | |
| Assays for lead, zinc, or copper, | | |
| 100 assays @ $2.00/assay | 200.00 | |
| Vehicle mileage (1,200 miles/month), | | |
| 4,800 miles @ $0.12/mile | 576.00 | |
| Accounting and office expenses, | | |
| 4 months @ $40.00/month | 160.00 | |
| | | $ 3,009.00 |

| | |
|---|---|
| Total Estimated Costs Stage I | $56,000.00 |

Stage II

| | |
|---|---|
| The schedule for Stage I applies | $56,000.00 |
| Total Estimated Actual Costs of the Work | $112,000.00 |
| Government Participation @ 75% | $ 84,000.00 |

EXHIBIT B

NONDISCRIMINATION IN EMPLOYMENT

(Section 202, Executive Order 11246, September 24, 1965)

"During the performance of this contract, the contractor agrees as follows:

'(1) The contractor will not discriminate against any employee or applicant for employment because of race, creed, color, or national origin. The contractor will take affirmative action to ensure that applicants are employed, and that employees are treated during employment, without regard to their race, creed, color, or national origin. Such action shall include, but not be limited to the following: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided by the contracting officer setting forth the provisions of this nondiscrimination clause.

'(2) The contractor will, in all solicitations or advertisements for employees placed by or on behalf of the contractor, state that all qualified applicants will receive consideration for employment without regard to race, creed, color, or national origin.

'(3) The contractor will send to each labor union or representative of workers with which he has a collective bargaining agreement or other contract or understanding, a notice, to be provided by the agency contracting officer, advising the labor union or workers' representative of the contractor's commitments under Section 202 of Executive Order No. 11246 of September 24, 1965, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.

'(4) The contractor will comply with all provisions of Executive Order No. 11246 of September 24, 1965, and of the rules, regulations, and relevant orders of the Secretary of Labor.

'(5) The contractor will furnish all information and reports required by Executive Order No. 11246 of September 24, 1965, and by the rules, regulations, and orders of the Secretary of Labor, or pursuant thereto, and will permit access to his books, records, and accounts by the contracting agency and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations, and orders.

'(6) In the event of the contractor's noncompliance with the nondiscrimination clauses of this contract or with any of such rules, regulations, or orders, this contract may be cancelled, terminated, or suspended in whole or in part and the contractor may be declared ineligible for further Government contracts in accordance with procedures authorized in Executive Order No. 11246 of September 24, 1965, and such other sanctions may be imposed and remedies invoked as provided in Executive Order No. 11246 of September 24, 1965, or by rule, regulation, or order of the Secretary of Labor, or as otherwise provided by law.

'(7) The contractor will include the provisions of Paragraphs (1) through (7) in every subcontract or purchase order unless exempted by rules, regulations, or orders of the Secretary of Labor issued pursuant to Section 204 of Executive Order No. 11246 of September 24, 1965, so that such provisions will be binding upon each subcontractor or vendor. The contractor will take such action with respect to any subcontract or purchase order as the contracting agency may direct as a means of enforcing such provisions including sanctions for noncompliance: Provided, however, That in the event the contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction by the contracting agency, the contractor may request the United States to enter into such litigation to protect the interests of the United States.'"

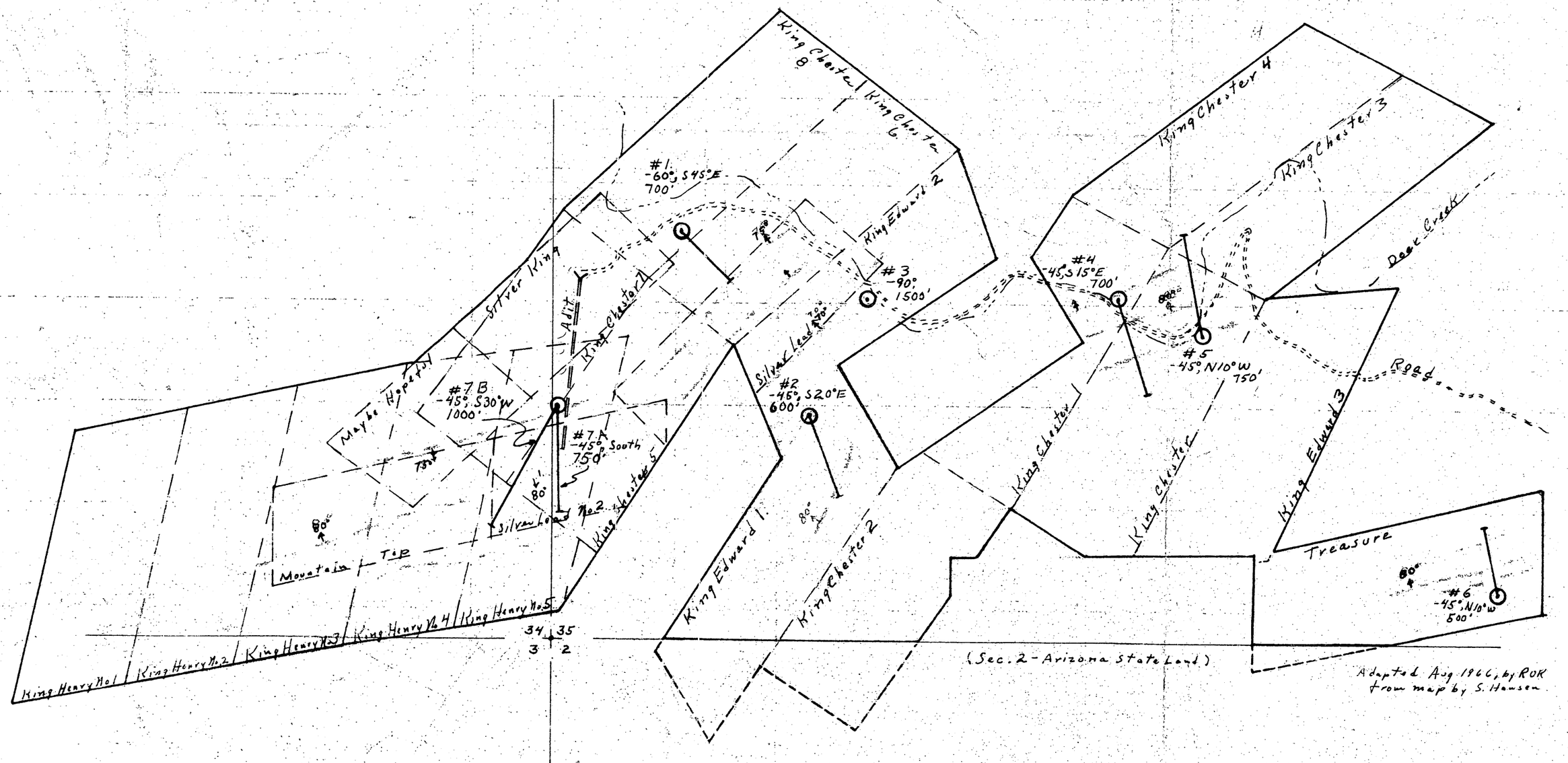


Figure 1 . Claim map of Big Treasure Mining and Development Company, Pinal County, Arizona, showing proposed exploration.

SPENST M. HANSEN, PH.D.
MINING GEOLOGIST
125 SEDGEFIELD COURT
DUBLIN, CALIFORNIA 94539

OFFICIAL
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O. M. E.
RECEIVED
SEP 22 1966
INITIALS | CODE
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September 21, 1966

Frank E. Johnson, Chief
Office of Minerals Exploration
U.S. Department of the Interior
Geological Survey
Washington 25, D.C.

Re: O.M.E.-6548 (Silver Gold)
--Big Treasure Mining and Development Co.
--Little Treasure and Adjust Mines
--Pinal County, Arizona

Dear Mr. Johnson

I appreciate the telephone call to me this morning from J. William Hasler, O.M.E. Field Officer , Region III dealing with the subject of our pending application for O.M.E. exploration assistance. Mr. Hasler asked that I provide you with the following information.

(1) A copy of the recorded notice of location for the "TREASURE" lode mining claim is enclosed in order to verify that I had ownership of the claim prior to my assignment to Big Treasure Mining and Development Co., and that I had a right to assign the claim.

The land covered by this "TREASURE" claim was overlooked and not located by Mr. Whktelock when the original locations on the property were made. In checking over the property boundaries last March, this oversight was noted by me and I located the claim in my own name to be later transferred to the company. You have a copy of the notarized assignment of this claim to the company.

(2) The name of the claim is "TREASURE". No claim exists in the area by the name of Treasure Lode to the best of my knowledge.

I hope the above information is adequate to resolve this question.

Sincerely

Spenst M. Hansen

Spenst M. Hansen
For Big Treasure Mining
and Development Co.

Phone (415) 828-4126

SMH:bh
CC: J. William Hasler, Field Officer
Region III, O.M.E.
Denver, Colorado
Enclosure:

# Notice of Mining Location

## LODE CLAIM

TO ALL WHOM IT MAY CONCERN:

This Mining Claim, the name of which is the Treasure Mining Claim, situate on land belonging to the United States of America, and in which there are valuable mineral deposits, was entered upon and located for the purpose of exploration and purchase by a citizen of the United States

(Locator must insert either "A Citizen of the United States," or "Who has declared his intention to become a Citizen of the United States.")

the undersigned, on the 20 day of March, 1966

The length of this claim is 1500 feet and 1 claim 250 feet in a S 78° W direction and 1250 feet in a N 78° E direction from the center of the discovery shaft, at which this notice is posted, lengthwise of the claim together with 300 feet in width of the surface grounds, on each side of the center of said claim. The general course of the lode deposit and premises is from the SW to the NE

The claim is situated and located in the Saddle Mountain Mining District, in Pinal county, in the State of Arizona, about 2 miles in an easterly direction from the Gila River along Deer Creek Wash. The west end line of this claim is common with the east end line of the Big Rock patented lode mining claim. The NW. corner of this claim lies N. 86° 2' W, a distance of 7117.5 ft from the cor. of tps 4 and 5 S., Rs. 16 + 17 E.

The surface boundaries of the claim are marked upon the ground as follows: The below described corners and other monuments are marked by substantial wooden posts at least 4 ft. high or by substantial rock cairns. Beginning at a point in a S 78° W direction 250 feet from the discovery shaft (at which this notice is posted), being in the center of the West end line of said claim; thence 300 feet to a N 03° W, being the NW corner of said claim; thence 1500 feet to a N 78° E being at the NE corner of said claim; thence 300 feet to a S 03° E direction to the center of the east end of this claim; thence 300 feet to a S 03° E direction, being at the SE corner of said claim; thence S 78° W, 1500 feet to the SW corner of said claim; thence N 03° W, 300 feet to the place of beginning.

Dated and posted on the ground this 20 day of March, 1966

Spenst M. Hansen

Witness

Spenst M. Hansen

Locator(s)

INDEXED COMPARED

STATE OF ARIZONA
COUNTY OF PINAL } ss.

I hereby certify that the within instrument was filed and recorded at request of Spenst M. Hansen 125 Sedgefield Court Dublin, Calif 94566 on APR 18 1966 at 2:00 P.M, Docket 319463 Page

Fee $1.00

Witness my hand and official seal the day and year aforesaid.

Sophie M. Smith
County Recorder.

By
Deputy Recorder.

| Indexed | Photostat Compared | Blotted |
|---|---|---|
| | | |



Form No. 24—Notice of Location—Lode Claim—Ampco Line Legal Blanks—Phoenix, Arizona

SPENST M. HANSEN, PH.D.
MINING GEOLOGIST
125 SEDGEFIELD COURT
DUBLIN, CALIFORNIA 94539

OFFICIAL COPY
O. M. E.
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SEP 2 1966
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110
RPH 120 S

August 30, 1966

U. S. Department of the Interior
Office of Minerals Exploration
Geological Survey
Building 25, Room 2284
Denver Federal Center
Denver, Colorado 80225 Attn: J. William Hasler
Field Officer, Region III

Re: OME-6548 (Silver Gold)

Dear Mr. Hasler

Enclosed please find one copy of the Assignment of the Treasure Lode Mining Claim to Big Treasure Mining and Development Co. This should have been enclosed with the original application material. I appreciate the telephone call from your office today advising me that it had been left out.

Thank you for the attention you have given this application. We look forward to learning of your decision.

Sincerely

Spenst M. Hansen
for Big Treasure Mining
and Development Co.

SMH:bh

P.S. Between September 2nd and September 12, I will be at 1478 El Rey St., Salt Lake City, Utah, Phone (801) KU5-0837. Any correspondence during that period should be addressed to me there.

CC: Frank E. Johnson
Chief, Office of Minerals Exploration
Washington 25, D.C.

ASSIGNMENT OF MINING LEASE AND CLAIM

In consideration of ONE DOLLAR ($1.00) and other good and valuable consideration, receipt of which is hereby acknowledged, the undersigned assignors hereby sell, transfer and assign to BIG TREASURE MINING AND DEVELOPMENT CO., a California corporation, assignee, all their right, title and interest in and to the following described lease and mining claim:

TREASURE LODE MINING CLAIM dated March 20, 1966, Pinal County, State of Arizona.

Dated: ~~May~~ August 30, 1966.

Spenst M. Hansen

Spenst M. Hansen

Blanchet W. Hansen

Blanchet W. Hansen, his wife

125 Sedgefiled Court
Dublin, California

STATE OF CALIFORNIA )
) SS.
COUNTY OF ALAMEDA )

On ~~May~~ August 30, 1966, before me, PAUL D. WELLS, a Notary Public in and for said County and State, personally appeared SPENST M. HANSEN and BLANCHET W. HANSEN, known to me to be the persons whose names are subscribed to the within instrument, and acknowledged to me that they executed the same.

Witness my hand and official seal.

PAUL D. WELLS
Notary Public
Alameda County
State of California

PAUL D. WELLS

Paul D. Wells

Notary Public in and for the State of California, with principal office in Alameda County.

CHARLES A. GALE
(1901-1958)
WM. H. GALE, JR.
LEE J. AMARAL

Law Offices
# Gale & Amaral

846-2876
62 W. NEAL STREET
PLEASANTON, CALIFORNIA

May 5, 1966

OFFICIAL
COPY
O. M. E.
RECEIVED
MAY 9 1966
MINERALS CODE
~~120 114~~
~~RMS 110~~
~~RMS 1208~~

United States Department of the Interior
Office of Minerals Exploration
Geological Survey
Washington 25, D. C.

Attention: Frank E. Johnson, Chief
Office of Minerals Exploration

Re: OME-6548 (Silver-Gold)
Big Treasure Mining and Development Co.
Little Treasure and Adjust Mines
Pinal County, Arizona

Gentlemen:

I am the attorney for Big Treasure Mining and Development Co. Enclosed are two photocopies of Assignment of Mining Leases and Claims.

Should you need any further information, please feel free to contact me.

Very truly yours,

Lee J. Amaral

LJA/vg

Enclosures

Copy sent R-III
file letter - not assignment
5/10/66
m

ASSIGNMENT OF MINING LEASES AND CLAIMS

In consideration of ONE DOLLAR ($1.00) and other good and valuable consideration, receipt of which is hereby acknowledged, the undersigned assignors hereby sell, transfer and assign to BIG TREASURE MINING AND DEVELOPMENT CO., a California corporation, assignee all their right, title and interest in and to the leases and mining claims set forth on "Exhibit A" attached hereto and made a part hereof.

Executed on April 22, 1966.

Chester L. Whitelock

Blanche D. Whitelock, his wife

494 South Main Street
Payson, Utah

Executed on April 22, 1966

Spenst M. Hansen

Blanchet W. Hansen, his wife

125 Sedgefield Court
Dublin, California

STATE OF UTAH )
) SS.
COUNTY OF Utah )

On April 22, 1966, before me Lorna B. Crump a Notary Public in and for said County and State personally appeared CHESTER L. WHITELOCK and BLANCHE D. WHITELOCK, known to me to be the persons whose names are subscribed to the within instrument, and acknowledged to me that they executed the same.

Witness my hand and official seal.

Notary Public in and for said County and State

STATE OF CALIFORNIA )
) SS.
COUNTY OF ALAMEDA )

On April 29, 1966, before me Verna J. Garibaldi, a Notary Public in and for said County and State, personally appeared ERNEST M. HANSEN and BERNICE W. HANSEN known to me to be the persons whose names are subscribed to the within instrument, and acknowledged to me that they executed the same.

Witness my hand and official seal.

Verna J. Garibaldi
Notary Public in and for the State of California with principal office in Alameda County.

VERNA J. GARIBALDI
MY COMMISSION EXPIRES AUGUST 8, 1968

ACCEPTANCE OF ASSIGNMENT OF MINING LEASES AND CLAIMS

In consideration of the above Assignment of Lease, the undersigned assignee hereby accepts the foregoing assignment of Mining Leases and Mining Claims, and agrees to make all the payments and to observe, keep and perform all the terms, covenants and conditions specified and set forth in said leases and mining claims, to be made, observed, kept and performed by the lessee or holders of said mining claims as therein provided, as fully as though the undersigned was originally named in said leases as lessee and said mining claims as holders or owners of said mining claims.

Executed on April 29, 1966.

Big Treasure Mining & Development Co.
Big Treasure Mining and Development Co.

By _____
President

By Eileen N. Smith
Secretary

State of California
County of } SS

On this 29th day of April in the year One Thousand Nine Hundred and Sixty-Six before me E. D. Antonelli a Notary Public in and for the County of Alameda State of California, residing therein, duly commissioned and sworn, personally appeared David H. Kimball known to me to be the President and Owen R. Smith known to me to be the Secretary of the Corporation that executed the within instrument and the officers who executed the within instrument on behalf of the Corporation therein named, and acknowledged to me that such Corporation executed the same.

**In Witness Whereof,** I have hereunto set my hand and affixed my official seal the day and year in this certificate first above written.

E. D. Antonelli
Notary Public
In and for said County of Alameda State of California

CORPORATION ACKNOWLEDGEMENT
Form NF 265 4 PICA, Oakland, Calif.

My Commission Expires March 14, 1967

"EXHIBIT A"

1. That certain mining lease, dated May 19, 1965, between JOSEPH JAMESON and MANUEL SOSA, as Lessors, and C. L. WHITELOCK, as Lessee, more particularly described as follows:

Situated in Pinal County, State of Arizona, to-wit:

Mining Claims in the Saddle Mountain Mining District: Silver Lead, Silver Lead #2, Maybe Hopeful, Silver King, Mountain Top.

All the above named claims are recorded at Florence, Pinal County, Arizona.

2. The Trenton and Concord Mining Claims, U. S. Patent Nos. 2180 and 2179, respectively, being a part of that certain Mining Lease dated April 29, 1965, between LEE ACTON and MARGARET M. ACTON, as Lessors, and C. L. WHITELOCK, as Lessee, in Pinal County, State of Arizona.

3. The following mining claims:

King Henry The First Mining Claim, filed and recorded on August 16, 1965 with the Recorder of the County of Pinal, State of Arizona, Docket 425, Page 462.

King Henry The Second Mining Claim, filed and recorded on August 16, 1965 with the Recorder of the County of Pinal, State of Arizona, Docket 425, Page 463.

King Henry the Third Mining Claim, filed and recorded on August 16, 1965, with the Recorder of the County of Pinal, State of Arizona, Docket 425, Page 464.

King Henry The Fourth Mining Claim, filed and recorded on August 16, 1965, with the Recorder of the County of Pinal, State of Arizona, Docket 425, Page 465.

King Henry The Fifth Mining Claim, filed and recorded on August 16, 1965, with the Recorder of the County of Pinal, State of Arizona, Docket 425, Page 466.

King Edward The First Mining Claim, filed and recorded on August 23, 1965, with the Recorder of the County of Pinal, State of Arizona, Docket 426, Page 123.

King Edward The Second Mining Claim, filed and recorded on August 23, 1965, with the Recorder of the County of Pinal, State of Arizona, Docket 426, Page 124.

King Edward The Third Mining Claim, filed and recorded on August 23, 1965, with the Recorder of Pinal County, State of Arizona, Docket 426, Page 125.

King Chester Mining Claim filed and recorded on August 25, 1965, with the Recorder of Pinal County, State of Arizona, Docket 426, Page 273.

King Chester Mining Claim Nos. 1 through 8, Docket 428, Pages 412 through 419.

ASSIGNMENT OF [illegible] LEASES AND CLAIMS

[illegible] DOLLAR ($1.00) and [illegible] and valuable [illegible] receipt of which is [illegible] the undersigned assignors hereby [illegible] GREAT [illegible] MINING AND [illegible] [illegible] leases and mining claims [illegible] and made a part [illegible]

Executed on April 22 [illegible] 1966

Chester L. [illegible] Wolock

Blanche [illegible]

494 [illegible]
Payson, Utah

Executed on 4 [illegible] 20

Sophie M. Han[illegible]

Blanche W. Hanner

125 Sedgefield Court
Dublin, California

STATE OF UTAH )
) SS.
COUNTY OF Utah )

On April 22, 1966, before me [illegible] a Notary Public in and for said County and State, [illegible] appeared CHESTER L. WHITELOCK and BLANCHE [illegible] to me to be the persons whose names are subscribed [illegible] within instrument, and acknowledged to me [illegible] same.

Witness my hand and official seal.

Notary Public [illegible]
[illegible] County and State

STATE OF CALIFORNIA )
) SS.
COUNTY OF ALAMEDA )

On April 29, 1966, before me Verna J. Garibaldi, a Notary Public in and for said County and State, personally appeared SPENST M. HANSEN and BLANCHET W. HANSEN, known to me to be the persons whose names are subscribed to the within instrument, and acknowledged to me that they executed the same.

Witness my hand and official seal.

Verna J. Garibaldi
Notary Public in and for the State of California, with principal office in Alameda County.

VERNA J. GARIBALDI
NOTARY PUBLIC-CALIFORNIA
COUNTY OF ALAMEDA

VERNA J. GARIBALDI
MY COMMISSION EXPIRES AUGUST 8, 1968

ACCEPTANCE OF ASSIGNMENT OF MINING LEASES AND CLAIMS

In consideration of the above Assignment of Lease, the undersigned assignee hereby accepts the foregoing Assignment of Mining Leases and Mining Claims, and agrees to make all the payments and to observe, keep and perform all the terms, covenants and conditions specified and set forth in said leases and mining claims, to be made, observed, kept and performed by the lessee or holders of said mining claims as therein provided, as fully as though the undersigned was originally named in said leases as lessee and said mining claims as holders or owners of said mining claims.

Executed on APRIL 29, 1966.

Big Treasure Mining & Development Co
Big Treasure Mining and Development Co.

By: [illegible]
President

By: [illegible]
Secretary

State of California
County of } SS

On this 29th day of April in the year One Thousand Nine Hundred and Sixty-Six before me E. D. Antonelli a Notary Public in and for the County of Alameda State of California, residing therein, duly commissioned and sworn, personally appeared David H. Kimball known to me to be the President and Owen R. Smith known to me to be the Secretary of the Corporation that executed the within instrument and the officers who executed the within instrument on behalf of the Corporation therein named, and acknowledged to me that such Corporation executed the same.

**In Witness Whereof,** I have hereunto set my hand and affixed my Official Seal, the day and year in this certificate first above written.

E. D. Antonelli
Notary Public
In and for said County of Alameda
State of California

CORPORATION ACKNOWLEDGEMENT
Form NF26X-4 FICA, Oakland, Calif.

My Commission Expires March 14, 1967

"EXHIBIT A"

1. That certain mining lease, dated May 19, 1965, between JOSEPH JAMESON and MANUEL SOSA, as Lessors, and C. L. WHITELOCK, as Lessee, more particularly described as follows:

Situated in Pinal County, State of Arizona, to-wit;

Mining Claims in the Saddle Mountain Mining District: Silver Lead, Silver Lead #2, Maybe Hopeful, Silver King, Mountain Top.

All the above named claims are recorded at Florence, Pinal County, Arizona.

2. The Trenton and Concord Mining Claims, U. S. Patent Nos. 2180 and 2179, respectively, being a part of that certain Mining Lease dated April 29, 1965, between LEE ACTON and MARGARET M. ACTON, as Lessors, and C. L. WHITELOCK, as Lessee, in Pinal County, State of Arizona.

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King Henry The Fourth Mining Claim, filed and recorded on August 16, 1965, with the Recorder of the County of Pinal, State of Arizona, Docket 425, Page 465.

King Henry The Fifth Mining Claim, filed and recorded on August 16, 1965, with the Recorder of the County of Pinal, State of Arizona, Docket 425, Page 466.

King Edward The First Mining Claim, filed and recorded on August 23, 1965, with the Recorder of the County of Pinal, State of Arizona, Docket 426, Page 123.

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King Chester Mining Claim filed and recorded on August 25, 1965, with the Recorder of Pinal County, State of Arizona, Docket 426, Page 273.

King Chester Mining Claim Nos. 1 through 8, Docket 428, Pages 412 through 419.

# MINING LEASE

THIS LEASE made and entered into this May 19 day of 1965, by and between JOSEPH JAMESON AND MANUEL SOSA owner of certain mining properties hereinafter described, and hereinafter referred to as "Lessor", and C. L. WHITELOCK hereinafter referred to as "Lessee"; WITNESSETH:

Lessor, for and in consideration of the payment of the rents and royalties and the performance of the covenants, terms, and conditions set forth by the Lessee to be paid, kept and performed, does by these presents grant and lease to said Lessee all of those certain mining properties belonging to Lessor situated in PINAL County, State of ARIZ., to-wit:

Mining Claims in the Saddle Mountain Mining District: Silver Lead, Silver Lead #2, Maybe Hopeful, Silver King, Mountain Top.

All the above named claims are recorded at Florence, Pinal County, Arizona.

1. TERM: The term of this lease shall be for a period of five years with the lessee having the option to buy the leased premises at any time during said term for the total price of $50,000.00. All payments made on this lease are to be applied to the purchase price. A minimum payment of $250.00 a month will be paid to the lessor.

2. RENT & ROYALTIES: Lessor will grant six months free rent to the lessee on said claims. This six-month period to begin the day this lease is signed. As consideration for this lease, lessee agrees to pay to lessor a royalty of 10% of the net proceeds received from the sale of mineral production of every kind and nature mined and shipped from the mining claims mentioned above. Net proceeds as used herein is defined to be the gross amount received from all sources from the sale of any ores mined from aforesaid properties. In the event the ore is shipped to a mill for milling or smelting, then the net proceeds shall mean net smelter returns of gross amounts received from the mill or smelter processor. The said royalty payments shall be payable within 15 days after receipt by Lessee of the money from the sale of said ore. If the 10% royalty is greater than the monthly payment of $250.00 a month, the larger amount will be paid. In the event the Lessee exercises its option to buy said leased premises, the full purchase price will be paid on or before the expiration of this lease and payments will not be less than those called for in this lease. Monthly payments will begin immediately after the six month free rent period.

3. RECORDS. Lessee agrees to keep a full, true and accurate account showing the tonnage and all shipments and sales of all minerals, metals, and other production from the said mining properties and receipts therefrom in connection therewith, which books, records and accounts may be inspected by Lessor at any reasonable time.

4. MINING OPERATIONS. Lessee further agrees to perform all mining operations in a good and workmanlike manner, to properly and adequately timber where necessary all shafts, tunnels and all underground excavations for the safety of the workmen and the preservation of said premises as a mine in a manner commensurate with good and economical mining.

5. RESERVATION OF TITLE TO EQUIPMENT. It is agreed that the title to all mining machinery, equipment, fixtures and structures erected or placed upon said mining claims and premises by Lessee shall be reserved to said Lessee and remain the personal property of Lessee, subject to removal at his will and pleasure during the continuance of this Agreement and ninety (90) days thereafter, irrespective of the manner or method of attachment to said real property; provided, that such right of removal shall not extend to foundations or mined dimbers in place, unless Lessor shall have given his written consent thereto. If Lessee is hampered by snowdrifts, washouts, inclement weather, or other climatic conditions from completing removal of said items within the specified time, then Lessor agrees to extend the time by a reasonable period if required by Lessee.

6. TERMINATION. Lessee may cancel or terminate this lease upon 10 days' notice in writing to that effect mailed to Lessor as provided under "Notice" at any time during the life of this lease. In the event of such termination, Lessee shall have the right to abandon his operation of the mining properties without the payment of any further sums, except rents and royalties required to be paid before expiration of said notice and without further penalty to the Lessee and sums of money paid to the Lessor prior to such termination shall be accepted by the Lessor and received by him in full and complete payment of all claims of every kind and nature which the Lessor may have against the Lessee.

7. DEFAULT. If Lessee fails, neglects or refuses to pay the rents and royaalties each month as herein provided, or fails or neglects to perform the other terms, covenants, or conditions or any part thereof, as herein provided, and such default continues for 30 days after notice to Lessee in writing to rectify such default, Lessor or his agents may re-enter and take possession of said mining claims and premises and may remove all persons found thereon and thereupon this agreement and lease shall be forthwith terminated and all payments of every kind theretofore made to Lessor shall be retained as rental for the use and occupation of said premises by Lessee, and thereupon within ninety (90) days Lessee shall remove his personal property and other property from said premises provided that any such notice of default sent by Lessor to Lessee must be signed by the Lessor or by the attorney for the Lessor.

8. ASSIGNMENT. This lease may be assigned in whole or in part by Lessee and upon such assignment the assignee shall be solely responsible to Lessor for such

assignee's pro rata portion of any or all of the obligations or liabilities under this lease and agreement, and Lessee shall proportionately be relieved of any or all of said obligations or liabilities.

9. NOTICE. Any notice required to be given to Lessor hereunder shall be given to him by registered mail addressed to him at: Joseph Jameson Box 26 Wankelman, Ariz or at such other address or addresses as he respectively may hereafter designate in writing from time to time.

Any notice required to be given to Lessee hereunder shall be given to him by registered mail addressed to him at: C. G. Whitelock 494 So. Main, Payson, Utah Ph #465-2711 or at such other address or addresses as he may designate in writing from time to time.

10. COMPLIANCE WITH STATE LAWS. Lessee agrees that he will operate said mine in full compliance with all State mining laws.

11. FORCE MAJEURE. In the event Lessee is prevented from performing this agreement by labor strikes, fires, floods, explosions, riots, any unusual mining casualties, acts of God, government restrictions of orders, suspension of buying by the government where no commercial market is available, severe weather conditions or other extraordinary events beyond his control, then the time of performance of this agreement by Lessee shall be suspended during the continuance of such acts which prevent performance.

12. TRANSFERABILITY. This agreement shall be binding upon and inure to the benefit of the heirs, administrators, executors, assigns and successors in interest of either Lessor or Lessee.

13. TAXES. Lessee shall pay all state and county tax assessments upon any and all structures and other improvements, machinery, equipment, tools, supplies, and personal property whatsoever placed upon the leased premises by the Lessee. Lessee shall also pay all state and county "net proceeds" or production taxes assessed against Lessee and other taxes assessed against Lessee on account of his operations hereunder. Lessor shall pay all state and county net proceeds or production taxes assessed against Lessor on account of his receipt of rents and royalties of whatever nature provided herein to be paid to Lessor by the Lessee.

14. NO LIEN NOTICE: Lessee agrees to keep "no lien" notice as set forth in Arizona Revised Statutes, Section 33-990, posted at the collar of all working shafts, tunnels and entrances to the mine and boarding houses.

15. INSPECTION OF PREMISES. Lessor or his agents may at all reasonable times and at Lessor's risk enter upon and into the leased premises for inspection and to conduct survey or sampling operations; provided, that such activities shall not unreasonably interfere with the operations of the Lessee.

IN WITNESS WHEREOF, the parties hereto have executed this Mining Lease the day and year first hereinabove written.

| LESSEE: | LESSOR: |
| --- | --- |
| Joseph Jameson | C L Whitelock |
| Manuel Sosa | |

STATE OF
COUNTY OF ss.

On the 19th day of May, 1965, before me, a Notary Public, personally appeared Joseph Jameson, Manuel Sosa and C L Whitelock, known to me to be the persons whose names subscribed to the within instrument, and acknowledged that they executed the same.

Irene Dorsey
Notary Public in and for said County and State
My Commission Expires 12/4/68

STATE OF
COUNTY OF ss.

On the _____ day of _____, 19____, before me, a Notary Public, personally appeared _____, known to me to be the person___ whose name___ subscribed to the within instrument, and acknowledged that _____ executed the same.

Notary Public in and for said County and State

STATE OF
COUNTY OF ss.

On _____, 19__, before me, a Notary Public, personally appeared _____ and _____ known to me to be the president and secretary respectively, of _____ the corporation that executed the within instrument, known to me to be the persons who executed the within instrument on behalf of the corporation therein named and acknowledged to me that such corporation executed the same.

Notary Public in and for said County and State

SPENST M. HANSEN, PH.D.
MINING GEOLOGIST
125 SEDGEFIELD COURT
DUBLIN, CALIFORNIA 94539

CENTRAL COPY
O. M. E.
RECEIVED
MAY 9 1966
INITIALS | CODE
120
RJ 110
RMB 120

May 4, 1966

Frank E. Johnson
Chief, Office of Minerals Exploration
U. S. Department of the Interior
Geological Survey
Washington 25, D.C.

Re: OME-6548 (Silver-Gold)
Big Treasure Mining and
Development Co.
Little Treasure and Adjust Mines
Pinal County, Arizona

Dear Mr. Johnson

This morning Mr. William Hasler from the O.M.E. Denver office telephoned me and suggested that the field examination of our Pinal County silver property be conducted by Mr. Robert U. King on May 20th. This is a suitable date for us, and either Mr. C. L. Whitelock or I will meet Mr. King in Tucson, the evening of May 19th and accompany him on his examination of the property.

Enclosed herewith please find two bids supporting the survey costs included in our original application. It is anticipated that we will use Mr. E. H. Jenkins (since his is the lowest bid) with a two man crew. The costs are divided as follows:

Drill holes
Mine workings
Claim corners

disallowed RMB

| | |
|---|---|
| (a) Five field days at $120 each . . . . | $600 |
| (b) Five days expenses for two men . . . | 80 |
| (c) Two and ½ days office work . . . . . | 160 |
| Total | $840 |

The original application included $900 for this item. Therefore, the cost of surveying should be reduced to $840.

A few moments ago I spoke with our attorney by telephone and he assures me that the property assignments to the corporation are completed and signed, and that he will mail them air mail-special delivery today. I trust you will receive them shortly

Thank you for your efforts in expediting our application for exploration assistance.

Sincerely

Spenst M Hansen

Spenst M. Hansen

SMH:bh
CC: William Hasler

*Mining Consultant* *U. S. Mineral Surveyor* *Topographic Maps*

HARVEY W. SMITH, E. M.
REGISTERED MINING ENGINEER
1331 NORTH 70TH STREET 946-0989
SCOTTSDALE, ARIZONA

April 20, 1966

Mr. S. M. Hansen
Big Treasure Mining & Development Company
125 Sedgefield
Dublin, California

Dear Mr. Hansen:

Thank you for calling on me to submit a proposal on your work at Winkelman, Arizona. I shall be glad to handle the engineering on your mining claims on the following quotation of prices:

| | | |
|---|---|---|
| For one week's work, | three man crew: | $175.00 per day + expenses |
| | two man crew: | $150.00 per day + expenses |

For extended periods of time, i.e. over one week; the above rates will be reduced $25.00 per day; in other words, for eight days work and over, the rate would be $150.00 for the three man crew + expenses, and $125.00 per day + expenses for a two man crew. This would apply regardless of the type of work, whether it would be stadia work or chaining work. If you are interested in a contract price, I shall be glad to discuss that with you, when I can look over the terrain. Perhaps the first day on the job, if you desire me to do it, I can discuss the contract price with you at that time and we can arrive at a satisfac tory arrangement.

I believe we can initiate this work for you probably within the next thirty days, if that is agreeable to you.

Thank you again for calling on me.

Sincerely yours,

Harvey W. Smith, Em.

Harvey W. Smith, E.M.

HWS/cmp

*Mining Consultant* *U. S. Mineral Surveyor* *Topographic Maps*

HARVEY W. SMITH, E. M.
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Thank you again for calling on me.

Sincerely yours,

Harvey W. Smith, Em

Harvey W. Smith, E.M.

HWS/cmp

General Surveying
Subdivisions
U.S. Mineral Surveys

**E. H. Jenkins**
*Registered Land Surveyor*

4373 E. 16th Street
Tucson, Arizona

EAst 5-5706

April 28,1966

Mr. Spenst M. Hansen
Engineering Geologist
125 Sedgefield Court,
Dublin, California 94539

Dear Mr. Hansen:

In acknowlegement of our recent telephone conversation, I respectfully submit the following fee schedule.

2 man party - $ 15.00 per hour. 8 hr. day $ 120.00
3 man party - $ 18.75 per hour. 8 hr. day $ 150.00

No overtime charge on weekdays- straight hourly basis.
Time and one half on Sundays.

Office work - $ 8.00 per hour, straight.

Materials - Claim corners at cost. No charge on lath, stakes etc. within reason.
Claim corners material can be supplied by client and is desired.

Expenses (Motels, meals) at cost, approx $ 8.00 per day per man.

At least 7 days notice for scheduling is requested.

Trusting the above meets your requirement.

Sincerely yours
E. H. Jenkins
E. H. Jenkins

General Surveying
Subdivisions
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Sincerely yours
E. H. Jenkins
E. H. Jenkins

UNITED STATES
DEPARTMENT OF THE INTERIOR
OFFICE OF MINERALS EXPLORATION

U. S. Geological Survey -- Denver Federal Center
Building 25- Room 2284
Denver, Colorado 80225

March 28, 1966

Memorandum

To: Chief, OME

From: Field Officer, Region III

Subject: The Big Treasure Mining and Development Company, A California Corporation, 125 Sedgefield Court, Dublin, California 94539.

The subject applicant is applying to the Office of Minerals Exploration for financial assistance to explore for silver on the Little Treasure--Adjust property in the Saddle Mountain Mining district, Pinal County, Arizona. The estimated cost of the project is $109,727.00. The claims under consideration are located in Sections 34 and 35 of T. 4 S., R. 16 E., in the Saddle Mountain Mining District, Pinal County, Arizona. Some of the claims are under lease and others have been located by the applicant. The property lies approximately 3-1/4 miles southeast of the Christmas mine owned by Inspiration Consolidated Copper Co. The area lies within the Christmas Quadrangle, Gila and Pinal Counties, Arizona that is the subject of USGS Bulletin 1161-E "Geology of the Christmas Quadrangle, Gila and Pinal Counties, Arizona by Ronald Willden. The quadrangle is one of several heretofore unmapped critical ones in the heart of the Arizona copper belt. Three mines, the Adjust, Little Treasure and Lee's Mine were worked in the early 1900's and there is a reported production totaling some 134,185.43 ounces of silver from a total of 4,525.62 tons of ore, and the average grade of ore was 29.6 ounces of silver per ton with some by-product lead, zinc and gold. The applicant proposes to explore a series of at least six mineral bearing veins with 9 diamond drill holes from the surface as well as underground, totaling 7,500 feet. The general proposal is reasonably well conceived but the costs proposed appear to be quite high. The Metler Brothers Drilling Company had done considerable drilling in the area of the Christmas Mine and their costs are undoubtedly well founded. The applicant under Costs, Item 5(b), (c), (d), and (e) appears to be duplicating Geologic and Engineering costs, and he has been advised of this. Mr. Ronald Willden, Geologist, U. S. Geological Survey, reviewed the application at my request and his remarks are included with the application. The application is herein enclosed.

J. William Hose

OPTIONAL FORM NO. 10
MAY 1962 EDITION
GSA GEN. REG. NO. 27

5010-108

UNITED STATES GOVERNMENT

# *Memorandum*

TO : William Hasler

DATE: March 21, 1966

FROM : Ronald Willden

SUBJECT: Application for OME loan by Big Treasure Mining and Development Company on property in Christmas Quadrangle, Arizona.

I have read the subject application and believe that it is reasonably well conceived. In general I find only minor points of difference in the presentation of the geologic features. The applicant is basing part of his exploration work, however, on the premise that the contact between the Cretaceous volcanic rocks and the Paleozoic limestones will be much shallower than I suggested in the U. S. G. S. Bull. 1161-E, and I think this premise is shaky at best. He postulates a connection between the Christmas and Quartzite Mountain faults with the application property largely on the upthrown block. This connection may be valid but if it is the Inspiration Copper Co. diamond drill hole in sec. 2, T. 5 S., R. 16 E. is also on the upthrown block and the depth to the contact was about 3000 in that hole. An irregular pre-volcanic surface is a reasonable postulate, but a relief of 1200(+) feet on the surface in a distance of about 1 mile which would be required to intersect the contact at 1500' depth in proposed surface drill hole number 3 doesn't seem so reasonable. No such relief is evident along the Cretaceous-Paleozoic contact on the north side of the Deer Creek syncline where the contact is exposed for nearly 11 miles.

The applicant proposes that the 8 holes be cored throughout their total length. Whether this is warranted, I'm not prepared to say, but Inspiration Copper cored the entire length of their exploration hole.

Ron Willden

Ronald Willden
Geologist

SPENST M. HANSEN, PH.D.
MINING GEOLOGIST
125 SEDGEFIELD COURT
DUBLIN, CALIFORNIA 94539

March 5, 1966

Office of Mineral Exploration
U. S. Geological Survey
Regional Office
Denver Federal Center
Denver, Colorado 80225

Attn: William Hasler

Dear Mr. Hasler

Enclosed herewith please find two completed applications and two sets of supplementary supporting documents for an O.M.E. loan. This loan is for financial assistance to explore for silver ore on our Pinal County, Arizona mining property. As set forth in detail in the application, this property has a history of silver production dating back to 1901, and to date, has produced more than 135,000 ounces of silver. The metal for which the property has been mined is silver, and no other metal values in substantial amounts have been produced. We are thus asking for O.M.E. loan assistance to the amount of 75% of the cost of the exploration project.

The proposed exploration consists mainly of 8 diamond drill core holes. Three of these are from an underground station, and five are from the surface. The total drilling footage is 7,500 feet. Our recommendation is to core throughout the entire lengths of all the holes, based on work in other parts of the district. Cuttings alone are usually insufficient to define the zones of silver mineralization, and zones not now suspected may be present. The item of core boxes was inadvertently left off the estimated cost summary sheet in the application. The cost of this item totals $562.50, for 375 core boxes at $1.50 each. One building in reasonably repair now on the property will serve for core storage.

On the aerial photograph overlay enclosed with the application, you will notice two patented claims surrounded by the application property. Our company presently has these claims under lease with an option to buy, but these are not included in the application because the present owner has refused to sign the MM52 forms. None of the planned exploration comes within 100 feet of the boundaries of these claims, nor is there any substantial development presently in existence on them. The application tract includes 17 lode mining claims, and all the property that has ever produced any commercial silver ore. We do not feel that omission of these two claims should be a hindrance to out exploration program.

Perf. Bond waive! - no work.

SPENST M. HANSEN, PH.D.
MINING GEOLOGIST
125 SEDGEFIELD COURT
DUBLIN, CALIFORNIA 94539



Your early attention to this application will be appreciated. We have confidence that commercial silver ore will be discovered as a result of this exploration program. We have out funds set aside for this purpose, and are anxious to begin.

Sincerely

Spenst M. Hansen

Spenst M. Hansen
Vice President
Big Treasure Mining and
Development Co.

SMH:bh

MME Form 40
Jan. 65

Budget Bureau No. 42-R1308
Approval expires Dec. 31, 1968

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

# 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.)*

Big Treasure Mining and Development Co.
(A California Corporation--State
corporate approval pending)

APPLICANT DO NOT USE THIS BLOCK

DOCKET NUMBER 6548

DATE RECEIVED 3/30/66

REGION III

DIVISION CODE

BUSINESS ORGANIZATION *(Check one)*

INDIVIDUAL
CORPORATION X
PARTNERSHIP
OTHER *(Specify)*

STATE IN WHICH FIRM IS ORGANIZED Calif.

LIST CORPORATE OFFICERS OR PARTNERS HERE, IF APPLICABLE

| NAME | ADDRESS | TITLE |
|---|---|---|
| David H. Kimball | 136 Belle Meade Pl<br>Dublin, Calif. | President |
| Spenst M. Hansen | 125 Sedgefield Court<br>Dublin, Calif. | Vice Pres. |
| Owen R. Smith | 4475 Belmont Way<br>Castro Valley, Calif | Sec. Treas. |

MINERAL(S) FOR WHICH YOU WISH TO EXPLORE
Silver

ESTIMATED COST OF PROJECT
$ 109,727.00

PROPERTY NAME: Little Treasure-Adjust

LOCATION — COUNTY: Pinal — STATE: 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.

February 25, 1966
DATED

Spenst M. Hansen
BY *(Signature)*

Corporation Vice President
TITLE

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

# INFORMATION REQUIRED WITH THIS APPLICATION

## 1. Financial Eligibility:

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

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

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

## 2. Applicant's Rights in Land:

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

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

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

## 3. Physical Description:

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

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

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

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

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

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

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

## 4. Accessibility of Property:

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

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

## 5. Exploration Work:

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

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

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

## 6. Experience:

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

## 7. Estimate of Costs:

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

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

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

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

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

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

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

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

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

SPENST M. HANSEN, PH.D.
MINING GEOLOGIST
125 SEDGEFIELD COURT
DUBLIN, CALIFORNIA 94539

February 28, 1966

APPLICATION SUBMITTED TO:

U.S. Geological Survey
Office of Mineral Exploration
Denver, Colorado

1. FINANCIAL ELIGIBILITY

(a) Private Sources. See attached sheets designated as exhibits 1 (a).

(b) Applicant. The Big Treasure Mining and Development Company, a California Corporation. Board of Directors and Officers of the corporation are as designated below:

Officers:

President: David H. Kimball
1293 Belle Meade Court
Dublin, California

Vice President: Spenst M. Hansen
125 Sedgefield Court
Dublin, California

Secretary-Treasurer: Owen R. Smith
4475 Belmont Way
Castro Valley, California

Board of Directors:

William E. Carter
3910 Wilson
Castro Valley, California

David H. Kimball
1293 Belle Meade Court
Dublin, California

Chester L. Whitelock
494 South Main Street
Payson, Utah

Owen R. Smith
4475 Belmont Way
Castro Valley, California

Spenst M. Hansen
125 Sedgefield Court
Dublin, California

This is an independent corporation and owned in total by the above and approximately 15 other individuals. There are no parent, affiliated, or controlling companies or organizations.

(c) Applicants Share of Cost. The funds necessary to provide our share of the cost of the exploration work will be placed in an escrow account in the Hayward National Bank, Hayward, California, upon notice from the OME of approval of the application. The funds are now available, plus necessary working capital.

2. Applicant's Right in Land

(a) Interest. The parcel of mining property to be developed under this application includes two separate groups of lode mining claims. These groups are enumerated below:

(1) Five unpatented lode mining claims held under lease from Joseph Jameson and Manuel Sosa by C. L. Whitelock and assigned to the Corporation. The names of the claims are: Silver Lead; Silver Lead No. 2; Maybe Hopeful; Silver King; and Mountain Top. Two true copies of the lease are enclosed as exhibit No. 2(a)2.

(2) Twelve unpatented lode mining claims located in the name of Chester L. Whitelock. The names of these claims are listed below:

if assignor retains an overriding interest then get L&S

| Claim Name | Docket No. | Page No. |
|---|---|---|
| King Chester | 426 | 273 |
| King Chester No. 1 | 428 | 412 |
| King Chester No. 2 | 428 | 413 |
| King Chester No. 3 | 428 | 414 |
| King Edward the First | 426 | 123 |
| King Edward the Second | 426 | 129 |
| King Edward the Third | 426 | 125 |

| Claim Name | Docket No. | Page No. |
|---|---|---|
| King Henry the First | 425 | 462 |
| King Henry the Second | 425 | 463 |
| King Henry the Third | 425 | 464 |
| King Henry the Fourth | 425 | 465 |
| King Henry the Fifth | 425 | 466 |

No liens, mortgages, or other encumbrances are against any of the above described property to the best knowledge of the applicant.

(b) Legal Description. The mining claims enumerated above in part 2(a) of this application are located in Sections 34 and 35 of T. 4 S., R. 16 E.; and Sections 2 and 3 of T. 5 S., R. 16 E.; of Saddle Mountain Mining District, Pinal County, Arizona.

The unpatented lode mining claims are tabulated above in part (a) giving recording date, docket number and page number for each location notice. All claims are recorded in the records of the Pinal County Recorder, Florence, Arizona.

Various portions of the property have been known in the past as: The Adjust Mine; The Little Treasure Mine; Lee's Mine; and the Bluebird Vein.

(c) Lien Agreements. Five copies of MM52 signed by Joe Jameson and Manuel Sosa relating to the five unpatented claims leased from them are enclosed herewith.

3. Physical Description

(a) Previous Operations. The property included within this application was developed, explored and mined until the late 1920's as three separate properties. These were: The Adjust Mine; The Little Treasure Mine; and The J. W. Lee Mine. The history of each of these is briefly summarized

below.*

(1) The Adjust Mine. This property was operated and explored sporadically from about 1900 until May, 1922. During this period at least 640 tons of good-grade silver ore had been shipped. At that time there existed more than 1,500 feet of workings, mainly on the Bluebird Vein. Additional exploration and mining was carried on between 1922 and 1925 with the shipment of several thousand tons of ore. Attached herewith as exhibits 3(a)1, 3(a)2, and 3(a)3, respectively, are: a longitudinal section and assay map of the Bluebird Vein; the plan and elevation of the Adjust Mine, and compiled shipping records of the Adjust Mine. No mining or exploration of consequence is known to have occurred between the late 1920's and the present.

Existing mine workings include those shown on the maps 3(a)1 and 3(a)2, plus one east trending tunnel approximately 875 feet in length, extending from near the bottom of Deer Creek Wash (on the Silver King Claim) to within about 300 feet of the downward projection of the Bluebird vein. This tunnel (Silver King Tunnel) is intended to be used as a station for underground diamond drilling. The tunnel is approximately 5 x 7 feet in dimension with an arched overhead, and is in good repair. One ore bin constructed of heavy timber is located about 50 yards from the tunnel entrance. This bin is in fair condition.

(2) The Little Treasure Mine. This property was originally located and developed by N. H. Miller of Winkelman about 1901. A road was built, two tunnels were constructed and a few carloads of ore were mined before about 1910. During the 1920's, the property was reopened, and

*Information contained in this section was taken from the files of the Department of Mineral Resources, State of Arizona, Phoenix, Arizona, and from U.S. Geological Survey Bulletin No. 771 by Clyde P. Ross, published in 1925.

more than 75 thousand ounces of silver were recovered. A shaft at least 70 feet deep with two drift levels is located to the north of Deer Creek Wash, and believed to be part of the workings constructed on the Little Treasure property prior to 1925. The shaft is filled with water below 60 feet. The shaft timber and the upper crosscut are in fair condition.

No exploration or production of consequence is known to have taken place on the Little Treasure property since the late 1920's.

(3) Lee's Mine and Adjacent Property. No production of consequence has been known to have occurred from this part of the application property. Several shallow exploration shafts and drifts, almost all of which are in poor condition, are present on several silver-bearing veins. No production facilities of any consequence now exist.

(b) Prior Interest. The applicants have had no interest whatever in the prior operations on the application property.

(c) Past and Current Production. There is no current production. Past production is only incompletely known. Records obtained from the State of Arizona, Department of Mineral Resources indicate a total production of at least 134,185.43 ounces of silver from a total of 4,525.62 tons of ore. The average grade of ore was 29.6 ounces of silver per ton with some by-product lead, zinc, and gold.

# PREVIOUS PRODUCTION HISTORY DURING THE PERIOD 1921 THROUGH 1925 ON THE ADJUST AND LITTLE TREASURE MINES

## ADJUST MINE

| Year | Dry Tons Shipped | Total Oz. Silver | Av. Grade Oz/Ton |
|---|---|---|---|
| 1921 | 287.51 | 13,931.13 | 48.6 |
| 1922 | 560.99 | 27,514.45 | 49.1 |
| 1923 | 724.06 | 17,684.25 | 23.5 |
| TOTAL: | 1,562.55 | 59,139.83 | 38.0 oz/ton |

## LITTLE TREASURE MINE

| Year | Dry Tons Shipped | Total Oz. Silver | Av. Grade Oz/Ton |
|---|---|---|---|
| 1922 | 160.30 | 8,920.09 | 55.7 |
| 1923 | 1,887.79 | 49,467.92 | 26.2 |
| 1924 | Not available | Not available | Not available |
| 1925 | 914.98 | 16,657.61 | 18.2 |
| TOTAL: | 2,963.07 | 75,045.62 | 25.6 oz/ton |

Total ounces silver from application property ..... 134,185.45

Total tons of ore shipped ..... 4,525.62

Average grade of silver ore produced ..... 29.6 oz. Ag per ton

These records include production from the Adjust Mine and Little Treasure Mine between 1921 and 1925. No payment for metals other than gold and silver was made. (See exhibit No. 3(a)3.)

(d) Ore Reserves. Some silver ore of undetermined tonnage and grade is presently known in the upper portions of the veins partially developed by the Little Treasure and Adjust Mines. Assay maps and sections in exhibits 3(a)1, and 3(a)2, and 3(a)4, are indicative of ore. This data is not sufficient to determine more than the existence of silver mineralization and to provide incentive for more complete exploration and further development of the vein structures.

(e) Geologic Features. The surface of the property consists of volcanic and sedimentary rocks of Cretaceous age, intruded by numerous porphyry dikes and sills. Considerable regional and local folding is present with a predominant easterly and northeasterly trend. At least two sets of silver-bearing fissure veins transect the property. The geology is more specifically outlined and described in the following paragraphs.

The subsurface of the property consists of an undetermined thickness of volcanic and sedimentary rocks of Cretaceous age. The Cretaceous rocks are underlain by a thick sequence of Paleozoic carbonate rocks; the uppermost unit of which is the Naco Limestone with a maximum thickness of 1,500 to 1,700 feet.

At least 3/4 of the rocks outcropping consists of the monotonous thickness of dark gray to brown colored andesite flows. Individual beds grade into one another. Distinctive beds that can be used as markers are almost entirely absent. Andesite flow breccias (auto-breccias) are the predominant texturely types. Bedding is poorly delineated, and accurate dips and strikes are very difficult to obtain. However, the inferred attitude of the beds from the surrounding area, and also such bedding as can be measured, indicate a general northeasterly strike with a gentle 10° to 25° dip to the

southeast. Approximately 1 mile southeast of the southern boundary of the application property, a drill hole penetrated nearly 3,000 feet of andesite before being bottomed in Naco Limestone. Intermixed with the andesites are poorly graded sandstones and conglomerates. These are well exposed on the extreme southwestern edge of the property. A more complete description of these Cretaceous andesites and sediments will be found on pages 11, 12, 13 and 14 of Bulletin 771, and pages 25, 26, and 27 of USGS Bulletin 1161-E (copies of which are attached).

The Cretaceous andesites and sediments are intruded by numerous porphyry dikes which have been divided into three groups (Bulletin 1161-E). These are: microdiorite, feldspar-mica porphyry, and hornblende andesite. In some parts of the property the various dikes are so numerous that they comprise the majority of the surface exposure. Detailed description of the lithology of these dikes is given in the attached excerpts from Bulletins 771 and 1161-3.

The sub-surface units probably consist of the Naco Limestone of Pennsylvanian age, the Escabrosa Limestone of Mississippian age, the Martin Formation (limestone) of Devonian age, and underlying crystalline rocks and quartzite of Cambrian and Pre-Cambrian age. The carbonite rocks underlying the volcanics will be of importance to the below described exploration project only in the event their depth below the surface is less than now suggested by Willden and others. In the event the veins exposed at the surface extend downward through the andesites into the limestones, widening of the veins by the replacement of the wall rock may occur, since favorable environment for the deposition of replacement principal metal and base metal deposits will likely exist.

The structural features locally, and in the immediately surrounding area remain relatively unknown. The monotonous andesite sequence makes the mapping of structure extremely difficult. The most recently published

geologic map (1964 by Ronald Willden) does not show any faults passing through this area whatever. Field mapping by the writer, however, had disclosed the presence of a number of important faults of moderate to large displacement passing through the property. The most important of these runs parallel with the bottom of the Deer Creek Wash for a distance of more than one thousand feet before leaving the Wash to the northeast. This fault has a probable displacement of at least several hundred feet. The fault plane strikes N 75° E and dips about 75° to the southeast. The direction of movement is not certain, but preliminary estimates are that this fault is normal, with the down thrown block to the southeast. It is believed by the writer that a fault zone connecting the Christmas and Quartzite Mountain faults passes through the vicinity of the property, probably somewhat to the south. These latter two faults are shown on Willden's 1964 map projecting both from the east and the west into the general vicinity of the property, but are not mapped in the area of andesite outcrop.

There are at least six important veins of the property. They are tentatively classed as epithermal, fissure type. Based on attitude, veins may be divided into two groups. The east-west trending veins, including the Bluebird and Silver King Veins strike nearly due east, and dip very steeply in either direction or are vertical. The northeast striking veins, including the Little Treasure, and Silver-Lead veins strike approximately N 35° to 55° E and dip between 50° and 70° to the northwest.

The vein gangue consists of quartz, barite and calcite. The sulfide minerals consist of galena, pyrite and sphalerite. Silver occurs as the principal metal of value, and is usually associated with the galena and pyrite. Some silver minerals sometimes are noted. The most important of which are pyrargyrite and native silver (wire silver has been encountered in the Little Treasure Mine). The ore shoots do not necessarily occupy the entire vein, nor are they always limited to the vein width. Ore thicknesses vary

from a maximum of more than 12 feet to a minimum of a few inches. An average ore thickness of 3 to 4 feet over considerable lateral distance is not uncommon. Barren vein material is frequently noted, as is also mineralized andesite beyond the vein walls.

The vein structures themselves are remarkably persistant. Several of the veins, notably the Bluebird, Silver King and Silver Lead veins can be traced on the surface for more than 1,000 feet. Over a substantial portion of this distance, in the case of the Bluebird vein, the vein is of mineable width (greater than 3 feet). An available assay map indicates that the Bluebird vein contains some ore of a grade which is now commercial, or near commercial. The depth of surface oxidation and weathering on the veins varies from about 20 to a maximum of not more than 100 feet. Almost no exploration has taken place below a depth of 150 feet on any of the vein structures. Available data to date indicates that the primary (unoxidized or sulfide) portions of the veins are essentially unchanged with regard to their silver content from the portions of the veins below the superficial zone of presumed secondary enrichment. It is thus inferred that the vein structures continue downward. The mineralized portions of the veins may continue along strike and down dip beyond the presently developed and explored zones of the comparable grade and thickness. Some lead and zinc has probably been recovered as by-products from the early periods of operation, however, available records do not provide specific grades and tonnages. The veins were mined for their silver content, and the minor amounts of gold, zinc and lead recovered were by-products. The secondary (oxidized) minerals observed in the upper portions of the veins include primarily carbonates, and sulfates of lead, zinc, and iron, with considerable iron oxide staining and some gypsum.

(f) Goal of Exploration. The veins now known to exist on the property have been formed along zones of strong shearing and brecciation. The veins are

persistent; it not being uncommon for individual veins to be traceable on the surface for distances of more than a thousand feet. In places, the mineralization and alteration associated with the veins are sufficiently strong that ore minerals have been deposited in significant amounts for more than ten feet outside the boundaries of the veins. Wall rock alteration is widespread, and in some places intense. The most common types are propylitization, and pyritization. Locally, calcitization and argillic alteration are important.

Numerous northeast trending dikes and small intrusive bodies of feldspar-mica porphyry (equivalent to the quartz mica diorite of Ross) are exposed at the surface. Intrusions of this rock type are commonly associated with substantial sized ore bodies in other parts of the district, notable examples of which are the Christmas and Seventy-Nine Mines, across the Gila River.

Since substantial production of silver ore has already occurred from veins exposed at the surface on this property, and other favorable geologic characters exist, indicating the possible existence of substantial additional tonnages of undiscovered ore, additional exploration is justified. The following points tend to substantiate this conclusion:

(1) Maximum exploration depths to date on this property have reached no more than 150 feet, and has consisted primarily of simple surface prospecting and sampling of underground development workings and stopes. Underground work on the property has consisted of shallow underground mining on a strictly small scale basis. No serious attempt has ever been made to develop ore below the shallow surface stopes, crosscuts and shallow exploration shafts. Assay maps indicate no significant change in silver values below the zone of surface enrichment to the lowest part of the work on any of the veins. Also, since silver has been the principal metal of value throughout the entire production history of the property, it is to be expected that

such a circumstance will continue as the veins are explored laterally, and at greater depth for the discovery of additional ore.

(2) The numerous veins present and the two directions of strike of the veins indicate the possibility of a junction on the property of the two separate vein systems. Other geologic observations such as the strong easterly trend in the fault system mapped at the surface, and the general geologic environment, tend to substantiate this possibility. Along the course of these two vein systems, and at their junction, important undiscovered ore bodies of more than ordinary magnitude have developed. Such would tend to supplement the known ore shoots within the partially developed portions of the vein structures.

(3) As Ross pointed out in U.S.G.S. Bulletin 771, pages 39-41, it is conceivable that veins in this area might be found to grade into contact-metamorphic replacement deposits at depth under favorable conditions. Ross further suggested that the thickness of the andesite overlying the Paleozoic limestone units might be in the order of 1,000 feet. At least one drill hole in any comprehensive program on this property should investigate this possibility. It should be pointed out that Ross has an excellent record of prediction regarding ore bodies in the district. Nearly thirty years before the principal ore body was discovered in the Christmas Mine, Ross predicted its existence on page 41 of this same bulletin by commenting, ". . . that valuable ore bodies might be expected on the down thrown side of the Christmas fault in the limestone lithology favorable to the production of ore bodies." More recent writers, including Willden, have suggested that in the general area of the application property, the depth to the favorable horizons of limestone might be 3,000 feet and greater. While the point of view held by Willden might well prove to be correct, considerable field data based on field mapping of the property during the period August through November, 1965, by the writer, indicates that the

depth to the limestone on the north side of a strong fault system which bisects the property is likely 1,000 feet or less. If such does indeed prove to be correct, replacement ore bodies of substantial size containing Silver-Lead ores could occur in the favorable limestone beds underlying the andesite exposed at the surface.

Sampling data available from the previous operations described in part 3(a), are graphically summarized in exhibits 3(a)1, 3(a)2 and 3(a)3. Some supplementary sampling has been done by the applicants in recent months. The main function of this sampling has been to substantiate the quality and accuracy of the existing assay maps, to verify the grade of silver ore which is now exposed and accessible in existing mine workings, and to provide first-hand information on the very important matter of what is ore and what is not, and where the highest grade ore occurs within the vein structures.

(g) Copies of geologic and engineering reports. Several geologic and mining engineering reports covering all or portions of the property are in possession of the applicant. Two copies of each of the following are enclosed:

(1) An unsigned mining engineer's report (probably retyped from the original) obtained from the files of the Department of Minerals Resources, State of Arizona in Phoenix. This report is five pages long and was apparently written for promotional purposes. The information contained therein is essentially correct, however, it is to be expected in such a report, that favorable aspects are emphasized and embellished, while the unfavorable are eliminated or de-emphasized. Also, while many of the conclusions presented in this report are correct, the bias of the writer is evident.

(2) The second report is a mining engineering report covering property, a portion of which is included in the application tract. This report

is also unsigned and apparently was abstracted in large part from USGS Bulletin 771 by Ross.

(3) A mining engineering report under the date of April 3, 1961 by Louis A. Smith. The stationery carried the letterhead of the Department of Mineral Resources, State of Arizona, and is designated Field Engineer's report. This report is presumed to be reliable, and Engineer Smith to be an employee of the State of Arizona, and without bias. The report tends to bear out this assumption. While most of the material presented verifies the observations made by Ross and Ransome, other observations are also made. These are not entirely favorable. Engineer Smith postulates that erosion has removed substantial overlying portions of the vein network. Smith did recommend that additional exploration be carried out.

(4) U.S. Geological Survey Bulletin 771, entitled, "Ore Deposits of the Saddle Mountain and Banner Mining Districts, Arizona," by Clyde P. Ross, 1925. The Ross report is 72 pages in length and represents the most comprehensive and outstanding piece of geologic work that has been done in the district to date. Some pages of this report have been reproduced and included with this application. The pages attached herewith provide basic geologic data on portions of pre-existing mine properties included within this application tract.

(5) U.S. Geological Survey Bulletin 1161-E, entitled, "Geology of the Christmas Quadrangle Gila and Pinal Counties, Arizona," by Ronald Willden, 1964. Willden's report accompanies a geologic map of the Christmas Quadrangle. He mentions the ore deposits of the Saddle Mountain Mining District (which include the application tract) only in passing.

In summary of the above listed reports, it might be said that except for general geologic setting, and some specific geology of the upper portions of

the veins, the application tract is not well known geologically. The greatest areas of incertainty may be summarized as follows: (1) the lateral and vertical extent of the veins; (2) specific control of the veins and their genetic relationships to the Feldspar-mica porphyry intrusions; (3) movement and attitudes of the faults; (4) the thickness and attitude of the andesite volcanic rocks, and the depth to the Paleozoic carbonates; (5) and the possibility for the occurrence of replacement deposits. The proposed exploration plan will provide answers to some of these questions and offers an unusually high possibility of discovering new silver ore bodies of commercial size and grade. How large?

## 4. ACCESSIBILITY OF PROPERTY

(a) Directions for Reaching the Property. The O. M. E. representative will be met and conducted to and around the property by either Mr. Chester L. Whitelock, 494 South Main Street, Payson, Utah, phone (801) 465-2711; or by Spenst M. Hansen, 125 Sedgefield Court, Dublin, California, phone (415) 828-2051.

The property is located about 7 miles from Winkelman, Arizona. The best route is to travel northeast from Winkelman along Highway 77 toward Globe, a distance of about 5 miles. A right turn is then made into the mouth of Deer Creek Wash. Proceed then across the Gila River and about 2 miles east along a poor road to the property. All except the last 400 yards of road is accessable to two wheel drive pickup trucks. The river crossing and the Deer Creek road are not recommended for ordinary highway automobiles.

An alternative route exists which reaches the property after about 11 miles of driving for Winkelman. This road joins Deer Creek about 1/2 mile east of the property. The routes formerly joined, but about 3/4 mile of road has been washed out by flooding along Deer Creek and is now impassable. The mine workings can easily be reached on foot from either of the two access roads after only a few minutes walk.

(b) Shipping and Supply Points. The shipping and supply points are Winkelman-Hayden (7 miles) and Globe (35 miles).

## 5. EXPLORATION WORK

The proposed exploration work consists of five (5) diamond drill holes from the surface and three (3) diamond drill holes from a station underground in the Silver King drift. Existing mine workings will be mapped geologically, and systematically sampled to provide data supplementary to that obtained from the drill holes. The specific items are outlined and explained below. ?

(a) Description of Each Item of Work

(1) Surface drill hole No. 1. This drill hole is planned for a total length of 1,000 feet at an angle of 45° in a direction S 40° E. The first 500 feet of the hole to be NXWL with a 100 ft. collar pipe. The bottom 500 feet to be BXWL. Core is to be taken throughout the hole. This hole begins near the old Adjust Mine campsite, and is planned to intersect the series of northeasterly trending veins exposed at the surface on the Silver Lead and Silver Lead No. 2 claims.

(2) Surface drill hole No. 2. This drill hole is planned for a total length of 1,000 feet at an angle of 45° in a direction of S 25° E. This drill hole will explore the highly altered and mineralized ground lying N.E. of the Trenton patented claim. This drill hole should also intersect at least two well developed vein structures in an area where the intersection of the two vein systems is projected. The first 500 feet to be NXWL with a 100 ft. collar pipe. The botton 500 feet to be BXWL.

(3) Surface drill hole No. 3. This is to be a vertical drill hole with a total depth of 1,500 feet. The first 500 feet to be NXWL with a 100 ft. collar pipe. The lower 900 feet of the hole to be BXWL.

This vertical hole is placed to intersect several veins dipping to the N.W. and will explore for the depth of the Naco Limestone formation. This hole is along the trend of both sets of mineralized vein structures and should provide valuable information regarding mineralization at depth.

(4) Surface drill hole No. 4. This drillihole is planned for a total length of 1,000 feet at an angle of 45° in a direction S 25° E. The location is about 300 feet northeast from the Little Treasure shaft. This drill hole is placed so as to explore the highly mineralized ground lying S.E. of the Little Treasure shaft. Several veins are exposed at the surface and should be intersected, including the Little Treasure vein. This drill hole also lies on the N.E. projection of the Bluebird vein. The first 500 feet to be NXWL with a 100 ft. collar pipe. The bottom 500 feet to be BXWL.

(5) Surface drill hole No. 5. Total planned length is 400 feet.at an angle of 45° in a direction N 15° W. The entire hole is to be NXWL with a 100 ft. collar pipe. This hole is placed to intersect and explore the N.E. extension of the Little Treasure vein.

(6) Underground diamond drill station. The station, complete with water and air lines is necessary to carry out the underground portion of the diamond drill program. Boyles Brothers Drilling Co. has informed us that 20 to 25 feet of open space behind the drill rig is needed opposite the direction of the hole. Also adequate air and water for drilling must be delivered to the drilling face. To construct a usable station at the end of the Silver King drift, the drift must be repaired in several places; muck from minor roof collapse must be removed and muck from the station excavation must be disposed of.

(7) Underground diamond drill hole No. 1. This drill hole is to be drilled approximately horizontal in a due south direction from the end of the

drift. The length is to be 750 feet. The hole will end approximately 50 feet from the property boundary. The Silver King drift (tunnel) was originally run to intersect the Bluebird vein at a depth of from 300 to 400 feet beneath the surface. However, the vein was never intersected, the downward projection being approximately 250 feet south of the drift face. This drill hole will effectively extend the drift to the Bluebird vein, and explore virgin ground beyond it.

(8) Underground diamond drill hole No. 2. Total length of 800 feet at an angle of 30° downward and in a direction S 20° E. This drill hole should intersect the Bluebird vein at another point, and explore mineralized ground surrounding it.

(9) Underground diamond drill No. 3. Total length of 1,000 feet at an angle of 30° downward, and in a direction S 70° E. This drill hole should provide a third point of intersection with the Bluebird vein, and should also explore some highly mineralized adjacent ground. It should be noted that underground holes 2 and 3 extend into the area of junction of the two major vein systems, which is one of the most significant target areas of the proposed exploration effort.

(10) Mapping and sampling of existing mine workings. Since numerous old mine openings, prospect pits, etc. are to be found on the property, they should be systematically mapped geologically and sampled for assay. It will be necessary to have a geologist on the property continuously during the drilling operations, and this work can and should be done during periods when his attention to the drilling is not immediately required.

(11) Road repair and construction of surface drill sites. No road need be constructed, but the existing road should be repaired to allow drill rigs, water trucks, and other support vehicles access to the property.

Repair is needed on approximately 6,300 feet of road from the junction with the county road to the east (upstream - Deer Creek Wash).

The locations of the surface diamond drill holes have been selected partly in view of reducing access difficulty for the drill rigs. However, some work will need to be done to provide easy access and a level drill pad of adequate size.

(12) Stripping overburden from surface exposures of veins. In several locations on the property (e.g. 300 feet east of surface drill No. 1, near surface drill hole No. 2, and near surface drill No. 4) veins can be trenched at the surface. Since a bulldozer will be on the property for road repair and drill site construction anyway, the trenching should be carried out and the veins sampled.

(b) No access road need be built. Only the repair of the existing road is proposed. The total length of road needing repair is 6,300 feet. The road will need to be widened and washed out spots filled in and built up. It is proposed that a bulldozer (TD-14) with a hydraulic blade be used. Some drilling and blasting on a small scale may also be necessary.

(c) Upon execution of an O.M.E. contract it is expected that work can begin within 30 days. It is expected that approximately six months (26 weeks) will be required to complete the work. The anticipated schedule is as follows:

| Phase of Work | Time for Job | Total Elapsed Time |
|---|---|---|
| Bulldozer | 3 weeks | 3 weeks |
| Underground drill station construction | 6 weeks | 9 weeks |
| Underground diamond drilling | 15 weeks | 24 weeks |
| Surface diamond drilling (Simultaneous with Underground) | 15 weeks | 24 weeks |

| Phase of Work | Time for Job | Total Elapsed Time |
|---|---|---|
| Contingency and completion | 2 weeks | 26 weeks |

6. EXPERIENCE

The officers and Board of Directors of the Big Treasure Mining and Development Co. have ample training and experience to conduct the proposed exploration work. Specific information is given as follows.

Spenst M. Hansen, Vice President, and mining geologist consultant. Education - B.S. degree in Geological Engineering from the University of Utah, and the Ph.D. degree in Mining Geology from the Missouri School of Mines. Employment experience developing mineral deposits - Bear Creek Mining Co. (Kennecott), Roberts Mining Co., Eldorado Consolidated Mining Co., and Consolidated Mining Co. of Canada.

Chester L. Whitelock, Member of Board of Directors. Twenty-six years of practical mining experience developing and bringing to production mining properties. Mr. Whitelock worked for more than eight years in the Tintic mining district of central Utah, founded and managed the Whitelock Uranium Company during the early 1950's, participated in the discovery and development of the western Utah beryllium and fluorspar deposits between 1957 and 1963, and presently is the part owner and superintendent of the Queen of Sheba Mine (presently being operated profitably) in Inyo County, California.

Mr. William E. Carter, Mr. Owne R. Smith, and Dr. David H. Kimball are all independent business owners and operators in the Castro Valley area, California. They are experienced in the administration of successful business ventures and in conducting contracting arrangements such as will be involved in the proposed mining exploration.

This group of five individuals who will direct the venture is well balanced from

the standpoints of technical competence, practical experience, and sound business judgment. The work will be supervised in the field by Mr. Hansen and Mr. Whitelock.

SPENST M. HANSEN, PH.D.
MINING GEOLOGIST
125 SEDGEFIELD COURT
DUBLIN, CALIFORNIA 94539

# COST OF PROPOSED EXPLORATION WORK

## 1. Bulldozer Work

To prepare drill stations and repair existing road sufficiently to permit access of drilling equipment water trucks. Also, some stripping to uncover portions of veins hidden by shallow overburden.

Mercer bid $40.00/hr

(a) Rental of bulldozer, complete with operator and support, and including fuel and moving costs.

D-8 Model 46-A Hydraulic Caterpillar
10 days (Hogen Bid), plus $150.00 moving charge ..... ($3,150)

37.50/hr

? high

(b) Comparable work could be done by a TD-14 hydraulic bulldozer with an estimated time of 18 days at $21.50 per hour complete, with no charge for moving ..... $3,096
(This figure is used)

To be contracted?

## 2. Underground Drill Station Preparation and Necessary Repair of Existing Access Drift (To be performed by applicants) Total ..... $7,230

Specifications

Outline of work:

| | | |
|---|---|---|
| (1) | high 90 man days (miners) ..... | $2,700 |
| (2) | Equipment rental (compressor, hammers, mucker, steel, etc.) ... | 2,100 |
| (3) | 400 ft. of rail (from face to cross-cut) ..... | 800 |
| (4) | 1,000 ft. of 2-inch air line ..... | 1,075 |
| (5) | 1,000 ft. of 1-inch water line ... | 535 |

30/man day

- Bid

50%

50%

50%

## 3. Underground Diamond Drilling

(a) 2,600 ft. of underground diamond drilling at a cost of $10.13 per ft. Total ..... $26,340

(b) Subdivision of above expense (as per Boyles Bros. bids.

| | | |
|---|---|---|
| (1) | Direct drilling costs (all holes to be drilled NXWL for the first 500 ft. and BXWL thereafter..... | $16,640 |
| (2) | Cementing labor and materials.... | 5,200 |
| (3) | Casing and transport ..... | 1,300 |
| (4) | Contingency (10%) including reaming and other costs ..... | 2,440 |
| (5) | Compressors (drilling air) ..... | 3,200 |

4. Surface Diamond Drilling (Boyles Bros.)

(a) 4,900 ft. of surface diamond drilling at cost of $10.48 per ft. Total ..... $51,353

(b) Subdivision of above expense:

| | | |
|---|---|---|
| (1) | Direct drilling costs (as per Boyles Bros. bid). All holes to begin NXWL. | |
| | 3,800 ft. at $6.90 per ft. ..... | $26,220 |
| | 1,100 ft. at $7.60 per ft. ..... | 8,360 |
| (2) | Estimated cementing costs through fracture zones and near the surface in poorly consolidated rock (500 hrs. at $12.50 each, plus $1,500 for materials ..... | 7,750 |
| (3) | Water truck rental (3 months and 2,250 miles) ..... | 840 |
| (4) | Casing and transportation ..... | 3,500 |
| (5) | Contingency (10%) ..... Includes reaming and other costs | 4,687 |

5. Sampling, Assaying, Geologic Work, Supervision and Miscellaneous

(a) Assaying rock samples and drilling core (1,000 samples)

(1) Assaying charge for gold and silver (Salt Lake City) $2.50 each ..... $ 2,500

(2) Shipping, sample preparation and handling $1.25 each ..... 1,250

(b) Geologist to provide technical guidance, supervision, and evaluate drill core for 24 weeks (including applicable payroll taxes) $312 per week ..... $ 7,388

(c) Rental of 4-wheel drive truck to haul core, and provide for supervisory field transportation, including estimated mileage. ($42 per week plus 12¢ per mile --24 weeks at 300 miles average each week) ..... 1,870

(d) Consulting engineer and/or mining geologist. Six months contract retainer (including expenses) for supervision and consultation as required at $800 per month. ($625 per month retainer fee and $175 per month expense allowance) ..... 4,800

(e) Contract Surveying of drill holes and existing mine workings to provide horizontal control ..... 900

(f) Bookkeeping and clerical expense at $75.00 per week ..... 1,800

(g) Liability and Workmen's Compensation insurance ..... 1,200

Total ..... $21,708

6. Total Cost of Project ..... $109,727

Requested Loan Amount $ 82,295.25

Exhibit 1(a)

SPENST M. HANSEN, PH.D.
MINING GEOLOGIST
125 SEDGEFIELD COURT
DUBLIN, CALIFORNIA 94539

December 11, 1965

Crocker-Citizens National Bank
1086 Second Street
Livermore, California

Dear Sirs:

The purpose of this letter is to make a request for a loan to explore approximately three hundred fifty acres of mining property for commercial deposits of silver ore. The parcel of mining property consists of the below listed three groups of mining claims.

Two patented lode mining claims (under lease with option to buy)--approximate acreage 28,

Five unpatented lode mining claims (under lease with option to buy)--approximate acreage 80,

Fourteen owned unpatented lode mining claims--approximate acreage 250.

This mining property is located in portions of sections 34 and 35, T.4S., R.16E. of Pinal County, Arizona.

These claims occupy what we believe to be a favorable environment for the deposition of economic deposits of silver ore. In several places on the property, positive evidence of commercial silver mineralization is exposed at the surface. The past production of silver from the property, based on shipping records currently in our possession, totaled more than 75,000 ounces during the period 1921 through 1925 alone, and probably has exceeded 300,000 ounces since production began in about 1905.

The estimated cost of the exploration program necessary to determine the value of the property is somewhat in excess of one hundred thousand dollars ($100,000.). This program will include underground diamond drilling (4 holes totaling approximately 3,500 ft.) and, surface diamond drilling (5 holes totaling approximately 4,000 ft.). The program will also include thorough geologic mapping of the existing vein structures, and sampling of the veins exposed in the presently existing and accessable underground mine workings. Our present cash reserves are such that an additional $75,000.00 will be sufficient to carry out this planned exploration program.

Our needs permit wide latitude with regard to the terms of the loan, and in the manner in which the loan may be secured. We propose the following arrangements, but will consider any alternate terms which you may suggest. We feel that the loan should be made on a five year basis and be repaid from production or sale of the developed mining property. The mining property and the future production therefrom is offered as security for the loan. We will also be willing to offer part ownership in the property, in addition to repayment of the loan, as a special consideration in order to make this loan more attractive to your bank.

Numerous well known geologists have evaluated this mining property and have been, in general, favorable in their recommendations. We feel the likelihood of developing large tonnages of commercial silver ore are excellent. In the event substantial tonnages of commercial grade ore are developed, the property will have a value many times the loan amount requested.

We will be grateful for your favorable consideration of our proposal. We look forward to your reply. The below listed individuals are acting as trustees in behalf of the corporation presently pending approval by the State of California Corporation Commission. The proposed name of the corporation is, The Big Treasure Mining and Developement Company. In the event the loan is concluded, it will be made to the corporation.

Sincerely,

William E. Carter
3910 Wilson Ave.
Castro Valley, Calif.

David H. Kimball
136 Belle Meade Pl.
Dublin, California

Loland L. Simpson
5022 Tyler Lane
Castro Valley, Calif.

Chester L. Whitelock
494 South Main St.
Payson, Utah

By: Ernest M Hanson
Consultant

SMH:ej

**CROCKER-CITIZENS NATIONAL BANK**
CHARTERED 1870
LIVERMORE OFFICE
1986 SECOND STREET • LIVERMORE, CALIFORNIA 94551

December 23, 1965

Mr. Spenst M. Hansen, Ph.D.
Mining Geologist
125 Sedgefield Court
Dublin, California

Dear Mr. Hansen:

We have considered your request, dated December 11, 1965, in regards to a commercial loan, concerning your mining claims and mining property. We are sorry to inform you that we are not in a position at this time to make this type of loan.

We appreciate the fact that you have considered us and we recognize that you do have experience in this line but we are not making this type of loans.

Sincerely,

C. C. Marcussen

C. C. Marcussen
Assistant Vice President and
Manager

CCM:mg

Exhibit 2 (c)

SPENST M. HANSEN, PH.D.
MINING GEOLOGIST
125 SEDGEFIELD COURT
DUBLIN, CALIFORNIA 94539

December 11, 1965

First Security Bank of Utah
Payson Office
Payson, Utah

Dear Sirs:

The purpose of this letter is to make a request for a loan to explore approximately three hundred fifty acres of mining property for commercial deposits of silver ore. The parcel of mining property consists of the below listed three groups of mining claims.

Two patented lode mining claims (under lease with option to buy)--approximate acreage 28,

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Fourteen owned unpatented lode mining claims--approximate acreage 250.

This mining property is located in portions of sections 34 and 35, T.4S., R.16E. of Pinal County, Arizona.

These claims occupy what we believe to be a favorable environment for the deposition of economic deposits of silver ore. In several places on the property, positive evidence of commercial silver mineralization is exposed at the surface. The past production of silver from the property, based on shipping records currently in our possession, totaled more than 75,000 ounces during the period 1921 through 1925 alone, and probably has exceeded 300,000 ounces since production began in about 1905.

The estimated cost of the exploration program necessary to determine the value of the property is somewhat in excess of one hundred thousand dollars ($100,000.). This program will include underground diamond drilling (4 holes totaling approximately 3,500 ft.) and, surface diamond drilling (5 holes totaling approximately 4,000 ft.). The program will also include thorough geologic mapping of the existing vein structures, and sampling of the veins exposed in the presently existing and accessable underground mine workings. Our present cash reserves are such that an additional $75,000.00 will be sufficient to carry out this planned exploration program.

Our needs permit wide latitude with regard to the terms of the loan, and in the manner in which the loan may be secured. We propose the following arrangements, but will consider any alternate terms which you may suggest. We feel that the loan should be made on a five year basis and be repaid from production or sale of the developed mining property. The mining property and the future production therefrom is offered as security for the loan. We will also be willing to offer part ownership in the property, in addition to repayment of the loan, as a special consideration in order to make this loan more attractive to your bank.

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William E. Carter
3910 Wilson Ave.
Castro Valley, Calif.

David H. Kimball
136 Belle Meade Pl.
Dublin, California

Loland L. Simpson
5022 Tyler Lane
Castro Valley, Calif.

Chester L. Whitelock
494 South Main St.
Payson, Utah

By: Samuel M. Hanson
Consultant

SMH:ej

First Security Bank of Utah
NATIONAL ASSOCIATION

PAYSON OFFICE

PAYSON, UTAH

December 24, 1965

Mr. Spenst M. Hansen
125 Sedgefield Court
Dublin, California 94539

Dear Mr. Hansen:

Thanks so much for your application of a loan on behalf of your intended mining development, but the policy of our bank does not permit us to invest in undeveloped and unproven enterprises.

Wishing you success in all that you do and a Merry Christmas to you and your wife.

Very truly yours,

Roy Broadbent
Manager

RB:zbc

MEMBER FIRST SECURITY CORPORATION SYSTEM
LARGEST INTERMOUNTAIN BANKING ORGANIZATION

Exhibit 3(c)

TO

Attn: L. M. Hansen - Consulting Engineer

FROM

**Hagen Construction Co., Inc.**

P .O. BOX 150
GLOBE, ARIZONA
PHONE: GA 5-5784

SUBJECT: We Wish to submit our bid to do

DATE: Jan 22-1966

FOLD ↑ the Following described work within in area of Deer Creek Wash and Gila River. - Roadways - Drill Sites. Working time - fully Operated and Maintained $37.50 per hour. Use of D8 - 46A - Full Hydralic Ripper - Dozer - Tilt.

Moving costs $300.00 if less than 10 working days
150.00 if more than 10 working days.

PLEASE REPLY TO ⟶ SIGNED Ron G. Anderson

DATE

SIGNED

SEND WHITE AND PINK COPIES WITH CARBONS INTACT. PINK COPY IS RETURNED WITH REPLY.

GRAYARC CO., BROOKLYN 32, N. Y.

TO

Attn: S. M. Hanson - Consulting Engineer

FROM

**Hagen Construction Co., Inc.**
P.O. BOX 150
GLOBE, ARIZONA
PHONE: GA 5-5784

SUBJECT: We Wish to submit our bid to do

DATE: Jan 22-1965

FOLD ↑ The following Included work within in area of Deer Creek Wash and Gila River. - Roadways - Drill sites. Working time - Fully Operated and Maintained $70.00 per hour. Use of D8 - 4GA - Full Hydraulic Ripper - Dozer - Tilt.

Moving cost $200.00 if less than 10 working days
150.00 if over than 10 working days.

RETURN TO ⟶

SIGNED G. Anderson

DATE

SIGNED

SEND WHITE AND PINK COPIES WITH CARBONS INTACT. PINK COPY IS RETURNED WITH REPLY.

GRAYARC CO., BROOKLYN 32, N. Y.

Exhibit 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
PHOENIX
RENO
SPOKANE
DENVER
SACRAMENTO
SANTIAGO, CHILE
LIMA, PERU

November 23, 1965

Mr. C. L. Whitelock
494 South Main Street
Payson, Utah

Dear Mr. Whitelock:

For your proposed drilling of some 15,000 feet at the Saddle Mtn. Mining area for both underground and surface drilling, we submit the following prices.

Surface Drilling - 10,000 Ft.

1.

| Drilling | BXWL | NXWL | NC or Collar Pipe |
|---|---|---|---|
| 0 to 500 Ft. | $6.40 | $6.90 | $7.60 |
| 500 to 1000 Ft. | 6.90 | 7.60 | |
| 1000 to 1500 Ft. | 7.60 | | |

2. Reaming, if necessary, $3.40 per foot for all sizes.

3. Cementing, if necessary, $12.50 per hour plus cost of cement or cement substitutes including drilling mud and chemicals.

4. Water Truck rental of $190.00 per month plus 12 cents a mile. Water to be hauled from your source of supply.

5. Casing lost in hole to be charged for at list price F. O. B. Jobsite.

6. Access roads and drill stations to be furnished at no cost to us.

Underground Drilling - 5,000 Ft.

1.

| Drilling | BXWL | NXWL | NC or Collar Pipe |
|---|---|---|---|
| 0 to 500 Ft. | $5.90 | $6.40 | $7.10 |
| 500 to 1000 Ft. | 6.40 | | |

2. Cementing, if necessary, $11.50 per hour plus cost of cement or cement substitutes including drilling mud and chemicals.

BOYLES BROS. DRILLING CO.

3. Casing lost in hole to be charged for at list price F. O. B. Jobsite.

4. You are to furnish ample air and water to drill sites at no cost to us. Drill stations to be furnished at no cost to us.

Thanks for asking for our prices.

Sincerely yours,

J. E. Roberts

J. E. Roberts
District Manager

DRILLING
BLASTING

QUARRYING
TUNNELING

# METLER BROTHERS DRILLING CO.

Core Drilling Contractors

Route 7, Box 945 4001 E. Illinois Street ★ ★ ★ Phone 327-4268 Tucson, Arizona 85714

27 November, 1965

Mr. C. L. Whitelock
494 South Main
Payson, Utah

Dear Sir:

As requested, we are forwarding the following proposal for doing your diamond drilling on the Little Treasure - Adjust Property, located in the Saddle Mountain Mining District about 7 miles north east of Winkleman, Arizona.

| 1. Surface Drilling: | | NX | BX | |
|---|---|---|---|---|
| Ledge to 500 ft. | 6.90 | $6.50 per ft. | $6.25 per ft. | 6.40 |
| 500 to 1000 ft. | 7.60 | 6.90 " " | 6.90 " " | 6.90 |
| 1000 to 1500 ft. | | 7.30 " " | 7.30 " " | 7.60 |

2. Reaming, if required 3.00 " "
3. Cementing & re-drilling cement, if required 12.50 " hr.
4. Casing left in hole due to ground conditions or ordered left in place will be billed at cost.
5. Drilling Mud hauled to jobsite & mixed @ $2.75 per bag. Additives used will be billed at cost.
6. Water, We will furnish a tank truck and pump and haul the water for drilling for $10.00 per 8 hr. shift plus 0.10 per mile.
7. There will be a charge of $350.00 for mobilization and de-mobilization.

Core boxes are to be furnished by your company, however, we will furnish them at 0.90¢ per box if requested to do so.

Access roads and drill sites are to be prepared by your company in advance and maintained until completion of the drill program.

UNDERGROUND DRILLING:

We will do the underground drilling under the same terms as for the surface drilling.

Your company is to furnish adequate air & water for drilling and provide the air and water lines to the drill.

SET UPS: -The drill sites must be prepared by your company in advance with adequate room for 20 foot pulls and with a sump of at least 6 ft. X 8 ft. X 4 ft. deep prepared in advance and lagged over.

The underground drill equipment required to drill holes to the depth you specify will use approximately 500 CFM of air and will consequently require a compressor of at least this capacity.

Thank you for requesting our bid on this project.

Very truly yours,

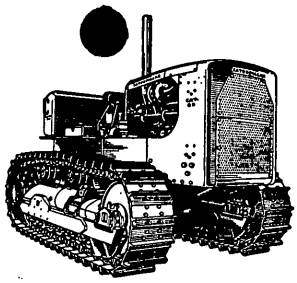
METLER BROS. DRILLING CO.

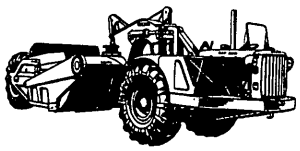
Frank C. Metler

Frank C. Metler

FCM/dr

P. O. BOX 1643 • GLOBE, ARIZONA • PHONE GA 5-4321





February 4, 1966

Mr. Spenst M. Hansen
P. O. Box 855
Livermore, California 94550

Re: Equipment Rental
Christmas Area

Dear Mr. Hansen:

Please forgive the delay in supplying the requested information regarding rental of our Model 46-A Caterpillar D-8 tractor. The 46-A has 235 horsepower, is 37 1/2 tons, and is more than the equivalent of International's TD-30.

Confirming our agreement, we will rent this machine to you for $40.00 (Forthy Dollars) per hour, fully operated and maintained, with the exception of ripper points and pins; which will be billed to you at our cost.

As we discussed, we estimate the moving time will be two or three hours, each way. However, if the tractor works on this project as long as one hundred thirty-five (135) hours (three full weeks), then there will be no move-out charge. If it works two hundred seventy hours (270), there will be no moving charges whatsoever.

Thank you for the opportunity of submitting our prices to you, and we most sincerely hope that we will have the pleasure of serving your needs on this project.

Very truly yours,

John F. Mercer Jr.

John F. Mercer, Jr.
Owner

JFMJr:jd

ACCEPTED:

Spenst M. Hansen

ARIZONA TESTING LABORATORIES

A DIVISION OF CLAUDE E. McLEAN & SON LABORATORIES, INC.

PHONE 254-6181 817 WEST MADISON ST. P. O. BOX 1888 PHOENIX 85001

Chemist . . . Engineers

For Mr. S. M. Hansen Date July 27, 1965

Sample of Ore Received: 7-27-65

Submitted by: Mr. C. L. Whitelock

## ASSAY CERTIFICATE

Gold figured at $ 35.00 per ounce Silver figured at $ 1.29 per ounce

| LAB. NO. | IDENTIFICATION | GOLD | | SILVER | | PERCENTAGES | |
|---|---|---|---|---|---|---|---|
| | | OZ. PER TON | VALUE | OZ. PER TON | VALUE | LEAD | ZINC |
| 159922 | #1, 2 ft. Vein | 0.04 | $1.40 | 6.20 | $8.00 | | |
| 159923 | #2, 8 ft. Vein | 0.04 | 1.40 | 2.80 | 3.61 | 2.85% | 16.05% |
| 159924 | #3, 20 ft. Vein | 0.20 | 7.00 | 10.60 | 13.67 | | |

Respectfully submitted,

ARIZONA TESTING LABORATORIES

Claude E. McLean Jr.

Claude E. McLean, Jr.

# SADDLE MOUNTAIN MINING CLAIMS

Pinal County, Arizona

The Saddle Mounta[illegible] mining claims situated in Sad[illegible] Mountain mining district about 9 miles north east of Winkelman, Pinal County, Arizona, between Ash and Deer Creeks. Winkelman is the shipping point by rail. The 9 miles of road is passable to the mine.

The patented claims are mineral surveys 2179, 2180, 2181 and 2182.

The following is part of the development performed on survey 2180 consisting of the patented claims, Lola, Lupa, Trenton, Golden Gate, Golden Charriot and West Ridge. About $10,000 worth of work was performed on them prior to being patented and an undetermined amount since that time, as follows: 9 shafts, 2 drifts, 4 tunnels and 14 cuts. The zinc shaft is about 80 ft. deep located on the Golden Charriot claim. The vein is traceable for a considerable distance and is from 4 to 8 feet wide; there is about 50 tons of ore on the dump, averaging about 14% zinc and 9% lead, gold and silver about $2.50 or $3.00.

Survey #2181 of this group contains the following patented mining claims; Bridgeport, Buffalo, Philadelphia, Side Show #1, Sleeper, and Side Show #2. Development shows 15 shafts, 8 cuts, 3 tunnels and other work done before application for patent.

Survey #2182 consists of two patented claims; Big Rock and Pittsburg, and they are situated about 900 ft. south east from corner #3 of the Trenton claim survey #2180.

Exploration work on above claims consist of 3 shafts, cuts and tunnels, valued at $3,000, prior to obtaining patent, and some since.

Concord claim, survey #2179 is about 400 ft. From the NW corner of Big Rock claim and crosses Deer Creek. Development consists of one tunnel, 3 shafts and 2 cuts, valued at $1,500, prior to obtaining patent, some since.

History of Saddle Mountain Mining Claims: In 1900, the Saddle Mountain Mining Company was organized by George B. Chittenden, who worked the claims and tried to

separate the zinc which was at that time very low in price, from the lead, gold and silver, with a portable concentrator situated on Ash Creek, but without any degree of success. He then acquired the Christmas Copper property where he directed his attentions and did little on the original holding.

Work, however, had, up to 1925, been intermittently done on the original group. Much of the work done by leasers and chloriders left no available records of the value of the ore shipped. Workings are probably around 4,000 or 5,000 feet, but many are caved in and are not accessible.

Character of deposits: The country rock at the property consists principally of cretaceous andesite and andesitic breccia, cut by a long dike of quartz-mica diorite and smaller masses of the same rock, offshoots of another large dike a little farther south. The long dike has an exposed length of over 3/4 of a mile, extending somewhat beyond the borders of the group and a maximum width of outcrop of over 30 feet. The average strike, N 50 degrees E, and dip is variable but steep. Indistinct stratification in the andesite on the south slope of Deer Creek indicates that it lies nearly horizontal. A line of exposure which may be parts of a single vein extend northwestward from the streamway in Little Gold Gulch, through the saddle, east of mineral monument No. 2180 to Deer Creek, just upstream from bench mark 2215. The vein in most places appears to be on the northwest side of the long quartz-mica diorite dike and roughly parallel to it but in the saddle the dike itself is mineralized.

The vein ranges in width from $2\frac{1}{2}$ to 5 feet and the wall rock is mineralized for several feet beyond these limits. The average strike is about N 50 degrees E. The dip ranges from 60 degrees to 90 degrees and is toward the northwest in some places and the southeast in others.

About 3,000 ft. east of the saddle, on the south slope of Deer Creek valley, another vein is exposed in a 90 ft. tunnel and open cuts. This vein is called the Big Rock vein from the claim in which the principle workings are situated. It is 2 or 3 ft. wide, strikes nearly east and dips 75 to 85 degrees south. The wall rock shows some alteration but little mineralization. The two veins are of similar type, they have fairly well defined walls, in places they have slick sides. Thin layers of gouge are present on parts of the walls. The unoxidized parts of the veins are made up of quartz, barite, sphalerite, pyrite, chalcopyrite and altered andesite, or in places, quartz-mica diorite.

In many places bedding is the common feature of the vein structure but elsewhere the vein is a heterogeneous mixture of fragments composed of vein minerals and altered country rock. The wall rock in most exposures is mineralized for a few inches to several feet beyond the vein. The alteration consists in the development chlorite siricite, carbonate, quartz and pyrite. Most of the pyrite noted is dissiminated in small crystals in the wall rock. There are small patches of more massive pyrite in the veins in places, principally near the walls.

Oxidization in these deposits is irregular and appears to extend only to shallow depths 25 to 50 feet, A little oxidation to 200 feet. The oxidized minerals are limonite and kindred iron oxides, anglisite cerusite, gypsum, and small amounts of chrysocola. Nearly all of the oxidized material contains residual galena, and sphalerite, but little pyrite remains in it. Gypsum occurs as flakes on tunnel walls, in small masses in the vein matter, and also as a distinct veinlet, an eighth of an inch or less in width. In some specimens there are numerous veinlets approximately parallel to one another and to the banding of the original vein matter.

There are workings on both sides of Little Gold Gulch at short distances above the streamway, at about the 2500 foot contour. On the west side is a shaft on a vein

in bleached and fractured gray andesite on slips that strike about N 80 degrees E and dip 75 degrees N. On the east side of the gulch is a 75 ft. tunnel in similar rock. Various slips of widely variable strike and dip are exposed in it with narrow seams pulverulent white gypsum on them. Much of the rock on the east side of Little Gold Gulch north of the large dike of quartz-mica diorite that crosses is nearly black massive basalt. This is likely to be classed as cretaceous flows, but its relation to other rocks is not clear and it may be of intrusive origin.

In Little Gold Gulch this rock contains rather sparsley disseminated pyrite and in the upper part of the gulch above the 2500 ft. contour there are outcrops of similar rock, reticulated with stringers of ribbon banded quartz. On the upper slopes to the east the rock has a rusty color and is cut by a number of narrow shear zones containing some quartz and stained with limonite. There are a number of prospect pits here and the shear zones contain higher gold values than elsewhere. Several of the zones are offset by minor faults. One of them appears to be cut by a small andesite dike similar in appearance to those that cut the ore in the Christmas copper mine.

Below is a copy of the assay certificate of ore on dump at the zinc shaft. #1 is ore, #2 is entire dump.

Copy of Assay Certificate

Colorado Assaying Company

| | | | | |
|---|---|---|---|---|
| #1 | Gold | Oz. .03 | | $1.05 |
| | Silver | 5.60 | | 5.04 |
| | Lead | | 11.3% | 33.90 |
| | Zinc | | 14.9% | 29.80 |
| #2 | Gold | Oz. .05 | | $1.75 |
| | Silver | 3.80 | | 3.42 |
| | Lead | | 1.2% | 3.60 |
| | Zinc | | 3.4% | 6.80 |

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limestone is equivalent to the Tornado limestone of Ransome[10] and includes strata of Mississippian and Pennsylvanian age. In the area in the Winkelman quadrangle between the limestone on Ash Creek and the Tornado limestone in the Ray quadrangle are scattered exposures of similar limestone containing fossils of similar appearance. There are so many resemblances in lithology, stratigraphic position, and age between the limestone of Ash Creek and the typical Tornado limestone that the correlation is made with confidence.

Limestone similar to that on Ash Creek was found in several places in the Christmas area, and in these places the evidence for correlating it with the Tornado is even better. The crest and southern flank of the prominent ridge in the northeastern part of the area are composed of such rock, and the exposure can be traced continuously northwestward into the Ray quadrangle, where it joins a mass mapped by Ransome as Tornado (see Pl. XVI). The fossils obtained near the Lower Coal Field mine came from the base of the ridge near the contact with the Cretaceous rocks and consequently from the top of the limestone section. Mr. Girty states that, like those from the upper beds on Ash Creek, they are "definitely Pennsylvanian, and probably lower Pennsylvanian." The list of fossils he identified in the collection follows:

Fusulina secalica.
Rhombopora lepidodendroides.
Derbya crassa.
Chonetes granulifer.
Productus cora.
Productus semireticulatus?
Marginifera wabashensis?
Pugnoides utah.
Dielasma bovidens.
Spirifer cameratus.
Spiriferina kentuckyensis.
Ambocoelia planiconvexa.
Composita subtilita.
Hustedia mormoni.

Near Christmas and in the southwest corner of the area there are masses of limestone which are eastward extensions of masses of Tornado limestone in the Ray quadrangle. (See Pls. IX, *A*, and XIII.) Small bodies of similar rock are brought up by a fault on the left side of Gila River near Sulphur Gulch. (See Pl. IX, *B*.) The fossils found near Christmas submitted to Mr. Girty proved to be indefinite. He states concerning this collection:

It may be Pennsylvanian, yet it obviously does not present the same facies as the two well-characterized Pennsylvanian faunas represented by the collections from Ash Creek and near the Lower Coal Field mine. On the other hand, it does not present any of the well-known lower Mississippian facies, though it contains nothing (unless it were the form called *Derbya?* sp.) that would debar it from the Madison or lower Mississippian. I should, however, prefer to call this lot Pennsylvanian rather than Madison. No upper Mississippian is known in this region, else it might even be upper Mississippian.

[10] Ransome, F. L., op. cit., pp. 47–49.



The list of fossils follows:

Cladochonus sp.
Derbya? sp.
Spirifer sp.
Composita aff. C. immatura.
Myalina sp.

In the part of the Banner district included in the Ray quadrangle the Paleozoic section corresponds essentially to the section for the Globe-Ray region shown in Plate III. For descriptions of these rocks the reader is referred to the work of Ransome.[11]

## CRETACEOUS STRATIFIED ROCKS

Rocks of Cretaceous age crop out over more than two-thirds of the Christmas area. Considerable quantities of other rocks are found only along the northern border and in the southeast corner. The Cretaceous rocks include all the somewhat metamorphosed volcanic rocks and the sedimentary beds associated with them and can easily be distinguished from the Tertiary lava and tuff by their less fresh appearance.

There is doubtless much variation in the succession of beds in different places, and in the Christmas area no place was found where a satisfactory section could be measured. The thickness is certainly over 1,000 feet, and the maximum may be as much as twice that. It may be roughly estimated that two-thirds of the total thickness is of volcanic origin and the remainder of sedimentary origin. Probably in some localities the proportion of sedimentary beds is much less than this. The irregular distribution of sedimentary beds, the irregularity and indistinctness of stratification in the volcanic rocks, and the numerous faults make accurate estimates impossible. Evidently sedimentary beds occur at several horizons in the section. In Reed Basin there is much sedimentary rock, especially near the Lower Coal Field mine, east of the Christmas area, where according to an estimate by Campbell[12] there is some 200 feet of sedimentary rock at the base of the Cretaceous section. In the valley of Little Rock Creek, especially on the left side, below the scarp of The Tablelands, are numerous beds of sedimentary rock,

[11] Ransome, F. L., The copper deposits of Ray and Miami, Ariz.: U. S. Geol. Survey Prof. Paper 115, 1919.

[12] Campbell, M. R., The Deer Creek coal field, Ariz.: U. S. Geol. Survey Bull. 225, p. 216, 1904.

principally conglomerate, but lava and pyroclastic rocks are interstratified with them. Along the portion of Deer Creek north of this locality there are beds of coarse conglomerate. On both sides of Ash Creek near the point where the stream crosses the southern border of the Christmas area are exposures of sedimentary rock, principally coarse conglomerate. Such beds form the base of the Cretaceous section and rest unconformably on the Tornado limestone. Others were noted interbedded with the volcanic strata on the slopes on either side. Near the head of Rock Creek, on the south side of the stream, are some thin beds of sandstone and conglomerate with volcanic breccia stratigraphically above and below. The Cretaceous rocks between Little Ash Creek and Rock Creek contain a considerable proportion of sedimentary beds. In places sandstone rests directly on the Tornado limestone, the bedding in the two being nearly parallel. For hundreds of feet along the contact, however, a gray hornblende porphyry, evidently a lava flow, is the lowest member of the Cretaceous section. In the mountains on the east side of Gila River below the mouth of Rock Creek conglomerate and other sedimentary rocks are interbedded with the volcanic strata. Coarse conglomerate and sandstone occur on the west side of the Gila near the railroad tunnel. A mass of sandstone, shale, and conglomerate with subordinate volcanic material extends from a point about 1,400 feet southwest of the Two Queens mine northward to Deer Creek. The above include all the localities covered by the Cretaceous rocks in which any considerable quantity of sedimentary rocks were noted. Elsewhere the rocks are predominantly of volcanic origin.

Most of the sandstone is yellow on weathered surfaces, but beds containing considerable calcareous material are dark gray when broken. Some massive beds are several feet thick. The shale is composed largely of clay and carbonaceous matter. It is fine grained, and much of it is thin banded. The colors are light green, various shades of gray, and black. Indistinct evidence of plant remains was noted in a number of outcrops, and carbonized tree stumps are reported to have been found.[13] No coal was noted in the Christmas area, but a little is supposed to have been found near the mouth of Little Ash Creek. Probably the major part of the sedimentary beds are conglomerates. Many contain pebbles or cobbles from a few inches to over a foot in diameter, composed largely of quartz, quartzite, and various granitic rocks, mostly somewhat metamorphosed. Pebbles of limestone, probably from the Tornado, are present in some beds, and andesitic pebbles can also be found. The pebbles in many such beds are well rounded and fairly well sorted.

[13] Mellor, N. H., personal communication.



These beds resemble the far older and more indurated Barnes conglomerate of the Globe-Bay region, and it is conceivable that they have been derived in part from eroded outcrops of the Barnes. There are also numerous thick beds in which most of the cobbles are composed of similar ancient quartzose and granitic rocks but are not well sorted and are in part subangular. Some of the cobbles in such beds are over 2 feet long. Typical examples are shown in Plate VI. Whether the pebbles and cobbles of ancient rocks were derived from the Barnes conglomerate or directly from the ancient rocks, it would seem that many of them must have been transported long distances. No rocks from which they could have come crop out in the Christmas area, and it is unlikely that any such rocks were exposed on the surface on which the Cretaceous beds were laid down. Some conglomerate beds are made up largely of fragments of the andesitic rocks. The pebbles in these beds are notably more angular than those composed principally of older rocks. In some the pebbles show little rounding. Beds that contain principally andesite pebbles lie stratigraphically both above and below beds that contain numerous pebbles of old rocks. Ransome[14] reports that south of O'Carroll Canyon in the Ray quadrangle the Tornado limestone "is unconformably overlain by a layer of angular cherty fragments, derived from the limestone, embedded in a gray clayey matrix." Such material was not noted in the Christmas area.

Most of the volcanic strata are breccias of various types, although unbrecciated flows were noted in numerous places. Many of the flows, both brecciated and unbrecciated, have amygdalodial texture. The prevailing colors are purple and green, although various shades of gray, brown, red, and black were noted. Most of the lava is of andesitic composition, but basalt crops out over considerable areas. In many of the andesites the ferromagnesian minerals have broken down into epidote, chlorite, calcite, and other alteration products, but in some of them hornblende is a prominent constituent. The feldspar is clouded with opaque dust and alteration products and ranges in composition from oligoclase to andesine. The basalt examined is a fine-grained black rock consisting essentially of bytownite feldspar and biotite, with much chlorite and epidote, some calcite, and other alteration products.

Near the head of Little Rock Creek is an outcrop of a drab andesite cut by ramifying dikelets of smoke-gray sandstone a few inches wide. The andesite is composed predominately of feldspar microlites of about the composition of oligoclase, with epidote and other alteration products. There are a few small lath-shaped oligoclase phenocrysts. The

[14] Ransome, F. L., The copper deposits of Ray and Miami, Ariz.: U. S. Geol. Survey Prof. Paper 115, 56–57, 1919.

sandstone is fine to medium grained and is composed largely of quartz and altered feldspar with some epidote and chlorite. Clastic dikes in the Cretaceous rocks of this region were also observed by Campbell,[15] but those he examined had a filling of conglomerate instead of sandstone.

The determination of the age of the volcanic and sedimentary strata described above rests largely on evidence obtained in the region east of the Christmas area, as no identifiable fossils have been found in them within that area. The stratigraphic evidence in the Christmas area shows that the rocks are younger than the Tornado limestone, on which they rest unconformably, and antedate the older Tertiary beds, which lie unconformably on them. The angular discordance between the Tornado limestone and the overlying beds is so slight that in most exposures it is imperceptible. The only place where a marked difference in the attitude of the beds was observed was on upper Ash Creek, and here the structure is complicated by small normal faults. The presence of an unconformity is attested, however, by minor irregularities in the contact as exposed along Little Ash Creek and by the sharp change in lithologic character. The unconformity at the base of the Tertiary beds can be seen by a glance at the map (Pl. I). In the northwestern part of the area Tertiary strata dipping gently southwestward rest on the truncated edges of more steeply inclined Cretaceous beds. In the southeast corner of the area the Cretaceous beds dip northwest and the Tertiary strata above them dip east.

The Cretaceous beds can be traced in continuous exposures eastward through the coal fields into the Stanley mining district. On the basis of collections of imperfectly preserved leaves and shells Walcott[16] and Campbell[17] both considered the corresponding rocks to be of Cretaceous age. A recent collection of invertebrate fossils found near the base of the Cretaceous in the Stanley mining district[18] was examined by T. W. Stanton, who states that they are of Colorado age. Thus the sedimentary beds in the lower part of the formation were clearly laid down in the early part of Upper Cretaceous time. Fossils have not been found in beds in the upper part of the formation, but it is probable that the whole group of volcanic and sedimentary beds was deposited in Upper Cretaceous time.

[15] Campbell, M. R., Conglomerate dikes in southern Arizona: Am. Geologist, vol. 33, pp. 135–138, 1904.

[16] Walcott, C. D., and Bannon, M., Deer Creek coal field, White Mountain Indian Reservation, Ariz.: 48th Cong., 2d sess., S. Ex. Doc. 20, p. 7, 1885.

[17] Campbell, M. R., The Deer Creek coal field, Ariz.: U. S. Geol. Survey Bull. 225, p. 240, 1904.

[18] Ross, C. P., The geology and ore deposits of the Aravaipa and Stanley mining districts, Graham County, Ariz.: U. S. Geol. Survey Bull. 763, 1925.



## OLDER TERTIARY STRATIFIED ROCKS

The bedded rocks younger than the Cretaceous rocks just described and older than the Gila conglomerate may be termed older Tertiary stratified rocks. They consist of rocks of both sedimentary and volcanic origin and have yielded no fossils. Four divisions were mapped in the southeast corner of the area, where the rocks are well exposed. (See fig. 3.) The same divisions were recognized in the outcrops between the main ridge of the Mescal Range and Rock Creek, but with a number of differences, particularly in the thickness. The lowest division, although probably present in places, was so scantily represented that it could not be mapped in this part of the area. It bears a striking resemblance to the well-known Gila conglomerate, as can be seen from Plate VII. It is tentatively correlated with the Whitetail conglomerate of the Globe-Ray region, as it is similar in age, stratigraphic position, and origin to that formation. As can be seen from Plate I, its thickness is variable. The

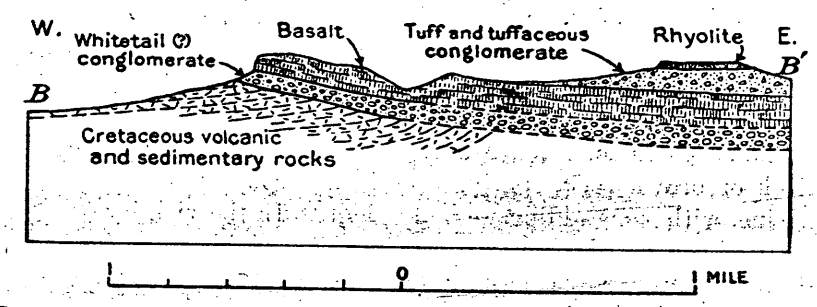



FIGURE 3.—Section through the west end of The Tablelands, showing relations of the Tertiary strata. For line of section see B–B', Plate I

maximum is about 400 feet on upper Ash Creek. The exposure around the rim of The Tablelands decreases gradually in thickness to the northeast. At a point 2,000 feet west of the east border of the area mapped none of the rock is visible, but east of this point the thickness again gradually increases. A little red gravel can be found in places at the base of the Tertiary section in the outcrops north of Rock Creek, and this is doubtless equivalent to that underlying The Tablelands. Its thickness in this part of the area is nowhere more than a few inches.

In the scarp of The Tablelands the material of the lowest division is coarse sand and gravel, sufficiently indurated to form steep slopes and small cliffs but easily broken down by a pick. The deposits are distinctly bedded but not well sorted. The fragments composing the beds range in size from coarse sand up to cobbles 2 feet long. Most of them are subangular, but in some beds the pebbles are fairly well rounded. The material is derived in large part from the Cretaceous

Christmas area may be provisionally considered as at least in part of Pliocene age.

### QUATERNARY ALLUVIUM

All the alluvial deposits younger than the Gila conglomerate may be grouped under the name Quaternary alluvium. Two divisions are recognized, and physiographic study would probably reveal more. The older alluvium includes the partly consolidated deposits, remnants of which can be found on slopes above the present flood plains. Patches of it have been mapped in several places along Gila River, on Ash Creek below the Two Queens mine, and on a ridge south of O'Carroll Canyon. On the north side of Deer Creek nearly a mile above its mouth and at Christmas there are slopes whose smooth contours contrast sharply with the dissected hillsides around them. These slopes are veneered with cemented gravel, which has been mapped as belonging to the older alluvium. There are in places patches of older alluvium so small and irregular that they have not been mapped. One such place is on upper Ash Creek near the southern boundary of the Christmas area. Alluvium of this age may be present in the parts of the area mapped as underlain by the Gila formation.

The second division of the Quaternary alluvium may be termed Recent alluvium. It occupies the channels and flood plains of the present streams. It has been mapped only in the flood plains of Gila River and Dripping Spring Wash, where the width is sufficient to warrant showing it. On Deer Creek gravel and sand occur for the first mile and a half above its mouth and from a point near the mouth of Little Rocky Creek upstream. In the intervening stretch the amount of gravel on the bedrock along the stream is small. There is a width of 100 feet or more of Recent alluvium along the whole of the portion of Ash Creek in the Christmas area. Recent alluvium occurs near the mouths of nearly all the streams emptying into the Gila, and many others have small amounts of gravel in places in their channels.

The older alluvium is in general a coarse, poorly sorted gravel composed of subangular to rounded fragments of Tertiary and older rocks. Most of it is more or less cemented with caliche. It is of either Pleistocene or Recent age. Part of the material mapped as older alluvium at Christmas consists of large angular blocks of andesitic rock and diorite porphyry and is probably talus, but some of it shows evidence of sorting by water. Some of the talus material may be of recent origin.

The Recent alluvium is unconsolidated. The flood-plain deposits mapped consist of sand and silt. The material in the smaller stream channels is coarse sand, gravel, and boulders. The boulders are



all of local derivation, and most of the gravel has not been carried far. On Ash Creek, however, limestone and basalt pebbles were noted several miles below outcrops of such rocks.

### CRETACEOUS INTRUSIVE ROCKS

The Cretaceous stratified rocks are everywhere cut by numerous small masses of fine-grained porphyritic rocks which may for purposes of description be grouped together. Many are similar petrographically to the flows and evidently are genetically related to them; others may be of later origin. Probably most of these intrusive bodies are dikes, but there are also a number of sills and irregular masses. Although the aggregate area of outcrop of such rocks in the Christmas region is large, most of the individual masses are so small and their relations are so complex that they could not be mapped without the expenditure of an undue amount of time. The dikes range in width from a few feet to more than 100 feet. Some of them may be traced for a few hundred yards, but most are shorter. The sills have about the same range in dimensions as the dikes. Some of the irregular masses may be as much as a few thousand feet in greatest dimension. In many places it is difficult to be sure whether a given mass is of effusive or intrusive origin.

These intrusive rocks have about the same range in color and composition as the Cretaceous lavas. Among the colors noted are purplish, green, black, brown, and gray. The greater part are andesites, consisting largely of hornblende and either oligoclase or andesine. There are a few masses of quartz latite containing oligoclase, orthoclase, hornblende, and quartz, and others of basalt containing augite, olivine, and calcic plagioclase. Most of them contain variable amounts of chlorite, calcite, sericite, and other alteration products.

Most of these porphyritic rocks may be confidently considered to belong to the same period of volcanism as the lava and associated strata which they cut, and they are consequently of Cretaceous age. There are, however, bodies of light-gray andesite, consisting essentially of hornblende and oligoclase, some of which may be related to the diorite dikes described below and consequently probably of early Tertiary age. This suggestion is founded on Ransome's observation [22] that in the vicinity of Troy, in the Ray quadrangle, fine-grained rock with small hornblende phenocrysts occurs as a marginal facies of quartz diorite porphyry dikes. On the other hand, in several places in the part of the Christmas area occupied by Cretaceous strata there are masses of similar gray hornblende porphyry which

[22] Ransome, F. L., The copper deposits of Ray and Miami, Ariz.: U. S. Geol. Survey Prof. Paper 115, pp. 65, 66, 1919.

are rudely stratified and appear to be of effusive origin. It is probable that some of the intrusive gray hornblende porphyry is related to such flows and consequently of Cretaceous age. In several places hornblende porphyry is cut by dikes of quartz-mica diorite.

### QUARTZ-HORNBLENDE DIORITE

The intrusive mass in the northeast corner of the Christmas area, that near the mouth of Dripping Spring Wash, and the associated dikes are composed of essentially the same kind of rock, a quartz-hornblende diorite. The color of the rock in general is a mottled gray with a greenish cast in weathered specimens. The phenocrysts are nearly white plagioclase, black or green hornblende and biotite, and quartz. Biotite is subordinate in amount to hornblende, and quartz is only sparingly present. The groundmass is gray, has a fine allotriomorphic texture, and appears to make up rather less than half the volume of the rock. The feldspar phenocrysts appear to be all plagioclase with zonal growths. The average composition is about that of oligoclase. In the groundmass there is also a small amount of alkali feldspar. The rock is thus a porphyritic quartz diorite. As hornblende predominates over biotite in it the word "hornblende" is added to its name to distinguish it from the somewhat similar rock cropping out farther south, which is called quartz-mica diorite.

The quartz-hornblende diorite is younger than the Cretaceous strata intruded by it and older than the Gila conglomerate, which rests on it in erosional contact. It may, like similar rock in the Ray quadrangle,[23] be tentatively considered to be of early or middle Tertiary age, more probably the former.

### QUARTZ-MICA DIORITE

The rock composing the intrusive mass at the Christmas mine and the dikes east and south of it shown on Plate I is called quartz-mica diorite. Rocks of this and related types were described by Ransome[24] under the term quartz diorite porphyry. For convenience the word porphyry, descriptive merely of texture, is omitted, as its use would make the name of the rock too long.

This rock is of predominantly greenish hue in most exposures, but fresh specimens have a mottled gray color. At a distance the dikes appear as nearly white bands. (See Pl. VIII, *B*.) Phenocrysts of feldspar, biotite, and quartz compose less than half of the volume of the rock. Hornblende is present in some specimens but is nowhere a prominent constituent. The groundmass has a fine to medium

[23] Ransome, F. L., op. cit., p. 82.
[24] Idem, pp. 64–66.



grained allotriomorphic texture and contains feldspar, quartz, epidote, and in many specimens chlorite, calcite, and other alteration products. The feldspar in both phenocrysts and groundmass is predominantly plagioclase with an average composition about that of oligoclase, but subordinate amounts of alkali feldspar, in part microcline, are present. The average composition of the rock is that of a quartz diorite, although in some of the dikes the proportion of alkali feldspar is nearly sufficient to give the rock the composition of a granodiorite. It can be distinguished from the similar quartz-hornblende diorite by the presence of numerous biotite phenocrysts and by the somewhat greater abundance of quartz.

This rock, like the quartz-hornblende diorite farther north and similar rocks in the Ray quadrangle, is probably of early Tertiary age. The only direct evidence as to its age is the fact that it cuts Cretaceous strata.

## STRUCTURE

In a broad way the structure of the Christmas area appears to be synclinal. Exposures of Cretaceous rocks in which satisfactory determinations of the attitude of the beds can be made are few and scattered, so that, in general, only the broadest features of the structure can be ascertained. The structure section on Plate I indicates what is known of the structure through the middle of the area. It seems that before faulting introduced complications the Cretaceous strata were bent into a syncline of broadly oval outline occupying most of the area mapped and having an outlet to the east in the narrower and more elongate syncline underlying what is now Reed Basin. The axial plane of the main synclinal basin appears to strike about N. 60° E. and seems to pass somewhere in the neighborhood of Lee's mine, but the available data are insufficient to establish these inferences with certainty. Eastward the axis swings around and, as Campbell[25] has shown, the narrower fold under Reed Basin is asymmetric and its axial plane extends approximately along the course of Deer Creek. In the central and south-central parts of the Christmas area the attitude of the strata could not be accurately determined, but it is believed that most of the beds are very gently inclined. A number of the quartz diorite dikes lie near the inferred position of the synclinal axis, and the average trend of the dikes is approximately parallel to the assumed strike of the axis. Tornado limestone rises from under the Cretaceous rocks in the northeast, southeast, and southwest corners of the area. The limestone seems to have been folded concomitantly with the Cretaceous rocks and probably underlies them throughout. The fact that the beds of the

[25] Campbell, M. R., The Deer Creek coal field, Ariz.: U. S. Geol. Survey Bull. 225, 1904.

two formations lie so nearly parallel to each other in most localities where the contact is exposed, both in the Christmas area and the region east of it, would seem to indicate that there had been little structural disturbance of the Tornado limestone before the Cretaceous strata were laid down. However, there appears to be an angular unconformity in the southeast corner of the area, and Campbell[26] reports one in Reed Basin, so that there must have been some disturbance of the limestone before Upper Cretaceous time. In view of the structural history of the region in which the Christmas area is situated and the apparent slight extent of the angular unconformities, it is probable that the movements prior to Upper Cretaceous time consisted largely of faulting. It is impossible to judge to what extent the buried parts of the Paleozoic rocks may have been broken by faulting at this time. The pebbles of old rocks in the Cretaceous conglomerates suggest the possibility that such rocks may have been exposed in the Christmas area at the time of their formation, but it is equally possible that these pebbles were derived from distant sources. In the southwest corner of the area the Tornado limestone dipping out from under the Cretaceous rocks is bent into a number of small folds and broken by small faults in addition to the general northeastward tilting of the strata. (See Pl. IX, *A*.)

The Cretaceous rocks are broken by normal faults. The longest zone of faulting that has been mapped is the one which has been called the Christmas fault at the mine of that name. This fault starts in the Ray quadrangle northwest of the Christmas mine and bounds the block of Tornado limestone containing the ore bodies of the mine on the northeast. What appears to be a continuation of the same zone of fracturing can be traced by means of limestone blocks southeastward into the Winkelman quadrangle in sec. 15, T. 5 S., R. 16 E. One such block is shown in Plate IX, *B*. The average strike is about N. 25° W. At Christmas the relative downthrow is on the east side, but farther south it appears to be reversed. Faulting was not traced continuously in the areas between the blocks of limestone, because of the absence of distinctive beds by means of which displacement could be detected, but it is thought probable that there is an essentially continuous zone of faulting. If so, the zone has a minimum length of about 7½ miles. In the part of the area where the Cretaceous rocks are the only stratified rocks exposed there are certainly some faults and may be many. The veins of the Saddle Mountain district follow fractures whose strikes vary within rather wide limits. The average strike of the veins is

[26] Campbell, M. R., op. cit., p. 245.



roughly parallel to the average strike of the quartz diorite dikes—that is, about N. 60° E., nearly at right angles to the strike of the Christmas fault. The dikes may also occupy fault fissures. Slickensided surfaces on outcropping masses of andesitic rocks attest the presence of faults not marked by either veins or dikes. There may well be other faults of which no direct evidence was found. The apparent large thickness of andesitic strata in the vicinity of Lee Mountain may be the result of repetition by faulting.

The Tertiary beds in the northern part of the area are broken by numerous faults. Some of these have been mapped, but there are doubtless many others. In the area between Little Ash Creek and Rock Creek are a number of separate exposures of rhyolite at different altitudes. It is probable that these are remnants of a once continuous lava sheet and that their present separation has been brought about in large measure by faulting, aided, of course, by subsequent erosion. The faulting here continued long enough to involve the Gila conglomerate. The strikes of the faults mapped vary markedly. The throw is of the order of several hundred feet in some places. The close alinement of Dripping Spring Wash, Rock Creek, and the stretch of Gila River between the mouths of these streams doubtless has structural significance. Ransome[27] has suggested that the portion of the Dripping Spring Range in the Ray quadrangle may be structurally a homoclinal block tilted to the southwest and shattered by numerous later faults, many of which he has mapped. On this hypothesis, which as he has shown fits the known facts better than any other that has been proposed, there is a fault zone buried under the Gila formation in Dripping Spring Valley, and the origin of the valley is directly related to the displacement along this zone. The same line of faults probably continues southeastward across the Christmas area, and the depressions now occupied by Rock Creek and the stretch of Gila River mentioned have resulted primarily from it. The Tertiary beds underlying The Tablelands were not shattered into such small blocks as those farther north. In the portion of The Tablelands included in the Christmas area there is evidence of nothing more than minor dislocations. The rocks have, however, been tilted a few degrees from the horizontal by a series of successive earth movements, as is proved by the angular unconformities between the rocks of different types.

## GEOLOGIC HISTORY

The early geologic history of the Christmas area must be inferred from rocks that crop out in adjoining regions, for none older than

[27] Ransome, F. L., The copper deposits of Ray and Miami, Ariz.: U. S. Geol. Survey Prof. Paper 115, pp. 81–84, 1919.

Carboniferous are exposed in this area. As Ransome[28] has shown, the Pinal schist records a period of marine sedimentation followed by folding, compression, and metamorphism of the sedimentary beds, all of which appears to have taken place long before the close of pre-Cambrian time. The Pinal schist was later intruded by igneous rocks of various types. At the end of the period of plutonic activity the region, according to Ransome, was mountainous and was being attacked by active erosion, which eventually wore it down to a peneplain. One more event in pre-Cambrian time may be indicated by the beds of metamorphosed sandstone unconformably below the quartzites correlated with the Apache group on Ash Creek south of the southeast corner of the Christmas area. This rock is well bedded and, although containing much mica of metamorphic origin, is not nearly as schistose as the rock underlying it, which is believed to belong to the Pinal schist. The sandstone may represent deposits formed during an incursion of the sea long after that during which were deposited the beds that later became the Pinal schist, but still in pre-Cambrian time.

Ransome[29] considers that a large part of the quartzite and conglomerate of the Apache group in the Ray quadrangle was deposited in deltas, but that the Mescal limestone, near the middle of the Apache section in that region, is of marine origin. The cross-bedding in the quartzite on Ash Creek indicates the play of shifting currents during its formation, and the ripple marks so beautifully preserved on some of the beds in the upper part of the section show that these beds were laid down in currents and under shallow water. The scanty fossils found in the upper beds are of marine origin. The Mescal limestone is absent, but its place in the section appears to be occupied by thin-banded green shale and red quartzite. That the rocks of the Apache (?) group exposed in Ash Creek were formed in Cambrian time, from sediment dumped by rivers in the shallow sea water at their mouths, appears to be proved by the discovery of Upper Cambrian fossils near the top of the rocks correlated with the Troy quartzite.

No rocks of Ordovician or Silurian age have yet been recognized in the region adjoining the Christmas area, and the events of those periods are consequently unknown. The Martin limestone, which contains Devonian fossils in its upper part, is of marine origin. This formation has been recognized west[30] and east[31] of the Christmas area, and there is shale which may be its equivalent in Ash Creek

[28] Ransome, F. L., op. cit., p. 84.
[29] Idem, pp. 85–86.
[30] Idem, pp. 45–46.
[31] Ross, C. P., The geology and ore deposits of the Aravaipa and Stanley mining districts, Graham County, Ariz.: U. S. Geol. Survey Bull. 763, 1925.



on the south, so that it is probable that the Christmas area was covered by the sea in Devonian time. In Mississippian and Pennsylvanian time thick deposits of limestone were formed.

No deposits representing Permian or early Mesozoic time are known in this area, which may have been above sea level during this long interval. In the Globe-Ray region extensive faulting and intrusion of diabase occurred at some time in the Mesozoic era, and Ransome[32] believes that these events may have taken place before the formation of the Cretaceous andesitic strata. No diabase was found in the Christmas area, and no evidence bearing on the age of the diabase was obtained during the present investigation. There was some structural disturbance in the time between the deposition of the Tornado limestone and that of the Cretaceous strata, but the approximate parallelism of the two formations in most places where the contact can be observed would seem to indicate that the amount of disturbance in most parts of the area was small.

In Colorado time there was sufficient relative subsidence of the area to permit the waters of the inland Cretaceous sea to overflow it. The shore of this sea at the time of its greatest westward extent in the region appears to have been near the west border of the Christmas area, as no sedimentary Cretaceous rocks are known beyond this boundary. From the character of the shale and sandstone and of the invertebrate fossils which have been found in them in the region east of the Christmas area[33] it is evident that they are of marine origin. The coal and conglomerate both indicate that the shore of the sea was close at hand. Perhaps these beds were laid down in a reentrant in the western shore of the Cretaceous sea.

The origin of the coarse conglomerate that consists largely of cobbles of ancient rocks is open to some question. The shape of the cobbles is such as may have resulted from abrasion in streams, but they are so poorly sorted and in part so ill rounded and so large that they can hardly have been transported far by water. There are a number of conceivable sources for the material of the conglomerate, but from the data available it is difficult to visualize such conditions in Colorado time at any place near by as would make it a suitable and probable source for the material. In the northern half of the Christmas quadrangle quartzite of the Apache group and pre-Cambrian granite are now exposed in abundance.[34] The Mescal Range now constitutes a formidable barrier, cut only by the narrow canyon of Gila River, to southward transportation of material from this part of the quadrangle. These ridges may not have existed in

[32] Ransome, F. L., op. cit., p. 87.
[33] Ross, C. P., op. cit.
[34] Darton, N. H., personal communication.

Colorado time, and if so, material to form the conglomerate might have been brought southward, provided the ancient rocks were then exposed. It would seem that, if the movement in which the Mescal Range was uplifted and the consequent erosion had not yet taken place, then the ancient rocks would still have been covered by later Paleozoic strata. In view of the present distribution of the Cretaceous rocks and the geologic history of the Globe-Ray region,[35] it seems more probable that sufficient movement had already taken place to initiate the formation of the Mescal Range and that the depression south of the range had been outlined before the deposition of the Cretaceous strata that now occupy it. On the assumption that the production of the dominant structural forms of the present day had already been begun and that consequently the broad features of the present topography had been blocked out, the cobbles of the Cretaceous conglomerate may have been transported by ancestors of Gila River and Dripping Spring Wash, emptying into an arm of the Cretaceous sea. It is conceivable that part of the material may have been derived from masses of ancient rocks then exposed and now covered by the Cretaceous deposits, but there is no direct evidence to confirm this hypothesis. The probable physiographic conditions in Colorado time, together with the lack of evidence of any such structural disturbance as would have been required to cause such ancient rocks to crop out in this part of the area in Colorado time, render the hypothesis unlikely. The andesitic material in the matrix of the coarse conglomerate and the subangular andesitic pebbles, mostly a few inches wide, that make up the greater part of some conglomerate beds were undoubtedly derived by erosion of volcanic beds formed earlier in the same period. If the cobbles of the coarse conglomerate were brought down by streams, as suggested, it would seem that the streams must have had steep gradients and that many of the cobbles were transported for rather short distances in them. It would be possible for such conglomerate to be formed by the reworking of beds of coarse alluvial material, but the original source of this material would be equally undeterminable. Another possibility may be suggested. If glaciers existed in this region in Colorado time, conglomerate beds of the sort described might well have been derived from the till formed by them with only a small amount of transportation or sorting in running water. A glacier might transport débris far from its source without much rounding of the edges of the component fragments.

Whatever the origin of the Cretaceous sedimentary beds, it is evident that volcanism was the dominant factor in the formation of the Cretaceous succession. Great masses of material, largely of

[35] Ransome, F. L., op. cit., pp. 84–89.



andesitic composition, were ejected from vents whose location is unknown. Many of the eruptions took place with explosive violence, but quiet outflows of lava also played an important part. The volcanic beds are traversed by numerous porphyritic intrusive masses, principally dikes. Many of the dikes are of similar composition to the volcanic beds and doubtless are related to them. Some of these may mark conduits through which lava was ejected.

After the deposition of the Cretaceous rocks they and the rocks below them were relatively uplifted to a position well above sea level and folded. In the Christmas area the principal folding in the Cretaceous beds preceded the deposition of the Tertiary strata. This does not accord with the record in the Stanley district, only a few miles to the east, where strata of both ages are sharply tilted but along the contact are essentially parallel to each other.

The folding was succeeded by faulting, which continued, probably intermittently, throughout the Tertiary period and may have extended into the Quaternary. Indeed, there are indications in the general region in which the Christmas area lies that fault movements have continued up to the present time. It seems that since some time in the Mesozoic era the earth's crust in this region has not been in stable equilibrium. The adjustments necessitated have been made largely by fracturing and slipping of the rock masses along the fractures. In the Christmas area there has been extensive folding, and in neighboring regions evidence of folding can be seen in many places, but in nearly all it is of minor importance. The process of adjustment has continued up to the present time by a series of movements of diminishing violence. The igneous activity, both intrusive and extrusive, which has been manifested at various times must be intimately related to the readjustment. The movements of magna may have in part produced the necessity for readjustment in the crustal rocks and in part resulted from the movements of those rocks. If the mass of quartz-hornblende diorite in the Mescal Range is a laccolith, as it appears to be, its intrusion doubtless contributed to the uplift of the overlying rocks. The part played by the dikes and irregular intrusive masses is less clear. All the intrusive rocks in the Christmas area, except those connected with the Cretaceous volcanism already mentioned, appear to be of Tertiary age. The granular rocks were intruded early in the Tertiary period, and the fine-grained rocks connected with the Tertiary volcanism probably came later. In any particular area the periods of crustal movement were probably separated by periods of quiescence, and it may well be that the disturbances were of local rather than general effect. Thus in the Christmas area there were strong crustal disturbances after the formation of the Cretaceous

beds and before the deposition of the earliest known Tertiary strata, whereas less than 10 miles farther east, in the Aravaipa-Stanley region, there is little evidence of structural movements in the corresponding interval. There can be little doubt that the rocks of both formations in the two areas are essentially contemporaneous.

The resultant effect of the earth movements subsequent to the Cretaceous volcanism probably was to uplift the region and increase its relief. Erosion, thus accelerated, continued long enough to subdue the relief to a notable degree. The present remnants of the earliest Tertiary strata were laid down on nearly level surfaces, but in the intervening areas in which no Tertiary beds now remain there were doubtless hills. The summits of the Mescal Range may never have been covered by Tertiary strata, and the same may perhaps be true of such heights as Lee Mountain. The great similarity between the conglomerate at the base of the Tertiary sequence and the Gila conglomerate implies similarity in the conditions prevailing at the time of deposition. This means that erosion was still active and that the climate was not very different from that of to-day, although it may have been more humid. The deposition of the conglomerate was followed successively by the eruption of basaltic lava, the deposition of siliceous tuff and tuffaceous agglomerate, and the outflow of rhyolitic lava similar in composition to the fragments in the agglomerate. There are slight unconformities between these deposits which appear to indicate that earth movements were in progress during the period of volcanism.

After the eruptions ceased normal faulting was resumed, and there was probably sufficient uplift to accelerate erosion once more. Large quantities of the Tertiary lava and associated sedimentary beds were swept away. The major features of the resulting topography were probably in many respects similar to those of the present day. Near the end of the Tertiary period came the deposition of the Gila conglomerate. This formation is found at present in the Christmas area only in the valleys of Dripping Spring Wash and Rock Creek. It resulted from the deposition in stream valleys of excess loads of sediment brought down from points farther upstream, and consequently it probably never formed a blanket over the whole area, but its distribution was probably once more extensive than at present. Later came further faulting, in which blocks of the Gila were thrown down against the edges of blocks of older Tertiary lava. These movements probably came early in the Pleistocene epoch. A little later, perhaps accelerated by the movements just mentioned, erosion became sufficiently powerful to cut deep gulches and sweep away much of the Gila formation. Subsequent fluctuations in the erosive power of the Quaternary streams are recorded by alluvial deposits



of at least two ages, which might be accounted for either by climatic changes or by earth movements. There is an increasing volume of evidence that climatic changes have occurred since the late Pliocene. The fossils in beds of that age in San Pedro Valley,[36] south of the Christmas area, seem to show that the climate when these beds were deposited was more humid than at present. The testimony of old residents shows that there have been marked changes in vegetation in the last 40 years. On the other hand, as Ransome[37] has shown, the character of the Gila formation in the mountains is such as could have resulted from streams acting under conditions similar to those of the present, and the recent changes in vegetation are in part to be accounted for by the influences of human industry. From the data now available it can not be said that the climate at any time since the late Tertiary has differed markedly from that of the present, although some changes doubtless have taken place.

## ORE DEPOSITS

### HISTORY AND PRODUCTION

A large part of the ore deposits of the Saddle Mountain and Banner districts have been known and intermittently worked since the seventies, but little ore was shipped before the beginning of the present century. None of the mines were ever developed sufficiently to attain steady and profitable production for more than a few years at a time, and not many of them have been profitably operated for more than a few consecutive months. Ore of good grade has been found in numerous places, however, and in some of the deposits there may be large quantities of ore of commercial grade still unmined. From available estimates of the production of the mines and prospects visited it appears that over 550,000 tons of copper ore, about 6,500 tons of lead-silver ore, and a little zinc ore have been shipped from them. Gold ore of a total value of some tens of thousands of dollars has been shipped from a few mines. Vanadium ore has been mined in two or three places, and a little may have been shipped. Except for some small pockets of high-grade gold ore, the ores of the several metals mined have been of moderate tenor. Most of the copper ore contains from 2 to 4 per cent of copper, but there are small bodies of notably higher grade. Probably most of the lead-silver ore mined contained less than 40 ounces of silver to the ton, although some ore assaying as much as 250 ounces to the ton has been found. Some of the gold ore found near the surface was very rich, but most of the deposits do not contain large amounts of this metal.

[36] Gidley, J. W., op. cit., p. 121.
[37] Ransome, F. L., op. cit., pp. 71–74.

## CLAIM BOUNDARIES

The property map (Pl. X) shows all the mines and prospects in the two districts regarding which any information was obtained. The position and extent of the claim groups whose outlines are drawn in full lines are fairly accurately known. The dashed lines show in a general way the position and extent of the land comprised in the respective groups but are not at all accurate in detail. For a number of claims the data obtained are insufficient on which to draw even approximate boundaries. The position of these claims is indicated by the names supplemented where possible by symbols showing the location of the principal workings. It is probable that there are a few prospects regarding which no information is available and which are consequently not shown on the map. The boundaries of the Banner mining district are believed to be correctly shown, being based on data supplied by D. W. O'Carroll, one of those who originally set the limits of the district. Exact data regarding the boundaries of the Saddle Mountain district were not obtained. Those drawn on Plate X are believed to be roughly correct, although it is possible that the southern boundary should be moved south a short distance to include prospects reported to be situated near Biddick's cabin on Ash Creek. No ore deposits are known for considerable distances east and north of the limits of the Saddle Mountain district indicated on Plate X.

## LEAD-SILVER VEINS

The deposits grouped under the term lead-silver veins have a gangue consisting essentially of quartz, barite, and calcite and contain galena and other sulphides. Ore bodies of this type are known only in the Saddle Mountain district, and most of them are north of Old Mill, between Ash Creek and Deer Creek. Most of the known veins are on the Adjust, Saddle Mountain, and Little Treasure properties and on the claims of J. N. Carmichael and J. W. Lee, which lie in this vicinity.

The country rock is Cretaceous andesite of various types, principally of effusive origin, cut by several dikes of quartz-mica diorite. The deposits lie principally in the volcanic rocks but also cut the diorite in places. They have been formed along zones of strong shearing and brecciation, partly by replacement of the rock, partly by filling of openings with vein matter. In most of the veins there is a central portion from a few inches to perhaps 2 feet wide of vein matter with only a minor amount of material derived from the original rock. The vein matter in most exposures is banded, with altered rock material between many of the bands ranging in width from a thin film up to several inches. In



many places the banding is obscured by brecciation, and the vein is composed of a heterogeneous collection of angular fragments of vein matter and altered rock. In a few places the veins contain openings lined with crystals. After mineralization was well under way there was renewed movement, resulting in brecciation of the vein matter. The zone of intense mineralization is flanked on both sides by sheared country rock, more or less thoroughly altered and replaced and in some exposures interleaved with bands of vein matter. Next beyond are zones in which the rock is not greatly sheared but is altered and contains small amounts of pyrite and other products of mineralization. The transition between this material and the mineralized country rock is gradual. In most places there are fairly well defined walls between which the more intensely mineralized parts of the vein are confined. The walls show slickensides and in some places are lined with gouge. The width between walls is in places as much as 7 feet but in most exposures is less than half that. The strike of the veins ranges from east to N. 35° E., the average is about N. 70° E. The dips range from 60° to 90°, and dips to the north and south are about equally common. The veins weather more easily than the surrounding andesite, and their outcrops are consequently inconspicuous, as can be seen from Plate XI, *A*. Vegetation grows a little more freely on the mineralized outcrops than elsewhere, and some of the veins can be traced on the surface by means of the lines of bushes along them, but this is at best a vague and unsatisfactory guide. At a number of places the veins are known to branch, and there can be little doubt that in general they form a linked system. Some idea of the attitude of the better-developed veins can be gained from the strikes and dips plotted on Plate I. A number of other veins are known to exist.

The nonmetallic minerals of the veins are quartz, barite, and calcite, with gypsum in the oxidized parts. The country rock associated with them contains sericite, chlorite, quartz, and calcite, developed in large part during the mineralization. The hypogene sulphides are galena, sphalerite, pyrite, and chalcopyrite. Chalcopyrite is nowhere abundant, and much of the ore does not contain it. Much of the pyrite is in the marginal parts of the veins and disseminated in the wall rock. The pyrite is the latest and galena the earliest of the hypogene sulphides to form. Quartz crystallized in two generations. The silver, which is the metal of principal economic importance, appears to be associated with all three of the common sulphides but is probably most abundant in the galena. In some specimens of galena tiny bright blebs are visible under the microscope, and these are probably a silver mineral. No other hypogene silver minerals are known, and the silver content of the ore can be

learned only by assay. There is a little gold in all the ore, and rich gold ore is reported to have been found in the early days. Indeed, it was the discovery of a gold nugget near the head of Little Gold Gulch by a member of a scouting expedition from old Camp Grant about 1880 that first drew attention to these veins.[26]

Most of the veins have been more or less oxidized at the surface, but in many outcrops there is residual hypogene sulphide. The depth to which oxidation has reached ranges from a few feet to perhaps as much as 40 feet. The oxidized metallic minerals known are cerusite, anglesite, limonite, and kindred iron oxides, and small amounts of chrysocolla. Gypsum is a prominent constituent of the oxidized parts of the ore bodies, occurring as flakes on the walls, in irregular masses, and in veinlets. Some of the veinlets are closely spaced and approximately parallel, producing a banded appearance like that of the original ore. Much of the oxidized ore is iron-stained material that shows little evidence of the presence of valuable metals yet may yield as much as 100 ounces of silver to the ton. Supergene silver minerals were distinguished only in ore from the Little Treasure mine. This ore contains wire silver partly filling small cavities and probably also argentite and pyargyrite. In some of the veins the supergene copper sulphides chalcocite, covellite, and bornite are present, but the copper enrichment is too slight to be of much commercial importance in any of the ore so far discovered.

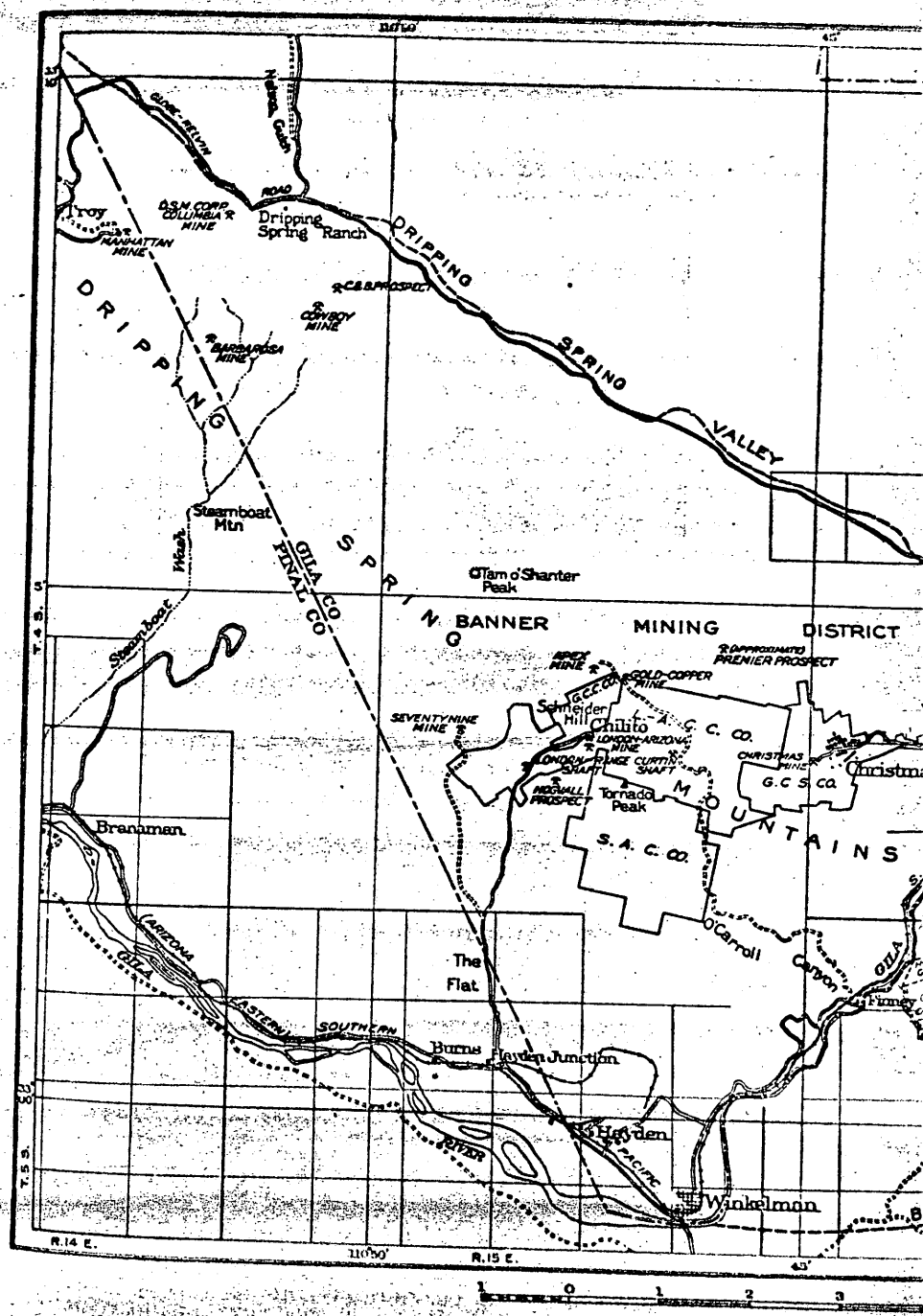
## PYRITIC GOLD DEPOSITS

The deposits in which pyrite is the characteristic sulphide and gold the metal of principal economic importance may be termed the pyritic gold deposits. The deposits in the vicinity of the lower part of Ash Creek are of this character. They include those on the Hoosier group, the prospects held by Reider and his various partners, Cook & Piper, R. F. Cook, Charles Courtney, part of the claims of J. N. Carmichael, and those of the Two Queens and Pool mines. Some of J. W. Lee's claims may be on bodies of this character. The deposits on the Hogvall prospect, near Chilito, and those on Mellor's prospects, near Christmas, also resemble this type.

The deposits lie in shear zones, which so far as known strike somewhat north of east and dip very steeply. They are principally in Cretaceous volcanic rocks. Some are in apparently intrusive hornblende porphyry. There are dikes of quartz-mica diorite near most of them, and such rock has been sheared and mineralized in places. The Hogvall prospect, which may be of this class, is in the Martin limestone. Part of the mineralized rock on the Hoosier

[26] Chittenden, G. B., letter dated October 10, 1922.

U. S. GEOLOGICAL SURVEY




PROPERTY MAP OF THE SADDLE MOUNTAIN AND BANNER M

group is in the Tornado limestone. Cretaceous sedimentary strata lie close to a few of the deposits.

The rocks along the mineralized zones are sheared and brecciated, and chlorite, sericite, calcite, and quartz have been developed in them. Pyrite is present wherever it has not been destroyed by oxidation, and in numerous places it is accompanied by chalcopyrite. Magnetite and specularite are prominent in the ore in limestone on the Hoosier group and were also noted in some of Reider's specimens. Metallic gold can be panned from some of the specimens of oxidized rock, and the rock containing pyrite also carries gold. Much of the unoxidized ore is reported to carry $5 to $15 worth of gold to the ton, although considerably higher assays have been obtained from small bodies. Some of the oxidized parts of the zones carry larger proportions of gold, and high assays have been obtained on samples of such ore. There is sufficient copper in some of the ore to be of commercial value, assays as high as 10 per cent of copper being reported. These mineralized bodies have been formed principally by metasomatic alteration of the rocks along paths opened by shearing. The replacement of the rocks was accompanied by the filling of crevices by quartz and minor amounts of other minerals.

Oxidation is irregular and in most places does not extend very deep. On the Hoosier group it goes down less than 50 feet. From the scanty information available it seems that it may reach greater depths on the Reider & Bailey group and at the Two Queens mine. In most of the outcrops oxidation has been thorough and the sulphide minerals are completely destroyed. Gold has been concentrated in favorable parts of the oxidized ore bodies, probably in the main by the leaching out of more soluble constituents. Much of the oxidized material is stained with copper.

## DISSEMINATED PYRITE DEPOSITS

In a few places pyrite crystals are disseminated in rock where no definite shear zones are present. These deposits may be merely variations of the pyritic gold deposits on shear zones just described. In this class may be grouped some of the deposits on Little Gold Gulch, on the Faull claims on Gila River, and a quarter of a mile east of the old Christmas workings. The rocks in which the pyrite occurs are basalt and dark andesite of Cretaceous age. Some of the rock on Little Gold Gulch is reticulated with narrow quartz veinlets, and on the east side of the gulch are shear zones which have been prospected for gold.

On Little Gold Gulch below the pyritic deposits and near Christmas in the rock containing disseminated pyrite there are prominent

The deposits in diabase at the Columbia mine differ somewhat from the other deposits described in this section but are probably related genetically to them. They are replacement deposits along shear zones near intrusive bodies of quartz-mica diorite. Contact-metamorphic minerals have not been found in the diabase, but calcareous shale in another part of the mine contains vesuvianite and garnet, and the mineralization is similar to that of the typical contact-metamorphic deposits.

Oxidation has attacked all the contact-metamorphic deposits of the area, and a large part of the ore mined was oxidized material. In most of the deposits, however, residual hypogene sulphides can be found at or near the surface. Oxidation probably nowhere extends more than 100 feet below the surface and in most places less than that. The oxidized minerals include malachite, chrysocolla, azurite, native copper, gold, hydrous manganese oxide, limonite, and kindred iron oxides, copper pitch ore, cerusite, anglesite, plumbojarosite, wulfenite, gypsum, and alunite. Concentration of the oxidized minerals of the valuable metals has taken place to some extent, especially in the lead deposits. The rich gold ore of the Apex and Cowboy mines may have been produced by concentration during oxidation. In both the gold was found in the oxidized part of lead ore bodies, but specimens were not available for examination. Vanadinite has been found associated with wulfenite in oxidized ore at three places in the Banner district. This mineral was not recognized in any of the deposits visited in the present investigation, but wulfenite is known to have been obtained from two of them. It may well be that the vanadinite was formed by the oxidation of lead deposits similar to those of the Seventy-nine mine, for example.

Enrichment by supergene sulphides has taken place in all the copper deposits seen but appears to be sporadic. The principal supergene sulphide is chalcocite. A little covellite was noted. Bornite is present in small veinlets in the ore bodies and might be interpreted as formed either in a late stage of hypogene deposition or early in the production of supergene sulphides, both chalcocite and covellite being later than the bornite. If the bornite is supergene, then enrichment of this character has greatly improved the tenor of the ore at Christmas. Veinlets of chalcocite, almost certainly of supergene origin, penetrate the ore down to at least the 300-foot level, but the amount of enrichment from this source in the ore seen is probably not very large. To judge by the available specimens massive chalcocite was present in the ore of the Schneider Hill deposits and in the tunnels of the London-Arizona mine. These specimens were, however, probably picked from the richer ore, and a considerable part of the ore shipped is believed



to have been oxidized material without large amounts of sulphides of any kind in it.

## GENERALIZATIONS AND INFERENCES

A number of generalizations and inferences can be drawn from a study of the ore deposits of the Saddle Mountain and Banner districts, and most of them have a direct bearing on economic problems. The following statements are based on all available evidence, but they must be regarded as expressions of opinion rather than of proved facts.

The ore deposits of the two districts have so many points of similarity that they may be confidently regarded as genetically related products of the same period of mineralization. Some are certainly and the others probably not older than the end of the Cretaceous, and all are of types that are generally regarded as genetically related to igneous rocks. The only igneous rocks known in either district whose character and age would permit their consideration in this connection are the quartz-mica diorite and quartz-hornblende diorite, both believed to be of early Tertiary age. Many of the ore deposits are intimately associated with quartz-mica diorite, and nearly all the known deposits have outcrops of this rock near by, whereas the quartz-hornblende diorite is not known to be associated with any of the ore deposits. Thus the same magmatic source from which the quartz-mica diorite came also supplied the agents of mineralization. Although the mineralizing solutions presumably came for the most part from depths below anything yet exposed by erosion, they rose near and in part through masses of quartz-mica diorite which are so exposed, and ore bodies are therefore to be expected only in the vicinity of such masses. Of course, there may be dioritic dikes with associated ore bodies which through the vagaries of erosion do not crop out. A study of the geologic map of the Christmas area (Pl. I) and of that of the Ray quadrangle, reproduced in part in Plate XVI, brings out some features of the distribution of the intrusions. In the Saddle Mountain district most of the dikes of quartz-mica diorite are included in an area about 4 miles long and 1½ miles wide trending about N. 70° E., which is the average strike of the dikes. The same area includes nearly all the known mineral deposits in the district and all those known to be of any value. In the Banner district the diorite bodies are more scattered, more irregular, and on the average larger. Associated with these are contact-metamorphic and similar ore bodies, a number of which are larger than the deposits of the Saddle Mountain district. In the vicinity of Troy, partly in and partly beyond the limits of the Banner district, there is another group of dikes. These lie in an area about 5 miles long by 2½ miles

wide, trending about N. 80° E., which again is about the average strike of the dikes. The Columbia mine and a number of others are in this area. The strikes of the dikes in both groups are fairly consistent within the group but are independent of the direction of the major faults in the region. The dikes and the veins associated with them appear to occupy fissures and shear zones formed subsequently to much of the faulting in the region, although some of the dikes near Troy seem to follow fissures that form parts of the regional fault pattern. The set of fractures now occupied by the dikes and ore deposits was probably produced at an early stage in the structural disturbance in which the quartz-mica diorite was intruded. Where the fractures were closely spaced the diorite magma may have split up into smaller masses than it could elsewhere. Another possibility is that under the areas of closely spaced dikes there are diorite masses larger than any exposed at the surface and that the force of intrusion of these masses caused the production of fractures in the overlying rocks through which narrow apophyses from the diorite magma were thrust.

As the ore deposits are interrelated, it follows that gradations between them may be expected. It is conceivable that a vein containing no contact-metamorphic minerals might be found to grade into a contact-metamorphic deposit where the conditions were favorable. Typical contact-metamorphic deposits can be formed only in rock susceptible of replacement of that character. In these two districts the rocks known to be suitable for such replacement comprise the purer beds of the Tornado limestone and certain beds in the Martin limestone, especially one near its base. Deposits have also been found in the Troy quartzite and in a rock supposed to belong to the Mescal limestone, but they are of less value. It is probable that valuable contact-metamorphic deposits of any great size will not be found in any of the rocks in the region other than those enumerated above, and that most of the large ore bodies of this type are confined to the Tornado and Martin limestones.

Although all the deposits were produced in the same period of mineralization they were doubtless not all formed simultaneously, and different types were probably formed at slightly different times. The contact-metamorphic deposits were doubtless produced in general at an early stage. The order of formation of the pyritic deposits, disseminated and in shear zones, and the lead-silver veins is not known. If order of deposition of the minerals in the ore is a criterion, then it would seem that the pyritic deposits are younger than those of galena and sphalerite, but other evidence is lacking.

From the facts above set forth something can be inferred as to future possibilities in the exploitation of specific deposits, and



examples of such inferences are given below. The Cretaceous strata that form the wall rock of the veins of the Saddle Mountain district are underlain by the Tornado limestone, which is cut by quartz-mica diorite, perhaps by a large mass of this rock. Consequently contact-metamorphic deposits may be expected in the limestone, but it is by no means certain that they lie under the deposits now being worked, which may be underlain by quartz-mica diorite in which there has been little or no valuable mineralization. Before passing out of the Cretaceous rocks the lead-silver veins may grade into pyritic deposits in depth, or the reverse may be true, according to which is the older. At the Christmas mine the bottom of the No. 3 shaft is probably less than 200 feet above the lower limit at which valuable ore bodies are to be expected, but on the downthrown side of the Christmas fault limestone lithologically favorable to the production of ore bodies extends to much greater depths and has not yet been explored.

excellent prediction

## MINES AND PROSPECTS

### ADJUST MINE

*Location.*—The Adjust mine, owned by the Adjust Mining Co., is on the south side of Deer Creek in secs. 34 and 35, T. 4 S., R. 16 E., about 2½ miles by trail from Christmas station on the Arizona Eastern Railroad. A branch of the road from Winkelman through Old Mill extends to the southern base of the hill on which the mine is situated, the distance being about 8½ miles. At present supplies are brought in by automobile on this road. When ore is shipped it is taken to Christmas station by burro pack train down Deer Creek.

*Property.*—The Adjust Mining Co., which has recently been reorganized, has 13 unpatented claims, on which there are a number of shafts, adits, and cuts. The principal developments are on the Blue Bird vein, shown in Figure 4, where there are more than 1,500 feet of workings. About 640 tons of ore,[30] principally oxidized material, has been shipped. In May, 1922, after a shutdown of several months, the mine was reopened with the intention of carrying out sufficiently extensive development to determine the value of the ore bodies to a depth of 300 feet or more.

*Character of the deposits.*—The country rock is principally Cretaceous andesite, but there are some small dikes of gray porphyry, probably quartz-mica diorite. These dikes are too small to show on Plate I, but larger ones have been mapped northwest and southeast of the property. Several veins crop out, but only one, called

[30] Heron, C. M., letter dated July 12, 1922.

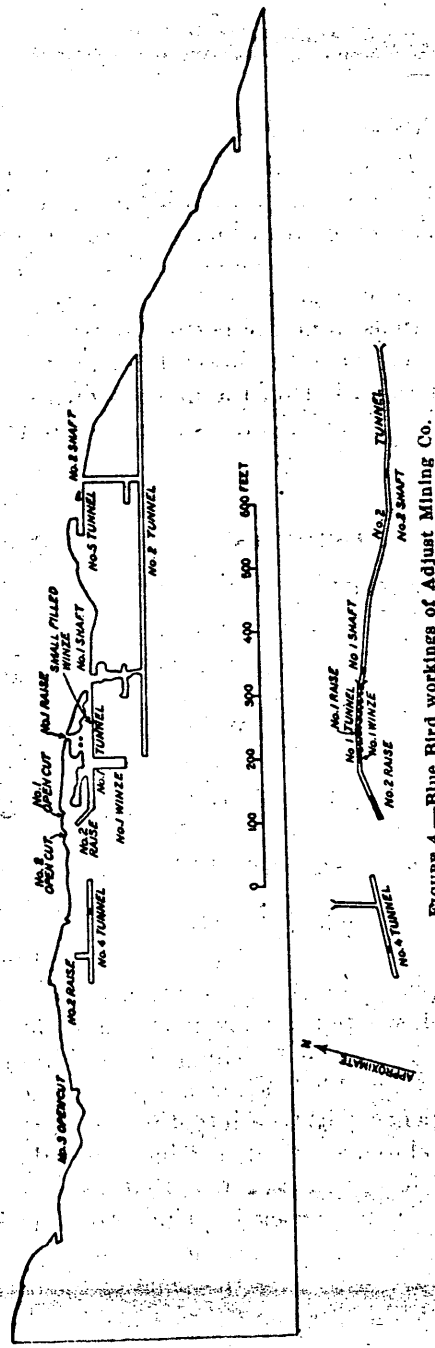



FIGURE 4.—Blue Bird workings of Adjust Mining Co.

the Blue Bird vein, has been developed to any extent. The Blue Bird vein has a proved length of nearly 1,500 feet and may be much longer. Its average strike is about N. 70°–80° E., but there are numerous variations beyond these limits. The dip is to the northwest in some places and to the southeast in others, but in general the vein is nearly vertical. The vein has well-defined and fairly continuous slickensided walls from 3 feet or less to as much as 7 feet apart. Between the walls there is altered and brecciated country rock interleaved with bands of vein matter. The amount of mineralization varies notably. There are considerable stretches in which the vein filling is of too low tenor to be regarded as ore, and in few places does ore fill the whole space between the walls. In No. 1 tunnel the well-mineralized part of the vein is 1 to 2 feet wide. In places in No. 1 shaft and parts of No. 2 tunnel the width is as much as 3 feet. Assays show that for a length of 200 feet in No. 2 tunnel ore of sufficiently high tenor to be profitably mined is exposed. This ore shoot is also exposed in No. 1 shaft and tunnel. In addition samples of satisfactory tenor from other parts of the workings have been assayed.

The gangue minerals noted are quartz, barite, and calcite. The sulphides are galena, sphalerite, and pyrite, with small amounts of



copper minerals, probably chalcopyrite and bornite. The andesite included in the vein is nearly everywhere thoroughly altered and largely replaced by vein minerals. The ore in places is stained with limonite, and the sulphides are partly or completely oxidized. The distribution of such material is irregular, but it appears that oxidized ore rarely extends much over a score of feet below the surface. Much of the ore mined contains about 30 ounces of silver and a small fraction of an ounce of gold to the ton, although ore containing more than 250 ounces of silver to the ton has been found. In 1920 325.11 tons of ore averaging 0.15 ounce of gold and 49.99 ounces of silver to the ton was shipped, and in 1921 298 tons averaging 0.15 ounce of gold and 48.46 ounces of silver to the ton.[40] The shipments consisted principally of oxidized ore, more or less hand sorted. The ore which it is planned to develop in the immediate future is principally sulphide material. Tests made by the company's engineers[41] on a composite sample of sulphide ore show that gravity concentration is hindered by the abundant barite, but flotation gives satisfactory results. To determine the distribution of the gold and silver, separate concentrates of the lead, iron, zinc, and slimes were made. It was found that the concentrates containing large proportions of lead, iron, and slime contained two or three times as much silver and gold as those high in zinc, but that the zinc concentrates contained too much silver to be discarded. These tests appear to indicate that most of the precious metals are associated with the galena and pyrite, but that some are too closely associated with the sphalerite to be separated by the methods of concentration used.

## SADDLE MOUNTAIN GROUP

*Location.*—The claims of the Saddle Mountain group lie north of Old Mill, on the ridge between Ash Creek and Deer Creek, southeast of the Adjust Mining Co.'s property.

*History.*—In 1900 the Saddle Mountain Mining Co. was organized by G. B. Chittenden, and a portable concentrating mill was erected on Ash Creek at the site of an arrastre put up by previous prospectors. The ruins of this mill still remain and the place is known as Old Mill. A little over $120 a ton was paid by a smelter in El Paso for the first two carloads of concentrates derived from oxidized ore shipped. The ore concentrated assayed about 12 ounces in silver and $1.50 in gold to the ton. A third car of concentrated sulphide ore was shipped. The concentrate in this car was found to average only about $30 a ton, although the ore treated was about as rich as that from the oxidized zone previously concentrated. This result

[40] Data furnished by Adjust Mining Co. from smelter returns.
[41] Heron, C. M., letter dated July 12, 1922.

led Mr. Chittenden to believe that a smelter near by was needed in order to treat the Saddle Mountain Co.'s ore successfully, and he consequently took steps to obtain what is now the Christmas mine, where there were two small blast furnaces. (See p. 53.)

After this mine was acquired the company appears to have done more work there than at its original property near Ash Creek. The Gila Copper Sulphide Co. was organized in 1909 and took over the property of the Saddle Mountain Mining Co. at both places. Work has continued intermittently on the original Saddle Mountain group up to the present time, much of it being done by lessees. Ore has been shipped from time to time, but records of the amounts are not available. In 1922 the deposits of this group and an adjoining one were being worked under lease by O. L. Orem and T. S. Sanford. In the spring they did most of their work on the claims on the north side of the ridge above Deer Creek. In July they found and mined ore on the south side above Little Gold Gluch. Most of the ore mined by them is oxidized material.

*Property.*—The Saddle Mountain group comprises 15 patented claims and one unpatented claim developed by a number of short tunnels, shafts, and pits. Workings are reported to aggregate 3,450 feet.[42] These are scattered over the property, with no more than a few hundred feet of workings at any one place, and a considerable part of them are now inaccessible.

*Character of the deposits.*—The country rock at the property consists principally of Cretaceous andesite and andesitic breccia cut by a long dike of quartz-mica diorite and smaller masses of the same rock, offshoots of another large dike a little farther south. The long dike has an exposed length of over three-quarters of a mile, extending somewhat beyond the borders of the group, and a maximum width of outcrop of over 30 feet. The average strike is N. 50° E., and the dip is variable but steep. Indistinct stratification in the andesite on the south slope of Deer Creek indicates that it lies nearly horizontal. A line of exposures which may be parts of a single vein extend northeastward from the streamway in Little Gold Gulch through the saddle east of mineral monument No. 2180 down to Deer Creek just upstream from bench mark 2215. The vein in most places appears to be on the northwest side of the long quartz-mica diorite dike and roughly parallel to it, but in the saddle the dike itself is mineralized. The vein ranges in width from 2½ to 5 feet, and the wall rock is mineralized for several feet beyond these limits. The average strike is about N. 50° E. The dip ranges from 60° to 90° and is toward the northwest in some places and the southeast in others.

[42] Weed, W. H., Mines Handbook, vol. 15, p. 275, 1922.



About 3,000 feet east of the saddle, at an altitude of 2,700 feet on the south slope of the Deer Creek valley, another vein is exposed in a 90-foot tunnel and open cuts. This vein is called the Big Rock vein, from the claim in which the principal workings are situated. It is 2 or 3 feet wide, strikes nearly east, and dips 70°–85° S. (See Pl. XI, *A*.) The wall rock shows some alteration but little mineralization.

The two veins are of similar type. They have fairly well defined walls, in places with slickensides. Thin layers of gouge are present on parts of the walls. The unoxidized parts of the veins are made up of quartz, barite, calcite, galena, sphalerite, pyrite, chalcopyrite, and altered andesite or, in places, quartz-mica diorite. In many places banding is the dominant feature of the vein structure, but elsewhere the vein is a heterogeneous mixture of fragments composed of vein minerals and altered country rock. The wall rock in most exposures is mineralized for a few inches to several feet beyond the vein. The alteration consists in the development of chlorite, sericite, carbonate, quartz, and pyrite. Most of the pyrite noted is disseminated in small crystals in the wall rock. There are small patches of more massive pyrite in the veins in places, principally near the walls. Oxidation in these deposits is irregular and appears to extend only to shallow depths. The oxidized minerals are limonite and kindred iron oxides, anglesite, cerusite, gypsum, and small amounts of chrysocolla. Nearly all the oxidized material contains residual galena and sphalerite, but little pyrite remains in it. Gypsum occurs as flakes on tunnel walls, in small masses in the vein matter, and also as distinct veinlets an eighth of an inch or less in width. In some specimens there are numerous veinlets of gypsum approximately parallel to one another and to the banding of the original vein matter.

There are workings on both sides of Little Gold Gulch at short distances above the streamway, at about the 2,550-foot contour. On the west side is a shaft on a vein in bleached and fractured gray andesite on slips that strike about N. 80° E. and dip 75° N. On the east side of the gulch is a 75-foot tunnel in similar rock. Various slips of widely variable strike and dip are exposed in it, with narrow seams of pulverulent white gypsum on them.

Much of the rock on the east side of Little Gold Gulch north of the large dike of quartz-mica diorite that crosses it is nearly black massive basalt. This is thought to belong to the Cretaceous flows, but its relations to other rocks are not clear, and it may be of intrusive origin. In Little Gold Gulch this rock contains rather sparsely disseminated pyrite, and in the upper part of the gulch above the 2,500-foot contour there are outcrops of similar rock

reticulated with stringers of ribbon-banded quartz. On the upper slopes to the east the rock has a rusty color and is cut by a number of narrow shear zones containing some quartz and stained with limonite. There are a number of prospect pits here, and the shear zones are reported to contain gold. Several of the zones are offset by small faults. It is reported [43] that one of them is cut by a small andesitic dike similar in appearance to those which cut the ore in the Christmas mine.

### LITTLE TREASURE MINE

*Location.*—The Little Treasure mine is in the SE. ¼ sec. 35, T. 4 S., R. 16 E., and the NE. ¼ sec. 2, T. 5 S., R. 16 E. The property covers much of the northeast end of a mountain on the south side of Deer Creek and is about 9 miles by road from Winkelman and 3 miles by trail from Christmas station on the Arizona Eastern Railroad.

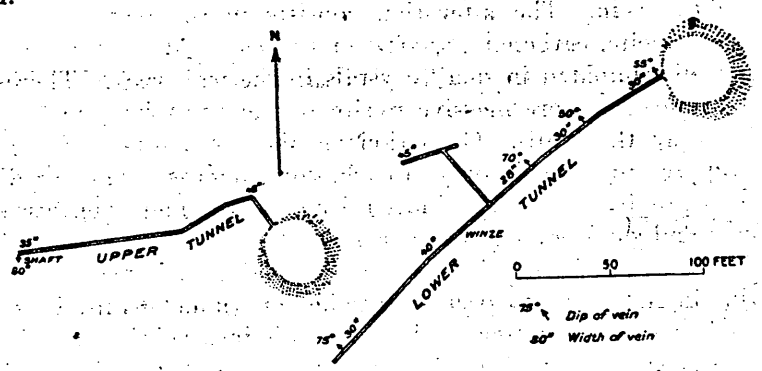



FIGURE 5.—Plan of principal workings at Little Treasure mine

*History.*—The claims were located by N. H. Mellor, of Winkelman, about 1901 and have been controlled by him since then. He built the road from Dudleyville south of Winkelman past this property to the coal prospects in Reed Basin in 1904 at a cost of $3,000 and has kept it in repair as far as his mine. A few carloads of ore have been shipped.

*Property.*—The property comprises six unpatented claims. The principal workings are on the southeast side of the mountain, at an altitude of about 2,700 feet. They consist of two tunnels roughly 240 and 150 feet long with a shaft about 55 feet deep connecting with the upper and shorter tunnel at its face. In the lower tunnel there is a winze and short crosscut. (See fig. 5.) There are other small workings on the property, but recent work has been restricted to those described.

[43] Mellor, N. H., personal communication.



*Character of the deposits.*—The country rock of the tunnels is a massive black basalt. This rock is doubtless of Cretaceous age and is thought to be of effusive origin. In the valley to the south a large dike of quartz-mica diorite which extends east from the Two Queens mine fingers out in a group of narrow dikes, of which the larger ones are shown somewhat diagrammatically on Plate I.

The vein developed by the lower tunnel in the Little Treasure mine has an average strike of N. 50° E., dips 55°–75° NW., and has a width of 30 to 40 inches of brecciated and altered rock between fairly definite walls, of which the hanging wall is the more pronounced. The part of the vein that is thoroughly mineralized has a width of less than a foot. A small amount of sulphide is contained in the oxidized ore exposed at the mouth of the tunnel, and the proportion of sulphide increases until at about the position of the winze there is almost no visible oxidation. Another vein exposed by the crosscut to the northwest strikes about N. 70° E., dips nearly vertically, is 15 inches wide, and contains unoxidized sulphide ore.

The vein in the upper tunnel has an average strike of about N. 75° E., with considerable variation. The dip ranges from nearly vertical at the mouth of the tunnel to about 80° S. near the face. The width of vein breccia exposed is 3 to 4 feet; the walls are somewhat less well defined than those in the lower tunnel. The ore near the tunnel mouth and in the upper part of the shaft is oxidized, but at the bottom of the shaft there is some unoxidized sulphide. The vein structure is similar to that of the Big Rock vein and others of that type on the Saddle Mountain, Adjust, and neighboring properties. The hypogene minerals found are quartz, barite, calcite, galena, sphalerite, and pyrite. Oxidation was noted only near the mouths of the two tunnels and the upper part of the shaft, and even in these places it is far from complete. Specimens of ore from the lower part of the shaft and from the upper tunnel show some evidence of enrichment by descending water. There are small cavities lined with wire silver and black films on galena and sphalerite and black stringers through the gangue which resemble argentite, although the amount in the specimens collected is too small for conclusive tests. Some of the ore contains dark-red grains that are probably pyrargyrite.

### LEE GROUP

J. W. Lee has claims covering most of the irregular area southeast of mineral monument 2180 bordered on the northwest and south by the claims of the Saddle Mountain group and on the northeast by the Little Treasure property. He also has some claims between Pool's mine and the Carmichael group. There are several tunnels, other workings, and trails on these claims, made in the course of

assessment work. The deposits are similar and related to the other in this vicinity.

### CARMICHAEL GROUP

J. N. Carmichael has a group of 20 unpatented claims in secs. 2, 3, 4, 9, and 10, T. 5 N., R. 16 E. They lie in an arc extending from a point near the mouth of Little Gold Gulch north of the Two Queens mine and down to Ash Creek about a mile from its mouth. These claims contain a number of shafts and other workings made in the course of assessment work, and veins carrying gold and silver have been exposed in them. The deposits are similar to the others in this vicinity.

Near the mouth of Little Gold Gulch, near the southeast end of this group, is a peculiar deposit. A mass of andesite shot through with numerous stringers of white pulverulent material crops out on the east side of the stream bed. In a large part of the outcrop, which is shown in Plate XII, *A*, the white material greatly exceeds the andesite in amount, and in the lower part scarcely any solid rock is present. The white material appears to be almost pure gypsum, mixed with a little calcite.

### TWO QUEENS MINE

*Location.*—The Two Queens mine is near the summit of the ridge on the north side of Ash Creek about three-quarters of a mile northeast of Old Mill. There is a road up to the mine from Ash Creek, but it is now washed out in places. The distance from Finney, the nearest siding on the Arizona Eastern Railroad, up Ash Creek to the mine is somewhat over 3 miles.

*Property.*—The property comprises about nine patented claims. From 1906 to 1908 it was operated by the Central Mining & Development Co., but since then it has been idle. Three small lots of ore averaging $36.53 to the ton are reported [44] to have been shipped to a smelter. The workings are said to comprise a shaft 260 feet deep with two 100-foot crosscuts off it, a tunnel over 400 feet long with a 90-foot winze off it, and several shallower shafts.

*Character of the deposits.*—The country rock comprises Cretaceous strata of both sedimentary and volcanic origin cut by small intrusive masses. Sandstone, in part calcareous, conglomerate, and carbonaceous shale make up a large part of the Cretaceous strata. The rest consists of andesitic lava, flow breccia, and tuff. West and south of the mine are masses of gray hornblende porphyry which lie approximately parallel to the stratification of the sedimentary rocks and andesitic lava. These are probably intrusions. There is a dike

[44] Stevens, H. J., Copper Handbook, vol. 8, p. 504, 1908.



of quartz-mica diorite at the principal shaft and another somewhat longer one a short distance to the north. The dump of the principal shaft shows andesite breccia, quartz-mica diorite, and a brown mineralized rock. Under the microscope the quartz-mica diorite is seen to be altered. It has a finer-grained groundmass than most of the rock of this type. The feldspars are sericitized, and the biotite chloritized and replaced by calcite. Pyrite, chlorite, and calcite are sparsely disseminated throughout. The alteration in the andesite breccia is similar to that in most of the Cretaceous lava in the Christmas area, except that there is more calcite than in most specimens examined. The brown rock is thoroughly altered. It now contains calcite, quartz, sericite, chlorite, epidote, and slightly oxidized pyrite. Most of the rock is a fine mosaic of quartz with small amounts of the other minerals disseminated through it, but in places calcite is segregated into masses of good-sized grains. The minerals have evidently resulted by metasomatic replacement of those of some previously formed rock during the process of ore deposition. Although the original minerals are completely destroyed, vestiges of what appears to have been a porphyritic texture can be discerned. From the appearance of this almost obliterated texture and the fact that incipient alteration of the same type has occurred in quartz-mica diorite found at the same place it is thought that the brown rock was produced by the mineralization of quartz-mica diorite.

Gold ore is reported to have been found in pockets at the surface in the early days. The tunnel is said to have cut a mass of oxidized ore, and the winze below it to have in the bottom sulphide ore carrying $16 in gold to the ton and 10 per cent of copper.

### POOL'S MINE

*Location.*—The principal workings of Pool's mine are in secs. 3 and 4, T. 5 S., R. 16 E., about 2½ miles by trail from Christmas station on the Arizona Eastern Railroad. There is another prospect which was worked by some of the people interested in Pool's mine on the east side of Gila River in the NE. ¼ sec. 5, T. 5 S., R. 16 E. This is about a mile up the river from the railroad siding of Finney.

*Property.*—The property at Pool's mine comprises 10 unpatented claims and is owned by the Ash Creek Gold Mining & Milling Co., of Winkelman. At the place marked "Pool's mine" on Plate I is a shaft, now full of water, equipped with a whim. There is a dump of considerable size at the shaft. The vein is exposed in a series of shallow cuts for a few hundred feet northeast of the shaft, and above these cuts are some shacks. About 1,500 feet to the east is

Report on
The Saddle Moutain Group of Claims.

LOCATION.

This group consists of 15 patented mining claims, situated in the Saddle Moutain mining district, Pinal county, Arizona. It is located 2 miles southeast from the Arizona Eastern Railway at Finney which is 5 miles by rail from the smelter at Hayden. A 6 mile road connects the property with Wilkelman which is reached by rail from Phoenix or by State and county highways from Tucson and Globe.

HISTORY

This group of claims was among the first claims located in the district. They have produced considerable high grade ore in the early days. The shipping records are not available and the only evidence we have at present are assays taken while mining on the claims and the tales of old time miners of the district.

The entire material form one 60 foot shaft on the Lola claim was packed a mile by burros to Ash Creek and put thru a small gravity concentrates. Mr. H. H. Wellor, who was present when this mill was in operation, says the table at times showed considerable quantities of gold, indicating that very rich pockets of gold were taken from this old shaft. A few samples taken from the sides of the shaft and from the old mill tailings showed that only a portion of the gold and silver was removed by this method of extraction and degree of grinding. Mr Wellor later syanided one dump on the Philadelphia claim which averaged $20 per ton in gold and siver. Many small lots of high grade ore have been shipped from the numerous surface ore lenses by lesseesin the past and Mr. T. S. Sanford and the writer shipped approximately $5000.00 gross ore from such lenses during the past 18 months.

As this property is located in the Dripping Spring Range at an elevation of between 2000and 3000 feet the climate is very mild and out door work can be carried on every month in the year.

GEOLOGY AND ORE DEPOSITS.

The country rock in this district consists of a volcanic complex, composed of a large variety of Andesitic flows, conglomerates and porphyries out to later quarts-porphyries and intrusive masses and dikes of diorite. These surface formations are held by F.L. Raneome in Professional Paper Fo.115,U.S.G.S., tobe underlain by Carboniferous limestone at $n^{0}t$ over 1000 feet depth.

The veins are persistant fault fissures in the andesite. Two, however, lie partly in the quarts porphyry and partly an contact fissures between the porphyry and andesite. The veins are numerous and many of them are easily traceable on the surface for several miles. They vary from a few inches to large altered, imoregarted masses, 40 to 50 feet in width.

The ores so far exposed are mostly oxidized silicones ores that carry silver, gold, lead, zinc, iron and copper. Silver and gold constitutes the main values and as the silver secure mainly in the sulphide form, reasonable rates are obtained from the copper smelter at Hayden, who desire the ore for its silica content. The gangus minerals are quarts, calcite, siderite, oxides of iron, gypsum and small amounts of barite. The oxicized zone is shallow, varying from 25 to 50 feet in depth, altho a little oxidation is found two hundred feet under the surface in some of the workings in the district. Belos the oxidized zone, some of the ore sheets are composed largely of sulphides of lead, zinc, and iron that carry gold and siver. Some of the veins are entirely quarts with disseminated sulphides scattered thru them, while others are chiefly altered andesitic material either carrying the sulphided in small lences thru it, or, as brecciated pieces, the total forming an ore or vein brecoia. Some of the veins show post mineral movement.

Accurate ore tests have been run on the sulphide ore of the district. They show that selective flottation giver a very high total recovery, 98% of the gold 96% of the silver and 92% of the lead being extracted.

Plenty of water could be developed for milling purposes. An old shaft on the Concord (see accompanhing patent plate) on Deer Creek had furnished plenty of water even during the driest seasons when all the creeks were dry. Should sufficient milling ore be developed to warrant a large mill, ideal mill sites are available on the Gila river and railroad which could be connected with the property by aerial tramway and airline distance of one mile with a drop of 600 feet.

## ASSAY VALUES, DEVELOPMENT WORK, AND POSSIBILITIES.

Every claim shows numerous small prospect shafts, cuts and tunnels. Only the more importand ones will be mentioned her. Nearly all the work was done on the high grade ore lenses by lessees with limited means and when the high grade ore lenses pinched or were faulted the work stopped.

The Concord claims has on 30 foot tunnel, the face of which sampled $30 in gold and silver across one foot. All along the surface the ore has been stripped from this vein by open outting. Two shafts that were under water were not sampled. One 150 foot tunnel and 30 foot winse from it show where narrow high grade lenses and 2 to 5 feet of lower grade ore. Another 30 foot shaft on the upper vein showed 6 inches of 60 ounce silver ore in one lense. The tree veins on this claim all show narrow lenses of ore that are generally very high grade. Samples carrying as high as 900 ounces silver have been taken from this claims.

On the Big Rock claim, one shaft, 150 feet deep but open only tothe 60 feet level, shows 18 inches to 4 feet of ore the full depth. 18 inches of this ore was mined from the sufrace by an open out. 12 feet deep by 50 feet long, and averaged 20 ounces silver and $2 gold per ton. A large number of samples were taken during the mining on this claim and some showed the presence of rich gold pockets, but the ore as shipped averaged only $2 or $3 gold per ton. Deeper in the shaft the ore contained lead, zinc and iron sulphides that only assayed 6 to 10 ounces silver and $1 to $3 gold. A short distance to the east of this shaft a 100 foot tunnel has produced considerable ore 20 years ago and one car of $53 ore last year. some of this ore was of very high grade-one width of 8 inches assayed 400 silver and many samples over a foot width assayed from 40 to 100 silver. An incline slip or fault along the vein cut off the ore 16 ft below

this tunnel level and two shallow winzes failed to relocate it. This vein averages 4 to 6 feet in width and the bottom workings show 3 to 4 feet of milling ore that will average 10 ounces silver and a small amount of gold. A 60 ft. crosscut on the hillside below will if extended 100 feet intersect this vein 200 ft. below the surface under the 150 ft shaft, or a 700 ft. drift along the vein from the ravine east of the present workings, would give 300 or 400 feet depth. Such a tunnel would develop the milling ore in the shaft and tunnel and explore a long distance of vein that shows numerous surface lenses.

The Pittsburg claim which overlaps the Big Rock shows several good ore lenses on the surface. The 100 ft shaft contained water and was sampled only near the surface. It showed from 1 to 3 ft. of ore assaying 23oz silver and $10 gold.

The Trenton claim has one 400 ft tunnel which cuts an ore shoot 75 ft. long, assaying 15 oz silver and $1 gold. It shows much lead, zinc and iron sulphides and is 2 ft. wide in the center of the tunnel level and tapers to either end. A winze on this ore lense may open up considerable milling ore as the tunnel seems to have cut near the top of a lense. One 30 ft open cut 500 ft. below this tunnel level yieled eight tons that averaged slightly under $100 per ton; values varied from 30 to 163 ozs. silver and $7 to $14 gold. A 200 ft shaft on the summit above the 400 ft tunnel has produced one or two small shipements of very high grade ore. The veins are wider to the northwest and show milling grades of ore over fair widths where samples on the surface and in small outs.

On the claims west of the Trenton there are a great many small surface workings. One of the more important of these is a 70 ft. shaft, sunk along the foot wall of a 30 to 40 ft. vain. In the 70 ft. level the vein is crosscutted and a 60 ft. drift to the west driven along the hanging wall. Above this lower drift a 20 ft. shaft has been sunk from the surface. This vein in these workings show from 3 to 8 ft. of lead, zinc and iron sulphides that carry from 2% to 18% lead, 14 oz silver and $1.20 gold per ton. The large altered mass between the hanging and footwall lenses contains smaller amounts of sulphides disseninated thru it. One 50 ft. shaft 500 ft east of these workings has from one to three feet of ore assaying from 7 to 18 oz silver and $1.20 to $10 gold. The entire material from this shaft was passed to a small concentrater on a creek one mile below. east of this shaft a long crosscut tunnel has been driven to intersept with a 60 foot shaft on a vein 3 to 5 feet in width that has produced several small shipments averaging approximately 60 ozs. silver ans small amounts of gold.

The lower group of claims has many small veins that show fair gold and silver values on the surface but the main vein in which this group is leased shows a quarts vein 3 to 20 ft. wide, which has produced several high grade ore shipments from the surface lenses. The Sleeper has one 150 feet shaft which has caved to the 50 foot level. Above this level three cars of ore averaging 23 to 30 ozs. silver and $2 to $3 gold were shipped last year. In places the higher grade ore was 4 feet wide and assayed $40 in gold and silver. The ore was soft and was mined almost entirely by picks with an occassional light blast in the harder ribs. On the side of this higher grade ore essaye one to three feet of lower grade material assaying from 9 to 18 oz silver. The shaft and tunnel on the Philadelphia claim show 18 inches of 18 oz silver ore, smaller widths of higher grade ore, and several feet of lower grade sulphide.

Many of the veins on this property offer an opportunity to develop considerable tonnage of milling ore with the additional assurance that such development will result in opening up many high grade ore lenses. There has been developed as deep systemmatic development work. Each lessee abandones his workings when it no longer showed a profit from the higher grade lenses. Such lenses are characteristically irregular. The property should be developed on the basis of the milling grade ore. The high grade lenses whenencountered would then be velvet. The lessees had insufficient operating capital to work on this basis. The Adjust mine, adjecent to this property has shown the ore and values to extend at least 200 feet below the surface in this district. The quarts-dicite porphyries in this district can be followed across the Gila river to Christmas and on over towards the 79 mine showing that they out the Carboniferous limestone below the andesitic surface formations. This is important when considering development possivilities with depth, as those porphyries on the above mentioned properties, are held to be genetically responsible for the large replacement deposits formed in the Carboniferous limestone. The iron pyrite in the deeper workings of the district has been found to carry the highest gold content, assays of the solid iron sulphide from several of the feins on this property and the adjust vein, both on the adjust property and the Ryan claim, showed values varying from $35 to $72 gold and 50 to 172 on silver per ton. This will become an important factor with deeper mining as the pyrite will be there more persistent mineral with depth. The veins near the surface contain considerable gypsum which has been formed by the action of surface waterson pyrite, indicating the former presence of considerable pyrite in the original sulphides.

MINING METHODS AND PRODUCTIONS COSTS.

The district has produced approximately $300,000.00 of gross ore up to date, practically all of which has been high grade lenses that have been worked by selective mining and careful hand sorting. The costs by this method vary greatly according to size, width and value of the lenses.mined A milling grade of ore could be mined from most of the veins in this district for a small fraction of the costs of selective mining of higher grade lenses. The vain material is soft, and easily and cheaply mined, The ore has been packed to the railroad on burrow and has cost an average of $4 per ton by constructing and airial tramway this cost could be reduced to $30.15 per ton. Freight to the smelter has averaged 1.40 per ton and the melting costs $5.50 per ton.

RECOMMADATIONS

Considerable development should be done to determine the extent and value of the many surface bodies. While these ore bodies offer many promising opportunities and should be developed, the real deed of this property and district is some deep development work. If possible a theww compartment shaft, centrally located, vertical, shold by equipped and sunk 500 foot level, and this large fissure vein system crosscut at this level. Adequate ore and waste pockets should be excavated and the shaft continued to the 1000foot level and the vein system again explored in the favorable limestond horizon on that level.

Although this would require considerable experditure it will prove by far the most economical development program in the end and may place this district will up on the list of Arizona's important producers.

Before such a program is carried out adjoining properties should be tied up under option if possible fne such a development program if successful will increase their value many times.

CONCLUSION

this property contains sufficient surface ore bodies of a shipping and milling grade, that under competent management, with a progressive development policy, should produce sufficient ore, to , at least warrant a small modern plant, that will be very profitable to its owners. Ther are many excellent tunnel although that makes cheap development of these surface ores possible.

The property is readily ascessible, being situated close to transportation, smelter and power facilities.

There are always deffinite causes for the deposition and concentration of ore. The chances of developing are of commercial grade and quantity are determined by certain will defined characteristics. From the experience gained while working on the surface ore bodies of many veins of this district, the writer has become impressed with the potantial opportunities it offers to open up important commercial ore bodies at depth.

it has an extensive and will mineralized network of strong persistent fissure veins that have already produced considerabel quantities of high grade are. It lies in a mining country that is noted for deep-seated mineral deposits, and is underlain by seimentary formations at moderate depths that have proved soem of the most productive ore horizons of the southwest. It contains ignaous intrusions that are responsible for large and important ore bodies in these sedimentary beds in the adjoining districts. The surface and geological indications on the property warrent the assumption that an extersive development programs will, with reasonable certainty, develop sufficient ore. to bring substantial returns on the investment.

DEPARTMENT OF MINERAL RESOURCES
STATE OF ARIZONA
FIELD ENGINEERS REPORT

Mine: Saddle Mountain Mine — Date: April 3, 1961

District: Saddle Mountain District, Pinal Co. — Engineer: Lewis A. Smith

Subject: Mine visit with Raymond Dye.

Property consists of 15 patented claims.

**Location:** S 3, T 5 S, R 16 E and S 34, T 4 S, R 16 E.

**Minerals:** Lead, zinc, gold, silver

**Owner:**

**History:** The history through 1922 is described by Ross.2/

**Work:** The various workings, assays, shipments etc. are described in C. L. Orem's report. 1/ Mr. Raymond Dye has repaired the 70 foot shaft in the west part of the claims and has extended the north drift somewhat.

**Geology:** The general geology is adequately described by Clyde P. Ross. The shaft reopened by Dye, lies on the footwall of a vein which is 25-30 feet wide and which was formed on the footwall of a dike composed of andesite porphyry or quartz-mica diorite. Many deposits in the area are believed, by Ross, to be associated with the latter although he mentions the pair of andesite dikes. A crosscut at the bottom of this shaft reaches the hangingwall from whence drifts were driven from 30-35 feet both ways along the wall. The vein and dike strike about N 80° E and dip between 70° and 75° to the south. At the shaft the vein has two strong and smooth walls. The vein material consists of brecciated, sheared and highly altered andesite. The 5-9 feet, next to the hanging wall, is oxidized around variable-sized breccia fragments and masses up to 1 foot in diameter. The fragments contain disseminated blebs of sphalerite and galena (with occasional thin fibers of argentite and sparse chalcopyrite (or cupriferous pyrite). According to Ross the oxidized portions, around the breccia fragment borders contain some anglesite, cerussite, and rarely chrysocolla. However, it is also probable that some massicot (PbO) and oxidized zinc minerals are also present along with considerable limonite. Residual blebs of galena and sphalerite are scattered in the oxidized material, but pyrite in the hangingwall zone has mainly been removed. This oxidized material is colored orange or red and this gives the outcrop a pinkish color. This along with the mottled appearance of the vein breccia ore outcrops are characteristic and could serve as indicators. Accessory minerals include calcite, chlorite, gypsum and sericite. The middle part of the vein is bleached gray and contains more pyrite and somewhat smaller zinc and lead sulphide blebs. It, however, carries some gold according to Mr. Dye. The breccia fragments are smaller and oxides are less prevalent. It also contains fine-grained quartz and is relatively compact. The footwall segment has yielded silver-lead bearing pockets and looks to be a little more oxidized than the other two divisions. In the area as a whole oxidization sometimes extends past the footwall for several feet. It was suggested that each division be sampled separately. The specimens from the hangingwall zone appear upon visual observation to have more zinc than lead and conversely the botwall area seems to have a little more lead, expecially

1/ Report by C.L. Orem (See Department of Mineral Resources file.)
2/ Ross, C. P., U. S. Geol. Survey Bull. 771 (1925) pp 43-46

in the upper half of the shaft. In all three divisions the proportion of oxides at the top of the shaft is somewhat greater than is the case in the bottom. Orem's descriptions give a definite hint that this was true in some of the other workings. Small pockets of relatively high grade gold were noted by Ross and Orem. On the whole the oxidation in this mine appears to be relatively incomplete since sulphide residuals are found at the surface. A decrease in overall silver values, in some areas in depth could along with hot silver lenses indicate that there may have been an overlying silver enrichment present prior to the late Tertiary erosional epoch. Thus the high grade silver pockets and lenses which so far were largely in the upper part of most workings, may represent the feathering out of the enrichment along downward projecting tongues, expecially along fractures. Some sulphide blebs in the shaft ore are coated by scattered films which are believed to be argentite. In the Little Treasure mine, Ross reports that native silver in vugs and black films probably argentite films were found on the galena and sphalerite, along with red occasional specks which he states probably could be pyrargyrite. In neither case was he able to accumulate enough material for proper tests. (The silver may be in halogen compounds.) The samples from the lead-zinc hangingwall section show several ounces silver and some gold, and the combined lead-zinc assays indicate about 12 percent. This particular vein is strong, has well defined walls, and evidently has good length. (Mr. Dye has traced it for over 1000 feet and it appears to be strong enough to reach a good depth. To the south is a narrow and fairly deep canyon and the vein dips toward this canyon. It was therefore suggested that an angled core drill hole from this canyon would be able to reach the vein at 100 or more feet below the bottom of the 75 foot shaft, depending upon the angle of the hole. At the present cost of shaft sinking it would seem rather expensive to sink the shaft as a means of determining the downward extension of the ore. The topography would permit other holes to the east for a considerable distance. If the vein continues downward the crosscut drilling could be supplemented by holes in the vein itself should the proportion of oxidation in the vein lessen as expected, the sulphide grade would be some better and ore would be more amenable to concentration. The ore would, if zonal deposition holds, be apt to contain proportionally more zinc in depth, since the temperature of zinc deposition is believed to be somewhat higher than lead and silver. It is hoped that appreciable silver values will continue downward.

The average elevation of much of the present mineralized area as roughly compared with the contact between the andesite and later volcanics (on Saddle Mountain and the Tablelands) indicates that many hundreds of feet of the Cretaceous was eroded away in addition to the later flows. Part of the Cretaceous was removed prior to the outpouring of the later flows. Thus the depth of erosion of the Cretaceous, within the Ash Creek Basin, could have reached as much as 1000 feet. Ross states that it is believed that the mineralization in this area probably occurred in early Tertiary. Therefore, it is certain that a considerable depth of the original deposits was also removed. The eroded part of these deposits would be apt to have contained more silver and lead mineralization on the average, than has been found in the present area, except for localized lenses. Conversely it would be expected that the proportion of zinc would be greater in depth. The presence of more fresh sphalerite in the deeper workings tends to confirm this. Some progressive lessening of the rate of oxidation can likewise be expected since it is generally believed that the climate in the region has relatively rapidly become more arid during the late

Tertiary (probably late Pliestocene and Quarternary). This is also influenced by the rate of degradation of the topographic surface due to the rapid back-cutting of the Gila River drainage area. This extensive erosion may have removed much of any silver enriched zone which might have existed and the drying up of the climate could have materially reduced the movement of the remaining silver downward. Also after a protracted erosional epoch the source material could have been materially reduced. This is to some degree varified by the absence of appreciable argentite in the present ores. Conversely the argentite could have been oxidized to silver halogens. Nevertheless the indicated decrease in silver values with depth excepting near surfaced local high-grade lenses, indicates the fingering out of any enrichment which may have existed above. Therefore, it would seem that the better hope for the future would lie in the development of the bare metal reserves to a point where they would warrant the building of a concentrating plant.

Of the mineralized areas, observed by Mr. Dye and me, the "Dye" vein area and one to the south would best lend themselves to future prospecting. The area to the south has a considerable surface extent (perhaps more than a fourth of a mile in diameter) in which much of the surface is well saturated with iron oxides and has bands of kaolinization spaced over it. This area appears to contain annumber of veins some of which have been worked to varying degrees. Much work would be required to obtain a true picture of this area. For example it must be determined whether the values are disseminated or more confined in veins. Geophysical prospecting methods might prove useful in this case.

The presence of transverse faulting is noted by Ross and Orem. Time did not permit a study of these, but Mr. Dye pointed out that the east portion of the Dye vein appeared to have been somewhat stepped southward. Two lines of de-arrangement in the andesite bedding and shallow escarpments are seen in the area east of the "Dye" shaft.

OFFICE OF MINERALS EXPLORATION
U. S. GEOLOGICAL SURVEY

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O. M. E.
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SEP 7 1971
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HX ~~130~~

TO: Chief, Branch of Budget and Finance
U. S. Geological Survey
Department of the Interior
Washington, D. C. 20242

FROM: Field Officer, Region II, OME
U. S. Geological Survey
345 Middlefield Road
Menlo Park, California 94025

ABSTRACT OF REMITTANCES

| Date | Amount | Bank, City and State | Name of Remitter | Docket & Contract Numbers | Purpose |
|---|---|---|---|---|---|
| 8-19-71 | $172.00 | Kanab State Bank Kanab, Utah | Eva Koyen | OME-6537 Ch. 2228 | Travel expense |

REMARKS: Reimbursement for costs incurred August 8, 9, and 10, 1971, by Field Officer for travel and subsistence while serving as a witness for the U.S. Government during lawsuit of Tempiute Mining Company against General Resources Corporation.

August 26, 1971
Date Prepared

Field Officer, OME, Region II
Person Preparing Abstract

9/3/71
Date Received

Lorraine E. Peterson
Person Receiving Remittance

Tempiute, Nevada
August 19, 1971

Geological Survey
Office of Minerals Exploration
c/o Harold K Stager

Re: OME-6537
Tempiute Mining Company
Sterling and South End Group of Claims
Lincoln County, Nevada
Contract 2228

Dear Mr. Stager:

Enclosed is the check to the Treasurer of the United States. We appreciate all you did for us. Thanks a lot.

We saw Tom Steffen yesterday and he is going ahead to collect the damages the court allowed. If we run into trouble, which we more than likely will, I'll let you know.

Sincerely,

Wesley Koyen
Tempiute Mining Company

Wesley Koyen

RECEIVED
AUG 25 1971
OFFICE OF MINERALS EXPLORATION
U.S. GEOLOGICAL SURVEY
MENLO PARK, CALIF.

IN REPLY REFER TO:

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

Office of Minerals Exploration
Building 53 Room 200

COPY
O. M. E.
RECEIVED
JUL 6 1971

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| CAC | 210 |
| gla | 130 |
| HKR | 120 |
| | |
| | 220 |

July 1, 1971

Memorandum

To: Chief, Office of Minerals Exploration

From: Assistant Chief, Office of Minerals Exploration

Subject: OME-6548 (Silver)
Big Treasure Mining and Development Co.
Little Treasure and Adjust Mines
Pinal County, Arizona
Contract 2231

Transmitted herewith is the final field report on the above-stated subject.

William L. Emerick

William L. Emerick,
Assistant Chief,
Office of Minerals Exploration

Enclosure

This is not a royalty.

FINAL FIELD REPORT -- OME EXPLORATION PROJECT

By W. L. Emerick

July 1, 1971

1. OME-6548 (Silver)
Big Treasure Mining and Development Co.
Little Treasure and Adjust Mines
Pinal County, Arizona
Contract 2231

Operator: Big Treasure Mining and Development Co.
125 Sedgefield Court
San Ramon (Dublin),
California 94583

Property: Consisted of two (2) patented and twenty three (23) unpatented lode mining claims, including all rights pertaining thereto, in secs. 34 and 35, T. 4 S., R. 16 E., and secs. 2 and 3, T. 5 S., R. 16 E., Gila and Salt River Base and Meridian, Saddle Mountain mining district, Pinal County, Arizona. A map showing the area of the claims was attached to the contract.

Ownership: The Operator was in possession of the two patented claims under the terms of an Assignment of Mining Leases and Claims, dated April 22, 1966, from Chester L. Whitelock and Blanche D. Whitelock, the lessors. The two lessors were in possession of the two claims under the terms of a Mining Lease, dated April 29, 1965, from Lee Acton and Margaret M. Acton, the owners.

The Operator was in possession of one (1) unpatented claim by right of location and of the remaining twenty two (22) unpatented claims under the terms of an Assignment of Mining Leases and Claims, dated April 22, 1966, from Chester L. Whitelock and Blanche D. Whitelock, lessors and owners. Chester L. Whitelock was in possession of five (5) of the unpatented claims under the terms of a Mining Lease, dated May 19, 1965, from Joseph Jameson and Manuel Sosa, the owners and of seventeen (17) of the unpatented claims by right of location.

2. Purpose of Project: The purpose of the project was to explore by diamond core drilling from surface sites for silver-bearing ore bodies in and along veins that traverse volcanic rocks interstratified with sandstone and conglomerate of Cretaceous age.

Temporary tag
Final Field
Report

3. Contract: Dated October 12, 1966, for a term of 12 months, later extended by amendment to 14 months.
Original contract amount - $112,000.00.
Government participation - 75 percent - $84,000.00.

Amendments -

No. 1 - January 12, 1967, to add under Annex I three claims to the land subject to the terms of the contract; to revise the reading of a paragraph under General Provisions, and to add a modifying paragraph under Description of the Work, Stage I.

No. 2 - March 6, 1967, to revise in Exhibit A an item under Estimated Costs of the Work, Stage I.

No. 3 - August 21, 1967, to extend the time for completion of the work from 12 to 13 months; in Exhibit A (1) to revise a paragraph under Description of the Work, (2) to add a schedule of Fixed Unit Costs under Estimated Costs of the Work, Stage I, (3) to revise the total Estimated Cost for Stage I, and (4) to revise the schedule and total costs under Estimated Costs of the Work, Stage II.

No. 4 - November 9, 1967, to extend the time for completion of the work from 13 to 14 months; in Exhibit A to revise the paragraph under Description of the Work, Stage II.

4. Project Work: Started November 18, 1966. Terminated July 17, 1968.

Stages I and II

| Cost Items | Authorized Units | Authorized Rate | Authorized Amount | Completed Units | Completed Amount |
|---|---|---|---|---|---|
| Mobilization and demobilization, one bulldozer | ----- | ----- | $200.00 | ----- | $85.00 |
| Bulldozing roads and drill sites | 120 hours | $20.00/hr. | $2,400.00 | 103 hours | $2,060.00 |
| Core drilling | 10,000 feet | Various | $66,210.00 | 7,357 feet | $48,784.00 |
| Casing lost in hole | 1,000 feet | $4.00/ft. | $4,000.00 | 276 feet | $560.65 |
| Reaming and installing casing | 2,000 feet | $3.40/ft. | $6,800.00 | ----- | ----- |
| Cementing and redrilling | 400 hours | $12.50/hr. | $5,000.00 | 14 hours | $175.00 |
| Additives | 400 sacks | $7.50/sack | $3,000.00 | 78 sacks | $490.50 |
| Water truck rental | 8 months | $190.00/mo. | $1,520.00 | 5 months | $950.00 |
| Water truck mileage | 4,000 miles | $0.12/mile | $480.00 | 261 miles | $31.32 |
| Supervisor-engineer-geologist | 7-1/2 months | $900.00/mo. | $6,750.00 | 9-1/2 months | $8,560.00 |
| Outside Consultant | 20 days | $75.00/day | $1,500.00 | 28 days | $2,100.00 |
| Per diem, outside consultant | 12 days | $16.00/day | $192.00 | 11 days | $176.00 |
| Miner | 10 days | $24.00/day | $240.00 | ----- | ----- |
| Laborer | 10 days | $20.00/day | $200.00 | ----- | ----- |
| Explosives | ----- | ----- | $220.00 | ----- | ----- |
| Core boxes | 1,000 boxes | $1.00/box | $1,000.00 | 694 boxes | $694.00 |

Stages I and II (Continued)

| Cost Items | Authorized Units | Authorized Rate | Authorized Amount | Completed Units | Completed Amount |
|---|---|---|---|---|---|
| Air Compressor Rental | 3-2/3 months | Various | $3,585.00 | 1-3/8 months | $1,247.69 |
| Vehicle (4-wheel drive) | 7-1/2 months | Various | $1,704.00 | 11-1/6 months | $1,784.00 |
| Air and waterlines | 3-1/2 months | $286.00/mo. | $1,001.00 | 1 month | $97.20 |
| Payroll taxes, insurance | ----- | ----- | $1,146.00 | ----- | ----- |
| Assaying | 1,200 assays | Various | $3,400.00 | 453 assays | $1,397.50 |
| Vehicle mileage | 9,600 miles | $0.12/mi. | $1,152.00 | 12,372 miles | $1,611.36 |
| Accounting and Office Expense | 7-1/2 months | $40.00/mo. | $300.00 | 10-1/3 months | $427.50 |
| Total Estimated Costs, Stages I and II | | | $112,000.00 | | $71,231.72 |
| Government Participation at 75% | | | $84,000.00 | | $53,423.80 |
| Paid to Operator | | | | | $53,423.80 |

The Government retained no equity in any of the material used.

Effectiveness of the Work - The target area of the project was adequately explored.

Efficiency of Operation - The work progressed normally and in an efficient manner.

5. Reports:

Operator's Final Report - An acceptable Final Report was transmitted to OME in February 1968 by the Operator.

Cost Review - A Report of Review was issued by the Office of Survey and Review in April 1968.

5. Reports: (Continued)

Final Audit

- A final audit was not requested because no additional vouchers were submitted or paid after the Report of Review. The final voucher was paid on March 21, 1968.

Royalty Review

- There was no production and no royalty was due the Government. A Royalty Review was not requested.

6. Project Results:

Discoveries

- Project work did not result in the discovery of a silver-bearing ore body.

Certification

- There was no discovery made and a Certification of Possible Production was not issued.

Production

- There was no production as a result of the OME work.

Royalties

- No royalties were paid or due the Government.

7. Geologic Summary

- The ore deposits occurred as veins along zones of shearing and brecciation and partly by filling of fissures in a thick series of andesitic flows and breccias interbedded with sandstone and conglomerate rocks of Cretaceous age. Gangue material consisted mainly of fragmental and altered country rock, quartz, barite, and calcite. Ore minerals consisted of argentiferous galena, sphalerite, pyrite, and minor chalcopyrite. Previous production records for the mines were incomplete but during the period 1921 to 1925 about 135,000 ounces of silver were recovered from about 4,500 tons of ore.

MME Form 7
(2/63)

OFFICIAL FILE COPY

| Date | Surname | Code |
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| 6/26/68 | [illegible] | 120 |
| 6/26/68 | [illegible] | 120 |
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SEP 10 1968

Messrs. Joe Jameson and Manuel Sosa
c/o Mr. Joseph Jameson
Box 26
Winkelman, Arizona 85292

Re: OME-6548 (Silver)
Big Treasure Mining and Development Co.
Little Treasure and Adjust Mines
Pinal County, Arizona
Contract 2231

Gentlemen:

Enclosed is a copy of a self-explanatory letter of today to the Operator under the subject contract.

This correspondence relates to the Lien and Subordination Agreements executed by you on February 25, 1966, under the Office of Minerals Exploration program.

Sincerely yours,

FRANK E. JOHNSON (gla)

Frank E. Johnson
Chief, Office of
Minerals Exploration

Enclosure

cc: Director's Reading File
Economic Geology File
OME Docket
OME Reading File
OME Region III
Mr. Smith
130

GLAult/a 6-26-68

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

September 5, 1968

Memorandum

To: Chief, Office of Minerals Exploration

From: Field Officer, Region III

Subject: OME-6548 (Silver)
Big Treasure Mining and Development Company
Little Treasure and Adjust Mines
Pinal County, Arizona
Contract 2231

gla / 30
Geol / 20 M
~~FCO~~ 110
120
(Smith)

Transmitted herewith are the "Government's Copy" and the "Budget and Finance's Copy" of the termination agreement on the above-stated property, signed for the Government and by an official of the company. The operator has retained the "Operator's Copy" and the "Field Office Copy" and "Extra Copy for Field Use" have been retained in the OME Region III field office files.

See letter aside

J. William Hasler

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

MME FORM 6 REFERENCE [P
REV. 2-59 OFFICE OF MINERALS EXPLORATION

| TO: | DATE | INITIALS |
|---|---|---|
| 1. ~~Assoc. Sol. - MR, Rm. 6554 Through Room 6042~~ | | |
| 2. Mr. Smith, Rm. 4459 INTERIOR DEPT. 6-68-2050, 3192 JUL 2 - 1968 | | |
| 3. | | |
| 4. SOLICITOR | | |
| 5. | | |
| FROM: Chief, OME | | |

FOR: Check items for action desired

____ Action ____ Reply for signature of ____
____ Approval ____ Investigate ____ Surname
____ Comment ____ Recommendations ____ Signature
____ Conference ____ Rewrite ____ File
____ Instructions ____ Your information

REMARKS:

RECEIVED
JUL 2 1968
Division of Mineral Resources
and General Legal Services

INT.-DUP. SEC., WASH., D.C. M56300-62

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To Legal 7/1/68

DRAFT 6/27/68
RMSmith/bsl

EXPLORATION CONTRACT
BIG TREASURE MINING AND DEVELOPMENT COMPANY
OME-6548

TERMINATION AGREEMENT

It is agreed this _____day of _____, 1968, between the United States of America, acting through the Department of the Interior, U. S. Geological Survey, hereinafter called the "Government," and Big Treasure Mining and Development Company, hereinafter called the "Operator," parties to that certain Exploration Contract No. 2231 (OME-6548), dated October 12, 1966, as amended, hereinafter called the "Contract," that:

1. Effective December 12, 1967, the Contract and all obligations of the parties thereunder, except as otherwise herein expressly provided, shall be and are hereby terminated.

2. The Government shall contribute only to the allowable costs incurred prior to said effective date.

3. All rights of the Government respecting certification of possible production, percentage royalty and liens to secure the payment thereof, reports (including preservation of the Operator's records), accounts, audits, and the right to recover any overpayment are hereby preserved.

4. The Operator hereby releases and agrees to save the Government harmless from all claims or demands under or arising out of said Contract except as otherwise provided in this termination agreement.

IN WITNESS WHEREOF, these parties have executed this agreement as of the day and year first above written.

THE UNITED STATES OF AMERICA

By_____
Chief, Office of Minerals Exploration
U. S. Geological Survey

BIG TREASURE MINING AND DEVELOPMENT COMPANY

By_____

Title_____

Office of Minerals Exploration
Building 53 Room 203

OFFICIAL
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O. M. E.
RECEIVED
AUG 5 1968
INITIALS CODE
120 S

August 1, 1968

Dr. David Kimball, President
Big Treasure Mining & Development Co.
125 Sedgefield Court
San Ramon, California 94583

Subject: OME-6548 (Silver)
Big Treasure Mining and Devel. Co.
Little Treasure and Adjust Mines
Pinal County, Arizona
Contract 2231

Dear Dr. Kimball:

Enclosed are the original and three copies of a proposed Termination Agreement (one page) to the subject contract, signed for the Government.

If the proposed agreement is satisfactory to you, all four copies should be signed by a duly authorized representative of Big Treasure Mining and Development Co., and returned to this office, retaining the Operator's Copy.

If any part of the proposed agreement does not have your approval, the original and all copies should be returned to this office together with the proposed changes for consideration.

Sincerely yours,

J. William Hasler

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

Enclosure

CC-Chief, OME
OME-6548
OME chron
Mr. Hasler

MME Form 7
(2/63)

OFFICIAL FILE COPY

| Date | Surname | Code |
|---|---|---|
| 7/12/68 | RM Smith | 120 |
| 7/12/68 | Kirkemo | 120 |
| " | Johnson | 110 |
| 7/17 | Kirkegaard | |
| 7/17 | Cappa | |
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| | | 110 |
| 7/17 | cal | 220 |
| | | 120M |

**AIRMAIL**

JUL 17 1968

**Memorandum**

**To:** Field Officer, Region III

**From:** Chief, Office of Minerals Exploration

**Subject:** OME-6548 (Silver)
Big Treasure Mining and Development Co.
Little Treasure and Adjust Mines
Pinal County, Arizona
Contract 2231

Enclosed are the original and three copies of proposed Termination Agreement (one page), to the subject contract, signed for the Government. An extra copy of the Termination Agreement is also enclosed for field use.

If the proposed agreement is satisfactory to you and the Operator, all four copies should be signed by a duly authorized representative of the Operator and distributed in the usual manner.

If any part of the proposed agreement does not have your approval or that of the Operator, the original and all copies are to be returned to this office together with the proposed changes for consideration.

FRANK E. JOHNSON

Frank E. Johnson

Enclosures

cc: Director's Reading File
Economic Geology File
OME Docket
OME Reading File
Mr. Smith
130

BLong/1 7/12/68

MME Form 7
(2/63)

OFFICIAL FILE COPY

| Date | Surname | Code |
|---|---|---|
| 6/26/68 | RM Smith | 120 |
| 6/26/68 | Nio Romo | 120 |
| | | 110 |
| 6/27 | | 220 |
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JUN 27 1968

**Memorandum**

**To:** Chief, Budget and Finance Branch

**From:** Chief, Office of Minerals Exploration

**Subject:** OME-6548 (Silver)
Big Treasure Mining and Development Co.
Little Treasure and Adjust Mines
Pinal County, Arizona
Contract 2231

Enclosed is a copy of the Field Officer's letter dated May 31, 1968, transmitting to the Operator a copy of the Report of Review issued in April 1968 on the subject contract. A copy of the report also is enclosed.

An acceptable Operator's final report of the exploration completed under the contract has been received. The $200.00 withheld from the Operator's Monthly Voucher for December 1967 may now be paid.

FRANK E. JOHNSON

Frank E. Johnson

Enclosures

cc: Director's Reading File
Economic Geology File
OME docket
OME Reading File
OME Region III
Mr. Smith

RMSmith/gla 6-25-68

**BIG TREASURE** **Mining and Development Company**

ARIZONA OFFICE
P. O. Box 663 • Winkelman, Arizona

MAIN OFFICE
125 Sedgefield • San Ramon, California 94583
Phone (415) 828-4126

OFFICIAL COPY
O. M. E.
RECEIVED
JUN 25 1968

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| gla | ~~130~~ |
| bsf | 120 m |
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| RBond | 130 S |

June 16, 1968

OME Region III
RECEIVED
JUN 19 1968
Denver, Colorado

Mr. J. William Reeler
Field Officer, Region III
Office of Minerals Exploration
Denver, Colorado

6548

Dear Bill:

In response to your telephone call yesterday, I have reviewed with Dr. Hansen our drilling results and our overall progress under our OME contract. We feel that it is in the best interest of the office of Minerals Exploration and the Big Treasure Mining Company, to terminate our OME contract effective this date.

I have received correspondence from Dr. Hansen and our final report should follow within a few days. rec'd 6/20/68

We would like to express thanks to you and your staff for the fine professional assistance you have rendered over the past two years.

Sincerely yours,

David H. Kimball

David H. Kimball, Pres.
Big Treasure Mining and Development Co.
125 Sedgefield Court
San Ramon, California

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

June 18, 1968

OFFICIAL COPY
O. M. E.
RECEIVED
JUN 20 1968

| INITIALS | CODE |
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| | 120 M |
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| | 120 S |

Memorandum

To: Chief, Office of Minerals Exploration

From: Field Officer, Region III

Subject: OME-6548 (Silver)
Big Treasure Mining and Development Company
Little Treasure and Adjust Mines
Pinal County, Arizona
Contract 2231

Transmitted herewith is one copy of the final report on the exploration program conducted on the above-stated subject.

One copy has been retained for the Region III field office files.

J. William Hasler

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

Enclosure

Operator's Final Report

Spenst M. Hansen, Ph.D.
MINING GEOLOGIST
125 Sedgefield Court
San Ramon, California 94583
Phone (415) 828-4126

June 15, 1968

OME Region III
RECEIVED
JUN 17 1968
Denver, Colorado

Mr. J. William Hasler
Field Officer, Region III
U. S. Geological Survey
Office of Minerals Exploration
Federal Center
Denver, Colorado 80225

Dear Mr. Hasler:

Enclosed please find two copies of the final report on the exploration program conducted under O. M. E. -6548 (silver) exploration contract. This report is prepared at the request, and on behalf of Big Treasure Mining and Development Company.

I trust the report is satisfactory and conforms to the requirements set forth in the O. M. E. contract.

It is my understanding that Dr. David H. Kimball, President of Big Treasure Mining and Development Company, will forward to you at an early date, a formal request on the part of the corporation that the contract be terminated. Should any question arise, please do not hesitate to contact me directly.

I am sure that I speak for all the officers and investors in Big Treasure Mining and Development Company when I offer my thanks to you personally and to the Office of Mineral Exploration for making these funds available to us. We found the personnel of the O. M. E. to be most cooperative in every possible way. In spite of the fact that the exploration program was generally unsuccessful in discovering important new deposits of silver ore, we appreciate the opportunity that this O. M. E. contract afforded us. Our only regret is that our efforts were not more successful.

Sincerely,

Spenst M. Hansen

Spenst M. Hansen, Consultant for
Big Treasure Mining and Development Co.

SMH/jt
Enclosure

# FINAL REPORT ON THE RESULTS OF EXPLORATION UNDER O. M. E. CONTRACT 6548

Ref: Big Treasure Mining and Development Co.
Adjust and Little Treasure Mines
Pinal County, Arizona

## I. GENERAL

O. M. E. Contract 5648 was approved in October, 1966, and work under this contract began in November, 1966. Prior to the completion of the contract in November, 1967, four amendments were approved by both the Government and the Operator.

Ten diamond drill holes were completed with footages as tabulated in the appendix. Bulldozer work was done on the property primarily for the purpose of building access roads and drill sites. Underground mine workings were mapped in detail and sampled extensively, as were also surface mineralized outcrops.

The entire exploration program outlined in the contract and its amendments was fully carried out. The results of this program and the conclusions therefrom are summarized in a separate section near the end of this report.

## II. GEOLOGY*

The following section is a report from the geologic field investigation conducted by Tom Sterrett during the period September 1, 1967 through

* Taken primarily from the report by Thomas S. Sterrett, Consultant Geologist, September 22, 1967.

September 21, 1967 on behalf of Big Treasure Mining and Development Company (BTM Co.). This investigation was conducted on property controlled by BTM Co. located primarily in sections 34 and 35, Township 4 south, Range 16 east, Pinal County, Arizona.

The purposes of the investigation were: 1) to assess all geologic data that had been developed by the mineral exploration program; 2) to evaluate the property with respect to the occurrence of commercial quantities of silver; and, 3) to present a geologic summary to be included in the O. M. E. final report.

A. General Geology

Although the geologic evaluation of the area had been previously well established, a brief description is included here primarily to report my findings and secondly to verify the prior interpretation by Ross, Willden Hansen, Janc, and Jardine.

The surface material is composed of a thick sequence of interbedded andesite flows, sandstone, and shale. The exact thickness cannot be determined in the area of interest without drilling completely through the sequence, but based on information extrapolated from nearby (less than 1-1/2 miles), I believe this thickness to be in excess of 2500 feet and probably as great as 2900 to 3000 feet.

Compositionally, the sandstones are composed primarily of andesite fragments of sand size, whereas, the shales tend to be more of a typical

quartzose material. Very little andesite could be identified in the shale from hand samples. The shales are also frequently carbonaceous.

I would interpret from the characteristics and occurrence of the sediments that they are of lagoonal or near shore type deposits accumulating during periods of between successive andesite flows.

The attitude of this sequence is essentially flat-lying with a slight regional dip of less than $2^{\circ}$ to the southeast. Initial inspection of these beds gives one the impression of complex structural attitudes, however, closer examination reveals the true horizontal nature. This is evidenced by orienting segments of sand-shale core to complement the angle of inclination of the core holes and observing bedding planes within the samples. A structure contour map drawn on the top of the first quartzite conglomerate penetrated in all but one of the core holes (Fig. 1) also indicates an essentially flat depositional surface associated with the sedimentary material. Any apparent structural complexity of this sequence is related to the contorting of bedding by intrusives which trend approximately northeast through most of the property.

Many dikes and sills have intruded the andesite-sediment sequence, probably along post depositional-pre intrusive faults, and over a large portion of the property, this intrusive material comprises the entire surface.

The dikes tend to be near vertical with high angle dips of greater than $75^{\circ}$ to both the northwest and southeast. The sills generally intrude parallel to bedding, giving further credence to the near-horizontal attitude of the

stratigraphy. These intrusives are probably very late Cretaceous or early Tertiary in age, and were found to be of either microdiorite or feldspar-mica porphyry composition.

Only relatively minor post intrusive faults were observed in the area, and these are now represented by major drainage paths. At no place within the area of interest were these faults observed with sufficient magnitude to exert a controlling influence on ore occurrence.

B. Mineralization

Mineralization is related to the intrusive history of the area, and was probably associated with the very late stages and/or immediately following this activity. The ore is epithermal in origin; the hydrothermal solutions rising from the underlying intrusive along fractures or zones of weakness created by the extensions of the intrusive (dikes and sills). These solutions concentrated in the near-surface region, but evidence that they originated in the intrusive is apparent from the finely disseminated traces of mineralization found in core samples of the dikes. Even though the core holes were located for the explicit purpose, veins with commercial quantities of ore were not intersected at depth in any of the holes. The slight mineralization observed in the cores was generally not of the vein filling type, and was concentrated almost exclusively within the sedimentary units. Units with the highest sulfide content were predominantly calcareous. Mineralization appeared to have migrated into the wall rock along bedding planes,

adjacent to hydrothermal solution paths. This occurrence is probably related to some sort of preferential carbonate replacement. Even the few very-thin veinlets observed in the cores were associated with calcite; indicating that these occurrences might also be related to carbonate replacement rather than the more typical injection type veins.

Preferential carbonate replacement type deposits are found on a large scale in the Christmas Mine, approximately three miles west of the property. Hydroghermal solutions have replaced significant intervals of Paleozoic carbonates. This replacement is confined to only certain carbonate units and is traceable throughout the area. No satisfactory explanation is available to explain why certain limestone and/or dolomite beds are replaced preferentially to others. However, this process is responsible for the commercial concentrations of base metal mineralization produced from this mine.

Since the trace mineralization observed in the cores appears to be related to the carbonate content also, I believe it is reasonable to assume that this mechanism of ore occurrence is present in the area of interest. The lack of significant quantities of carbonate in the andesite-sediment sequence precludes accumulation of commercial deposits within the material.

The mineralization that has been mined in the area of interest is all epithermal vein filling in origin and as such is not related to the carbonate content of the rocks involved. Significant quantities of primarily silver ore

have been mined from the epithermal vein deposits, and there is probably enough ore remaining in the veins and tailings to sustain a very limited, small scale operation.

The vein structures tend to become less distinct with depth, and the extent of sulfide mineralization decreases substantially with depth. It was somewhat startling to observe strong veins showing ore grade mineralization become almost indistinct when intersected several hundred feet below their outcrop. This was especially apparent with holes 7A and 7B. The veins have only limited depth development below their present exposures (50 to 200 feet maximum). This may have resulted from erosion removing the upper portions (most probable), or from only a very limited vertical range of mineralization.

No information was obtained regarding possible mineralization in the underlying Naco formation or other Paleozoic carbonate rocks, since they were not penetrated by any of the drill holes on the property. Hole No. 3 reached a depth of 1857 feet, which may be as much as 1,000 feet above the top of the Naco.

## III. EVALUATION

### A. Veins

The program of angle hole exploratory drilling was designed and carried out in such a way as to explore the downward extension of the known mineralized veins on the property. Numerous vein intersections at depths between about 100 and 500 feet were made by the diamond drill core holes. In every case, the results were disappointing in that:

1. The vein structures decrease in width and thickness with depth;
2. The amount of sulfide mineralization was lower in every case at the depth of intersection than was noted at the outcrop or intersection in known mine workings;
3. Some veins were absent entirely down their projected dip and were not intersected at all by the drill holes.

The geologic literature on silver bearing veins indicate that on some occasions epithermal veins of the general type present in the Saddle Mountain mining district have a very limited depth extension. This is apparently true on the properties investigated by this exploration program. It is also possible that erosion may have removed the upper portions of the vein structures, leaving only the vein bottoms. The actual situation here is probably a combination of limited vertical vein development, and removal of the upper portions by erosion. The one fact that is inescapable, however, is that the veins do not extend downward into the andesite below their present known exposures for more than a few to a maximum of a few hundred feet, and that their strength and the grade of the ore contained within them diminishes rapidly with depth.

B. Replacement Deposits

The same Paleozoic carbonate sequence that has been highly productive of sulfide ores in the Christmas mine area about three miles to the west underlies the property drilled. Since mineral bearing intrusive material penetrated these carbonate rocks as well as the andesite-sediment sequence, it is reasonable to expect the possible occurance of replacement deposits on this property as well as in the Christmas area. Whether or not ore deposits occur in the Naco and underlying Paleozoic carbonate rocks can be answered only by drilling through the andesite-sediment sequence and recovering core samples.

On this property, however, it appears at the present time to be of academic interest only as to whether or not the Naco and underlying formations are mineralized. The reason for this is that the best present estimate of depth to the Naco formation at drill hole location No. 3 seems to be between 2,800 and 3,000 feet below the surface. This estimate is largely based on drill data obtained during the drilling program. Even if ore were discovered in significant tonnages at this depth, it is highly questionable as to whether or not it could be mined at a profit. Even the downward extension of a single drill hole to this depth constitutes a very significant expense since the per footage will probably be in the $10 to $12 per foot range below 2,000 feet. The present depth of drill hole No. 3 is 1,857 feet. The hole was not deepened the additional 1,000 feet or more necessary to penetrate the upper portion of the Naco because of the high expense involved and the questionable economics of any ore body found at that depth.

## C. Conclusions

It is my opinion that the economic potential of the portion of the Saddle Mountain district explored under this O. M. E. contract is very limited. Relatively small amounts of silver ore can be expected along the downward extensions of the known silver veins. Because of the expected depth to the underlying Paleozoic carbonate rocks, ore cannot be expected to be produced from carbonate replacement deposits on the property at a profit. The downward extensions of the known veins and the possibility of subsurface replacement deposits in carbonate rocks along favorable structures were the two primary ore targets to be investigated by the exploration program. The program must be considered unsuccessful from the standpoint of developing ore reserves in either catagory.

The extensive mapping and sampling of the upper portions of the veins has substantiated the fact that significant tonnages of good grade silver ore do exist in the upper portions of the veins above the level of the Adjust main haulage drift. The ore tonnage available probably is in the 25, 000 to 30, 000 ton catagory. Most of this is situated on the far western side of the property (see Maps 1, 2, and 3). This ore could provide the basis for a small operation involving perhaps two to four men. A similar situation exists on the Treasure claim and it is possible that a small operation could be conducted there, on the east end of the property. It should be emphasized that the ore reserves in the upper portions of these veins were known prior to the beginning to the exploration program, and the drilling conducted did not add significantly to the known reserves available.

On an adjoining property, the Golden Gate and Golden Chariot claims owned by Lee Acton of Kearny, Arizona, the present surface outcrop of the veins is from 450 to 600 feet above the level of the Adjust main haulage drift. These veins have not been exploited to any appreciable extent, the lowest workings on them being about 100 feet below the surface. The main Adjust haulage drift could be extended 600 to 1,000 feet to the south and these veins intersected. A favorable intersection would permit drifts to be driven parallel to the veins with upward stoping to the surface outcrop. Such an operation might be profitable. However, after repeated attempts, we were totally unsuccessful in obtaining leases on these adjoining claims, even though they probably must be operated in conjunction with our claims if either is to be profitable. Unfortunately, the ore that would come from such a combined operation lies almost entirely outside the property controlled by Big Treasure Mining and Development Company.

The final conclusion is that the property is not economic, and cannot be mined under present conditions at a profit. The possible exceptions as stated above are: 1) A small, highly efficient operation might be successful in profitably removing silver ore remaining in the upper portions of the vein structures; and, 2) A combined operation with the adjoining Acton property using the main Adjust haulageway for access might be successful.

Respectively submitted this 12th day of June, 1968.

Spenst M. Hansen

Spenst M. Hansen, Ph. D.
Mining Geologist

## SUMMARY OF DIAMOND DRILL HOLES

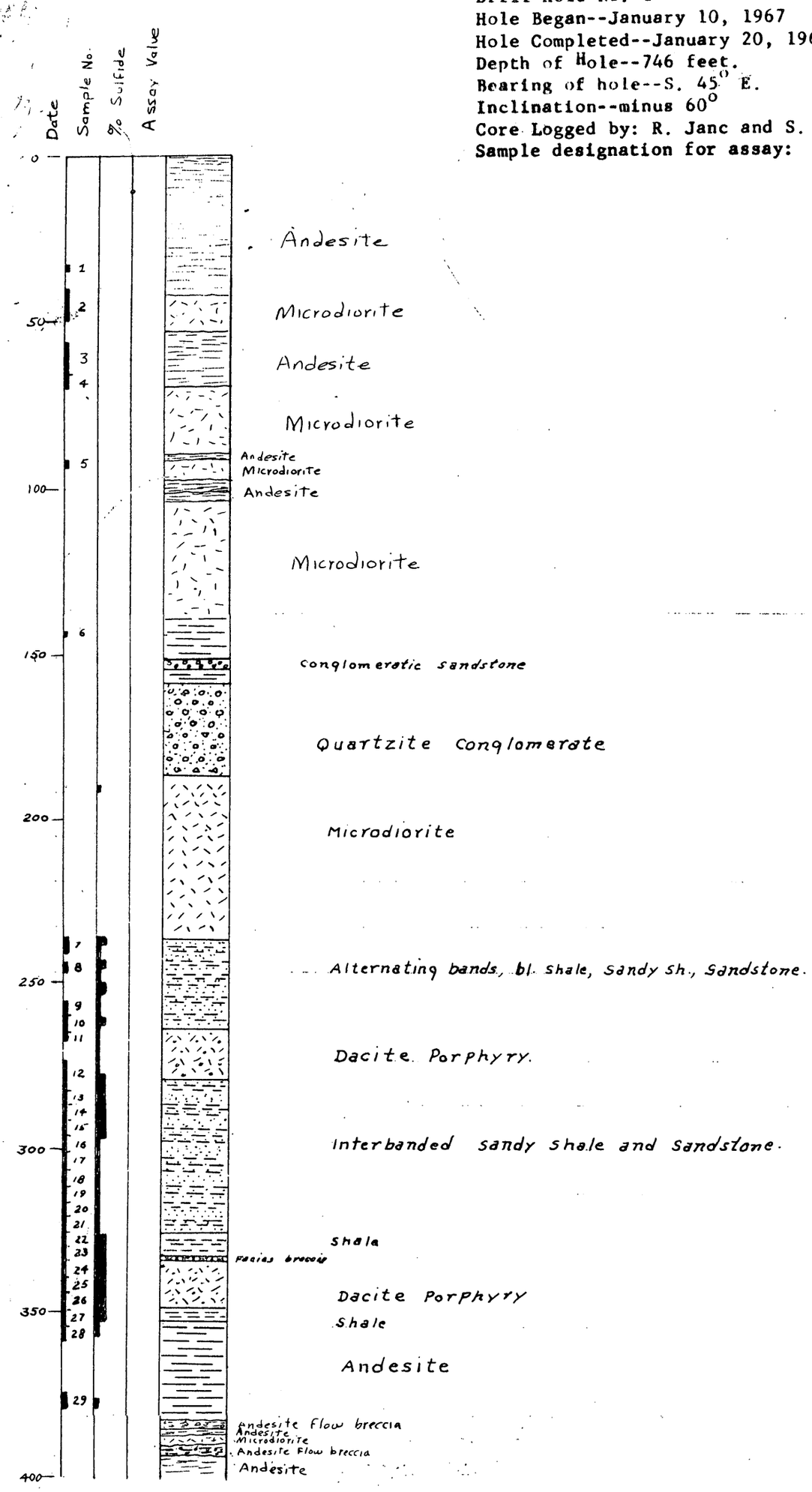
## APPENDIX A

| Hole No. | Feet | Date Completed |
|---|---|---|
| 1 | 746 | 1-20-67 |
| 2 | 600 | 2-3-67 |
| 3 | 1857 | 4-1-67 |
| 4 | 700 | 1-3-67 |
| 5 | 757 | 12-12-66 |
| 6 | 601 | 2-20-67 |
| 7A | 417 | July, 1967 |
| 7B | 387 | July, 1967 |
| 8 | 660 | 4-6-67 |
| 9 | 620 | 4-15-67 |
| Total footage drilled | 7,345 | |

# APPENDIX B
# DRILL HOLE LOGS

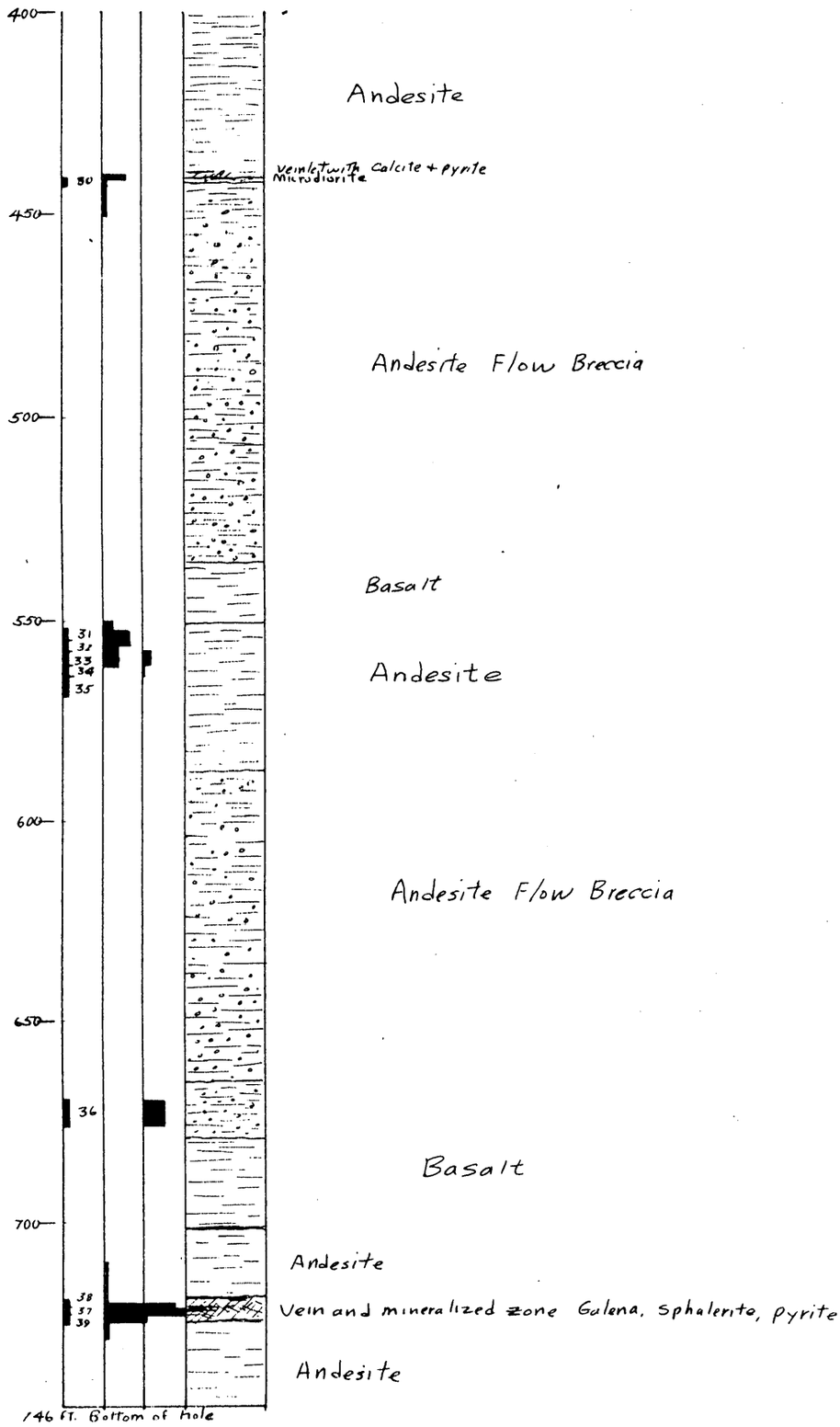
BIG TREASURE MINING AND DEVELOPMENT CO.
SADDLE MOUNTAIN PROJECT

Pinal County, Arizona
Drill Hole No. 1
Hole Began--January 10, 1967
Hole Completed--January 20, 1967
Depth of Hole--746 feet.
Bearing of hole--S. 45° E.
Inclination--minus 60°
Core Logged by: R. Janc and S. Hansen
Sample designation for assay: SM-1-xx



BIG TREASURE MINING AND DEVELOPMENT CO
SADDLE MOUNTAIN PROJECT

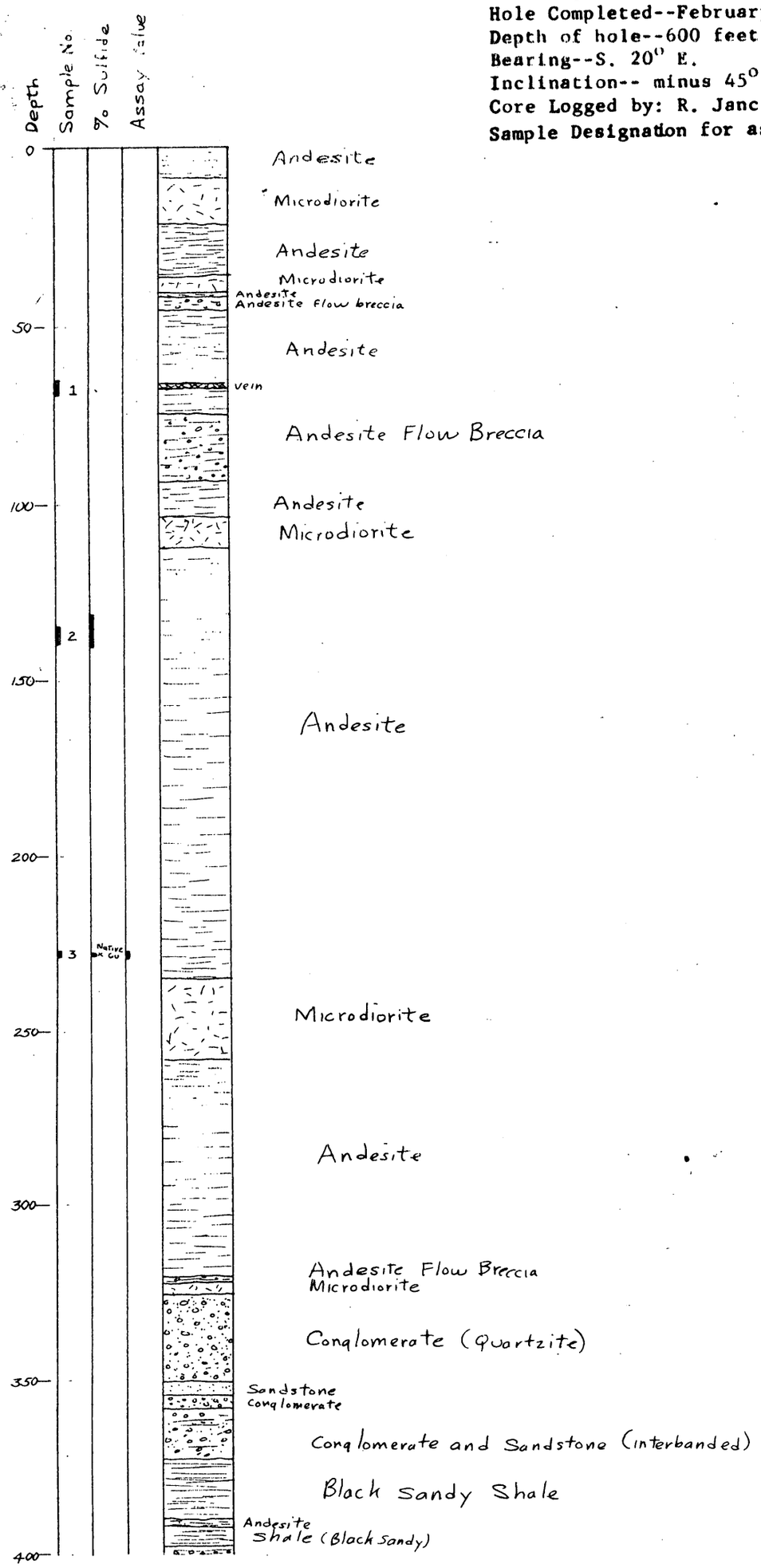
Drill Hole No. 1 Continued



BIG TREASURE MINING AND DEVELOPMENT CO.
SADDLE MOUNTAIN PROJECT

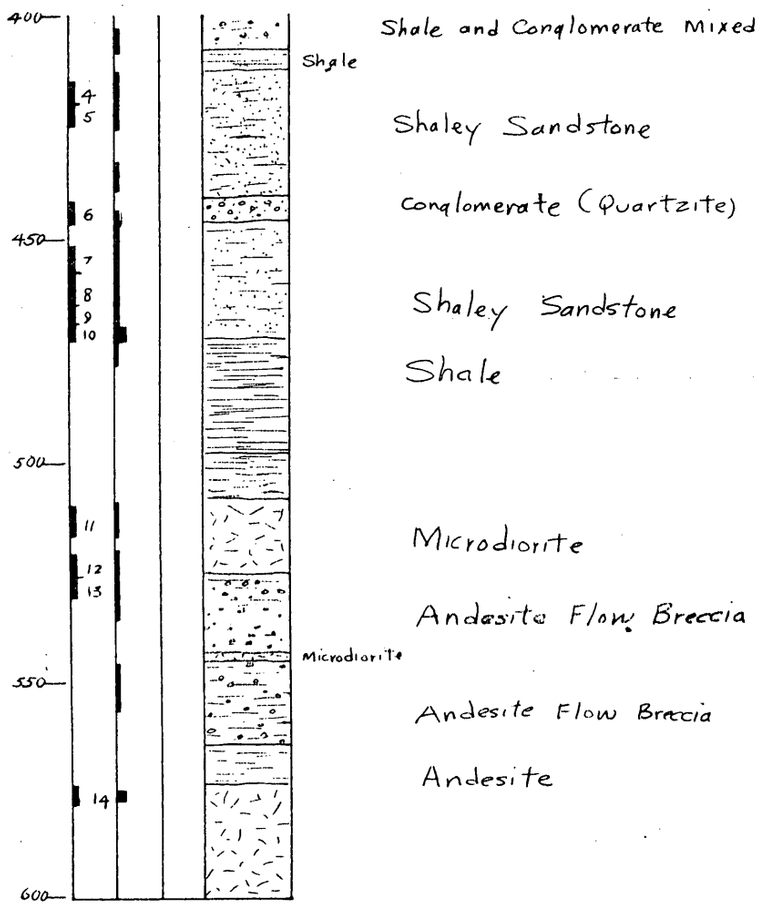
Pinal County, Arizona

Drill Hole No. 2
Hole Began--January 23, 1967
Hole Completed--February 3, 1967
Depth of hole--600 feet.
Bearing--S. 20° E.
Inclination-- minus 45°
Core Logged by: R. Janc and S. Hansen
Sample Designation for assay: SM-2-xx



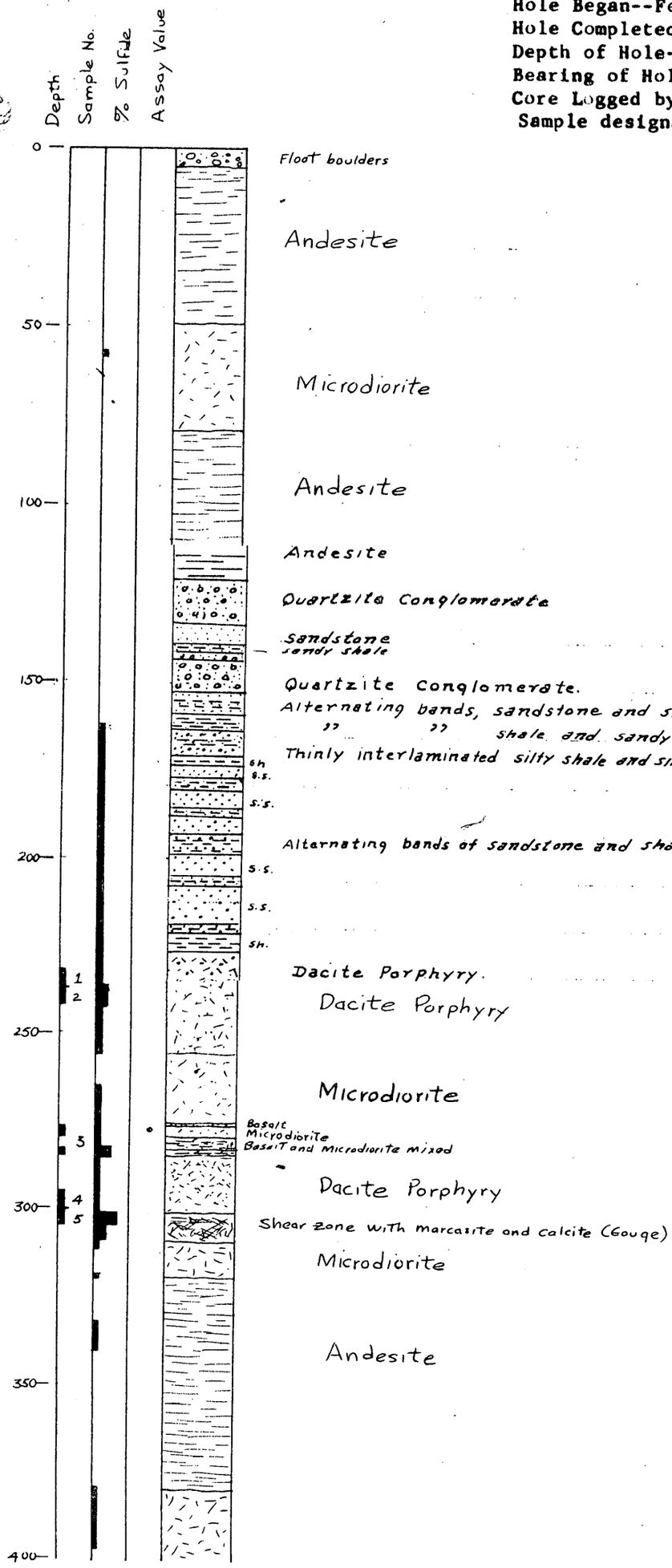
BIG TREASURE MINING AND DEVELOPMENT CO.
SADDLE MOUNTAIN PROJECT

Drill Hole No. 2 Continued



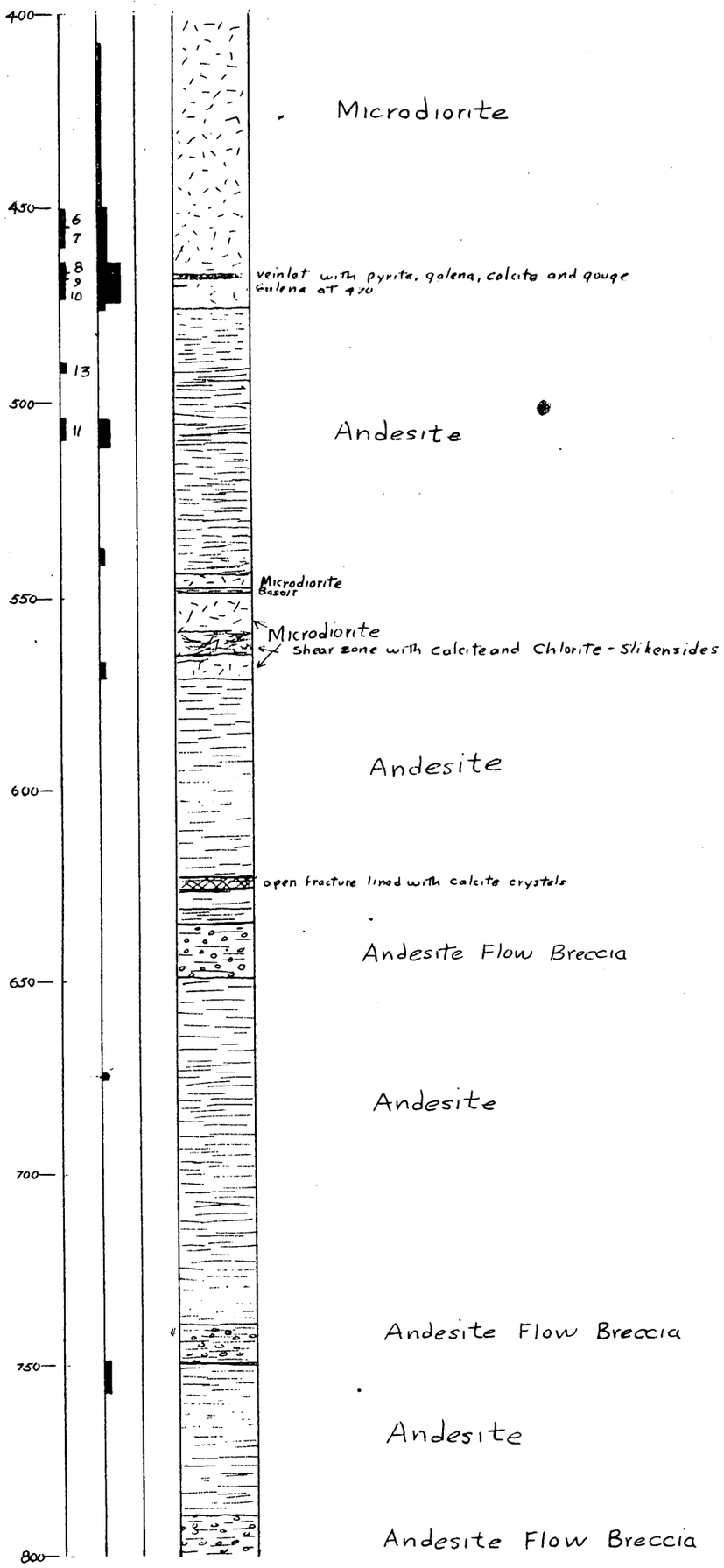
**BIG TREASURE MINING AND DEVELOPMENT CO.**
**SADDLE MOUNTAIN PROJECT**

Pinal County, Arizona
Drill Hole No. 3
Hole Began--February 23, 1967
Hole Completed--
Depth of Hole--
Bearing of Hole--Vertical
Core Logged by: R. Janc and S. Hansen
Sample designation for assay: SM-3-xx



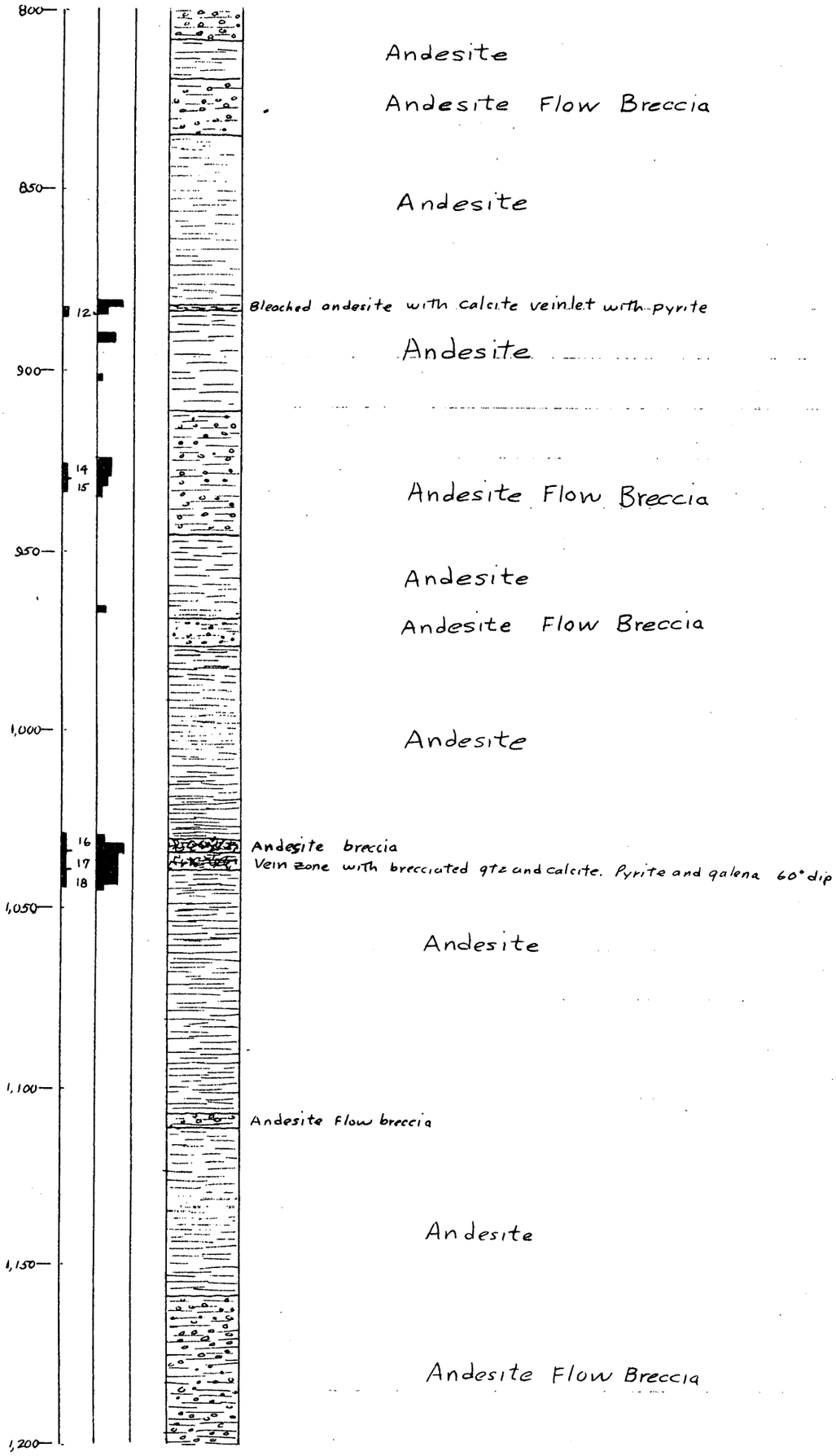
BIG TREASURE MINING AND DEVELOPMENT CO.
SADDLE MOUNTAIN PROJECT

Drill Hole No. 3 Continued



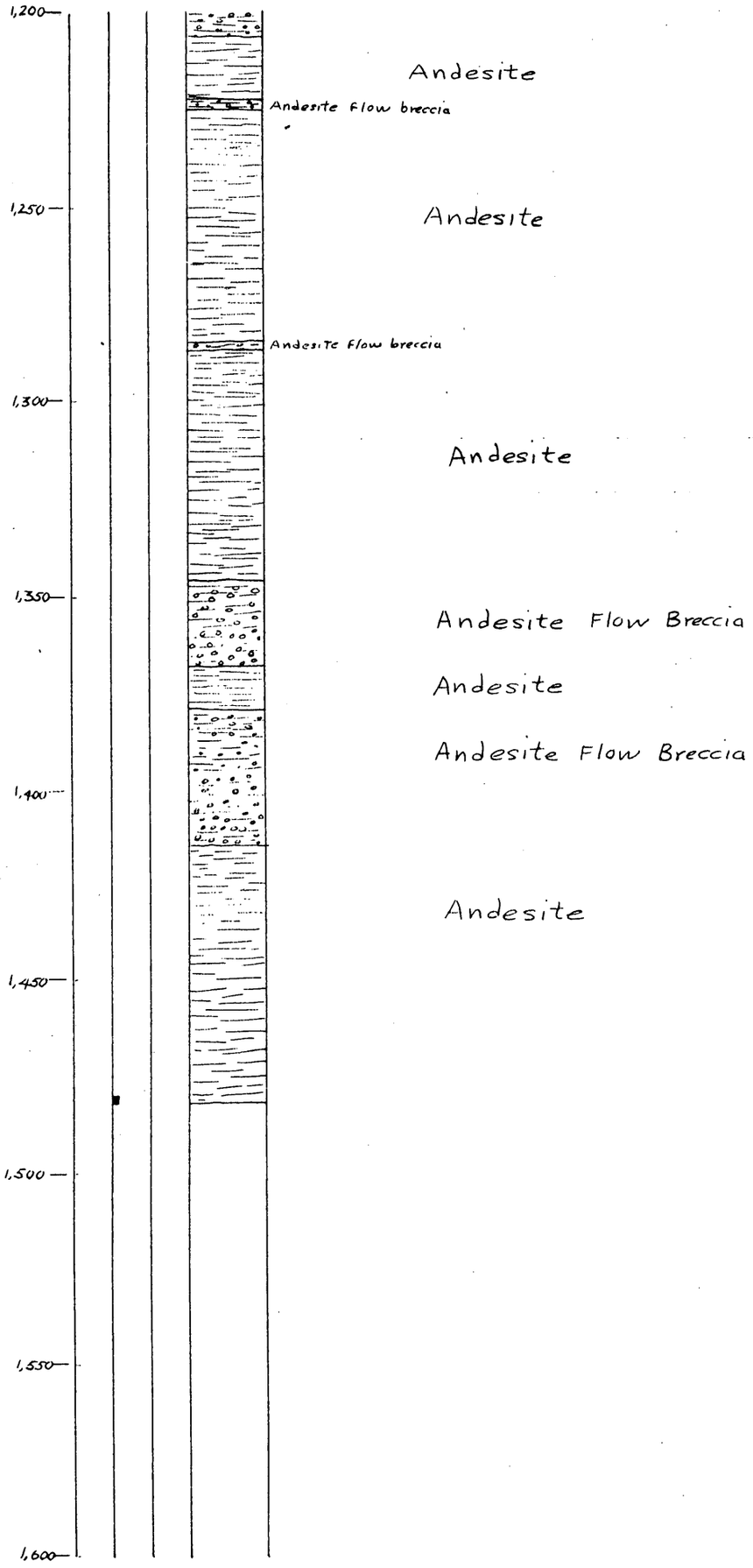
**BIG TREASURE MINING AND DEVELOPMENT CO.**
**SADDLE MOUNTAIN PROJECT**

**Drill Hole No. 3 Continued**



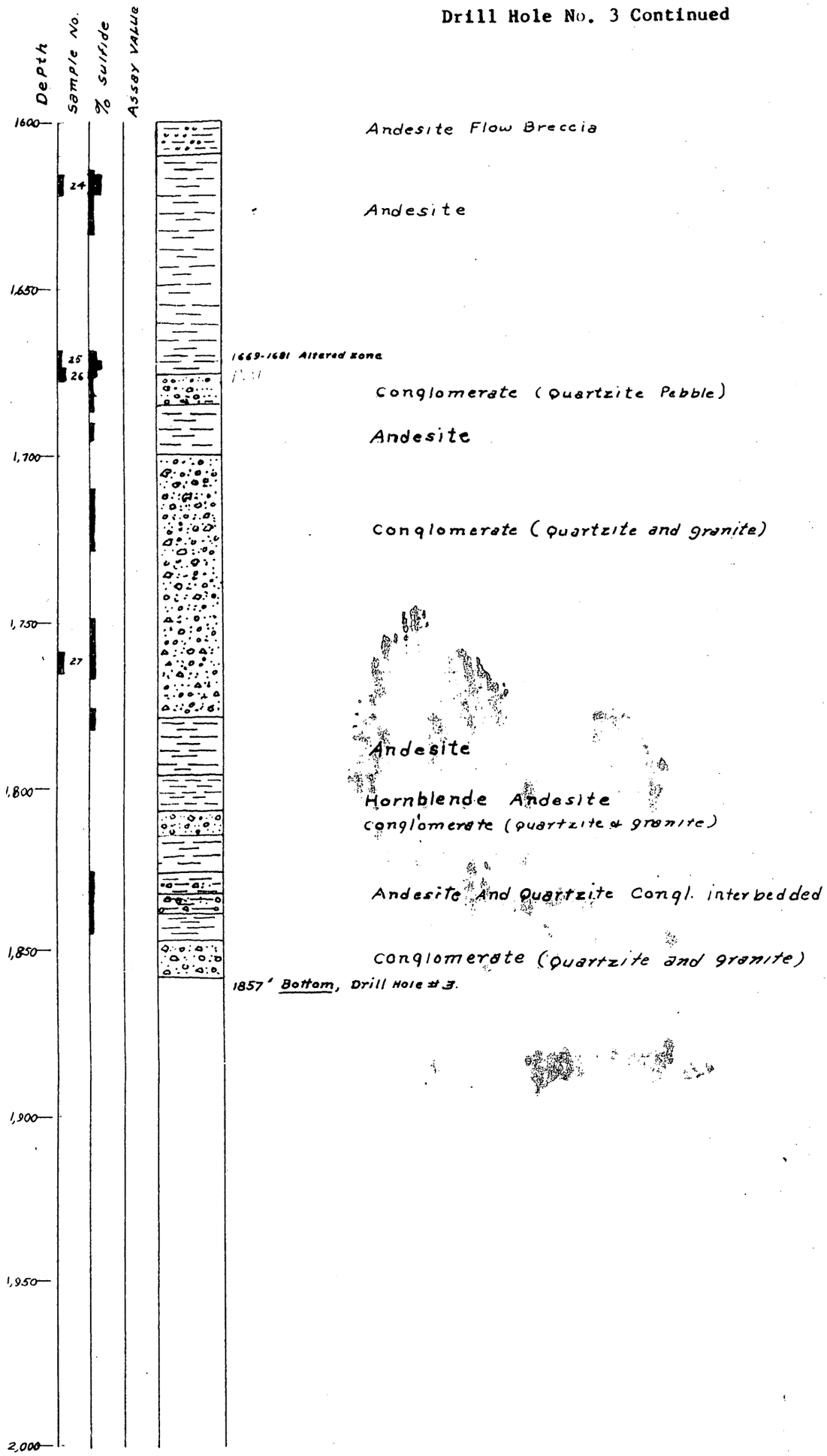
BIG TREASURE MINING AND DEVELOPMENT CO.
SADDLE MOUNTAIN PROJECT

Drill Hole No. 3 Continued



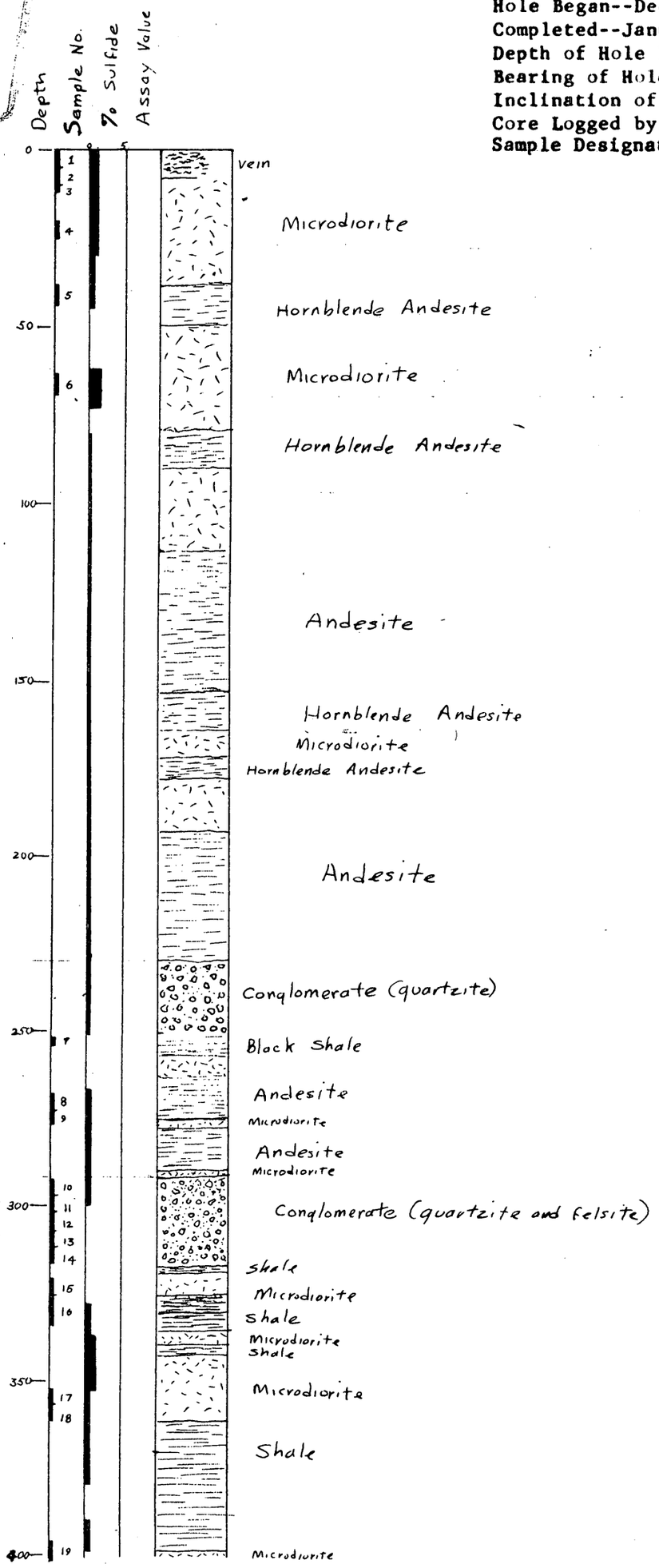
**BIG TREASURE MINING AND DEVELOPMENT CO.**
**SADDLE MOUNTAIN PROJECT**

**Drill Hole No. 3 Continued**



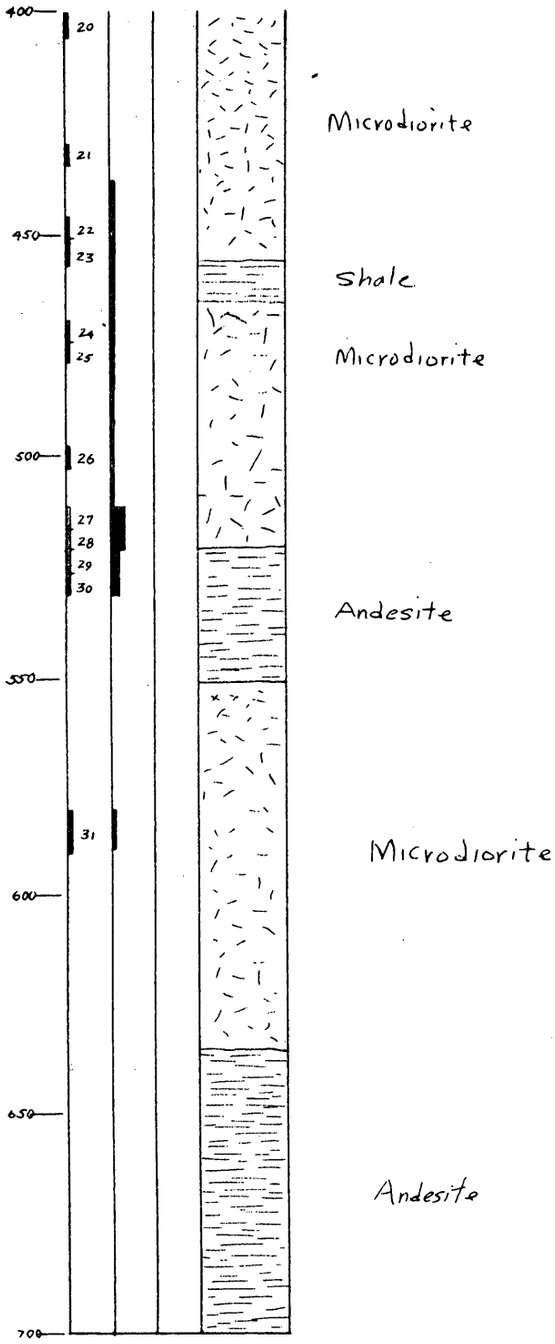
BIG TREASURE MINING AND DEVELOPMENT CO.
SADDLE MOUNTAIN PROJECT

Pinal County, Arizona
Drill Hole No. 4
Hole Began--December 27, 1966
Completed--January 3, 1967
Depth of Hole 700 feet
Bearing of Hole--S. 15° E.
Inclination of Hole--minus 45°
Core Logged by: R Janc and S Hansen
Sample Designation for assay: SM-4-xx



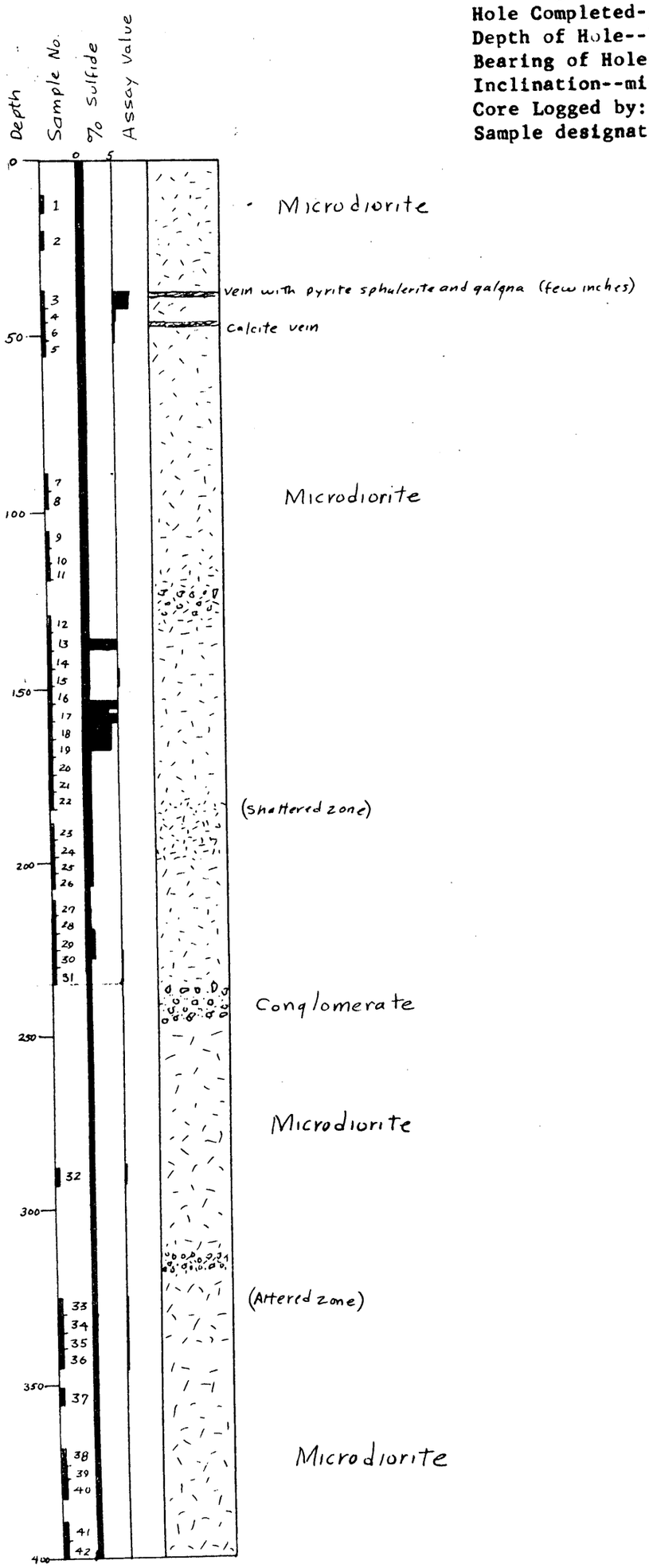
BIG TREASURE MINING AND DEVELOPMENT CO.
SADDLE MOUNTAIN PROJECT

Drill Hole No. 4 continued



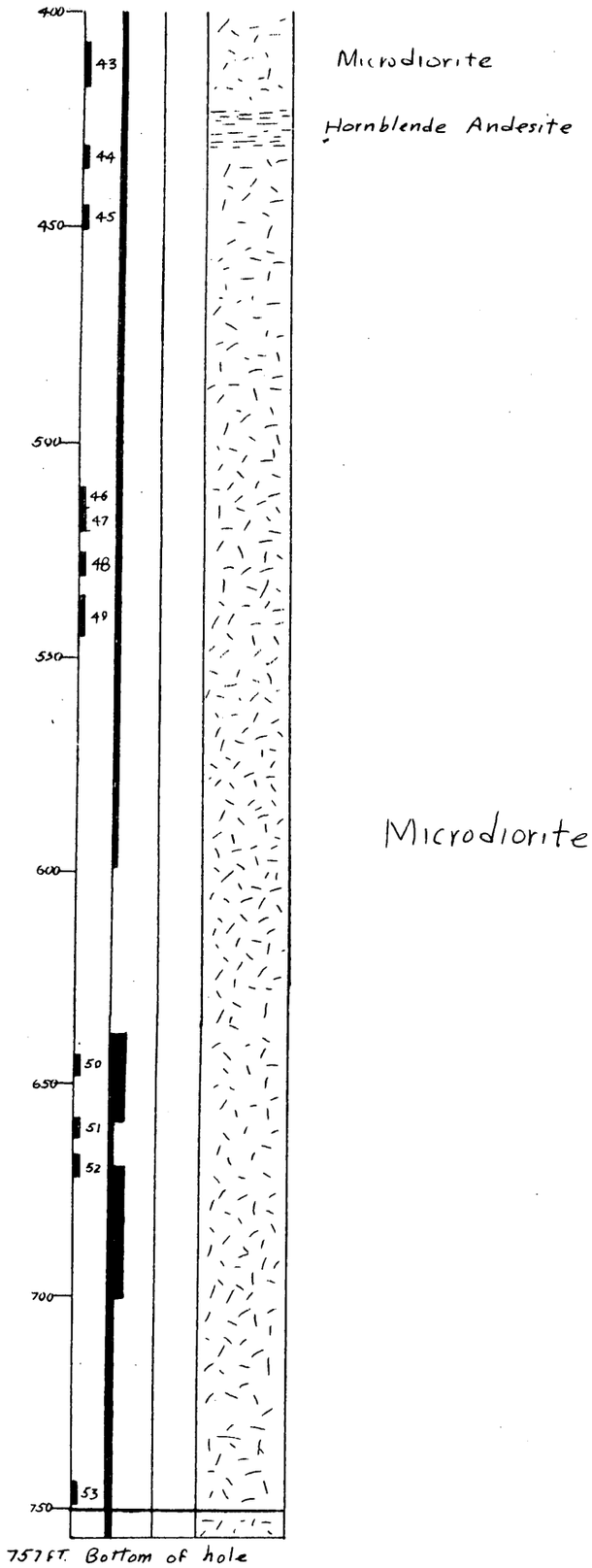
BIG TREASURE MINING AND DEVELOPMENT CO.
SADDLE MOUNTAIN PROJECT

Pinal County, Arizona
Drill Hole No. 5
Hole Began--December 12, 1966
Hole Completed--December 23, 1966
Depth of Hole--757 feet.
Bearing of Hole--N. 10° W.
Inclination--minus 45°
Core Logged by: R. Janc and S. Hansen
Sample designation for assay--SM-5-xx



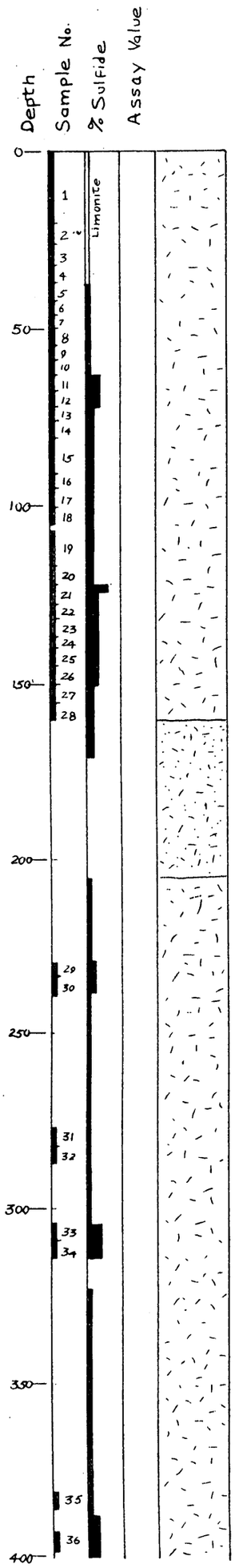
BIG TREASURE MINING AND DEVELOPMENT CO.
SADDLE MOUNTAIN PROJECT

Drill Hole No. 5 Continued



BIG TREASURE MINING AND DEVELOPMENT CO.
SADDLE MOUNTAIN PROJECT

Pinal County, Arizona
Hole No. 6
Hole Began--February 6, 1967
Hole Completed--February 20, 1967
Bearing of Hole--N. 10° W.
Inclination--minus 45°
Depth of Hole--601 feet.
Core Logged by: R. Janc and S. Hansen
Sample designation for assay: SM-6-xx



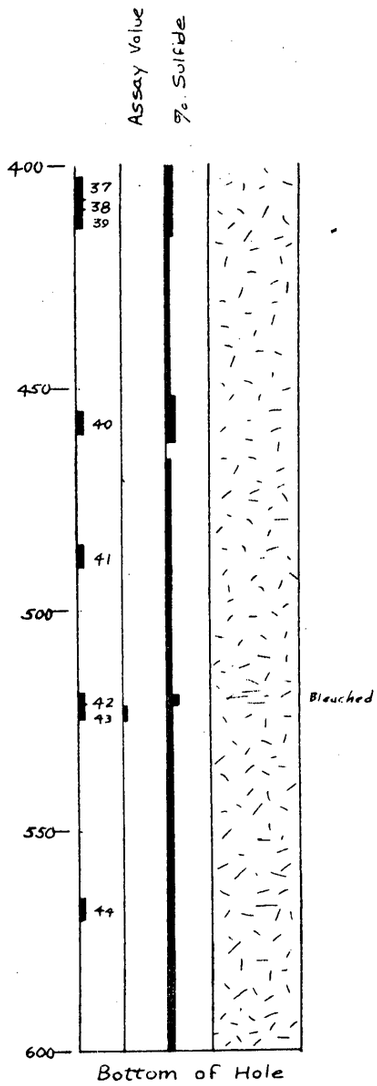

Microdiorite

Dacite Porphyry

Microdiorite

BIG TREASURE MINING AND DEVELOPMENT CO.
SADDLE MOUNTAIN PROJECT

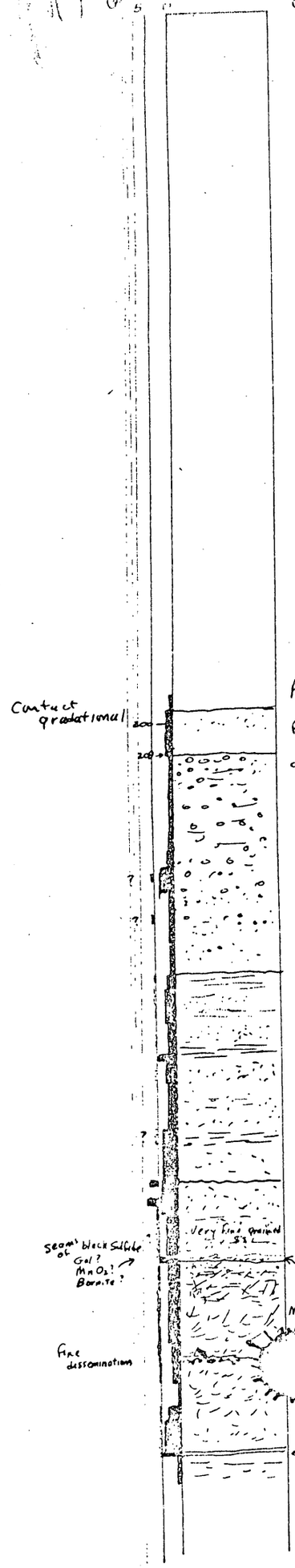
Hole No. 6 Continued




Microdiorite

Hole 7A
45° inclination
30° left from Adjust drift

Collar of hole



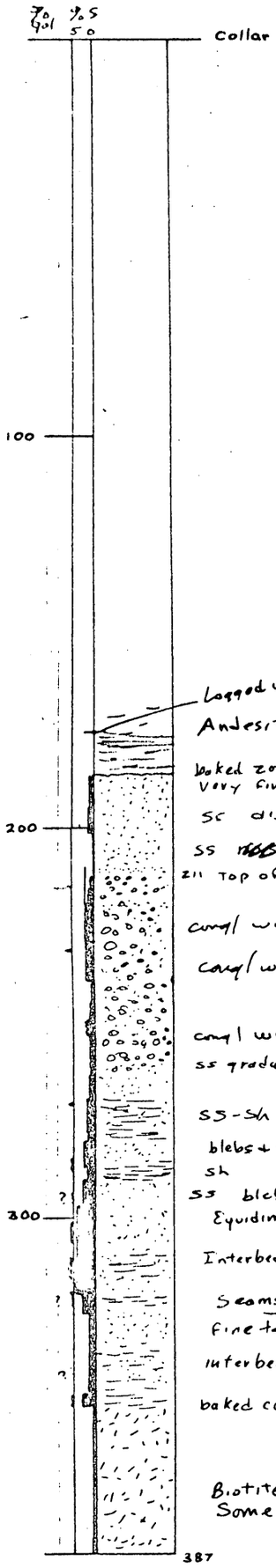

Pyritized Microdiorite

Fine grained ss. — Pyrite blebs and veinlets usually associated with calcite.

qtzite Congl + ss.

black shale
ss interbedded
ss.
sh — Pyrite concretions — Calcite throughout, particularly with the pyrite concretions and veinlets
ss — pyrite veinlets.
ss — Pyrite disseminations + veinlets.
sh — Pyrite along sed seams + layers
ss.
Calcite veinlet with black sulfide (galena?)
pyrite blebs and concretions in ss. Euhedral galena disseminations
Fine grained ss — Silicified. $CaCO_3$ present disseminated.
horizontal black seamlets. Maybe sulfide
1½ ft dike of Microdiorite — heavily pyritized
Highly silicified microdiorite? Euhedral crystals. Light in color. Light smokey Qtz. veinlets and blebs of black sulfide mineral associated with abundant pyrite.
Microdiorite
blebs and veinlets of black sulfide with the pyrite. About 1%
brecciated microdiorite — becoming progressively finer grained and mineralized toward a 4" veinlet at 397 composed of gouge, calcite (powdery) and some pyrite
Microdiorite
fine grained very hydrotacy porphyritic
Blebs + veinlets of pyrite + disseminated galena
6" veinlet of black gouge, pyrite & powdery calcite
andesite slightly pyritized — bottom of hole 417.

Hole 7B
45° Inclination
~~[illegible]~~ West from 7A.
32°




Logged upward to 176'

Andesite dark gray No py observed.

baked zone — interfingering aver about 1 ft andesite above
Very fine grained ss py diss + veinlets.

ss diss py + veinlets of py

ss ~~[illegible]~~. Sulfide scarce diss py.

211 Top of cmgl ss.

cmgl with ss matrix diss + veinlets of py. Zeolite (chabazite - pink radiating) in veinlet

cmgl with ss matrix diss pyrite. At 231, possible black sulfide blebs ?

cmgl with sandy matrix. diss. py.

ss gradational with cmgl.

ss-sh interbedded at 271 + seams of possible black sulfide
blebs + veinlets of pyrite
sh

ss blebs of py 1/4 - 1/3 in across
Equidimensional to elongate pyritic masses up to 1 in long with disseminated blebs of sulfide

Interbedded sh + ss pyritized. Some black sulfide disseminations.

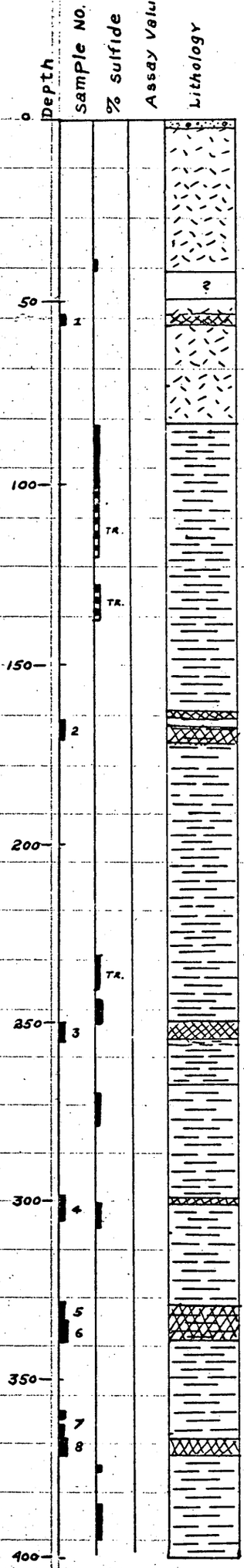
Seams of black sulfide ?
— Blebs of py 1/3 in across
fine to coarse grained ss.

interbedded ss + sh pyrite blebs + veinlets

baked contact (gradational) between microdiorite and sh Pyrite veinlets + blebs.

Biotite porphyry (microdiorite ?). Some small blebs of pyrite, irregular. Maybe
Some black sulfides (bornite ?). Associated pyrite + bleached zones or chlorite ? minerals

BTM Co. Drill Hole # 8
Hole began April 7, 1968
Bearing of hole S30°E
Inclination -35°
Core logged by
Ronald A. Janc,
Geologist
Sample Designation SM-8-




Surface sand and gravel

Microdiorite

? 15% Recovery, Probably microdiorite

heavily oxidized, stained

Andesite

163.5-164.5' vein zone, Bleached andesite, with calcite.

166'-171' Vein zone, Bleached andesite with calcite.
@ 166.8 : 3/16" wide seam of Galena

250-255.5
vein zone, oxidized Andesite
with calcite, Appears Barren.

Hornblende Andesite

Andesite

299-301 vein zone Heavily oxidized andesite/calcite

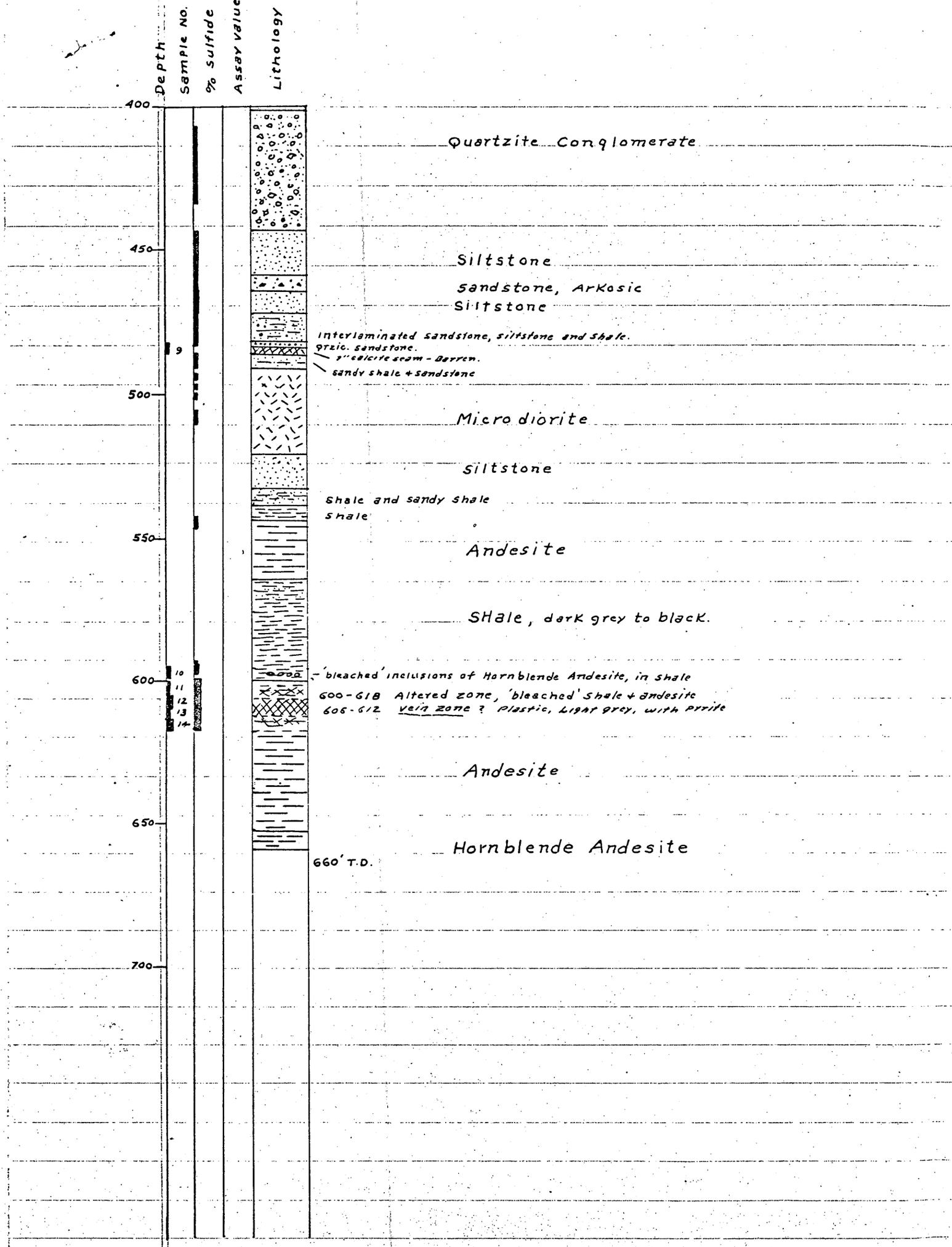
Andesite.

329-340' vein zone, Heavily oxidized andesite/calcite + Quartz Veinlets

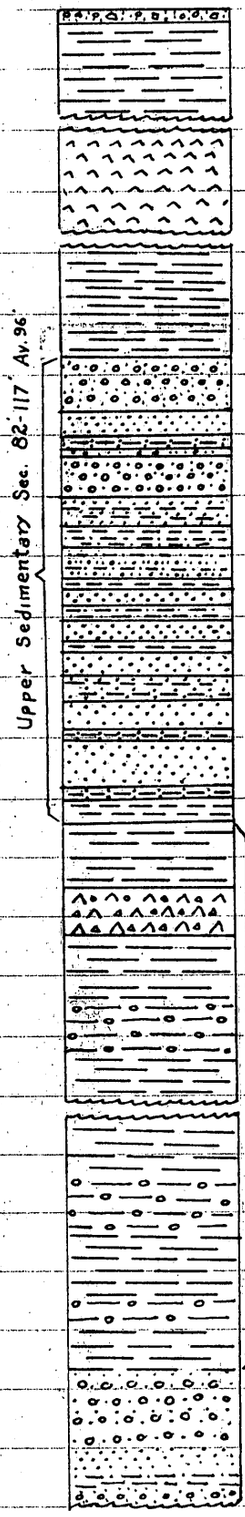
Andesite

366.5-371 vein zone Heavily oxidized andesite/calcite veinlets.

Andesite


Depth
Sample No.
% sulfide
Assay value
Lithology
400
450
500
550
600
650
700
9
10
11
12
13
14
Quartzite Conglomerate
Siltstone
Sandstone, Arkosic
Siltstone
Interlaminated sandstone, siltstone and shale.
Qtzic. sandstone.
3" calcite seam - Barren.
Sandy shale + sandstone
Micro diorite
Siltstone
Shale and sandy shale
Shale
Andesite
Shale, dark grey to black.
'bleached' inclusions of Hornblende Andesite, in shale
600-618 Altered zone, 'bleached' shale + andesite
606-612 Vein zone ? Plastic, Light grey, with pyrite
Andesite
Hornblende Andesite
660' T.D.

Typical Lithological Column
within the Deer Creek group of claims of
Big Treasure Mining & Development Co.
Saddle Mtn. Mining Dist., Final Co., Ariz.



# APPENDIX C
# ASSAY REPORT SHEETS

R. F. CASTO
PHONE EM 3-7417

P. [illegible] CRISMON
ORRIN F[illegible]R
HAROLD E. CULVER

# CRISMON & NICHOLS

ASSAYERS AND CHEMISTS
229-231 SOUTH WEST TEMPLE STREET
P. O. Box 1708

## REPORT OF ASSAY

BALT LAKE CITY, UTAH February 28, 1967

Big Treasure Mining & Development Co.

WE HAVE ASSAYED YOUR thirteen SAMPLES AND FIND them TO CONTAIN AS FOLLOWS:

| DESCRIPTION | NO. | OZS. GOLD PER TON | OZS. SILVER PER TON | PER CENT LEAD | PER CENT COPPER | PER CENT ZINC | PER CENT INSOL. | PER CENT IRON | PER CENT | VALUE OF GOLD PER TON |
|---|---|---|---|---|---|---|---|---|---|---|
| SM | 5-10 | Trace | Trace | | | | | | | |
| SM | 5-11 | Trace | Trace | | | | | | | |
| SM | 5-12 | Trace | Trace | | | | | | | |
| " | 5-13 | Trace | Trace | | | | | | | |
| " | 5-14 | Trace | Trace | | | | | | | |
| " | 5-15 | 0.01 | 0.20 | | | | | | | 35¢ |
| " | 5-16 | Trace | Trace | | | | | | | |
| " | 5-17 | Trace | Trace | | | | | | | |
| " | 5-18 | Trace | Trace | | | | | | | |
| " | 5-19 | Trace | Trace | | | | | | | |
| " | 5-20 | Trace | Trace | | | | | | | |
| " | 5-21 | Trace | Trace | | | | | | | |
| " | 5-23 | Trace | Trace | | | | | | | |

REMARKS:

CHARGES $ 39.00

CRISMON & NICHOLS
BY [illegible]

R. R. CASTO P. CRISMON ORRIN F[illegible]R HAROLD E. CULVER

# CRISMON & NICHOLS

ASSAYERS AND CHEMISTS

229-231 SOUTH WEST TEMPLE STREET

PHONE EM 3-7417 P. O. BOX 1708

## REPORT OF ASSAY

SALT LAKE CITY, UTAH February 7, 1967

Big Treasure Mining Co.

WE HAVE ASSAYED YOUR nine SAMPLES AND FIND them TO CONTAIN AS FOLLOWS:

| DESCRIPTION | NO. | OZS. GOLD PER TON | OZS. SILVER PER TON | PER CENT LEAD | PER CENT COPPER | PER CENT ZINC | PER CENT INSOL. | PER CENT IRON | PER CENT | VALUE OF GOLD PER TON |
|---|---|---|---|---|---|---|---|---|---|---|
| SM-1 | 31 | Trace | Trace | | | | | | | |
| " | 32 | Trace | 0.10 | | | | | | | |
| " | 33 | 0.06 | 1.35 | | | | | | | $ 2.10 |
| " | 34 | 0.01 | 0.20 | | | | | | | 35¢ |
| " | 35 | Trace | Trace | | | | | | | |
| " | 36 | 0.07 | 6.35 | | | | | | | $ 2.45 |
| " | 37 | 0.18 | 15.80 | | | | | | | $ 6.30 |
| " | 38 | 0.09 | 9.50 | | | | | | | $ 3.15 |
| " | 39 | Trace | 0.10 | | | | | | | |

REMARKS:

CHARGES $ 27.00

CRISMON & NICHOLS

BY Crismon

R. [illegible]TO M. CRISMON ORRI[illegible]HER HAROLD E. CULVER

# CRISMON & NICHOLS

ASSAYERS AND CHEMISTS

OFFICE AND LABORATORY

229-231 SOUTH WEST TEMPLE STREET

PHONE EM 3-7417

P. O. Box 1708

## ASSAY REPORT

SALT LAKE CITY, UTAH February 10, 1967

Big Treasure Mining & Development Co. - Mr. Spenst M. Hansen

WE HAVE ASSAYED YOUR one SAMPLES AND FIND it TO CONTAIN AS FOLLOWS:

| DESCRIPTION | NO. | PER CENT SILICA ~~XXXXX~~ | PER CENT IRON OXIDE | PER CENT ALUMINUM OXIDE | PER CENT LIME | PER CENT MAGNESIUM OXIDE | PER CENT | PER CENT LOSS BY IGNITION (WATER OF CRYSTALLIZATION, ETC.) |
|---|---|---|---|---|---|---|---|---|
| | 20-13 | 46.10 | | | | | | |

REMARKS:

CHARGES $ 5.00

CRISMON & NICHOLS

BY [signature]

R. R. CASTO  CRISMON  ORRIN [illegible]ER  HAROLD E. CULVER

# CRISMON & NICHOLS

ASSAYERS AND CHEMISTS
229-231 SOUTH WEST TEMPLE STREET

PHONE EM 3-7417  P. O. BOX 1708

## REPORT OF ASSAY

BALT LAKE CITY, UTAH January 31, 1967

Big Treasure Mining & Development Co. PAGE TWO

WE HAVE ASSAYED YOUR sixty-six SAMPLES AND FIND them TO CONTAIN AS FOLLOWS:

| DESCRIPTION | NO. | OZS. GOLD PER TON | OZS. SILVER PER TON | PER CENT LEAD | PER CENT COPPER | PER CENT ZINC | PER CENT INSOL. | PER CENT IRON | PER CENT | VALUE OF GOLD PER TON |
|---|---|---|---|---|---|---|---|---|---|---|
| SM | ~~4-4~~ | ~~Trace~~ | ~~Trace~~ | | | | | | | |
| " | 4-5 | Trace | Trace | | | | | | | |
| " | 4-6 | Trace | Trace | | | | | | | |
| " | 4-7 | Trace | Trace | | | | | | | |
| " | 4-8 | Trace | Trace | | | | | | | |
| " | 4-9 | Trace | Trace | | | | | | | |
| " | 4-10 | Trace | Trace | | | | | | | |
| " | 4-11 | Trace | Trace | | | | | | | |
| " | 4-12 | Trace | Trace | | | | | | | |
| " | 4-13 | Trace | Trace | | | | | | | |
| " | 4-14 | Trace | Trace | | | | | | | |
| " | 4-15 | Trace | Trace | | | | | | | |
| " | 4-16 | Trace | Trace | | | | | | | |
| " | 4-17 | Trace | Trace | | | | | | | |
| " | 4-18 | Trace | Trace | | | | | | | |
| " | 4-19 | Trace | Trace | | | | | | | |
| " | 4-20 | Trace | Trace | | | | | | | |
| " | 4-21 | Trace | Trace | | | | | | | |
| " | 20-1 | 0.10 | 11.10 | | | | | | | $ 3.50 |
| " | 20-2 | Trace | Trace | | | | | | | |
| " | 20-3 | 0.03 | 32.75 | 1.95 | | | | | | $ 1.05 |
| " | 20-4 | 0.02 | 0.80 | None | | | | | | 70¢ |
| " | 20-5 | Trace | Trace | | | | | | | |
| " | 20-6 | Trace | Trace | | | | | | | |
| " | 20-7 | Trace | 0.20 | | | | | | | |
| " | 20-8 | Trace | 0.20 | | 0.60 | | | | | |
| " | 20-9 | 0.47 | 1.10 | | 4.40 | | | | | $ 16.45 |
| " | 20-10 | Trace | Trace | | 0.15 | | | | | |
| " | 20-11 | Trace | Trace | | | | | | | |
| " | 20-12 | Trace | Trace | | | None | | | | |
| " | 20-13 | 0.02 | 10.60 | 0.10 | | 0.20 | | | | 70¢ |
| " | 20-14 | Trace | 1.60 | | | | | | | |
| " | 20-15 | Trace | 0.20 | | | | | | | |

REMARKS:

CHARGES $211.50

CRISMON & NICHOLS
By [illegible]

R. R. CASTO
P. M. CRISMON
ORRIN FISHER
HAROLD E. CULVER

# CRISMON & NICHOLS

ASSAYERS AND CHEMISTS
229-231 SOUTH WEST TEMPLE STREET
PHONE EM 3-7417
P. O. Box 1708

## REPORT OF ASSAY

SALT LAKE CITY, UTAH February 28, 1967

Big Treasure Mining & Development Co.

WE HAVE ASSAYED YOUR thirty-two SAMPLES AND FIND them TO CONTAIN AS FOLLOWS:

| DESCRIPTION | NO. | OZS. GOLD PER TON | OZS. SILVER PER TON | PER CENT LEAD | PER CENT COPPER | PER CENT ZINC | PER CENT INSOL. | PER CENT IRON | PER CENT | VALUE OF GOLD PER TON |
|---|---|---|---|---|---|---|---|---|---|---|
| SM | 2-1 | 0.03 | 0.20 | | | | | | | $ 1.05 |
| " | 2-2 | Trace | Trace | | | | | | | |
| " | 2-3 | Trace | Trace | | 0.10 | | | | | |
| " | 2-4 | Trace | Trace | | | | | | | |
| " | 2-5 | Trace | Trace | | | | | | | |
| " | 2-6 | Trace | Trace | | | | | | | |
| " | 2-7 | Trace | Trace | | | | | | | |
| " | 2-8 | Trace | Trace | | | | | | | |
| " | 2-9 | Trace | Trace | | | | | | | |
| " | 2-10 | Trace | Trace | | | | | | | |
| " | 2-11 | Trace | Trace | | | | | | | |
| " | 2-12 | Trace | Trace | | | | | | | |
| " | 2-13 | Trace | Trace | | | | | | | |
| " | 2-14 | Trace | Trace | | | | | | | |
| " | 4-22 | Trace | Trace | | | | | | | |
| " | 4-23 | Trace | 0.20 | | | | | | | |
| " | 4-24 | Trace | 0.20 | | | | | | | |
| " | 4-25 | Trace | Trace | | | | | | | |
| " | 4-26 | Trace | Trace | | | | | | | |
| " | 4-27 | Trace | Trace | | | | | | | |
| " | 4-28 | Trace | Trace | | | | | | | |
| " | 4-29 | Trace | Trace | | | | | | | |
| " | 4-30 | Trace | Trace | | | | | | | |
| " | 5-1 | Trace | Trace | | | | | | | |
| " | 5-2 | Trace | Trace | | | | | | | |
| " | 5-3 | 0.01 | 7.20 | | | | | | | 35¢ |
| " | 5-4 | Trace | 0.70 | | | | | | | |
| " | 5-5 | Trace | Trace | | | | | | | |
| " | 5-6 | 0.01 | 0.30 | | | | | | | 35¢ |
| " | 5-7 | Trace | Trace | | | | | | | |
| " | 5-8 | Trace | Trace | | | | | | | |
| " | 5-9 | Trace | Trace | | | | | | | |

REMARKS:

CHARGES $ 97.50

CRISMON & NICHOLS
BY [illegible]

R. R. CASTO, P. [illegible] CRISMON ORRIN F[illegible]R HAROLD E. CULVER

# CRISMON & NICHOLS

ASSAYERS AND CHEMISTS
229-231 SOUTH WEST TEMPLE STREET

PHONE EM 3-7417 P. O. Box 1708

## REPORT OF ASSAY

SALT LAKE CITY, UTAH March 1, 1967

Big Treasure Mining & Development Co.

WE HAVE ASSAYED YOUR twenty-eight SAMPLES AND FIND them TO CONTAIN AS FOLLOWS:

| DESCRIPTION | NO. | OZS. GOLD PER TON | OZS. SILVER PER TON | PER CENT LEAD | PER CENT COPPER | PER CENT ZINC | PER CENT INSOL. | PER CENT IRON | PER CENT | VALUE OF GOLD PER TON |
|---|---|---|---|---|---|---|---|---|---|---|
| SM-5 | 23 | Trace | Trace | | | | | | | |
| " | 23 | Trace | Trace | | | | | | | |
| " | 24 | Trace | Trace | | | | | | | |
| " | 25 | Trace | Trace | | | | | | | |
| " | 26 | Trace | Trace | | | | | | | |
| " | 27 | Trace | Trace | | | | | | | |
| " | 28 | Trace | Trace | | | | | | | |
| " | 29 | Trace | Trace | | | | | | | |
| " | 30 | Trace | 0.20 | | | | | | | |
| " | 31 | Trace | 0.20 | | | | | | | |
| " | 32 | Trace | 0.20 | | | | | | | |
| " | 33 | Trace | 0.40 | | | | | | | |
| " | 34 | Trace | 0.30 | | | | | | | |
| " | 35 | Trace | 0.40 | | | | | | | |
| " | 36 | Trace | 0.30 | | | | | | | |
| " | 37 | Trace | Trace | | | | | | | |
| " | 38 | Trace | Trace | | | | | | | |
| " | 39 | Trace | Trace | | | | | | | |
| " | 40 | Trace | Trace | | | | | | | |
| " | 41 | Trace | Trace | | | | | | | |
| " | 42 | Trace | Trace | | | | | | | |
| " | 43 | Trace | Trace | | | | | | | |
| " | 44 | Trace | Trace | | | | | | | |
| " | 45 | Trace | Trace | | | | | | | |
| " | 46 | Trace | Trace | | | | | | | |
| " | 47 | Trace | Trace | | | | | | | |
| " | 48 | Trace | Trace | | | | | | | |
| " | 49 | Trace | Trace | | | | | | | |

REMARKS:

CHARGES $ 84.00

CRISMON & NICHOLS
BY [illegible]

R. R. CASTO P. N[illegible]RISMON ORRIN FIS[illegible] HAROLD E. CULVER

# CRISMON & NICHOLS

ASSAYERS AND CHEMISTS

229-231 SOUTH WEST TEMPLE STREET

PHONE EM 3-7417 P. O. BOX 1708

## REPORT OF ASSAY

SALT LAKE CITY, UTAH March 2, 1967

Big Treasure Mining & Development Co.

WE HAVE ASSAYED YOUR seventeen SAMPLES AND FIND them TO CONTAIN AS FOLLOWS:

| DESCRIPTION | NO. | OZS. GOLD PER TON | OZS. SILVER PER TON | PER CENT LEAD | PER CENT COPPER | PER CENT ZINC | PER CENT INSOL. | PER CENT IRON | PER CENT | VALUE OF GOLD PER TON |
|---|---|---|---|---|---|---|---|---|---|---|
| SM-6 | 29 | Trace | Trace | | | | | | | |
| " | 30 | Trace | Trace | | | | | | | |
| " | 31 | Trace | Trace | | | | | | | |
| " | 32 | Trace | Trace | | | | | | | |
| " | 33 | Trace | Trace | | | | | | | |
| " | 34 | Trace | Trace | | | | | | | |
| " | 35 | Trace | Trace | | | | | | | |
| " | 36 | Trace | Trace | | | | | | | |
| " | 37 | Trace | Trace | | | | | | | |
| " | 38 | Trace | Trace | | 0.08 | | | | | |
| " | 39 | Trace | Trace | | | | | | | |
| " | 40 | Trace | Trace | | | | | | | |
| " | 40 | Trace | Trace | | | | | | | |
| " | 41 | Trace | Trace | | | | | | | |
| " | 42 | Trace | Trace | | 0.05 | | | | | |
| " | 43 | Trace | 1.40 | | | | | | | |
| " | 44 | Trace | Trace | | | | | | | |

REMARKS:

CHARGES $ 54.00

CRISMON & NICHOLS

BY [signature]

R. R. CASTO  P. CRISMON  ORRIN P. ...ER  HAROLD E. CULVER

# CRISMON & NICHOLS

ASSAYERS AND CHEMISTS
229-231 SOUTH WEST TEMPLE STREET

PHONE EM 3-7417  P. O. BOX 1708

## REPORT OF ASSAY

SALT LAKE CITY, UTAH March 2, 1967

Big Treasure Mining & Development Co.

WE HAVE ASSAYED YOUR thirty-two SAMPLES AND FIND them TO CONTAIN AS FOLLOWS:

| DESCRIPTION | NO. | OZS. GOLD PER TON | OZS. SILVER PER TON | PER CENT LEAD | PER CENT COPPER | PER CENT ZINC | PER CENT INSOL. | PER CENT IRON | PER CENT | VALUE OF GOLD PER TON |
|---|---|---|---|---|---|---|---|---|---|---|
| SM-5 | 50 | Trace | Trace | | | | | | | |
| " | 51 | Trace | Trace | | | | | | | |
| " | 52 | Trace | Trace | | | | | | | |
| " | 53 | Trace | Trace | | | | | | | |
| SM-6 | 1 | Trace | Trace | | | | | | | |
| " | 2 | Trace | Trace | | | | | | | |
| " | 3 | Trace | Trace | | | | | | | |
| " | 4 | Trace | Trace | | | | | | | |
| " | 6 | Trace | Trace | | | | | | | |
| " | 7 | Trace | Trace | | | | | | | |
| " | 7 | Trace | Trace | | | | | | | |
| " | 8 | Trace | Trace | | | | | | | |
| " | 9 | Trace | Trace | | | | | | | |
| " | 10 | Trace | Trace | | | | | | | |
| " | 11 | Trace | Trace | | | | | | | |
| " | 12 | Trace | Trace | | | | | | | |
| " | 13 | Trace | Trace | | | | | | | |
| " | 14 | Trace | Trace | | | | | | | |
| " | 15 | Trace | Trace | | | | | | | |
| " | 16 | Trace | Trace | | | | | | | |
| " | 17 | Trace | Trace | | | | | | | |
| " | 18 | Trace | Trace | | | | | | | |
| " | 19 | Trace | Trace | | | | | | | |
| " | 20 | Trace | Trace | | | | | | | |
| " | 21 | Trace | Trace | | | | | | | |
| " | 22 | Trace | Trace | | | | | | | |
| " | 23 | Trace | Trace | | | | | | | |
| " | 24 | Trace | Trace | | | | | | | |
| " | 25 | Trace | Trace | | | | | | | |
| " | 26 | Trace | Trace | | | | | | | |
| " | 27 | Trace | Trace | | | | | | | |
| " | 28 | Trace | Trace | | | | | | | |

REMARKS:

CHARGES $ 96.00

CRISMON & NICHOLS
BY [illegible]

R. R. CASTO P. CRISMON ORRIN FIS[illegible] HAROLD E. CULVER

PHONE EM 3-7417

# CRISMON & NICHOLS

ASSAYERS AND CHEMISTS

229-231 SOUTH WEST TEMPLE STREET

P. O. BOX 1708

## REPORT OF ASSAY

SALT LAKE CITY, UTAH March 29, 1967

Big Treasure Mining & Development Co.

WE HAVE ASSAYED YOUR nineteen SAMPLES AND FIND them TO CONTAIN AS FOLLOWS:

| DESCRIPTION | NO. | OZS. GOLD PER TON | OZS. SILVER PER TON | PER CENT LEAD | PER CENT COPPER | PER CENT ZINC | PER CENT INSOL. | PER CENT IRON | PER CENT | VALUE OF GOLD PER TON |
|---|---|---|---|---|---|---|---|---|---|---|
| SM | 2-30 | Trace | Trace | | | | | | | |
| " | 20-30 | Trace | Trace | | | | | | | |
| " | 20-32 | Trace | Trace | | | | | | | |
| " | 20-33 | Trace | Trace | | | | | | | |
| " | 20-34 | Trace | Trace | | | | | | | |
| SM-30-35 & " | 20-35 | Trace | Trace | | | | | | | |
| " | 20-36 | Trace | Trace | | | | | | | |
| " | 20-37 | Trace | Trace | | | | | | | |
| " | 20-38 | Trace | Trace | | | | | | | |
| " | 20-39 | Trace | Trace | | | | | | | |
| " | 20-40 | Trace | Trace | | | | | | | |
| SM-30-41 & " | 20-41 | Trace | Trace | | | | | | | |
| " | 20-42 | Trace | Trace | | | | | | | |
| " | 20-43 | 0.01 | Trace | | | | | | | 35¢ |
| " | 20-44 | 0.07 | 5.20 | | | | | | | $ 2.45 |
| " | 20-45 | Trace | Trace | | | | | | | |
| " | 20-46 | Trace | Trace | | | | | | | |
| " | 20-47 | Trace | Trace | | | | | | | |
| " | 20-48 | Trace | Trace | | | | | | | |

REMARKS: Two samples above had two numbers each.

CRISMON & NICHOLS

BY P. Crismon

CHARGES $ 57.00

R. R. CASTO · [illegible]. M. CRISMON · OR[illegible] FISHER · HAROLD E. CULVER

# CRISMON & NICHOLS

ASSAYERS AND CHEMISTS

229-231 SOUTH WEST TEMPLE STREET

PHONE EM 3-7417 · P. O. Box 1708

## REPORT OF ASSAY

SALT LAKE CITY, UTAH April 11, 1967

Big Treasure Mining & Development Co.

WE HAVE ASSAYED YOUR twenty-nine SAMPLES AND FIND them TO CONTAIN AS FOLLOWS

| DESCRIPTION | NO. | OZS. GOLD PER TON | OZS. SILVER PER TON | PER CENT LEAD | PER CENT COPPER | PER CENT ZINC | PER CENT INSOL. | PER CENT IRON | PER CENT | VALUE OF GOLD PER TON |
|---|---|---|---|---|---|---|---|---|---|---|
| SM-3 | 1 | Trace | Trace | | 0.05 | | | | | |
| " | 2 | 0.03 | Trace | | 0.05 | | | | | $ 1.05 |
| " | 3 | Trace | Trace | | 0.10 | | | | | |
| " | 4 | Trace | Trace | | | | | | | |
| " | 5 | Trace | Trace | | | | | | | |
| " | 6 | Trace | Trace | | | | | | | |
| " | 6 | Trace | Trace | | | | | | | |
| " | 7 | Trace | Trace | | 0.16 | | | | | |
| " | 8 | Trace | Trace | | | | | | | |
| " | 9 | 0.02 | 0.20 | | 0.13 | | | | | 70¢ |
| " | 10 | Trace | Trace | | | | | | | |
| " | 12 | Trace | Trace | | 0.18 | | | | | |
| " | 12 | Trace | Trace | | | | | | | |
| " | 13 | 0.01 | Trace | | | | | | | 35¢ |
| " | 14 | 0.01 | Trace | | | | | | | 35¢ |
| " | 15 | Trace | Trace | | | | | | | |
| " | 16 | Trace | Trace | | | | | | | |
| " | 17 | 0.04 | 0.60 | | | | | | | $ 1.40 |
| " | 18-A | Trace | Trace | | | | | | | |
| " | 18 | Trace | Trace | | | | | | | |
| " | 19 | Trace | Trace | | | | | | | |
| " | 20 | Trace | Trace | | | | | | | |
| " | 21 | Trace | Trace | | | | | | | |
| " | 22 | Trace | Trace | | | | | | | |
| " | 23 | Trace | Trace | | 0.16 | | | | | |
| " | 24 | 0.01 | 0.10 | | | | | | | 35¢ |
| " | 25 | 0.01 | Trace | | | | | | | 35¢ |
| " | 26 | Trace | Trace | | | | | | | |
| " | 27 | Trace | Trace | | | | | | | |

REMARKS:

CHARGES $ 97.50

CRISMON & NICHOLS

BY [illegible]

R. R. CASTO

M. CRISMON

ORR[illegible]ISHER

HAROLD E. CULVER

PHONE EM 3-7417

# CRISMON & NICHOLS

ASSAYERS AND CHEMISTS
229-231 SOUTH WEST TEMPLE STREET

P. O. BOX 1708

## REPORT OF ASSAY

Big Treasure Mining & Development Co. SALT LAKE CITY, UTAH April 12, 1967

WE HAVE ASSAYED YOUR eighteen SAMPLES AND FIND them TO CONTAIN AS FOLLOWS:

| DESCRIPTION | NO. | OZS. GOLD PER TON | OZS. SILVER PER TON | PER CENT LEAD | PER CENT COPPER | PER CENT ZINC | PER CENT INSOL. | PER CENT IRON | PER CENT | VALUE OF GOLD PER TON |
|---|---|---|---|---|---|---|---|---|---|---|
| SM-20 | 49 | 0.03 | 3.75 | | | | | | | $ 1.05 |
| " | 50 | 0.03 | 4.75 | | | | | | | $ 1.05 |
| " | 51 | 0.02 | 5.15 | | | | | | | 70¢ |
| " | 52 | 0.02 | 1.80 | | | | | | | 70¢ |
| " | 53 | 0.02 | 1.30 | | | | | | | 70¢ |
| " | 54 | 0.04 | 7.75 | | | | | | | $ 1.40 |
| " | 55 | 0.04 | 3.95 | | | | | | | $ 1.40 |
| " | 56 | 0.02 | 2.20 | | | | | | | 70¢ |
| " | 57 | 0.02 | 3.00 | | | | | | | 70¢ |
| " | 58 | 0.04 | 4.55 | | | | | | | $ 1.40 |
| " | 59 | 0.01 | 1.00 | | | | | | | 35¢ |
| " | 60 | 0.02 | 1.00 | | | | | | | 70¢ |
| " | 61 | 0.01 | 1.60 | | | | | | | 35¢ |
| " | 62 | 0.01 | 2.80 | | | | | | | 35¢ |
| " | 63 | 0.03 | 4.95 | | | | | | | $ 1.05 |
| " | 64 | 0.01 | 3.60 | | | | | | | 35¢ |
| " | 65 | 0.01 | 0.90 | | | | | | | 35¢ |
| " | 66 | 0.03 | 7.55 | | | | | | | $ 1.05 |

REMARKS:

CHARGES $ 54.00

CRISMON & NICHOLS

BY [illegible]

R. R. CASTO
M. CRISMON
ORR[illegible]ISHER
HAROLD E. CULVER

PHONE EM 3-7417

# CRISMON & NICHOLS

ASSAYERS AND CHEMISTS
229-231 SOUTH WEST TEMPLE STREET
P. O. BOX 1706

## REPORT OF ASSAY

SALT LAKE CITY, UTAH April 25, 1967

Big Treasure Mining & Development Corp.

WE HAVE ASSAYED YOUR fourteen SAMPLES AND FIND them TO CONTAIN AS FOLLOWS:

| DESCRIPTION | NO. | OZS. GOLD PER TON | OZS. SILVER PER TON | PER CENT LEAD | PER CENT COPPER | PER CENT ZINC | PER CENT INSOL. | PER CENT IRON | PER CENT | VALUE OF GOLD PER TON |
|---|---|---|---|---|---|---|---|---|---|---|
| SM | 8-1 | Trace | Trace | | | | | | | |
| " | 8-2 | Trace | Trace | | | | | | | |
| " | 8-3 | 0.01 | 0.10 | | | | | | | 35¢ |
| " | 8-4 | Trace | Trace | | | | | | | |
| " | 8-5 | 0.01 | 0.10 | | | | | | | 35¢ |
| " | 8-6 | Trace | 0.20 | | | | | | | |
| " | 8-7 | Trace | Trace | | | | | | | |
| " | 8-8 | Trace | Trace | | | | | | | |
| " | 8-9 | Trace | 0.40 | | | | | | | |
| " | 8-10 | Trace | 0.10 | | | | | | | |
| " | 8-11 | Trace | Trace | | | | | | | |
| " | 8-12 | Trace | 0.30 | | | | | | | |
| " | 8-13 | Trace | 0.20 | | | | | | | |
| " | 8-14 | Trace | 0.20 | | | | | | | |

REMARKS:

CHARGES $42.00

CRISMON & NICHOLS
BY Crismon

R. R. CASTO  P. CRISMON  ORRIN F. NICHOLS  HAROLD E. CULVER

# CRISMON & NICHOLS

ASSAYERS AND CHEMISTS
229-231 SOUTH WEST TEMPLE STREET

PHONE EM 3-7417  P. O. BOX 1708

## REPORT OF ASSAY

SALT LAKE CITY, UTAH May 23, 1967

Big Treasure Mining & Development Co.

WE HAVE ASSAYED YOUR thirty-one SAMPLES AND FIND them TO CONTAIN AS FOLLOWS:

| DESCRIPTION | NO. | OZS. GOLD PER TON | OZS. SILVER PER TON | PER CENT LEAD | PER CENT COPPER | PER CENT ZINC | PER CENT INSOL. | PER CENT IRON | PER CENT | VALUE OF GOLD PER TON |
|---|---|---|---|---|---|---|---|---|---|---|
| SM-9 | 1 | Trace | Trace | | | | | | | |
| -"- | 2 | Trace | Trace | | | | | | | |
| -"- | 3 | 0.05 | Trace | | | | | | | $ 1.75 |
| ADJ-2-E | 1 | 0.02 | 7.40 | | | | | | | 70¢ |
| -"- | 2 | 0.01 | 2.80 | | | | | | | 35¢ |
| -"- | 3 | 0.01 | Trace | | | | | | | 35¢ |
| -"- | 4 | 0.01 | 0.50 | | | | | | | 35¢ |
| -"- | 5 | 0.01 | 2.00 | | | | | | | 35¢ |
| -"- | 6 | 0.02 | 13.40 | | | | | | | 70¢ |
| -"- | 7 | Trace | 6.80 | | | | | | | |
| -"- | 8 | Trace | 0.40 | | | | | | | |
| -"- | 9 | Trace | 0.20 | | | | | | | |
| ADJ-2-W | 1 | Trace | Trace | | | | | | | |
| -"- | 2 | 0.02 | 0.80 | | | | | | | 70¢ |
| -"- | 3 | Trace | 0.40 | | | | | | | |
| -"- | 4 | Trace | 0.80 | | | | | | | |
| -"- | 5 | 0.01 | 4.20 | | | | | | | 35¢ |
| -"- | 6 | Trace | 0.20 | | | | | | | |
| -"- | 7 | Trace | 0.20 | | | | | | | |
| -"- | 8 | Trace | Trace | | | | | | | |
| -"- | 9 | Trace | Trace | | | | | | | |
| -"- | 10 | 0.01 | 0.60 | | | | | | | 35¢ |
| -"- | 11 | Trace | Trace | | | | | | | |
| -"- | 12 | Trace | Trace | | | | | | | |
| -"- | 13 | Trace | Trace | | | | | | | |
| -"- | 14 | Trace | 0.50 | | | | | | | |
| -"- | 15 | Trace | 0.20 | | | | | | | |
| -"- | 16 | 0.02 | 4.60 | | | | | | | 70¢ |
| -"- | 17 | Trace | Trace | | | | | | | |
| -"- | 18 | 0.01 | 0.20 | | | | | | | 35¢ |
| -"- | 19 | Trace | Trace | | | | | | | |

REMARKS:

CHARGES $ 93.00

CRISMON & NICHOLS
By P. Crismon

P. M. CRISMON, Pres.

# CRISMON & NICHOLS

ASSAYERS AND CHEMISTS

229-231 SOUTH WEST TEMPLE STREET

PHONE 363-7417

P. O. BOX 1708

SALT LAKE CITY, UTAH 84110

## REPORT OF ASSAY

May 23, 1967

Big Treasure Mining & Development Co.

WE HAVE ASSAYED YOUR one SAMPLES AND FIND it TO CONTAIN AS FOLLOWS:

| DESCRIPTION | NO. | OZS. GOLD PER TON | OZS. SILVER PER TON | PER CENT LEAD | PER CENT COPPER | PER CENT ZINC | PER CENT INSOL. | PER CENT IRON | PER CENT | VALUE OF GOLD PER TON |
|---|---|---|---|---|---|---|---|---|---|---|
| Special | 1 | 0.19 | 48.80 | | | | | | | $ 6.65 |

REMARKS:

CHARGES $ 3.00

CRISMON & NICHOLS

BY Crismon

P. M. CRISMON, Pres.

# CRISMON & NICHOLS

ASSAYERS AND CHEMISTS

PHONE 363-7417 | 229-231 SOUTH WEST TEMPLE STREET | P. O. BOX 1708

SALT LAKE CITY, UTAH 84110

## REPORT OF ASSAY

May 29, 1967

Big Treasure Mining & Development Co.

WE HAVE ASSAYED YOUR one SAMPLES AND FIND it TO CONTAIN AS FOLLOWS:

| DESCRIPTION | NO. | OZS. GOLD PER TON | OZS. SILVER PER TON | PER CENT LEAD | PER CENT COPPER | PER CENT ZINC | PER CENT INSOL. | PER CENT IRON | PER CENT | VALUE OF GOLD PER TON |
|---|---|---|---|---|---|---|---|---|---|---|
| SM-20 | 1 | Trace | Trace | | | | | | | |

REMARKS:

CHARGES $ 3.50

CRISMON & NICHOLS

BY Crismon

P. M. CRISMON, Pres.

# CRISMON & NICHOLS

ASSAYERS AND CHEMISTS

PHONE 363-7417

229-231 SOUTH WEST TEMPLE STREET

P. O. Box 1708

SALT LAKE CITY, UTAH 84110

## REPORT OF ASSAY

May 29, 1967

Big Treasure Mining & Development Co.

WE HAVE ASSAYED YOUR one SAMPLES AND FIND it TO CONTAIN AS FOLLOWS:

| DESCRIPTION | NO. | OZS. GOLD PER TON | OZS. SILVER PER TON | PER CENT LEAD | PER CENT COPPER | PER CENT ZINC | PER CENT INSOL. | PER CENT IRON | PER CENT | VALUE OF GOLD PER TON |
|---|---|---|---|---|---|---|---|---|---|---|
| SM-20 | 1 | Trace | Trace | | | | | | | |

REMARKS:

CHARGES $ 3.50

CRISMON & NICHOLS

BY Crismon

R. R. CASTO P. CRISMON ORRIN FI[illegible] HAROLD E. CULVER

# CRISMON & NICHOLS

ASSAYERS AND CHEMISTS
229-231 SOUTH WEST TEMPLE STREET

PHONE EM 3-7417 P. O. Box 1708

## REPORT OF ASSAY

SALT LAKE CITY, UTAH June 27, 1967

Big Treasure Mining & Development Co.

WE HAVE ASSAYED YOUR twenty-six SAMPLES AND FIND them TO CONTAIN AS FOLLOWS:

| DESCRIPTION | NO. | OZS. GOLD PER TON | OZS. SILVER PER TON | PER CENT LEAD | PER CENT COPPER | PER CENT ZINC | PER CENT INSOL. | PER CENT IRON | PER CENT | VALUE OF GOLD PER TON |
|---|---|---|---|---|---|---|---|---|---|---|
| BB | 3-1 | 0.01 | 0.20 | | | | | | | 35¢ |
| BB | 3-2 | 0.01 | Trace | | | | | | | 35¢ |
| BB | 3-3 | 0.01 | 0.20 | | | | | | | 35¢ |
| BB | 3-4 | 0.01 | 0.40 | | | | | | | 35¢ |
| BB | 3-5 | 0.03 | 1.90 | | | | | | | $ 1.05 |
| BB | 3-6 | 0.01 | 0.10 | | | | | | | 35¢ |
| BB | 3-7 | 0.04 | 2.00 | | | | | | | $ 1.40 |
| BB | 3-8 | 0.01 | 0.20 | | | | | | | 35¢ |
| BB | 3-9 | 0.01 | 0.10 | | | | | | | 35¢ |
| BB | 3-10 | Trace | Trace | | | | | | | |
| BB | 3-11 | Trace | Trace | | | | | | | |
| BB | 3-12 | 0.01 | Trace | | | | | | | 35¢ |
| BB | 3-13 | 0.01 | 0.40 | | | | | | | 35¢ |
| BB | 3-14 | 0.02 | 1.00 | | | | | | | 70¢ |
| BB | 3-15 | 0.01 | 0.40 | | | | | | | 35¢ |
| BB | 3-16 | 0.01 | 0.40 | | | | | | | 35¢ |
| BB | 3-17 | 0.08 | 16.20 | | | | | | | $ 2.80 |
| BB | 3-18 | 0.01 | 0.10 | | | | | | | 35¢ |
| BB | 3-19 | 0.01 | 2.00 | | | | | | | 35¢ |
| BB | 3-20 | 0.01 | 1.00 | | | | | | | 35¢ |
| BB | 3-21 | 0.01 | Trace | | | | | | | 35¢ |
| BB | 3-22 | Trace | 0.20 | | | | | | | |
| BB | 3-23 | Trace | 0.10 | | | | | | | |
| BB | 3-24 | Trace | 0.20 | | | | | | | |
| BB | 3-25 | Trace | 0.10 | | | | | | | |
| BB | 5-1 | 0.08 | 16.30 | | | | | | | $ 2. |

REMARKS: Copy mailed to Mr. Jardin at Winkleman

CHARGES $ 78.00

CRISMON & NICHOLS
BY Crismon

R. R. CASTO P. M. CRISMON ORRIN FISHER HAROLD E. CULVER

# CRISMON & NICHOLS

ASSAYERS AND CHEMISTS

229-231 SOUTH WEST TEMPLE STREET

PHONE EM 3-7417 P. O. BOX 1708

## REPORT OF ASSAY

SALT LAKE CITY, UTAH [illegible] 2, 1937

[illegible] Mining & Development Co.

WE HAVE ASSAYED YOUR [illegible] SAMPLES AND FIND [illegible] TO CONTAIN AS FOLLOWS:

| DESCRIPTION | NO. | OZS. GOLD PER TON | OZS. SILVER PER TON | PER CENT LEAD | PER CENT COPPER | PER CENT ZINC | PER CENT INSOL. | PER CENT IRON | PER CENT | VALUE OF GOLD PER TON |
|---|---|---|---|---|---|---|---|---|---|---|
| M.-1 | A-1 | 0.01 | 6.90 | | | | | | | 35¢ |
| " | A-2 | Trace | 0.80 | | | | | | | |
| ED-2 | 1 | 0.02 | 5.80 | | | | | | | 70¢ |
| " | 2 | Trace | 0.80 | | | | | | | |
| " | 3 | 0.02 | 2.40 | | | | | | | 70¢ |
| " | 4 | 0.03 | 2.80 | | | | | | | $ 1.05 |
| " | 5 | 0.02 | 1.00 | | | | | | | 70¢ |
| " | 6 | 0.01 | 1.90 | | | | | | | 35¢ |
| " | 7 | 0.01 | 0.30 | | | | | | | 35¢ |
| " | 8 | 0.01 | 0.10 | | | | | | | 35¢ |
| " | 9 | 0.02 | 0.90 | | | | | | | 70¢ |
| " | 10 | 0.02 | 0.90 | | | | | | | 70¢ |
| " | 11 | 0.03 | 8.50 | | | | | | | $ 1.05 |
| " | 12 | Trace | 0.70 | | | | | | | |
| " | 13 | 0.01 | 0.10 | | | | | | | 35¢ |
| " | 14 | 0.02 | 0.90 | | | | | | | 70¢ |
| " | 15 | 0.02 | 0.90 | | | | | | | 70¢ |
| ET | 1 | 0.02 | 12.00 | | | | | | | 70¢ |
| " | 2 | 0.01 | 2.90 | | | | | | | 35¢ |
| " | 3 | 0.02 | 10.80 | | | | | | | 70¢ |
| " | 4 | 0.02 | 32.60 | | | | | | | 70¢ |
| " | 5 | 0.01 | 6.10 | | | | | | | 35¢ |
| " | 6 | 0.02 | 16.00 | | | | | | | 70¢ |
| Special | 2 | Trace | Trace | | | | | | | |

REMARKS: Copies sent to San Manon Calif & Winkleman Ariz.

CHARGES $ [illegible]

CRISMON & NICHOLS

BY [illegible]

P. M. CRISMON, Pres.

# CRISMON & NICHOLS

ASSAYERS AND CHEMISTS

229-231 SOUTH WEST TEMPLE STREET

Phone 363-7417

P. O. Box 1708

## REPORT OF ASSAY

SALT LAKE CITY, UTAH 84110 July 14, 1967

Big Treasure Mining & Development Co.

WE HAVE ASSAYED YOUR five SAMPLES AND FIND them TO CONTAIN AS FOLLOWS:

| DESCRIPTION | NO. | OZS. GOLD PER TON | OZS. SILVER PER TON | PER CENT LEAD | PER CENT COPPER | PER CENT ZINC | PER CENT INSOL. | PER CENT IRON | PER CENT | VALUE OF GOLD PER TON |
|---|---|---|---|---|---|---|---|---|---|---|
| Special | 3 | 0.05 | 44.75 | | | | | | | $ 1.75 |
| " | 4 | 0.06 | 25.55 | 0.30 | | | | | | $ 2.10 |
| " | 5 | 0.01 | 4.00 | | | | | | | 35¢ |
| " | 6 | 0.02 | 0.50 | | | | | | | 70¢ |
| " | 7 | Trace | 0.60 | | | | | | | |

REMARKS:

CRISMON & NICHOLS

BY P. M. Crismon

CHARGES $ 16.50

P. M. CRISMON, PRES.

# CRISMON & NICHOLS

ASSAYERS AND CHEMISTS

229-231 SOUTH WEST TEMPLE STREET

PHONE 363-7417

P. O. BOX 1708

SALT LAKE CITY, UTAH 84110

## REPORT OF ASSAY

July 25, 1967

Big Treasure Mining & Development Co.

WE HAVE ASSAYED YOUR five SAMPLES AND FIND them TO CONTAIN AS FOLLOWS:

| DESCRIPTION | NO. | OZS. GOLD PER TON | OZS. SILVER PER TON | PER CENT LEAD | PER CENT COPPER | PER CENT ZINC | PER CENT INSOL. | PER CENT IRON | PER CENT Silica | VALUE OF GOLD PER TON |
|---|---|---|---|---|---|---|---|---|---|---|
| Sample of July 14 Special | 3 | | | 1.20 | | | | | 85.20 | |
| Sample of July 14 Special | 4 | | | | | | | | 86.60 | |
| Sample of July 14 Special | 5 | | | | | | | | 82.50 | |
| SM-20 | 48 | 0.01 | 0.80 | 3.80 | 1.17 | | | | 69.20 | |
| SM-20 | 49 | Trace | Trace | None | | | | | 89.00 | |

REMARKS: Silicas run perchloric acid method and charged at insoluble rate.
~~Copies mailed to both Arizona & California.~~

CRISMON & NICHOLS

P. M. Crismon

CHARGES $ 19.50

R. R. CASTO P. CRISMON ORRIN FI HAROLD E. CULVER

# CRISMON & NICHOLS

ASSAYERS AND CHEMISTS
220-231 SOUTH WEST TEMPLE STREET

PHONE EM 3-7417 P. O. BOX 1708

## REPORT OF ASSAY

SALT LAKE CITY, UTAH August 22, 1967

Big Treasure Mining & Development Co.

WE HAVE ASSAYED YOUR twenty-nine SAMPLES AND FIND them TO CONTAIN AS FOLLOWS:

| DESCRIPTION | NO. | OZS. GOLD PER TON | OZS. SILVER PER TON | PER CENT LEAD | PER CENT COPPER | PER CENT ZINC | PER CENT INSOL. | PER CENT IRON | PER CENT | VALUE OF GOLD PER TON |
|---|---|---|---|---|---|---|---|---|---|---|
| SM | 7A-1 | Trace | Trace | | | | | | | |
| " | 7A-2 | Trace | Trace | | | | | | | |
| " | 7A-3 | Trace | Trace | | | | | | | |
| " | 7A-4 | Trace | Trace | | | | | | | |
| " | 7A-5 | Trace | Trace | | | | | | | |
| " | 7A-6 | Trace | Trace | | | | | | | |
| " | 7A-7 | Trace | Trace | | | | | | | |
| " | 7A-8 | Trace | Trace | None | | | | | | |
| " | 7A-9 | Trace | Trace | | | | | | | |
| " | 7A-10 | Trace | Trace | | | | | | | |
| " | 7A-11 | Trace | Trace | | | | | | | |
| " | 7A-12 | Trace | Trace | | | | | | | |
| " | 7A-13 | Trace | Trace | None | | | | | | |
| " | 7A-14 | Trace | 0.10 | | | | | | | |
| " | 7A-15 | Trace | Trace | | | | | | | |
| " | 7A-16 | Trace | Trace | | | | | | | |
| " | 7A-17 | Trace | Trace | | | | | | | |
| " | 7A-18 | Trace | Trace | | | | | | | |
| " | 7A-19 | Trace | Trace | | | | | | | |
| " | 7A-20 | Trace | Trace | None | | | | | | |
| " | 7A-21 | Trace | Trace | None | | | | | | |
| " | 7A-22 | Trace | Trace | | | | | | | |
| " | 7A-23 | Trace | Trace | | | | | | | |
| " | 7A-24 | Trace | Trace | | | | | | | |
| " | 7A-25 | Trace | Trace | | 0.38 | | | | | |
| " | 9-4 | 0.01 | 0.60 | None | | | | | | 35¢ |
| " | 9-5 | 0.04 | 2.55 | 0.20 | | | | | | $ 1.40 |
| SMJ | 3 | Trace | Trace | | | | | | | |
| " | 4 | Trace | 2.60 | | | | | | | |

REMARKS: Copies sent to San Ramon, California and Winkleman Arizona

CHARGES $ 97.50

CRISMON & NICHOLS

BY Crismon

APPENDIX D
GEOLOGIC REPORT
BY THOMAS S. STERRETT

THOMAS S. STERRETT

CONSULTANT GEOLOGIST — OIL, MINING, GROUNDWATER

TELEPHONE:
(415) 443-2485

1040 AUBURN STREET
LIVERMORE, CALIF. 94550

September 22, 1967

# GEOLOGIC REPORT

## Introduction

The following is a report of a geologic field investigation conducted by myself during the period September 1, 1967 through September 21, 1967 on behalf of Big Treasure Mining and Development Company (BTM Co.). This investigation was conducted on property controlled by BTM Co. located primarily in sections 34 and 35, Township 4 south, Range 16 east, Pinal County, Arizona.

The purposes of the investigation were: 1) to assess all geologic data that had been collected prior to the investigation, 2) to add to existing data any other pertinent geologic information derived during the investigation, and 3) to evaluate the property, based on all geologic information, with respect to the occurrence of commercial quantities of base metal deposits, primarily silver.

## Prior Geologic Information

The general geologic evaluation of the property had been well established prior to this investigation by Hansen, Janc, and Jardine, however, I believe certain phases of the program deserve special mention because of their direct

applicability to the purposes of my investigation.

I found that the surface map of the area, constructed by Jardine, was extremely well done. Several surveyed points on the map were verified by hand transit and pacing technique, and were found to be very accurately located. Time did not permit a complete check of all surveyed lines, but the accuracy of those that were checked allowed me to work with complete confidence in the map. Outcrops of veins were also found to be very accurately mapped. Considering the terrain of the area and the surveying difficulties inherent to such, I believe this map to be a very outstanding effort.

The locations of the ten core holes, recently completed, were selected with optimum concern for the evaluation of all vein features on the property. I believe it would have been physically impossible to have located these holes any better, even in light of the information provided by the holes themselves.

Geologic Program

A. General Geology

Although the geologic evaluation of the area had been previously well established, a brief description, as interpreted by myself, is included in this report primarily to report my findings and secondly to verify the prior interpretation.

The surface material is composed of a thick sequence of interbedded andesite flows, sandstone, and shale. The exact thickness can not be determined in the area of inter-

est without drilling completely through the sequence, but based on information extrapolated from nearby (less than $1\frac{1}{2}$ miles), I believe this thickness to be in excess of 2500 feet and probably as great as 2900 to 3000 feet.

Compositionally, the sandstones are composed primarily of andesite fragments of sand size, whereas, the shales tend to be more of a typical quartzose material. Very little andesite could be identified in the shale from hand samples. The shales are also frequently carbonaceous.

I would interpret from the characteristics and occurrence of the sediments to be indicative of lagoonal or near shore type deposits accumulating during periods of between successive andesite flows.

The attitude of this sequence is essentially flat-lying with a slight regional dip of less than 2° to the southeast. Initial inspection of these beds gives one the impression of complex structural attitudes, however, closer examination reveals the true horizontal nature. This is evidenced by orienting segments of sand-shale core to complement the angle of inclination of the core holes and observing bedding planes within the samples. A structure contour map drawn on the top of the first quartzite conglomerate penetrated in all but one of the core holes also indicates an essentially flat depositional surface associated with the sedimentary material. Any apparent structural complexity of this sequence is related to the contorting of bedding by intrusives which trend approximately northeast through most of the property.

Many dikes and sills have intruded the andesite-sediment sequence, probably along post depositional-pre intrusive faults, and over a large portion of the property, this intrusive material comprises the entire surface.

The dikes tend to be near vertical with high angle dips of greater than 75° to both the northwest and southeast. The sills generally intrude parallel to bedding, giving further credence to the near-horizontal attitude of the stratigraphy. These intrusives are probably very late Cretaceous or early Tertiary in age, and were found to be of either microdiorite or feldspar-mica porphyry composition.

Only relatively minor post intrusive faults were observed in the area, and these are now represented by major drainage paths. At no place within the area of interest were these faults observed with sufficient magnitude to exert a cotrolling influence on ore occurrence.

B. Mineralization

Mineralization is related to the intrusive history of the area, and was probably associated with the very late stages and/or immediately following this activity. The ore is epithermal in origin; the hydrothermal solutions rising from the underlying intrusive along fractures or zones of weakness created by the extensions of the intrusive (dikes and sills). These solutions concentrated in the near-surface region, but evidence that they originated in the intrusive is apparent from the finely disseminated traces of mineralization found in core samples of the dikes.

Even though the core holes were located for the explicit purpose, veins with commercial quantities of ore were not intersected at depth in any of the holes. The slight mineralization observed in the cores was generally not of the vein filling type, and was concentrated almost exclusively within the sedimentary units. Units with the highest sulfide content were predominantly calcareous. Mineralization appeared to have migrated into the wall rock along bedding planes, adjacent to hydrothermal solution paths. This occurrence is probably related to some sort of preferential carbonate replacement. Even the few very-thin veinlets observed in the cores were associated with calcite; indicating that these occurrences might also be related to carbonate replacement rather than the more typical injection type veins.

Preferential carbonate replacement type deposits are found on a large scale in the Christmas Mine, approximately three miles west of the property. Hydrothermal solutions have replaced significant intervals of Paleozoic carbonates. This replacement is confined to only certain carbonate units and is traceable throughout the area. No satisfactory explanation is available to explain why certain limestone and/or dolomite beds are replaced preferentially to others. However, this process is responsible for the commercial concentrations of base metal mineralization produced from this mine

Since the trace mineralization observed in the cores appears to be related to the carbonate content also, I believe

it is reasonable to assume that this mechanism of ore occurrence is present in the area of interest. The lack of significant quantities of carbonate in the andesite-sediment sequence precludes accumulation of commercial deposits within the material.

The mineralization that has been mined in the area of interest is all epithermal vein filling in origin and as such is not related to the carbonate content of the rocks involved. Significant quantities of primarily silver ore have been mined from the epithermal vein deposits, and there is probably enough ore remaining in the veins and tailings to sustain a very limited, small scale operation.

C. Evaluation

As stated above, it is my belief that no commercial quantities of carbonate replacement mineralization exist in the andesite- sediment sequence. However, the same paleozoic carbonate sequence that is productive in the Christmas Mine area underlies the area of interest. Since mineral-bearing intrusive material penetrated these carbonates, as well as the andesite-sediment sequence, it is reasonable to expect the possible occurrence of replacement deposits in this area as well as in the Christmas area.

Upon examination of two area west of your property where where the Paleozoic carbonates crop out, it was observed that the uppermost portion (Naco limestone), which immediately underlies the andesite-sediment sequence, is frequently mineralized due to the carbonate replacement method. Intrusive

dikes and sills were not nearly as prevalent as in the area of your property. This could indicate that, since intrusive material is so abundant in your area, the underlying Paleozoic carbonates are much closer to a source of epithermal solutions, and as such, are more susceptible to the replacement method of ore deposition than areas more removed from the main intrusive body. With this in mind, I believe there is a reasonable possibility that the uppermost Naco limestone could be mineralized in the area of interest. The degree of mineralization and whether or not it actually does exist can be answered only by drilling through the andesite-sediment sequence and recovering core samples from the Naco.

D. Recommendations

Based on the above evaluation, the obvious solution to evaluating the area would be to drill a hole, but certain complicating factors should be considered prior to drilling.

Only one hole (No. 3) of the ten drilled on the property is applicable to deepening. The others are all slant holes and would require almost twice as much drilling to reach the limestone as would a vertical hole drilled at a similar elevation. Hole No. 3 is vertical and is also the deepest yet drilled on the property (1857 ft.). Therefore, from the standpoint of drilling economics alone, this hole is the obvious choice for deepening; should it be decided to do so. Another critical question, however, is yet unanswered: how much deeper must the hole be drilled to intercept the limestone?

As stated above, the andesite-sediment sequence could be

as thick as 3000 feet in the area. This statement is based on reports of a hole drilled in section 2, Township 5 south, Range 16 east by Inspiration Mining Company. The drill hole is less than one mile southeast of your No. 3 hole and has a collar elevation approximately 250-300 feet higher. More specific information concerning this drill hole was impossible to obtain due to company restricted information. Therefore, topographically, with hole No. 3 already drilled to 1857 feet, a maximum additional 900-1000 feet might have to be drilled to reach the Naco limestone. The increased increment could be reduced, however, to a possible minimum of several hundred feet, depending upon topographic variation. It should be mentioned though that the lithologic unit in which the No. 3 hole bottomed could not be found in an interval of approximately 800 feet above the Naco in the Christmas Mine area.

Structural variation of the stratigraphy in the area of interest could also exert a controlling influence over the actual thickness of the andesite-sediment sequence. An overlay of Wilden's map (attached) illustrates this possibility. I believe the Reed Basin Syncline actually projects through the property as shown. This is evidenced by dip-slope outcrops of Naco limestone in locality "A". These slopes appear to me to be the north limb of an essentially east-west trending syncline. If this is the case, drill hole No. 3 should be on the south limb; somewhere between the trough and the crest of any complementary parallel anticline.

Both Wilden and Ross mention the possibility of a paral-

lel anticline, but are unable to verify its' existence, as was I, due to the masking of the Paleozoic strata by the Cretaceous volcanics. In this eventuality, the thickness of andesite-sedimentary material at the locality of hole No. 3 would be dependent upon the proximity of the hole to the trough of the syncline and the crest of the anticline.

Any deepening of drill hole No.3 should be restricted to coring only. Since the actual thickness of andesite- sediment strata between the bottom of the hole and the top of the Naco limestone can not be conclusively established with existing information, continuous coring would be the only drilling technique that would provide this data. At the depths involved, I would expect BX size core to cost in the range of $10.00 to $12.00 per foot, if a wire-line setup is used.

Should intrusive material be encountered for an interval of 100 feet prior to reaching the limestone, the drill hole should be abandoned at that point. In my opinion, such an eventuality would indicate that the drill hole had pierced a dike and was following it downward or that the main intrusive had been encountered. Continued coring under this condition would probably preclude penetrating any of the Paleozoic carbonates within a reasonable depth range.

By the same reasoning, 100 feet of penetration into the Naco limestone without encountering significant mineralization would also be indicative of abandonment of the hole.

Statement

This report represents, in my professional opinion, the geologic conditions and the evaluation of mineral deposits associated with the property described in the report.

Thomas S Sterrett

Thomas S. Sterrett

Consultant Geologist

Office of Minerals Exploration
Building 53 Room 203

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May 31, 1968

Dr. David H. Kimball, President
Big Treasure Mining and Development Company
125 Sedgefield Court
San Ramon, California 94583

Subject: OME-6548 (Silver)
Big Treasure Mining and Development Co.
Little Treasure and Adjust Mines
Pinal County, Arizona
Contract 2231

Dear Dr. Kimball:

Enclosed is the Operator's copy of a Report of Review issued in 1968 on the subject contract. I have reviewed the Report of Review and concur in the facts stated in this report. The $200.00 that has been withheld for payment to you will be authorized for payment upon receipt of an acceptable final report. Dr. Spenst Hansen informed me by telephone that he would complete the report within ten days which is now past.

Sincerely yours,

J. William Hasler
mc

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

cc: Chief, Office of Minerals Exploration (2)
OME chron
Mr. Hasler
OME-6548

# A-Claims Acquired By Consolidated Oil

Consolidated Oil & Gas, Inc., announced its wholly owned subsidiary, Petro-Nuclear Ltd., has acquired an 80 per cent interest in 2,120 uranium claims covering an approximate 42,000-acre bloc from Nuclear Resources, Inc., of Denver. Nuclear Resources retains a 20 per cent interest.

Harry A. Trueblood Jr., Consolidated Oil president, said the uranium claims are situated in the Muskrat Creek area west of the Gas Hills Mining District in the Wind River Basin of Fremont County, Wyo.

Dr. Spenst M. Hansen, vice president-manager of operations of Petro-Nuclear, said an active "to investigate the possible significance of known uranium geo-exploratory-drilling program chemical and radiometric anomalies" will be commenced next week.

This new activity, Hansen, said brings to 10 the number of drilling rigs now operating on Petro-Nuclear's uranium properties in Wyoming and Colorado.

Hansen recently joined Consolidated's management team. Holder of a Ph.D. in mining geology, he previously worked for the Lawrence Radiation Laboratories as a special consultant to the Atomic Energy Commission.

Big Treasure Mtg. & Dev. Co. OME-6548

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MAY 17 1968

**AIRMAIL**

Big Treasure Mining and Development Company
125 Sedgefield Court
San Ramon, California 94583

Re: OME-6548 (Silver)
Big Treasure Mining and Development Company
Little Treasure and Adjust Mines
Pinal County, Arizona
Contract 2231

Gentlemen:

We have not received an Operator's Final Report of the work completed under the contract cited above, although Mr. Hanson has informed us that we may expect it in the near future.

In the meantime, to facilitate the closing of our records, including final settlement of the $200.00 withheld pending receipt of the final report, will you please send us a written request to terminate the contract and your conclusions on the feasibility of doing additional exploratory work on the property under this contract.

Sincerely yours,

FRANK E. JOHNSON

Frank E. Johnson
Chief, Office of
Minerals Exploration

cc: Director's Reading File
Economic Geology File
OME docket
OME Reading File
OME Region III
Mr. Smith

RMSmith/gla 5-16-68

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MAY 6 1968

AIRMAIL

Memorandum

To: Field Officer, Region III

From: Chief, Office of Minerals Exploration

Subject: OME-6548 (Silver)
Big Treasure Mining and Development Company
Little Treasure and Adjust Mines
Pinal County, Arizona
Contract 2231

Enclosed are the Field Office's and Operator's copies of a Report of Review issued in April 1968 on the subject contract.

If you concur in the facts as stated in this report, one copy should be sent to the Operator with any comments you may care to make, and the other copy retained for your files. As evidence of your concurrence, two copies of your letter transmitting the Operator's copy of the report should be furnished this office. If for any reason you do not concur, both copies of the report should be returned to this office with appropriate comments.

The $200.00 withheld from payment to the Operator will be authorized for payment upon receipt of an acceptable final report from the Operator.

FRANK E. JOHNSON

Frank E. Johnson

Enclosures

cc: Director's Reading File
Division File
Economic Geology File
OME docket
OME Reading File
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Mr. Smith

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UNITED STATES
DEPARTMENT OF THE INTERIOR
OFFICE OF THE SECRETARY
WASHINGTON, D.C. 20240

APR 29 1968

Memorandum

To: Director, Geological Survey

From: Assistant Director, Contract and Grant Audit
Audit Operations, Office of Survey and Review

Subject: Review of Contract 2231
Docket No. OME-6548 (Silver)
Big Treasure Mining and Development Company (Operator)
Little Treasure and Adjust Mines
Pinal County, Arizona

Pursuant to a request dated November 16, 1967, from the Chief, Office of Minerals Exploration (OME), we have made a cost review of Contract 2231, examining the contract and accounting records and files of OME and the Branch of Budget and Finance, Administrative Division, Geological Survey. Four copies of the report of review are enclosed.

W A Wilkerson, Jr.
For Donald R. Moysey

Enclosures

RECEIVED
U. S. GEOLOGICAL SURVEY
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OFFICE OF THE DIRECTOR

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

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January 18, 1968

Memorandum

To: Chief, Office of Minerals Exploration

From: Field Officer, Region III

Subject: OME-6548 (Silver)
Big Treasure Mining & Development Company
Little Treasure and Adjust Mines
Pinal County, Arizona
Contract 2231

The operator, in a letter dated October 7, 1967 accompanying his Operator's Monthly Voucher and Progress Report for September, requested that Drill Hole No. 3, which was terminated at a total depth of 1,857 feet due to drilling difficulties, be deepened sufficiently to intersect the Naco limestone, the original objective of Drill Hole No. 3.

Recent geologic study by Mr. Thomas S. Sterrett, Mr. Donald H. Jardine and the Company Geologist indicates that the Naco limestone may be penetrated at approximately 2,760 feet or at an additional depth of 900 feet below the bottom of drill hole No. 3.

The Naco limestone had not yet been penetrated at a depth of 1857 feet, after having drilled through a thick succession of andesite flows, flow breccia, andesite quartz porphyry, and alternating andesite, and conglomerate containing quartzite fragments and granite. There was no evidence at a depth of 1857 feet that the Naco limestone might be penetrated within the next few hundred feet. Mineralization consisted largely of disseminated pyrite and occasionally chalcopyrite. Samples from the most promising looking material assayed as high as 0.16 percent copper, 0.01 oz. gold and 0.10 oz. silver per ton, however, most samples showed only a trace of gold and silver.

Drilling difficulties were encountered and it also appeared that the Naco limestone would not be penetrated without considerable additional cost. Consequently, it was deemed advisable to terminate

1857

drill hole No. 3 at that depth of 1875 feet.

Downward in drill hole No. 3 andesite and microdiorite were penetrated from 5 feet to 120 feet; quartzite conglomerate from 120 to 130 feet; a series of alternating bands of sandstone and sandy shale from 132 to 226 feet; and a series of dacite porphyry, microdiorite, and andesite flows from 226 to 623 feet. There were some sulfides present in the interval 150 feet to 243 feet, and in the interval 263 feet to 310 feet sulfides amounted to as much as 70 percent. Some marcasite and calcite were present in the sulfide intervals.

A veinlet at 470' contained some pyrite, galena and calcite. Assays showed 0.02 oz. Au, 0.20 oz. Ag, and 0.13% Cu.

A series of alternating andesites and andesite flow breccia were penetrated from 470 feet to 1500 feet. They contained sparse sulfide and occasional calcite veinlets with pyrite that showed largely traces of gold and silver. A vein zone at 1,040 feet assayed 0.04 oz. Au, and 0.60 oz. Ag. An altered andesitic zone between 1,554 and 1,584 feet contained abundant scattered sulfides, largely pyrite that showed from a trace of Au and Ag to as much as 0.16 percent copper. Between 1,600 and 1,857 feet a series of interbedded andesite flow breccias, quartzite and granite conglomerates were penetrated without having drilled into the Naco limestone.

A consultation with Ronald Wilden, Geologist, U. S. Geological Survey indicates there is a repeated sequence of interbedded andesites, flow breccias and quartzite conglomerates for some distance above the Naco limestone and that the likelihood of penetrating the Naco limestone within the next few hundred feet was not likely. It is deemed inadvisable at this time to relocate on Diamond Drill Hole No. 3 and attempt to deepen the hole in an effort to penetrate the Naco limestone, unless there is a better than average chance of finding an ore body in that localized area. It was at first thought that the leakage of sulfide mineralization from the Naco limestone into the overlying volcanics might indicate significant mineralization at depth, but present drilling does not indicate this fact, especially in the light of diamond drilling that has been completed this far during the current exploration work.

Since no significant mineralized material was penetrated in the volcanic rocks and only minor quantities showed even in the interbedded sedimentary sequence, it appears as though the Naco limestone may not be mineralized as extensively as was previously supposed.

It is recommended that no further drilling be considered under the current contract, either by deepening DDH No. 3 or on proposed drilling in any of the other areas that have been explored under the contract.

The Operator's representative, Mr. Spenst Hansen, called this office on December 21, 1967 and asked about the completion and submittal of a final report. He indicated to Mrs. Clark, who took the phone call, that the Operator had exhausted all the possibilities for exploration on the subject property and wishes to terminate the work.

The final geologic and engineering report has not yet been submitted to this office as of the date of this memorandum.

William L. Emerick

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

To legal 11/13/67

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EXPLORATION CONTRACT
BIG TREASURE MINING AND DEVELOPMENT CO.
OME-6548

AMENDMENT NO. 4

It is agreed this 9th day of November, 1967, between the United States of America, acting through the Department of the Interior, U. S. Geological Survey, hereinafter called the "Government," and Big Treasure Mining and Development Co., hereinafter called the "Operator," that Exploration Contract 2231 (OME-6548), dated October 12, 1966, as amended, is further amended effective March 1, 1967, as follows:

1. The time fixed by Amendment No. 3 to the Contract Article 1 of the contract for completion of the work is extended from 13 to 14 months, or until December 12, 1967.

2. In Exhibit A;

(a) Under the heading Description of the Work, Stage II, the paragraph is revised to read as follows:

The work shall consist of preparing access roads and drill sites as necessary and drilling a maximum of 5,000 feet in approximately seven (7) holes. One vertical hole may be drilled approximately 1,800 feet deep at Site 3 approximately as shown on Figure 1 to explore the Naco limestone for replacement ore bodies near the Dear Creek fault. Other holes may be drilled to further explore mineralized zones indicated by the preceding holes in Stages I and II.

This amendment shall not be construed to change the estimated total cost of the contract, the aggregate amount which the Government may be required to contribute, nor the fixed unit costs of any item of work.

Executed in quadruplicate the day and year first above written.

THE UNITED STATES OF AMERICA

By_____
Chief, Office of Mineral Exploration
U. S. Geological Survey

BIG TREASURE MINING AND DEVELOPMENT CO.

By_____

Title:_____

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 15, 1967

OFFICIAL COPY

Memorandum

To: Chief, Office of Minerals Exploration

From: Field Officer, Region III

Subject: OME-6548 (Silver)
Big Treasure Mining and Development Company
Little Treasure and Adjust Mines
Pinal County, Arizona
Contract 2231

Transmitted herewith are the Government's copy and Budget and Finance's copy of Amendment No. 4 on the subject contract which have been signed on behalf of the Government and by the Operator.

J. William Hasler

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

Enclosures

Office of Minerals Exploration
Building 53 Room 203

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December 1, 1967

Mr. Spenst M. Hansen, Ph. D.
Mining Geologist
125 Sedgefield Court
Dublin, California 94539

Subject: OME-6548 (Silver)
Big Treasure Mining and Development
Little Treasure-Adjust Mines
Pinal County, Arizona
Contract 2231

Dear Mr. Hansen:

While reviewing your last voucher and your overall program it was brough to my attention that Diamond Drill Hole No. 3 under Stage II was to have been drilled to a maximum of 1500 feet, but was drilled to a total depth of 1857 feet to test for further possible mineralization that may have extended below the 1500 feet scattered mineralization, as well as to find the Naco limestone at depth. Amendment No. 4, enclosed, will allow government participation of 75 percent for the cost of Diamond Drill Hole No. 3.

Enclosed are the original and three copies of proposed Amendment No. 4 (one page), to the subject contract, signed for the Government.

If the proposed amendment is satisfactory to you, all four copies should be signed by a duly authorized representative and return three copies. Please retain the "Operator's Copy".

If any part of the proposed amendment does not have your approval, the original and all copies should be returned to this office together with the proposed changes for consideration.

Sincerely yours,

J. William Hasler

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

Enclosures cc: Chief, OME / Hasler chron OME chron OME-6548

Extra copy

EXPLORATION CONTRACT
BIG TREASURE MINING AND DEVELOPMENT CO.
CMR-6548

AMENDMENT NO. 4

It is agreed this 9th day of November, 1967, between the United States of America, acting through the Department of the Interior, U. S. Geological Survey, hereinafter called the "Government," and Big Treasure Mining and Development Co., hereinafter called the "Operator," that Exploration Contract 2231 (CMR-6548), dated October 12, 1966, as amended, is further amended effective March 1, 1967, as follows:

1. The time fixed by Amendment No. 3 to the Contract for completion of the work is extended from 13 to 14 months, or until December 12, 1967.

2. In Exhibit A:

(a) Under the heading Description of the Work, Stage II, the paragraph is revised to read as follows:

The work shall consist of preparing access roads and drill sites as necessary and drilling a maximum of 5,000 feet in approximately seven (7) holes. One vertical hole may be drilled approximately 1,800 feet deep at Site 3 approximately as shown on Figure 1 to explore the Naco limestone for replacement ore bodies near the Bear Creek fault. Other holes may be drilled to further explore mineralized zones indicated by the preceding holes in Stages I and II.

This amendment shall not be construed to change the estimated total cost of the contract, the aggregate amount which the Government may be required to contribute, nor the fixed unit costs of any item of work.

Executed in quadruplicate the day and year first above written.

THE UNITED STATES OF AMERICA

By FRANK E. JOHNSON (Ph)
Chief, Office of Minerals Exploration
U. S. Geological Survey

BIG TREASURE MINING AND DEVELOPMENT CO.

By _____

Title _____

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**AIRMAIL**

**Memorandum**

**To:** Field Officer, Region III

**From:** Chief, Office of Minerals Exploration

**Subject:** OME-6548 (Silver)
Big Treasure Mining and Development Company
Little Treasure and Adjust Mines
Pinal County, Arizona
Contract No. 2231

Enclosed are the original and three copies of proposed Amendment No. 4 (one page), to the subject contract, signed for the Government. An extra copy of the amendment is also enclosed for field use.

If the proposed amendment is satisfactory to you and the Operator, all four copies should be signed by a duly authorized representative of the Operator and distributed in the usual manner.

If any part of the proposed amendment does not have your approval or that of the Operator, the original and all copies are to be returned to this office together with the proposed changes for consideration.

FRANK E. JOHNSON

Frank E. Johnson

Enclosures

cc: Director's Reading File
Division File
Economic Geology File
OME Docket
OME Reading File
Mr. Smith
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Office of Minerals Exploration

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Mr. Spenst M. Hansen
Big Treasure Mining and Development Company
125 Sedgefield Court
San Ramon, California 94583

Subject: OME-6548 (Silver)
Big Treasure Mining and Development Company
Little Treasure and Adjust Mines
Pinal County, Arizona
Contract 2231

Dear Mr. Hansen:

We are returning your September voucher which was received in this morning's mail. We cannot process it in such an unassembled manner. Will you please separate, assemble, staple and return the original and four copies to us for processing.

Sincerely yours,

J. William Hasler

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

Enclosures

cc: Chief, OME
Hasler chron
OME chron
2231

IN REPLY REFER TO:

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

August 29, 1967

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Memorandum

To: Chief, OME

From: Field Officer, Region III

Subject: OME-6548 (Silver)
Big Treasure Mining and Development Company
Little Treasure and Adjust Mines
Pinal County, Arizona
Contract 2231

Transmitted herewith are the Government's copy and the Budget and Finance's copy of *Amendment No. 3 on the above-stated contract which have been signed by the applicant and for the Government.

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

* left side of folder

Office of Minerals Exploration

August 23, 1967

Mr. Spenst M. Hansen
Big Treasure Mining and Development Company
125 Sedgefield Court
Dublin, California 94339

Subject: OME-6548 (Silver)
Big Treasure Mining and Development Company
Little Treasure-Adjust Mines
Pinal County, Arizona
Contract 2231

Dear Mr. Hansen:

Enclosed are the original and three copies of proposed Amendment No. 3 (two pages) and one map, Figure 2, to the subject contract, signed for the Government.

If the proposed amendment is satisfactory, all four copies should be signed by a duly authorized representative of the Operator, then please retain the "Operator's Copy" and return the other copies to this office.

If any part of the proposed amendment does not have your approval, the original and all copies are to be returned to this office together with the proposed changes for consideration.

Sincerely yours,

J. William Hasler

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

Enclosures

cc: Chief, OME
OME chron
Hasler chron
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**AIRMAIL**

**Memorandum**

**To:** Field Officer, Region III

**From:** Chief, Office of Minerals Exploration

**Subject:** OME-6548 (Silver)
Big Treasure Mining and Development Company
Little Treasure and Adjust Mines
Pinal County, Arizona
Contract 2231

Enclosed are the original and three copies of proposed Amendment No. 3 (two pages) and one map, Figure 2, to the subject contract, signed for the Government. An extra copy of the amendment is also enclosed for field use.

If the proposed amendment is satisfactory to you and the Operator, all four copies should be signed by a duly authorized representative of the Operator and distributed in the usual manner.

If any part of the proposed amendment does not have your approval or that of the Operator, the original and all copies are to be returned to this office together with the proposed changes for consideration.

FRANK E. JOHNSON

Frank E. Johnson

Enclosures

cc: Director's Reading File
Division File
Economic Geology File
OME Docket
OME Reading File
Mr. Smith
130

GLAult/a 8-17-67

23263

IN REPLY REFER TO:

See folder #2

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

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AUG 4 1967

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August 3, 1967

Memorandum

To: Chief, OME

From: Field Officer, Region III

Subject: OME-6548 (Silver)
Big Treasure Mining and Development Company
Little Treasure and Adjust Mines
Pinal County, Arizona
Contract 2231

The operator, in his narrative report accompanying the Operator's Monthly Voucher, MME Form 60, and the Operator's Monthly Report, MME Form 61, for the month of June, 1967 requested that an amendment be executed to allow for certain items to be included in the subject contract that are required to drill diamond drill holes Nos. 7A and 7B from an underground station in the Adjust Tunnel level, in lieu of surface drilling.

The operator also requested that an additional estimated 3-1/2 months expenditures be allowed for supervisor-geologist-engineer; outside consultant; 4-wheel drive vehicle, and accounting expenses. The operator estimates that 3-1/2 months is adequate time in which to complete drill holes 7A and 7B and it is requested that the expiration date of work to be completed be extended until October 31, 1967.

The operator requests the following items and costs:

| Cat. | | | |
|---|---|---|---|
| 2 | 1. | Supervisor-geologist-engineer 3-1/2 months at $900./mo | $3,150.00 |
| 4 | 2. | 4-wheel drive vehicle 3-1/2 momths at $304.00/mo. | 1,064.00 |
| 7 | 3. | Accounting and office expense 3-1/2 mo. at $40./mo. | 140.00 |
| 2 | 4. | Outside Consultant : | |
| | | 12 days at $75.00 per day | 900.00 |
| | | 12 days per diem at $16.00 per day | 192.00 |

| | | | |
|---|---|---|---|
| 5. | Compressor rental 3 months at $700.00/mo. | $2,100.00 | |
| | Transportation to compressor ? | 200.00 | |
| | Diesel fuel and oil | 633.60 | |
| | Lubrication and compressor oil | 249.60 | |
| | 700 ft. air line at $10.80/ft. | 226.80 | 3183.20 |
| | 700 water line at $5.40/ft. | 113.40 | |
| | Mobilization for air and water line ? | 200.00 | |
| | Installation of air and water lines ? | 460.00 | 1000.20 |

Total estimated cost---------- $9,629.40

Data from the operators most recent maps show the Silver King Vein to have an average width of about 3 feet and a gross value in gold and silver of about $3.30. The sampling was of course taken along the vein in areas that have been mined out and the major values are now gone. The Silver King Vein is exposed and has been sampled some 250 feet above the Adjust Tunnel level, and even though assaying the remaining material along the vein does not appear encouraging it is advisable to explore the Silver King Vein at a depth of 250 feet below the Adjust Tunnel level by drilling holes 7A and 7B referred to in Amendment No. 1 of the subject contract. The Operator's costs do not appear out of line for the amount of work to be completed under the present circumstances, it is therefore recommended that the contract be amended to include the requested costs as well as to extend the date of expiration of work to October 31, 1967.

J. William Hasler

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

IN REPLY REFER TO:

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

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JUN 19 1967

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| RMS | 120 |
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June 16, 1967

Memorandum

To: Chief, OME

From: Field Officer, Region III

Subject: OME-6548 (Silver)
Big Treasure Mining and Development Company
Little Treasure and Adjust Mines
Pinal County, Arizona
Contract 2231

The operator, in a letter dated June 11, 1967, accompanying the monthly operator's voucher and monthly operator's progress report for the month of May reviews the drilling to date, and at the same time indicates that the original estimate of time required to complete the project was inadequate, and therefore ~~are~~ is requesting an amendment to extend completion date of the contract from October 12, 1967 for a period of six months to April 12, 1968. It is also evident that the 8 months provided for a supervisor geologist-engineer will not be adequate to provide supervision if the contract is extended an additional six months and it is requested the operator be permitted to retain the services of (1) Supervisor-Geologist-Engineer; (2) Rental for a 4-wheel vehicle and mileage (1200 miles a month) for this six-month period; (3) Accounting and office expense of $40.00 a month for the additional six months; and (4) an extension of the authorization for an outside consultant for the same period of time.

Why? Revised to Nov. 12 1967.

See May report

The operator understands this proposed amendment will not change the total cost of the contract nor the aggregate amount which the government will contribute.

It is recommended that funds be allowed to cover the above-mentioned costs for the additional period of time.

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

6/26/67 F.O. to furnish justification.
7/5/67 Defer action

Office of Minerals Exploration

March 24, 1967

Mr. David H. Kimball, President
Big Treasure Mining and Development Company
125 Sedgefield
San Ramon, California 94583

Subject: OME-6548 (Silver)
Big Treasure and Adjust
Pinal County, Arizona
Contract 2231

Dear Mr. Kimball:

We are holding your MME Form 60, Operator's Monthly Voucher, and MME Form 61 Operator's Progress Report, the accompanying narrative and the substantiating statements for payment on the voucher for the month of February, 1967.

The vouchers cannot be processed until the descriptive logs and graphical summaries of the cores, sketch maps and cross sections showing the locations of samples taken for assay have arrived. You stated that you were forwarding the information under separate cover.

In reply to your request that you have thus far been unable to determine the method for submitting assay data and analysis for reimbursement, we would recommend the following: The normal method for obtaining reimbursement for analytical work is to submit two copies of statements for the analytical work received by you from the assay company, and also include copies of their results of the assay data in the same method that you have used, relative to the Boyles Diamond Drilling Company in submitting their statements of costs for work for the month. The bills concerning the work should be sufficient to claim the amount of costs for the assay work as allowed in the subject contract.

You have submitted only an original and two letters of the voucher forms for the month of February. I might cite for your instructions on the reverse side of MME Form 60, the Operator's Monthly Voucher "The operator submits the original and four copies of each of the three sections of this report to the OME Regional Executive Officer at the end of each month during the life of the contract." Your conformance with these instructions will considerably facilitate the processing of your vouchers.

Sincerely yours,

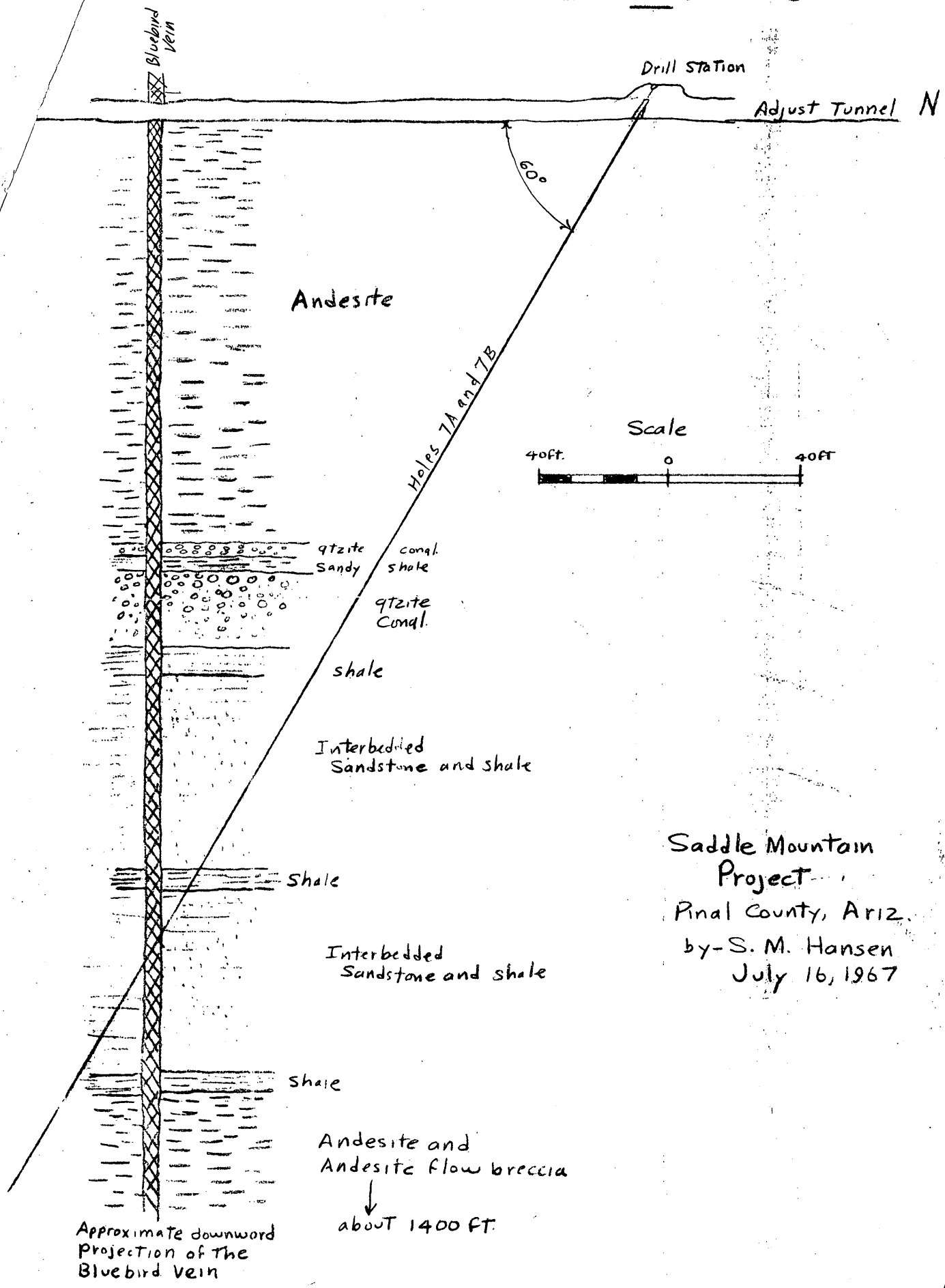
J. William Hasler

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

cc: Chief, OME ✓
Hasler chron
OME chron
2231

Figure 2

# Generalized Cross Section of Drill Holes 7A and 7B.




Saddle Mountain Project
Pinal County, Ariz.
by-S. M. Hansen
July 16, 1967

Office of Minerals Exploration

March 17, 1967

Mr. Spenst M. Hansen
Big Treasure Mining and Development Company
125 Sedgefield Court
Dublin, California 94539

Re: OME-6548 (Silver)
Big Treasure Mining and Development Company
Little Treasure and Adjust Mines
Pinal County, Arizona
Contract 2251

Dear Mr. Hansen:

This letter is to acknowledge receipt of the executed Amendment No. 2 under the current contract, executed by the Big Treasure Mining and Development Company.

The execution of Amendment No. 2 will now enable you to reclaim suspension of certain costs claimed in your January and December vouchers. In the preparation of your voucher for February 1967, you may now claim for 657 feet of NXM diamond drilling in the category 0 - 500 feet, at $6.40 a foot for a total of $4,204.80, plus a $.20 error in calculation monthly total column, making $4,205.00. From your January voucher you may claim 975 feet at $6.40 amounting to $6,240.00. Thus, the total amount of NXM drilling in the category 0-500 feet which you may reclaim for suspensions in January and December ($4,205.00 + $6,240.00) will be $10,445.00 as shown on the attached administrative suspension statements sent to us from Washington.

This letter may also serve as a written approval for you to progress with State II drilling provided under the contract. Verbal approval was given you on February 20, 1967. Pursuant to your request for permission to begin diamond drill hole No. 3 prior to the completion of Stage I drilling the information obtained from diamond drill hole No. 1 showed that significantly mineralized material had penetrated between 671 and 678 feet. It was concluded that drill hole No. 1 penetrated a high enough grade material at depths between 671 and 678, and 719 to 724 feet to indicate that there had been some leakage of mineralized solutions from

the underlying Naco limestone into the overlying andesitic rocks and that there is a possibility of penetrating mineralized material by intersecting veins to the northwest, as well as finding mineralized material at depth in the Naco limestone. Diamond drill hole No. 3 was designed to explore along the trend of both sets of mineralized vein structures and to provide valuable information regarding the mineralized material at depth.

Sincerely yours,

J. William Hasler

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

JWHasler/mc/3/17/67
cc: Chief, OME
Hasler chron
OME chron
2231

IN REPLY REFER TO:

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

March 17, 1967

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MAR 20 1967
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Memorandum

To: Chief, OME

From: Field Officer, Region III

Subject: OME-6548 (Silver)
Big Treasure Mining and Development Company
Little Treasure and Adjust Mines
Pinal County, Arizona
Contract No. 2231

Transmitted herewith are the Government's Copy and Budget and Finance's Copy of Amendment No. 2, signed in behalf of the Government and the operator, on the above-mentioned contract.

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

Enclosures

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COPY
O. M. E.
RECEIVED
MAR 9 1967
INITIALS | CODE
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120 S

Office of Minerals Exploration

March 7, 1967

Mr. Spenst M. Hansen, Ph. D.
Big Treasure Mining and Development Company
125 Sedgefield Court
Dublin, California 94539

Subject: OME-6548 (Silver)
Big Treasure Mining and Development Company
Little Treasure and Adjust Mines
Pinal County, Arizona
Contract 2231

Dear Mr. Hansen:

Enclosed are the original and three copies of proposed Amendment No. 2 (one page) to the subject contract, signed for the Government.

If the proposed amendment is satisfactory to you, all four copies should be signed by an authorized representative of the company and returned to this office.

If any part of the proposed amendment does not have your approval the original and all copies are to be returned to this office together with the proposed changes for consideration.

Sincerely yours,

J. William Hasler

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

Enclosures

cc: Chief, OME
Hasler chron
OME chron
2231

OFFICIAL FILE COPY

| Date | Surname | Code |
|---|---|---|
| 2/28 | RM Smith | |
| 3/1/67 | Kirkham | |
| " | Johnson | |
| | Bonner | |
| 3/2 | Kilsgaard | |
| 3/3 | [illegible] | |
| 3/6 | [illegible] | 210 |
| | | 130 M |
| | | |

**AIRMAIL**

Memorandum

To: Field Officer, Region III

From: Chief, Office of Minerals Exploration

Subject: OMX-6548 (Silver)
Big Treasure Mining and Development Co.
Little Treasure and Adjust Mines
Final County, Arizona
Contract 2231

Enclosed are the original and three copies of proposed Amendment No. 2 (one page) to the subject contract, signed for the Government. An extra copy of the amendment is also enclosed for field use.

If the proposed amendment is satisfactory to you and the Operator, all four copies should be signed by an authorized representative of the Operator and distributed in the usual manner.

If any part of the proposed amendment does not have your approval or that of the Operator, the original and all copies are to be returned to this office together with the proposed changes for consideration.

FRANK E. JOHNSON

Frank E. Johnson

Enclosures

cc: Director's Reading File
Division File
Econ. Geol. Reading File
OME Reading
✓OME Docket
K 130

MMerrithew/mm (2/28/67)

23263

IN REPLY REFER TO:

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

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O. M. E.
RECEIVED
MAR 2 1967
INITIALS

February 28, 1967

Memorandum

To: Chief, OME

From: Field Officer, Region III

Subject: OME-6548 (Silver)
Big Treasure and Development Company
Little Treasure and Adjust Mines
Pinal County, Arizona
Contract 2231

In a letter dated February ~~26~~ 6, 1967, the operator requested an amendment to the subject contract to include the BXWL core drilling in the category from 0 - 100 feet, at a bid cost of $6.40 per foot. The bid price had been included in their original application from Boyles Drilling Company, but was inadvertently deleted from the contract. Amendment 1 now being signed 3/2/67

During December 1966 the operator drilled a total of 657 feet of BXWL core drilling from 0 - 500 feet, and billed the Government at the price of $6.40 per foot for a total of $4,204.80. During January 1967 the operator drilled a total of 975 feet of BXWL from 0 - 500 feet at $6.40 per foot, the cost was $6,240.00.

The drilling company found it necessary to reduce the hole size within the 0 - 500 foot category and since the bid price had been originally submitted by the applicant it recommended that an amendment be prepared to include the BXWL core drilling in the category from 0 - 500 foot depth at a quoted bid price of $6.40. This will allow the operator to reclaim the amount expended for drilling in this category during January, 1967 and December, 1966.

In the same letter the operator requested an additional category to provide for AX drilling at an estimated cost of $5.90 a foot. However, during a subsequent telephone conversation with the applicant, he requested that this amendment not be executed at this time. They will perhaps request AX footage at a later date if it becomes necessary to reduce the hole to this size.

The operator requests permission to begin diamond drill hole No. 3 prior to completion of the Stage I drilling since drill hole Nos. 1, 2, 4 and 5 have now been completed and that drill hole No. 6 is essentially completed.

Diamond drill hole No. 1 penetrated significantly mineralized material between the following intervals:

| Sample No. Hole No. | Interval in feet | Au oz. | Ag oz. |
|---|---|---|---|
| SM-1-32 | 555 - 558 | Tr. | 0.10 |
| SM-1-33 | 558 - 561 | 0.06 | 1.35 |
| SM-1-34 | 561 - 564 | 0.01 | .20 |
| SM-1-35 | 564 - 569 | Tr. | Tr. |
| SM-1-36 | 671 - 678 | 0.07 | 6.35 |
| SM-1-37 | 721 - 722 | 0.18 | 15.80 |
| SM-1-38 | 719 - 721 | 0.09 | 9.50 |
| SM-1-39 | 722 - 724 | Tr. | 0.10 |

Mineralization in the andesite porphyry between 555 - 564 feet consisted of occasional narrow calcite veinlets, abundant disseminated pyrite, and some indication of fine grained sulphide. Between 671 - 678 no particular mineralized material was noted in the log, but an assay of apparently mineralized material of 6.35 oz. Ag. per ton was obtained. Between 721 - 724 feet the gray to dark gray andesite porphyry is heavily pyritized, and between 721 - 722 feet a 1-foot interval consisted of calcite stringers included fragments of galena as much as 1/2 inch across. This interval assayed 0.18 oz. Au. and 15. 80 oz. Ag. per ton.

It is concluded that drill hole No. 1 penetrated high enough grade material at depths between 671 - 678 feet and 719 - 724 feet to indicate that there had been some leakage of mineralized solutions from the underlying Naco limestone into the overlying andesitic rocks and that there is a possibility of penetrating mineralized material by intersecting veins to the northwest as well as finding mineralized material at depth in the Naco limestone. Hole No. 3 was designed to explore along the trendof both sets of mineralized vein structures and should provide valuable information regarding mineralized material at depth.

thru

replacement in limestone

It is therefore recommended that written approval be given by the Government for the operator to proceed immediately with drill hole No. 3, under Stage II of the subject contract. The operator has been given tentative approval by telephone, but is to contact the Field Officer, before proceeding with drill hole No. 3, for formal approval to proceed with Stage II drilling.

Stage II justified by favorable results in hole 1

J. William Hasler

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

APPENDIX C

Request for Contract Amendments

February 6, 1967

(1) We request that the figure Six Dollars and Forty Cents ($6.40) be inserted in the contract on Page 3 of Exhibit A as the price for BX wireline drilling between 0 and 500 feet. This figure was included in the original bid obtained from Boyles Brothers Drilling Company but was omitted from the OME contract. In the case of every hole drilled thus far, it has proved desirable, and in some cases essential, to reduce the hole size to BX wireline at depths less than 500 feet. The characteristics of the drilling equipment used by Boyles Brothers on this job permit BX hole to be drilled for considerable distances without the need for hole reduction. In the event NX hole had been drilled to 500 feet and BX thereafter, it would have been necessary to case the upper 500 feet of hole with BX casing before BX hole could be continued below that point. The characteristics of the ground are such that casing can be recovered only with difficulty and such a course of action would have caused considerable additional expense from: (a) The higher cost of drilling the NX hole to 500 feet as compared to BX; (b) The cost of casing the hole to 500 feet; (c) The cost of recovering the casing; (d) The cost of losing considerable sections of casing. On Page 1 of Exhibit A under General Provisions, the statement is made that "all drill holes shall be completed not less than BX wireline size" which led us to believe that we had the option of reducing to BX size (but not smaller) at our option, and where conditions justified such reduction. No difficulty, whatever, has been encountered thus far in completing all of the holes BX wireline in size. Core recovery has been virtually 100% throughout all of the drilling completed thus far.

Last week he asked that this NOT be included, so Am. I prepared without it.

We would also like to have one additional category included, that of AX minimum size in the event we encounter exceptionally unfavorable drilling conditions. We do not anticipate that any AX drilling whatever will be required, but it seems desirable to us to have the provision in the contract that if we should encounter exceptional drilling difficulty we can reduce to AX size with oral approval from the OME field officer. The price of AX drilling deeper than 500 feet should be listed at Five Dollars and Ninety Cents, ($5.90) per foot. Requires new bid

(2) Request for authorization to begin drill hole No. 3 prior to the completion of stage one. At the present time, drill holes 1, 2, 4, and 5 have been completed and No. 6 is about one-half completed. Following hole No. 6, all that remains in stage one are holes 7a and 7b. Consistent with the amendment approved, January 12, 1967, we are proceeding with efforts to re-locate holes 7a and 7b in the Silver King drift to intersect the Bluebird vein. We have encountered some delays in the availability of equipment to both complete the construction of the drill station underground, and for the drilling itself. We feel confidant that the drilling of these holes underground can be commenced within about thirty days providing present equipment availability schedules can be met. However, in the meantime we would like to be engaged in drilling hole No. 3.

The drill holes to date have provided us with considerable additional information on the sub-surface geology of the premises. Drill hole No. 1 has encountered significant silver mineralization in the vicinity of 700 feet. An unexpectedly high degree of iron pyrite mineralization was noted almost throughout the entire depth of drill hole No. 5 and galena was encountered at several places. Drill holes No. 4 and No. 2 have apparently (subject to more complete evaluation of the core and assay data from No. 2) failed to encounter expected levels of mineralization. The explanation for part of this may have been the fact that hole No. 2 was shortened 400 feet and hole No. 4 was shortened 300 feet over the hole length originally requested. A sub-surface marker bed consisting of a cobble conglomerate unit about thirty feet thick has been recognized at the surface at the western edge of the premises and also has been encountered in drill holes 1, 2 and 4. This

same cobble conglomerate is also recognized about one and one-half miles to the west apparently lying stratigraphically only a few hundred feet above the lower limestone contact. We thus have now obtained increased sub-surface stratigraphic control, and have a more solid foundation for our earlier estimation of the thickness of the volcanic rocks overlying the limestone of the Naco formation. The characteristics of other ore deposits in the Banner and Saddle Mountain mining districts show a pattern of occurrence of metasomatic replacement deposits in the limestone units of Paleozoic age, e.g. Seventy Nine mine, Christmas mine. The exploration for replacement deposits of primary silver ore in the vicinity of the Deer Creek fault near the Bluebird and related vein systems is the primary purpose of drill hole no. 3. (See pages 40 and 41 of U.S.G.S. Bulletin 771 by Clyde P. Ross.)

If approval for the drilling of this hole is not obtained at the time of completion of hole no. 6, we risk the transfer by Boyles Brothers (the drilling contractor) of both crew and equipment to other drilling projects. Heavy current demand for exploratory drilling by others in Arizona may result in serious delays before arrangements can be made later to resume surface drilling on this project.

David H. Kimball

DAVID H. KIMBALL, PRESIDENT
BIG TREASURE MINING AND DEVELOPMENT CO.

MME FORM 6
REV. 2

REFERENCE SLIP
OFFICE OF MINERALS EXPLORATION

| TO: | DATE | INITIALS |
|---|---|---|
| 1. ~~Assoc. Solicitor Room 6042~~ | | |
| 2. Mr. Johnson - Rm. 4450 OME | | |
| 3. | | |
| 4. | | |
| 5. | | |
| FROM: | | |

FOR: Check items for action desired

| | | |
|---|---|---|
| ___ Action | ___ Reply for signature of ___ | |
| ___ Approval | ___ Investigate | |
| ___ Comment | ___ Recommendations | ___ Surname |
| ___ Conference | ___ Rewrite | ___ Signature |
| ___ Instructions | ___ Your information | ___ File |

REMARKS:

3192

FROM SOLICITOR I-66-2098-11.

2-27-67

INTERIOR DEPT.
FEB 23 1967
SOLICITOR

FOR SIGNATURE

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

M56300-62

To Legal 2/21

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DRAFT 2/21/67
RMSmith/gla

EXPLORATION CONTRACT
BIG TREASURE MINING AND DEVELOPMENT CO.
OME-6548

AMENDMENT NO. 2

It is agreed this _____ day of _____, 1967, between the United States of America, acting through the Department of the Interior, U. S. Geological Survey, hereinafter called the "Government," and Big Treasure Mining and Development Co., hereinafter called the "Operator," that Exploration Contract 2231 (OME-6548), dated October 12, 1966, as amended, is further amended effective the date of the contract as follows:

In Exhibit A,

Under Estimated Costs of the Work, Stage I, Actual Costs, Category (1) Independent Contracts, the third item is revised to read as follows:

Core drilling, 5,000 feet 35,221.00

| Depth, ft. | NC | NXWL | BXWL |
|---|---|---|---|
| 0- 500 | $7.60 | $6.90 | $6.40 |
| 500-1,000 | | 7.60 | 6.90 |
| 1,000-1,500 | | | 7.60 |

This amendment shall not be construed to change the estimated total cost of the contract, the aggregate amount which the Government may be required to contribute, nor the amount of any item designated as maximum.

Executed in quadruplicate the day and year first above written.

THE UNITED STATES OF AMERICA

By_____
Chief, Office of Minerals Exploration
U. S. Geological Survey

BIG TREASURE MINING AND DEVELOPMENT CO.

By_____

Title_____

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O. M. E.
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Office of Minerals Exploration

February 10, 1967

Mr. David E. Kimball
President, Big Treasure Mining and Development Company
125 Sedgefield Court
Dublin, California 94539

Subject: OME-6348 (Silver)
Big Treasure Mining and Development Company
Little Treasure and Adjust Mines
Pinal County, Arizona
Contract 2231

Dear Mr. Kimball:

Your certified airmail letter No. 985751 arrived in this afternoon's mail.

There were four copies of your MME Form 60, four copies of the MME Form 61, two copies of the narrative report and two copies of the substantiating documents. Please note on the reverse of MME Form 61--we need the original and three copies of the MME Form 61, MME Form 60, narrative report and the substantiating documents. These should be made out on the forms we sent you as certification by a Government representative as well as approval by an OME Executive Officer or alternate is required, as well as their title and date.

Additional forms are enclosed for your convenience, if you require more please let us know.

Two sets of your Appendix A, B, and C were also received for the proposed amendment. One copy is being forwarded to Washington, D. C. tonight. You will be hearing from either the Region III OME field office or the Washington office in the near future.

Sincerely yours,

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

cc; Chief, OME
Hasler chron
OME chron
2231

cc; Spenst M. Hansen

UNITED STATES
DEPARTMENT OF THE INTERIOR
OFFICE OF MINERALS EXPLORATION
Denver Federal Center-Building 25- Room 2284
Denver, Colorado 80225

February 10, 1967

OFFICIAL
COPY
O. M. E.
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FEB 13 1967
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Memorandum

To: Chief, OME

From: Field Officer, Region III

Subject: OME-6548 (Silver)
Big Treasure Mining and Development Company
Little Treasure and Adjust Mines
Pinal County, Arizona
Contract 2231

Transmitted herewith are the following documents pertaining to the above-mentioned subject:

Appendix A: Diamond Core Hole No. 1

Appendix B: Assay Results From Sampling

Appendix C: Request for Contract Amendments

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

Enclosures

OME-6548

APPENDIX C

Request for Contract Amendments

February 6, 1967

(1) We request that the figure Six Dollars and Forty Cents ($6.40) be inserted in the contract on Page 3 of Exhibit A as the price for BX wireline drilling between 0 and 500 feet. This figure was included in the original bid obtained from Boyles Brothers Drilling Company but was omitted from the OME contract. In the case of every hole drilled thus far, it has proved desirable, and in some cases essential, to reduce the hole size to BX wireline at depths less than 500 feet. The characteristics of the drilling equipment used by Boyles Brothers on this job permit BX hole to be drilled for considerable distances without the need for hole reduction. In the event NX hole had been drilled to 500 feet and BX thereafter, it would have been necessary to case the upper 500 feet of hole with BX casing before BX hole could be continued below that point. The characteristics of the ground are such that casing can be recovered only with difficulty and such a course of action would have caused considerable additional expense from: (a) The higher cost of drilling the NX hole to 500 feet as compared to BX; (b) The cost of casing the hole to 500 feet; (c) The cost of recovering the casing; (d) The cost of losing considerable sections of casing. On Page 1 of Exhibit A under General Provisions, the statement is made that "all drill holes shall be completed not less than BX wireline size" which led us to believe that we had the option of reducing to BX size (but not smaller) at our option, and where conditions justified such reduction. No difficulty, whatever, has been encountered thus far in completing all of the holes BX wireline in size. Core recovery has been virtually 100% throughout all of the drilling completed thus far.

you do

We would also like to have one additional category included, that of AX minimum size in the event we encounter exceptionally unfavorable drilling conditions. We do not anticipate that any AX drilling whatever will be required, but it seems desirable to us to have the provision in the contract that if we should encounter exceptional drilling difficulty we can reduce to AX size with oral approval from the OME field officer. The price of AX drilling deeper than 500 feet should be listed at Five Dollars and Ninety Cents, ($5.90) per foot. How much for below 1,000 feet

Bid required

(2) Request for authorization to begin drill hole No. 3 (Stage II) prior to the completion of stage one. At the present time, drill holes 1, 2, 4, and 5 have been completed and No. 6 is about one-half completed. Following hole No. 6, all that remains in stage one are holes 7a and 7b. Consistent with the amendment approved, January 12, 1967, we are proceeding with efforts to re-locate holes 7a and 7b in the Silver King drift to intersect the Bluebird vein. We have encountered some delays in the availability of equipment to both complete the construction of the drill station underground, and for the drilling itself. We feel confidant that the drilling of these holes underground can be commenced within about thirty days providing present equipment availability schedules can be met. However, in the meantime we would like to be engaged in drilling hole No. 3.

Needs justification by favorable results in stage I

The drill holes to date have provided us with considerable additional information on the sub-surface geology of the premises. Drill hole No. 1 has encountered significant silver mineralization in the vicinity of 700 feet. An unexpectedly high degree of iron pyrite mineralization was noted almost throughout the entire depth of drill hole No. 5 and galena was encountered at several places. Drill holes No. 4 and No. 2 have apparently (subject to more complete evaluation of the core and assay data from No. 2) failed to encounter expected levels of mineralization. The explanation for part of this may have been the fact that hole No. 2 was shortened 400 feet and hole No. 4 was shortened 300 feet over the hole length originally requested. A sub-surface marker bed consisting of a cobble conglomerate unit about thirty feet thick has been recognized at the surface at the western edge of the premises and also has been encountered in drill holes 1, 2 and 4. This

Marker bed

same cobble conglomerate is also recognized about one and one-half miles to the west apparently lying stratigraphically only a few hundred feet above the lower limestone contact. We thus have now obtained increased sub-surface stratigraphic control, and have a more solid foundation for our earlier estimation of the thickness of the volcanic rocks overlying the limestone of the Naco formation. The characteristics of other ore deposits in the Banner and Saddle Mountain mining districts show a pattern of occurrence of metasomatic replacement deposits in the limestone units of Paleozoic age, e.g. Seventy Nine mine, Christmas mine. The exploration for replacement deposits of primary silver ore in the vicinity of the Deer Creek fault near the Bluebird and related vein systems is the primary purpose of drill hole no. 3. (See pages 40 and 41 of U.S.G.S. Bulletin 771 by Clyde P. Ross.)

viz.?

If approval for the drilling of this hole (3) is not obtained at the time of completion of hole no. 6, we risk the transfer by Boyles Brothers (the drilling contractor) of both crew and equipment to other drilling projects. Heavy current demand for exploratory drilling by others in Arizona may result in serious delays before arrangements can be made later to resume surface drilling on this project.

David H. Kimball

DAVID H. KIMBALL, PRESIDENT
BIG TREASURE MINING AND DEVELOPMENT CO.

APPENDIX A

February 6, 1967
To: J. William Hasler
O.M.E. Field Officer
Region III, Denver, Colo.

DIAMOND CORE HOLE NO. 1 DME-65548

Big Treasure Mining and Development Co.
125 Sedgefield, San Ramon, California

| | |
|---|---|
| Mining Property: | Saddle Mountain Mining District, Pinal County, Ariz |
| Location of Hole: | Approximately N.27°E., 1800 ft. from U.S.M.M. No. 2180. S.W. ¼ of Section 35, T.4.S., R. 16. E. |
| Depth of Hole: | 746 feet |
| Bearing: | S. 45° E. |
| Inclination: | -60° |
| Hole Size: | 10 ft. NC with 10 ft. collar pipe.<br>30 ft. NX with casing to 40 ft. |
| Began Coring: | January 9, 1967. Completed Hole: Jan. 21, 1967 |
| % Recovery: | 90 to 100% |
| Contractor: | Boyles Brothers Drilling Company |
| Core Description By: | Spenst M. Hansen, Consulting Geologist |
| Remarks: | Hole was drilled entirely with untreated creek water. No unusual problems were encountered. |

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LITHOLIGIC DESCRIPTION OF CORE

| Footage | Core Recovery | Assays | Description |
|---|---|---|---|
| 0-12 | 2½ ft. | | Brownish gray porphyritic ANDESITE with some narrow calcite veinlets and locally abundant phenocrysts of zeolite. Local reddish cast from iron and manganese oxides. Some local iron staining. Weathering and surface oxidation is apparent. |
| 12-18 | 7½ ft. | | Weathered gray to brown ANDESITE. Some local iron staining phenocrysts of ferro-magnesian minerals, probably mainly hornblende and chlorite make up as much as 20% of the rock. Phenocryst size varies from .08 to .2 of an inch. No mineralization apparent, although some of the iron staining could have resulted from oxidation of iron pyrites. |
| 18-20 | 2 ft.<br>100% | | Weathered brownish gray ANDESITE similiar to that described in the previous interval. Rock shows less weathering at the bottom of the interval. No mineralization apparent. |
| 20-23 | 3 ft.<br>100% | | Greenish gray ANDESITE fairly fresh. Plagioclase and chlorite phenocrysts up to ½ inch across. Iron staining along fractures. No mineralization apparent. |
| 23-27 | | | A litholigic change occurs at 23 ft. Chlorite phenocrysts are still present although not as abundant as above. Lath shaped phenocrysts of white mineral probably plagioclase make up approximately 15% of the rock. A greenish chlorite mineral is also present in abundance. Calcite is locally abundant, and is present in occasional veinlets as much as .2 of an inch thick. |
| 27-33 | 6 ft.<br>100% | | Reddish to gray porphyritic ANDESITE, similiar to the interval described above, with phenocrysts of dark green chlorite abundant in the lower 2 ft. of the interval. These phenocrysts make up approximately 20% of the total rock |

| Footage | Core Recovery | Assays | Description |
|---|---|---|---|
| | | | mass and vary from .05 to .2 inches across. No mineralization present but at the bottom of the interval a fracture inclined at 30° from the core direction is filled with hematite disseminated in calcite. |
| 33-40 | 7 ft. 100% | | A litholigic change occurs at 33 ft. grading over a distance of about one ft. The rock is a greenish gray fine grained ANDESITE tending towards basalt in composition. Phenocrysts of dark green ferromagnesian minerals, mainly chlorite, make up from 15 to 20% of the rock. These phenocrysts have a maximum dimension as great as 3/4". Fragments of serpentine resembling obsidian as large as ½" across are present near the bottom of the interval. Several fractures inclined about 30° from the direction of the core are filled with assorted carbonates, some of which contained disseminated hematite. Minor veinlets of rhodochrosite are present and rhodochrosite also fills some of the larger fractures. No mineralization noted. |
| 40-50 | 10 ft. 100% | | Very dark gray colored porphyritic basalt. Phenocrysts of calcite, plagioclase and hornblende. Texture resembles diabase. Local portions of the core contain disseminated pyrite occupying as much as 10% of the rock volume. Iron oxides are common along the fractures, constituting veinlets as much as ½ inch across. |
| 50-56 | 6 ft. 100% | | Very dark gray uniform basalt porphyry, similiar to that described in the previous interval. The later part of the interval grains into maroonish gray ANDESITE porphyry with laths of plagioclase up to 1/10 inch in length. |
| 56-66 | 10 ft. 100% | | Reddish gray ANDESITE porphyry with narrow lath shaped phenocrysts of plagioclase. Blebs of hematite about .03 inches across are disseminated throughout. Serpentine is locally abundant, as is also a blueish-green mineral presumed to be chlorite. The rock has a varigated mottled appearance. Irregular masses of carbonate (probably rhodoclosite) are locally abundant, particularly near the bottom of the interval. See sample SM-1-3. |
| 66-70 | 3½ ft. | | This rock is mottled in appearance and consists basically of reddish-gray ANDESITE with abundant blebs of red hematite and carbonate, (calcite and rhodocrosite). A green chlorite mineral is abundant. No sulphide minerals are noted. |
| 70-78 | 10 ft. 100% | | Dark gray ANDESITE to basalt. Contains veinlets and blebs of chlorite up to ½inch across. Chlorite varies from dark green to very light green. Texture resembles diabase. Occasional very small particles disseminated pyrite. |
| 78-88 | 10 ft. 100% | | Dark gray ANDESITE to basalt. Similiar to above interval. Dark green chlorite masses are smaller. Near the base of the interval, serpentine resembling absidian coats some fracture planes. |
| 88-97 | 10 ft. 100% | | Dark gray ANDESITE to basalt similiar to above interval. Veinlets of reddish hematite up to ¼ inch thick locally present. Local veinlets and blebs of calcite and gypsum. Occasional blebs of zeolite typically ¼ inch across. Texture similiar to diabase |
| 96-107 | 10 ft. 100% | | Medium to dark gray ANDESITE. Diabasic texture local of chlorite, hematite and zeolite. One small fragment of mycrodiorite 6" thick at 98 ft. |

| Footage | Core Recovery | Assays | Description |
|---|---|---|---|
| 107 - 114 | 8ft. 100% | | Dark gray ANDESITE with diabasic texture. |
| 114-125½ | 12 ft. 100% | | Very fine grained maroonish gray colored ANDESITE. Uniform color and texture throughout. Texture appears like broken porcelain. Near 120 ft. irregular narrow veinlets of calcite were present. |
| 125½-134 | 10 ft. 100% | | Very fine grained maroonish gray ANDESITE. Similiar to above interval. Occasionally narrow veinlets of calcite. Occasional green chloritic mottling. No sulphide noted. |
| 134-144 | 10 ft. 100% | | Very fine grained maroonish gray ANDESITE similiar to above two intervals. Veinlets of calcite better developed. As much as .02 inch across. Green chloritic interval at 143 ft. with dissemination of very fine grained pyrite. |
| 144-151 | | | Fine to very fine grained gray ANDESITE. Some with maroonish cast. Some mottling with green chlorite. |
| 151-154 | 100% | | Poorly sorted lithic sandstone with chloritic matrix (graywocke). Fragments include ANDESITE basalt and other rock types. Largest fragments about ½ inch across. |
| 154½-158 | | | Lithic sandstone with size of fragments increasing towards base of interval. Fragments of ANDESITE and basement crystalline rock are common. Cobble conglomerate. Matrix consists of graywocke sandstone with cobbles as large as 6". The lithic fragments (cobbles) consist predominantly of basement rock including quartzite, granite, and arkosic sandstone. |
| 173-182 | 100% | | Pebble conglomerate similiar to above interval. Lithic fragments of ANDESITE common. |
| 181-186 | 100% | | Pebble conglomerate similiar to above interval except the size of lithic fragments increases downward. |
| 186-200 | 100% | | Fine grained dacite porphyry. Color is light gray. Contains irregular blebs and veinlets of calcite and phenocrysts of hornblende. |
| 200-208 | | | Fine grained, light gray microdiorite. Porphyry, similiar to above interval. |
| 208-218 | 100% | | Light gray microdiorite similiar to above interval except numerous veinlets of calcite as much as ½ inch thick are present. Some chlorite is also present along fracture surfaces. Irregular blebs of calcite are abundant throughout the rock mass, as large as ½" across. |
| 218-228 | 100% | | Medium gray fine grained microdiorite with irregular veinlets and blebs of calcite. Inclusions of zeolite also present. |
| 228-237 | 100% | | Fine grained medium gray basite porphyry. (This rock could possibly be a very fine grained intrusive equilevant). Numerous veinlets of pink calcite (rhodocrosite) transect the core at about 45°. These could represent veinlets along volcanic bedding planes. No mineralization. |

| | | |
|---|---|---|
| 237-246. | | Fine grained basite porphyrite. Lithic fragments in the central portion of the interval are as much as 2" across.and represent approximately the same composition. Numerous small veinlets of calcite are present particularly in the central part of the interval. Abundant disseminated pyrite is also present, some grains are .025 inches across, some about flour size. In the lower portion of the interval, the pyrite occurs in disseminations and streaks and is very abundant |
| 246-255 | | Very fine grained, even textured aphanitic rock. Irridescence indicates very fine grained SULPHIDE may be disseminated. Larger pyrite grains occur near the bottom of the interval. Chlorite occurs along fracture planes. Pyritic banding tends to be oriented about 45° to the direction of the core, as do most of the fractures, some of which are filled with calcite. Some textural banding with the same approximate orientation is also observed. |
| 255-260 | 100% | Medium to light gray colored very fine to medium grained aphanite. Pyrite disseminated throughout the interval. |
| 260-274 | 100% | Medium grained microdiorite.porphyry. Phenocrysts constitute about 40% of the rock and vary in size up to 1/10 inch. Veinlets of calcite are common. Pyrite disseminated throughout the interval. Other SULPHIDES are also present but are too fine grained to permit positive identification. |
| 274-279 | 100% | Medium grained gray microdiorite similiar to above interval. Blebs of pyrite up to 1/10 inch across are disseminated throughout the interval. Phenocrysts of quartz and feldspar are abundant. |
| 279-285 | 100% | Fine to medium grained microdiorite. Some disseminated pyrite. |
| 285-300 | | Interbedded layers 2 to 3 feet thick of black shale (?) and medium grained shaley sandstone. Pyrite disseminated abundantly throughout. Banding oriented from 15° to 25° from the direction of the core. Interbedded bands of almost pure pyrite along with irregular blebs common throughout the black shale. Numerous veinlets of calcite as much as ½ inch thick throughout the interval. |
| 300-310 | 100% | Very fine grained black massive shale interbedded with thin bands and layers of sandstone of medium gray color. Pyrite disseminated throughout. The shale near the lower part of the interval shows a concoidal fracture. |
| 310-321 | About 10' of badly broken core. Approximate recovery 70% | Brittle dark gray shale similiar to above intervals but with less gray sandstone. Fracture is concoidal. Fractures shows some calcite, but are poorly healed. Very fine grain pyrite disseminated throughout. |
| 321-330 | | Very dark gray to black very fine grained shale. Thin bands of sandy material oriented about 25° to the direction of the core. Occasional blebs and seamlets of calcite. Lithic fragments up to 2/10 inch becoming common near the bottom of the interval. Very fine grained pyrite disseminated throughout with seamlets up to 1/10 inch across and blebs up to 2/10 inches across also common. |

DIAMOND CORE HOLE NO. 2
core descriptions

BIG TREASURE MINING AND DEVELOPMENT COMPANY
125 SEDGEFIELD, SAN RAMON, CALIFORNIA

Mining Property: Saddle Mountain Mining District, Pinal County, Ariz.

Location of Hole: S.W. ¼ of Section 35, T. 4S., R. 16 E. On the King Edward The First lode mining claim.

| | |
|---|---|
| Depth: | 600 feet |
| Bearing: | S. 20° E. |
| Inclination: | inclined downward 45° |
| Hole Size: | 9 feet NC (Collar pipe), to a depth of 30 feet NX and cased with BX casing, remainder of hole BX and uncased. |
| Began Drilling | January 23, 1967. Hole was completed February 3, 1967. |
| Contractor: | Boyles Brothers Drilling Company, Main Office Salt Lake City, Utah, Branch Office Phoenix, Arizona. |
| Drillers: | Daylight: Virgil Larios (toolpusher) and Robert Sample. Swinshift: Don Snider and Rudolph Miranda. |

Core Description By: Ronald A. Janc, Consulting Geologist

Footage interval

# Core Description Hole No. 2.

NX size 0-9'

Box #1 0-9' — 0-9' Andesite, dull Medium grey, with disseminated Epidote, badly weathered broken. Recovery, about 50%. No visible sulfides.

NX Bx size 9-30'

Box #2 9-18' — 9-18 Microdiorite, Medium grey, finely crystalline, uniform throughout. few scattered inclusions of dark green-black (Epidote?) occasionally broken along hairline thin, calcite filled fractures, slight limonite staining on calcite, No visible sulfides.

Box #3 18-27' — 18-22 Microdiorite, As above with few very thin calcite veinlets, some limonite staining, No visible sulfides. fairly uniform, medium hard.

22-27 Andesite dark grey with greenish tinge, with few disseminated hornblende inclusions medium hard. few thin calcite filled fractures limonite stained, also few serpentine lined fractures. - a 4" seam of clay, Medium grey, separates Microdiorite from andesite at TOP of 22' interval. No discernable sulfides.

Bx size from 30'-TD

Box #4 27-37'

27-37' Andesite dark grey as above, alternating with bands of medium grey Microdiorite, hairline thin calcite filled veinlets running parallel with direction of core some minor limonite staining No visible sulfides. Core becoming shattered in 37' interval.

37-46

Box #5 — 37-41 Microdiorite, Medium dark grey, finely crystalline, uniform throughout No visible sulfides, fractured thru 37' interval along series of closly spaced, thin calcite filled fractures, with some limonite staining.

41-42 Andesite, Medium grey with maroon tinge, has tiny Phenocrysts of calcite heavily disseminated throughout. also numerous thin, calcite filled veinlets with limonite staining, no visible sulfides.

42-46 Andesite Flow breccia, Medium grey with maroon cast. has small Phenocrysts of calcite disseminated throughout. also small inclusions of yellow-green epidote. few calcite (hairline) ~~veil~~ veinlets, No sulfides.

Core description Hole # 2.



Footage interval

Box # 6

46-56 46-49.5 Andesite, dull Med grey with calcite (small) Phenocrysts Throughout. uniform Throughout, No visible sulfides.

49.5-53 Andesite, dull Maroon-grey fine textured. Limonite staining along few hairline fractures. No discernable sulfides.

53-55 Andesite, as above, though more grey in color, still has slight maroon cast. also few scattered greenish-grey inclusions, No sulfides

Box # 7

56-65 56-63.5 Andesite dull med grey. with slight Maroon cast. Shattered or broken at intervals along Thin, calcite veinlets. with traces of limonite staining. No visible sulfides.

63.5-65.5 Andesite, brownish grey, dull, with Tiny Phenocrysts of white calcite heavily disseminated Throughout. May be influence of alteration

Box # 8 - 65.5-74

(Vein) 65.5-69 Andesite, Altered, vein zone, Andesite alternating with calcite, brecciated, heavy Limonite staining Throughout. but No visible Primary sulfides broken (sampled S.M.-2-1)

69-73 Andesite, Med. grey, fine textured, with apple green mineral scattered Throughout. No visible sulfides, grading downward into Andesite flow breccia.

73-75 Andesite flow breccia mottled medium grey + Maroon with phenocrysts of white calcite, & occasional Large crystalline calcite inclusions. No visible sulfides.

Box # 9

75-84 75-84 Andesite flow breccia, Mottled maroon-grey, with disseminated yellow-green (epidote?) & inclusions of white calcite. No sulfides Present.

Box # 10

84-94 Andesite flow breccia, as above, gradually grading to dull grey andesite becoming finer textured with fewer inclusions, No visible sulfides. broken along 90° interval along Thin calcite fracture. Shows some movement, Limonite staining.

Core Description - Hole # 2.

Footage interval

Box # 11- 94-104

94-104 Andesite, Medium grey, crystalline, medium textured with Maroon tinge has scattered small inclusions of yellow-green to black (Epidote?) and finely disseminated apple green mineral, possibly Pyroxene. a few, hairline thin, calcite filled veinlets toward bottom of interval show zone of alteration about 3/16" wide on either side of veinlets. No Primary sulfides are visible becomes More crystalline toward bottom, appears to be grading to microdiorite

Box # 12 - 104-113

104-113 Microdiorite ? Medium grey, with inclusions of Bluish-green dull mineral Throughout also specks and small inclusions of Epidote. occasional hairline thin, Random veinlets of calcite throughout, some alteration adjacent to veinlets from 106 Thru 107 (1/8" wide) No visible Primary sulfides A few fracture Planes lined with chlorite

Box # 13; 113-123

113-123 Andesite. Maroon grey 113-115, Thereafter grading to dull Medium grey with slight maroon cast has much disseminated white calcite throughout Together with Thin, Random calcite veinlets a series of closly spaced calcite veinlets through the interval 120', green (Epidote) finely disseminated Throughout. Some Liminite staining and chlorite along fracture Planes showing slickenslide effect No visible sulfides. Andesite becoming more crystalline near base.

Box # 14 123-132

123-127 Andesite, Medium grey, crystalline with Random, Thin calcite veinlets Throughout. Some chlorite associated with calcite, has inclusions of epidote Throughout. No sulfides.

127-132 Andesite, as above with scattered inclusions of Epidote, dark green calcite veinlets as above, No visible sulfides

Box # 15 132-141

132-137 Andesite, Medium grey, crystalline, with finely disseminated green mineral, with fine, thin calcite veinlets, increasing toward base of interval, Some finely disseminated Pyrite near base.

Sample SM-2-2 135-140

# Core description - Hole #2

Footage interval

137-141 Andesite, medium grey, with finely disseminated green mineral. Much calcite at 32' thru 38' containing some finely disseminated pyrite. Thin calcite veinlets throughout. sampled, SM-2-2 135-140.

Box # 16

141-151 141-144 Andesite, as above, with thin calcite veinlets throughout. One three inch calcite vein at 143.5 but has no visible sulfides.

144-148.5 Andesite, medium grey with much black mineral inclusions (1-2 MM x sec.) scattered throughout few hairline pyrite stringers. No sulfides.

148.5-151 Andesite, dull maroon with white, frost-like flecks of calcite heavily disseminated throughout also green mineral inclusions scattered throughout, few thin calcite veinlets, No visible sulfides. Phenocrysts of green-white calcite in bottom 1/2 foot.

Box #17 151-160

151-155 Andesite, maroon-grey, with phenocrysts of white-greenish-white calcite scattered throughout, together with some epidote, few thin calcite stringers, no sulfides.

155-159 Andesite, maroon-grey, with frostlike flecks of calcite throughout. No sulfides.

159-160 Andesite, dull medium grey with finely disseminated green mineral, No sulfides.

Box # 18 160-170

160-170 Andesite, dull medium grey, few inclusions of epidote throughout. few thin calcite stringers, no sulfides. Core shattered at base of interval.

Box # 19 170-180

170-180 Andesite, dull medium grey, with small inclusions of dark green-grey ferromagnesian mineral, possibly epidote, heavily disseminated throughout. No visible sulfides.

Box # 20 180-189

180-182 Andesite, as above, has slight maroon cast with epidote ? inclusions as above, and frost-like blades of white calcite scattered throughout, No sulfides.

182-189 Andesite, dull medium grey, with small green-black epidote inclusions heavily scattered throughout together with blades calcite, No sulfides.

Core Description Hole #2

Footage interval

Box #21 189-199

189-193 Andesite, dull medium grey with disseminated calcite and epidote. a 4" clay seam at 191.5. No visible sulfides.

193-199 Andesite, maroon-grey with inclusions of chalk white calcite heavily disseminated throughout. also inclusions of epidote. No visible sulfides core very soft. one 2" scorpion in box.

Box #22 199-208

199-208 Andesite, and andesite flow breccia, dull medium grey to maroon grey has much disseminated white calcite throughout together with inclusions of and finely disseminated epidote, No visible sulfides.

Box #23 208-217

208-210 Andesite, as above, with much disseminated calcite & Epidote, Barren.

210-215 Andesite, dull, medium-light grey, with inclusions & finely disseminated Epidote, also finely disseminated apple green mineral, probably Pyroxene, No sulfides.

215-217 Andesite, light grey, dull, looks soft, with finely disseminated calcite throughout. inclusions of epidote & Pyroxene. No visible sulfides.

Box #24 217-226

217-222 Andesite, light grey, as above, with same accessories, No visible sulfides.

222-227 Andesite, medium grey, crystalline, with disseminated inclusions of Epidote broken near base of interval, along talc and chlorite lined fracture planes breaks show movement - slickenslide effect. No visible sulfides.

* Native cu ?

Box #25 227-235

227-228 Andesite, as above, shattered along talc & chlorite lined fracture planes slickenslide on faces, movement. No visible sulfides.

Native copper w/ cuprite ?

228-229 Andesite, dull medium grey, with thin bands of disseminated reddish-orange mineral (cuprite ?) associated with rare flecks of (Native copper ?) zone is about 10 inches wide, Andesite may be grading into microdiorite.

# Core Description, Hole #2

Footage Interval

229-235 Andesite, ? medium grey, crystalline, with finely disseminated, and inclusions of yellow green - black epidote, and much vitreous black ferromagnesian mineral, core broken occasionally along talc - chlorite filled ~~fract~~ fracture zones showing slickenslide few traces of cuprite(?) staining @ 230'.

Box #26 235-244

235-244 Microdiorite, Medium grey, crystalline, uniform fairly hard with disseminated epidote. No visible sulfides core broken along talc filled fracture planes showing movement

Box #27 244-253

244-253 Microdiorite, as above with same accessory minerals, broken in places along Talc filled fractures, No visible mineralization.

Box #28 253-262

253-259 Microdiorite, Medium grey, with same accessories, as above, No sulfides

259-262 Andesite, dull medium grey, with scattered inclusions of epidote and fine blades of feldspar. No discernable mineralization

Box # 29 262-272

262-264 Andesite, etc. all as above.

264-266.5 Andesite ? Maroon-grey, very fine textured, uniform throughout. No discernable mineralization, with few thin bands of andesite, as above.

266.5-267.5 Andesite flow breccia, groundmass, maroon-grey, enclosing small angular fragments of medium grey andesite as in (262-264) has a terrazo-like appearance, No mineralization

267.5-272 Andesite ? maroon-grey, very fine textured uniform throughout, could be classed as basalt. has one hairline thin, calcite filled fracture running parallel with core. No mineralization.

Box # 30 272-282

272-282 Andesite, light grey to maroon-grey, with finely disseminated green mineral, fine textured, uniform throughout, No visible sulfides.

Box # 31 282-292

282-292 Andesite, light grey, fine - very fine grained, uniform, barren

Core Description, Hole # 2

Footage interval

Box # 32 292-302

292-297.5. Andesite, light grey with maroon tinge very fine textured with few inclusions of epidote, uniform throughout, No sulfides.

297.5-302 Andesite, dull medium grey, with finely disseminated green mineral. No visible sulfides.

Box # 33 302-311.5

302-311.5 Andesite, Medium grey, very fine textured, finely crystalline, uniform, except for occasional maroon streaks. No visible sulfides.

Box #34 311.5-321

311.5-312 Andesite, as above. No sulfides.

312-320 Andesite, dull medium grey, with scattered, irregular inclusions of white calcite throughout, also a few thin veinlets of calcite. a few scattered inclusions of black vitreous ferromagnesian mineral, No visible sulfides.

320-321 Andesite, light grey, dull, bleached appearance, possibly altered zone adjacent to white calcite filled fracture zone at 321.5, ± 4 inches wide, No discernable sulfides

Box # 35 321-330

321-322.5 Andesite breccia Medium grey andesite groundmass enclosing sand to pebble sized grains of quartzite & other fragments of dark ferromagnesian mineral.

322.5-326 Microdiorite, light-medium grey, with slight greenish tinge due to finely disseminated green mineral. a few scattered inclusions of dark, ferromagnesian mineral, No visible sulfides.

rtzite conglomerate

326-330 Quartzite conglomerate. Medium grey groundmass enclosing buff to pink quartzite pebbles & cobbles. No visible mineralization

Box # 36 330-340

330-335 Quartzite conglomerate, Med. grey groundmass enclosing pink-buff quartzite fragments ranging from sand to cobble size, poorly sorted No mineralization.

Core Description Hole #2

Footage interval

335-337 conglomeratic Arkose light grey composed of andesite, and/or microdiorite debris and quartz grains - Barren.

337-340 quartzite conglomerate, alternating with Arkosic conglomerate as above. quartzite inclusions from pebble to gravel size. No sulfides.

Box #37 340-349

340-349 quartzite pebble conglomerate, alternating with bands of arkose. groundmass is light - medium grey, No mineralization.

344-349 Quartzite conglomerate, light grey arkosic groundmass enclosing buff to pink quartzite pebbles & some rounded inclusions of gravel size. No discernable mineralization.

Box #38 349-359

349-350 quartzite pebble conglomerate, sand to pebble sized buff pink qtzite grains, enclosed in a grey, arkosic groundmass. No mineralization.

351-355 Arkosic sandstone, light greyish-green, uniform throughout, except for few streaks of pebble conglomerate, as above barren.

355-359 quartzite conglomerate, and arkosic sandstone, in alternating bands few gravel sized inclusions of buff quartzite, No visible sulfides.

Box #39 359-369

359-369 Alternating bands, and irregular gradations from pebble conglomerate, gravel conglomerate, and fine grey arkosic sandstone. in general, interval is predominantly pebble conglomerate, especially toward bottom of interval, No discernable mineralization.

Box #40 369-378

369-373 Arkose and quartzite conglomerate. light green-grey arkose with gradations thru pebble - gravel conglomerate. quartzite inclusions buff - pink. Conglomerate interval ends abruptly at 2 inches short of 373'.

373-378 Graywacke, arenaceous, banded, medium to dark grey, very fine textured, with thin bands of fine carbonaceous(?) matter. - Barren.

Core Description Hole #2

Footage interval

Box # 41 375-387

378-381.5 Graywacke (?) Medium grey, ~~fine~~ very fine textured with hairline thin seams of calcite throughout. No sulfides. Core shattered through 380-381' interval.

~~381.5~~

381.5-385 Graywacke, arenaceous, light grey, with thin calcite seams at intervals. No discernable sulfides.

385-387 Andesite (?) dark grey, with fine black ferromagnesian disseminated throughout. Mineral has white streak giving outside surface of core a finely porphyritic appearance. No visible sulfides.

Box # 42 387-397

387-391 Grawacke (?) arenaceous, fine grained, light grey, with occasional streaks of pebble conglomerate.

391-396.5 Graywacke (?) as above, alternating with bands of pebble conglomerate bottom ½ foot includes few gravel sized quartzite inclusions, buff-pink. No visible mineralization.

Box #43 397-406

397-406 Interbanded layers of arenaceous graywacke and pebble conglomerate containing pink to buff quartzite grains from sand thru ~~to~~ pebble size, few inclusions larger, few calcite filled seams throughout.

Pyr. 403 Few grains of disseminated pyrite thru foot # 403.

Box # 44 406-416

406-408 graywacke + pebble conglomerate, as above, trace of pyrite in foot 407.

408-409 dark grey shale, indurated, semi-conchoidal fracture, with seam of graywacke, as above, No sulfides.

409-413 Dark grey shale, indurated, as above grading downward into arenaceous graywacke, light grey. This interval shattered along few thin calcite filled seams.

# Generalized core Description, core Hole #4

Big Treasure Mining & Development Co. Saddle Mountain, Area, Arizona.

Depth of hole — 700 ft.

Bearing — S. 15° E.

Inclination — minus 45°

Hole size — 10 ft NC, 90 ft NX and cased to a depth of 100 ft, remainder BX and uncased

Began hole — Dec 27, 1966, Completed hole — Jan. 3, 1967

% core recovery — 90 to 100%.

Hole location — King Chester No. 1 Claim, as shown on map.

Box #4 - 31-40' 31-39. Microdiorite, light grey with green mineral inclusions, Pyrite, Traces to absent. some gradation to quartz-microdiorite @ 34-35.

39-40' Hornblende andesite, light grey groundmass enclosing Phenocrysts of Hornblende. scattered throughout, also fine grains Pyrite scattered throughout.

Box #5 - 40-49 40-40.30' Hornblende andesite, as above. 40.3 - 45 Microdiorite. Medium grey with green mineral inclusions, fine grains pyrite throughout, decreasing downward to 45., Absent thereafter. 45-49 Quartz Microdiorite, Medium grey with green mineral inclusions, also minute blades of Hornblende scattered throughout, only traces pyrite. Core broken through 43' interval due to closly spaced minute calcite filled veinlets.

Box # 6 - 49-59 Microdiorite, medium grey, finely crystalline, hard, with inclusions of green mineral scattered throughout, also minute blades of hornblend. Pyrite disseminated in fine grains, Rare to absent this interval.

Box # 7 - 59-68 59-62 Microdiorite, as above. 59-63' No Pyrite.

62-68 Microdiorite, light grey, finely crystalline with much fine grained Pyrite disseminated throughout. also few minute calcite veinlets.

Box # 8 - 68-77 68-69 Microdiorite with pyrite, as above, thereafter, through 69-77, Pyrite content zero. 69-77 Microdiorite, Medium grey, finely crystalline, hard with green mineral inclusions throughout. No visible pyrite, few hairline thin calcite filled veinlets throughout.

Box # 9 - 77-86 77-79. Microdiorite as above 69-77,

79-86 Hornblende andesite, Medium grey, with large (up to 2 cm. x sec) Phenocrysts Hornblende, also green mineral inclusions throughout. No visible pyrite in interval.

core #4 Hole, General core description

| | |
|---|---|
| Box #10 - 86-95 | 86'-89.75" Hornblende andesite as above (79'-86') (±11') Grey with Hornblende Phenocrysts + inclusions of green mineral, NO visible Pyrite. |
| | 89'.75" - 95 Microdiorite, light-medium grey, finely crystalline, with much green mineral inclusions scattered throughout, also minute blades Hornblend. only few grains Pyrite present throughout interval. |
| Box #11 - 95-100 Bottom of Bx core | Microdiorite, medium grey, finely crystalline, hard, with inclusions of yellow-green mineral, and minute blades of Hornblende scattered throughout. No visible Pyrite, except in bottom foot (101) very fine grains Pyrite disseminated. |
| Box #12 - 100-109 | Microdiorite, medium grey, finely crystalline, with inclusions of yellow-green mineral scattered throughout also minute blades of Hornblende. No visible Pyrite. |
| Box #13 - 109-119 Andesite | 109-113 Microdiorite as above, No Pyrite. Transitional gradation through 112 to andesite? 113-119 Andesite, medium grey, dull, with few hornblende inclusions. with traces of green mineral inclusions, No visible Pyrite. |
| Box #14 - 119-128 | ANDESITE, medium-dark grey, finely crystalline, with traces green mineral. overall dull lustre. few hairline, calcite filled veinlets. No Pyrite. |
| Box #15 - 128-137 | Andesite, dull medium grey, with dark grey aphanitic inclusions, Andesite grades to dull reddish-grey at 130-134, irregular distribution of yellow-green mineral scattered throughout, No visible Pyrite. from 134-137 Andesite, dull medium grey, as above. |
| Box #16 137-146 | (137-144) Andesite, dull medium grey, with small hornblende inclusions, also some yellow green inclusions throughout, few thin calcite filled stringers. 144-146 Andesite, as above with more calcite stringers + calcite, light green inclusions throughout. some iron staining on calcite, No visible Pyrite. |
| Box #17 - 146-156 | 146-148 Andesite, as above. 148-154 Andesite, medium grey, dull, with minute blades hornblende, heavily scattered throughout. also some yellow green mineral, No Pyrite. 154-156 Hornblende andesite. Medium grey with reddish tinge, enclosing phenocrysts of hornblende, also much yellow green mineral scattered throughout. |

# General Core Description - Hole #4

| Footage interval | |
|---|---|
| Box #18 156-165 | 156-164, Hornblende andesite. Phenocrysts Hornblende in grey, finely crystalline groundmass. also yellow-green mineral inclusions scattered Throughout. No visible Pyrite. |
| no microdiorite. | 164-165 Microdiorite, Light grey, with green Mineral inclusions scattered Throughout. No visible Pyrite, few hairline fracs with traces limonite stain. |
| Box #19 - 167-174 | 167-172 Microdiorite, Light grey, finely crystalline, with greenish mineral inclusions. No visible Pyrite |
| | 172-174 - Hornblende andesite, Medium grey groundmass, enclosing Phenocrysts of Hornblende & inclusions of yellow-green mineral. No Pyrite. |
| Box # 20 - 174-183 | 174-178 - Hornblende andesite, as above, with some accessories, interval broken along thin, calcite filled veinlets, calcite having scattered iron staining, no visible Pyrite. |
| | 178-183 - Microdiorite, Medium grey, very finely crystalline, hard. No visible Pyrite. |
| 183-193 Box #21 [redacted] | 183-189 Microdiorite, Light-Medium grey, all as above. No visible sulfides. |
| | 189-193 - Microdiorite, grading to Andesite dark, dull green-grey |
| Box #22 - 192-202 | Andesite, Med-dark dull grey, with dark grey dull inclusions. No visible sulfides. |
| Box #23 - 202-211 | Andesite, Medium-dark grey, with scattered dark grey inclusions, No visible sulfides. |
| Box #24 - 211-221 | Andesite, Medium-dark grey, as above, with scattered dark grey inclusions, also increase in disseminated green mineral especially near bottom of interval. No visible sulfides. |
| Box #25 221-230 Pebble zone → | 221-227, Andesite, [redacted] Medium grey with dull dark grey inclusions heavily scattered Throughout, also much yellowish green mineral Throughout, No vis. Sulfides. |
| | 227-230. Microdiorite, Light grey, finely crystalline groundmass enclosing Pebbles quartzite, Pink-Tan also some yellow green mineral scattered Throughout. |
| Box #26 - 230-240 | Conglomerate, Pebbles of [redacted] cobble quartzite, Rounded with Rounded Microdiorite Pebbles, some yellow green Mineral scattered Throughout, No visible sulfides. |
| Box # 27 240-249 | Conglomerate, as above, with occasional stringer of Microdiorite (241) light grey finely crystalline, some green mineral, No visible sulfides. |

General core description Hole ~~Core~~ # 4

| Footage interval | |
|---|---|
| Box #28 249- greywacke-slate | 249-251 - Quartzite conglomerate as above |
| | 251-258 - Alternating zones of dark grey slate and light ~~gre~~ - medium grey greywacke? (has grained texture, much quartz, trace calcite) also rare disseminated inclusions of pyrite. |
| Box 29 - 258-267.5 | 258-264, Microdiorite light grey, finely crystalline, with darker grey microdiorite inclusions. @ 261 ~~[illegible]~~ -262 Microdiorite with inclusion of greywacke, A.A. |
| | 264-267 Microdiorite grading to ANdesite, dull dark grey with fine ~~[illegible]~~ ~~gre~~ light grey inclusions microdiorite, No visible sulfides. |
| Box #30 267.5-277 | 267.5-269 Andesite, as above. |
| | 269-277 Microdiorite, light grey, finely crystalline, with fine grains pyrite disseminated throughout, occasional streaks of dark grey, dull aphanitic ~~[illegible]~~ felsite? in upper part of interval. |
| Box #31 277-286 | 277-279, Microdiorite as above, with pyrite throughout. |
| | 279-280 Andesite, dark grey, with rare grains pyrite throughout. |
| | 280 - Andesite - microdiorite interbanded, grading downward into dark grey Andesite-Felsite? with occasional crystal of pyrite enclosed. |
| Box #32 286-295 | 286-291 Andesite - Felsite as above. |
| | 291-293 Microdiorite light grey, with finely disseminated pyrite. |
| | 293-295 quartz microdiorite conglomerate, light grey enclosing quartzite pebbles, fine grains pyrite scattered throughout. |
| Box #33 295-305 | 295-303 quartz microdiorite conglomerate, light grey with quartz + felsite inclusions slightly calcareous, much fine grained pyrite scattered throughout. |
| | 303-305 Microdiorite, light grey, finely crystalline, with much fine pyrite disseminated throughout + heavy concentration pyrite along minute, calcite filled fracture. |
| Box #34 305-314 | 305-305.5 Microdiorite, as above |
| | 305.5-314 quartz-microdiorite conglomerate, light grey groundmass, enclosing quartzite ~~felsite~~ pebbles + felsite inclusions, pyrite scattered throughout. |

# General Core Description, Hole # 4.

| Footage interval | |
|---|---|
| Box # 35 314-324 | 314-318 quartz-microdiorite conglomerate, light grey groundmass, with pebbles & inclusions quartzite & felsite, fine pyrite, and yellow-green mineral throughout. |
| | 318-320. Felsite, dark grey & aphanitic with few crystals pyrite throughout. |
| | 320-324 quartz microdiorite, light grey, very finely crystalline with fine grains, pyrite disseminated throughout, and larger concentrations pyrite along minute fracture planes. |
| Box # 36 324-333 | 324-326 quartz microdiorite, as above. |
| | 326-328. Felsite, (dark grey, carbonaceous appearance, like slate.) barren of pyrite. |
| | 328-333 quartz-microdiorite, light grey with hairline streaks of dark grey felsite? becoming interbanded with felsite near base of interval. few grains pyrite. |
| Box # 37 333-343 | 333-337 Felsite, dark grey, dull with occasional large inclusion pyrite and pyrite along fracture planes. |
| | 337-340 Microdiorite, light grey, with very fine grains pyrite [redacted] scattered throughout. |
| | 341-343 [redacted] Felsite, dark grey, dull, aphanitic. |
| Box # 38 343-353 | Microdiorite, light grey, finely crystalline, with occasional thin streaks to bands of dark grey felsite. - Much very fine grained pyrite disseminated throughout. |
| Box # 39 353-362 | Microdiorite, light grey, as above, with very fine grained pyrite scattered throughout. few thin calcite filled fractures, grading to interbanded microdiorite-felsite near bottom. |
| Box # 40 362-371 | Felsite, dark grey, dull, aphanitic, with thin bands & occasional interval of microdiorite as above. Pyrite in microdiorite, but only along thin fracture planes in felsite. |
| Box # 41 371-380 | Felsite primarily with interbands of microdiorite, as above. Pyrite on frac planes. |
| Box # 42 380-390 | Felsite, dark grey, aphanitic, dull, hard, few hairline calcite streaks, ~~&~~ No pyrite sub-conchoidal fracture. |
| Box # 43 390-399 | 390-396 - Felsite, dark grey, as above, broken occasionally along thin calcite veinlets. No pyr. |
| | 396-399 Microdiorite, light grey with specs green yellow mineral & small inclusions felsite, some fine grains pyrite throughout. |

General Core description: - Hole #4.

| Footage interval | |
|---|---|
| Box #44 ~~#45~~ 399-409 | Microdiorite, light grey, with fine Needles hornblende(?) disseminated throughout. slightly coarser ~~[illegible]~~ crystalline, with yellow green mineral & ~~grains~~ grains to fine crystals of Pyrite scattered throughout. few hairline thin fracs filled w/ calcite. |
| Box #45 409-419 | Microdiorite, light grey with heavy dissemination of hornblende Needles throughout, some yellow green mineral throughout. No visible sulfides. |
| Box #46 419-428 | Microdiorite & accessories, identical to above. |
| Box #47 428-437.5 | Microdiorite, with Hornblende "Needles" (Laths) heavily disseminated throughout, some yellow-green mineral, No visible sulfides. |
| Box #48 437.5-448 | Microdiorite, etc, as above; hornblende inclusions decreasing toward bottom of interval. |
| Box #49 448-456 | 448-450.5 Microdiorite, Light grey, finely crystalline with pyrite disseminated throughout<br>450.5-452 Felsite, dark grey, aphanitic, dull, broken along thin fracs.<br>452-456 quartz microdiorite, medium grey, finely crystalline, hard, with occasional quartzite pebble inclusions, & traces pyrite throughout. |
| Box #50 456-465 | 456-457.5 qtz. Microdiorite, as above.<br>457.5-465 Felsite, dark grey, aphanitic dull, hard. No visible sulfides - few thin calcite veinlets. |
| Box #51 465-475 | 465-466 Felsite as above<br>466-475 Microdiorite medium grey, finely crystalline, hard with very fine grains of pyrite scattered throughout + occ pebble inclusion of quartzite. |
| Box #52 475-484 | Microdiorite as above, with occasional pebble - cobble sized quartzite inclusions fine pyrite disseminated throughout |
| Box #53 484-493 | Microdiorite, light grey with inclusions of darker grey microdiorite, increase in yellow green mineral clusters scattered throughout, some pyrite throughout. & few thin calcite filled fractures. |

# General Core Description [redacted] #4.

| Footage interval | |
|---|---|
| Box #54 493-503 | 493-499. Microdiorite light-medium grey with inclusions of darker grey Microdiorite, also scattered yellow-green mineral, very little visible Pyrite. |
| | 499-502 : Microdiorite, light grey, with much scattered yellow green mineral containing grains & crystals of pyrite. |
| [redacted] Gridcite. | 502-503 [redacted] Microdiorite Med. grey w/darker inclusions, little green mineral, some pyrite. |
| Box #55 503-512 | ~~Andesite~~ Microdiorite. 503-507.5. Med. grey w/darker grey inclusions, Pyrite rare. |
| | 507.5-512 Microdiorite. Medium grey with much yellow-green mineral throughout. increase in fine Pyrite throughout, especially along minute fracture planes. |
| Box #56 512-522 Pyrite | Microdiorite, Med. grey finely crystalline with specs of yellow-green mineral and <u>much finely disseminated pyrite</u> throughout. interval from 516.5-519.5 is shattered along thin, closly spaced, calcite veinlets, some traces of limonite staining ~~also~~ on calcite fracture zone. Runs parallel with core. |
| Box #57 522-532 | Andesite. Dull medium grey with reddish tinge, some yellow green mineral & fine grains + flakes pyrite scattered throughout. few thin breaks parallel with core calcite filled. Trace limonite staining in break at 531. |
| Box #58 532-542 | Andesite, med. grey with reddish tinge, No pyrite, has some yellow green mineral throughout, core shattered 532-536 along thin calcite filled veinlet having slight limonite staining on [redacted] fracture. |
| Box #59 542-552 | Andesite, med. grey carrying inclusions of dark grey microdiorite, quartzite pebbles & yellow green mineral, few thin calcite veinlets, No sulfides, appears to be grading into microdiorite. |
| Box #60 552-561 | Microdiorite, med-dark grey, finely crystalline, with specks green mineral No visible sulfides, few thin calcite veinlets. with traces limonite stain. |
| Box #61 561-570 | Microdiorite, as above, with green mineral. 561.5-567.5 badly shattered along closly spaced thin calcite veinlets parallel to core, No staining, No pyrite. |

General core description Hole # 4

| Footage interval | |
|---|---|
| Box #62 570-580 | Microdiorite Med. grey, finely crystalline, hard. Traces yellow green mineral throughout, few thin calcite filled veinlets. No visible sulfides. |
| Box #63 580-589 | Microdiorite, Medium grey, with very fine dark ferromagnesian inclusions. only few rare grains pyrite throughout. |
| Box # 64 589-598 | Microdiorite, Medium-dark grey, hard, No visible sulfides. - Solid throughout. |
| Box #65 598-608 | Microdiorite, identical to above. |
| Box # 66 608-617 | Microdiorite Med-dark grey, Solid throughout, No visible sulfides. |
| Box # 67 617-626 | 617-619, Microdiorite, as above.<br>619-622.5 Microdiorite, light greyish green, (due to finely disseminated green mineral No visible sulfides.<br>622.5-626 Microdiorite, Med-dark grey, finely crystalline, barren of sulfides; appears to be grading to andesite. |
| Box # 68 626-636 | 626 Microdiorite-andesite. dull dark grey, barren.<br>627-636 Andesite dark reddish-grey with scattered grains green mineral, few thin calcite filled veinlets. No visible sulfides. |
| Box # 69 636-645 | Andesite, dull grey with deep reddish tint. specks & inclusions of green mineral throughout, No visible ~~fer~~ sulfides. |
| Box # 70 645-654 | Andesite, as above, grading to dark grey andesite near base, No visible sulfides. |
| Box # 71 654-664 | Andesite, dull redish grey to 657. from 657-662 Andesite Pale grey green to grey. 662-664 Andesite medium grey, No visible sulfides |
| Box # 72 664-674 | Andesite, dull grey, grading through greenish grey, containing few inclusions, No sulfides. |
| Box # 73 674-683 | Andesite, as above. No change. |
| Box # 74 683-692 | Andesite, dull Med grey to greenish grey, has yellow green mineral incl. No visible sulfides. |
| Box # 75 692-700 | Andesite, Light greenish grey - Medium grey, No visible sulfides. (Bottom core # 4). |

DIAMOND CORE HOLE NO. 5
CORE DESCRIPTIONS

BIG TREASURE MINING & DEVELOPMENT COMPANY
125 Sedgefield, San Ramon, California

Mining Property: Saddle Mountain Mining District, Pinal County, Ariz.

Location of Hole: Approximately NW/4 SE/4, Sec. 35, T.4 S., R. 16 E, Pinal County, Arizona, on King Chester claim, in Deer Creek Bottom about 100 feet west of first road crossing on Deer Creek. Map reference: Christmas Quadrangle 1:62,500

Depth of Hole: 750 ft.

Bearing: N. 10° W.

Inclination: -45°

Hole Size: 10 ft. NC with 10 ft. collar pipe 100 ft. NX, ≠ 657 ft.

Began Coring: December 12, 1966

Completed Coring: December 23, 1966

% Core Recovery: 80 to 100%

Contractor: Boyles Bros. Drilling Company, Salt Lake City, Utah.

Drillers: Daylight: Virgil Larios and Robert Sample
Swingshift: Don Snider and Rudolph Miranda

Core Description By: Ronald A. Janc, Consulting Geologist

Remarks: Hole was cored entirely with untreated creek water. Two bags of cal-seal were used during spudding of the hole. No unusual problems encountered during coring. Core recovery - excellent.
One Hundred feet of BX casing could not be removed from the hole, left 100 ft. BX casing in hole, from surface downward.

# CORE DESCRIPTION - HOLE NO. 5

Footage Interval

Box #1 NX

1. Microdiorite Lt. greenish-gray. Fine grained, slightly weathered with few traces Pyrite.
2. Microdiorite as above, with cross fracturing, fracture faces Limonite stained.
3. Microdiorite as above fractured.
4. Microdiorite as above, shattered throughout, Limonitic staining on fracture planes.
5. Microdiorite medium gray with yellow-green inclusions associated with specs of Pyrite-Fracs.
6. Microdiorite as above, fractures with Limonitic staining.

Box #2 NX

7. Microdiorite as above, lower 6" fractured.
8. Microdiorite medium gray with greenish yellow crystalline inclusions associated with Pyrite specs.
9. Microdiorite as above shattered, Limonitic staining or fractures. Also white Calcite fillins.
10. Microdiorite as above, massive, two minor fractures.

Box #3 BX

11. Microdiorite medium gray-green, two fractures, Limonite stained, slight increase indisseminated Pyrite with darker gray inclusions. Thin calcite stringer.
12. Microdiorite, medium gray with increase in greenish yellow inclusions associated with Pyrite specs.
13. Microdiorite as above, fractured, Limonite stained faces and horizontal.
14. Microdiorite, medium gray scattered throughout with dark gray inclusions ($\frac{1}{2}$-1MM $\not{+}$ sec.) scattered throughout. One Calcite filled frac. - to core ($45^{\circ}$) extending from $14\frac{1}{2}$ - $15\frac{1}{2}$".
15. Microdiorite, medium gray with (est.) 10% greenish-yellow inclusions, associated with finely dissem. Pyrite.
16. Microdiorite, medium gray, $\pm$ 5% greenish incl. and dark gray inclusions, $\frac{1}{2}$ = 2MM + sec., one nearly vertical, thin (2MM) calcite filled stringer through middle of foot.
17. Microdiorite, as above, but with few gray and greenish inclusions, traces Pyrite.
18. Microdiorite as above, with two nearly horizontal fracs near bottom, Limonite stained faces.

Box #4 BX

19. Microdiorite, medium dark gray, mottled, with dark gray inclusions($\pm$ 1MM x sec.) + 5% green-yellow x ln. inclusions.
20. Microdiorite as above with dark gray inclusions, $\frac{1}{2}$ - 2MM x sec. $\mp$ 2% greenish inclusions of disseminated Pyrite.
21. Microdiorite, medium gray with traces greenish inclusions associated with Pyrite.
22. Microdiorite as above with $\pm$ $40^{\circ}$ thin (1MM) calcite filled fracture, Limonite stained.
23. Microdiorite, medium gray with scattered dark gray inclusions ($\frac{1}{2}$ - 3MM cross section). Trace green-gray inclusion.
24. Microdiorite, medium gray with dark gray inclusions ($\frac{1}{2}$ - 2MM cross section) scattered throughout, traces of green yellow inclusions. Traces Pyrite coarsly crystalline.
26. Microdiorite as above, fractured near base ($26\frac{1}{2}$ - $27\frac{1}{2}$) calcite filled ( $\pm$ 1MM) slight Limonite staining.
27. Microdiorite with dark gray inclusions ($\frac{1}{2}$ - 2MM cross section) scattered throughout, hairline frac system at right angles calcite filled with Limonite staining.

CORE DESCRIPTION - HOLE NO. 5

Footage Interval

Box #5 BX
*

28. Microdiorite, as above, fractured throughout.
29. Microdiorite, med. gray, crystalline, with scattered dark gray inclusions (½ - 1MM cross section) Note: increase in Pyrite disseminated throughout. Few hairline fractures, slight Limonite staining on fracture faces.
30. Microdiorite, med. gray with scattered dark gray inclusions, (½ - 3MM cross section) hairline, calcite filled fractures, few specks Pyrite detectable.
31. Microdiorite, as above. Describes as above.
32. Microdiorite, med. gray, crystalline, with scattered inclusions dark gray, (½ - 4MM cross section) few hairline fractures, calcite filled. Little Limonite staining, intersticial Pyrite inclusions.
33. Microdiorite, as above, more coarsly crystalline, traces intersticial and disseminated Pyrite.
34. Microdiorite, med. gray with dark gray inclusions as above, Increase in disseminated Pyrite, (± 1%) thin (hairline) fractures, calcite filled, traces of Limonite staining.
35. Microdiorite, med. gray, finely crystalline, disseminated Pyrite rare, except along fracture planes.
36. Microdiorite, med. gray, finely grained, with disseminated and intersticial Pyrite, rare.
37. Microdiorite, with dark gray inclusions also yellow green Pyrite alteration inclusions, Pyrite, finely disseminated also intersticial, throughout, and along fracture planes.

Box # 6 BX
*

38. Microdiorite, med. gray grading into 5 inch zone of Microdiorite-quartz, with + 1 ½ inch vagular zone containing sphalerite and galena together with disseminated Pyrite. Limonite staining throughout.

Stained

39. Microdiorite, fine grained, with numerous hairline veinlets to 40½, Limonite stained throughout, with disseminated Pyrite where unoxidized.
40. Microdiorite, med. gray, with darker gray inclusions, very little Pyrite disseminated throughout.
41. Microdiorite, gray, as above, Pyrite dissemination rare, thin calcite fractures, some stain.
42. Microdiorite, med. dark gray, with traces Pyrite and green yellow specks, few calcite stringers 3MM wide.
43. Microdiorite, as above, with traces disseminated Pyrite with associated green calcite stringers.
44. Microdiorite, med gray, as above, with calcite stringers.
45. Microdiorite, gray with finely disseminated Pyrite, altered to Limonite. Limonite stained throughout.

Box #7 BX
(calcite vein)

46. Microdiorite, gray, grading to Calcite, heavily Limonite stained throughout with three calcite filled vugs. (dogtooth spar) some spar crystals with black coating. Zone is about one foot wide.

Core description, Core # 5

Footage interval

74 Microdiorite, Med. grey. finely crystalline, with some dark grey inclusions, and also olive-green inclusions scattered throughout, Traces of disseminated Pyrite, Shattered along hairline, calcite filled fractures, traces limonite staining on calcite.

75 Microdiorite, as above, Pyrite rare, hairline fractures, slickenside effect in calcite.

Box #10, Bx. 76 Microdiorite, Med. grey, with dk. grey inclusions ±2MM x sec, also olive green inclusions scattered throughout. few hairline traces, No visible Pyrite. except on fracture faces.

77 Microdiorite, as above, few traces disseminated Pyrite., grading into below foot —

Texture (Change) 78 Microdiorite, Med. grey, Very finely crystalline, with Large dark grey inclusions (2-15 MM x sec) also olive green inclusions scattered throughout. flecks of Pyrite on fracture faces.

80 Microdiorite, as above, with occasional traces of Pyrite scattered throughout

81 Microdiorite, with large (4-10 MM, x sec) dark incl. scatt. throughout, also olive green mineral. very little Pyrite, occasional traces only.

82 Microdiorite, as above. few traces Pyrite.?

83 Microdiorite, Med. grey with large grey inclusions, also greenish mineral scattered throughout giving core a greenish grey cast. Traces Pyrite (or possibly) chalcopyrite, throughout. Tendency for core to shatter into elongate splinters along parallel planes of weakness.

Box #11 Bx 84 Microdiorite, as above. with green-olive mineral scattered throughout, also traces Pyrite(?)

85 Microdiorite, as above, with fewer dark inclusions, finely crystalline. No olive green mineral No Pyrite

86 Microdiorite, grey, finely crystalline, with darker grey inclusions, No visible Pyrite.

87 Microdiorite, as above, with few inclusions of olive green mineral, and traces Pyrite.

88 Microdiorite, as above, with increase in disseminated Pyrite(?) & olive green mineral

change - increase in sulfide. 89 Microdiorite, grey, with large dark grey inclusions, as above, which give core a "porphyritic" appearance. also inclusions of olive green mineral scattered throughout, together with associated disseminated Pyrite(?) - amount of disseminated Pyrite(?) increasing

Pyrite(?) increase. * 90 Microdiorite, as above, with increase in Pyrite(?) content very finely disseminated throughout core. - estimate about 1%

91 Microdiorite, with much disseminated Pyrite (?) as above.

calcite zone. 92 Microdiorite as above, leaner in Pyrite content, grading into soft, shattered calcite zone.

93 Microdiorite, heavily impregnated with calcite, Pyrite (?) disseminated throughout.

Box # 12 94 Microdiorite - calcite, as above, loose, shattered. fine Pyrite (?) disseminated throughout

95 Microdiorite, Medium grey, with large (± 10 MM) dark grey inclusions, finely crystalline. with fine Pyrite disseminated throughout. calcite filled fracture parallell with core showing slickenside effect. No limonitic staining on fracture breaks.

Page No. 5

Core description, Core No. 5

Footage interval

96 Microdiorite, as above with ± 1% finely disseminated Pyrite Throughout.

decrease sulfide 97 Mic[illegible]ite, grey, with da[illegible] grey inclusions, & olive [illegible]een mineral, Normally associated with Pyri[illegible]out. Py[illegible] content decreas[illegible] to traces, from above.

98 Microdiorite as above, [illegible] fair distribu[illegible] f disseminated Pyrite.

1⅞" ↕ 1½" 99 Microdiorite, Med. grey wi[illegible] large dark [illegible]lusions, fine Pyrite scattered Throughout.

Reduced core size 100 Microdiorite, Med. grey, fin[illegible]stalline, fair a[illegible] of Pyrite(?) distributed Throughout.

101 Microdiorite, Med. grey, with [illegible]rey inclusions (± [illegible]M. x sec.) Pyrite scattered Throughout

102 Microdiorite, grey, finely crys[illegible], No dark inclusions, fine flecks of Pyrite Throughout.

103 Microdiorite, as above, Pyrite, as above.

Box #13 104 Microdiorite, Med. grey, finely crystalline, with Rare specs Pyrite Throughout.

105 Microdiorite, as above, with large, dark grey inclusions and some yellow-green Mineral with specs Pyrite scattered Throughout.

106 Microdiorite, as above, with fine Pyrite distributed Throughout.

107 Microdiorite, all as above.

* 108 Microdiorite, Med. grey, finely crystalline, Pyrite(?) ±1% scattered Throughout (Note) some sulfide flecs appear to have slight irridescence, May be Chalcopyrite.

109 Microdiorite, grey, with darker grey inclusions, some yellow green - Pyrite associated Mineral & Pyrite(?) liberally scattered Throughout. Lower Part shattered.

110 Microdiorite, composed of equal parts Medium grey & dark grey inclusions with Pyrite(?) scattered throughout.

111 Microdiorite, with Pyrite, as above.

112 Microdiorite, Med. grey, finely crystalline, with flecs of Pyrite throughout.

Box #14 113 Microdiorite, grey with flecs Pyrite throughout, though less than above.

114 Microdiorite, Med. grey, with olive green inclusions, Pyrite flecs throughout, shattered, by system of hairline, calcite veinlets, running parallell with core.

115 Microdiorite, as above, with ~~[illegible]~~ Pyrite flecs throughout

116 Microdiorite, grey with increase in yellow green & emrald green Mineral, Pyrite inclusions (± 1MM x sec) scattered throughout.

117 Microdiorite, as above, with thin calcite filled fracture running parallell to core. Calcite shows some slickenslide effect.

118 Microdiorite, as above, with green mineral inclusions & Pyrite, upper part shattered.

119 Microdiorite, grey, with darker grey inclusions, green mineral & fine flecs Pyrite Throughout.

Box 115. 120 Microdiorite as above, with Pyrite, - few thin fractures.

* 121 Microdiorite, as above, Pyrite distribution, rare.

Core Description, Core No. 5

Footage interval

(Texture change) 122 Microdiorite, grey, as above, grading into Microdiorite groundmass with ~~[illegible]~~ nodular inclusions of varied composition & color, has appearance of conglomerate. Much mineral in groundmass together with disseminated Pyrite.

123 Microdiorite, as above, fewer inclusions, Pyrite in groundmass.

124 Microdiorite groundmass, grey with darker grey & yellow green inclusions also varicolored gravel-like inclusions. ~~Pyrite ground~~ Pyrite disseminated throughout groundmass.

125 Microdiorite, & components, as above.

126 Microdiorite, grey, with green inclusions, Pyrite, & gravel-like inclusions.

127 Microdiorite, med. grey, finely crystalline, with yellow-green mineral & dissem. Pyrite throughout. "gravel" inclusions, quartzite pebble.

128 Microdiorite, grey, as above, few gravel inclusions. finely disseminated Pyrite.

129 Microdiorite, as above, increase in gravel-like inclusions, Pyrite in micro-groundmass.

Box #16 130 Microdiorite, grey with traces green mineral, fair Pyrite distribution throughout.

131 Microdiorite, light grey, finely crystalline, with Pyrite specs & stringers throughout.

132-~~133~~ Microdiorite & components, as above.

Altered zone. * 133 Microdiorite, as above grading into Limonite stained Altered zone toward base. to about 134.5' altered zone impregnated with calcite

134 Microdiorite, Altered zone, grading into grey Microdiorite, one vugular calcite veinlet iron stained spar crystals.

135 Microdiorite, with greenish-grey groundmass, containing disseminated Pyrite(?) and gravel-like inclusions of varied composition.

136 Microdiorite, grey groundmass, impregnated with disseminated Pyrite, The whole containing pebbles of varied composition to 136.5. Lithology changes abruptly to

* Change. Microdiorite, light-greenish grey, finely crystalline, (The first 3 inches ~~bar~~ has a "bleached" appearance. some Limonite staining) containing Pyrite inclusions (1-2 MM. x sec)

Incr. in Pyrite heavily distributed throughout.

137 Microdiorite, light grey, finely crystalline with scattered Pyrite inclusions (1-2 MM x sec) scattered throughout. Pyrite 70 ± 5% (est)

138 Microdiorite, as above.

Box # 17 139 Microdiorite, uniform with above.

140 Microdiorite, light grey-green with occasional Pyrite inclusion.

141 Microdiorite, as above, with Pyrite inclusions and crystals (½ - 1½ MM. x sec) also inclusions of clear calcite.

Core Description, Core #5

Footage interval

47 Microdiorite, Med. grey, fine grained, speckled with dark grey inclusions and green, pyrite alteration specks, few calcite stringers, transitional from above zone.

48 Microdiorite, as above, few specs disseminated pyrite.

49. Microdiorite, greenish-grey with dark grey inclusions (1/2-2 MM x sec) scattered throughout disseminated pyrite scattered throughout.

50 Microdiorite, grey, finely porphyritic with dark inclusions, traces pyrite specs.

51 Microdiorite, Med. grey, finely crystalline with increase in disseminated pyrite.

52 Microdiorite, similar to above.

53 Microdiorite, as above

54 Microdiorite, grey, fine grained, increase in disseminated pyrite, few calcite filled fractures with some limonite staining.

55 Microdiorite, grey, ~~finely porphyritic~~ with disseminated inclusions, dk. grey, as above, with few traces disem. pyrite.

Box #8 ax 56 Microdiorite, Med. grey, finely crystalline, with pyrite associated green inclusions, visible pyrite, rare.

57 Microdiorite, as above, with fine disseminated pyrite, ~~[illegible]~~ scattered throughout. 1 thin calcite frac parallell to core.

58. Microdiorite, Med grey, finely crystalline, traces greenish, pyrite associated mineral, pyrite rare.

59 Microdiorite, as above, pyrite dissemination opposite hairline fracture 1 - zone ± 1 MM wide.

60 Microdiorite, as above, with green-~~gr~~ crystalline inclusions, ~~[illegible]~~ scattered throughout, several calcite filled fractures 2 MM wide, only slight traces of limonite staining

61. Microdiorite, light-medium grey, finely crystalline, with dark grey-greenish inclusions scattered throughout. Pyrite ? associated with greenish-olive inclusions.

62. Microdiorite as above.

63. Microdiorite, as above, badly shattered, thin hairline, calcite filled fractures throughout pyrite dissemination rare, except some on fracture faces

64. Microdiorite, grey, with pyrite associated olive-green inclusions, with thin fractures.

65 Microdiorite, as above, badly shattered along numerous hairline fractures as foot 63.

Box #9 ax. 66. Microdiorite, grey, finely crystalline, with olive green, pyrite associated inclusions scattered throughout.

67 Microdiorite, as above, with few, thin fractures.

68 Microdiorite, grey, finely crystalline, no perceptible difference from above

69 Microdiorite, grey, with olive green inclusions, pyrite dissemination rare.

70. Microdiorite, as above, slightly more disseminated pyrite.

71 Microdiorite, grey, with ~~a~~ slight greenish cast on broken surface due to pyrite associated greenish mineral. with traces of pyrite dissemination

72. Microdiorite grey with olive green inclusions, pyrite dissemination rare.

73 Microdiorite, as above, with rare traces pyrite.

 Core Description, core # 5.

Footage interval

142 Microdiorite, as above, to 142.5. Altered zone 142.5 - 143.5. zone is impregnated with calcite & limonitic staining, crystal lined vug at center.

143 Microdiorite, ~~lower~~ upper half-foot as described above, lower portion very light grey bleached appearance, with few pyrite crystals and green inclusions associated with pyrite.

144 Microdiorite, as above, grading into med. grey color. Pyrite disemination less than above

145 Microdiorite, med. grey, finely crystalline, with inclusions of green mineral & traces pyrite.

146 Microdiorite, as above.

147 Microdiorite, light grey, with occasional pyrite inclusions scattered throughout.

148 Microdiorite, as above, with increase in pyrite distribution.

Box #18 149 Microdiorite, light grey, finely crystalline, with fine disseminated pyrite, and pyrite inclusions (½ - 2 MM x sec) common.

150 Microdiorite, with pyrite, as above.

151 Microdiorite, very light grey, with less pyrite than above

152 Microdiorite, identical to 151

Much dissem. pyrite. * 153 Microdiorite, light grey with high concentration of disseminated pyrite. est. 6-7%.

" 154 Microdiorite. very light grey, with much pyrite, as above. break tendency along parallell planes.

155 Microdiorite, as above, with slightly less pyrite than above.

* 156 Microdiorite, light tan-grey with scattered dark inclusions associated with pyrite (appears as a halo around pyrite inclusions). Core heavily charged with pyrite ±5%

high pyrite * 157 Microdiorite, identical to previous foot, very much pyrite throughout - est 8-10%.

high pyrite. * 158 Microdiorite, as above, with ± 8-10% pyrite throughout. (vien: protore?)

* 159 Microdiorite, lt. tan-grey, finely crystalline, hard. heavily disseminated throughout. are flecks to inclusions of pyrite (2-4 MM x sec.) est. 8-10%.

* 160 Microdiorite, as above, slightly less pyrite throughout. ±5%

* 161 Microdiorite, lt. tan-grey, with disseminated pyrite - 3-4%

162 Microdiorite as above, with pyrite inclusions ±2% one large (8x10 MM.) xl.

* 163 Microdiorite, lt-tan-grey, very finely crystalline. pyrite scattered throughout, estimate ±4%.

* 164 Microdiorite, as above, with pyrite about same amount

Prite crystals. * 165 Microdiorite, lt. greenish-grey, finely crystalline pyrite scattered throughout ±5% - several well defined pyrite ~~crystals~~ crystals @ base 165' - (3-4 MM x sec.)

166 Microdiorite as above, much less pyrite - about 2%

167 Microdiorite, as above, ± 1% scattered pyrite.

Core Description, Core # 5

| Footage interval | | |
|---|---|---|
| Box # 20 | 168 | Microdiorite, light greenish-grey, finely crystalline with small amount of Pyrite flecs and ~~crystals~~ crystals throughout one calcite filled veinlet 3MM wide |
| | 169 | Microdiorite, as above, slightly more disseminated Pyrite, est. about 1%. |
| | 170 | Microdiorite lt. grey with rare dark inclusions, very small amount of Pyrite ½ of 1% |
| | 171 | Microdiorite, as above with Pyrite inclusions surrounded by bands of darker, altered material. |
| | 172 | Microdiorite lt. grey with slight Pinkish cast finely crystalline, with few scattered Pyrite inclusions. thin calcite vein with vugs, near bottom. |
| | 173 | Microdiorite, light grey, with darker altered inclusions containing Pyrite, about ½-1% Pyrite. |
| | 174 | Microdiorite, light grey, with small amount of finely disseminated Pyrite. |
| | 175 | Microdiorite, as above, with Pyrite, as above |
| | 176 | Microdiorite, as above, with finely disseminated Pyrite |
| | 177 | Microdiorite, light grey, finely crystalline, with about 1% finely disseminated Pyrite. |
| Box # 21 | 178 | Microdiorite, light greyish green, with occasional rare Pyrite inclusion. |
| | 179 | Microdiorite, as above, Pyrite rare. |
| Fractured zone | 180 | Microdiorite, light grey, with fine grains Pyrite disseminated throughout. few, closly spaced thin calcite filled veinlets with strong limonite staining. |
| " | 181 | Microdiorite, as above, fractured, limonite staining, much calcite fill. visible Pyrite. |
| Frac zone | 182 | Microdiorite grey, badly shattered, thin calcite veinlets, no limonite stain. fine flakes Pyrite. |
| | 183 | Microdiorite, light grey, impregnated with calcite - vugs. fine flakes Pyrite dissem. throughout. |
| | 184 | Microdiorite, light grey as above, much calcite, vugs, limonite staining, fine Pyrite throughout. |
| | 185 | Microdiorite, as above, several calcite veins, with crystal lined vugs, limonite staining light. |
| Frac. zone | 186 | Microdiorite, light grey, with Pyrite dissem. throughout. fractured, few vuggy calcite veins. |
| | 187 | Microdiorite, grey with thin veinlets & impregnations calcite, Pyrite rare, fine flakes throughout. |
| Box # 22 | | |
| Frac. zone | 188 | Microdiorite, tan-grey, with light grey inclusions, looks bleached, upper ½ foot badly fractured much calcite, no visible pyrite though some limonite stain present. |
| Shattered zone | 189 | Microdiorite with inclusions, as above, but entire zone badly shattered, limonite staining |
| " | 190 | Microdiorite tan-grey, passing into Microdiorite med. grey, calcite filled, with finely dissem. Pyrite throughout. - badly broken core |
| " | 191 | Microdiorite as above, impregnated with calcite & veinlets, badly shattered. |
| " | 192 | Microdiorite as above, shattered |
| " | 193 | Microdiorite as above, shattered |
| " | 194 | Microdiorite, grey calcite veinlets & fill, badly broken, fine Pyrite throughout. |
| " | 195 | Microdiorite, grey broken, as above |
| " | 196 | Microdiorite, grey shattered, as above. |

Page # 9

Core description Core # 5

Footage interval

Frac. zone. 197 Microdiorite, light grey, grading into calcite with Microdiorite fragments, thence back to Microdiorite, the whole, badly shattered.

Box # 23 198 Microdiorite, light grey, with .5% dissem Pyrite, calcite impregnated with Microdiorite fragments in calcite Matrix in Places

199 Microdiorite, light grey, finely crystalline, with flecks & inclusions of Pyrite throughout.

200 Microdiorite, as above, with small amount of Pyrite throughout.

201 Microdiorite, light grey, as above, with slight increase in disseminated Pyrite.

202 Microdiorite, light grey, finely crystalline, with Pyrite flecks & inclusions throughout.

203 Microdiorite, as above, Pyrite rare, grading into Microdiorite, Medium grey at 204.

204 Microdiorite Medium grey-green. Very finely crystalline, hard, with occasional Pyrite inclusions.

205 Microdiorite, as above, with few thin 1-2 MM wide calcite vienlets.

206 Microdiorite, medium grey-green, with Pyrite specks throughout.

Box # 24 207 Microdiorite, lt greyish green, with specks Pyrite throughout, few thin calcite vienlets.

208 Microdiorite, identical to above, few ~~the~~ Pyrite inclusions.

209 Microdiorite, as above, fine flecks Pyrite throughout.

210 Microdiorite, ~~med~~ light grey, with increase, in Pyrite content, slickenslide on vienlet calcite.

211 Microdiorite, light grey with disseminated Pyrite, also calcite inclusions & large Pyrite crystals.

212 Microdiorite, as above, less Pyrite, few hairline calcite vienlets.

213 Microdiorite, as above,

214 Microdiorite, light grey, finely crystalline, hard, with disseminated Pyrite flecks & inclusions.

Box ~~# 5~~ 25 215 Microdiorite, Medium grey-green, few hairline vienlets, Pyrite disseminated throughout.

216 Microdiorite, as above, hard, with Pyrite specks + inclusions throughout.

217 Microdiorite, Medium grey, traces Pyrite throughout

218 Microdiorite, as above, with large Pyrite inclusions, (3-4 MM x sec) scattered throughout.

219 Microdiorite, Medium grey, with Pyrite inclusions throughout, also inclusions of yellow-green Mineral which forms halo around Pyrite inclusions.

220 Microdiorite, as above, increase in diseminated Pyrite, est 1%.

221 Microdiorite, light grey, finely crystalline, with ± 1-2% Pyrite dissem. throughout.

222 Microdiorite, light grey, few hairline calcite vienlets, less than .1% Pyrite.

223 Microdiorite, as above, with fine grains Pyrite throughout

224 Microdiorite, lt-med grey, with fine grains Pyrite, as above about 1%

Box # 26 225 Microdiorite, Medium grey, finely crystalline, hard, small flecks of Pyrite scattered throughout.

226 Microdiorite, lt grey, increase in Pyrite content, total (est). 1%.

227 Microdiorite as above

Core Description, Core # 5

Footage interval

*LL (Pebble inclusions zone)

228 Microdiorite, light grey, finely crystalline, hard with Pyrite flecks and inclusions throughout

229 Microdiorite, as above. hairline fracture, at base, filled with calcite, showing slickensside

unusual staining effect. Reddish coating on calcite, unlike Limonite, similar to hematite.

" 230 Microdiorite, light grey, finely crystalline, with Pyrite grains + inclusions, several

Thin fractures filled with calcite, having limonitic and red (Hematite ?) stainings

231 Microdiorite, as above, with about 1% Pyrite scattered throughout.

unusual stain 232 Microdiorite, light grey, cut by several calcite veinlets, showing crystal lined vugs

Entire footage interval is shattered, Much limonite and red (hematite ?) stainings on

fragments, host rock ~~altered~~ stained by ~~weathering~~ oxidation.

stain 233 Microdiorite, light grey, in lower 2/3 of foot interval, contains Pyrite throughout

upper 1/3 foot stained and broken, as above

234. Microdiorite, grey, with tan cast. few specks Pyrite, few fractures show limonite + red stain.

Box # 27. 235. Microdiorite, as above, few fractures, with above stain. Pyrite content Moderate.

*LL

unusual inclusions 236. Microdiorite, Light grey, as above, with calcite filled fracture, crystalline druse, + gouge

like filling containing Rounded Pebble of brown quartzite, (2x4 cm. x sec)

" 237 Microdiorite, grey groundmass enclosing inclusions of Microdiorite + rounded Pebbles

Shattered in Places, fragments have limonite + unusual red staining, Pyrite rare.

" 238. Microdiorite, grey groundmass ~~with~~ enclosing microdiorite fragments and brownish quartzite

Pebbles, Pyrite disseminated throughout

239 Microdiorite, groundmass, pebbles, etc, as above, grading into Microdiorite, Med. grey

~~240~~ finely crystalline, barren of Pyrite.

240 Microdiorite, grey groundmass, containing fragments, Pyrite, rare. fractured, calcite filled

Change 241 Microdiorite, as above first 1/2 foot, then grading to Lt brown quartzite (large quartzite pebbles) to 242.5

Change 242. Quartzite, as above for top 1/2 of foot grading to fragmented microdiorite in microdiorite

groundmass, Thin fractures calcite filled limonite + (Hematite ?) stained face.

243 Microdiorite groundmass, grey with disseminated Pyrite, enclosing fragments of

Microdiorite, as above, also Pebbles of Lt brown quartzite

END OF PEBBLE INCLUSION ZONE. 244 Microdiorite groundmass, as above, with dissem. pyrite, containing Microdiorite frags. + qtz. Pebbles,

*>> ~~245~~ through top 6". Lower part of foot is Microdiorite Med. grey, fine crystalline w/ Pyrite.

Box # 28 245 Microdiorite, Medium grey, finely crystalline, hard, with fine grains Pyrite throughout

246 Microdiorite, as above, with finely disseminated Pyrite throughout. few thin

~~247~~ fractures with calcite fill having limonitic stainings

247 Microdiorite, Medium grey, with No visible Pyrite.

Core description, core #5

Footage interval

248 Microdiorite, light to medium grey, very finely crystalline, hard, broken, thin hairline veinlets with ~~calcite~~ calcite. Pyrite rare except of fracture faces as flakes.

249 Microdiorite + components, as above, all badly shattered.

250 Microdiorite, as above, badly shattered, Pyrite rare.

251 Microdiorite, medium grey, finely crystalline, hard, with grains + ~~crys~~ small crystalls Pyrite disseminated throughout. Broken, many thin calcite filled veinlets.

252 Microdiorite, as above, broken up. One calcite filled vein zone (closly spaced thin veins) at 252' 3". Soft, eroded, lower section solid microdiorite.

253 Microdiorite, med. grey, finely crystalline, hard, with fine grains of Pyrite throughout.

254 Microdiorite, as above, with inclusions of olive green, Pyrite associated mineral,

255 Microdiorite, as above, with few dk. grey inclusions, plus green mineral + Pyrite.

Box #29 256 Microdiorite medium greenish grey with few small crystalls of Pyrite throughout

257 Microdiorite, as above, with green mineral inclusions, usually associated with Pyrite. also Pyrite grains + small crystals throughout.

258 Microdiorite, as above, with accessories, as above

259 Microdiorite, medium grey, with green mineral, plus disseminated Pyrite.

260 Microdiorite, with accessories, as above. Increase in disseminated Pyrite.

261 Microdiorite, medium grey, finely crystalline, with greenish cast due to disseminated yellow green to olive green, mineral, which is usually associated with the disseminated Pyrite.

262 Microdiorite, and accessories, as above: few thin fractures showing slickenside effect.

263 Microdiorite, and accessories, as above

264 Microdiorite medium grey, finely crystalline, hard, with finely disseminated green mineral but Pyrite content very low.

265 Microdiorite + accessories as above, very little Pyrite

Box #30 266 Microdiorite, medium grey, with disseminated green mineral, Pyrite flakes and grains localized on microscopic fracture faces

267 Microdiorite, and accessories, as above.

268 Microdiorite, medium grey, finely crystalline, hard, with green mineral finely disseminated throughout. Pyrite along minute fracture faces.

269 Microdiorite and accessories, as above

270 Microdiorite and accessories, as above

271 Microdiorite, medium grey, with green mineral inclusions also a few grains of a black, ferromagnesian mineral (Hornblende ?) (1MM x sec) throughout. Some Pyrite.

Core description, core #5

Footage interval

272 Microdiorite with accessories, as above.

273 Microdiorite, grey, with Hornblende grains, green disseminated mineral & traces pyrite.

274 Microdiorite, as above, Pyrite becoming scarce.

275 Microdiorite, grey, finely crystalline, with traces Pyrite & green disseminated mineral.

Box # 31 276 Microdiorite, as above, with accessories, as above, Core broken, by Numerous calcite filled vienlets, limonite stain on calcite, moderate.

277 Microdiorite, Medium grey, Shattered by thin calcite vienlets, Pyrite inclusions Rare.

278 ~~280~~ Microdiorite, as above, Pyrite concentrated as flakes along faces of Minute fractures.

279 Microdiorite, medium grey, with disseminated, green mineral, Pyrite along fracture faces, broken.

280 Microdiorite, and accessories, as above.

281 Microdiorite, and accessories, as above.

282 Microdiorite, Medium grey, hard, finely crystalline, with green, finely disseminated mineral & Pyrite flakes concentrated along minute fracture planes., broken.

283 Microdiorite, with accessories, as above.

Box # 32. 284 Microdiorite, light grey, finely crystalline, hard, with fine grains pyrite disseminated throughout, few thin, calcite filled vienlets.

285 Microdiorite, and accessories, as above.

286 Microdiorite, as above, with few disseminated grains hornblende (?) Pyrite throughout.

287 Microdiorite, grey, as above, with accessories, Pyrite flakes along minute fracture planes.

288 Microdiorite, as above, with increase in Needle like Hornblende inclusions, Pyrite, rare.

289 Microdiorite, Medium grey, containing fine Hornblende (?) laths. Pyrite flakes on fracture planes.

290 Microdiorite, with accessories, as above.

291 Microdiorite, as above, fine grains pyrite scattered throughout.

292 Microdiorite, light grey, ~~finely~~ finely crystalline, hard, with grains Pyrite Throughout & Pyrite concentration along narrow fracture planes

293 Microdiorite, as above, with accessories, also thin hairline calcite vienlets.

Box #33 294 Microdiorite, light grey, finely crystalline, hard, with few grains pyrite Throughout.

295 Microdiorite, with accessories, as above.

296 Microdiorite, Medium grey, fine, hard, with fine grains Pyrite disseminated Throughout.

297 Microdiorite, and accessories, as above.

298 Microdiorite, etc., as above.

299 Microdiorite, Medium grey, finely crystalline, with fine disseminated Pyrite Throughout.

300 Microdiorite & Pyrite, as above.

301 Microdiorite, grey, fine, hard, with fine grains Pyrite Throughout.

Core Description, Core #5

Footage interval

302 Microdiorite, light grey, very finely crystalline, hard, with fine grains Pyrite disseminated throughout core, & flakes Pyrite concentrated on minute fracture planes.

Box #34 303 Microdiorite, as above, with accessories as above.

304 Microdiorite, Medium greenish grey, finely crystalline, green cast due to finely disseminated ~~pr~~ yellow-green Mineral, associated with Pyrite, - Pyrite, fine, Throughout.

305 Microdiorite, accessories + Pyrite, as above.

306 Microdiorite, Medium grey with greenish cast with fine grains Pyrite disseminated Throughout and especially along minute fracture planes.

307 Microdiorite, with above accessories, grey, finely crystalline, hard.

308 Microdiorite, grey with disseminated Pyrite, as above

309 Microdiorite, identical to above.

310 Microdiorite, Med. grey - Light grey, fine grains Pyrite throughout, with hairline calcite filled fractures.

311 Microdiorite, Light grey, finely crystalline, hard, fine grains Pyrite Throughout.

Box 35 312 Microdiorite, Light grey, with accessories, as above.

* 313 Microdiorite, grey groundmass enclosing, grey microdiorite fragments + fine Red-gravel quartzite inclusions. Pyrite disseminated throughout.
(quartzite inclusions)

314 Microdiorite, grey, with some fragment inclusions, as above, with thin calcite veinlet running parallel to core. fine grains Pyrite Throughout core.

* 315 Microdiorite groundmass enclosing fragments quartz + Microdiorite.

* 316 Microdiorite groundmass, quartzite + Microdiorite, fragments, Pyrite, all badly broken.

* 317 Microdiorite groundmass, grey, with finely disseminated Pyrite, Mass encloses Pebbles quartzite, brown, and fragments of microdiorite.

318 Microdiorite, medium grey, finely crystalline, hard, with fine grains ~~Pyrite~~ Pyrite disseminated Throughout.

319 Microdiorite, with accessories, as above.

320 Microdiorite, Medium grey, with fine grains Pyrite, Less than above.

321 Microdiorite and accessories, as above.

Box #36 322 Microdiorite, grey, with dissem. Pyrite throughout.

323 ~~322~~ Microdiorite, grey, finely crystalline, fine grains ~~Pyrite~~ Pyrite, on frac. faces.

324 Microdiorite, dark grey, very fine, very little Pyrite.

325 Microdiorite, Medium grey. Very fine mica specs disseminated throughout.

326 Microdiorite, Medium grey, fine, hard, Traces Pyrite.

327 Microdiorite - Medium grey, fine ~~m~~ Pyrite Throughout.

Core Descriptions Core #5

Footage interval

328 Microdiorite, light-medium grey, hard with fine Pyrite specs throughout.

329 Microdiorite, as above.

330 Microdiorite, light grey, fine, hard, fine grains Pyrite Throughout.

Box #37 331 Microdiorite, with small grains Pyrite disseminated throughout.

332 Microdiorite, light grey, fine, hard fine grained Pyrite Throughout.

333 Microdiorite, with accessories, as above.

334 Microdiorite, light grey, fine pyrite throughout.

335 Microdiorite with grains ~~crystals~~ crystals of Pyrite Throughout.

336 Microdiorite, light grey, fine, hard fine grained Pyrite.

337 Microdiorite, as above.

338 Microdiorite, grey, as above, with fine Pyrite Throughout.

339 Microdiorite, light grey, looks bleached, with fine grained Pyrite Throughout.

(Bleached appearance) 340 Microdiorite, as above.

Box #38 341 Microdiorite, light grey, bleached fine Pyrite Throughout.

" 342 Microdiorite, with accessories, identical to above.

" 343 Microdiorite. Medium green-grey, hard fine, Pyrite (fine) Throughout.

" 344 Microdiorite, as above, slightly lighter color, with disseminated Pyrite.

" 345 Microdiorite, very light grey, bleached appearance, fine Pyrite Throughout.

" 346 Microdiorite as above.

" 347 Microdiorite, identical to 346.

" 348 Microdiorite, light green grey, "bleached" few grains Pyrite throughout.

" 349 Microdiorite very light grey, coarser texture, very fine ~~[illegible]~~ Pyrite Throughout.

Box #39 350 Microdiorite, as above.

" 351 Microdiorite, light greyish green, bleached appearance, coarser texture, fine grains Pyrite Throughout.

" 352 Microdiorite, as above.

" 353 Microdiorite as 351

354 Microdiorite, Med. grey, fine, hard, greenish cast, Pyrite Throughout. fracture.

355 Microdiorite, Medium grey-green. Pyrite disseminated Throughout.

356 Microdiorite, light grey, with green mineral inclusions, Pyrite Throughout.

357 Microdiorite, with accessories, as above.

358 Microdiorite, light grey, fine grains Pyrite Throughout.

359 Microdiorite, Med. grey hard, fine, with Pyrite grains

360 Microdiorite, light grey, banded, fine, hard.

Core description Core #5

| Footage interval | | |
|---|---|---|
| Box #40 | 361 | Microdiorite, medium grey, fine, hard, traces of fine grains Pyrite throughout. |
| | 362 | Microdiorite, light grey, banded 'flow' appearance, with finely disseminated Pyrite. |
| | 363 | Microdiorite, similar to above. |
| | 364 | Microdiorite, light grey, but coarser textured than above, with fine Pyrite. |
| | 365 | Microdiorite, light grey, fine textured with very finely disseminated Pyrite. |
| | 366 | Microdiorite, light grey, coarser, "bleached" with fine grains Pyrite. |
| | 367 | Microdiorite, light grey, finely ~~textu~~ crystalline, hard, traces Pyrite. |
| | 368 | Microdiorite, medium grey, very fine, traces Pyrite. |
| | 369 | Microdiorite, as above hard, fine, little Pyrite. |
| | 370 | Microdiorite, light grey, fine, hard, with increase in Pyrite content. |
| | | + Pyrite in fracture zone, 4 mm. wide |
| Box #41 | 371 | Microdiorite, light grey, fine, hard, with finely disseminated Pyrite throughout. |
| | 372 | Microdiorite, as above |
| | 373 | Microdiorite, as above. |
| | 374 | Microdiorite, light grey, with greenish inclusions + fine grains Pyrite throughout. |
| | 375 | Microdiorite, as above; increase in Pyrite content. |
| | 376 | Microdiorite as above, with Pyrite, as above. |
| | 377 | Microdiorite, light grey, hard, with finely disseminated Pyrite throughout. |
| | 378 | Microdiorite, identical to above. |
| Box #42 | 379 | Microdiorite, light grey, hard, with fine grains Pyrite throughout. |
| | 380 | Microdiorite, as above, with Pyrite. |
| | 381 | Microdiorite, as above, identical |
| | 382 | Microdiorite, as above 3" then grading to Microdiorite, light grey finely crystalline, with disseminated Pyrite. |
| | 383 | Microdiorite, light grey hard, with fine grains Pyrite throughout. |
| | 384 | Microdiorite, med. grey, finely crystalline, hard conchoidal fracture, with very fine Pyrite dissemination. |
| | 385 | Microdiorite, as above, with accessories, one calcite veinlet |
| | 386 | Microdiorite, as above. |
| | 387 | Microdiorite, medium grey, finely crystalline, hard with finely disseminated Pyrite. |
| | 388 | Microdiorite, medium grey, very fine textured, conchoidal, hard, finely disem. Pyrite. |
| Box #43 | 389 | Microdiorite, with accessories, as above. |
| | 390 | Microdiorite, light grey, hard, with very finely disseminated Pyrite. |
| | 391 | Microdiorite, light grey, as above, with disem. Pyrite, also Pyrite concentration in minute fractures. |

Core Description, Core #5.

| Footage interval | | |
|---|---|---|
| | 392 | Microdiorite, light grey, finely crystalline, hard, with specs pyrite finely disseminated throughout. few thin calcite veinlets with pyrite concentration. |
| | 393 | Microdiorite, light grey, with same accessories as above. |
| | 394 | Microdiorite, light grey, with increase in pyrite dissemination throughout. |
| | 395 | Microdiorite, as above, identical |
| | 396 | Microdiorite, medium grey, hard, conchoidal with very fine specs pyrite + some larger grains throughout, pyrite concentration along fracture faces. |
| | 397 | Microdiorite, similar to above |
| Box #14 | 398 | Microdiorite, ~~light~~ medium grey, finely crystalline, hard, fine specs pyrite disseminated thru. |
| | ~~399~~ 399 | Microdiorite, as above, with fine grains pyrite throughout. |
| | 400 | Microdiorite, medium grey, fine, conchoidal frac, very finely disem. pyrite, + along minute fracs. |
| | 401 | Microdiorite, as above with accessories as above |
| | 402 | Microdiorite, medium grey, finely crystalline, with fine disseminated pyrite. |
| | 403 | Microdiorite, medium grey, hard conchoidal, fine pyrite. |
| | 404 | Microdiorite, medium grey finely crystalline, with very fine grains pyrite throughout. |
| | 405 | Microdiorite, as above, with accessories, also pyrite concentration on fracture planes. |
| | 406 | Microdiorite, medium grey, finely crystalline, hard, fine grains pyrite throughout. |
| pyrite increase. * | 407 | Microdiorite, as above, with increase in pyrite content + size of grains. |
| Box #15 | 408 | Microdiorite, medium grey - greenish grey, finely crystalline, hard, with |
| hornblende needles | | scattered inclusions of black, ferromagnesian mineral (hornblende?) about |
| " | | 2 MM. in x sec. also increase in pyrite inclusions 1-2 MM. x sec. |
| " | 409 | Microdiorite, identical to above, with pyrite concentration in minute fractures. |
| " | 410 | Microdiorite, with accessories as 408. |
| " | 411 | Microdiorite, medium grey with blades of hornblende(?) + few calcite inclusions. |
| " | | with fine grains pyrite throughout. |
| " | 412 | Microdiorite, as above, identical. |
| " | 413 | Microdiorite, as above, with concentration of pyrite along fracture planes. |
| " | 414 | Microdiorite, medium grey, with blades of hornblend. (1-3 MM) scattered |
| " | | throughout, with finely disseminated pyrite. |
| " | 415 | Microdiorite, as above. pyrite concentration on fractures. |
| " | 416 | Microdiorite, medium grey with hornblende needles scattered throughout |
| | | some grains pyrite disseminated throughout, with concentration on fractures. |
| Box #16 | 417 | Microdiorite, medium grey, hard, finely crystalline, with scattered hornblende |
| | | needles and finely disseminated pyrite. |

Core Description, core #5

Footage interval

418. Microdiorite, medium grey, fine, hard, with finely disseminated Pyrite.

419 Microdiorite, identical to above.

420. Microdiorite, medium grey hard, with fine grains Pyrite throughout.

421. Microdiorite, as above.

422 Microdiorite, Medium grey, finely crystalline, hard, with scattered fine grains Pyrite.

423 Microdiorite, as above. grading into Microdiorite, Medium grey with inclusions, (Phenocrysts) of Hornblende, Pyrite rare.

(hornblende phenocrysts) 424 Hornblende Andesite, Medium Grey with Hornblende Phenocrysts (5X 8 MM. x sec.) largest, with Pyrite throughout

425 Hornblende andesite, with Pyrite, as above

Box # 17 426 Hornblende andesite, with large Phenocrysts of Hornblend, Pyrite Throughout core & on fracture Planes

427 Hornblende andesite, Medium grey, with Phenocrysts & Pyrite as above

428 Hornblende andesite, and accessories, as above

429 Hornblende andesite, etc as above

430 Hornblende andesite, Med. grey with above accessories, grading to Microdiorite, grey at 430.9'

431 Microdiorite, medium grey, fine crystalline, with fine flakes disseminated Pyrite Throughout.

432 Microdiorite, medium grey, and accessories, as above.

433 Microdiorite, etc, as above,

434 Microdiorite, etc. as above,

435 Microdiorite, light to medium grey, finely crystalline, with fine disseminated Pyrite Throughout.

Box # 18 436 Microdiorite, light grey, fine, with flakes & inclusions of Pyrite Throughout.

437 Microdiorite, and accessories, as above grading into Microdiorite medium grey, very finely crystalline

438 Microdiorite, Medium grey, very finely crystalline, with flecs of Pyrite Throughout

439 Microdiorite, as above, becoming light grey, increase in Pyrite content, few calcite veinlets.

440 Microdiorite, as above, with 2" shattered, calcite filled zone, some iron staining, Pyrite Throughout

441 Microdiorite, Medium grey, very fine, Pyritic.

442 Microdiorite, & accessories, as above.

443 Microdiorite, medium grey, very finely crystalline, with finely disseminated Pyrite.

Box #19. 444 Microdiorite, as above.

445 Microdiorite, Medium grey, with greenish tinge, Pyrite, rare, only as occasional flecs Throughout

446 Microdiorite, as above, grading to light colored Microdiorite, with more Pyrite

447 Microdiorite, light grey, with disseminated Pyrite

448 Microdiorite, light grey, with much fine Pyrite scattered throughout, fine hairline flecs, slickenslide

449 Microdiorite, As above. grading to darker Microdiorite with greenish tinge.

450 Microdiorite, Med. grey, very finely crystalline, greenish tinge, Rare Pyrite, very fine, Throughout.

Core Description, Core No 5

| Footage interval | |
|---|---|
| 151 | Microdiorite, light grey, very finely crystalline, greenish tinge, Rare pyrite |
| 152 | Microdiorite, as above, with streaks dark grey Microdiorite, conchoidal frac. rare pyrite |
| 153 | Microdiorite, Medium to dark grey, very fine, as above. |
| Broken interval 154 | Microdiorite, as above, badly shattered. Pyrite rare, some calcite on thin ~~frac~~ fractures |
| 155 | Microdiorite, as above. |
| 156 | Microdiorite, light grey, finely crystalline, with fine pyrite disseminated Throughout. |
| 157 | Microdiorite, with accessories as above. |
| 158 | Microdiorite, light grey, finely crystalline, some fine disseminated pyrite |
| 159 | Microdiorite, identical to above, with few hairline fractures. |
| 160 | Microdiorite, light grey, very finely crystalline, few fine flakes Pyrite Throughout. |
| shattered 161 | Microdiorite, as above. shattered, calcite filled fractures, traces of iron stain. |
| 162 | Microdiorite, light grey, very finely crystalline, greenish tinge. few thin fractures |
| 163 | Microdiorite, as above, fine pyrite throughout, with concentration on frac. planes |
| shattered 164 | Microdiorite, Medium grey, fine crystalline, broken. |
| shattered 165 | Microdiorite, as above, badly shattered, lean recovery, pyrite or staining rare |

CORE NO. 5

466 - 476 Microdiorite, medium light gray, very fine, finely crystalline few thin calcite filled veinlets throughout. Pyrite dissemination throughout, more concentrated along fracture planes. Zone ln lower part of 471 broken, Limonite and Hermatite staining on fracture faces. (2").

476 - 481.5 Microdiorite, light, medium gray. More coarsely crystalline. Pyrite in minor quantity disseminated throughout. A greater amount of Pyrite is concentrated along minute fracture planes. A few, hairline calcite filled veinlets.

481.5 - 486 Microdiorite, medium gray finely crystalline, with occasional thin (1-2 MM) calcite filled veinlets. Pyrite throughout but less common than above.

486 - 496 Microdiorite, medium gray, finely crystalline, with dark inclusions of Hornblende (± 2 MM cross section) scattered throughout. Few grains Pyrite scattered throughout, more along minute fracturefaces. Core from 492.5 - 495 shattered due to concentration of closely spaced calcite filled veinlets. No ironstaining.

496 - 505 Microdiorite, as above, with occasional breaks due to calcite filled fractures. Pyrite present, but rare.

505 - 515 Microdiorite, medium gray, finely crystalline, 505-507 with minute Hornblende (2) inclusions scattered throughout. Remainder of interval, shattered in places due to Calcite veinlets. Pyrite grains throughout, generally rare. More Pyrite concentrated along minute fracture planes.

515-525 515 - 517, Microdiorite medium gray, very finely crystalline, hard, with conchoidal fractures. Fine specks Pyrite throughout, grading into (517-525) Microdiorite, medium gray, finely crystalline with increase in Pyrite scattered throughout and more along minute fracture planes. Few thin, Calcite filled veinlets throughout interval.

525 - 535 525 - 531, Microdiorite ground mass, light gray with slight greenish tinge, Pyrite scattered throughout, groundmass encloses fragments of darker gray and light gray, very finely crystalline Microdiorite. 531.5 - 532, consists of a light tan gray quartzite inclusion. 532 - 535, Microdiorite, medium gray, very finely xln. Pyrite grains throughout but rare.

535 - 545 Microdiorite, light gray, finely crystalline, solid throughout with only one thin Calcite veinlet. Much finely disseminated Pyrite scattered throughout from 535 - 538, less thereafter.

545 - 554 Microdiorite, light gray finely crystalline, few grains Pyrite throughout, but with increase and concentration of Pyrite along minute fracture planes, in interval 546-548.

554 - 563 554 - 559, Microdiorite, medium gray, finely crystalline, pyrite rare except along minute fracture planes. One calcite filled shatter zone, ½" wide at 557. (No staining).
559 - 563, Microdiorite as above, enclosing occasional fragments of light medium gray Microdiorite.

563 - 572 Microdiorite, light gray, finely crystalline, with fair amount of scattered Pyrite grains and streaks throughout. Numerous hairline thin veinlets filled with Calcite.

572 - 582 Microdiorite, medium gray finely crystalline, uniform, hard, with very little detectable Pyrite.

582 - 592 Microdiorite, medium gray, as above, very little Pyrite except on occasional minute fracture face, 586 shattered, with numerous thin Calcite veinlets and Calcite inclusions, no iron staining.

5 92 - 602 Microdiorite, light, medium gray, finely crystalline, uniform, hard, with very little Pyrite. Slight increase in Pyrite from about 600 - 602.

602 - 612 Microdiorite, light gray (602) grading to medium gray, with occasional inclusions of gray Microdiorite, finer texture. Many thin Calcite veinlets throughout interval. Pyrite very rare, occasional concentration along minute fractures. Core shattered near base due to interval of closely spaced Calcite veinlets, some iron staining on Calcite.

612 - 621 Microdiorite, light gray with inclusions of darker gray Microdiorite. Thin Calcite veinlets throughout. One well developed vug, crystal lined at 616. Core broken in places along veinlets, with traces iron staining. Pyrite is very rare to absent in this interval.

621 - 630 Microdiorite, light medium gray enclosing fragments of darker gray Microdiorite. Hairline thin veinlets of Calcite throughout. Pyrite present only as rare occasional grain in upper part of interval, slight increase in grains Pyrite in lower part.

630 - 640 Microdiorite, as above, with inclusions of darker Microdiorite. Few Calcite filled veinlets, and occasional grains Pyrite throughout.

640 - 649 640 - Microdiorite. medium gray, finely crystalline, with (pebble) inclusion of tan-gray quartzite. Inclusions of darker gray Microdiorite scattered throughout interval (640 - 649). Few thin Calcite stringers. Fair amount of Pyrite disseminated throughout interval.

649 - 659 Microdiorite, light, medium gray with inclusions of darker gray Microdiorite scattered throughout. Pyrite concentration increasing with much disseminated Pyrite throughout interval.

659 - 668 Microdiorite, light gray, finely crystalline, hard. Occasional pebble inclusion of tan-gray quartzite, much fine grained Pyrite disseminated throughout interval, with concentrations along minute fracture planes.

668 - 677 668 - 672, Microdiorite, light gray, as above, with much disseminated Pyrite.
672 - 677, Microdiorite, medium gray, very finely crystalline, hard, with little to no Pyrite throughout.

677 - 686 677 - 679, Microdiorite, as 672 - 677.
679 - 686, Microdiorite, light gray with Pyrite well disseminated throughout.

686 - 695 Microdiorite, light gray with inclusions of darker gray Microdiorite, fair amount of Pyrite flakes and inclusions throughout.

| | |
|---|---|
| 695 - 706 | Microdiorite, light, medium gray, finely crystalline, hard, with pyrite content diminishing. |
| 706 - 715 | Microdiorite, light gray, finely crystalline, very little Pyrite throughout interval except some concentration along minute fracture planes. |
| 715 - 724.5 | Microdiorite, light gray, finely crystalline, uniform,hard, with inclusions of olive-green mineral ± 4MM cross sec. few grains Pyrite throughout but very rare. |
| 724.5-734 | Microdiorite, with accessory mineral as above, few grains rare Pyrite, few thin Calcite filled veinlets throughout. |
| 734 - 744 | Microdiorite, light, medium gray with occasional inclusions of olive-green, yellow-green mineral, few grains rare Pyrite throughout interval, few hairline thin Calcite veinlets. |
| 744 - 753 | Microdiorite, as above, with numerous thin Calcite veinlets, grains rare Pyrite throughout. Ironstaining on Calcite ½" veinlet 745 - 746. |
| 753 - 757 | Microdiorite, medium gray finely crystalline, broken, numerous thin Calcite veinlets. No visible Pyrite in this interval. |
| Bottom | Bottom of core 757' |

# APPENDIX B

## Assay Results From Sampling

| Sample No. | Assay Au | Assay Ag | Location |
|---|---|---|---|
| SM -1-1 | Trace | Trace | Hole 1, 33-35 ft. |
| SM -1-2 | Trace | Trace | Hole 1, 40-50 ft. |
| SM -1-3 | Trace | Trace | Hole 1, 56-66 ft. |
| SM -1-4 | Trace | Trace | Hole 1, 66-70 ft. |
| SM -1-5 | Trace | Trace | Hole 1, 91.5-93.5 ft. |
| SM -1-6 | Trace | Trace | Hole 1, 143 ft. |
| SM -1-7 | Trace | Trace | Hole 1, 237-241 ft. |
| SM -1-8 | Trace | Trace | Hole 1, 244-246 ft. |
| SM -1-9 | Trace | Trace | Hole 1, 256-260 ft. |
| SM -1-10 | Trace | Trace | Hole 1, 260-265 ft. |
| SM -1-11 | Trace | Trace | Hole 1, 265 -268 ft. |
| SM -1-12 | Trace | Trace | Hole 1, 274-283 ft. |
| SM -1-13 | Trace | Trace | Hole 1, 283-287 ft. |
| SM -1-14 | Trace | Trace | Hole 1, 287-292 ft. |
| SM -1-15 | Trace | Trace | Hole 1, 292-297 ft. |
| SM -1-16 | Trace | Trace | Hole 1, 297-302 ft. |
| SM -1-17 | Trace | Trace | Hole 1, 302-307 ft. |
| SM -1-18 | Trace | Trace | Hole 1, 307-312 ft. |
| SM -1-19 | Trace | Trace | Hole 1, 312-317 ft. |
| SM -1-20 | Trace | Trace | Hole 1, 317-321 ft. |
| SM -1-21 | Trace | Trace | Hole 1, 321-326 ft. |
| SM -1-22 | Trace | Trace | Hole 1, 326-330 ft. |
| SM -1-23 | Trace | Trace | Hole 1, 331-335 ft. |
| SM -1-24 | Trace | Trace | Hole 1, 335-340 ft. |
| SM -1-25 | Trace | Trace | Hole 1, 340-345 ft. |
| SM -1-26 | Trace | Trace | Hole 1, 345-350 ft. |
| SM -1-27 | Trace | Trace | Hole 1, 350-355 ft. |
| SM -1-28 | Trace | Trace | Hole 1, 355-359 ft. |
| SM -1-29 | Trace | Trace | Hole 1, 375-380 ft. |
| SM -1-30 | Trace | Trace | Hole 1, 441-443 ft. |
| SM -1-31 | Trace | Trace | Hole 1, 552-555 ft. |
| SM -1-32 | Trace | 0.10 | Hole 1, 555-558 ft. |
| SM -1-33 | .06 | 1.35 | Hole 1, 558-561 ft. |
| SM -1-34 | .01 | .20 | Hole 1, 561-564 ft. |
| SM -1-35 | Trace | Trace | Hole 1, 564-569 ft. |
| SM -1-36 | .07 | 6.35 | Hole 1, 671-678 ft. |
| SM -1-37 | .18 | 15.8 | Hole 1, 721-722 ft. |
| SM -1-38 | .09 | 9.50 | Hole 1, 719-721 ft. |
| SM -1-39 | Trace | .10 | Hole 1, 722-724 ft. |
| | | | 39 |
| SM -4-1 | Trace | Trace | Hole 4, 1-5 ft. |
| SM -4-2 | Trace | Trace | Hole 4, 5-10 ft. |
| SM -4-3 | Trace | Trace | Hole 4, 10-12 ft. |
| SM -4-4 | Trace | Trace | Hole 4, 20-25 ft. |
| SM -4-5 | Trace | Trace | Hole 4, 38-44 ft. |
| SM -4-6 | Trace | Trace | Hole 4, 63-69 ft. |
| SM -4-7 | Trace | Trace | Hole 4, 252-254 ft. |
| SM -4-8 | Trace | Trace | Hole 4, 268-273 ft. |
| SM -4-9 | Trace | Trace | Hole 4, 273-277 ft. |
| SM -4-10 | Trace | Trace | Hole 4, 293-297 ft. |
| SM -4-11 | Trace | Trace | Hole 4, 297-302 ft. |
| SM -4-12 | Trace | Trace | Hole 4, 302-307 ft. |
| SM -4-13 | Trace | Trace | Hole 4, 307-312 ft. |
| SM -4-14 | Trace | Trace | Hole 4, 312-317 ft. |
| SM -4-15 | Trace | Trace | Hole 4, 321-326 ft. |
| SM -4-16 | Trace | Trace | Hole 4, 326-330 ft. |
| SM -4-17 | Trace | Trace | Hole 4, 353-357 ft. |
| SM -4-18 | Trace | Trace | Hole 4, 357-362 ft. |
| SM -4-19 | Trace | Trace | Hole 4, 396-401 ft. |
| SM -4-20 | Trace | Trace | Hole 4, 401-406 ft. |
| SM -4-21 | Trace | Trace | Hole 4, 430-435 ft. |
| | | | 21 |

# APPENDIX B

Surface & underground samples

| Sample No. | Assay Au | Assay Ag | Location |
|---|---|---|---|
| SM -20-1 | 0.10 | 11.10 | Bluebird vein at surface above Silver King drift. |
| SM -20-2 | Trace | Trace | 20 ft. mineralized zone at surface. |
| SM -20-3 | 0.03 | 32.75 | Channel sample across 4 ft. vein cut in Silver King drift. |
| SM -20-4 | 0.02 | 00.80 | Sample across 18 inch vein out in Silver King drift. |
| SM -20-5 | Trace | Trace | Chip sample across 2 ft. vein structure outcropping near drill station No. 5. |
| SM -20-6 | Trace | Trace | Channel sample across 5 ft. oxidized structure near drill hole No. 5. |
| SM -20-7 | Trace | 0.20 | 2 ft. surface vein. |
| SM -20-8 | Trace | 0.20 | Copper stained veinlets. |
| SM -20-9 | 0.47 | 1.10 | Surface vein structure about 18 inches wide - channel sample. |
| SM -20-10 | Trace | Trace | Copper stained veinlets. |
| SM -20-11 | Trace | Trace | 4 ft. wide barite vein on Treasure claim. Channel sample. |
| SM -20-12 | Trace | Trace | 2 ft. wide barite vein on Treasure claim. Channel sample. |
| SM -20-13 | 0.02 | 10.60 | Channel sample across 5 ft. of Treasure dump. |
| SM -20-14 | Trace | 1.60 | Channel sample across north 7 ft. of 12 ft. vein structure exposed near trailer. |
| SM -20-15 | Trace | 0.20 | Channel sample across south 5 ft. of 12 ft. vein structure exposed near trailer. |

. R. E. CASTO  P. M. CRISMON  ORRIN FISHER  HAROLD E. CULVER

# CRISMON & NICHOLS

ASSAYERS AND CHEMISTS

PHONE EM 3-7417  229-231 SOUTH WEST TEMPLE STREET  P. O. Box 1708

## REPORT OF ASSAY

SALT LAKE CITY, UTAH January 31, 1967

Big Treasure Mining & Development Co. PAGE TWO

WE HAVE ASSAYED YOUR sixty-six SAMPLES AND FIND them TO CONTAIN AS FOLLOWS:

| DESCRIPTION | NO. | OZS. GOLD PER TON | OZS. SILVER PER TON | PER CENT LEAD | PER CENT COPPER | PER CENT ZINC | PER CENT INSOL. | PER CENT IRON | PER CENT | VALUE OF GOLD PER TON |
|---|---|---|---|---|---|---|---|---|---|---|
| SM | ~~4-4~~ | ~~Trace~~ | ~~Trace~~ | | | | | | | |
| " | 4-5 | Trace | Trace | | | | | | | |
| " | 4-6 | Trace | Trace | | | | | | | |
| " | 4-7 | Trace | Trace | | | | | | | |
| " | 4-8 | Trace | Trace | | | | | | | |
| " | 4-9 | Trace | Trace | | | | | | | |
| " | 4-10 | Trace | Trace | | | | | | | |
| " | 4-11 | Trace | Trace | | | | | | | |
| " | 4-12 | Trace | Trace | | | | | | | |
| " | 4-13 | Trace | Trace | | | | | | | |
| " | 4-14 | Trace | Trace | | | | | | | |
| " | 4-15 | Trace | Trace | | | | | | | |
| " | 4-16 | Trace | Trace | | | | | | | |
| " | 4-17 | Trace | Trace | | | | | | | |
| " | 4-18 | Trace | Trace | | | | | | | |
| " | 4-19 | Trace | Trace | | | | | | | |
| " | 4-20 | Trace | Trace | | | | | | | |
| " | 4-21 | Trace | Trace | | | | | | | |
| 18 " | 20-1 | 0.10 | 11.10 | | | | | | | $ 3.50 |
| " | 20-2 | Trace | Trace | | | | | | | |
| " | 20-3 | 0.03 | 32.75 | 1.95 | | | | | | $ 1.05 |
| " | 20-4 | 0.02 | 0.80 | None | | | | | | 70¢ |
| " | 20-5 | Trace | Trace | | | | | | | |
| " | 20-6 | Trace | Trace | | | | | | | |
| " | 20-7 | Trace | 0.20 | | | | | | | |
| " | 20-8 | Trace | 0.20 | | 0.60 | | | | | |
| " | 20-9 | 0.47 | 1.10 | | 4.40 | | | | | $ 16.45 |
| " | 20-10 | Trace | Trace | | 0.15 | | | | | |
| " | 20-11 | Trace | Trace | | | | | | | |
| " | 20-12 | Trace | Trace | | | None | | | | |
| " | 20-13 | 0.02 | 10.60 | 0.10 | | 0.20 | | | | 70¢ |
| " | 20-14 | Trace | 1.60 | | | | | | | |
| " | 20-15 | Trace | 0.20 | | | | | | | |

REMARKS:

CHARGES $ 211.50

CRISMON & NICHOLS

BY P. M. Crismon

. R. R. CASTO  P. M. CRISMON  ORRIN FISHER  HAROLD E. CULVER

# CRISMON & NICHOLS

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| DESCRIPTION | NO. | OZS. GOLD PER TON | OZS. SILVER PER TON | PER CENT LEAD | PER CENT COPPER | PER CENT ZINC | PER CENT INSOL. | PER CENT IRON | PER CENT | VALUE OF GOLD PER TON |
|---|---|---|---|---|---|---|---|---|---|---|
| SM | 4-4 | Trace | Trace | | | | | | | |
| " | 4-5 | Trace | Trace | | | | | | | |
| " | 4-6 | Trace | Trace | | | | | | | |
| " | 4-7 | Trace | Trace | | | | | | | |
| " | 4-8 | Trace | Trace | | | | | | | |
| " | 4-9 | Trace | Trace | | | | | | | |
| " | 4-10 | Trace | Trace | | | | | | | |
| " | 4-11 | Trace | Trace | | | | | | | |
| " | 4-12 | Trace | Trace | | | | | | | |
| " | 4-13 | Trace | Trace | | | | | | | |
| " | 4-14 | Trace | Trace | | | | | | | |
| " | 4-15 | Trace | Trace | | | | | | | |
| " | 4-16 | Trace | Trace | | | | | | | |
| " | 4-17 | Trace | Trace | | | | | | | |
| " | 4-18 | Trace | Trace | | | | | | | |
| " | 4-19 | Trace | Trace | | | | | | | |
| " | 4-20 | Trace | Trace | | | | | | | |
| " | 4-21 | Trace | Trace | | | | | | | |
| " | 20-1 | 0.10 | 11.10 | | | | | | | $ 3.50 |
| " | 20-2 | Trace | Trace | | | | | | | |
| " | 20-3 | 0.03 | 32.75 | 1.95 | | | | | | $ 1.05 |
| " | 20-4 | 0.02 | 0.80 | None | | | | | | 70¢ |
| " | 20-5 | Trace | Trace | | | | | | | |
| " | 20-6 | Trace | Trace | | | | | | | |
| " | 20-7 | Trace | 0.20 | | | | | | | |
| " | 20-8 | Trace | 0.20 | | 0.60 | | | | | |
| " | 20-9 | 0.47 | 1.10 | | 4.40 | | | | | $ 16.45 |
| " | 20-10 | Trace | Trace | | 0.15 | | | | | |
| " | 20-11 | Trace | Trace | | | | | | | |
| " | 20-12 | Trace | Trace | | | None | | | | |
| " | 20-13 | 0.02 | 10.60 | 0.10 | | 0.20 | | | | 70¢ |
| " | 20-14 | Trace | 1.60 | | | | | | | |
| " | 20-15 | Trace | 0.20 | | | | | | | |

REMARKS:

CHARGES $ 211.50

CRISMON & NICHOLS

BY Crismon

Denver Federal Center-Building 25- Room 2284
Denver, Colorado 80225

OFFICIAL COPY

January 30, 1967

Mr. David H. Kimball, President
Big Treasure and Development Company
125 Sedgefield
San Ramon, California 94583

Subject: OME-6548 (Silver)
Big Treasure Mining and Development Company
Little Treasure-Adjust Mines
Pinal County, Arizona
Contract 2231

Dear Mr. Kimball:

see Kane memo 1/13/67 in folder # 2 w/voucher

In your monthly operator's report for December, 1966 you billed the Government for a total footage of 657 feet of BX wireline drilling from 0 - 500 feet at a cost of $4,204.80. It was found necessary to disallow this amount in your voucher because of the fact that there is no figure shown for BX wireline drilling between 0 and 500 feet in the subject contract.

In your contract, under the estimated cost of the work, Stage I, core drilling, the various categories of NX wireline and BX wireline with accompanying costs at appropriate depths are listed. We are in the process of executing an amendment in an attempt to allow you to recover this sum.

It will be necessary for us to include in that breakdown the cost of $6.40 a foot that was charged by the Boyles Drilling Company. I discussed this problem with Mr. Hansen during an interim examination which was made on the property on January 19, 1967.

In preparing the amendment to cover this footage, we are wondering now if the contract should not read "that drilling should not be done below AX wireline size". This is in the event that any of the deeper holes, 500 and 1,000, feet or between 1,000 and 1,500 feet cannot be finished BX wireline size it might be necessary to reduce the hole to AX wireline size, if there is not a bid figure shown here you will not be able to claim costs for that footage either.

It might be advisable for you to contact the drilling company and ask them for a quotation for a reasonable amount of AXWL footage between 500 and 1,000 feet and 1,000 to 1,500 feet so that we might include this in the present amendment and thus avoid losing any time in having to write an additional amendment at a later date. You might give this some thought and have Mr. Hansen contact me next week after his return from Arizona.

Sincerely yours,

J. William Hasler

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

cc: Chief, OME ✓
Hasler chron
OME chron
2231

UNITED STATES
DEPARTMENT OF THE INTERIOR
OFFICE OF MINERALS EXPLORATION

Denver Federal Center - Building 25- Room 2284
Denver, Colorado 80225

OFFICIAL COPY
OME RECEIVED
JAN 31 1967

January 27, 1967

Memorandum

To: Chief, OME

From: Field Officer, Region III

Subject: OME-6548 (Silver)
Big Treasure Mining and Development Company
Little Treasure and Adjust Mines
Pinal County, Arizona
Contract 2231

Enclosed are two copies (the Government's copy and the Budget and Finance copy) of Amendment No. 1 to the subject contract. The amendment has been signed both by the Government and by the Operator. The amendment was given to the operator during an interim examination of the property on January 19, 1967. It was mailed to the applicant's president, signed, and returned to this office. We are therefore transmitting it on to you.

Amendment No. 1 consists of two pages and includes claims map of Big Treasure Mining and Development Company property.

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

Enclosures

MME Form 7
(2/63)

OFFICIAL FILE COPY

| Date | Surname | Code |
|---|---|---|
| 1/6/67 | B.M. Smith | |
| 1/6/67 | Kirkemo | |
| 1/9/67 | Jones | |
| | Bolen | |
| 1/12 | cae | 210 |
| | | 120M |
| | | |
| | | |
| | | |

**AIRMAIL**

**Memorandum**

JAN 12 1967

**To:** Field Officer, Region III

**From:** Chief, Office of Minerals Exploration

**Subject:** OME-6548 (Silver)
Big Treasure Mining and Development Co.
Little Treasure and Adjust Mines
Pinal County, Arizona
Contract 2231

Enclosed are the original and three copies of proposed Amendment No. 1 (2 pages), signed for the Government. An extra copy is enclosed for field use.

If the proposed amendment is satisfactory to you and the Operator, all four copies should be signed by an authorized representative of the Operator and distributed in the usual manner.

If any part of the proposed amendment does not have your approval or that of the Operator, the original and all copies are to be returned to this office together with the proposed changes for consideration.

Frank E. Johnson

Enclosures

cc: Director's Reading File
Division File
Economic Geology File
OME Docket
OME Reading File
130
Mr. Smith

MMerrithew/mm (1/6/67)

P.S. (added 1/12/67) The Operator's request to drill proposed Hole 3 in Stage I instead of Stage II is denied because such a change would be premature at present and actually may never become necessary. If the results of Holes 1 and 2 are favorable, Stage II can be authorized immediately and Hole 3 can be drilled in sequence. If 1 and 2 are not favorable, then the potential of Hole 3 should be reassessed. Additional justification for an amendment would then be required.

23263

Denver Federal Center-Building 25-Room 2284
Denver, Colorado 80225

OFFICIAL COPY

January 11, 1967

Mr. Spenst M. Hansen, Ph. D.
Big Treasure Mining and Development Company
125 Sedgefield Court
San Ramon, California 94583

Subject: OME-6348 (Silver)
Big Treasure Mining and Development Company
Little Treasure and Adjust Mines
Pinal County, Arizona
Contract 2231

Dear Mr. Hansen:

We received in this morning's mail your letter dated January 4, 1967 enclosing four copies each of MME Form 60 (Operator's Monthly Voucher) and MME Form 61 (Operator's Progress Report) and narrative report for the month of December on the above mentioned subject.

As soon as these reports have been gone over, they will be transmitted promptly to the Washington office for processing.

Sincerely yours,

J. William Hasler

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

cc: Chief, OME
Hasler chron
OME chron
2231

UNITED STATES
DEPARTMENT OF THE INTERIOR
OFFICE OF MINERALS EXPLORATION

Denver Federal Center-Building 25- Room 2284
Denver, Colorado 80225

January 5, 1967

Memorandum

To: Chief, OME

From: Field Officer, Region III

Subject: OME-6548 (Silver)
Big Treasure Mining and Development Company
Little Treasure-Adjust
Pinal County, Arizona
Contract 2231

The operator in a request dated December 30, 1966 proposes an amendment to the present contract to drill three diamond drill holes from the face of the Silver King Drift as follows:

"Hole U-1: An approximately horizontal hole (inclined 2° (+30°) upward for ease of drilling and circulation) extending S 05° W from the end of the Silver King drift. Hole length--500 feet. This hole would end between 200 and 250 feet from the outer boundary of the premises. ?

Hole U-2: A horizontal hole (similar to U1) drilled in a direction S 30° W with a 500 ft. length. This hole would also be drilled from the station at the end of the Silver King drift. The end of this hole would be 350 to 400 ft. from the outer boundary of the premises.

Hole U-3: An inclined hole (35° below the horizontal) in a direction S 17-1/2 W. The length of this hole is 650 feet. This hole would end about 300 feet from the outer boundary. Holes U1 and U2 will provide two points of intersection of the Bluebird vein at 300+ feet below the outcrop while hole U3 will give a third intersection between 150 to 200 feet below the first two. The angles of intersection will be better than the 45 degree inclined holes 7A and 7B from the surface. Further, the third intersection will provide a better three dimensional picture of the vein structure."

The estimated cost of the proposed amendment will increase the cost of the present contract by $2,045.00 according to calculations made by the operator.

In a memorandum dated December 7, 1966 under Item 2, the problems involved in drilling holes 7A and 7B were discussed, and the following recommendations

are now proposed, providing the operator will rehabilitate the tunnel at his own expense.

It is deemed advisable to drill the proposed U-1 hole at an angle of +30 degrees rather than at a +2 degrees as proposed by the operator. The U-1 hole if drilled at a +35 degrees should intersect the downward extension of the Bluebird vein at a point somewhat greater than 300 feet below the lowest known workings. The hole should be drilled to a depth of 600 feet to assure penetration into the area of projection of the veins that crop out farther south (see attached schematic cross section).

Proposed drill hole U-2 should be drilled horizontally from the end of the Silver King drift and can be drilled on a bearing of S 30° W. I think this hole should be drilled only after the results of the U-1 hole are known. If the results of Hole U-1 are favorable then hole U-2 should be drilled. I don't think proposed hole U-3 at a vertical angle of -35 degrees is warranted in any instance. We are interested only in exploring for the veins at depth, not delineating the ore bodies.

The operator's proposed cost of $2,045.00 for the proposed work appears too high. I cannot see why slabbing out as much as 30 feet of rock and tramming it a few hundred feet should take 10 days. I would recommend using 10 foot rods, and should only need a breakage of some 14 feet (see diagrammatic sketch).

Finally, I would recommend that the costs appropriated for drill 7A and 7B be transferred to drill proposed holes U-1 and U-2 as recommended herein and that an amendment be prepared to permit the completion of holes U-1 and U-2.

J. William Hasler

**BIG TREASURE** *Mining and Development Company*

ARIZONA OFFICE
P. O. Box 663 • Winkelman, Arizona

MAIN OFFICE
125 Sedgefield • San Ramon, California 94583
Phone (415) 828-4126

OFFICIAL COPY
O. M. E.
RECEIVED
JAN 3 1967
INITIALS CODE
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RA 1208
HK 1204

December 30, 1966

Mr. J. William Hasler
Field Officer, Region III
Office of Minerals Exploration
U.S. Geological Survey
Federal Center
Denver, Colorado 80225

Subject: OME - 6548 (Silver) Big Treasure Mining and Development Company, Little Treasure and Adjust Mines, Pinal County, Arizona, Contract 2231.

Dear Mr. Hasler

The purpose of this letter is to request an amendment to the above named OME contract. In our application of February 28, 1966, we recommended that certain underground drilling be done from a station constructed at the end of the Silver King drift in order to explore the Bluebird vein at a depth of from 300 to 400 feet beneath the surface. Subsequently, through the efforts of OME representatives and ourselves, modifications were made to this portion of the exploration program. When Contract 2231 was issued on October 12, 1966, the underground drilling was replaced entirely by two surface drill holes (7A and 7B) which were planned to intersect the Bluebird vein at about the same depth beneath the surface. As we pointed out in our letter to you of December 2, 1966, it is not possible to move the drill rigs to the drill site locations specified for holes 7A and 7B because of steepness of terrain and other unfavorable topographic features. In order to make certain that we were not mistaken in our appraisal of the difficulties involved, we called in representatives from the construction company doing the road work (Charlie Nichols, Heavy Equipment Contractor, Globe, Arizona), and the District Manager for Boyles Brothers Drilling Company. Both agreed that it is not possible to move the drill rigs to the drill site locations shown on the contract without a prohibitive amount of road construction.

We are then still faced with the problem of how to best obtain information on the downward extension of the Bluebird vein. Cross sections and assay maps in our possession (copies of which were forwarded with the original application) show indicated

protore in excess of 25,000 tons with silver content averaging between 15 and 20 ounces silver above a depth of 150 feet on this vein. No exploration thus far has been conducted by anyone below this 150 foot depth. We feel it imperative that the downward extension of this very important vein system be explored to determine vein thickness and grade and extent of silver mineralization. Drill hole intersections at depths of 300 to 400 feet below the vein outcrop would provide data to evaluate the economic character of the Bluebird vein from the standpoint of current mining and milling potential.

After a careful evaluation of the factors involved, we have reached a conclusion that the below outlined program is best suited to carry out this exploration. From the costs tabulated below it is clear that this exploration can be carried out at only a slightly increased cost over that involved in the drilling of the two surface drill holes (7A and 7B) even if the drill site access problems could be overcome. Further, we believe that besides overcoming the practical difficulties involved in drilling holes 7A and 7B, the procedure outlined below will provide more useful information and better attain our goal of exploring the Bluebird vein system.

Three holes (U1, U2 and U3) should be drilled from a station to be constructed at the end of the Silver King drift. The three holes would be drilled BX WL size throughout except for 20 feet of collar pipe. In the event rock conditions require, the holes could be begun NX WL and reduced to BX WL. The holes should be completed a minimum size of BX WL. The total footage to be drilled would be 1,650 (a reduction of 100 feet from the 1,750 ft. total for 7A and 7B).

Hole U1---An approximately horizontal hole (inclined 2° upward for ease of drilling and circulation) extending S 05° W from the end of the Silver King drift. Hole length--500 feet. This hole would end between 200 and 250 feet from the outer boundary of the premises.

Hole U2---A horizontal hole (similar to U1) drilled in a direction S 30° W with a 500 ft. length. This hole would also be drilled from the station at the end of the Silver King drift. The end of this hole would be 350 to 400 ft. from the outer boundary of the premises

Hole U3---An inclined hole (35° below the horizontal) in a direction S 17½° W. The length of this hole is 650 feet. This hole would end about 300 feet from the outer boundary.

Holes U1 and U2 will provide two points of intersection of the Bluebird vein at 300+ feet below the outcrop while hole U3 will give a third intersection between 150 to 200 feet below the first two. The angles of intersection will be better than the 45 degree inclined holes 7A and 7B from the surface. Further, the third intersection will provide a better three dimensional picture of the vein structure.

The prices given to us by Boyles Bros. Drilling Contractors for the drilling of holes from an underground station in November, 1965 are still in effect. These were verified by telephone today by Mr. J. E. Roberts, District Manager. The prices are $5.90 per foot direct drilling cost BX WL from 0 to 500 feet and $6.40 BX WL from 500 to 1,000 feet. NX WL drilling is quoted only to 500 feet at a price of $6.40 per foot. Collar pipe drilling (NC) at $7.10 per ft. Other costs for cementing, additives, casing, etc. remain comparable to surface drilling and need not be modified from page 3 of Exhibit A of the existing contract. It is thus to be expected that the direct drilling costs will be about $0.50 per ft. of hole underground less than surface drilling, resulting in a reduction in direct drilling costs of $825.00 for the required 1,650 feet of drilling. An additional reduction of $760.00 will result from the elimination of 100 feet of 500 to 1,000 foot depth range drilling made possible by using the existing underground drift for a station.

Some additional costs will result from: (1) preparation of the underground drill station; (2) supply of compressed air for drilling; and (3) air and water pipe. The costs of these items are tabulated below.

(1) Underground drill station----
Explosives---$110.00 (no change from existing contract).
Air compressor, drill and drill steel---$800.00 (10 days at $80.00 per day will be required, an increase of $400.00 over the original contract).
Labor---$660.00 (an increase of $440.00 over the original contract since both a miner and a laborer will be required for 15 days instead of 5 days).
General---From a re-evaluation of the work involved in preparing this drill station it is our conclusion that one miner and one helper can drill and blast the necessary rock from the end of the Silver King drift in order to make a drill station of the required size in ten days. This also includes some time for minor repair of the drift in other places, and minor repair of existing timber as required. The additional five days each for the miner and laborer will give them time to hand muck and wheel the broken rock from the

face to one of the cross drifts located between 200 and 300 feet towards the portal from the proposed drill station location.

(2) Air Supply----It is estimated that the underground drilling of these three holes will require approximately 60 shifts or two months with double shifts part of the time. The current rental price for a 600 compressor adequate to supply the needed air is $700.00 per month plus $100 each way moving charge (This price was obtained by telephone from Mr. Wilbank of Equipment Sales Co., 7205 19th Ave., Phoenix, Arizona on December 28, 1966). In addition, there will be diesel fuel consumption of about 45 gallons per 8 hour shift (at 22¢ per gallon delivered-this gives a fuel cost of $595.00). Twelve cases (est.) of lubricating oil and 12 cases (est.) of compressor oil will also be required at $7.35 and $9.90 per case respectively which will total $207.00.

Total cost for air supply (all in addition to the original contract) will be----$2,402.00.

(3) Air and Water Pipe----Boyles Bros. has given us a price of $7.50 rental per 100 feet per month for 3 inch I.D. aluminum air pipe and $5.00 rental per 100 feet per month for 1 inch water pipe, plus transportation charges estimated at $100.00. This totals $120.00 rental on the air pipe and $80.00 rental on the water pipe. Laying is estimated to take two men (the miner and laborer) two days at a total cost of $88.00 for laying.

Total cost for laying and renting air and water supply pipe (all in addition to the original contract) will be---- $388.00.

(4) COST SUMMARY OF PROPOSED AMENDMENT

| | |
|---|---|
| Cost Reductions-------- | |
| Lower direct drilling costs---- | (-) $825.00 |
| Eliminating 100 feet of underground drilling-- | (-) $760.00 |
| Cost Increases | |
| Underground drill station---- | (+) $840.00 |
| Air Supply---- | (+) $2402.00 |
| Air and water pipe---- | (+) $388.00 |
| TOTAL COST INCREASE | (+) $ 2,045.00 |

It is suggested that your early attention be given to this proposed contract amendment. Since it is not possible to drill holes 7A and 7B as presently set forth in the contract it will not be possible to complete Stage I until some modification has been made. We feel that this Bluebird vein structure is the most promising single vein system occurring in the andesite in the entire Saddle Mountain Mining District. It is clear from data available at present that considerable silver mineralization exists in this vein with considerable tonnages of barely sub-economic protore. Favorable results from the exploration of the downward extension and width and grade of this vein could form the basis of a producing silver mine.

Yours Truly

Spenst M. Hansen

Spenst M. Hansen for
Big Treasure Mining and Development Co.

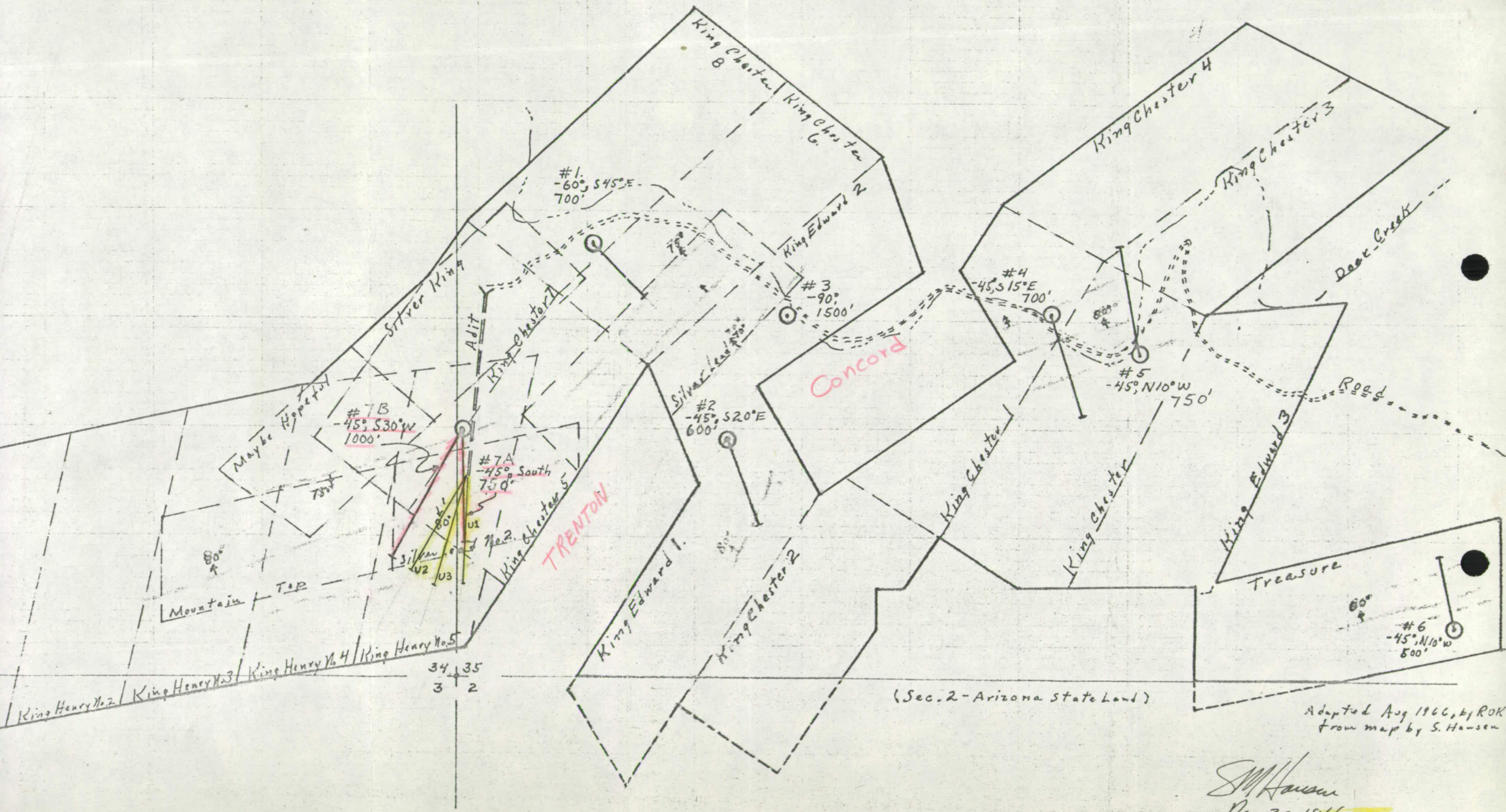
David H. Kimball

David H. Kimball, President
Big Treasure Mining and Development Co.

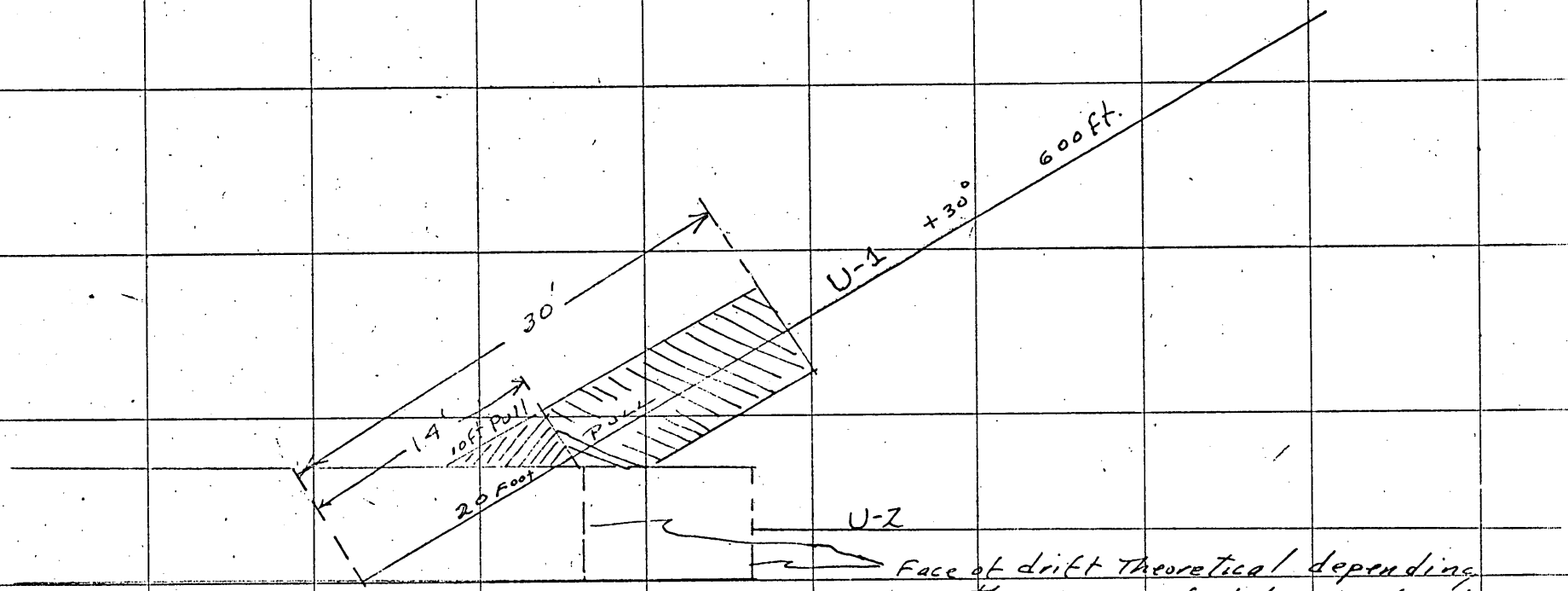
SMH:s

Enclosure: Contract Claim Map.

CC: Office of Mineral Exploration
Washington, D.C.




Claim map of Big Treasure Mining and Development Company, Pinal County, Arizona, showing proposed exploration.

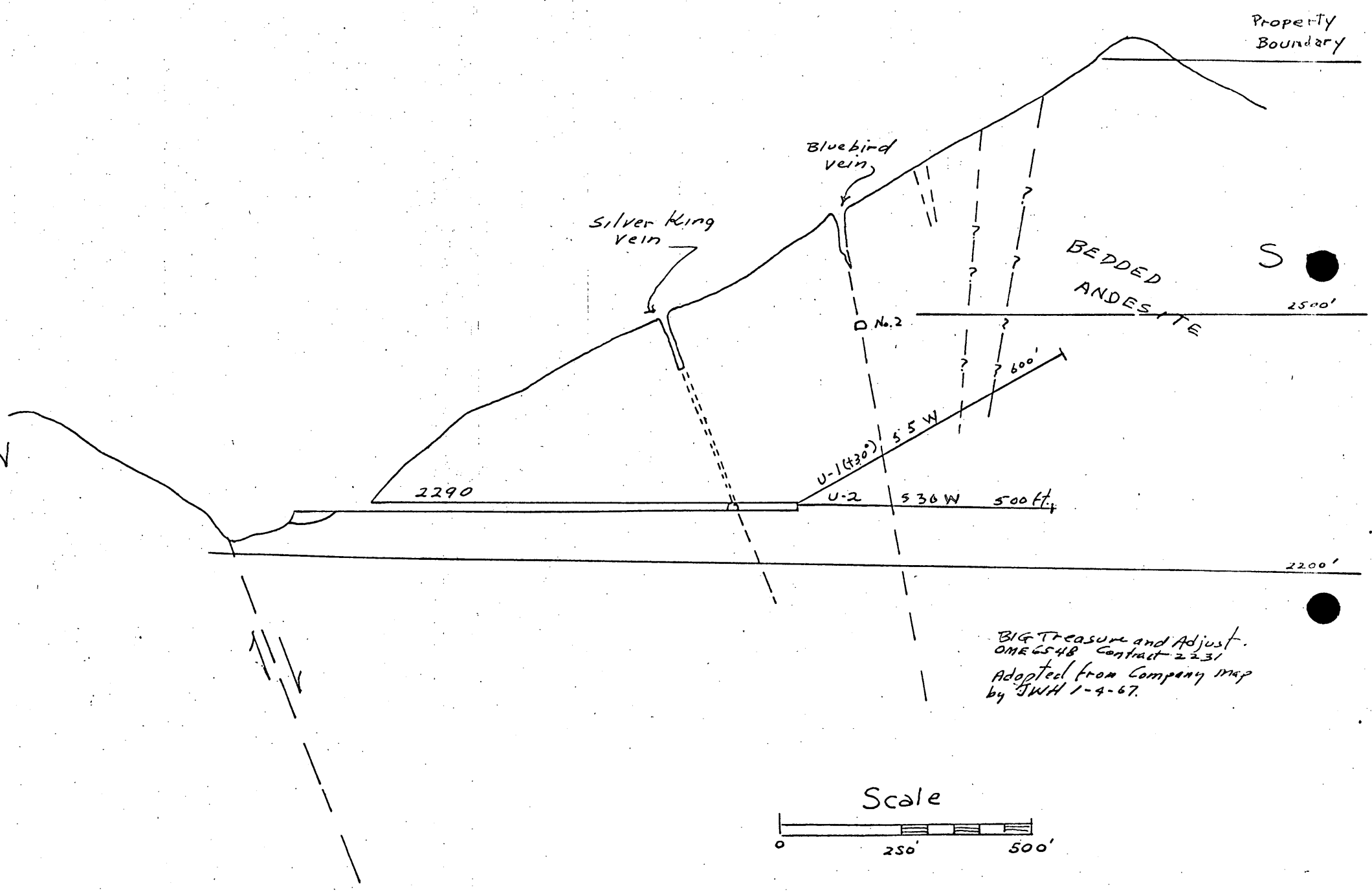



Face of drift Theoretical depending on wither 10 or 20 foot length of rods are pulled. I recommend 10 ft rods or 14 ft of tail room....

Scale 1" = 10'

BIG TREASURE AND Adjust Mine
OMG 6548 Contract 2231

# Schematic Cross Section Along Silver King Drift



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MME FORM 6
REV. 2

REFERENCE SLIP
OFFICE OF MINERALS EXPLORATION

| TO: | DATE | INITIALS |
|---|---|---|
| 1. ~~Assoc Sol.--MR Rm. 6554 Through Room 6042~~ | | |
| 2. Mr. Smith, Room 4559 - OME 3125 | | |
| 3. INTERIOR DEPT. | | |
| 4. DEC 21 1966 SOLICITOR | | |
| 5. I-66-2098.11 | | |
| FROM: Chief, OME | | |

FOR: Check items for action desired

| | | |
|---|---|---|
| ____ Action | ____ Reply for signature of ____ | |
| ____ Approval | ____ Investigate | ____ Surname |
| ____ Comment | ____ Recommendations | ____ Signature |
| ____ Conference | ____ Rewrite | ____ File |
| ____ Instructions | ____ Your information | |

REMARKS: 3192

FROM SOLICITOR
JAN 5-1967
FOR SIGNATURE

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

M56300-62

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DRAFT 12/19/66
RMSmith/gla

EXPLORATION CONTRACT
BIG TREASURE MINING AND DEVELOPMENT COMPANY
OME-6548

AMENDMENT NO. 1

It is agreed this _____ day of _____, 19__, between the United States of America, acting through the Department of the Interior, U. S. Geological Survey, hereinafter called the "Government," and Big Treasure Mining and Development Company, hereinafter called the "Operator," that Exploration Contract 2231 (OME-6548), dated October 12, 1966, is amended effective the date of the contract as follows:

In Annex I,

1. Three unpatented lode mining claims are added to the land subject to the terms of the contract:

| Name of Claim | Docket | Page |
|---|---|---|
| Treasure Fraction | 475 | 429 |
| Treasure Extension | 450 | 457 |
| Treasure Extension No. 1 | 450 | 458 |

The Operator is owner of the Treasure Fraction by right of location and is owner of the two remaining claims by Assignment of Lode Mining Claims, dated December 1, 1966, from Spenst M. Hansen and Blanchet W. Hansen, his wife. A copy of the Assignment is contained in the docket of this contract and is made part hereof by reference.

2. The three claims are illustrated on Figure 3 entitled "Big Treasure Mining and Development Company," attached and made part hereof.

In Exhibit A,

1. Under General Provisions, the eighth paragraph is revised to read as follows:

The Government will not contribute to the cost of any hole that is on or within 100 feet of the boundaries of either the Concord claim or the Trenton claim, or to the cost of a hole closer than 100 feet to the outer boundary of the project area.

2. Under Description of the Work, Stage I, the following paragraph is added after the list of drill holes:

In lieu of drilling holes 7A and 7B from the land surface, two holes they may be drilled (toward the same targets) from the Adit Shown on Figure 1 at inclinations modified to compensate for the different elevation. In lieu of bulldozing an access road to site 7, rehabilitation by bulldozing of the Adit portal site and access road shall be an allowable cost under this contract.

This amendment shall not be construed to change the estimated total cost of the contract, the aggregate amount which the Government may be required to contribute, the amount of any item designated as maximum, nor the fixed unit cost of any item of work.

Executed in quadruplicate the day and year first above written.

THE UNITED STATES OF AMERICA

By_____
Chief, Office of Minerals Exploration
U. S. Geological Survey

By
Title

BIG TREASURE MINING AND DEVELOPMENT CO.

TREASURE FRACTION LODE MINING CLAIM.

DATE RECORDED NOV 23 1966

DOCKET RECORDED 475

PAGE RECORDED 429

NUMBER 332274

SOPHIE M. SMITH

BY Evelyn Jones
Deputy Recorder

LOCATED BY BIG TREASURE MINING AND DEVELOPMENT CO.

IN REPLY REFER TO:

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

OFFICIAL COPY
O. M. E.
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JH 110
RMJ 1208

December 7, 1966

Memorandum

To: Chief, OME

From: Field Officer, Region III

Subject: Request for amendment to Contract: OME-6548 (Silver)
Little Treasure - Adjust
Pinal County, Arizona
Contract 2231

1. Drill Holes Nos. 2 and 6

The operator is correct in his observation that these two holes as plotted on the contract map are collared at sites less than 200 feet from property boundaries. They scale 200 ft. on the contract map

In regard to Hole No. 2, it was positioned (S. 20° E. at -45° bearing and inclination) so as to explore the silver-bearing veins at distances greater than 200 feet from property boundaries. Only about the first 100 feet of the hole will be within the 200-foot boundary zone. Within which zone no exploration targets are anticipated. Amend to "100 feet"

Regarding Hole No. 6--the operator in his letter of December 2, 1966 has submitted 3 additional claims (or fractions) to be added to the subordinated land. If these claims can be made part of the subordinated property--the boundary problem would be eliminated. In any event, Hole No. 6, though collared within 200 feet of the claim boundary, is directed toward the central part of the claim. Include in amendment

2. Drill Holes 7A and 7B

The operator's statement that it is virtually impossible to occupy the surface drill sites for holes 7A and 7B is supported by the drilling contractor. Why did you recommend these sites?

The targets, the Bluebird and Silver King veins can be explored at suitable depths below the lowest workings from underground drill stations in the Silver King tunnel. To reach the target area at suitable depths the underground holes probably would have to be inclined upward, perhaps as much as 30°.

The applicant-operator originally requested to drill holes 7A and 7B from an underground station in the Silver King tunnel--The chief reason this location was not recommended was the excessive costs involved in the preparation of the station. If the operator is willing to prepare such a station at his own expense the original underground location would be satisfactory. O.K.

3. Drill Hole No. 3.

The objective of Hole No. 3, being "To explore for silver mineralization in the underlying favorable limestone formation along or close to a known mineralized fault zone"; the probability of reaching the objective would not depend primarily on the results of other drilling for silver bearing veins. Change to stage I may be unnecessary.

A significant replacement deposit should have "leakage" into overlying fractures. Holes 1 and 2 will test for such a leakage.

J. William Hasler

SPENST M. HANSEN, PH.D.
MINING GEOLOGIST
125 SEDGEFIELD COURT
DUBLIN, CALIFORNIA 94539

OFFICIAL
COPY
O. M. E.
RECEIVED
DEC 5 1966
INITIAL'S CODE
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December 2, 1966

Mr. J. William Hasler
Field Officer, Region 3
Office of Minerals Exploration
U.S. Geological Survey
Federal Center,
Denver, Colorado 80225

Subject: OME-6548 (Silver)
Big Treasure Mining and Development Company
Little Treasure and Adjust Mines
Pinal County, Arizona
Contract 2231

Dear Mr. Hasler

Thank you for your letter of November 10th with which were enclosed vouchers, forms, and posters pertaining to performance under OME contract 2231. Big Treasure Mining and Development Company began work under the provisions of this contract on November 18th, 1966. On that date Mr. Charlie Nichols, Heavy Equipment Contractor from Globe, Arizona, moved his D-7 Caterpillar bulldozer to the property and began the construction of the drill stations and access roads. Our resident geologist, Mr. Ronald A. Janc, began working full time on the project on that date. Also, Big Treasure provided at that time a rental four wheel drive International Scout truck. The bulldozer work on the drill stations and access roads will be completed by about December 6. Arrangements have been made with Boyles Brothers Drilling Contractors of Phoenix, Arizona, to move skid mounted rotary diamond drill rigs to the property on December 7th or shortly thereafter.

Careful examination of the contract has brought to our attention several points that should be clarified. In Exhibit A, Page 2, Paragraph 2, the statement is made that "The government will not contribute to the cost of any hole that is on or within 200 feet of the boundaries of either the Concord Claim or the Trenton Claim, or to the cost of a hole closer than 200 feet to the outer boundary of the project area." It was our understanding from communication with representatives of the OME prior to receiving the written contract that this restriction would be 100 feet rather than 200 feet. Two of the six drill holes (Numbers 2 and 6) shown on the claim map attached to the contract at the end of Exhibit A are plotted within this 200 feet wide restricted area. This renders Exhibit A internally inconsistent, because in order for drill holes 2 and 6 to be moved outside the 200 feet wide restricted zone, their location as plotted on the map in Exhibit A would have to be materially changed. Amend

With regard to drill hole 6---this 200 ft. restriction can be satisfied by adding three additional claims to Annex 1 of the contract. This we are able to do. Copies of the appropriate documents including an instrument of transfer of two claims to the Corporation, and evidence of recording a

third claim in the name of the Corporation are enclosed herewith. These claims are: Treasure Fraction, recorded November 23, 1966, Docket 475, Page 429, No. 332274; Treasure Extension, recorded May 26, 1966, Docket 450, Page 457, No. 321675; and Treasure Extension No. 1, recorded May 26, 1966, Docket 450, Page 458, No. 321676. The addition of these three lode mining claims to the premises and subordinated to the Government, extends the boundary line more than 200 feet beyond the existing approved location of hole no. 6 (see sketch enclosed).

Drill hole no. 2---the problem here is not so easily resolved. Please notice the enclosed xerox copy of a portion of U.S. Patent Survey plat No. 2179. The distance between Corner No. 1 of the Concord Patented Claim and Corner No. 3 of the Trenton Patented claim is 365.8 feet. Hole no. 2 is placed approximately equidistant between these two claims, or roughly 180 feet from each. It is not possible to position hole no. 2 200 feet from the boundary lines of both of these claims without moving it a considerable distance to the south east. Where the hole now is, it explores the King Edward No. 1 Claim and adjacent ground in the most effective fashion. It is our suggestion with regard to drill hole no. 2 that we be permitted to use the location as shown on the map in Exhibit A with government participation in the cost of the hole.

In our application submitted on February 28, 1966, we suggested that two holes be drilled to explore the Blue Bird vein at depth down the dip and along its westerly strike. It was our recommendation that these two holes be drilled from an underground station constructed near the end of the Silver King Tunnel. This tunnel is approximately 5 feet by 7 feet in dimension with an arched overhead, and is in reasonably good repair. The length of this tunnel is somewhat over 800 feet and stops short of intersecting the Blue Bird vein underground. These two holes were replaced in the final contract by surface drill holes 7A and 7B. The locations of these two holes 7a and 7b are well chosen from the standpoint of providing information on the downward extension of the Blue Bird vein, and I am familiar with the reasons for placing these two holes where they are, however, it is not possible to move the drill rigs to the drill site locations shown on the map without a prohibitive amount of road construction. This access problem was one of the main reasons we recommended in the original application that the holes be drilled from underground. Yesterday a representative of Boyles Brothers Drilling Co. and a representative of our heavy equipment contractor visited the proposed site and both agreed that it was not possible to position drill rigs in that place. Also, on the 19th and 20th of November I spent considerable time attempting unsuccessfully to lay out a practical route along which a road could be constructed. I am forced back to the conclusion that if we are to explore this very promising portion of the Blue Bird vein system, the only practical way to do it is by diamond drilling from a station located along the Silver King Tunnel. It may be that we will want to change the inclination of the underground drill holes to horizontal or nearly so, in order to explore the veins at lesser depths below the surface. At the present time we are investigating the construction of an underground drill station suitable for drilling one hole due south and the second hole south 30° west from the end of the Silver King Tunnel. It is my expectation that after the costs involved have been tabulated, we will

be far better off both from a cost standpoint and from the standpoint of obtaining useful exploration data to drill these two holes from this underground station. As soon as more data regarding costs are available we intend to submit a specific request for an amendment to the contract regarding these two holes.

At this time we would like to request that the contract be amended to permit Hole No. 3 to be drilled as a part of Stage 1. The main purpose of this drill hole is to explore for mineralization along a known mineralized structure below the andesite-limestone contact. The target of Hole No. 3 is substantially different from that being explored by any of the other drill holes, since this hole alone explores for contact metasomatic replacement deposits below the andesite. The results from Drill Hole No. 3 will probably have a greater bearing than the results from any of the other drill holes with respect to the planning of Stage 2. Further, metasomatic replacement ore bodies in the limestone near the Deer Creek fault will have the greatest silver production potential of any of the mineral deposit types being explored for on the property. The results of all geologic data that can be brought to bear on the problem indicates that limestone will be encountered in Drill Hole No. 3 under circumstances conducive to the formation of important replacement silver ore bodies. If the exploration data obtained by this drill hole indicates the above to be true, Stage 2 will likely be devoted largely to further exploration of this very important target.

I wish to express our appreciation for the opoortunity of exploration that this OME exploration contract gives us. It is not likely that without this assistance we would be financially able to undertake this project. We have high hopes for success and trust we will all be able to work together with the greatest effectiveness toward our common goal.

Sincerely

Spenst M. Hansen

Spenst M. Hansen, for
Big Treasure Mining and Development Co.

SMH:b

CC: Office of Mineral Exploration
Washington, D.C.

Enclosures: Copy of mining claim assignment.
Verification of recording of mining claim
Portion of survey plat 2179
Claim location sketch.

ASSIGNMENT OF LODE MINING CLAIMS

In consideration of ONE DOLLAR ($1.00) and other good and valuable consideration, receipt of which is hereby acknowledged, the undersigned assignors hereby sell, transfer, and assign to BIG TREASURE MINING AND DEVELOPMENT CO., a California Corporation, assignee, all their right, title and interest in and to the following described lode mining claims situated in the Saddle Mountain mining district, Pinal County, State of Arizona.

TREASURE EXTENSION LODE MINING CLAIM
Location date-----May 14, 1966
Recorded: Docket 450; Page 457; No. 321675

TREASURE EXTENSION NO. 1 LODE MINING CLAIM

Location date-----May 14, 1966
Recorded: Docket 450; Page 458; No. 301676

Dated: December 1, 1966

Spenst M. Hansen

Spenst M. Hansen

Blanchet W. Hansen

Blanchet W. Hansen, his wife

125 Sedgefield Ct.
San Ramon, California

STATE OF CALIFORNIA )
) SS.
COUNTY OF ALAMEDA )

On December 1, 1966, before me, Denise Thibault a Notary Public in and for said County and State, personally appeared SPENST M. HANSEN and BLANCHET W. HANSEN, known to me to be the persons whose names are subscribed to the within instrument, and acknowledged to me that they executed the same.

Witness my hand and official seal.

DENISE THIBAULT
NOTARY PUBLIC-CALIFORNIA
PRINCIPAL OFFICE IN
ALAMEDA COUNTY

Denise Thibault
Notary Public in and for the State of California, with principal office in Alameda County.

DENISE M. THIBAULT
My Commission Expires May 4, 1968

TREASURE FRACTION LODE MINING CLAIM.

DATE RECORDED NOV 23 1966

DOCKET RECORDED 475

PAGE RECORDED 429

NUMBER 332274

SOPHIE M. SMITH

BY Evelyn Jones

Deputy Recorder

LOCATED BY BIG TREASURE MINING AND DEVELOPMENT CO.

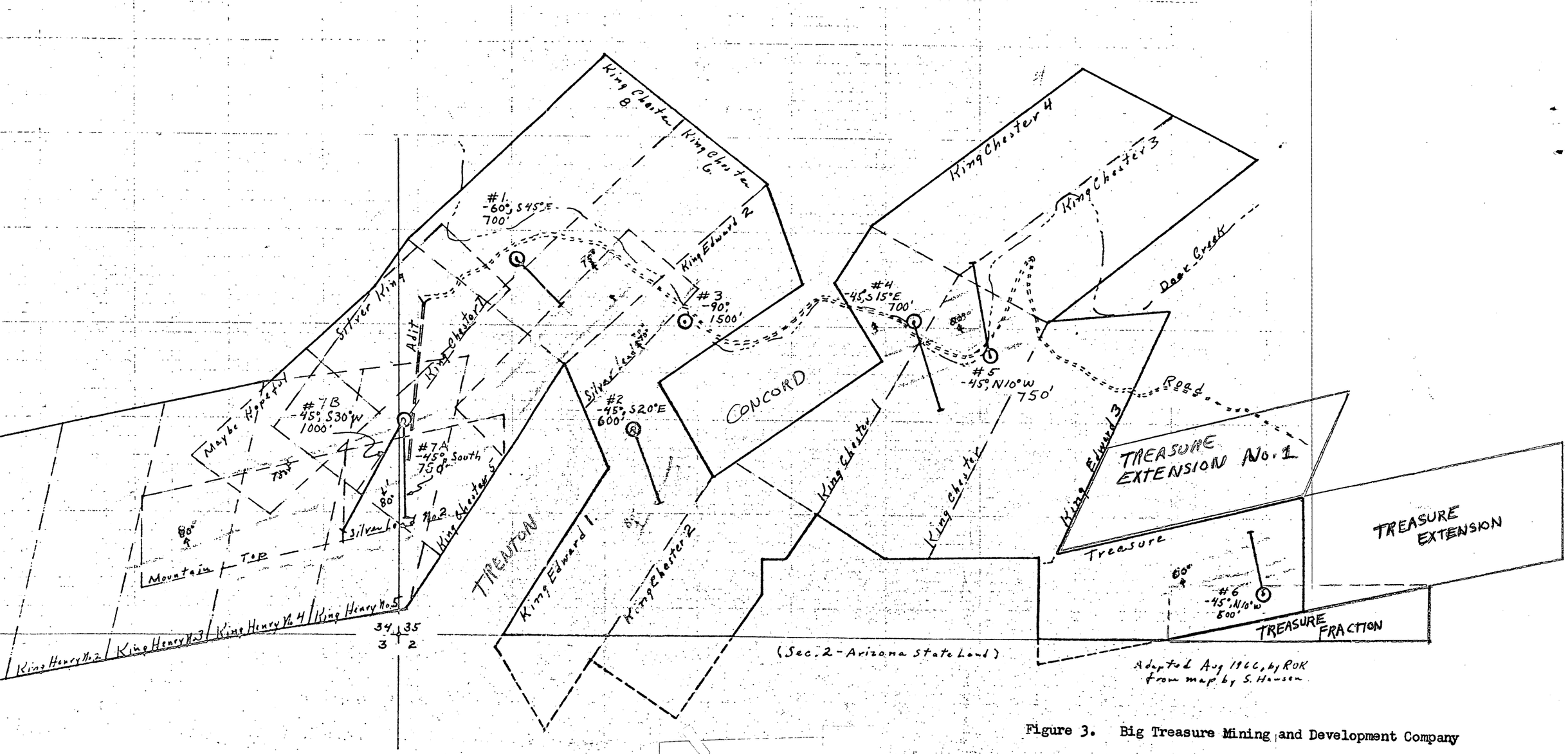
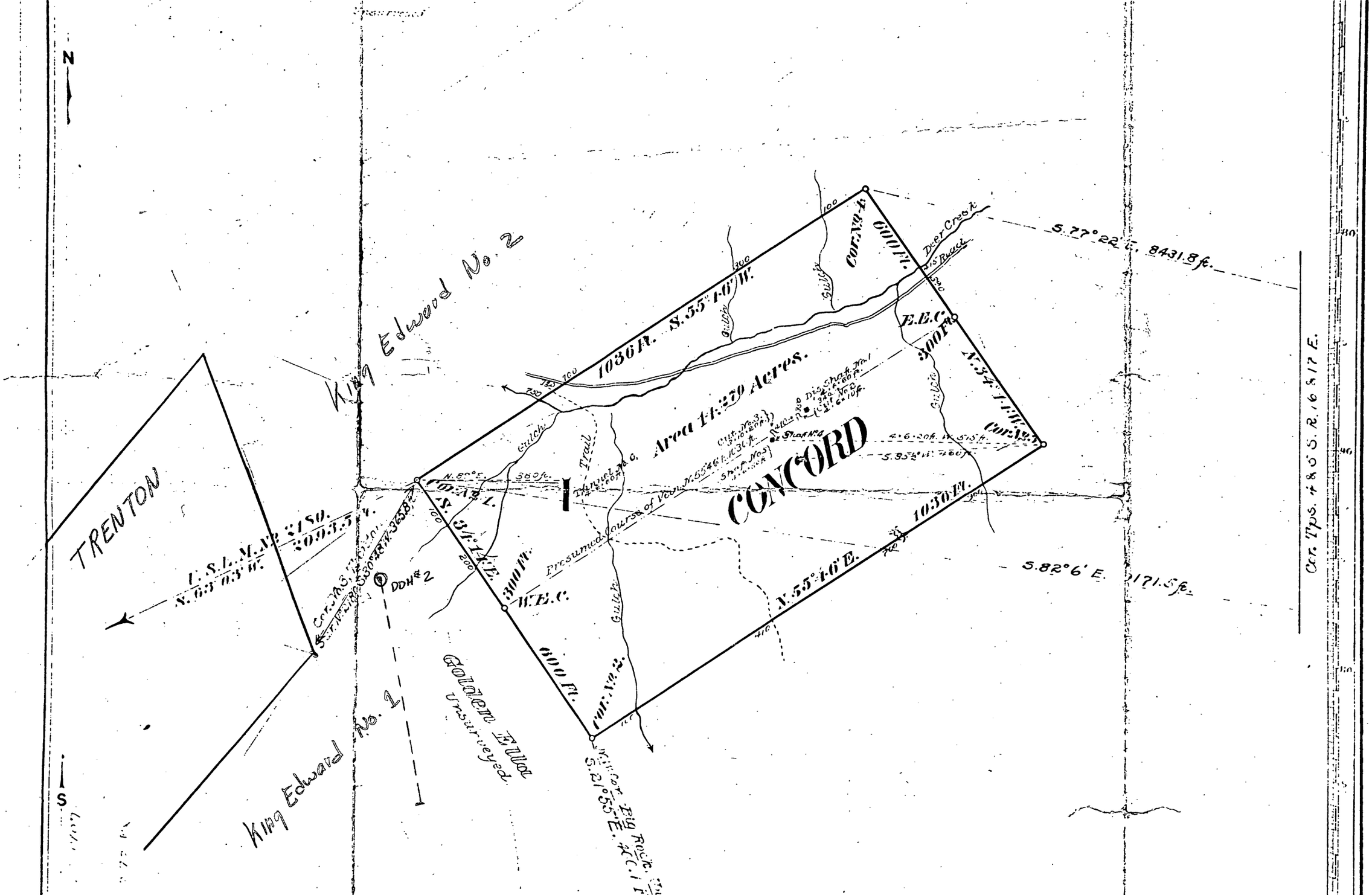



Figure 3. Big Treasure Mining and Development Company

Claim map of Big Treasure Mining and Development Company, Pinal County, Arizona, snow


N
S
TRENTON
U.S.L.M. No. 2150.
S. 63° 03' W.
King Edward No. 2
King Edward No. 1
Golden Fellow
Unsurveyed.
DDH No. 2
Cor. No. 3
S.E. Cor. Lot No. 3
N. 6° E.
380 ft.
Cor. No. 1
S. 34° 14' E.
300 ft.
W.E.C.
600 ft.
Cor. No. 2
S. 21° 55' E.
Cor. Fig. Rock
Presumed course of Vein
N. 55° 46' E.
1036 ft.
S. 55° 46' W.
Area 11.279 Acres.
CONCORD
Trail
Gulch
Deer Creek
Wagon Road
Cor. No. 4
600 ft.
E.E.C.
300 ft.
N. 34° 14' W.
Cor. No. 1
S. 77° 22' E. 8431.8 ft.
S. 82° 6' E. 2171.5 ft.
N. 55° 46' E.
1030 ft.
Cor. Tps. 4 & 5 S. R. 16 S. 17 E.

OFFICIAL
COPY
O. M. E.
RECEIVED
NOV 17 1966

Office of Minerals Exploration

November 16, 1966

Mr. Spencer M. Hansen, Ph. D.
Mining Geologist
125 Sedgefield Court
Dublin, California 94539

Subject: OME-6548 (Silver)
Big Treasure Mining and Development Company
Little Treasure and Adjust Mines
Pinal County, Arizona
Contract 2231

Dear Mr. Hansen:

In my letter to you dated October 25, 1966 which accompanied the above-mentioned contract, you were advised that the 7-1/2 percent interest accrues from the dates on which individual payments are made by the Government and like the principal is repayable by royalty on production.

The figure 7-1/2 percent interest is incorrect in that the contract shows the interest to be 7-1/4 percent and this amount of interest accrues from the dates on which individual payments are made by the Government and like the principal is repayable from royalty on production.

Sincerely yours,

J. William Hasler

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

cc: Chief, OME
OME chron
Hasler chron
Contract 2231

IN REPLY REFER TO:

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

November 14, 1966

OFFICIAL COPY
O. M. E.
RECEIVED
NOV 15 1966

Memorandum

To: Chief, OME

From: Field Officer, Region III

Subject: OME-6548 (Silver)
Big Treasure Mining and Development Company
Little Treasure-Adjust
Pinal County, Arizona
Contract 2231

Cal 210 P
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110
RMA 120 S

Transmitted herewith are the "Government's Copy" and the "Extra Copy for Field Use" of the subject contract that has been executed by the Government and the Operator. The Budget and Finance copy has been temporarily misplaced and will be forwarded to you. The "Extra copy for field use" is an executed copy and may be sent to Budget and Finance as their copy. We have retained the "Field Copy" in our files. The two copies of the contract consist of MME Form 50 (7 pages), Annex 1 (3 pages), 1 Lien and Subordination Agreement, Exhibit A (5 pages), Exhibit B (1 page) and 1 map (Figure 1). The date for commencement of the work has been inserted by the applicant, and the applicant has been advised that the 6-3/4% interest accrues from the dates on which individual payments are made by the Government and like the principal is repayable from royalty on production. The Chief, OME was notified on November 8, 1966 via telephone of the execution of the subject contract by the Field Officer, Region III.

should be 7 1/4 %
F.O. will write to Operator: - 7 1/4 %
(Phone 11/15)

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

OFFICIAL
COPY
O. M. E.
RECEIVED
NOV 14 1966
120 m
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120 s

Office of Minerals Exploration

November 10, 1966

Mr. Spencer M. Hansen, Ph. D.
Mining Geologist
125 Sedgefield Court
Dublin, California 94599

Subject: OME-6948 (Silver)
Big Treasure Mining and Development Company
Little Treasure and Adjust Mines
Pinal County, Arizona
Contract 2231

Dear Mr. Hansen:

Relative to the subject contract, transmitted herewith is the following material:

(1) Four copies of Equal Employment Opportunity posters. This notice is to be posted by the operator in accordance with Section 1 of Exhibit B in OME contracts which states in part as follows:

"The contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided by the contracting officer setting forth the provisions of this nondiscrimination clause."

(2) A Form to be completed and returned to: Field Officer, Region III, Office of Minerals Exploration, U. S. Geological Survey, Denver Federal Center-Building 25-Room 2203-Denver, Colorado 80225.

(3) A 12-months supply of monthly report forms (plus samples); MME Form 60 "Operator's Monthly Voucher" and MME Form 61 "Operator's Progress Report".

Article 7b of the subject contract states: "The Operator shall provide the Government with four copies of monthly reports in three sections as follows:

(1) Operator's Monthly Voucher claiming costs for work performed;

(2) Operator's Progress Report showing the number of units of the various types of work performed; and

(3) a narrative report of the work performed during the reporting period, including adequate engineering-geological maps or sketches, drill hole logs and locations, and assay reports on samples taken concurrently with advance in mineralized ground. (Forms for reporting under (1) and (2) above will be provided by the Government; however, the original of the Operator's Monthly Voucher shall be supported by documentary evidence, such as certified copies or transcripts of payrolls and invoices, for all costs claimed under Article 6(a) (1).)

Sincerely yours,

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

cc: Chief, OME
Kaslerchron
OME chron
2220

SPENST M. HANSEN, PH.D.
MINING GEOLOGIST
125 SEDGEFIELD COURT
~~DANVILLE~~ CALIFORNIA ~~94526~~ 94583
San Ramon,

November 7, 1966

OME-6548
Silver
Contract No. 2231

J. William Hasler
Field Officer, Region III
Office of Minerals Exploration
United States Geological Survey
Federal Center
Denver, Colorado 80225

Dear Mr. Hasler

Thank you for the copies of the contract for the above-mentioned docket relating to our application for O.M.E. exploration assistance. The contracts (3 copies) are returned herewith properly signed by the President and Secretary of Big Treasure Mining and Development Company and with the corporate seal affixed. We are pleased to accept the contract as submitted to us and plan to begin actual work under its provisions before December 12, 1966, and probably about November 17, if present contractor schedules can be relied upon.

Your assistance in evaluation and processing of this contract is appreciated. It is my earnest hope that this joint effort between the O.M.E. and Big Treasure Mining and Development Co. will result in important new reserves of silver ore.

I will look forward to receiving from your office the necessary forms and instructions to permit us to properly account for our expenditures so that the reimbursement of 75% of the covered expenses can be obtained. Please address all correspondence to me at the above listed address. If I am not here, the material will be forwarded.

Sincerely

Spenst M. Hansen

Spenst M. Hansen for
Big Treasure Mining and
Development Co.

Telephone (415) 828-4126

SMH:bh
Enclosures

OFFICIAL
CONT
O. K. B.
RECEIVED
OCT 28 1966
INTERIOR BLDG.
Fla 120M
Ff 110
Sms 120S

Office of Minerals Exploration

October 25, 1966

Mr. Spenst M. Hansen
Big Treasure & Development Company
125 Sedgefield Court
Dublin, California 94339

Re: OME-6548 (Silver)
Big Treasure Mining and Development Company
Little Treasure-Adjust
Pinal County, Arizona
Contract 2231

Dear Mr. Hansen:

Transmitted herewith is the contract for the above-mentioned docket. The proposed contract consists of MME Form 50 (7 pages), Annex I (3 pages) 1 lien and subordination agreement, Exhibit A (5 pages), Exhibit B (1 page).

If the proposed contract is satisfactory to you, all four copies should be signed by an authorized representative of the company, and returned to this office, except for the Operator's copy, which you should retain if the proposed contract meets with your approval.

Please be advised that the 7-1/2 percent interest accrues from the dates on which individual payments are made by the Government and like the principal is repayable from royalty on production.

If any part of the proposed contract does not have your approval, the original and all copies should be returned to this office together with the proposed changes for consideration.

should be 7/1/70 F.P. will write to operator & correct to 7/1/4 (phone 11/15)

Sincerely yours,

cc: Chief, OME
OME chron
Hasler chron
2231

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

Office of Minerals Exploration

October 18, 1966

Mr. Spencer M. Hansen
Big Treasure Mining and Development Co.
125 Sedgefield Court
Dublin, California 94539

OME-6548 (Silver)
Big Treasure Mining and Development Company
Little Treasure-Adjust
Pinal County, Arizona

Dear Mr. Hansen:

Transmitted herewith is the "Extra copy for Field Office" for the above-mentioned docket. The proposed contract consists of MMSForm 50 (7 pages), Annex I (3 pages), 1 Lien and Subordination Agreement, Exhibit A (5 pages), Exhibit B (1 page). Figure 1 (the map) is not enclosed.

If the proposed contract is satisfactory to you, the Applicant, please return this copy and the Field Officer, Region III, after reviewing the contract, will send you the original and three copies of the proposed contract for signature.

As we do have need of the enclosed copy, please return it to this office at your earliest convenience.

Sincerely yours,

Mary E. Clark
Secretary to Field Officer, Region III,
Office of Minerals Exploration

cc: Chief, OME
OME chron
Hasler chron
OME-6548

Form 7
(2/63)

OFFICIAL FILE COPY

| Date | Surname | Code |
|---|---|---|
| 10/7 | R M Smith | |
| 10/7/66 | Kirkemo | |
| 10/10 | Johnson | |
| 10/11 | Kirkgaard | |
| 10/11 | Jurets | |
| 10/12 | Coe | 210 |
| | | 120M |
| | | |
| | | |

**AIRMAIL**

**Memorandum**

OCT 12 1966

**To:** Field Officer, Region III

**From:** Chief, Office of Minerals Exploration

**Subject:** OME-6348 (Silver)
Big Treasure Mining and Development Co.
Little Treasure and Adjust Mines
Pinal County, Arizona

Enclosed are the original and three copies of a proposed contract for the subject property. The contract consists of MME Form 30 (7 pages), Annex I (3 pages), 1 Lien and Subordination Agreements, Exhibit A (5 pages), Exhibit B (1 page), and one map (Figure 1). All copies of the contract have been signed for the Government. The date for commencement of the work should be inserted. Also enclosed is an extra copy of the contract for field use.

If the proposed contract is satisfactory to you and the Applicant, all four copies should be signed by an authorized representative of the Applicant. Thereafter, please distribute the copies in the usual manner.

Please advise the Applicant that the 7¼ percent interest accrues from the dates on which individual payments are made by the Government and like the principal is repayable from royalty on production.

If any part of the proposed contract does not have your approval or that of the Applicant, the original and all copies should be returned to this office together with the proposed changes for consideration.

FRANK E. JOHNSON

Frank E. Johnson

Enclosures

cc: Director's Reading File
Division File
Economic Geology File
OME Docket
OME Reading File
130

MMerrithew/mm (10/7/66)

23263

Docket copy

MME Form 50
July 1965

UNITED STATES OF AMERICA
DEPARTMENT OF THE INTERIOR
U. S. GEOLOGICAL SURVEY

EXPLORATION CONTRACT
(Long Form)

| Docket No. | Commodity | Contract No. | County | State |
|---|---|---|---|---|
| OME -6548 | Silver | | Pinal | Arizona |

It is agreed _____ (Date), between the United States of America, acting through the Department of the Interior, U. S. Geological Survey, hereinafter called the "Government," and

Big Treasure Mining and Development Co., a California corporation

whose mailing address is 125 Sedgefield Court, Dublin, California 94539, hereinafter called the "Operator," as follows:

ARTICLE 1. Authority and scope.--(a) This contract entered into under the authority of Public Law 701, 85th Cong., 2d sess. (72 Stat. 700; 30 U.S.C. § 641 - 646), consists of this form, the attached Annex I (land description), Exhibit A (work and costs), and the maps and documents listed. The work is a search for new or unexplored deposits of the commodity designated above. The Operator shall begin the work on or before _____ (Date), and, subject to the provisions of Article 9 and Exhibit A, shall either have completed the work within 12 months from the date of the contract or shall have incurred allowable costs (see Article 6) in a sum not less than the total cost set forth in Exhibit A.

(b) The total allowable cost of the work set forth in Exhibit A is $ 112,000.00. The Government will contribute ~~50~~ 75 percent of the allowable costs as they are incurred, in a total sum not in excess of $ 84,000.00 in accordance with the provisions of Articles 3, 4, 5, and 6. "Costs incurred" means costs that have been paid or have become due and payable, or that the Government determines have become obligations.

(c) Interest computation.--Simple interest at the rate of _____ percent shall accrue from the dates Federal funds are made available until the period specified for payment of royalty expires, or until the amount of Federal funds contributed is fully repaid with interest.

(d) The Operator shall not transfer or assign this contract or any right or obligation thereunder without the written consent of the Government.

ARTICLE 2. Operator's right in land.--(a) The Operator represents and undertakes that Annex I correctly describes the land which is the subject of this contract and the nature of the Operator's right of property and possession therein (whether as owner, lessee, or otherwise), and that such right, title, or interest is subject only to the following claims, liens, or encumbrances:

_____

(b) The Subordination Agreement of the holder of any claim, lien, or encumbrance listed above and (if the Operator does not hold the legal title) the lien agreement of any holder of the legal title of the land (lessor, seller, optionor, etc.) are attached as follows:

_____

(c) The Operator shall preserve and maintain his right, title, or interest in the land and his right to the possession thereof for the purposes of this contract, and shall devote the land and all existing improvements, facilities, buildings, installations, and appurtenances to the purposes of this contract. The Operator shall neither transfer, convey, nor surrender the land nor any right, title, or interest therein, nor permit nor suffer any claim, lien, or encumbrance thereon, without expressly referring to and providing in the instrument of conveyance, lien, or encumbrance for the preservation of the Government's right to a royalty on production and liens for the payment thereof. Two true copies of such instrument shall be furnished to the Government. If the Government's rights to royalty as provided in Article 7 have been terminated, the provisions of this paragraph (c) shall become inapplicable.

ARTICLE 3. Performance of the work.--(a) Operator's responsibility.--The work shall be performed diligently, efficiently, in a workmanlike manner in accordance with good mining standards, and in compliance with State laws governing health, safety, and liability insurance covering employment. The Operator shall provide suitable and adequate equipment, facilities, materials, supplies, and labor to complete the work as specified in Article 1(a).

(b) Independent contracts.--To the extent that the allowable costs are estimated in Exhibit A with express reference to performance by independent contractors on a unit-price basis (such as per foot of drilling, per foot of drifting, per hour of bulldozer operations), the work may be so performed (see Article 6(a), Category (1)). Any such independent contract shall refer to some specific and identifiable part of the work, and shall be subject to all of the pertinent terms and conditions of this exploration contract; but the Government shall not be considered a party thereto, and its rights under this contract, including the right to terminate its contributions, shall not be affected thereby. Regardless of the provisions of any such independent contract, the Government will participate in payments to the independent contractor only as to work performed in accordance with the provisions of this exploration contract, and only to the extent that the Government deems the unit prices for the work under the independent contract to be reasonable.

(c) Government may inspect.--The Operator shall consult with and inform the Government on all phases of the work as it progresses. The Government may enter at all reasonable times to inspect the work under the contract and production operations during the period that royalty is payable to the Government. The Operator shall provide the Government with all reasonable means of access for such inspections.

ARTICLE 4. Contribution by the Government.-- The Government will make its contribution on the basis of the monthly vouchers referred to in Article 5(b), but all payments by the Government are provisional only, subject to audit. Until the account between the Operator and the Government is finally audited and settled and the Operator's final report has been received, the Government may withhold such sums as are necessary to protect its interests. The Government may make payments for the account of the Operator directly to independent contractors and suppliers rather than to the Operator.

ARTICLE 5. Reports, accounts, audits.--(a) Operator's records.--The Operator shall keep suitable records and accounts of the work performed and of any production in which the Government may have an interest; and shall preserve those with respect to work performed for at least three years after final payment by the Government, and those with respect to production for at least three years after any obligation to pay royalties to the Government has terminated. The Government may inspect and audit said records and accounts at any time, either by itself or by a certified public accountant. The Comptroller General of the United States or his representative, until the expiration of said three-year periods, shall have access to and the right to examine all pertinent books, documents, papers, and records of the Operator. If work under this contract is carried on in conjunction with any other operations, or if labor, supervision, services, materials, supplies, equipment, facilities, or other requirements for carrying on the work are also used in connection with other operations, the costs shall be segregated and accounted for on a basis and by methods and accounts that are satisfactory to and approved by the Government.

(b) Monthly reports.--The Operator shall provide the Government with four copies of monthly reports in three sections as follows:

(1) Operator's Monthly Voucher claiming costs for work performed;

(2) Operator's Progress Report showing the number of units of the various types of work performed; and

(3) a narrative report of the work performed during the reporting period, including adequate engineering-geological maps or sketches, drill hole logs and locations, and assay reports on samples taken concurrently with advance in mineralized ground.

(Forms for reporting under (1) and (2) above will be provided by the Government; however, the original of the Operator's Monthly Voucher shall be supported by documentary evidence, such as certified copies or transcripts of payrolls and invoices, for all costs claimed under Article 6 (a) (1).)

(c) Final report.--Upon completion of the work or termination of the Government's obligation to contribute to costs, the Operator shall furnish the Government with three copies of a final report (in addition to the final monthly report). This final report shall include a geological and engineering evaluation of the results of the work performed under the contract with an estimate of the ore reserves resulting from such work, complete assay data, adequate geological and engineering maps or sketches, and a summary of the work performed and the related costs.

(d) Report of sales.--The Operator shall provide the Government with suitable accounting and documentary evidence covering all production to which the Government's royalty relates, such as two copies of smelter or concentrator settlement sheets and certified accounts of production and sale or other disposition of production.

(e) Compliance with requirements.--If the Government determines that any of the Operator's reports, records, or accounts are insufficient or incomplete, or if the Operator fails to make them, the Government may procure the preparation or completion of the same with suitable attachments as an expense of the work to which the Operator shall contribute. The Government may withhold approval and payment of any vouchers relating to insufficient or incomplete reports, records, or accounts.

ARTICLE 6. Costs.--(a) Allowable costs.--The allowable costs of the work to which the Government will contribute are limited to:

(1) the necessary, reasonable, and direct actual costs that are estimated in Exhibit A by categories as specified in this article; and

(2) fixed costs for units of work to be performed (per foot, per hour, etc.) agreed upon in lieu of actual costs and set forth in Exhibit A.

The Government will not contribute to costs under any category or subcategory omitted from the estimate of costs in Exhibit A. Any excess over any estimate which is indicated as the maximum of any category, subcategory, or item, either as to requirement or related cost; any excess over a fixed unit cost; and any excess over the total allowable cost of the work are not allowable. The Operator shall incur such excesses for his own account without contribution by the Government, but the Operator is not obligated to incur more than his agreed percentage of the total allowable cost of the work.

Any category or subcategory or element thereof not designated as a maximum in this article, or in Exhibit A may be exceeded, provided that the total allowable cost of the work, which is a maximum, is not exceeded.

CATEGORY (1)--INDEPENDENT CONTRACTS.--(See Article 3(b)). The total of this category and the average unit cost estimated for each type of work to be performed under an independent contract are maximums.

CATEGORY (2)--PERSONAL SERVICES.

Subcategory (a)--Supervision and Technical Services--All elements of this subcategory (number of supervisors, technicians, outside consultants, periods of employment, rates of pay, and total) are maximums.

Subcategory (b)--Labor.

CATEGORY (3)--OPERATING MATERIALS AND SUPPLIES.--Includes such items as drill bits and steel, explosives, fuel, pipe, power, timber, rail, and small tools costing less than $50 each.

CATEGORY (4)--OPERATING EQUIPMENT.

Subcategory (a)--Rental.--The number of each rented item [6 mine cars, 1 truck], the rate of rental [$100 per month, $5 per hour], and the total of this subcategory are maximums.

Subcategory (b)--Purchases.--The total of this subcategory is a maximum.

Subcategory (c)--Depreciation.--All elements of this subcategory (time periods, rate of depreciation, and subcategory total) are maximums.

CATEGORY (5)--INITIAL REHABILITATION AND REPAIRS.--Costs of items listed under this category include all requirements, such as labor, materials and supplies, and supervision at a rate not higher than provided for in Category (2), and shall not be duplicated under any other category. The total of this category is a maximum.

Subcategory (a)--Initial rehabilitation and repairs of existing buildings, fixtures, and installations (exclusive of mine workings).--The total of this subcategory is a maximum.

Subcategory (b)--Initial rehabilitation and repairs of operating equipment.--The total of this subcategory is a maximum.

CATEGORY (6)--NEW BUILDINGS, FIXTURES, AND INSTALLATIONS (EXCLUSIVE OF MINE WORKINGS).--Costs of items listed under this category include all requirements, such as labor, materials and supplies, and supervision at a rate not higher than provided for in Category (2), and shall not be duplicated under any other category. The total of this category is a maximum.

CATEGORY (7)--MISCELLANEOUS.--Includes requirements and costs that do not fall within any of the first six categories, such as repairs other than initial and maintenance of operating equipment, analytical work, prints and other reproductions, accounting, Operator's share of payroll taxes, liability insurance covering employment, travel, and communications.

(b) Nonallowable costs.--In addition to the limitations imposed by paragraph (a) of this Article 6 the Government will not contribute to the following costs:

(1) Costs of the land, such as rental, depreciation, depletion, or other costs of acquiring, owning, or holding possession;

(2) Indirect costs, such as general overhead, corporate management, interest, taxes (other than payroll and sales taxes), insurance (other than liability insurance covering employment), damages to persons, damages to property (other than necessary repairs or replacements of equipment or other property used in the work);

(3) Previous work performed or costs incurred before the date of this contract; and

(4) Deferred payments.--Any costs incurred by the Operator under any rental-purchase agreement, installment-purchase agreement, or any agreement for the purchase of goods under the provisions of which payment of the full purchase price is deferred more than 90 days from the delivery of the goods, unless the purchase agreement is approved by the Government in writing.

(c) Reductions in costs.--The Operator shall account for and give the Government credit for any incidental benefits, credits, or money received in the ordinary course of business in prosecuting the work (as by salvage or sale of materials or equipment, furnishing of room or board, furnishing of power or services to third persons, rebates or discounts on purchases, etc.), in the same ratio in which the Government contributes to costs; and such amounts shall be treated as a reduction in costs incurred so that they are available for use within the limit of the original total cost. The provision does not apply to receipts from production which are subject to the Government's royalty under the provisions of Article 7.

ARTICLE 7. Repayment by Operator.--(a) Certification.--If the Government considers that mineral or metal production from the land covered by the contract may be possible as a result of the exploration work, it shall so certify in writing to the Operator at any time not later than six months after a sufficient final report and final accounting (see Article 5) have been furnished.

(b) Royalty on production.--The Operator, whether or not the producer (for example, if the Operator either transfers or does not retains his interest in the land), shall pay to the Government a royalty on all minerals and metals mined or produced from the land as follows:

(1) irrespective of any certification of possible production--from the date of the contract until the lapse of the time within which the government may issue such certification or until the total net amount contributed by the Government is fully repaid with interest, whichever occurs first; or

(2) if the Government issues a certification of possible production--for a period of ten years from the date of the contract, or until the total net amount contributed by the Government is fully repaid with interest, whichever occurs first.

(c) Payment of royalty.--(1) The Government's royalty shall be five percent of the gross proceeds (including any bonuses, premiums, allowances, or other benefits) from the production sold, in the form sold (ore, concentrate, metal or equivalent), at the point of delivery (the f.o.b. point); except, that charges of the buyer arising in the regular course of business and shown as deductions on the buyer's settlement sheets (such as treatment processes performed by the buyer, sampling and assaying to determine the value of the production sold, and freight payable by the buyer to a carrier (not the Operator or producer)), shall be allowed as deductions in arriving at the "gross proceeds" as that term is used herein. No costs of the Operator or Producer are deductible in arriving at the "gross proceeds" as that term is here used.

The term "treatment processes" means those processes (such as milling, concentrating, smelting, refining, or equivalent, but excluding fabricating or manufacturing) applied to the crude ore or other production after it is extracted from the ground to put it into a commercially marketable form.

(2) The Government's royalty shall be computed and paid currently upon each lot sold, held, or used in integrated operations, as the case may be.

(d) Unsold production.--If any production (ore, concentrate, metal, or equivalent), after the lapse of six months from the date the ore was extracted from the ground, remains neither sold nor used in integrated manufacturing or fabricating operations (for instance, if it is stockpiled), the Government, at its option, as long as it so remains, may require the computation and payment of its royalty on the value of such production in the form (ore, concentrate, metal, or equivalent) it is in when the Government elects to require computation and payment. If any production is used in integrated manufacturing or fabricating operations before the Government makes its election, the Government's royalty on such production shall be computed on the value thereof in the form in which and at the time it is so used. "Value" as here used means what is or would be gross income from mining operations for percentage depletion purposes in Federal income tax determination or the market value, whichever is greater.

(e) Lien for payment.--To secure the payment of royalty (see Article 7(b)), the Operator hereby grants to the Government a lien upon his interest in the land and upon any production of minerals and metals therefrom until the royalty claim is extinguished by lapse of time or is fully paid.

(f) Notice to purchasers.--The Operator or producer shall give notice of the Government's claim for royalty to any purchaser of the production, and shall authorize and direct such purchaser to pay the royalty directly to the Government and to furnish the Government with copies of the settlement sheets. If the records of any production and sales or other disposition of production, whether the production is by the Operator or by others, are not made available to the Government, the amount of the royalty may be estimated by the Government, and this estimate shall be final and binding upon the Operator or producer.

(g) No obligation to produce.--Nothing in this contract shall be construed as imposing any obligation on the Operator or the Operator's successor in interest to engage in any production operations.

(h) Government not obligated to buy.--Nothing in this contract shall be construed as imposing any obligation on the Government to purchase any minerals and metals mined or produced from the land.

ARTICLE 8. Interests in purchased property.--(a) Title and ownership.--All costs under this contract shall be incurred by the Operator in the Operator's own name and for the Operator's own account; but any property acquired to the cost of which the Government contributes shall belong to the Operator and the Government jointly in proportion to their respective contributions although title thereto shall be taken in the name of the Operator.

(b) Preservation of property.--Until the final disposal of any property in which the Government has an interest, the Operator shall preserve and protect same for the best interest of the Government, and any reasonable and necessary cost thereof will be treated as an allowable cost of the exploration. After the completion of the work, termination of the Government's obligation to contribute, or when such property is not being used for the work, the Operator shall not use it elsewhere without the written consent of the Government and without paying a reasonable rental to be fixed by the Government for its proportionate interest.

(c) Disposal of property.--Upon the completion of the work, termination of the Government's obligation to contribute to costs, or when the property is no longer needed for the work, the Operator shall promptly dispose of salable or salvageable property in which the Government has an interest for the joint account of the Government and the Operator, either by return to the vendor, sale to others, purchase by the Operator, or sale or transfer to the Government at a price at least as high as could be obtained from others, unless the Government in writing waives its interest in any such property. Without advance approval of the sales price by the Government, the Operator shall not sell at any price any item of property that cost more than $500, and shall not sell at less than 25 percent of the purchase price any item of property that cost $500 or less. The Government, in lieu of approving the sales price for any such item, may itself purchase the item at the best price which the Operator is able to obtain or offers. Property remaining upon any termination of the work shall be considered in groups or categories (such as drill steel, explosives, pipe, or rail), and if the original cost of the remaining unexpended portion of any such group or category is less than $50, the Government waives its interest therein. If necessary to accomplish the disposal of any item, the Operator shall dismantle and sever it from the land, the cost thereof to be treated as a cost of the exploration.

(d) Default of the Operator re disposal.--If within 90 days after the completion of the work, termination of the Government's obligation to contribute to costs, or after the property is no longer needed for the work, the Operator has failed to sell or otherwise liquidate or dispose of any property in which the Government has an interest, the Government, at any time prior to final settlement under the contract, may:

(1) in writing extend the time within which the Operator must dispose of or liquidate the property;

(2) by written notice to the Operator, place upon such property what it determines to be a fair valuation thereof, not in excess of the cost less 1.66 percent per month from the date such property was purchased under this contract to the termination of said 90-day period; and such property shall thereupon be considered and accounted for as having been purchased by the Operator at the valuation so fixed by the Government; and

(3) enter and take possession of such property wherever it may be found, and remove and dispose of it for the joint account of the parties.

ARTICLE 9. Termination of the Government's obligations.--(a) If the Government determines that operations at any time have failed to achieve anticipated results and further work is not justified, the Government may give the Operator written notice thereof, and thereupon:

(1) the Government shall be free of all obligation to contribute to costs not then incurred other than such as may be allowable under the provisions of the contract as necessary and incidental to final accounting and reporting; and

(2) the Operator shall be free of all obligation to prosecute the work other than such as may be necessary and incidental to final accounting and reporting.

(b) If the Government determines that the Operator is in default under the terms of the contract, the Government may give the Operator written notice of such default with a specification of reasonable time within which the default must be cured; and if the Operator fails to cure such default as required, thereupon:

(1) the Government shall be relieved of all obligation to contribute to costs not incurred when the notice was given, other than such as may be allowable by the provisions of the contract as necessary and incidental to final accounting and reporting; and

(2) the Operator shall be free of all obligation to prosecute the work other than such as may be necessary and incidental to final accounting and reporting.

The Government may also avail itself of any other remedy the law may provide for breach of contract, including the right to rescind the contract and to demand repayment of all moneys contributed by the Government under the contract.

(c) The giving of any notice by the Government under the provisions of this Article 9 shall not affect the Government's rights as provided for in the contract with respect to royalty and liens to secure the payment thereof, and such rights shall be fully preserved.

(d) The determinations of the Government are subject to appeal under Article 13.

ARTICLE 10. Notices to be given by the Government may be delivered to the Operator, or may be sent by certified mail addressed to the Operator at his mailing address stated in this contract. If mailed, notices are deemed to have been delivered five days after the date of mailing.

ARTICLE 11. Officials not to benefit.--No member of or delegate to Congress or resident commissioner shall be admitted to any share or part of this contract or to any benefit that may arise therefrom; but this provision shall not be construed to extend to this contract if made with a corporation for its general benefit.

ARTICLE 12. Nondiscrimination in Employment. The provisions respecting nondiscrimination in employment which are required by section 301 of Executive Order 10925, dated March 6, 1961 as amended and supplemented are attached hereto as Exhibit B and are hereby incorporated in and made a part of this contract.

ARTICLE 13. Disputes.--Any dispute arising under this contract which is not disposed of by agreement shall be decided by the Director, U. S. Geological Survey, who shall reduce his decision to writing and mail or otherwise furnish a copy thereof to the Operator. The decision of the Director, U. S. Geological Survey, shall be final and conclusive unless, within 30 days from the date of receipt of such copy, the Operator mails or otherwise furnishes to the Director, U. S. Geological Survey, a written appeal addressed to the Secretary of the Interior. The decision of the Secretary or his duly authorized representative for the determination of such appeals shall be final and conclusive unless determined by a court of competent jurisdiction to have been fraudulent, or capricious, or arbitrary, or so grossly erroneous as necessarily to imply bad faith, or not supported by substantial evidence.

The term "Director, U. S. Geological Survey," as used herein includes his duly authorized representative.

ARTICLE 14. Work Hours Act of 1962 - Overtime Compensation.--This contract, to the extent that it is of a character specified in the Work Hours Act of 1962 (Public Law 87-581, 76 Stat. 357-360) and is not covered by the Walsh-Healey Public Contracts Act (41 U.S.C. 35-45), is subject to the following provisions and to all other provisions and exceptions of said Work Hours Act of 1962.

(a) Overtime requirements.--No Operator or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any laborer or mechanic to be employed on such work in excess of eight hours in any calendar day or in excess of forty hours in any workweek unless such laborer or mechanic receives compensation at a rate of not less than one and one-half times his basic rate of pay for all hours worked in excess of eight hours in any such calendar day or in excess of forty hours in any such workweek, as the case may be.

(b) Violations; liability for unpaid wages; liquidated damages.--In the event of any violation of the clause set forth in subparagraph (a) of this paragraph, the Operator and any subcontractor responsible therefor shall be liable to any affected employee for his unpaid wages. In addition, such Operator and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for

liquidated damages. Such liquidated damages shall be computed, with respect to each individual laborer or mechanic employed in violation of the clause set forth in subparagraph (a) of this paragraph, in the sum of $10 for each calendar day on which such employee was required or permitted to work in excess of eight hours or in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in subparagraph (a) of this paragraph.

(c) Withholding for unpaid wages and liquidated damages.--The U. S. Geological Survey may withhold or cause to be withheld, from any moneys payable on account of work performed by the Operator or subcontractor, such sums as may administratively be determined to be necessary to satisfy any liabilities of such Operator or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in subparagraph (b) of this paragraph.

ARTICLE 15. Copeland (Anti-Kickback) Act--Nonrebate of wages.--The regulations of the Secretary of Labor applicable to contractors and subcontractors (29 CFR, Part 3), made pursuant to the Copeland Act, as amended (40 U. S. C. 276c) and to aid in the enforcement of the Anti-Kickback Act (18 U. S. C. 874) are made a part of this contract by reference. The Operator will comply with these regulations and any amendments or modifications thereof and will be responsible for the submission of affidavits required of independent contractors thereunder. The foregoing shall apply except as the Secretary of Labor may specifically provide for reasonable limitations, variations, tolerances, and exemptions.

ARTICLE 16. Changes and added provision.--

_____

_____

_____

_____

Executed in quintuplicate the day and year first above written.

THE UNITED STATES OF AMERICA

**BIG TREASURE MINING AND DEVELOPMENT CO.**
(Operator)

By_____

By_____
**Director, U. S. Geological Survey**

Title_____

_____

I, _____, certify that I am the
(Name)

_____ secretary of the corporation named as Operator herein; that

_____, who signed this contract on behalf of the Operator, was then
(Name)

_____ of said corporation; that said contract was duly signed for
(Title)

and in behalf of said corporation by authority of its governing body, and is within the scope of its corporate powers.

_____

 [ CORPORATE SEAL ]

Smith
Kirk
Johnson
Mason

RMSmith/mm
9/14/66
Second DRAFT

EXPLORATION CONTRACT
BIG TREASURE MINING AND DEVELOPMENT CO.
OME-6548

ANNEX I

The land, including all rights pertaining thereto, referred to in Article 2 of the contract consists of twenty-three (23) unpatented lode mining claims and two (2) patented claims in secs. 34 and 35, T. 4 S., R. 16 E., and secs. 2 and 3, T. 5 S., R. 16 E., G&SRB&M, Saddle Mountain mining district, Pinal County, Arizona. It is shown on Figure 1 entitled, "Claim Map of Big Treasure Mining and Development Company, Pinal County, Arizona, showing proposed exploration," attached and made part hereof.

The unpatented claims are recorded in the County Clerk's office at Florence, Arizona, as follows:

| Name of Claim | Docket | Page |
|---|---|---|
| Silver Lead | 103 | 319 |
| Silver Lead #2 | " | 320 |
| Maybe Hopeful | " | 321 |
| Silver King | " | 322 |
| Mountain Top | " | 323 |
| King Henry The First | 425 | 462 |
| " " " Second | " | 463 |
| " " " Third | " | 464 |
| " " " Fourth | " | 465 |
| " " " Fifth | " | 466 |

| Name of Claim | Docket | Page |
|---|---|---|
| King Edward The First | 426 | 123 |
| " " " Second | " | 124 |
| " " " Third | " | 125 |
| King Chester * | " | 273 |
| King Chester No. 1 | 428 | 412 |
| " " " 2 | " | 413 |
| " " " 3 | " | 414 |
| " " " 4 | " | 415 |
| " " " 5 | " | 416 |
| " " " 6 | " | 417 |
| " " " 7 | " | 418 |
| " " " 8 | " | 419 |
| Treasure | 447 | 109 |

The patented claims are as follows:

| Name of Claim | Patent No. |
|---|---|
| Concord | 2179 |
| Trenton | 2180 |

The Operator is in possession of the first five unpatented claims listed above under the terms of an Assignment of Mining Leases and Claims dated April 22, 1966, from Chester L. Whitelock and Blanche D. Whitelock, his wife. C. L. Whitelock leased the claims from the owners, Joseph Jameson and Manuel Sosa, under terms of a Mining Lease dated May 19, 1965.

The Operator is the owner of the Treasure unpatented claim under the terms of an Assignment of Mining Lease and Claim dated August 30, 1966, from Spenst M. Hansen and Blanchet W. Hansen, his wife. Spenst M. Hansen was the locator and original owner of the claim.

The Operator is the owner of the remaining 17 unpatented claims under the terms of the above mentioned Assignment of Mining Leases and Claims dated April 22, 1966, from Chester L. Whitelock and Blanche D. Whitelock, his wife.

The Operator is in possession of the two patented claims under the terms of the above-mentioned Assignment of Mining Leases and Claims dated April 22, 1966, from Chester L. Whitelock and Blanche D. Whitelock, his wife. Chester L. Whitelock leased the claims from Lee Acton and Margaret M. Acton, his wife, on April 29, 1965, as shown in Exhibit A" attached to the Assignment.

Copies of the two assignments are contained in the docket of this contract and are made part hereof by reference.

A Lien and Subordination Agreements executed February 25, 1966, by Joe Jameson and Manuel Sosa, owners of the first five unpatented ~~xxxx~~ claims listed above is attached and made part hereof.

A Lien and Subordination Agreements covering the two patented claims is waived (See Exhibit A, General Provisions).

EXPLORATION CONTRACT
BIG TREASURE MINING AND DEVELOPMENT CO.
OME-6548

EXHIBIT A

The purpose of the project is to explore by drilling from sites to be prepared on the land surface for silver-bearing ore bodies in and along the Little Treasure, Bluebird, and other quartz-barite-calcite veins which traverse andesitic volcanic rocks interstratified with sandstone and conglomerate of Cretaceous age. Additional deep drilling to explore for silver-lead replacement deposits near the Deer Creek fault in Naco limestone of Pennsylvanian age depends upon the results of drilling the veins.

General Provisions

A bulldozer no smaller than a D-7 Caterpillar shall be used for road repair and preparation of drill sites.

All drill holes shall be completed not less than BX wireline size, and shall be cased as necessary. The Government will not contribute to the cost of casing left in a hole at the Operator's request.

Facilities shall be provided for recovering drill sludge, and such sludge shall be retained when drilling in significantly mineralized rock.

All drill core shall be stored in boxes identified as to hole number with markers in the core sections indicating the depths represented. Significantly mineralized core shall be split and one split assayed for gold and silver and for lead, zinc, or copper as warranted. Whenever core recovery is less than 50 percent, a split of the corresponding retained sludge (continue to p. 2)

shall be assayed separately. The remaining core shall be stored in proper sequence with the unsampled core, and the remaining sludge shall be stored in suitable containers properly identified as to hole number and depth. Stored samples shall be made available for Government inspection and possible use.

No ~~Stored samples~~ may be disposed of by the Operator with prior Government approval.

True copies of assay certificates of all samples shall be submitted with the Operator's monthly report.

All drill holes shall be logged and copies of the logs showing the locations of all samples taken and the geological formations and structures traversed by the drill holes shall be furnished monthly to the Government.

The Operator shall provide such supervision, labor, and technical services as may be required to perform the work in a satisfactory manner.

The Government will not contribute to the cost of any hole that is on or within 200 feet of either the Concord claim or the Trenton claim, or to the cost of a hole closer than 200 feet to the outer boundary of the project area.

The location, direction, and extent of each work item shall be subject to Government approval.

The work shall be divided into two stages. The Operator shall complete all of Stage I and as much of Stage II as is authorized in advance by the Government and confirmed in writing. Approval of Stage II shall depend upon favorable results having been obtained in Stage I.

## Description of the Work

### Stage I

The work shall consist of bulldozing and blasting access roads to six (6) drill sites, leveling the drill sites, and drilling a maximum of 5,000 feet in a maximum of seven (7) inclined drill holes at the approximate locations shown on Figure 1. The approximate bearings, inclinations, and depths of the seven holes are as follows:

| Hole | Bearing | Inclination | Depth, feet |
|---|---|---|---|
| 1 | S 45 E | -60° | 700 |
| 2 | S 20 E | -45° | 600 |
| 3 | (See Stage II) | | |
| 4 | S 15 E | -45° | 700 |
| 5 | N 10 W | -45° | 750 |
| 6 | N 10 W | -45° | 500 |
| 7A | South | -45° | 750 |
| 7B | S 30 W | -45° | 1,000 |

### Stage II

The work shall consist of preparing access roads and drill sites as necessary and drilling a maximum of 5,000 feet in approximately seven (7) holes. One vertical hole may be drilled a maximum of 1,500 feet deep at Site 3 approximately as shown on Figure 1 to explore the Naco limestone for replacement ore bodies near the Deer Creek fault. Other holes may be drilled to further explore mineralized zones indicated by the preceding holes in Stages I and II.

## Estimated Costs of the Work

### Stage I

**Actual Costs**

Category (1) Independent Contracts

| | |
|---|---|
| Mobilization and demobilization, one bulldozer | $100.00 |
| Bulldozing roads and drill sites, 60 hours @ $20.00/hour | 1,200.00 |
| Core drilling, 5,000 feet | 35,221.00 |

| Depth, ft. | NC | NXWL | BXWL |
|---|---|---|---|
| 0-500 | $7.50 | $6.90 | |
| 500-1,000 | | 7.60 | $6.90 |
| 1,000-1,500 | | | 7.60 |

| | |
|---|---|
| Casing lost in hole, 500 feet @ $4.00/foot | 2,000.00 |
| Reaming and installing casing, 1,000 feet @ $3.40/foot | 3,400.00 |
| Cementing and redrilling, 200 hours @ $12.50/hour | 2,500.00 |
| Additives, 200 sacks, @ $7.50/sack | 1,500.00 |
| Water truck rent, 4 months @ $190.00/month | 760.00 |
| Water truck mileage, 2,000 miles @ $0.12/mile | 240.00 |
| | $46,921.00 |

Category (2) Personal Services

None except:

Subcategory (a) Supervision and Technical Services

| | | |
|---|---|---|
| 1 Supervisor-geologist-engineer | | |
| 4 months @ $900.00/month | $3,600.00 | |
| 1 Outside consultant | | |
| 8 days @ $75.00/day | 600.00 | |
| Subcategory (b) Labor | | |
| 1 Miner (surface) | | |
| 5 days @ $24.00/day | 120.00 | |
| 1 Laborer | | |
| 5 days @ $20.00/day | 100.00 | |
| | | $4,420.00 |

Category (3) Operating Materials and Supplies

None except:

| | | |
|---|---|---|
| Explosives including detonators | $ 110.00 | |
| Core boxes (cardboard) | | |
| 500 @ $1.00/box | 500.00 | |
| | | $ 610.00 |

Category (4) Operating Equipment

None except:

Subcategory (2) Rental

| | | |
|---|---|---|
| Air compressor, drill, drill steel, | | |
| 5 days @ $80.00/day | $ 400.00 | |
| Vehicle (4-wheel drive) | | |
| 4 months @ $160.00/month | 640.00 | |
| | | $ 1,040.00 |

Category (7), Miscellaneous

None except:

| | | |
|---|---|---|
| Payroll taxes and insurance @ 15% | $ 573.00 | |
| Assays for gold and silver, | | |
| 500 assays @ $3.00/assay | 1,500.00 | |
| Assays for lead, zinc, or copper, | | |
| 100 assays @ $2.00/assay | 200.00 | |
| Vehicle mileage (1,200 miles/month), | | |
| 4,800 miles @ $0.12/mile | 576.00 | |
| Accounting and office expenses, | | |
| 4 months @ $40.00/month | 160.00 | |
| | | $ 3,009.00 |
| Total Estimated Costs Stage I | | $56,000.00 |

Stage II

| | |
|---|---|
| The schedule for Stage I applies | $56,000.00 |
| Total Estimated Actual Costs of the Work | $112,000.00 |
| Government Participation @75% | $ 84,000.00 |

First draft

EXPLORATION CONTRACT
BIG TREASURE MINING AND DEVELOPMENT CO.
OME-6548

EXHIBIT A

The purpose of the project is to explore by drilling from sites to be prepared on the land surface for silver-bearing ore bodies in and along the Little Treasure, Bluebird, and other quartz-barite-calcite veins which traverse andesitic volcanic rocks intemstratified with sandstone and conglomerate of Cretaceous age. Additional deep drilling to explore for silver-lead replacement deposits near the Deer Creek fault in Naco limestone of Pennsylvanian age depends upon the results of drilling the veins.

General Provisions

A bulldozer no smaller than a D-7 Caterpillar shall be used for road repair and preparation of drill sites.

All drill holes shall be cased as necessary, the Government will not contribute to the cost of casing left in the hole at the discretion of the geologist. ~~and shall be~~ completed not less than BX wireline size, and shall be

Facilities shall be provided for recovering drill sludge, and such sludge shall be retained when drilling in significantly mineralized rock.

All drill ~~X~~ core shall be stored in boxes identified as to hole number with markers in the core sections indicating the depths represented.

No 91

Significantly mineralized core shall be split and one split assayed for gold and silver and for ~~base metals~~ lead, zinc, or copper as warranted. Whenever core ~~X~~ recovery is less than 50 percent, a split of the corresponding retained sludge

## Description of the Work

### Stage I

The work shall consist of bulldozing and blasting access roads to six (6) drill sites, leveling the drill sites, and drilling a maximum of 5,000 feet in a maximum of seven (7) inclined drill holes. ~~The 7 holes shall be drilled~~ at the approximate locations shown on Figure 1. The approximate bearings, inclinations, and depths of ~~each~~ the seven holes are ~~XX~~ as follows:

| Hole | Bearing | Inclination | Depth, feet |
|---|---|---|---|
| 1 | S 45 E | -60° | 700 |
| 2 | S 20 E | -45° | 600 |
| 3 | (See Stage II) | | |
| 4 | S 15 E | -45° | 700 |
| 5 | N 10 W | -45° | 750 |
| 6 | N 10 W | -45° | 500 |
| 7A | South | -45° | 750 |
| 7B | S 30 W | -45° | 1,000 |

### Stage II

The work shall consist of preparing access roads and drill sites as necessary and drilling a maximum of 5,000 feet in approximately seven (7) holes. One vertical hole may be drilled a maximum of 1,500 feet deep at Site 3 approximately as shown on Figure 1 to explore the Naco limestone for replacement ore bodies near the Deer Creek fault. Other holes may be drilled to further explore mineralized zones indicated by the preceding holes in Stages I and II.

## Estimated Costs of the Work

### Stage I

**Actual Costs**

Category (1) Independent Contracts

| | | | | |
|---|---|---|---|---|
| Mobilization and demobilization, one bulldozer | | | | $ 100.00 |
| Bulldozing roads and drill sites, 60 hours @ $20.00/hour | | | | 1,200.00 |
| Core drilling, 5,000 feet | | | | 35,221.00 45,351.00 |
| Depth, ft. | NC | NXWL | BXWL | |
| 0-500 | $7.60 | $6.90 | | |
| 500-1,000 | | $7.60 | $6.90 | |
| 1,000-1,500 | | | $7.60 | |
| Casing lost in hole 500 feet @ $4.00/foot | | | 2,000.00 | |
| Reaming and installing casing 1,000 feet @ $3.40/foot | | | 3,400.00 | |
| Cementing and redrilling 200 hours @ $12.50/hour | | | 2,500.00 | |
| Additives, 200 sacks @ $7.50/sack | | | 1,500.00 | |
| Water truck rent 4/ ~~4~~ months @ $190.00/month | | | 760.00 | |
| Water truck mileage 2,000 miles @ $0.12/mile | | | 240.00 | |
| | | | | $46,651.00 921.00 |

Category (2) Personal Services

None except:

Subcategory (a) Supervision and Technical Services

| | | |
|---|---|---|
| 1 Supervisor-geologist-engineer | | |
| 4 months @ $900.00/month | $3,600.00 | |
| 1 Outside consultant | | |
| 8 days @ $75.00/day | 600.00 | |
| | $4,200.00 | |

Subcategory (b) Labor

| | | |
|---|---|---|
| 1 Miner (surface) | | |
| 5 days @ $24.00/day | $120.00 | |
| 1 Laborer | | |
| 5 days @ $20.00/day | 100.00 | |
| | $220.00 | |
| | | $4,420.00 |

Category (3) Operating Materials and Supplies

None except:

| | | |
|---|---|---|
| Explosives including detonators | $ 110.00 | |
| Core boxes (cardboard) | | |
| 500 @ $1.00/box | 500.00 | |
| | | $ 610.00 |

Category (4) Operating Equipment

None except:

Subcategory (a) Rental

| | | |
|---|---|---|
| Air compressor, drill, drill steel | | |
| 5 days @ $80.00/day | $ 400.00 | |
| Vehicle (4-wheel drive) | | |
| 4 months @ $160.00/month | 640.00 | |
| | | $ 1,040.00 |

Category (7) Miscellaneous

None except:

| | | |
|---|---|---|
| Payroll taxes and insurance @ 15% | $ ~~843~~ 573.00 | |
| Assays for gold and silver | | |
| 500 ~~samples~~ assays @ $3.00/~~sample~~ assay | 1,500.00 | |
| Assays for ~~base metals~~ lead, zinc, or copper | | |
| 100 ~~samples~~ assays @ $2.00/~~sample~~ assay | 200.00 | |
| Vehicle mileage (1,200 miles/month) | | |
| 4,800 miles @ $0.12/mile | 576.00 | |
| Accounting and office expenses | | |
| 4 months @ $40.00/month | 160.00 | |
| | | ~~$3,279~~ 3,009.00 |
| Total Estimated Costs Stage I | | $56,000.00 |

Stage II

| | |
|---|---|
| The schedule for Stage I applies | $56,000.00 |
| Total Estimated Actual Costs of the Work | $112,000.00 |
| Government Participation @ 75% | $ 84,000.00 |

~~1/ The Government will not contribute to the cost of casing, left in a hole at the Operator's request.~~

Form 7
(2/63)

I-65-2098.11

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| 9/27 | RM Smith | 120 |
| " | Johnson | 110 |
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September 27, 1966

Memorandum

To: The File

From: R. M. Smith, Office of Minerals Exploration

Subject: OME-6548 (Silver-Gold)
Big Treasure Mining and Development Co.
Little Treasure and Adjust Mines
Pinal County, Arizona

Justification for waiving Lien and Subordination Agreements on Concord and Trenton Claims

In the original application the Applicant requested that the two patented claims, Concord and Trenton, be excluded from the land subject to the contract, not because of any known ore reserves, but because the owner will not sign a Lien and Subordination Agreements. These two claims are near the center of the project area and are likely, but not certain, to benefit in a general way from the project even though no work is done on the claims themselves. Because of this possibility of benefit to the claims, and because they are held under lease by the Applicant, they should be included in the land subject to the contract in order to protect fully the Government's interest in the event of production from these two claims by the Applicant.

The possibility of production from the Trenton claim as a direct or indirect result of the project is almost nil because none of the veins on the claim are to be explored. The continuations of veins on the Concord claim, however, are to be explored on adjoining claims in areas where local targets unrelated to the showings on the Concord indicate the probability of ore bodies. Discoveries on these adjoining claims are unlikely to be so large as to extend into the Concord claim, but they might conceivably encourage subsequent exploration, discovery, and production from the Concord. In this event, the Government's interest is partly protected by Article 7(b) of the contract which makes the Operator, whether or not he is the producer, responsible for repayment. The Government's interest is not protected, however, in the event that production is made from either of the two patented claims and the Operator is defunct.

The Applicant is financially unable to furnish a Performance Bond in lieu of a Lien and Subordination Agreements because it would be required to furnish collateral in the full amount of the bond.

The two unsubordinated claims contain less than 8 percent of the project area; they will not benefit directly from the proposed work; and production from them as a result of the project is unlikely. The potential value of the silver and gold that may be discovered in the subordinated area is more than adequate to repay the Government's participation without any production from the unsubordinated claims, and far exceeds the small potential risk engendered by the owner's refusal to sign a Lien and Subordination Agreements. The examining geologist and the Field Officer concur that the property should be explored and that the Applicant is reliable and technically qualified to perform the work. I recommend, therefore, that a Lien and Subordination Agreements for the Concord and Trenton Claims be waived.

Roscoe M. Smith

Roscoe M. Smith

cc: Director's Reading File
Division File
Economic Geology File
OME File
OME Reading File
Mr. Long, SOL. Rm. 6554
Mr. Smith

RMSmith/gla 9-27-66

SPENST M. HANSEN, PH.D.
MINING GEOLOGIST
125 SEDGEFIELD COURT
DUBLIN, CALIFORNIA 94539

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COPY
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SEP 19 1966

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| RMS | 120 S |
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| | |

September 15, 1966

Frank E. Johnson
Chief, Office of Minerals Exploration
U. S. Department of the Interior
Geological Survey
Washington 25, D. C.

Re: OME-6548 (Silver Gold)
-Big Treasure Mining and Development Co.
-Little Treasure and Adjust Mines
-Pinal County, Arizona

Dear Mr. Johnson

I appreciated the informative telephone conversation with Mr. Roscoe M. Smith on Tuesday morning regarding our application for O.M.E. exploration assistance. As I pointed out on the telephone, this is my first effort in preparing an O.M.E. application, and I apologize for the many errors and omissions. Your patience and helpful assistance are very much appreciated.

The goal of vertical drill hole no. 3 is primarily to intersect and explore the Naco Limestone at depth beneath the andesite cover for the presence of economic silver mineralization. The field work I have done in the area and the excellent previous work by others including Ransom, Ross and Willden have helped to substantiate my opinion that the andesite may indeed be less than 1,000 feet thick in the vicinity of drill hole no. 3. Further, the extensive mineralization in the Naco Limestone in nearby areas, including the Christmas and other mines in the adjacent Banner district, have substantiated the fact that it is of a character amenable to replacement mineralization. The exploration of this Naco Limestone target is one of the most important single goals of the exploration project, for if replacement bodies of sulfide ore containing a high silver content can be intersected in this hole, then the property has an excellent chance to make a mine regardless of what the other holes show. Any veins that are cut by this no. 3 drill hole will be of secondary importance, since the prime reason for the hole is to explore for replacement bodies of silver ore in the underlying limestone.

The sketch enclosed shows the approximate location of the Deer Creek fault (probable extension of the Christmas-Joker fault system). This is a proved mineralized structure into which trend most of the important veins on the property. This fault structure is especially difficult to map in the property area because the wall rock on both sides is andesite and of similar appearance. The fault is vertical to steeply dipping, probably to the north. At least two N.E. trending

branch faults, one of which shows considerable silver mineralization were mapped also, and are shown on the drawing. It is felt by us that the location shown for hole number 3 is best for a number of reasons, including: (1) it is near the bottom of the wash, which gives maximum depth exploration for a minimum of drilling footage; (2) it is clearly on the upthrown side of the fault structure and located far enough away so that a minor error in placement of the fault trace would not put the hole on the downthrown side, and yet close enough so that associated replacement mineralization in the Naco can be expected to reasonably be encountered. It should be pointed out that small intrusions of microdiorite, similar to those noted by Ross and others to be associated with metallization in other parts of the district, are also found near hole no. 3 on the south side of the Deer Creek fault.

If you feel that the location of drill hole No. 3 should be changed, we will certainly consider your suggestions. However I feel that it is now well located to permit it to accomplish its major purpose of exploring for replacement bodies in the Naco Limestone.

We are most anxious to begin the exploration program and look forward to learning your decision regarding O.M.E. participation.

Today I received a copy of Standard Form 25 (Performance Bond) sent to me by Mr. Smith. We do not feel that a bond of this type is consistent with the type of exploration program proposed. I hope the above information and statement of the purpose of drill hole no. 3 will remove any objection from a legal standpoint to the placement of drill hole no. 3, and eliminate the necessity for considering the bond further.

Thank you for your efforts in expediting our application for exploration assistance.

Sincerely

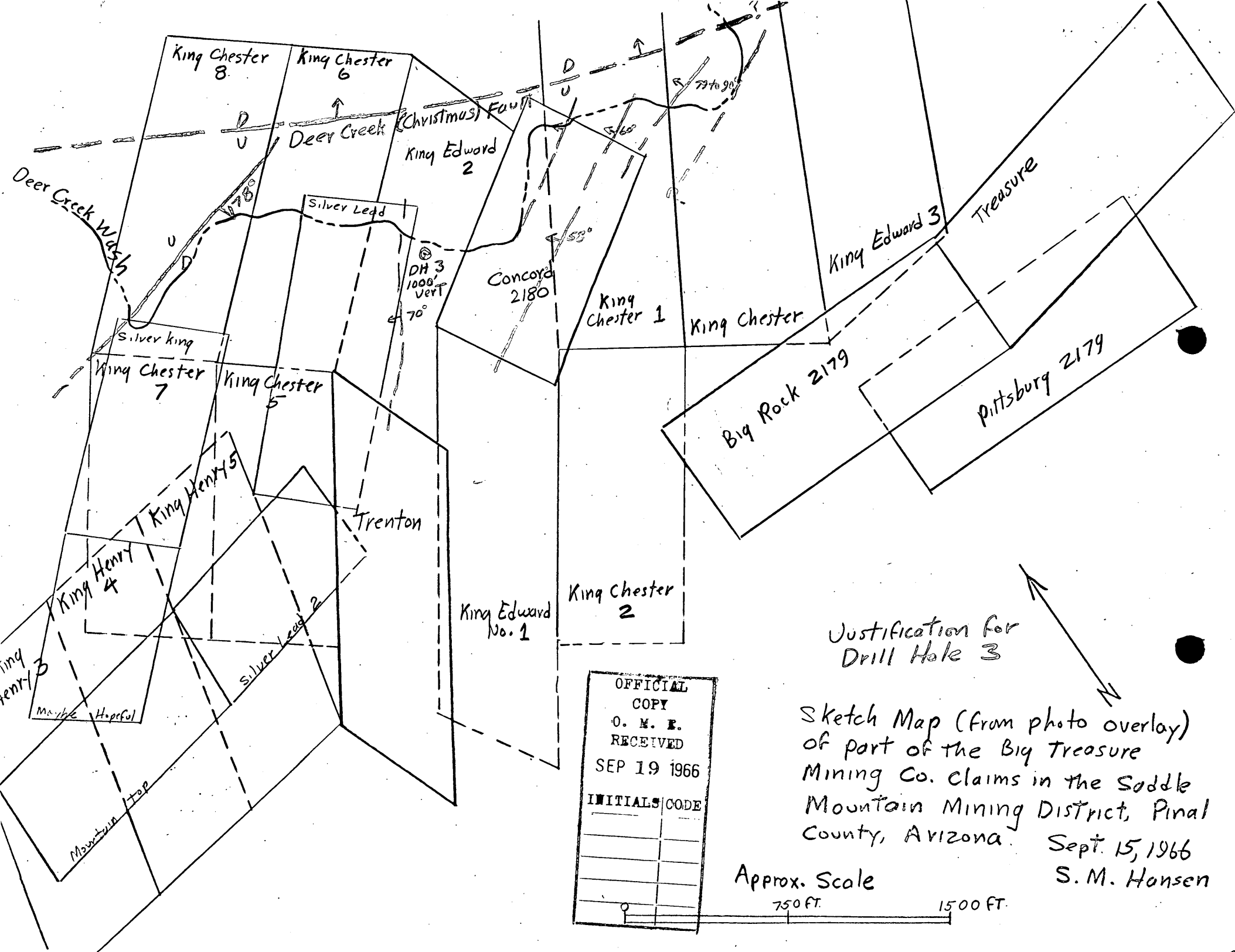
Spenst M. Hansen

Spenst M. Hansen
For Big Treasure Mining
and Development Co.

Phone (415) 828-4126

SMH:bh

CC: J. William Hasler, Field Officer
Region III, O.M.E.
U.S. Geological Survey
Denver, Colorado

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Sketch Map (from photo overlay) of part of the Big Treasure Mining Co. Claims in the Saddle Mountain Mining District, Pinal County, Arizona.

Sept. 15, 1966
S. M. Hansen

MME Form 7
(2/63)

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| 9/12/66 | RM Smith | 130 |
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SEP 13 1966

Memorandum

To: Field Officer, Region III

From: Chief, Office of Minerals Exploration

Subject: OME-6548 (Silver-Gold)
Big Treasure Mining and Development Co.
Little Treasure and Adjust Mines
Pinal County, Arizona

Please refer to your memo of September 8, 1966, relating to the exploration targets for proposed drill holes 1, 2, 3, and 6. We are giving favorable consideration to this application but one problem remains to be settled before a contract could be prepared. The targets for hole 3 are the Concord and Little Treasure veins in the Naco limestone and also possible replacement bodies in the limestone near these veins. We consider these targets to have the largest potential of the entire project, and would be reluctant to exclude them from a contract. We can not approve hole 3, however, because both veins apex on the Concord claim which is not subordinated. Either a Lien and Subordination Agreements or a Performance Bond on Standard Form 25 will be required before a contract can be approved.

Will you please so inform the Applicant, determine its wishes in this matter, and if possible, obtain its assurance that one or the other of these documents will be furnished if a contract is offered.

FRANK E. JOHNSON

Frank E. Johnson

cc: Director's Reading File
Division File
Economic Geology File
OME Docket
OME Reading File
130
Smith

RMSmith/mm (9/12/66)

Applicant phoned Sept. 13 and promised to send a map showing location of Deer Creek fault with respect to hole 3. Replacement bodies near this fault are the target — not the veins, Hence L & S may not be needed.

23263

IN REPLY REFER TO:

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

Office of Minerals Exploration -- Building 25

September 8, 1966

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| FEJ | 110 |
| RWD | 120 |
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To: Chief, Office of Minerals Exploration

From: Field Officer, Region III

Subject: OME-6548 (Silver)
Big Treasure Mining and Development Co.
Little Treasure-Adjust
Pinal County, Arizona

The following is in reply to Roscoe Smith's request concerning the subject docket. The area chosen as a target for proposed diamond drill hole No. 1 is based upon the fact that an unnamed vein, and the silver-lead vein, outcrop over a distance of 500 to 1,000 feet on the King Cluster No. 5 and No. 6 claim. The veins in the target area range from 2 to 8 feet wide, and are known to assay at the surface as much as 0.04 oz Au, 2.80 oz Ag, 2.8 percent Pb, and 16 percent Zn. The drill site as shown, is in an area of good access near a former mine road in an area otherwise difficult of access.

Ag leached?

Proposed diamond drill hole No. 2 target area was chosen because it is in the most favorable area to explore, at depth, two unnamed veins that trend NNE across the King Edward No. 1 claim. It is possible that these veins are continuations or branches of the Concord-Little Treasure, or another unnamed vein that had been developed through the Little Treasure mine workings near Deer Creek. Another analysis of a sample of the Little Treasure vein that outcrops near Deer Creek shows the vein to be 2 feet wide and to contain 0.04 oz Au and 6.2 oz Ag. Veins in the target area are from 2 to 4 feet wide and consist of light-colored argillized brecciated wallrock. The drill-site location is more than 200 feet from the applicant's property boundary in a flat area at the base of a steep inaccessible hillside.

The target area of proposed diamond drill hole No. 3 is the underlying Naco limestone that is considered to be one of the most favorable host rocks for mineralization in the Christmas district 3 miles to the northwest as discussed by C. P. Ross in USGS Bull. 771, 1925. The drill site is adjacent to the access road along Deer Creek and is at the lowest

Also the biggest potential for OME6548

possible elevation and still be above flood danger. The target area for proposed diamond drill hole No. 2 was selected because it will explore between the Concord-Little Treasure veins at depth, and to the east of known mine workings. The site is adjacent to an existing access road and is in the bottom of Deer Creek above flash-flood level.

These veins apex on Concord claim — not subordinated.

The target area of proposed hole No. 6 is the eastward projection of the Big Rock vein which outcrops on the Big Rock and Treasure claims. The Big Rock was developed to rather shallow depths by the Little Treasure Mining Company in the early 1900's. It was discussed in my memorandum dated Aug. 30, 1966, from data supplied by R. U. King and is considered an adequate and suitable target area.

In regard to the question of justification for the 1,000 assays--the proposed figure of 1,000 is an estimated maximum based on the possibility (1) that the drill holes may intersect several veins in addition to the named target veins; (2) that large veins should be sampled over small intervals; and (3) that altered wallrock adjacent to veins should be sampled where intensely altered or mineralized.

J. William Hasler

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

IN REPLY REFER TO:

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

Office of Minerals Exploration -- Building 25

August 30, 1966

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| | 110 |
| RMJ | 120 |
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| | |

To: Chief, Office of Minerals Exploration

From: Field Officer, Region III

Subject: OME Docket 6548 (Silver)
Big Treasure Mining & Development Co.
Little Treasure and Adjust
Pinal County, Arizona

The applicant's representative, Mr. Spent Hansen, was contacted by telephone August 23, 1966, and was requested to furnish additional data to justify the targets for proposed holes Nos. 1, 2, and 6 on the subject application.

Information relating only to proposed hole No. 6 was included in the application and is therefore summarized below.

The following description of the target vein on the Treasure claim is presented as justification for the applicant's proposed hole No. 6.

The Big Rock vein is exposed, according to Ross, p. 45 (U.S.G.S. Bull. 771) about 3,500 feet east of the SW section corner of sec. 35, on the south slope of Deer Creek Valley, at an elevation of about 2,700 feet. This location is approximately that of the west end line of the Treasure claim. Ross states that the Big Rock vein is from 2 to 3 feet wide, strikes easterly and dips 75° to 80° S. The wall rocks are altered but little mineralized.

In an unsigned report obtained from the Arizona Dept. of Mineral Resources files, tenor of ore in the Big Rock vein is stated to have ranged from 6 ounces to 400 ounces silver per ton, and from $1 to $3 value in gold. The vein, from 8 inches to 4 feet wide on the Big Rock claim was mined to a maximum depth of about 150 feet.

The applicant's proposed hole No. 6 will explore at depth the eastward projection of the Big Rock vein ("system") and adjacent veins that have been identified on the Treasure claim.

J. William Hasler

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

SPENST M. HANSEN, PH.D.
MINING GEOLOGIST
125 SEDGEFIELD COURT
DUBLIN, CALIFORNIA 94539

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August 27, 1966

Re:OME-6548 (Silver Gold)

U.S. Department of the Interior
Office of Minerals Exploration
Geological Survey
Building 25, Room 2284
Denver Federal Center
Denver, Colorado 80225

Attn: J. William Hasler
Field Officer, Region III

Dear Mr. Hasler

This letter is in response to Mr. Robert U. King's request that I provide additional data regarding the target veins for drill holes No. 1 and 2 on our proposed exploration project in the Saddle Mountain Mining District. What about 3, 5 and 6 ?

Enclosed with the original proposal was an assay certificate from Arizona Testing Laboratories (a duplicate is enclosed herewith). Sample No. 2 (an 8 foot channel sample across the steeply dipping vein and adjacent alteration zone) was obtained from the vein marked on the enclosed drawing. This vein outcrops near the center line of Silver Lead claim. Drill hole No. 1 will intersect this vein at a depth of from about 400 to 600 feet. and 200' SW of the sample One additional vein (from 3 to 4 feet wide) which outcrops on the south east edge of the Silver Lead claim is similar in mineralogy and appearance. I do not have assay data from this vein, but qualitative chemical tests on samples from it have shown silver to be present in significant amounts. Further, the area between these two veins, and adjacent to them, contain several veinlets with similar mineralization. The strike is well defined, although the dips are variable or difficult to measure. Hole No. 1 should provide data on the development of this vein system at depth, and as to whether or not they are branches of a more important single mineralized structure.

The area included within the King Edward No. 1 claim (which is to be explored by hole no. 2) shows intense alteration, particularly pyritic and argillic. This is probably the most intensely altered portion of the exploration tract. Several small veins (2 to 3 feet wide) are exposed on the surface, and several veinlets. Two major vein structures strike into this area from King Chester and King Chester No. 1 claims. Sample No. 1 on the enclosed assay sheet was cut from one of these and shows 6.2 ounces of silver per ton. at a point 1700 feet from the proposed drill hole.

* What I requested was { Bob King's views on "What constitutes the targets for holes 1, 2, 3, 5, & 6."

These two vein systems are the primary exploration target of hole No. 2, plus the investigation of the downward development of the minor veins outcropping in the altered zone of the King Edward No. 1 claim.

Because of the general lack of any exploration in this part of the district at depth below about 150 feet, the downward development of the vein systems is not well understood. It is thus not possible to predict with confidence either constant dip or thickness. I feel that holes 1 and 2 are justified since they can reasonably be expected to penetrate and explore known silver bearing vein systems. Careful field and laboratory examination (microscopic examination and qualitative chemical tests for silver) of vein material from the veins mentioned above has substantiated their significant silver content.

I hope this provides the necessary additional data to permit the continued processing of our application. Please telephone me in the event further information is needed.

This page implies that the veins are expected to be ore throughout and that a hole anywhere will tell the story. Are there no ore-shoots expected? More important, are there no barren segments expected?

Sincerely

Spenst M. Hansen

Spenst M. Hansen--
for Big Treasure Mining
and Development Co.

Phone (415) 828-4126

SMH:bh

CC:Frank E. Johnson
Chief, Office of Minerals Exploration
Washington 25, D.C.

P.S.
Between September 2nd and September 13th I will be in the field in western Utah. I can be reached during this period at 1478 El Rey St., Salt Lake City, Utah. Phone (801) HU5-0837.

ARIZONA TESTING LABORATORIES

A DIVISION OF CLAUDE E. McLEAN & SON LABORATORIES, INC.

PHONE 254-6181 817 WEST MADISON ST. P. O. BOX 1888 PHOENIX 85001

Chemist . . . Engineers

For Mr. S. M. Hansen Date July 27, 1965

Sample of Ore Received: 7-27-65

Submitted by: Mr. C. L. Whitelock

## ASSAY CERTIFICATE

Gold figured at $ 35.00 per ounce Silver figured at $ 1.29 per ounce

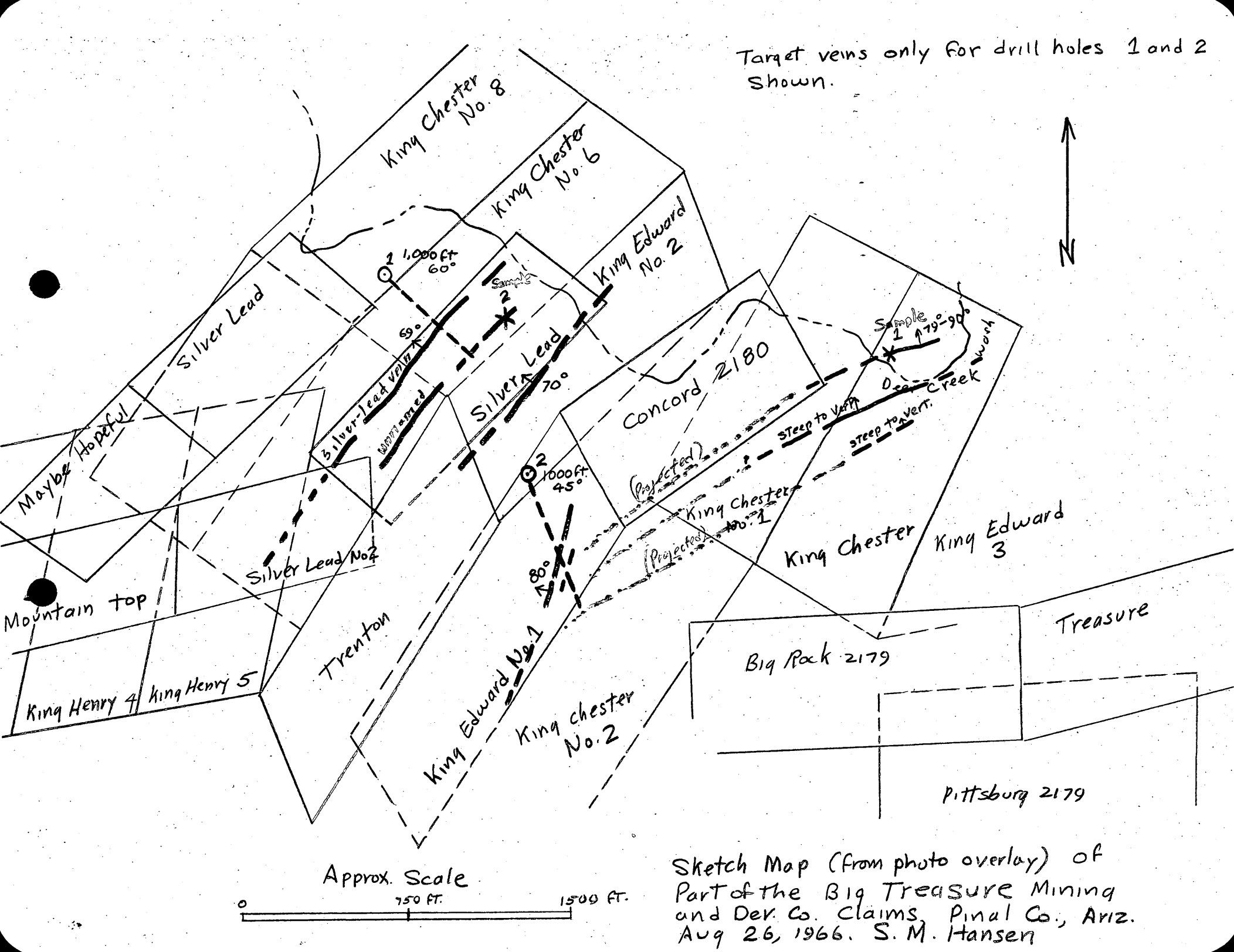
| LAB. NO. | IDENTIFICATION | GOLD | | SILVER | | PERCENTAGES | |
|---|---|---|---|---|---|---|---|
| | | OZ. PER TON | VALUE | OZ. PER TON | VALUE | LEAD | ZINC |
| 159922 | #1, 2 ft. Vein | 0.04 | $1.40 | 6.20 | $8.00 | | |
| 159923 | #2, 8 ft. Vein | 0.04 | 1.40 | 2.80 | 3.61 | 2.85% | 16.05% |
| 159924 | #3, 20 ft. Vein | 0.20 | 7.00 | 10.60 | 13.67 | | |

Respectfully submitted,

ARIZONA TESTING LABORATORIES

Claude E. McLean Jr.

Claude E. McLean, Jr.




Sketch Map (from photo overlay) of Part of the Big Treasure Mining and Dev. Co. Claims, Pinal Co., Ariz. Aug 26, 1966. S. M. Hansen

UNITED STATES
DEPARTMENT OF THE INTERIOR
OFFICE OF MINERALS EXPLORATION

U. S. Geological Survey -- Denver Federal Center
Building 25- Room 2284
Denver, Colorado 80225

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AUG 19 1966

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August 16, 1966

To: Chief, OME

From: Field Officer, Region III

Subject: Report of examination OME Docket 6548 (Silver)
Big Treasure Mining and Development Co.
Little Treasure-Adjust property
Pinal County, Arizona

Transmitted herewith is an original and one copy of a report of examination by Robert U. King, on the subject property recommending approval for the proposed exploration work herein outlined.

The Field Officer concurs with the examiner's modifications of the applicant's proposal and recommends that an OME contract be prepared and executed to explore for silver on the Little Treasure-Adjust property.

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

cc: Hasler chron
OME chron
R. U. King
6548

ON-SITE REPORT

UNITED STATES

DEPARTMENT OF THE INTERIOR

STEWART L. UDALL, SECRETARY

U. S. GEOLOGICAL SURVEY

OFFICE OF MINERALS EXPLORATION

# Report of Examination

Region III

OME Docket 6548 (Silver)

Big Treasure Mining and Development Company

Little Treasure-Adjust Property

Pinal County, Arizona

by

Robert U. King

August 1966

## Contents

Introduction and summary---------- 2

The property---------- 3

History and production---------- 7

Geology and ore deposits---------- 8

Applicant's proposed exploration---------- 10

Recommended exploration---------- 14

Estimated costs of recommended exploration---------- 16

Summary and conclusions---------- 18

## Illustrations

Figure 1. Claim map of Big Treasure Mining and Development Company, Pinal County, Arizona, showing proposed exploration---------- 5

## Introduction and summary

The Big Treasure Mining and Development Company, a California corporation (state approval pending) applied on February 25, 1966 under OME Docket No. 6548 for Government assistance to explore for silver on the Little Treasure-Adjust property in the Saddle Mountain mining district, Pinal County, Arizona. The applicant's property consists of 23 unpatented lode mining claims held under location, lease, and assignment.

The property was examined by Robert U. King in company with Mr. Spenst M. Hansen, Vice President of the applicant company.

Small Potatoes

Over 130,000 oz. of silver has been produced during the period 1921 to 1925 from silver-bearing fissure veins that cut andesitic flow rocks interbedded with sedimentary rocks of volcanic origin. Although assay maps indicate the presence of significant silver in the veins at the extremities of existing mine workings, the data are not sufficient to calculate any ore reserves.

Underlying the volcanic rocks three miles northwest of the property, is a limestone formation which is a recognized favorable host rock for precious and base metal deposits in the Banner mining district.

The applicant proposes to explore the most favorable of the identified veins on the property, and to test the favorable underlying limestone formation by core drilling, from surface and underground stations, for a total of 7,500 feet at an estimated cost of $109,867.00.

It is concluded that there is a fair chance of discovering significant silver deposits on the property and a program of core drilling from surface locations totalling 10,000 feet is recommended at an estimated total cost of $107,769.00.

## The property

The Little Treasure-Adjust property is in secs. 34 and 35, T. 4 S.; R. 16 E., and in secs. 2 and 3, T. 5 S.; R. 16 E., in the Saddle Mountain Mining district, Pinal County, Arizona. It is about six miles airline NE of the town of Winkleman, Arizona.

The property is accessible by gravel road by following state highway 77 southeast from Winkleman for one and a quarter miles, thence northeast by graded road for 10 miles to the property on Deer Creek. The property can be reached alternatively by going north from Winkleman on highway 77 for 5 miles, thence turning right at the mouth of Deer Creek, and following an ungraded road along Deer Creek for 2 miles to the property.

The topography is rough, with relief at the property amounting to 600 feet in less than one half mile. Elevations on the property range from 2,200 feet in the bed of Deer Creek to 3,050 at the highest point on the claims. Climate is hot and dry -- typical of the semi-arid regions of the southwestern states. Winkleman, the nearest supply town is on the Southern Pacific Railroad.

Sufficient water for drilling purposes can be obtained with few exceptions, year-round from Deer Creek which crosses the property. Power, timber, or other facilities are not available in the immediate vicinity. All work could be conducted out of Winkleman.

The applicant's claims and status of ownership as recorded in the Pinal County Clerk's office are as follows: (Figure 1)

| Claim Name | Docket (Book) No. | Page |
|---|---|---|
| 1. Unpatented claims held by applicant under assignment from C. L. Whitlock, locator: | | |
| King Chester | 426 | 273 |
| King Chester No. 1 | 428 | 412 |
| King Chester No. 2 | " | 413 |
| King Chester No. 3 | " | 414 |
| King Edward the First | 426 | 123 |
| King Edward the Second | " | 129 |
| King Edward the Third | " | 125 |
| King Henry the 1st | 425 | 402 |
| " " " 2nd | " | 463 |
| " " " 3rd | " | 464 |
| " " " 4th | " | 465 |
| " " " 5th | " | 466 |
| 2. Unpatented claims held under lease from Joseph Jamieson and Manuel Sosa to C. L. Whitelock and under assignment from C. L. Whitelock to the applicant: | | |
| Silver Lead | 103 | 319 |
| Silver Lead No. 2 | " | 320 |
| Maybe Hopeful | " | 321 |
| Silver King | " | 322 |
| Mountain Top | " | 323 |

USDI
Geological Survey

OME
Docket 6548

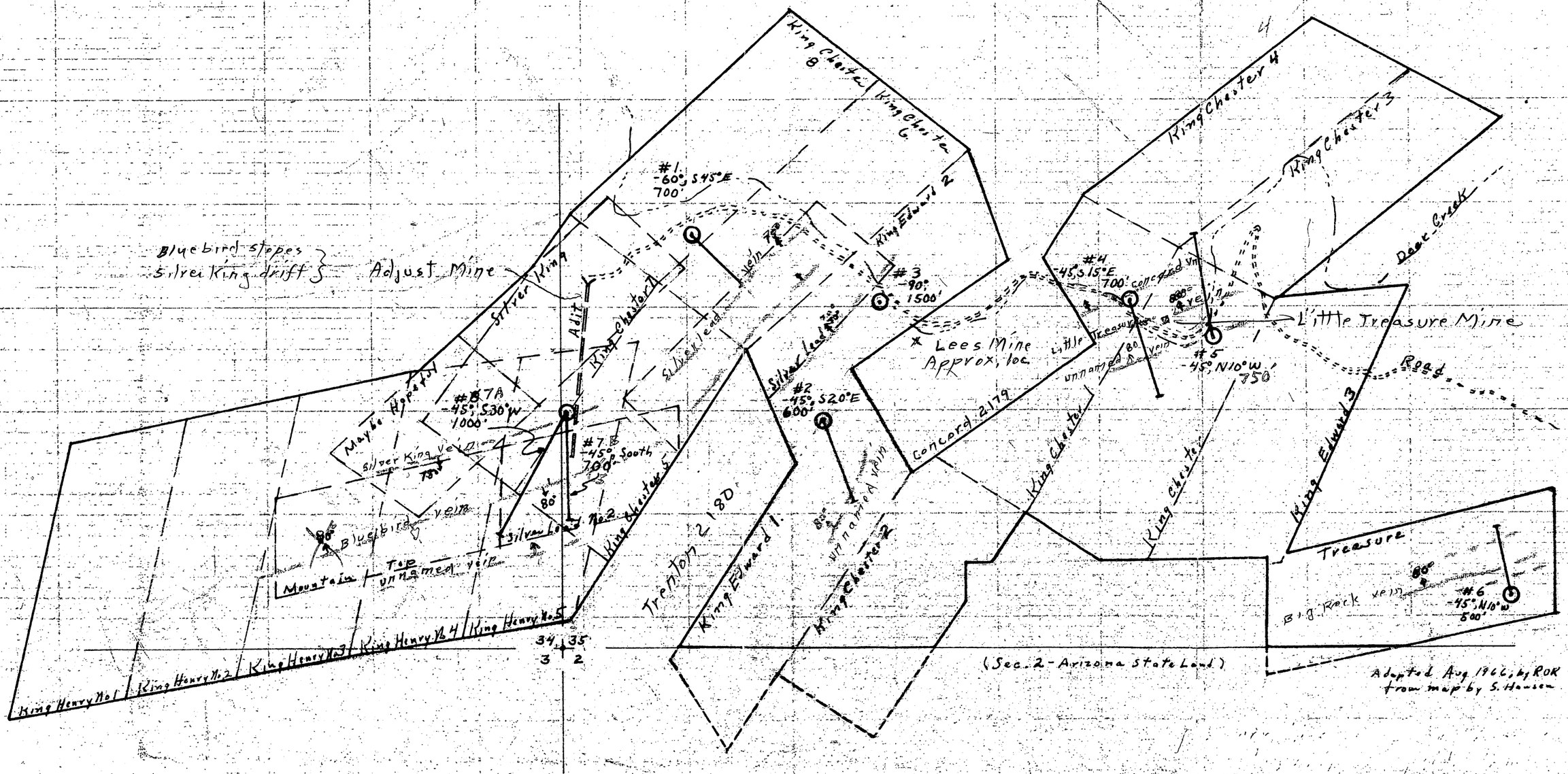


Figure 1. Claim map of Big Treasure Mining and Development Company, Pinal County, Arizona, showing proposed exploration.

3. The following unpatented claims, added to the application tract by the applicant in a letter dated April 16, 1966:

| | | |
|---|---|---|
| King Chester No. 4 | 428 | 416 |
| King Chester No. 5 | " | 417 |
| King Chester No. 6 | " | 418 |
| King Chester No. 7 | " | 419 |
| King Chester No. 8 | " | 420 |
| Treasure * | 447 | 109 |

Lien and subordination agreements from property owners on MME form 52 accompany the original application. Assignment agreements between C. L. Whitelock to the applicant corporation have been forwarded to OME in Washington, D. C. according to the applicant.

* — Assignment of 4/22/66 does not include the Treasure claim — probably by error. Either get the assignment or cut out hole 6.

## History and production

The applicant's property consists of a consolidation of three separate mining properties, discovered and worked during the period 1900 to about 1925. The properties included in the consolidation are: The Adjust Mine,* the Little Treasure Mine,* and the J. W. Lee Mine.* From over 1,500 feet of workings in the Adjust Mine, chiefly on the Bluebird vein,* some 2,000 tons of ore were shipped, 1,500 tons of which contained about 60,000 ounces of silver. A cross-cut was driven southerly from the vicinity of Deer Creek* for about 875 feet to intersect the Bluebird vein about 350 feet below the lowest then existing level.* One old survey shows the cross-cut passing under the Adjust workings on the Bluebird vein, but a more recent survey by the applicant indicates that the cross-cut fell short of its objective by about 300 feet. The Adjust mine occupies the western part of the applicant's property.

~~40~~ oz/ton
33.0

The Little Treasure mine is reported to have yielded about 75,000 oz. of silver from 3,000 tons in the early 1920's. Complete records are not available. The mine workings are not extensive, the Little Treasure Mine occupies the northeastern part of the property.

~~25~~ oz/ton
25.0

Little information is available on the J. W. Lee mine -- other than its meager record of development and production. The Lee group of claims* occupies an irregular area in the central and southern part of the applicant's property.

?
small prod.

Of all the mine workings on the applicant's property, only the cross-cut tunnel on the Adjust mine is in good and useable condition.



* Not shown on map

## Geology and ore deposits

Somewhat more than 135,000 oz. of silver have been recovered from 4,500 tons of ore taken from two major vein deposits in the Saddle Mountain district during the period 1921 to 1925. The area has been studied by C. P. Ross (Ore deposits of the Saddle Mountain and Banner mining districts, Arizona, U. S. Geol. Survey Bull. 721, 1925) and more recently by Ronald Wilder (Geology of the Christmas Quadrangle, Gila and Pinal Counties, Arizona: U. S. Geol. Survey Bull. 1161-E, 1964).

strike? dip?

A thick series of volcanic rocks interbedded with sedimentary rocks of Cretaceous age that are intruded by numerous porphyry dikes and sills, underly the property. The volcanic rocks consist of andesitic flows and flow breccias; the interbedded sedimentary rocks are poorly graded sandstone and conglomerate chiefly of volcanic origin.

Naco ls,

Limestone of Pennsylvanian age underlies the volcanic rocks: the limestone ranges in depth from surface outcrop in the vicinity of the Christmas Mine in the Banner district to as much as 3,000 feet deep (reported in a drill hole log) -- one mile southeast of the property.

dip N?

The property is on the south limb of an east-trending (Deer Creek) syncline (Wilden, 1964, p. 40). Two high angle faults generally paralleling the south limb of the syncline are mapped to the east and west of the property. One of these faults, the Deer Creek fault, dips steeply to the north and trends east-southeast across the northern part of the applicant's claims. The Deer Creek fault may be a continuation of the Christmas fault, a major ore related structure in the Christmas Mine. Normal displacement is believed to have occurred along both of these faults. The faults are not readily discernable in the volcanic rocks in the vicinity of the property, and can therefore only be inferred as to number, displacement and trend.

According to Ross (1925, p. 29) the ore deposits of the Banner and Saddle Mountain districts have been known and mined since the 1870's. With the exception of the Christmas Mine of the Inspiration Copper Corp., development has been limited to shallow workings and mining has been intermittent. Good grade ore has been found in places and Ross concludes that commercial grade ore may yet be found. Significant production of copper ore, lead-silver ore, gold, and some zinc and vanadium ores has been made from mines in the two districts. Records indicate that copper predominates in the Banner district and silver-lead predominate in the ore of the Saddle Mountain district.

The silver-lead vein deposits of the Saddle Mountain district according to Ross, are principally in the volcanic rocks, and were formed along zones of shearing and brecciation, and in part by filling of fissures. Gangue material is mostly fragmental and altered country rock with quartz, barite, and calcite.

Ore minerals consist of galena, sphalerite, pyrite, and minor chalcopyrite + gold content. Records indicate the silver content of the ores of the Saddle Mountain district ranged from 20 to 40 ounces per ton, and occurring mostly in the galena. Pyritic-gold veins are known in the district but are not identified on the applicant's property.

Sampling records indicate that in the Little Treasure mine the ore-bearing parts of the veins ranges from one foot to 4 feet in width, and in the Adjust mine, from one foot to a maximum of five feet in width. The silver content of the veins ranges from a few ounces of silver per ton to as much as 100 ounces per ton, with the average as

shown by records of shipments of crude ore (1920 to 1925) varying between 20 and 40 ounces of silver per ton, and from .05 to .1 ounces of gold per ton. There are no records showing that any recovery was made of the copper, lead, or zinc content of the veins.

## Applicant's proposed exploration

The applicant's proposed exploration consists of six core drill holes (amended from 5) from surface stations totalling 5,750 feet and two holes (amended from 3) from one underground station (figure 1) totalling 1,750 feet to explore at depth for silver in the most favorable of the identified veins on the property, and to test the underlying Naco limestone for silver mineralization close to the projection of the Deer Creek fault. The approximate location, bearing, inclination, and depth of the proposed drill holes are as follows:

Rec. by F.O.

| Vein | Number | Justification | Collar Location | Bearing | Inclination | Depth | |
|---|---|---|---|---|---|---|---|
| | | | Surface stations | | | | |
| silver-lead vein | 1 | | SE corner King Chester No. 8 | S. 45 E. | -60° | 1,000' | 700 |
| unnamed vein | 2 | | Overlap, King Edward Nos. 1 and 2 | S. 20° E. | -45° | 1,000' | 600 |
| Naco ls. near Deer Creek fault | 3 | Continuation of Christmas fault-ore contact | Center, King Edward No. 2 | -------- | -90° | 1,500' | stage I-b |
| Little Treasure vn unnamed vein | 4 | 3000 tons 25 oz Ag/ton 1'-4' wide | N.E. King Chester No. 1 | S. 15° E. | -45° | 1,000' | 700 |
| Little Treasure vn Concord? | 5 | | N.E. King Chester | N. 10° W. | -45° | 750' | |
| Big Rock vein | 6 | | S.E. Treasure | N. 10° W. | -45° | 500' | |
| | | | Underground Station | | | | |
| Bluebird vein | 7 | 2000 tons 40 oz Ag/ton 1'-5' wide | Face, Cross Cut (Surface) | S. [5° W.] | -45 [0°] | 750' | |
| Bluebird vein | 8 | | Face, Cross Cut (Surface) | S. [35° W.] 34 | -45 [-30°] | 1,000' | |
| | | | | | Total | 7,500' | 6,500' 3,500' |

Stage II - offset

Support work to facilitate the above proposed drilling will require the use of one bulldozer to repair existing mine roads, sufficient to permit moving in of drill equipment and access for water trucks, to prepare surface drill stations, and to perform some stripping of shallow overburden from portions of veins.

The applicant proposes a schedule of operations in which each phase of work i.e.: bulldozer, underground drill station preparation, underground drilling, and surface drilling proceed consecutively. Including two weeks for contingencies, the total time required for completion of the proposed exploration would be six months. Starting date would be within 30 days of contract.

Targets. – Except for the Bluebird vein 1'–5' wide and the Little Treasure vein which is 1'–4' wide the veins are not described.

wrong presumption

Presumably no ore is exposed on the surface! – why is ore expected in the localities to be cut by the drill holes? In other words, how were the drill sites chosen?)

1.

2.

3. Evidence of loc. of [Deer Creek fault] (Concord, Little Treas.

4,

5,

6,

7 } Below old stopes?
8

Cost of applicant's proposed work

1. Preparation of surface drill stations, and road repair:

(1) Bulldozer:

| | |
|---|---|
| Rental basis - D-7 (Cable, 17A) | |
| 12 days--96 hours at $20.00 hr. (amended) | $1,920.00 |
| Moving charge (amended) | 100.00 |

(2) Blasting:

| | |
|---|---|
| a. Rental basis - Compressor, drill, steel, misc. equipment -- 4 days (amended) | 325.00 |
| b. Labor: 8 man days (amended) | 240.00 |
| c. Dynamite (amended) | 110.00 |
| Total surface | 2,695.00 |

2. Preparation of underground drill station:

| | |
|---|---|
| (1) 90 man days (miner) | 2,700.00 |
| (2) Equipment rental compressor, drill, mucker, steel | 2,100.00 |
| (3) Rail - 400 feet | 800.00 |
| (4) Air line 1,000 feet (2 inch) | 1,075.00 |
| (5) Water line 1,000 feet (1 inch) | 535.00 |
| Total underground | 7,210.00 (corrected figure) |

3. Underground diamond drilling:

2,600 feet at $10.13 per foot (Boyles Bros. bid) 26,340.00

4. Surface diamond drilling:

4,900 feet at $10.48 per foot 51,352.00

5. Sampling, geologic supervision, consulting engr. Survey, Misc.

(a) Assaying - 1,000 samples

| | |
|---|---|
| Au and Ag -- Assay charge at $2.50 each | 2,500.00 |
| Sample preparation and handling at $1.25 each | 1,250.00 |

(b) Geologist -- supervision and logging core:

24 weeks at $312.00 per week 7,388.00

52
624
1560
16,224

5. Sampling, geologic supervision, consulting engr. Survey, Misc.

| | | |
|---|---|---|
| (c) | Rental 4-wheel drive vehicle<br>$42.00 per week and $.12 per mile for 24 weeks and 300 miles per week | $1,870.00 |
| (d) | Consulting Engineer<br>$800.00 month for 6 months | 4,800.00 |
| (e) | Surveying (drill holes and mine workings) | 900.00 |
| (f) | Bookkeeping--clerical $75.00 per week (24 weeks) | 1,800.00 |
| (g) | Workmen's compensation and liability insurance | 1,200.00 |
| (h) | Core boxes (amended) 375 boxes at $1.50 each | 562.50 |
| | | 22,270.00 |
| Grand total | | $109,867.00 |

## Recommended Exploration

It is recommended that the applicant's proposed exploration be approved but modified to provide that all diamond core drilling be done from the surface; and to reduce the cost of supervision of the work. It is also recommended that certain of the drill holes be reduced in length to a more reasonable depth beyond the farthest identified vein objective. It is recommended that 3,500 feet of drilling be held in reserve to follow up or offset favorable holes or to deepen favorable holes upon request of the applicant and prior approval of the Government.

Recommended changes in the applicant's amended drilling program are as follows:

(1) Hole No. 1. Hole should be drilled a maximum of 700 feet.

(2) Hole No. 2 -- shorten to 600 feet.

(3) Hold in abeyance and until completion of other specified holes for prior Government approval. If no encouragement is obtained from exploration of the veins at depth, the value of this hole, in testing the underlying (Naco) limestone for silver mineralization, would be significantly diminished. Total depth should be flexible to assure reaching the objective--the Naco limestone--but not more than 1,500 feet without prior government approval.

(4) Hole No. 4 -- Shorten to 700 feet.

(5) Hole No. 5 -- No change.

(6) Hole No. 6 -- No change.

(7 and 8) Holes Nos. 7 and 8 should be drilled from a surface location in order to reduce costs of tunnel rehabilitation and station preparation, approximately on the center line of the King Henry No. 5 claim approximately 500 feet south of the north end line (figure 1). This (collar) location will be approximately that of the shallow surface workings on the Silver King Vein.

The two holes should be inclined so as to cut the Bluebird Vein about 300 feet below the lowest workings, or about 500 feet below the surface as follows:

Hole No. 7 to bear south, at -45°, for a maximum depth of 750 feet.

Hole No. 8 to bear S. 30° W. at -45° for a maximum total depth of 1,000 feet.

The above recommended drilling, totals 6,500 feet or 1,000 feet less than applicant's proposal.

It is recommended that an additional 3,500 feet of drilling be included in the exploration project to be held in reserve and to be used as supplementary drilling in the event additional discoveries are made and to offset or deepen favorable holes, the footage to be used subject to government approval.

16

Estimated costs of recommended exploration

1. Actual costs

(Independent contract)

| | |
|---|---|
| a. 120 hours bulldozing roads, and drill sites @ $20.00/hr. | $2,400.00 |
| b. Mobilization and demobilization | 100.00 |
| c. Blasting -- access to drill sites | |
| Rental of equipment (compressor, drill steel, tools) | |
| 4 days at $80.00 per day | 320.00 |
| Dynamite, caps, fuse | 110.00 |
| Sub-total (c) | 430.00 |
| d. Drilling | |
| 10,000 feet of core drilling @ $9.27 ft. | 92,700.00 |
| Collar pipe, NC size: 100 ft. @ $7.60 | 760.00 |
| 0 to 500 ft. NXWL 5,000 ft. @ $6.90 | 34,500.00 |
| 500 to 1,000 ft. NXWL 2,000 ft. @ $7.60 | 15,200.00 |
| 500 to 1,000' ft. BXWL 1,900 ft. @ $6.90 | 13,110.00 |
| 1,000 to 1,500 ft. BXWL 1,000 ft. @ $7.60 | 7,600.00 |
| Reaming and Casing 1,000 ft. @ 3.40 /ft. | 3,400.00 |
| Cementing 500 hrs. @ $12.50/hr | 6,250.00 |
| Additives -- $1,500 | 1,500.00 |
| Water truck 6 mo. @ $190.00 and 2 | 1,140.00 |
| 2,000 m @ $.12 m | 240.00 |
| Casing (lost in hole) | |
| 500 ft. @ ~~$10~~.00/ft. $4.00 | 5,000.00 |
| ? Incidental allowances for each per foot of drilling completed 10,000 ft. @ $.40/ft. | 4,000.00 |
| Sub Total | $92,700.00 |

No Bids

Op. Equip ? category 4

2. Personal Services

a. Supervision and technical services

| | |
|---|---|
| 1 Outside consultant 10 days @ $75.00/day | $750.00 |
| 1 Supervisor-geologist-engineer 6 months @ $900.00/mo. | 5,400.00 |
| | $6,150.00 |

b. Labor

Blasting? Independent cont?

| | |
|---|---|
| 1 Miner (surface) 5 days @ $24.00/day | 120.00 |
| 1 Laborer (helper) 5 days @ $20.00/day | 100.00 |
| | $220.00 |

3. Miscellaneous

a. Assaying

OK

| | |
|---|---|
| 1,000 samples analyzed for Ag and Au @ $2.50 | 2,500.00 |

b. Core boxes

| | |
|---|---|
| 500 cardboard core boxes @ $1.00 each | 500.00 |

c. Transportation

Vehicle rental 4 x 4 truck

| | |
|---|---|
| 24 weeks @ $42.00/week ($1,008.00) plus 12¢/mile for 300 miles per week ($864.00) | 1,872.00 |

d. Accounting and office expenses

| | |
|---|---|
| 26 weeks @ $10.00/week | 260.00 |

e. Payroll taxes, liability insurance 637.00

107,769.00

## Summary and Conclusions

The Big Treasure Mining and Development Company, a California corporation, applied for Government assistance to explore for silver on its Little Treasure-Adjust property, Pinal County, Arizona.

The applicant's proposal consists of 7,500 feet of core drilling from surface and underground drill sites at an estimated cost of $109,867.00.

It is concluded that there is a fair chance of finding significant reserves of silver on the property, and a modified program of exploration consisting of 10,000 feet of core drilling from surface sites only, is recommended. The estimated cost of the modified program is about the same as the applicant's proposal, $107,769.00. The government's share at 75% would be $80,826.75.

SPENST M. HANSEN, PH.D.
MINING GEOLOGIST
125 SEDGEFIELD COURT
DUBLIN, CALIFORNIA 94539

OFFICIAL
COPY
O. M. E.
RECEIVED
MAY 31 1966
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RMD 120

May 23, 1966

U. S. Department of the Interior
Office of Minerals Exploration
Geological Survey
Bldg. 25, Room 2284
Denver Federal Center
Denver, Colorado 80225

Re: OME-6548 (Silver-Gold)

Attn: J. William Hasler,
Field Officer, Region III

Dear Mr. Hasler

It was a pleasure for me to accompany your representative, Mr. Robert U. King, Geologist, U. S. Geological Survey, on his visit to our mining property east of Winkelman, Arizona, last Friday (May 20th). I trust his visit was satisfactory.

Enclosed herewith is one copy of a map of the property prepared on transparent plastic overlay, and taped to a 3X enlargement of an aerial photograph. One copy of this was sent to Washington D.C. on April 16. During the field examination, Mr. King pointed out that I had neglected to send a copy of this map to Denver. I hope this oversight on my part has not been an inconvenience.

Again, I would like to modify the portion of the application dealing with the bulldozer work for access road improvement, and drill site construction. On April 16, when I indicated bulldozers smaller than D-8 size, adequate to do the job, were not available locally, I was not aware of Charlie Nichols bulldozer in Globe. We have recently had Mr. Nichols do some work for us and have found him to be responsible and competent. His bulldozer is a D-7 (cable) in excellent condition. This model is roughly equivalent to the TD-14 we originally had suggested. A bid from Mr. Nichols is enclosed. He has looked over the job and feels, as I do, that the 96 hours will be sufficient. However, we both feel that some blasting will be required, especially when using this smaller bulldozer. Mr. Whitelock (one of the principals in the BTM Co.) has agreed to perform this drilling and blasting on the following terms. This work should be considered to be performed by the applicant.

| | | |
|---|---|---|
| (a) | Four days rental and use of equipment including compressor, hammers, steel, etc. | $325.00 |
| (b) | Eight man days. | 240.00 |
| (c) | Dynamite. | 110.00 |
| | Total | $675.00 |

This results in a total for access road repair and drill site construction of $2,695. The lowest bid originally using a D-8 bulldozer was $3,150. Please therefore reduce the amount on the application by the $455.00 saving.

I look forward to hearing from you in the near future regarding the disposition of our application. I can be reached by telephone at my Dublin, California office, or a message to return your call will be relayed to me. My numbers are (415) 828-4126 and (415) 828-2051.

Thank you for your consideration of our application.

Sincerely

Spenst M. Hansen

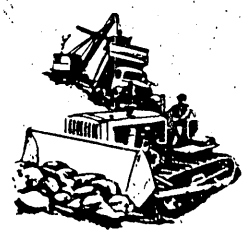
Spenst M. Hansen
Vice President
Big Treasure Mining and
Development Co.

SMH:bh

CC: Frank E. Johnson
Chief, Office of Minerals
Exploration
Washington 25, D.C.

# CHARLIE NICHOLS

**HEAVY EQUIPMENT CONTRACTOR**
**BOX 752**
**GLOBE, ARIZONA 85501**
**Phone 425-5158**



Big Treasure Mining and Development Co.
C/O Spenst M. Hansen
125 Sedgefield Court
Dublin, California 94566

DATE May 20, 1966

TERMS:

STATEMENT

| DATE | | CHARGES | CREDIT | BALANCE |
|---|---|---|---|---|
| | | | BALANCE FORWARDED → | |
| BID: | 96 hr. work with 17A D7 Caterpillar fully operated and maintained | @ $20.00 per hr. | | $1,920.00 |
| signed: | Charlie Nichols<br>Charlie Nichols, Contractor | | | |
| | A charge of $100 will be added for moving to and from the job. | | | |
| | | | PAY LAST AMOUNT IN THIS COLUMN → | |

U. S. Geological Survey -- Denver Federal Center
Building 25- Room 2284
Denver, Colorado 80225

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RMS 1208

May 4, 1966

Mr. Spenst M. Hansen
Big Treasure Mining and Development Company
125 Sedgefield Court
Dublin, California 94539

Re: OME-6548 (Silver)
Big Treasure Mining and Development Company
Little Treasure-Adjust
Pinal County, Arizona

Dear Mr. Hansen:

This letter is to verify my telephone conversation with you this morning relative to the scheduling of a field examination on the subject property in Pinal County, Arizona, concerning your application for financial assistance under the Office of Minerals Exploration. Mr. Robert U. King, Geologist, U. S. Geological Survey will be in the area and will meet you at the Highland Tower Motel, 1919 Miracle Mile Strip, Tucson, Arizona on May 20, 1966 and examine the property that day. Mr. King has had considerable experience on the former DMEA program and the OME program as well, and is a very well-trained and highly qualified geologist. Should you have any questions or problems regarding the proposed scheduled date on certain aspects of the project please call me here at Denver, Office of Minerals Exploration, U. S. Geological Survey, Denver Federal Center, Building 25 - Room 2284, Denver, Colorado 80225; the telephone number is 303-233-3611, extension 8398.

Sincerely yours,

J. William Hasler

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

cc: Chief, OME
R. U. King
OME-6548
OME chron
Hasler chron

MME Form 7
(2/63)

OFFICIAL FILE COPY

| Date | Surname | Code |
|---|---|---|
| 5/3 | RW Smith | 120 S |
| 5/3 | Kirkburno | 120 K |
| | | 110 |
| 5/4 | Cal | 220 |
| | | 120 TW |
| | | |
| | | |
| | | |
| | | |

MAY 5 1966

AIRMAIL

Memorandum

To: Field Officer, Region III

From: Chief, Office of Minerals Exploration

Subject: OMX-6348 (Silver-Gold)
Big Treasure Mining and Development Co.
Little Treasure and Adjust Mines
Pinal County, Arizona

The application is referred to Region III for a field examination and recommendations. The Applicant has furnished most of the information requested in our letter of April 7 in his reply of April 16, a copy of which is enclosed along with a revised copy of the photo-overlay map. We have not yet received copies of the Assignments (our Item 2) but the Applicant states they have been prepared and will be forwarded when properly executed.

In the application (p. 10-11) the statements are made (1) that the silver content is virtually the same in both the primary and secondary portions of the veins, and (2) ore minerals occur in significant amounts for more than 10 feet outside the vein boundaries in altered wall rock. If these statements can be supported by assays, preferably of samples taken during the examination, the Applicant's case for a silver project rather than a base metal project might be strengthened.

If you recommend a project, please inform the Applicant that if a contract is approved the Concord and Trenton claims would be included in the land subject to royalties, but we may waive Lien and Subordination Agreements from the owner provided the work does not directly benefit the two claims. The revised map indicates that drill hole 2 is now suitably oriented to meet our requirements.

Gen. Provis. Not less than 200 ft. from these claims

Estimated costs of the proposed work appear to be realistic, although we question the $30.00 per man-day for miners. You might explain to the Applicant that pipe and rail would be charged to the project

23263

at 50 percent of cost and that the Government would not retain an equity in its salvage value. We would need to know how many days per month the Outside Consultant would spend on the property.

FRANK E. JOHNSON

Frank E. Johnson

Enclosures

cc: Director's Reading File
Division File
Economic Geology File
OME Reading File
130
Mr. Smith

RMSmith/mm (5/3/66)

MME Form 7
(2/63)

OFFICIAL FILE COPY

| Date | Surname | Code |
|---|---|---|
| 5/3 | RMSmith | 120S |
| 5/3 | Kitkemo | 120K |
| | | 110 |
| | | 220 |
| | | 120M |
| | | |
| | | |
| | | |
| | | |

Big Treasure Mining and Development Co.
125 Sedgefield Court
Dublin, California 94539

MAY 4 1966

Re: CMC-6548 (Silver-Gold)
Big Treasure Mining and Development Co.
Little Treasure and Adjust Mines
Pinal County, Arizona

Gentlemen:

Thank you for your letter of April 18, 1966, enclosing part of the information we requested on April 7, and indicating that the bids and Assignments will be furnished.

The application has now been referred to Mr. J. W. Hasler, Field Officer, Region III, U. S. Geological Survey, Office of Minerals Exploration, Building 25, Federal Center, Denver, Colorado 80225.

The Regional Office will notify you if additional information is needed.

Sincerely yours,

FRANK E. JOHNSON

(RK)

Frank E. Johnson
Chief, Office of
Minerals Exploration

cc: Director's Reading File
Division File
Economic Geology File
OME Reading File
Region III
Smith
RMSmith/mm (5/3/66)

23263

SPENST M. HANSEN, PH.D.
MINING GEOLOGIST
125 SEDGEFIELD COURT
DUBLIN, CALIFORNIA 94539

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April 16, 1966

United States Department of the Interior
Office of Minerals Exploration
Geological Survey
Washington 25, D.C.

Re: OME-6548 (Silver)
Big Treasure Mining and Development Co.
Little Treasure and Adjust Mines
Pinal County, Arizona

Dear Sirs:

Thank you for your letter of April 7th regarding our application for exploration assistance. I have provided herewith part of the additional information you requested. The balance of the information will be forwarded to you under separate cover within a few days. Thank you also for our telephone discussion of yesterday.

2. Our attorney has prepared the necessary assignments from Chester L. Whitelock and Spenst M. Hansen to the Big Treasure Mining and Development Co. No overriding interest is held back from Big Treasure on any of the properties. These will be forwarded to you as soon as they have been properly executed and notarized.

Regarding the Concord and Trenton patented claims currently under lease by Big Treasure Mining Co. are not to be subject to government royalty because of the refusal of the owner to sign Lien and Subordination Agreements. Pursuant to our telephone discussion I have modified the placement of the drill holes to prevent their benefiting these two claims. No work is planned within 100 feet of the boundaries of these claims, and geologic trends that can be extended into these claims are avoided. Please notice also that these two claims have been more carefully plotted on the enclosed claim map overlay. This more accurate plot was made possible as a result of my obtaining the original survey plat from the patent survey. Drill hole number 2 directly benefits the King Edward No. 1 claim, and does not benefit the Trenton patented claim except in a general way. The location of Drill Hole number 2 can be further changed if necessary. However, alteration and mineralization in this area is intense, and I feel that a drill hole here is justified. Further movement to the southwest will probably accomplish much the same result, but will result in additional expense from road building and drill site preparation

Not nec.

3. Physical description. I trust the enclosed map showing the location and names of the individual veins, the positions of

individual claims, and proposed drill sites will be sufficient for your needs. Since the date of our original application, we have added 6 (six) additional unpatented lode mining claims, and desire to have them added to the application tract. These are named King Chester No. 4, King Chester No. 5, King Chester No. 6, King Chester No. 7, King Chester No. 8, and Treasure. They will be included in the assignment agreements and in any lien and subordination agreements executed. These claims are currently held by the Big Treasure Mining Co.

7. Since submitting the original application, I learned that TD-14 bulldozers are not available for rent in the area equipped with hydraulic attachments. I have accompanied several earthmoving experts to the property in recent weeks (including John F. Mercer Jr., Owner of Mercer Construction Co., Globe) and have been advised that the work can best be performed with the larger D-8, model 46A bulldozer. I therefore suggest that the available D-8 equipment be utilized, per bids enclosed with the original application.

I have contacted by telephone the survey contractors in Arizona that we plan to have perform the mine working and drill hole surveying. I will forward their bids under separate cover as soon as they are received by me.

Sec 2 & Sec 3
Sec 34

Please notice on the photo over-lay map that because of the more accurate location of the Trenton (2180) patented claim it is now necessary to modify the planned underground drilling in order to assure that no work is done within 100 feet of the boundary of this claim. One hole has been moved from the east side of the trend of the Silver King Drift to the west side as shown. The length of this hole has also been changed from 1050 feet to 1,000 feet. Its angle of inclination below the horizontal remains unchanged. The drill hole extending 750 feet from the end of the drift remains unchanged. The third drill hole (800 feet to the S.E. at an angle of 30° below horizontal) has been eliminated, with the 800 feet of drill footage plus the 50 feet of drill footage reduced from the other underground drill hole to be utilized elsewhere on the property as described in the following paragraph.

Silver Lode claim

?

-30°

Please notice that the following changes have been made on the planned surface drilling. I feel these are constructive changes and are made on the basis of further geologic evidence, and as a result of the nuisance presented by the Trenton claim not being subordinated. The proposed drill holes as of this date are tabulated below:

Surface Drill Hole 1-------Planned depth 1,000 feet. Inclination from the horizontal--60°. Location--unchanged. The only change here is the angle of inclination being increased from 45° to 60°.

Surface Drill Hole 2-------Planned depth 1,000 feet. Inclination from the horizontal--45°. Location--moved about 100 feet to the S.W. Only change is location.

Purpose ?

Surface Drill Hole 3 (No Change)-----Depth--1,500 feet. Inclination--vertical.

Surface Drill Hole 4 (No change)-----Depth--1,000 feet. Inclination from the horizontal--45°.

Surface Drill Hole 5-------Planned depth--750 feet. Inclination from the horizontal--45°. Location--unchanged. Only change is the increase in length of hole from 400 to 750 feet. This extra 350 feet is part of the 850 feet eliminated from the underground drilling.

Surface Drill Hole 6-------Planned depth 500 feet. Inclination--45° from the horizontal. Location as shown on the Treasure claim. This hole was not included on the original application. The 500 feet of hole proposed here includes the remainder of the footage eliminated from the underground portion of the drilling program. This hole is positioned so as to explore the extension of the Big Rock vein system. This silver vein system has had considerable production in the past, mainly in the 1900 to 1915 production period. Mining widths along this vein have varied up to 6½ feet.

The costs of the exploration work on the original application should be amended as follows:

Elimination of 850 feet of underground diamond drilling at an average cost of $10.13 per foot should result in a reduction of $8,610.50.

Addition of 850 feet of surface diamond drilling at an average cost of $10.48 per foot should result in an addition of $8,908.

This results in the addition of $297.50 to the total cost of the project. The total drilling footage remains the same. In my opinion, this modification improves the chances for success of the project, in that one additional vein with a good production history will be explored, and one hole will be deepened to increase its probability of successfully exploring the Little Treasure vein system.

Very truly yours

Spenst M. Hansen

Spenst M. Hansen

Form 7
(2/63)

OFFICIAL FILE COPY

| Date | Surname | Code |
|---|---|---|
| 4/6 | R M Smith | 130 |
| 4/7 | Kirkamo | 130K |
| | | 110 |
| 4/7 | Cal | 220 |
| | | 130M |
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| | | |
| | | |

AIRMAIL

Big Treasure Mining and Development Co.
123 Sedgefield Court
Mobile, California 94339

APR 7 1966

Re: [illegible]-6148 (Silver-Gold)
Big Treasure Mining and Development Co.
Little Treasure and Adjust Mines
Pinal County, Arizona

Gentlemen:

Preliminary review of your well prepared application for financial assistance in exploring the referenced mines indicates that to continue its processing additional information is needed on Items 2, 3, and 7, as requested in the application form.

2. Applicant's Rights in Land

Please submit one copy each of the two Assignments of mining claims from Chester L. Whitelock to Big Treasure Mining and Development Co. If Mr. Whitelock retains an overriding interest in either group of claims he should execute a Lien and Subordination Agreements.

Your cover letter of March 3, 1966 states that the Concord and Trenton patented claims are leased to your company but are not to be subject to Government royalty because the owner has refused to sign Lien and Subordination Agreements.

Please clarify further why a discovery by the proposed work would not result in production from these two claims. Alternatively, would your company be willing to furnish a Performance Bond for the amount of the Government's participation if a contract were granted?

3. Physical description

The photo-overlay map in the application shows the outline of the property, 12 veins, and the locations of the proposed drill holes. Please submit a map on the same or on a larger scale indicating the boundaries and names of the individual claims and the names of the individual veins and their dip directions. It will be a convenience to us if the locations of the proposed drill holes are also shown on the new map.

23263

7. Estimate of Costs

The figure of $3,096 for bulldozing with a TD-14 is not supported by a bid. Is this work to be performed by an independent contractor or by the Applicant? If contracted, a copy of the bid should be submitted.

Surveying of drill holes and mine workings is to be performed by an independent contractor. Please submit three bids if possible for this work.

This request for additional information should not be construed as a commitment by the Government to grant an exploration contract. We shall hold the further processing of your application in abeyance until the requested data are received.

Sincerely yours,

FRANK E. JOHNSON

Frank E. Johnson
Chief, Office of
Minerals Exploration

cc: Director's Reading File
Division File
Economic Geology File
OME Docket
OME Reading File
Region III
Mr. Smith

RMSmith/mm (4/6/66)

March 30, 1966

Big Treasure Mining and
Development Co.
125 Sedgefield Court
Dublin, California 94539

Subject: OME-6548

Gentlemen:

Your application for exploration assistance, dated February 25, 1966, submitted to our office at Denver, Colorado, has been assigned Docket No. OME-6548.

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

Sincerely yours,

Frank E. Johnson
Chief, Office of
Minerals Exploration

Copy to Region III